


SERVO AMPLIFIERS & MOTORS

MITSUBISHI SERVO AMPLIFIERS & MOTORS

MELSERVO J4



A photograph of the Aurora Borealis (Northern Lights) in a dark sky, with vibrant green and yellow light streaks. Below the sky, a city skyline is visible at night, with numerous lights from buildings and streets. The overall scene is a composite image used for a Mitsubishi MELSERVO advertisement.

MITSUBISHI SERVO AMPLIFIERS & MOTORS

MELSERVO-A large, bold, black letter 'J' that is part of the 'MELSERVO-J' logo. It is positioned to the right of the 'MELSERVO-' text and extends downwards, partially overlapping the city skyline at the bottom of the image.

Man, machine and environment in

4



perfect harmony

MELSERVO-J4 — trusted technology makes an evolutionary leap forward

Introducing the MELSERVO-J4 series. Offering more than just improved performance, these servos are designed to drive the industries of tomorrow. Backed by Mitsubishi leadership in all-digital technology, MELSERVO has become one of the most globally respected names in factory automation. And now — with the safety, ease of use, and energy-efficient design of the new MELSERVO-J4 series — man, machine and environment can at last work together in perfect harmony.

A complete system lineup to meet your production and manufacturing

Responding to expanding applications such as semiconductor and LCD manufacturing, machine tools, robots, and food processing machines, Electric's other product lines such as Motion controllers, servo system networks as well as displays and programmable controllers. MELSERVO-J4

HUMAN MACHINE I/F

Graphic Operation Terminal



GOT2000/GOT1000 series

PC/AT compatible computer



SOFTWARE



CONTROLLER

Programmable controllers



MELSEC iQ-R series



MELSEC-Q series



MELSEC-QS/WS series

Motion controller



SSCNET III/H compatible
Motion controller
R32MTCPU
R16MTCPU



SSCNET III/H compatible
Stand-Alone Motion controller
Q170MSCPU
Q170MSCPU-S1

Simple Motion module



SSCNET III/H compatible
Simple Motion module
RD77MS16/RD77MS8
RD77MS4/RD77MS2



SSCNET III/H compatible
Simple Motion module
LD77MS16
LD77MS4
LD77MS2

C Controller Interface Module



SSCNET III/H compatible
C Controller Interface Module
Q173SCCF

SSCNET III/H compatible Position Board



SSCNET III/H compatible
Position Board
MR-MC210
MR-MC211

NETWORK

SSCNET III/H serial bus



CC-Link IE Field Network

Pulse train input

SERVO AMPLIFIER

MR-J4-B/MR-J4W2-B/MR-J4W3-B



SSCNET III/H compatible
servo amplifier
MR-J4-B(-RJ)



SSCNET III/H compatible
2-axis servo amplifier
MR-J4W2-B



SSCNET III/H compatible
3-axis servo amplifier
MR-J4W3-B

MR-J4-B-RJ010 +MR-J3-T10



CC-Link IE Field Network
servo amplifier with Motion
MR-J4-B-RJ010
+MR-J3-T10

MR-J4-A



General-purpose interface
compatible servo amplifier
MR-J4-A(-RJ)

SERVO MOTOR

Rotary servo motor



Small capacity,
low inertia
HG-KR series
Capacity: 50 to 750 W



Small capacity,
ultra-low inertia
HG-MR series
Capacity: 50 to 750 W



Medium capacity,
medium inertia
HG-SR series
Capacity: 0.5 to 7 kW



Medium/large
capacity,
low inertia
HG-JR series
Capacity: 0.5 to 55 kW



Medium capacity,
ultra-low inertia
HG-RR series
Capacity: 1 to 5 kW



Medium capacity,
flat type
HG-UR series
Capacity: 0.75 to 5 kW

Linear servo motor



Core type
LM-H3 series
Rating: 70 to 960 N



Core type with magnetic
attraction counter-force
LM-K2 series
Rating: 120 to 2400 N

*1. For the combination, refer to "Combinations of 1-Axis Servo Amplifier and Servo Motor" on pp. 1-3 to 1-5, and "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-6.

SOLUTION



Mitsubishi Electric's integrated FA solution for achieving seamless information collaboration between information systems and control systems, and enabling lateral integration of production sites.



needs

MELSERVO-J4 is flexibly coordinated with Mitsubishi allows you to freely create an advanced servo system.

Programmable Controller Engineering Software — MELSOFT **GX Works3**

Motion Controller Engineering Software — MELSOFT **MT Works2**

Servo Setup Software — MELSOFT **MR Configurator2**

Capacity Selection Software



MELSEC-L series



MELSEC-F series

Simple Motion module



CC-Link IE
Field Network
Simple Motion module
QD77GF16

Positioning module



RD75P2/4
RD75D2/4



LD75P1/2/4
LD75D1/2/4



FX2N-10PG

LOW-VOLTAGE SWITCHGEAR

Molded-case circuit breaker



WS-V

Magnetic contactor



MS-T



Core type
(natural/liquid cooling)
LM-F series
Rating: 300 to 3000 N
(natural cooling)
Rating: 600 to 6000 N
(liquid cooling)



Coreless type
LM-U2 series
Rating: 50 to 800 N

Direct drive motor



TM-RFM series
Rating: 2 to 240 N·m

Mitsubishi Electric's integrated FA platform for achieving lateral integration of controllers & HMI, engineering environments and networks at production sites.

MELSERVO-J4

I N D E X

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■ Harmony with Man

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■ Heritage

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■ Product Specifications

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MELSERVO-J4 Product Lines





■ Servo amplifier

●: Compatible —: Not compatible

Servo amplifier (Note 6)		Number of control axes	Power supply specifications	Rated output [kW] (Note 1, 4)	Command interface				Control mode				Compatible servo motor series													
					SSCNET III/H	CC-Link IE Field	Pulse train	Analog voltage	RS-422 multi-drop	Position	Speed	Torque	Positioning function	Fully closed loop control (Note 2)	HG-KR	HG-MR	HG-SR	HG-JR	HG-RR	HG-UR	LM-H3	LM-F	LM-K2	LM-U2	TM-RFM	
SSCNET III/H interface		1 axis	1-phase 100 V AC	0.1, 0.2, 0.4	●	—	—	—	—	●	●	●	—	●	●	●	—	—	—	—	—	●	—	●	●	●
			3-phase 200 V AC	0.1, 0.2, 0.4, 0.6, 0.75, 1, 2, 3.5, 5, 7, 11, 15, 22, 30, 37	●	—	—	—	—	●	●	●	—	●	●	●	●	●	●	●	●	●	●	●	●	●
			3-phase 400 V AC	0.6, 1, 2, 3.5, 5, 7, 11, 15, 22, 30, 37, 45, 55	●	—	—	—	—	●	●	●	—	●	—	●	●	—	—	—	—	●	—	—	—	—
		2 axes	3-phase 200 V AC	0.2, 0.4, 0.75, 1	●	—	—	—	—	●	●	●	—	●	●	●	●	—	●	●	—	—	●	●	●	●
	3 axes	3-phase 200 V AC	0.2, 0.4	●	—	—	—	—	●	●	●	—	—	●	●	—	—	—	—	●	—	—	●	●	●	
CC-Link IE Field Network interface with Motion		1 axis	3-phase 200 V AC	0.1, 0.2, 0.4, 0.6, 0.75, 1, 2, 3.5, 5, 7, 11, 15, 22	—	●	—	—	—	●	●	●	—	—	●	●	●	●	●	—	—	—	—	—	—	
			3-phase 400 V AC	0.6, 1, 2, 3.5, 5, 7, 11, 15, 22	—	●	—	—	—	●	●	●	—	—	—	—	●	●	—	—	—	—	—	—	—	
General-purpose Interface		1 axis	1-phase 100 V AC	0.1, 0.2, 0.4	—	—	●	●	●	●	●	●	(Note 3)	●	●	—	—	—	—	—	●	—	●	●	●	
			3-phase 200 V AC	0.1, 0.2, 0.4, 0.6, 0.75, 1, 2, 3.5, 5, 7, 11, 15, 22, 30, 37	—	—	●	●	●	●	●	●	●	(Note 3)	●	●	●	●	●	●	●	●	●	●	●	
			3-phase 400 V AC	0.6, 1, 2, 3.5, 5, 7, 11, 15, 22, 30, 37, 45, 55	—	—	●	●	●	●	●	●	●	(Note 3)	●	—	—	●	—	—	—	—	—	●	—	—

- Notes: 1. The listed are the rated output of the servo amplifier. For the compatible servo motor capacities, refer to "Combinations of 1-Axis Servo Amplifier and Servo Motor" on pp. 1-3 to 1-5, and "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-6.
2. MR-J4-B/A servo amplifier is compatible with two-wire type serial linear encoder. For four-wire type serial and pulse train interface (A/B/Z-phase differential output type) linear encoders, Use MR-J4-B-RJ/A-RJ servo amplifier.
3. Positioning function is available only with MR-J4-A-RJ.
4. 30 kW or larger is drive unit. One unit of converter unit is required for each drive unit.
5. MR-J4-B/A servo amplifier is compatible with two-wire type and four-wire type serial linear encoders. For pulse train interface (A/B/Z-phase differential output type) linear encoder, use MR-J4-B-RJ/A-RJ servo amplifier.
6. Some functions are available only with the servo amplifier with specific versions. Refer to relevant Servo Amplifier Instruction Manual for detail.

■ Linear servo motor






	Linear servo motor series	Maximum speed [m/s]	Continuous thrust [N]	Maximum thrust [N]	Cooling method	Features	Application examples
Core type	<div>LM-H3 series</div> <div></div>	3.0	9 types 70, 120, 240, 360, 480, 720, 960	175, 300, 600, 900, 1200, 1800, 2400	Natural cooling	Suitable for space-saving. Compact size and high thrust. Maximum speed: 3 m/s.	•Semiconductor mounting systems •Wafer cleaning systems •LCD assembly machines •Material handlings
	<div>LM-F series</div> <div></div>	2.0	8 types 300, 600, 900, 1200, 1800, 2400, 3000	1800, 3600, 5400, 7200, 10800, 14400, 18000	Natural cooling	Compact size. The integrated liquid-cooling system doubles the continuous thrust.	•Press feeders •NC machine tools •Material handlings
	2.0	8 types 600, 1200, 1800, 2400, 3600, 4800, 6000	1800, 3600, 5400, 7200, 10800, 14400, 18000	Liquid cooling			
	<div>LM-K2 series</div> <div></div>	2.0	7 types 120, 240, 360, 720, 1200, 1440, 2400	300, 600, 900, 1800, 3000, 3600, 6000	Natural cooling	High thrust density. Magnetic attraction counter-force structure enables longer life of the linear guides and lower audible noise.	•Semiconductor mounting systems •Wafer cleaning systems •LCD assembly machines
Coreless type	<div>LM-U2 series</div> <div></div>	2.0	9 types 50, 75, 100, 150, 225, 400, 600, 800	150, 225, 300, 450, 675, 1600, 2400, 3200	Natural cooling	No cogging and small speed fluctuation. No magnetic attraction force structure extends life of the linear guides.	•Screen printing systems •Scanning exposure systems •Inspection systems •Material handlings

Note: 1. : For 400 V.



Rotary servo motor

●: Available —: Not available

Rotary servo motor series	Rated speed (maximum speed) [r/min]	Rated output [kW] (Note 1)	Servo motor type			IP rating (Note 3)	Replaceable series	Features	Application examples
			With electro-magnetic brake (B)	With reducer (G1) (Note 2)	With reducer (G5, G7) (Note 2)				
Small capacity 	HG-KR series	3000 (6000)	5 types 0.05, 0.1, 0.2, 0.4, 0.75	●	●	●	IP65	HF-KP series	Low inertia Perfect for general industrial machines. •Belt drives •Robots •Mounters •Sewing machines •X-Y tables •Food processing machines •Semiconductor manufacturing equipment •Knitting and embroidery machines
	HG-MR series	3000 (6000)	5 types 0.05, 0.1, 0.2, 0.4, 0.75	●	—	—	IP65	HF-MP series	Ultra-low inertia Well suited for high-throughput operations. •Inserters •Mounters
Medium capacity 	HG-SR series	1000 (1500)	6 types 0.5, 0.85, 1.2, 2.0, 3.0, 4.2	●	—	—	IP67	HF-SP series	Medium inertia This series is available with two rated speeds. •Material handling systems •Robots •X-Y tables
		2000 (3000)	14 types 0.5, 1.0, 1.5, 2.0, 3.5, 5.0, 7.0 0.5, 1.0, 1.5, 2.0, 3.5, 5.0, 7.0	●	●	●	IP67		
Medium/large capacity 	HG-JR series	3000 (6000: 0.5 to 5 kW 5000: 7, 9 kW)	18 types 0.5, 0.75, 1.0, 1.5, 2.0, 3.5, 5.0, 7.0, 9.0 0.5, 0.75, 1.0, 1.5, 2.0, 3.5, 5.0, 7.0, 9.0	●	—	—	IP67	HF-JP series	•Food packaging machines •Printing machines
		1500 (3000: 7 to 15 kW 2500: 22 to 55 kW)	14 types 7.0, 11, 15, 22, 30, 37 7.0, 11, 15, 22, 30, 37, 45, 55	● (Note 5)	—	—	IP67/ IP44 (Note 4)	HF-JP HA-LP series	Low inertia Well suited for high-throughput and high-acceleration/deceleration operations. •Injection molding machines •Press machines
		1000 (2000: 6 to 12 kW 1500: 15 to 37 kW)	16 types 6.0, 8.0, 12, 15, 20, 25, 30, 37 6.0, 8.0, 12, 15, 20, 25, 30, 37	● (Note 5)	—	—	IP67/ IP44 (Note 4)	HA-LP series	
Medium capacity 	HG-RR series	3000 (4500)	5 types 1.0, 1.5, 2.0, 3.5, 5.0	●	—	—	IP65	HC-RP series	Ultra-low inertia Well suited for high-throughput operations. •Ultra-high-throughput material handling systems
Medium capacity, flat type 	HG-UR series	2000 (3000: 0.75 to 2 kW 2500: 3.5, 5 kW)	5 types 0.75, 1.5, 2.0, 3.5, 5.0	●	—	—	IP65	HC-UP series	Flat type The flat design makes this unit well suited for situations where the installation space is limited. •Robots •Food processing machines

Notes: 1.  : For 400 V.


2. G1 for general industrial machines. G5 and G7 for high precision applications.

3. The shaft-through portion is excluded. Refer to the asterisk 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion. For geared servo motor, IP rating of the reducer portion is equivalent to IP44.

4. For HG-JR1500 r/min series, 15 kW or smaller is rated IP67, and 22 kW or larger is rated IP44. For HG-JR 1000 r/min series, 12 kW or smaller is rated IP67, and 15 kW or larger is rated IP44.

5. The servo motor with electromagnetic brake is not available for HG-JR 1500 r/min series 22 kW or larger, and 1000 r/min series 15 kW or larger.

Direct drive motor

Direct drive motor series	Motor outer diameter [mm]	Hollow shaft diameter [mm]	Rated speed [r/min]	Maximum speed [r/min]	Rated torque [N·m]	Maximum torque [N·m]	IP rating (Note 1)	Features	Application examples
TM-RFM series 	φ130	φ20	200	500	3 types 2, 4, 6	6, 12, 18	IP42	•Suitable for low-speed and high-torque operations. •Smooth operation with less audible noise. •The motor's low profile design contributes to compact construction and a low center of gravity for enhanced machine stability. •Clean room compatible.	•Semiconductor manufacturing devices •Liquid crystal manufacturing devices •Machine tools
	φ180	φ47	200	500	3 types 6, 12, 18	18, 36, 54	IP42		
	φ230	φ62	200	500	3 types 12, 48, 72	36, 144, 216	IP42		
	φ330	φ104	100	200	3 types 40, 120, 240	120, 360, 720	IP42		

Note: 1. Connectors and gap between rotor and stator are excluded.

Machine



MITSUBISHI SERVO AMPLIFIERS & MOTORS
MELSERVO-

J4

The leading edge in drive control,
with unrivaled accuracy and
response for next-generation
machine performance.

Backed by Mitsubishi MELSERVO's
global track record of proven reliability,
the new MR-J4 takes machine
performance to the highest level.

Industry leading level 2.5 kHz speed frequency response, with servo amplifiers, servo motors, and optical networks linked in symphonic productivity

MELSERIO-J4

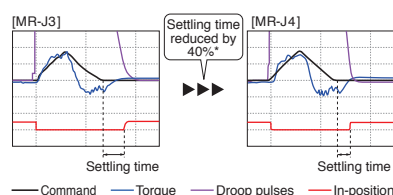
Industry-leading Basic Performance

Industry-Leading Level of Servo Amplifier Basic Performance

Industry-leading levels

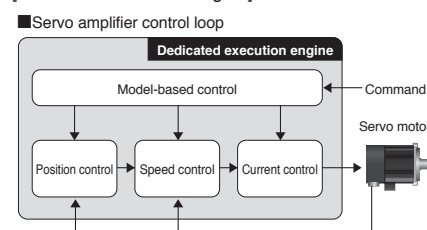
Our original high-speed servo control architecture is evolved from the conventional two-degrees-of-freedom model adaptive control and applied to the dedicated execution engine. **Speed frequency response is increased to 2.5 kHz.** Compatible servo motors are equipped with a **high-resolution absolute position encoder of 4,194,304 pulses/rev (22-bit)**, enabling high-speed and high-accuracy operation. The performance of the high-end machine is utilized to the fullest.

[Settling time comparison with the prior model]



* The result is based on our evaluation condition.

[Dedicated execution engine]

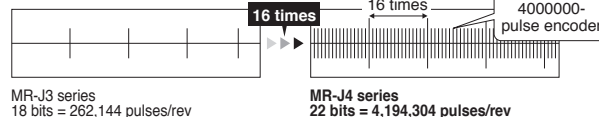


Improving Machine Performance with High-performance Servo Motors

Industry-leading levels

Rotary servo motors achieve high-accuracy positioning and smooth rotation with a high-resolution encoder and improved processing speed.

[Resolution comparison with the prior model]



MELSERIO-J4

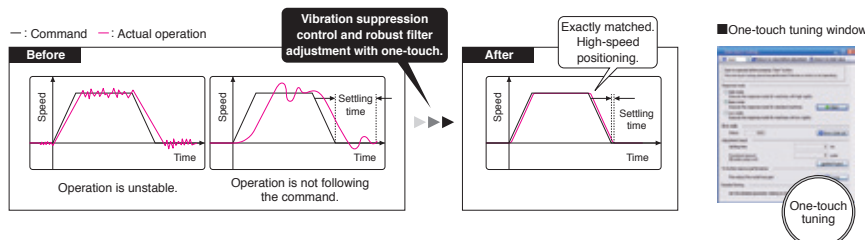
Advanced Servo Gain Adjustment Function

Advanced One-touch Tuning Function

Enhanced functions

Servo gain adjustment is complete just by turning on the one-touch tuning function. With this function, machine resonance filter, advanced vibration suppression control II*, and robust filter are automatically adjusted to maximize your machine performance. This function also sets responsivity automatically while the real-time auto tuning requires manual setting.

* The advanced vibration suppression control II automatically adjusts one frequency.

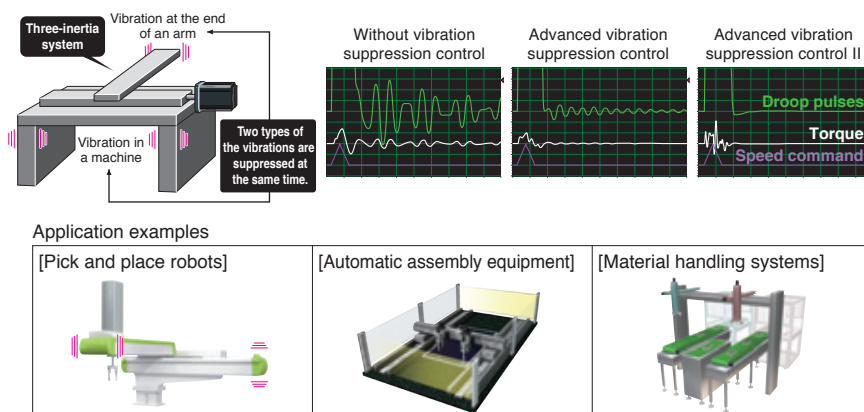


Advanced Vibration Suppression Control II

Patent pending

Enhanced functions

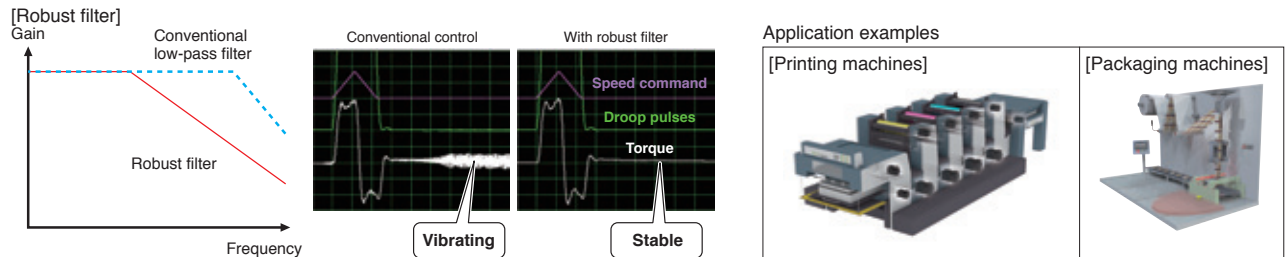
The advanced vibration suppression control II suppresses two types of low frequency vibrations owing to vibration suppression algorithm which supports three-inertia system. This function is effective in suppressing residual vibration with relatively low frequency of approximately 100 Hz or less generated at the end of an arm and in a machine, enabling a shorter settling time. Adjustment is easily performed on MR Configurator2.



Robust Filter

Patent pending NEW

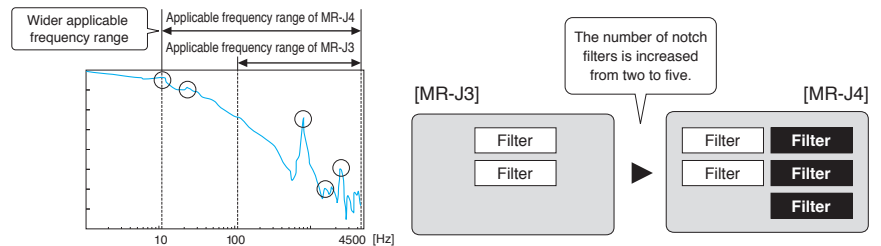
Achieving both high responsivity and stability was difficult with the conventional control in high-inertia systems with belts and gears such as printing and packaging machines. Now, this function enables the high responsivity and the stability at the same time without adjustment. The robust filter gradually reduces the fluctuation of torque in a wide frequency range and achieves more stability as compared to the prior model.



Expanded Machine Resonance Suppression Filter

Enhanced functions

With advanced filter structure, applicable frequency range is expanded from between 100 Hz and 4500 Hz to between 10 Hz and 4500 Hz. Additionally, the number of simultaneously applicable filters is increased from two to five, improving vibration suppression performance of a machine.

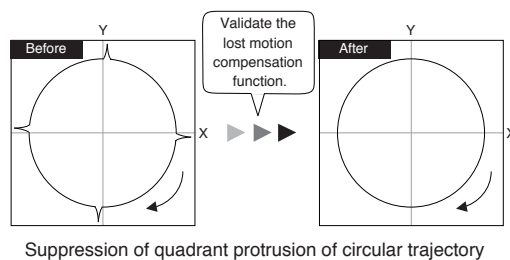


Lost Motion Compensation Function

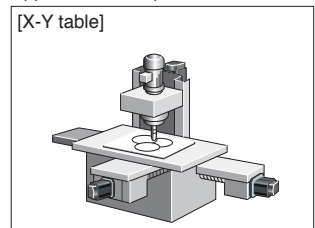
NEW

This function suppresses quadrant protrusion caused by friction and torsion generated when the servo motor rotates in reverse direction. Therefore, the accuracy of circular path will be improved in trajectory control used in XY table, etc.

* This function is not available with MR-J4-B-RJ010/ MR-J4W2-B/MR-J4W3-B.



Application example



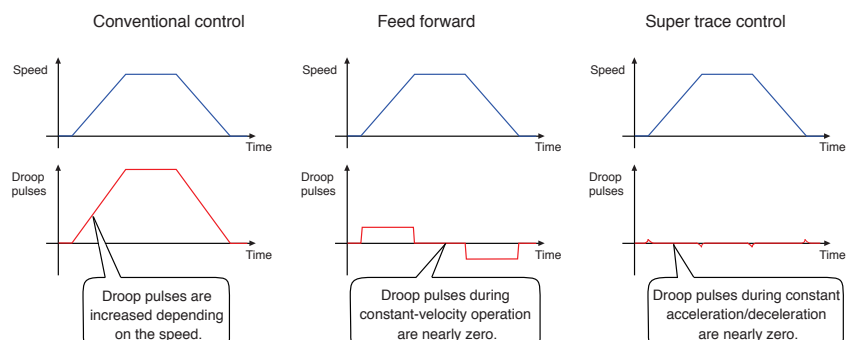
Super Trace Control

NEW

This function controls droop pulse to nearly zero not only during constant operation, but also during constant acceleration/deceleration.

The trajectory accuracy will be improved in high rigidity machines.

* This function is not available with MR-J4-B-RJ010/ MR-J4W2-B/MR-J4W3-B.



Tightening & Press-fit Control

RnMTCPU

Q17nDSCPU

Q170MSCPU

Patent pending

NEW

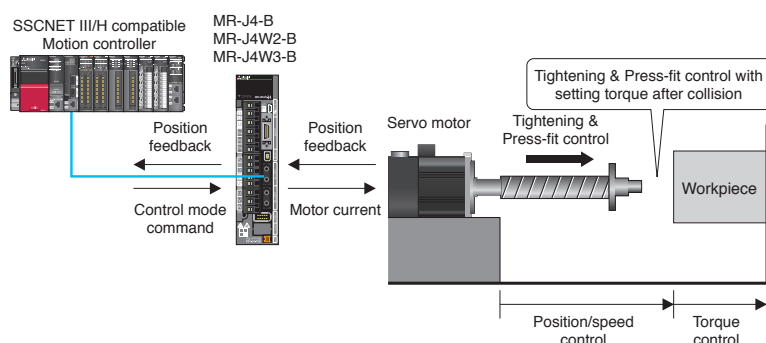
RD77MS

QD77MS

LD77MS

Position/speed control switches to torque control smoothly without stopping or changing the speed or the torque rapidly. Load to the machine is reduced, and high-quality molding is achieved for an application where control is switched from position to torque such as Tightening & Press-fit control or insertion of a work, and cap or screw tightening.

* Available in MR-J4-B/MR-J4W2-B/MR-J4W3-B.

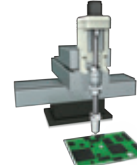


Application examples

[Press-fit machines]



[Screw tightening machines]



Master-slave Operation Function

RnMTCPU

Q17nDSCPU

Q170MSCPU

NEW

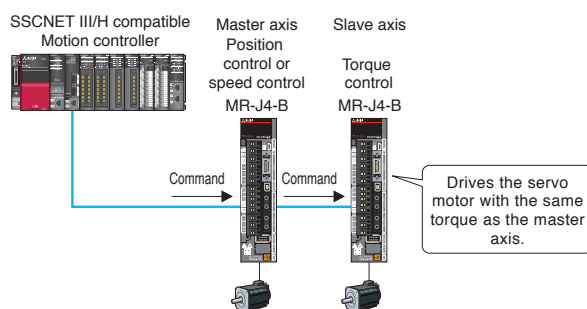
RD77MS

QD77MS

LD77MS

For MR-J4-B servo amplifier*, the master-slave operation function transmits a master axis torque to slave axes using driver communication, and the torque as a command drives slave axes by torque control. Since torque data is transmitted from the master axis to slave axes via SSCNET III/H, additional wiring is not required.

* This function is available with MR-J4-B servo amplifier with software version A8 or later.



Application examples

[Press machines]



[Material handling systems]



Scale Measurement Function

RnMTCPU

Q17nDSCPU

Q170MSCPU

NEW

RD77MS

QD77MS

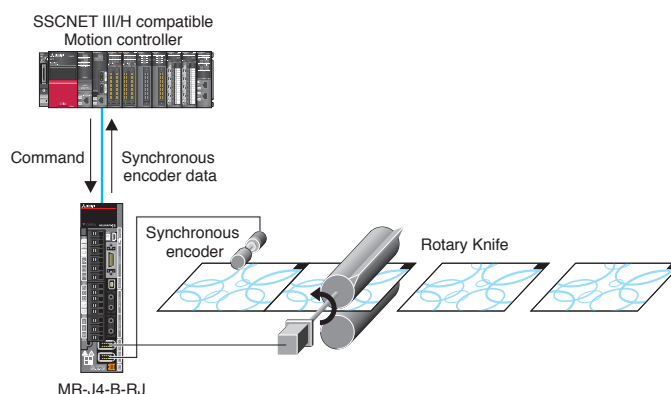
LD77MS

For MR-J4-B*(-RJ)/MR-J4W2-B servo amplifier*¹, the scale measurement function enables to transmit position information of a scale measurement encoder to the controller when the scale measurement encoder is connected in semi closed loop control.

The data of linear or synchronous encoders are transmitted to the servo system controller via the servo amplifier, achieving less wiring.

¹. This function is available with the MR-J4-B(-RJ)/MR-J4W2-B servo amplifier with software version A8 or later.

*². Use corresponding servo amplifier (MR-J4-B or MR-J4-B-RJ) for load-side encoder.



Fully closed loop control supported as standard.
Operate rotary servo motors, linear servo motors, or direct drive motors.

MELSERIO-J4

Applicable for Various Control and Driving Systems

Compatible Servo Motors

MR-J4 series servo amplifier operates rotary servo motors, linear servo motors, and direct drive motors as standard*.

* Not all of the servo amplifiers are compatible with all three of these servo motors. For the combination, refer to "Product lines" on p. 35 in this catalog.



Rotary servo motor



Linear servo motor



Direct drive motor

1-axis/2-axis/3-axis Servo Amplifiers

For SSCNET III/H compatible servo amplifiers, 2-axis and 3-axis types are available in addition to 1-axis type, enabling flexible systems based on the number of control axes.



MR-J4-B



MR-J4W2-B



MR-J4W3-B

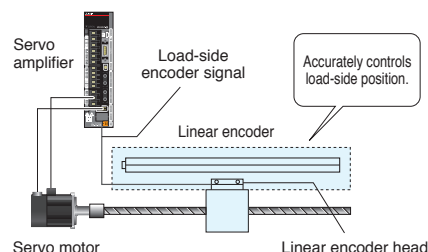
Compatible with Fully Closed Loop Control

Standard equipment

MR-J4-B/MR-J4-A servo amplifier is compatible with fully closed loop control system*. Accurate control of load-side position is achieved.

* MR-J4-B/MR-J4-A servo amplifier is compatible with two-wire type serial linear encoder. For four-wire type serial and pulse train interface (A/B/Z-phase differential output type) linear encoders, MR-J4-B-RJ/MR-J4-A-RJ servo amplifier is available.

* Some models are not compatible with the fully closed loop control system. Refer to "Product lines" on p. 35 in this catalog.

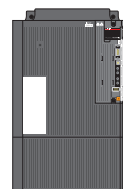


Wide Range of Power Supplies and Capacities

For MR-J4-B/MR-J4-A servo amplifier, 1-phase 100 V AC main circuit power supply type is added to product lines in addition to 3-phase 200 V AC and 3-phase 400 V AC. Capacities varying from 100 W to 55 kW are available for MR-J4 series servo amplifier.



MR-J4-10B1



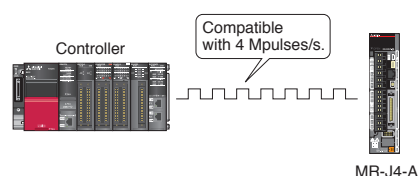
MR-J4-22KB



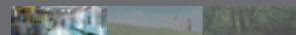
MR-CR55K4 + MR-J4-DU55KB4

Maximum Command Pulse Frequency

General-purpose interface compatible
MR-J4-A servo amplifier supports maximum command pulse frequency of 4 Mpulses/s.



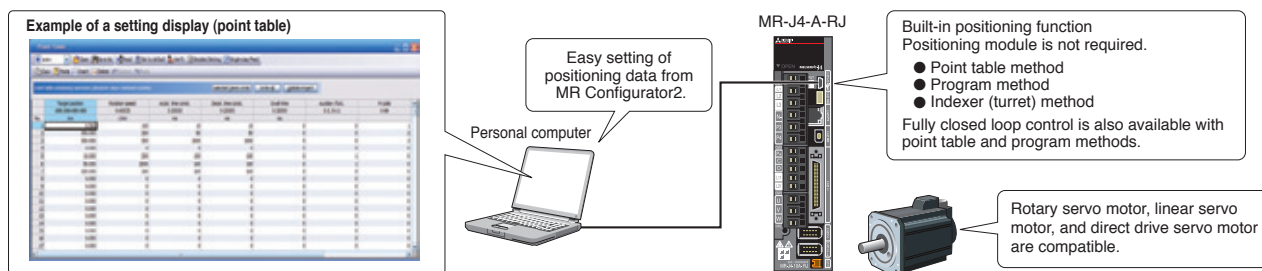
MR-J4-A



Servo Amplifier with Built-in Positioning Function

NEW

Positioning operation with point table, program, and indexer (turret) methods became capable by built-in positioning function in MR-J4-A-RJ^{*1}, allowing to configure positioning system without controller such as Positioning module. Command interface is selectable from DI/O and RS-422 serial communication (maximum 32 axes). The positioning data can be set from MR Configurator2^{*2} easily.



^{*1} Use MR-J4-A-RJ servo amplifiers with software version B3 or later when using the positioning function.

^{*2} Be sure to update your MR Configurator2 to the latest version.

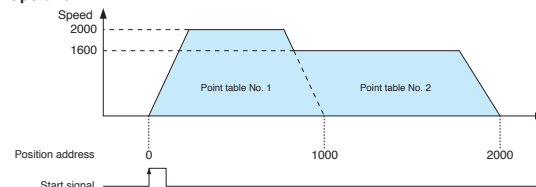
Point table method

Setting position data (target position), servo motor speed, and acceleration/deceleration time constants in point table is as easy as setting a parameter. Up to 255 points are settable for the point table. The positioning operation is performed with a start signal after selecting the point table No.

Point table example

Point table No.	Position data	Servo motor speed	Acceleration time constant	Deceleration time constant	Dwell	Sub function	M code
1	1000	2000	200	200	0	1	1
2	2000	1600	100	100	0	0	2
...
255	3000	3000	100	100	0	2	99

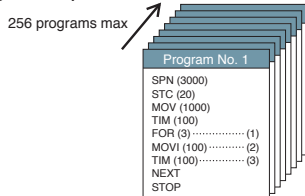
Operation



Program method*

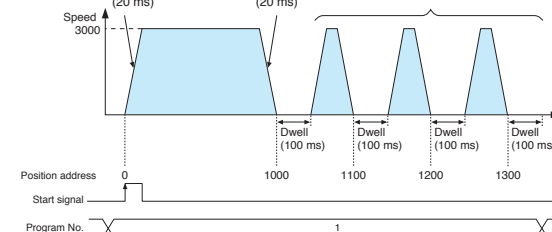
Create positioning programs with dedicated commands. The positioning operation is performed with a start signal after selecting the program No. The program method enables more complex positioning operation than the point table method. Maximum of 256 programs are settable. (The total number of steps of program: 640)

Program example



* MR Configurator2 is required to create programs.

Operation



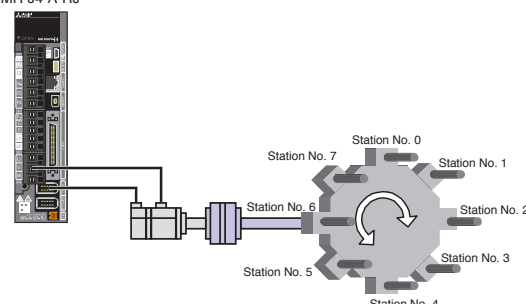
Indexer (turret) method*

Positioning operation is performed by specifying equally divided stations (up to 255 stations). By setting the number of teeth on load and motor sides and equally divided stations, the travel distance will be calculated automatically. The positioning operation is performed with a start signal after selecting the station position No.

In addition to rotation direction specifying indexer and shortest rotating indexer, backlash compensation and override function are also available.

* Fully closed loop control mode and linear servo motor control mode are not available with the indexer (turret) method.

MR-J4-A-RJ



SSCNET III/H

SERVO SYSTEM CONTROLLER NETWORK

The blazingly fast

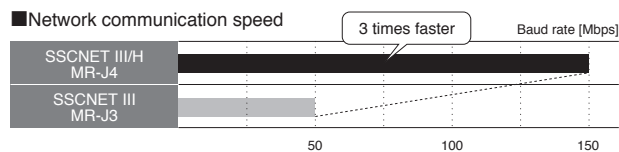
MELSERVO-J4

High-response System Achieved with SSCNET III/H

Three Times Faster Communication Speed

Industry-leading levels

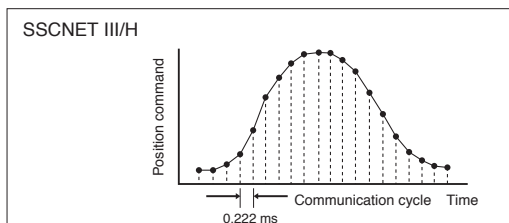
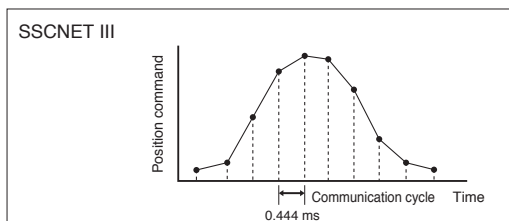
Communication speed is increased to 150 Mbps full duplex (equivalent to 300 Mbps half duplex), three times faster than the conventional speed. System response is dramatically improved.



Cycle Times as Fast as 0.222 ms

Industry-leading levels

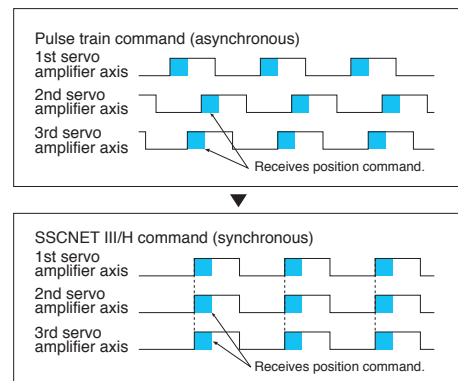
Smooth control of machine is possible using high-speed serial communication with cycle times of 0.222 ms.



Deterministic and Synchronized Communication

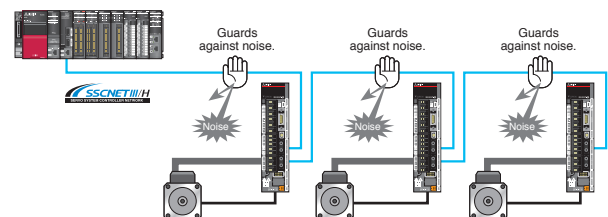
Complete deterministic and synchronized communication is achieved with SSCNET III/H, offering technical advantages in machines such as printing and food processing machines that require synchronous accuracy.

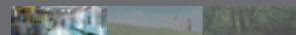
Timing of servo amplifier processing



No Transmission Collision

The fiber-optic cables thoroughly shut out noise that enters from the power cable or external devices. Noise tolerance is dramatically improved as compared to metal cables.

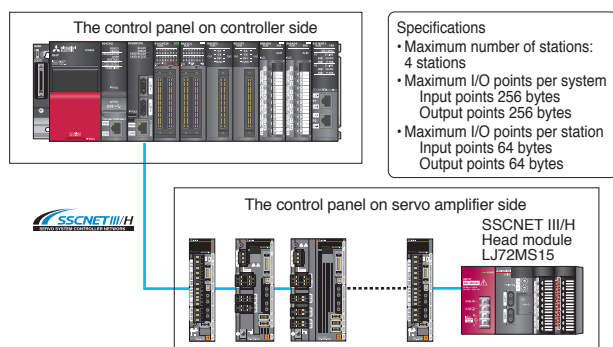




speed and response of 150 Mbps full-duplex baud rate SSCNET III/H optical networking

Dramatically Reduced Wiring

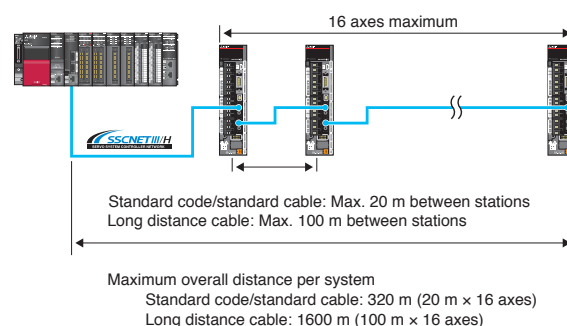
The SSCNET III/H Head module allows the controller to connect remotely with various modules (I/O, analog, high-speed counter, etc.) via SSCNET III/H. This results in reduced wiring since the Motion controller receives the I/O and analog I/O signals directly from the servo amplifier side.



Long Distance Wiring up to 1600 m Enhanced performance

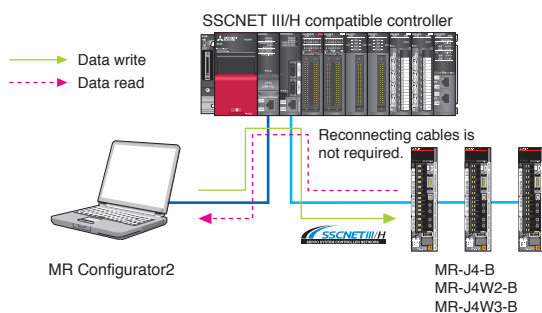
Long distance wiring is possible up to 1600 m per system (maximum of 100 m between stations × 16 axes). Thus, it is suitable for large-scale systems.

* This is when all axes are connected via SSCNET III/H.



Central Control with Network

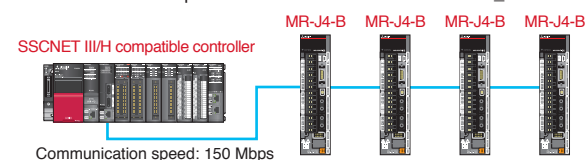
Large amounts of servo data are exchanged in real-time between the controller and the servo amplifier. Using MELSOFT MR Configurator2 on a personal computer that is connected to the Motion controller or the Simple Motion module helps consolidate information such as parameter settings and monitoring for the multiple servo amplifiers.



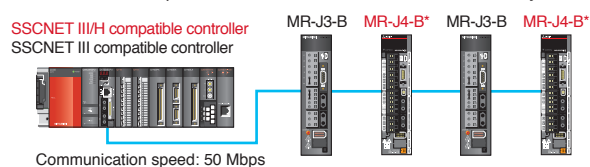
SSCNET III/H Compatible and SSCNET III Compatible Products Connected in a Same System

SSCNET III/H and SSCNET III compatible controllers support the use of SSCNET III/H and SSCNET III compatible servo amplifiers together in a same system.

■ SSCNET III/H compatible controller + MR-J4-B/MR-J4W_-B



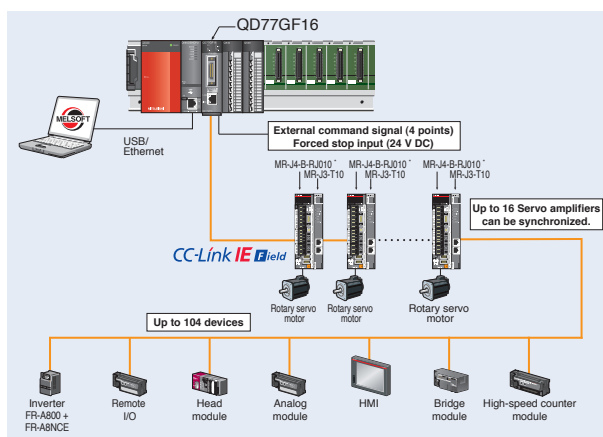
■ SSCNET III compatible controller and MR-J3_-B in a same system



* When the SSCNET III compatible products are in the system, the communication speed is 50 Mbps interactive, and the function and the performance are equivalent to those of MR-J3.

All-rounder Network

CC-Link IE Field Network is an Ethernet-based open network. Its highly flexible wiring to match your device layout can perform high-speed controller distributed control, I/O control and safety control. Because the CC-Link IE Field Network is based on the Ethernet, cables and connectors are highly available in the world.



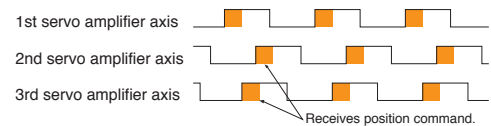
* As MR-J4-B-RJ010 servo amplifier is designed exclusively for Motion control, use QD77GF Simple Motion module for a controller. (As of September 2014)

Motion Control Achieved

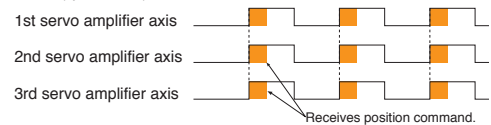
CC-Link IE Field Network is now equipped with Motion function. High-speed positioning control, synchronous control and cam control can be performed easily at a control cycle of 0.888 ms/1.777 ms/3.555 ms just with simple parameter settings and startup from the sequence program. This network is suitable for food processing machines and machine tools which require synchronous control.

CC-Link IE Field Network is compatible with speed and torque control, and suitable for spinners.

Pulse train command (asynchronous)



CC-Link IE Field Network communication command (synchronous)



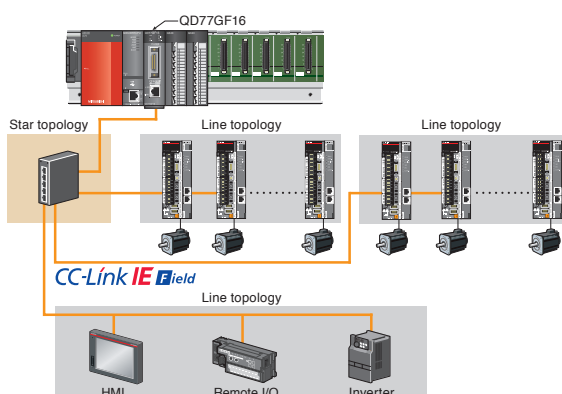
Flexible Network Topology

Line, star, and line/star mixed topologies are available for the CC-Link IE Field Network wiring layout.

Line/star mixed topology

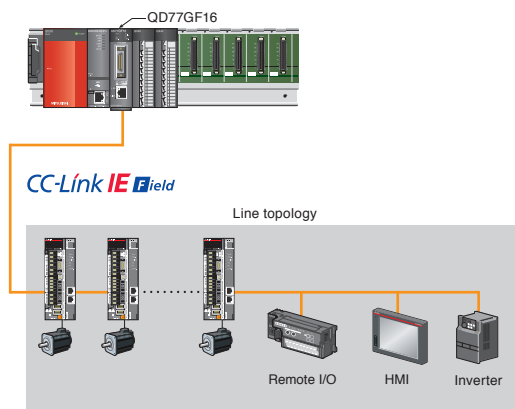
Star topology is available using an industrial switching HUB.

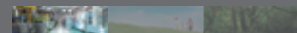
HUB applied: DT135TX (manufactured by Mitsubishi Electric System & Service Co., Ltd.)



Line topology

The Simple Motion modules (Master station) can be connected to slave devices without using a HUB, which reduces cost.



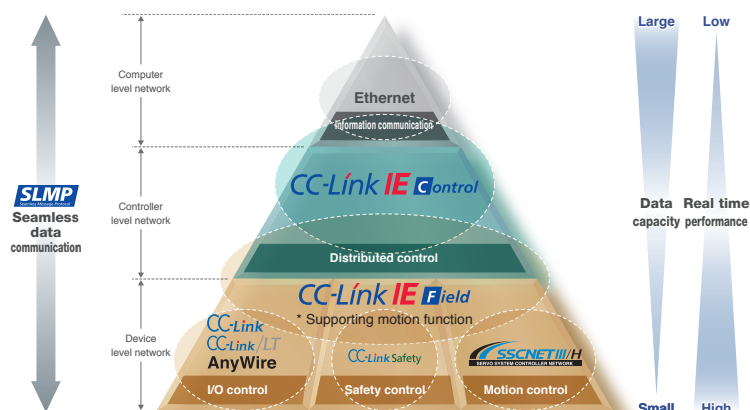


Seamless communication between upper-level information systems and lower-level field systems

MELSERIO-J4

FA Integrated Network for Optimal FA Environment

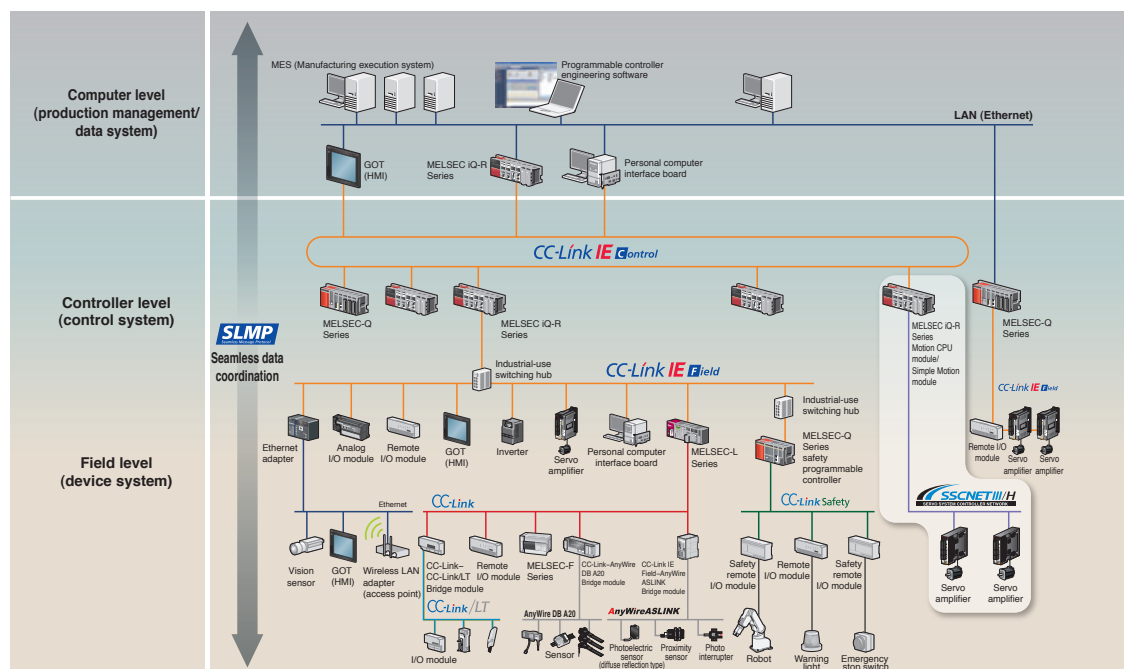
Seamless Data Communication with FA Integrated Network



One seamless solution that matches different demands with the appropriate network type. Data and information can easily be shared among the different networks without the need for any special converters or overly complicated configuration process.

FA Integrated Network System Architecture

Connections and accesses to various devices are possible through CC-link IE Control, the controller network; CC-Link IE Field, the field network; and SSCNET III/H, the Motion network; and Anywire, the sensor network. The network wiring layout is highly flexible to best fit the needs of the application.



Optimal network proposals for each level



SSCNET III/H is a dedicated high-speed, high-performance, highly reliable servo system control network that offers flexible long-distance wiring capabilities based on optical-fiber cable topology.

CC-Link IE Control

CC-Link IE Control is a high-reliability distributed control network designed to handle very large data communications (128 K word) over a high-speed (1 Gbps) dual-loop optical cable topology.

CC-Link IE Field

CC-Link IE Field is a versatile gigabit Ethernet-based network integrating controller, I/O control, safety control, and motion control in a flexible wiring topology supporting star, ring, and line configurations.

CC-Link CC-LinkSafety CC-Link/LT

CC-Link is a high-speed and highly reliable deterministic I/O control network that realizes reduced wiring while offering multi-vendor compatible products.

AnyWire

AnyWire is a sensor level distributed control network that is designed to reduce installation costs by utilizing general-purpose wiring and robot cables.

Man

The leading edge in safety
and convenience, designed to
harmonize with the way you work.

The easy-to-use MR-J4 was created with human needs in mind. It meets world-class safety standards and is exceptionally simple to maintain, ensuring optimum setup and operating ease for both design and manufacturing personnel.



MITSUBISHI SERVO AMPLIFIERS & MOTORS
MELSERVO-

J4



Advanced features for world-class safety

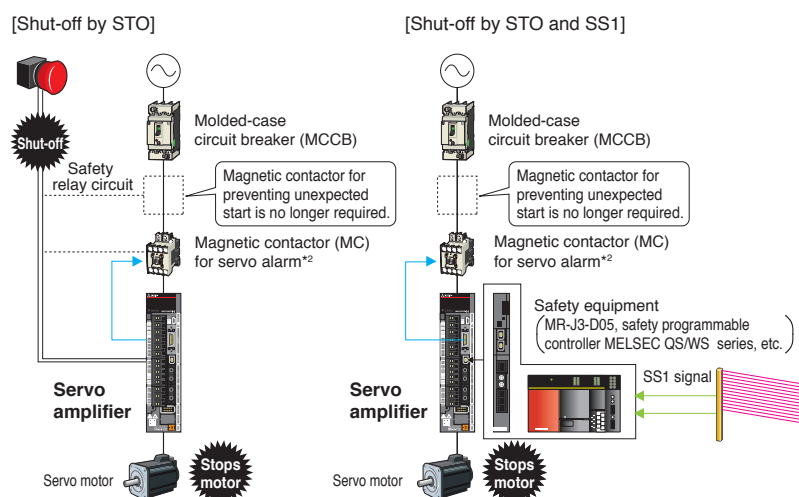
MELSERIO-J4

Equipped with the Safety Observation Function

Functions According to IEC/EN 61800-5-2

STO (Safe torque off) and SS1*¹ (Safe stop 1) are integrated as standard, enabling the safety system to be configured easily in the machine.

- Turning off the control power of servo amplifier is not required, cutting out the time for restart. Additionally, home position return is not required.
- Magnetic contactor for preventing unexpected motor start is not required.*²



IEC/EN 61800-5-2:2007 function	Contents
STO (Safe torque off)	Category 3, PL d, SIL 2
SS1 (Safe stop 1)* ¹	

*1. Safety equipment (MR-J3-D05, safety programmable controller MELSEC QS/WS series, etc.) is required.

*2. For MR-J4 series servo amplifier, magnetic contactors are not required to meet the STO requirements. However this figure has a magnetic contactor installed to prevent the short circuit of servo amplifier or electric shock.

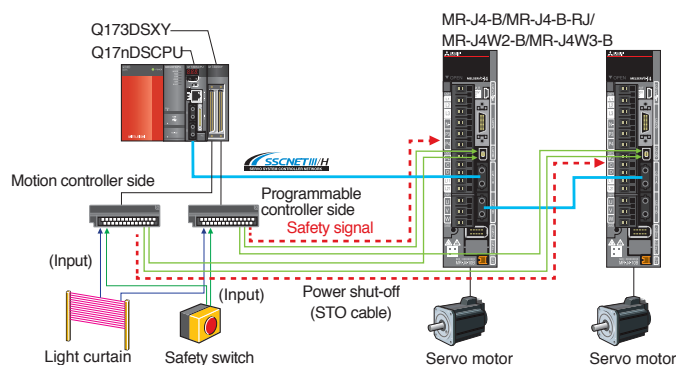
Increasing Safety Level by Combining MR-J4 with Motion Controller

The safety observation function of Q17nDSCPU*¹ is compatible with the following functions defined as "Power drive system function" in IEC/EN 61800-5-2.

IEC/EN 61800-5-2:2007 function	Contents
STO (Safe torque off)	Category 3, PL d, SIL 2
SS1 (Safe stop 1)	
SS2 (Safe stop 2)	
SOS (Safe operating stop)	
SLS (Safely-limited speed)	
SBC (Safe brake control)	
SSM (Safe speed monitor)	

*1. The safety function has obtained the approval of Certification Body by the combination of Q17nDSCPU, Q173DSXY and QnUD(E)(H)CPU.

Safety function with a combination of Motion controller and servo amplifier



Increasing Safety Level with MR-D30 Functional Safety Unit

NEW

The safety level will be increased by inputting signals directly to the functional safety unit, and the wiring will be reduced by inputting the safety signals through SSCNET III/H.

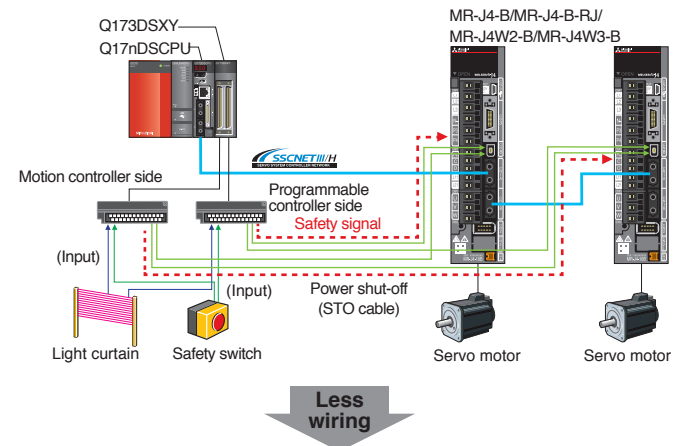
Safety Signals Via SSCNET III/H

By combining MR-J4-B-RJ servo amplifier and MR-D30 functional safety unit, safety signals are inputted from Q17nDSCPU Motion controller*1 through SSCNET III/H. Therefore, the previously required power shut-off (STO cable) wiring between controller and servo amplifier is not necessary. Attachment of MR-D30 is required only for the axis that needs the safety function. In addition, because the safety function is achieved on MR-D30 side, cost of designing ladder program on controller side can be dramatically reduced.

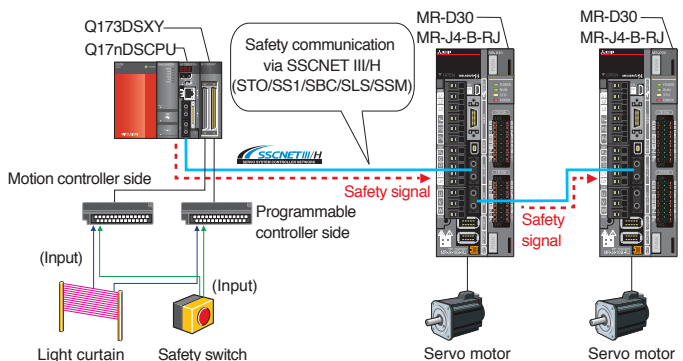
IEC/EN 61800-5-2:2700 function	Contents
STO (Safe torque off)	Category 3, PL d, SIL 2
SS1 (Safe stop 1)	
SBC (Safe brake control)	
SLS (Safely-limited speed)	
SSM (Safe speed monitor)	

*1. The safety function has obtained the approval of Certification Body by the combination of Q17nDSCPU, Q173DSXY and QnUD(E)(H)CPU.

Safety function with a combination of Motion controller and servo amplifier



Reduced wiring with a combination of functional safety unit and Motion controller

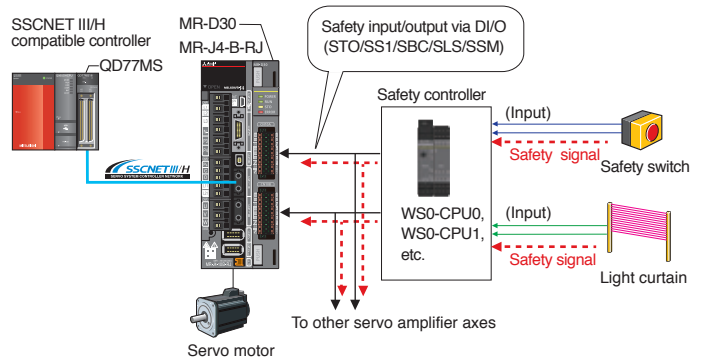


Achieving Category 4, PL e, SIL 3 by wiring to functional safety unit

Higher safety level, Category 4, SIL 3, is achieved by wiring the safety input signals directly to MR-D30 functional safety unit. The safety function is easily enabled just by setting parameters. Attachment of MR-D30 is required only for the axis that needs the safety function.

IEC/EN 61800-5-2:2700 function	Contents
STO (Safe torque off)	Category 4, PL e, SIL 3
SS1 (Safe stop 1)	
SBC (Safe brake control)	
SLS (Safely-limited speed)	Category 3, PL d, SIL 2
SSM (Safe speed monitor)	

Increasing safety level by wiring to functional safety unit



Achieving IEC/EN 61800-5-2 Functions

- (1) Functions achievable with MR-J4-B(-RJ)/MR-J4W_-B/MR-J4-B-RJ010/MR-J4-A(-RJ)
 (2) Functions achievable with MR-J3-D05 + MR-J4-B(-RJ)/MR-J4W_-B/MR-J4-B-RJ010/MR-J4-A(-RJ)
 (3) Functions achievable with Q17nDSCPU + Q173DSXY + MR-J4-B(-RJ)/MR-J4W_-B
 (4) Functions achievable with MR-D30 + MR-J4-B-RJ **NEW**

⊙: Supported (SIL 3) ○: Supported (SIL 2) —: Unsupported

IEC61800-5-2 Safety standard	(1)	(2)	(3)	(4)
Safe torque off (STO) <p>The STO function shuts off power to the motor electronically using the internal circuit by responding to the input signal from external equipment (shuts off through secondary-side output). This function corresponds to the Stop category 0 of IEC/EN 60204-1.</p> <p>Execute the STO function after the motor is stopped in servo off state.</p>	○	○	○	⊙
Safe stop 1 (SS1) <p>Responding to the input signal from external equipment, the motor starts to decelerate. After the set delay time for motor stop is passed, the STO function starts. This function corresponds to the Stop category 1 of IEC 60204-1.</p>	—	○	○	⊙
Safe stop 2 (SS2) <p>Responding to the input signal from external equipment, the motor starts to decelerate. After the set delay time for motor stop is passed, the SOS function starts. This function corresponds to the Stop category 2 of IEC/EN 60204-1.</p>	—	—	○	—
Safe operating stop (SOS) <p>This function monitors the position of the motor not to deviate from the specified range. Power is still supplied to the motor during the SOS function.</p>	—	—	○	—
Safely-limited speed (SLS) <p>This function monitors the motor not to exceed the required speed limit. If the speed exceeds the limit, the motor power is shut off by the STO.</p>	—	—	○	○
Safe brake control (SBC) <p>The SBC signals are outputted for external brake control.</p>	—	—	○	⊙
Safe speed monitor (SSM) <p>The SSM signals are outputted when the motor speed is below the specified speed limit.</p>	—	—	○	○

V: Speed
 Vmax: User specified speed limit value
 S1, S2: Specified stop position
 Ensured safety range

Enhanced operating ease and drive stability

MELSERVO-J4

Maintenance Function to Achieve TCO* Reduction

* TCO : Total Cost of Ownership

Compatible with SEMI-F47

MELSERVO-J4 series servo amplifier complies with SEMI-F47 standard* corresponding to semiconductors and LCD manufacturing systems. (SEMI-F47 is not applicable to 1-phase 100 V AC and 1-phase 200 V AC. To comply with SEMI-F47 by using 11 kW or larger servo amplifiers, the dynamic brake is not usable.)

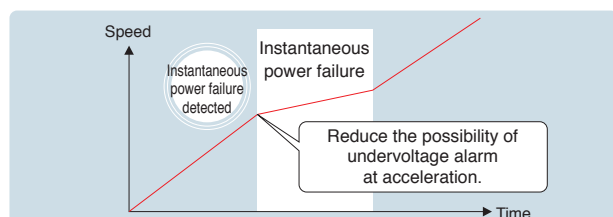
* The control power supply of the servo amplifier complies with SEMI-F47. Note that the backup capacitor may be required depending on the power impedance and operating situation for the instantaneous power failure of the main circuit power supply. Be sure to perform a test on your machine to meet the SEMI-F47 Voltage Sag Immunity Standard. Please use the 3-phase power supply for the servo amplifier input.

Tough Drive Function

Enhanced functions

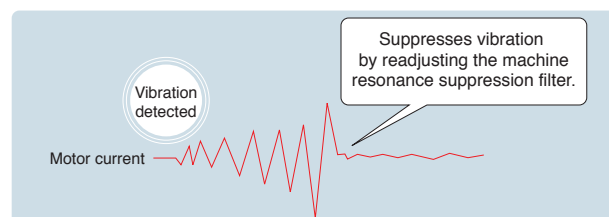
Instantaneous power failure tough drive

This function detects instantaneous power failure in the input power, reducing the occurrence of undervoltage alarm.



Vibration tough drive

Machine resonance suppression filter is automatically readjusted when a change in machine resonance frequency is detected by the servo amplifier. Losses from the machine stop due to age-related deterioration are reduced.

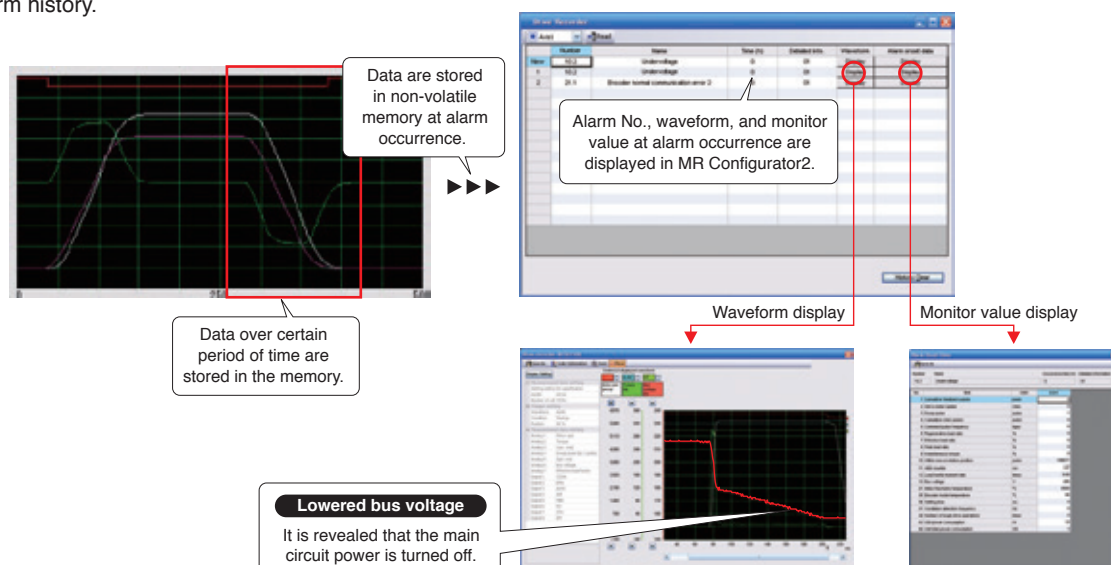


Large Capacity Drive Recorder

Patent pending

Enhanced functions

- Servo data such as motor current and position command before and after the alarm occurrence are stored in non-volatile memory of the servo amplifier. Reading the servo data on MELSOFT MR Configurator2 helps you analyze the cause of the alarm.
- Check the waveform ((analog 16 bits × 7 channels + digital 8 channels) × 256 points) and the monitor values of 16 alarms in the alarm history.

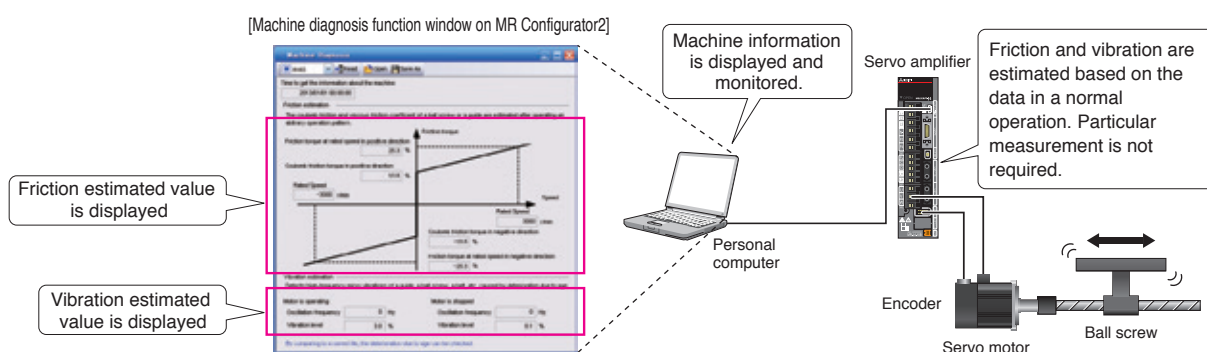


Machine Diagnosis Function

Patent pending

NEW

This function detects changes of machine parts (ball screw, guide, bearing, belt, etc.) by analyzing machine friction, load moment of inertia, unbalanced torque, and changes in vibration component from the data inside the servo amplifier, supporting timely maintenance of the driving parts.



Three-digit Alarm

In MR-J4 series, servo alarms are displayed in three digits.

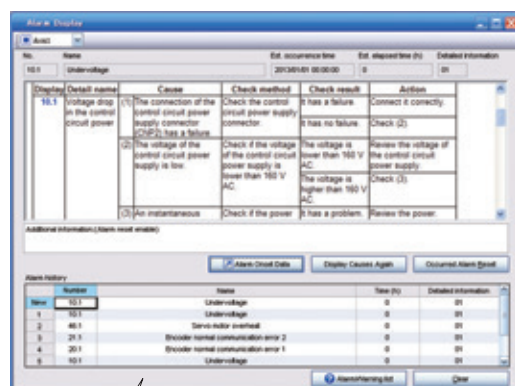
Troubleshooting at alarm occurrence is easy.

[Three-digit alarm display]



This display is of MR-J4-A.

[Example of an alarm window on MR Configurator2]



For the undervoltage alarm, whether the alarm occurred in the main or the control circuit is identified by the alarm No.



User-friendly software for easy setup, tuning and operation

Servo setup software

MR Configurator2 (SW1DNC-MRC2-E)

Tuning, monitor display, diagnosis, reading/writing parameters, and test operations are easily performed on a personal computer.

This startup support tool achieves a stable machine system, optimum control, and short setup time.

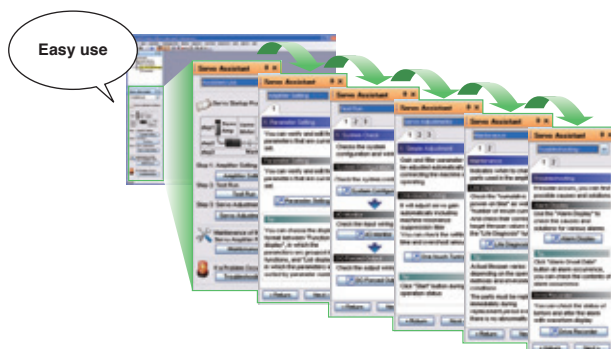


MELSERVO-J4

Preparation

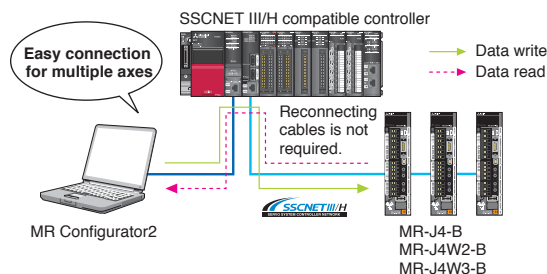
Servo Assistant Function

Complete setting up the servo amplifier just by following guidance displays. Setting parameters and tuning are easy since related functions are called up from shortcut buttons.



Using MR Configurator2 via Motion Controller

MR Configurator2 can be used with MT Developer2 on a personal computer that is connected to a Motion controller. Information such as parameter settings and monitoring for the multiple servo amplifiers is consolidated easily just by connecting the Motion controller and the personal computer with cables.



MELSERVO-J4

Setting and Startup

Parameter Setting Function

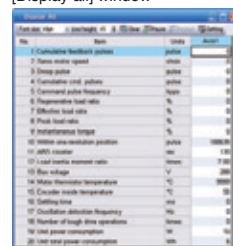
Display parameter setting in list or visual formats, and set parameters by selecting from the drop down list. Set in-position range in mechanical system unit (e.g. μm). Parameter read/write time is approximately one tenth of the conventional time.



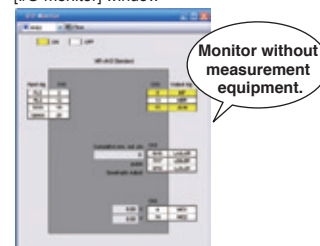
Monitor Function

Monitor operation status on the [Display all] window. Measurement equipment such as electric power meter is not required since power consumption is monitored. Assigning input/output signals and monitoring ON/OFF status are also performed on the "I/O monitor" window.

[Display all] window



[I/O monitor] window

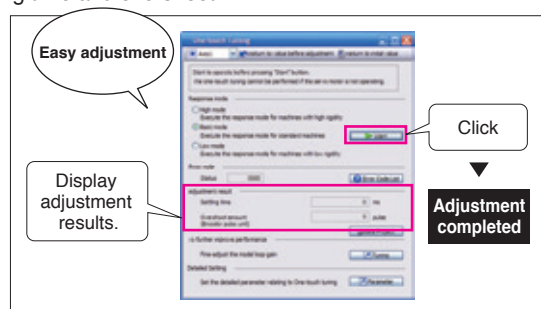




One-touch Tuning Function

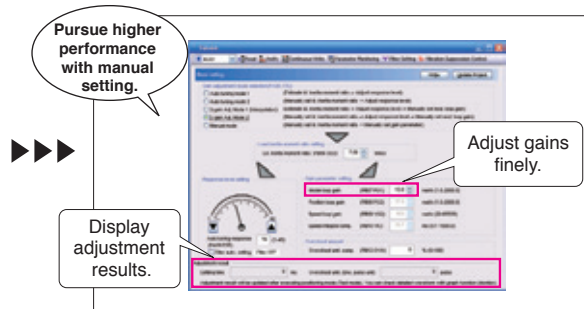
NEW

Adjustments including estimating load to motor inertia ratio, adjusting gain, and suppressing machine resonance are automatically performed for the maximum servo performance just by clicking the start button. Check the adjustment results of settling time and overshoot.



Tuning Function

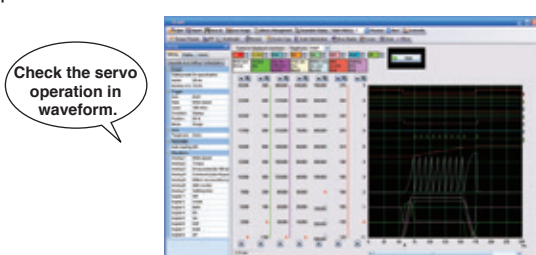
Adjust control gain finely on the [Tuning] window manually for further performance after the one-touch tuning.



Graph Function

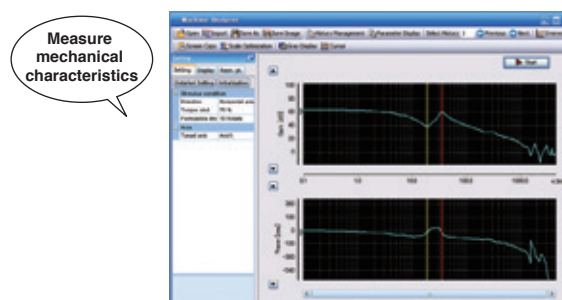
Enhanced functions

The number of measurement channels is increased to 7 channels for analog, and 8 channels for digital. Display various servo statuses in the waveform at one measurement, supporting setting and adjustment. Convenient functions such as [Overwrite] for overwriting multiple data and [Graph history] for displaying graph history are available. Waveform measurement for the connected axes is simultaneously performed via Motion controller communication.



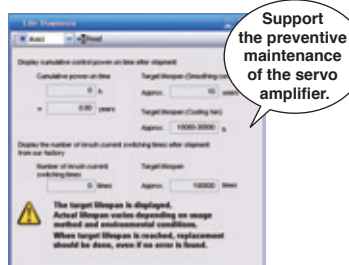
Machine Analyzer Function

Input random torque to the servo motor automatically and analyze frequency characteristics (0.1 Hz to 4.5 kHz) of a machine system just by clicking the [Start] button. This function supports setting of machine resonance suppression filter, etc.



Servo Amplifier Life Diagnosis Function

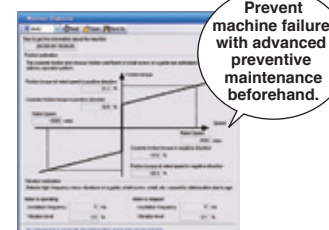
Check cumulative operation time and on/off times of inrush relay. This function provides an indication of replacement time for servo amplifier parts such as capacitor and relays.



Machine Diagnosis Function

NEW

This function estimates and displays machine friction and vibration in normal operation without any special measurement. Comparing the data of the first operation and after years of operation helps to find out the aging deterioration of machine and is beneficial for preventive maintenance.



The Environment

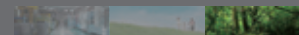


MITSUBISHI SERVO AMPLIFIERS & MOTORS
MELSERVO-

J4

The new MR-J4 series:
an evolution in eco-friendly design
that's winning acclaim worldwide.

The MR-J4 series was designed with the environment in mind. In addition to helping you reduce your energy consumption, MR-J4 servos have a small footprint and simple wiring requirements that help save space and valuable resources.



Designed to cut waste and save on space, wiring, and energy use

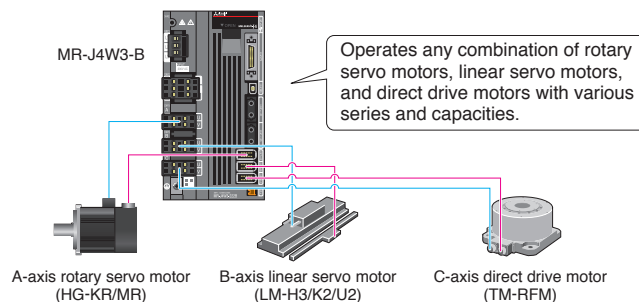
MELSERVO-J4

Multi-axis Servo Amplifier in Harmony with Eco-friendly Society

2-axis/3-axis Types for Energy-conservative, Miniaturized, and Low-cost Machine

2-axis and 3-axis servo amplifiers are available for operating two and three servo motors, respectively. These servo amplifiers enable energy-conservative, compact machine at lower cost. Different types of servo motors including rotary servo motors, linear servo motors, and direct drive motors are freely combined as long as the servo motors are compatible with the servo amplifier*.

* For the combination, refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-6 in this catalog.

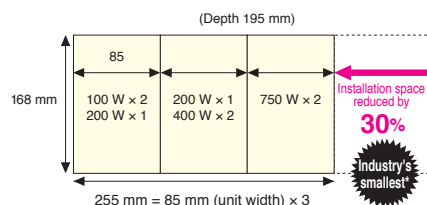


Space-saving with Industry's Smallest* 3-axis Type

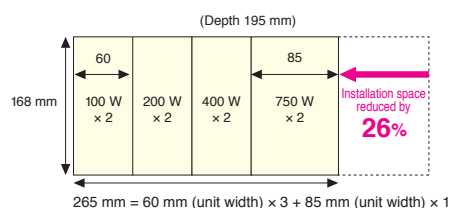
2-axis servo amplifier MR-J4W2-B requires 26% less installation space than two units of MR-J4-B. 3-axis servo amplifier MR-J4W3-B requires 30% less installation space than three units of MR-J4-B.

[Installation space: structure example of installing two units of each 100W, 200W, 400W, and 750W]

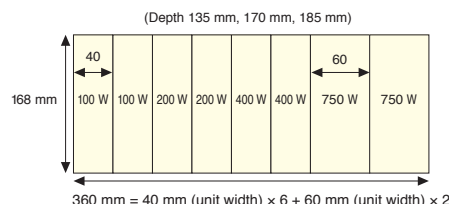
MR-J4W3-B
(3-axis type)



MR-J4W2-B
(2-axis type)



MR-J4-B

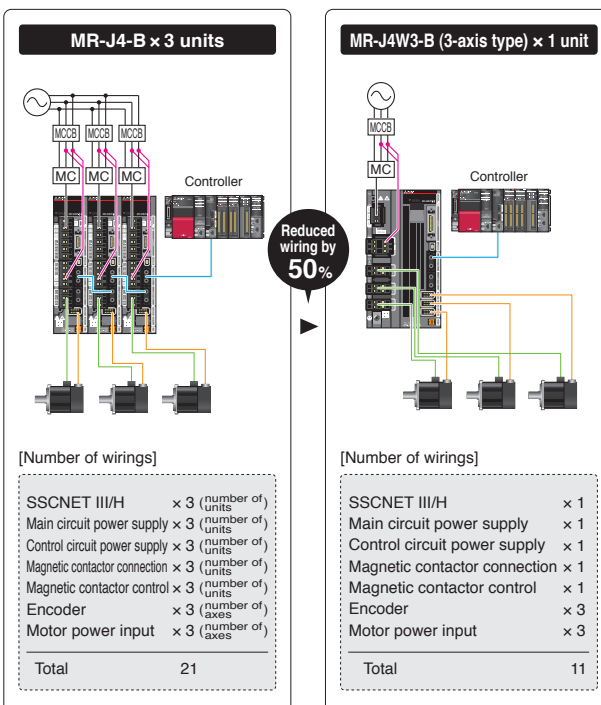


* Based on Mitsubishi Electric research as of September 2014.

Reduced Wiring by Approx. 50% with 3-axis Type

In 3-axis servo amplifier MR-J4W3-B, the three axes use the same connections for main and control circuit power, peripheral equipment, control signal wire, etc. Thus, the number of wirings and devices is greatly reduced.

[Comparison of the number of wirings]



Eco-friendly performance, designed to save energy in every detail

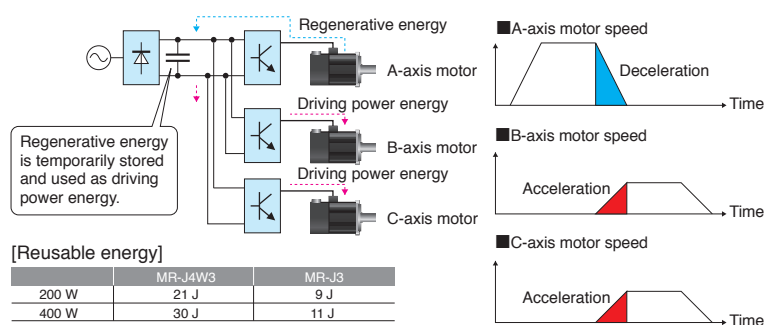
MELSERVO-J4

Optimal Energy-conservative System for Your System

Supporting Energy-conservative Machine Using Regenerative Energy

In the multi-axis servo amplifier, the regenerative energy of an axis is used as driving power energy for the other axes, contributing to energy-conservation of machine. Reusable regenerative energy stored in the capacitor is increased for MR-J4W2-B/MR-J4W3-B as compared to the prior model. Regenerative option is no longer required*1.

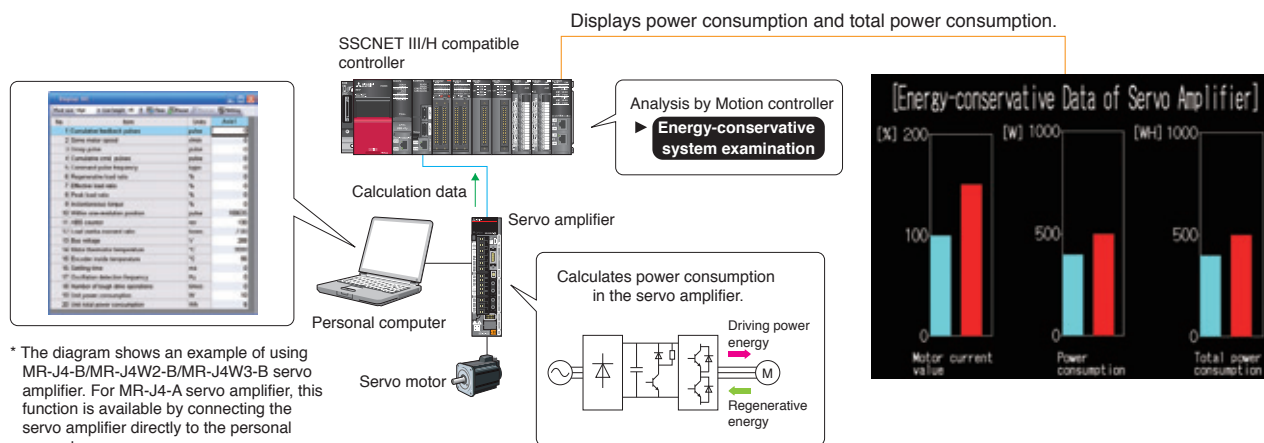
*1. Regenerative option may be required depending on the conditions.



* In the multi-axis servo amplifier, the amount of temporarily stored regenerative energy can be increased by using a capacitor bank. (Available in the future) Contact your local sales office for more details.

Power Monitor Function

Driving power and regenerative energy are calculated from the data in the servo amplifier such as speed and current. Motor current value, power consumption, and total power consumption are monitored with MR Configurator2. In SSCNET III/H system, data are transmitted to a Motion controller, and the power consumption is analyzed and displayed.



* The diagram shows an example of using MR-J4-B/MR-J4W2-B/MR-J4W3-B servo amplifier. For MR-J4-A servo amplifier, this function is available by connecting the servo amplifier directly to the personal computer.

Advanced Function and Performance for More Energy-conservation

Reduced energy loss of servo amplifier and servo motor

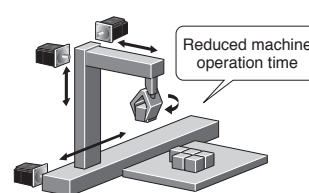
[Servo amplifier]
Efficiency is increased by the use of a new power module.

[Servo motor]
Motor efficiency is increased by optimized design of magnetic circuit.



Energy-conservation due to the improved machine performance

The servo amplifiers and the servo motors with the industry-leading level of high performance reduce machine tact time and operation time, resulting less energy consumption.



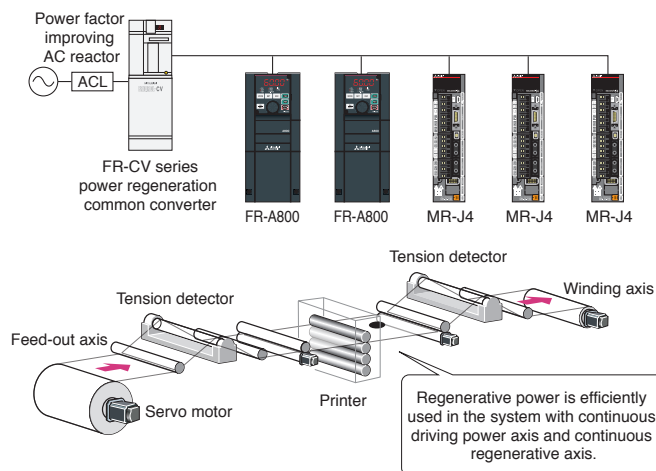
Optimal Energy-conservative Machine System

PN bus voltage connection + power regeneration common converter

Regenerative energy is used efficiently when multiple servo amplifiers and inverters are connected through common PN bus to the power regeneration common converter.

* System only with common PN bus connection is also possible to be configured without using the power regeneration common converter. However, there are restrictions depending on the system. Contact your local sales office for more details.

* Refer to each Servo Amplifier Instruction Manual for selection of FR-CV series power regeneration common converter.

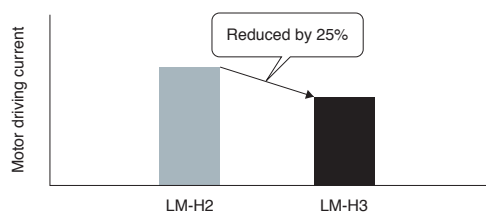


Energy-conservation Achieved by LM-H3 Linear Servo Motor Series

Reduced motor driving power

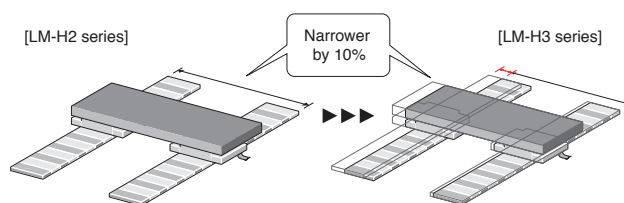
LM-H3 has achieved a reduction of 25% in motor driving current due to a new magnetic design with optimized magnet form, contributing to power conservation for machines. The motor coil is lighter as compared to the prior model, which also contributes to saving energy for driving the moving part.

* For 720 N rated linear servo motor.



Space saving

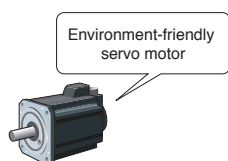
For LM-H3, widths of the motor coil and the magnet are reduced by 10% from the prior model. Increased thrust to current ratio results in using the servo amplifier in smaller capacity, contributing to more compact machine (the reduction of materials).



Contribution to Resource-saving

The new environment-friendly HG rotary servo motor series uses 30% less permanent magnet than the prior HF series due to the optimized design of magnetic circuit. The total mass is also reduced.

* For HG-KR43.



Heritage



MITSUBISHI SERVO AMPLIFIERS & MOTORS
MELSERVO-

J4

A heritage of trust and
continuity — the hallmark of
every MELSERVO product.

The MR-J4 series integrates seamlessly with
your existing manufacturing assets, ensuring
a smooth transition to the speed and cost
benefits of leading-edge MELSERVO technology.



The speed and cost benefits achieved with the existing manufacturing assets

MELSERVO-J4

Seamless Integration with Existing System

Easy Replacement of MR-J3 Series

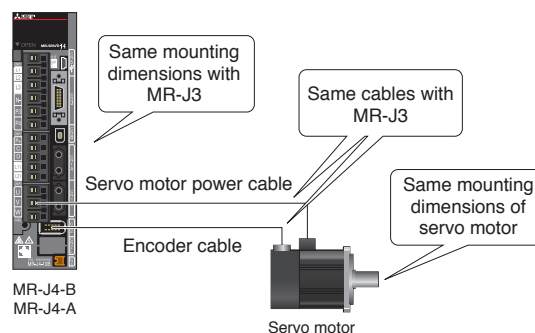
Compatible mounting

MR-J4-B/MR-J4-A has the same mounting dimensions*¹ with MR-J3-B/MR-J3-A. HG rotary servo motor series has the same mounting dimensions*² and uses the same optional cables for the power, the encoder*³, and the electromagnetic brake as HF series or HC-RP/HC-UP series.

*1. Mounting dimensions are smaller for 200 V 5 kW, 400 V 3.5 kW, 200 V/400 V 11 kW, and 200 V/400 V 15 kW servo amplifiers.

*2. For replacing HA-LP series to HG-JR series, contact your local sales office for more detail.

*3. HG-JR series of 11 kW to 55 kW uses a different encoder cable from HF-JP series.



When not changing the controller to SSCNET III/H controller

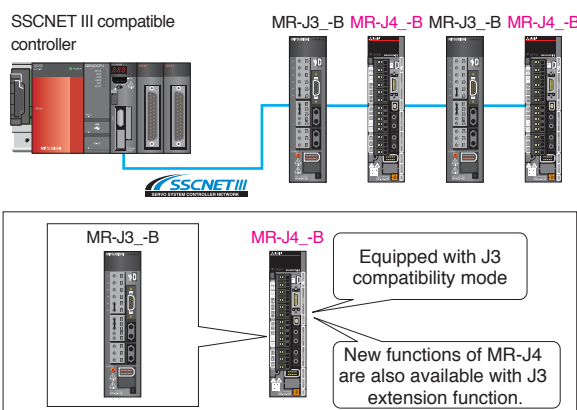
MR-J4-B/MR-J4W2-B/MR-J4W3-B servo amplifier has J3 compatibility mode. By operating in J3 compatibility mode, MR-J4 series servo amplifier and MR-J3 series servo amplifier can be used together in a same system without changing the existing controller.

* When the SSCNET III compatible products are in the system, the communication speed is 50 Mbps, and the function and the performance are equivalent to those of MR-J3.

* Some functions may not be available in the J3 compatibility mode. Refer to relevant Servo Amplifier Instruction Manual for details.

The following new functions of MR-J4 series are available with J3 extension function of J3 compatibility mode.

- Advanced one-touch tuning function
- Robust filter
- SEMI-F47 function
- Drive recorder function
- Power monitoring function
- Advanced vibration suppression control II
- Machine resonance filter (5 filters)
- Tough drive function
- Machine diagnosis function

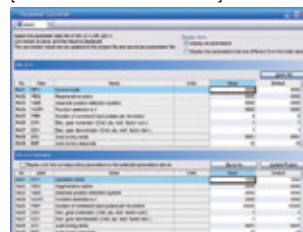


Parameter conversion

Parameters are automatically converted by changing MR-J3-B to MR-J4-B with MELSOFT MT Works2*¹. Parameters of MR-J3-A are converted to those of MR-J4-A, using the parameter converter function of MELSOFT MR Configurator2*¹.

*1. Be sure to update your MT Works2 and MR Configurator2 to the latest version.

[Parameter converter window]

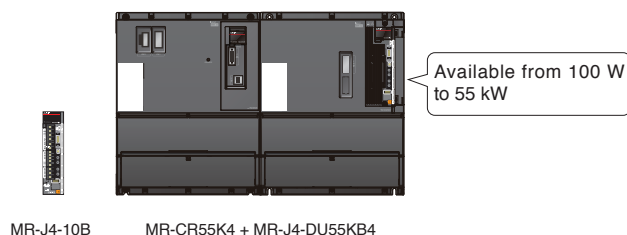


Parameters are converted by selecting the parameter file of the prior model servo amplifier.

Wide variety of product lines

MELSERVO-J3 series is replaceable with MELSERVO-J4 series with a wide variety of power supplies and capacities. MR-J4-B/MR-J4-A is available from 100 W to 55 kW, and the main circuit power supply is selectable from 3-phase 200 V AC, 3-phase 400 V AC and 1-phase 100 V AC.

*1. For the product lines, refer to "MELSERVO-J4 Product Lines" on p.5 in this catalog.

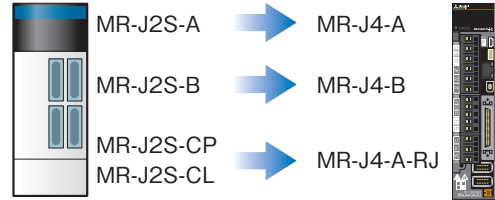


MR-J4-10B

MR-CR55K4 + MR-J4-DU55KB4

Easy Replacement of MR-J2-Super Series

MELSERVO-J4 series product lines include general-purpose interface, positioning function, and SSCNET III/H interface. MELSERVO-J4 series is compatible with a wide variety of command interface and also replaceable from MELSERVO-J2S series.

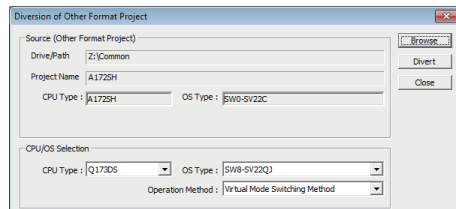


For renewing the units to MR-J4 series

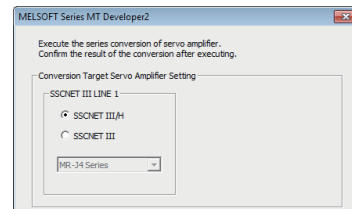
Parameters are automatically converted by changing MR-J2S-B to MR-J4-B with MELSOFT MT Works2*1. Parameters of MR-J2S-A are converted to those of MR-J4-A, and parameters of MR-J2S-CP and MR-J2S-CL are converted to those of MR-J4-A-RJ, using the parameter converter function of MR Configurator2*1.

*1. Be sure to update your MT Works2 and MR Configurator2 to the latest version.

[MT Works2 window]



Division of other format project window



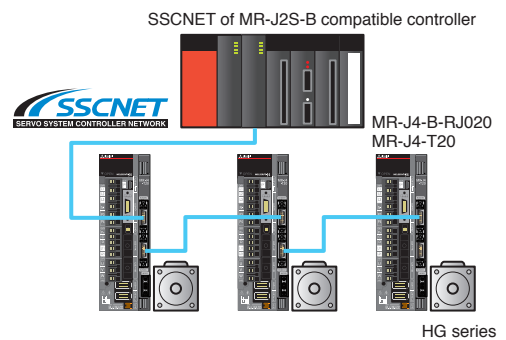
Servo amplifier conversion window

When not changing the controller to SSCNET III/H controller

A combination of MR-J4-B-RJ020 and MR-J4-T20 conversion unit for SSCNET of MR-J2S-B is capable of connecting to the SSCNET of MR-J2S-B compatible servo system controller.* Thus, renewing the units other than the controller to MR-J4 series is possible without changing the existing controller.

* The function and performance are equivalent to those of MR-J2S-B. (J2S compatibility mode)
* Refer to "New Product Release of Conversion Unit for SSCNET of MR-J2S-B" and "MR-J4-B-RJ020 MR-J4-T20 Servo Amplifier Instruction Manual" for details.

The set of MR-J4-B-RJ020 and MR-J4-T20 is compatible with the following servo system controllers:
A171SHCPU(N), A172SHCPU(N), A173UHCPU,
A1SD75M, QD75M, Q172CPU(N), and Q173CPU(N)

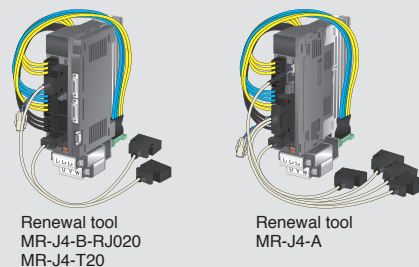


When using the existing connections

MR-J2S-B renewal tool manufactured by Mitsubishi Electric System & Service Co., Ltd. is available when using the existing HC/HA series servo motors or when replacing MR-J2S-B using the existing connections.

This renewal tool enables to use the existing mounting holes and wiring, and the replacement and wiring can be completed in a short period of time.

For MR-J2S-B renewal tool, contact your local sales office.



Mitsubishi Electric System & Service Co., Ltd.



Renewal related materials

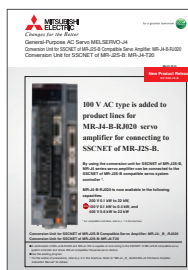
We provide support for the renewal with the following materials from the catalog of renewal introduction, the handbook with detailed information to the instruction manual for the renewal tool to use the existing connections.



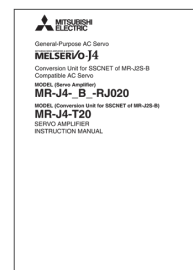
**MELSERVO-J2-Super
Transition Guide catalog
L(NA)03091**
Upgrading MR-J2S to MR-J4 is introduced.



**Transition from
MELSERVO-J2-Super/J2M Series to
J4 Series Handbook
L(NA)03093**
This handbook explains how to replace your
MR-J2S/J2M to MR-J4 series.



**New Product Release of Conversion
Unit for SSCNET of MR-J2S-B
SV1306-1**
This brochure announces a new release of
MR-J4-B-RJ020 and a conversion unit for
connecting to SSCNET of MR-J2S-B.
Specifications of the servo amplifier and the
conversion unit are also listed.



**Conversion Unit for SSCNET of
MR-J2S-B Compatible
MR-J4-B-RJ020/MR-J4-T20
SERVO AMPLIFIER INSTRUCTION
MANUAL
SH-030125**
This instruction manual describes
MR-J4-B-RJ020 and MR-J4-T20 conversion
unit for SSCNET of MR-J2S-B.



**MR-J2S Renewal Tool Catalog
X901307-312**
This guide introduces a renewal tool for
replacing MR-J2S to MR-J4. The renewal tool
allows to use the existing wiring and mounting
holes, making the replacement simple and fast.



**Manual for Replacement from
MELSERVO-J2S Series Using
MR-J2S Renewal Tool
X903130707**
This handbook explains how to replace your
MR-J2S to MR-J4, using the renewal tool. Be
sure to read through this handbook when
considering and implementing the
replacement.

Mitsubishi Electric System & Service Co., Ltd.

Introducing basic functions from the conventional to the latest

MELSERIO-J4

Offering Various Basic Functions

Various Basic Functions

Position/Speed/Torque control

Position, speed, and torque controls are available. The position control performs positioning by following position command and is suitable when synchronous or interpolation control is used. Speed and torque are controlled to be constant by the speed and torque controls following the speed and torque commands respectively.

Control switching

Control can be switched among position, speed, and torque controls.

* Control can be switched between two of the controls for MR-J4-A.

Real-time auto tuning

The load to motor inertia ratio of a machine is always estimated from the servo motor current and speed during acceleration/deceleration. Therefore, gains such as model loop gain, position loop gain, and speed loop gain are automatically set just by setting the response level.

Model adaptive control

Control with high responsivity and high stability is achieved according to the model control.

The two-degrees-of-freedom model adaptive control enables to set the response for command and disturbance respectively.

Adaptive filter II

Adaptive filter II is a function in which the servo amplifier detects machine resonance for a predetermined period of time and sets the filter characteristics automatically to suppress mechanical system vibration. Since the filter characteristics (frequency and depth) are set automatically, it is not required to consider the resonance frequency of a mechanical system.

This function is effective for the comparatively high frequency of machine resonance around 100 Hz to 2.25 kHz.

Low-pass filter

The low-pass filter suppresses high-frequency resonance which occurs as servo system response is increased. The filter is enabled as default, and the set frequency is automatically adjusted.

Slight vibration suppression control

This function suppresses vibration of ± 1 pulse produced at a servo motor stop.

Gain switching function

This function enables to switch gains. Gains during rotation and during stop can be switched. Using a switching signal to switch gains is also possible during operation.

* Will be available with MR-J4-B-RJ010 in the future.

Feed forward

By setting the feed forward gain, the droop pulses will be nearly zero during constant-velocity operation. This function improves the tracking of position command during trajectory control, etc.

Internal speed command

Up to seven internal speed commands can be stored in parameters. Speed control is possible without using the analog voltage command by selecting the internal speed command with input device.

* Available only with MR-J4-A.

Absolute position detection system

Merely setting a home position once makes home position return unnecessary at every power-on.

Built-in regenerative resistor

Servo amplifiers from 0.2 kW to 7 kW have a built-in regenerative resistor, saving installation space for option and enabling more compact system.

Regenerative option

Use a regenerative option when the built-in regenerative resistor of the servo amplifier does not have sufficient regenerative capability. For 5 kW or larger servo amplifiers, the brake unit is available when the regenerative option does not provide enough regenerative power.

* Available as an option.

Power regenerative common converter

Use a power regeneration common converter when the regenerative option does not provide enough regenerative power. The excessive regenerative energy is returned to the power supply, which contributes to energy-conservation.

* Available as an option.

* Available with 200 V 100 W to 22 kW and 400V 11 kW to 22 kW servo amplifiers.

Some functions may not be available depending on the models.
Refer to relevant Servo Amplifier Instruction Manual for details.



Dynamic brake

The dynamic brake is designed to decelerate the servo motor immediately at an alarm occurrence, power failure, or forced stop. The dynamic brake is not for holding a shaft at a stop.

* The dynamic brake is built in the 7 kW or smaller servo amplifiers.

* The external dynamic brake is required for the 11 kW or larger servo amplifiers.

Close mounting

Close mounting is possible for 200 V 3.5 kW or smaller servo amplifiers. Mounting space efficiency is significantly improved.

* When the servo amplifiers are closely mounted, the operation environment condition is different.

Input signal selection (device settings)

Function assigned to each pin for digital input can be changed by setting parameters.

* Available only with MR-J4-A.

Output signal selection (device settings)

Function assigned to each pin for digital output can be changed by setting parameters.

Encoder output pulse

Encoder output pulses can be outputted in the differential line driver type as A/B/Z-phase pulse. Output pulse per servo motor revolution can be set with the parameter.

* MR-J4W3-B is not compatible with this function.

A/B-phase pulse through output

When using A/B/Z-phase differential output, A/B/Z-phase signal from linear encoder can be output from servo amplifier as encoder output pulse.

This function can be used by controller without branching the signal from linear encoder.

* Available only with MR-J4-B-RJ/MR-J4-A-RJ.

Monitoring (Status display)

Servo status such as regenerative load ratio, effective load ratio, instantaneous torque, servo motor speed, or droop pulses can be monitored on MR Configurator2. For MR-J4-A, the status is also confirmed on the seven-segment LED display.

Analog monitor output

Servo status such as torque, servo motor speed, and droop pulses is outputted in terms of voltage in real time.

* MR-J4W2-B/MR-J4-W3-B is not compatible with this function.

Alarm history

The last 16 alarms are recorded in the servo amplifier. The alarms can be confirmed in list using MR Configurator2.

Test operation

Before starting actual operation, perform test operation to make sure that the machine operates normally. The following can be performed using MR Configurator2.

- JOG operation
Test operation function for checking a speed control operation without a command from a controller.
- Positioning operation
Test operation function for checking a positioning operation by position control without a command from a controller.
- Motor-less operation
Without connecting a servo motor, this function outputs signals in response to the input device and displays status as if the servo motor is actually running. The motor-less operation is useful for checking the sequence of controller, etc.
- Program operation
Without using a controller, this function enables positioning operation consisting of multiple simple operation patterns.
- Output signal (DO) forced output
This function switches output signals on/off forcibly independently of the servo status, useful for checking the output signal wirings.

Some functions may not be available depending on the models.
Refer to relevant Servo Amplifier Instruction Manual for details.

A wide-ranging lineup to meet virtually every drive control need

The new MR-J4 series lineup includes
servo amplifiers and servo motors to meet virtually
every production need — because every production site is different,
with unique problems that require unique and
innovative solutions.



2-axis and 3-axis types
are available for your system.

Servo amplifier



MR-J4-B(-RJ)

With the SSCNET III/H compatible servo amplifier, a complete synchronous system can be configured using high-speed serial optical communication. Servo system performance and functions are utilized to the fullest when MR-J4-B(-RJ) is used combined with the servo system controller.



MR-J4W2-B

The SSCNET III/H compatible 2-axis servo amplifier drives two servo motors, enabling energy-conservative, less-wiring, compact machine at lower cost.

Product lines

SSCNET III/H compatible, CC-Link IE Field Network interface with Motion compatible, and general-purpose interface compatible products are available.

●: Compatible —: Not compatible

Model	Power supply	Command interface	Fully closed loop control*2	Compatible servo motor			
				Rotary	Linear*3	Direct drive	
MR-J4-B(-RJ)*1	1-phase 100 V AC	SSCNETIII/H	●	●	●	●	
	3-phase 200 V AC		●	●	●	●	
	3-phase 400 V AC		●	●	●*4	—	
MR-J4W2-B	3-phase 200 V AC 2-axis		●	●	●	●	
MR-J4W3-B	3-phase 200 V AC 3-axis		—	●	●	●	
MR-J4-B-RJ010 + MR-J3-T10	3-phase 200 V AC	CC-Link IE Field Network with Motion	—	●	—	—	
	3-phase 400 V AC		—	●	—	—	
MR-J4-A(-RJ)*1	1-phase 100 V AC	General-purpose pulse train/ analog voltage	●	●	●	●	
	3-phase 200 V AC		●	●	●	●	
	3-phase 400 V AC		●	●	●*4	—	

*1. MR-J4-B-RJ/A-RJ servo amplifier is compatible with two-wire and four-wire type serial, and pulse train interface (A/B/Z-phase differential output type) linear encoders.
*2. MR-J4-B/A servo amplifier is compatible only with two-wire type serial and pulse train interface (A/B/Z-phase differential output type) linear encoders, use MR-J4-B-RJ/A-RJ.
*3. MR-J4-B/A servo amplifier is compatible only with two-wire type and four-wire type serial linear encoders. For pulse train interface (A/B/Z-phase differential output type) linear encoder, use MR-J4-B-RJ/A-RJ.
*4. Available only in some models.



MR-J4W3-B

The SSCNET III/H compatible 3-axis servo amplifier drives three servo motors, enabling energy-conservative, less-wiring, compact machine at lower cost.



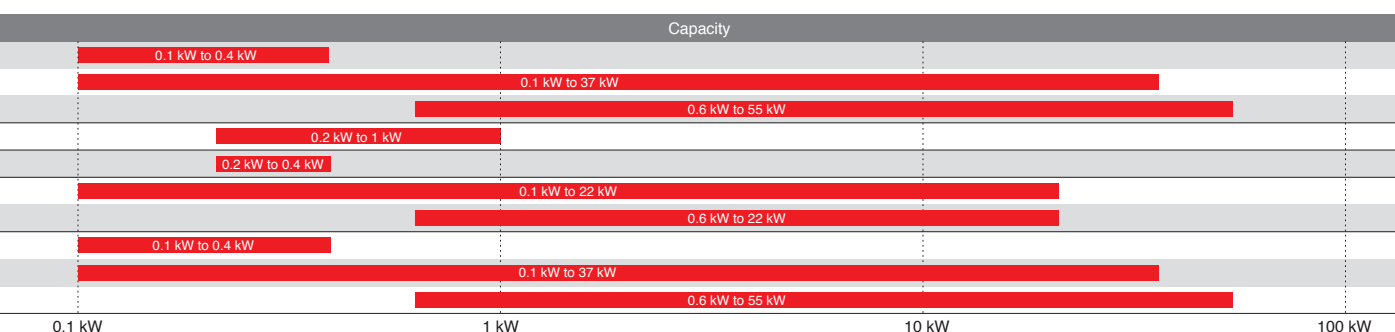
MR-J4-B-RJ010 +MR-J3-T10

The CC-Link IE Field Network interface servo amplifier with Motion is compatible with the Motion control in the Ethernet-based open network.



MR-J4-A(-RJ)

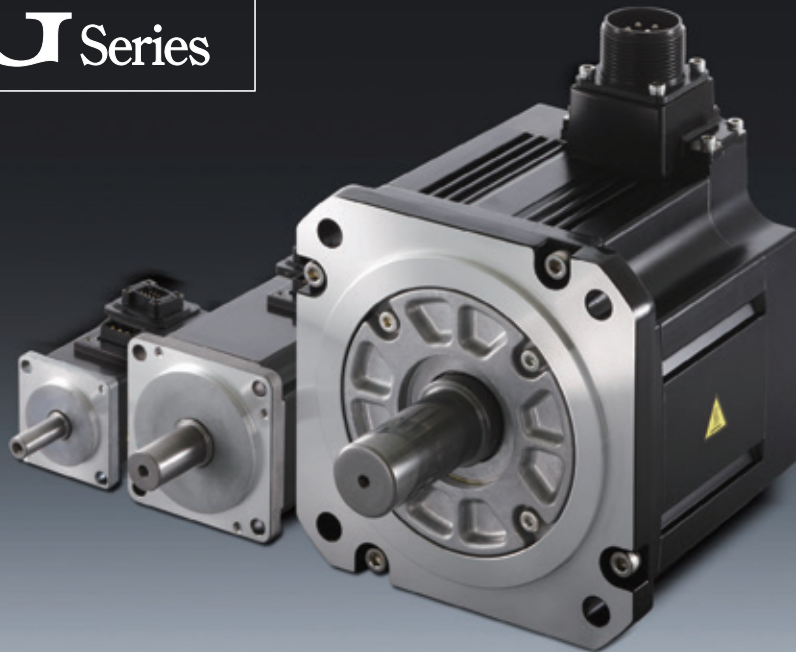
The general-purpose interface compatible servo amplifier enables position control by pulse train command and speed/torque control by analog voltage command. The maximum command pulse frequency is 4 Mpulses/s.



High-speed, high-torque servo motors for fast, precise machine operation

Rotary servo motor

HG Series

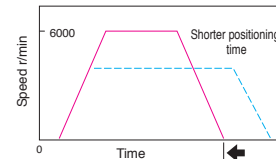


HG-KR/HG-MR Series

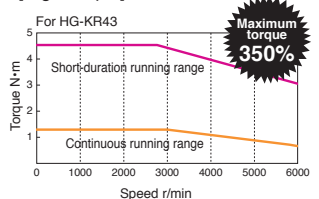
Rated speed: 3000 r/min
Maximum speed: 6000 r/min
Maximum torque is 350%* of the rated torque, and high torque is achieved during high-speed. * Available only in HG-KR.

[High speed]

Comparison with motors with max. speed of 4500 r/min



[High torque]



HG-SR Series

This medium capacity, medium inertia servo motor enables stable operation. The industry's shortest length is achieved by optimizing the structural design.



HG-JR Series

This medium/large capacity, low inertia servo motor is suitable for high-throughput and high-acceleration/deceleration operations.



HG-RR Series

This medium capacity, ultra-low inertia servo motor is perfect for high-throughput operations.



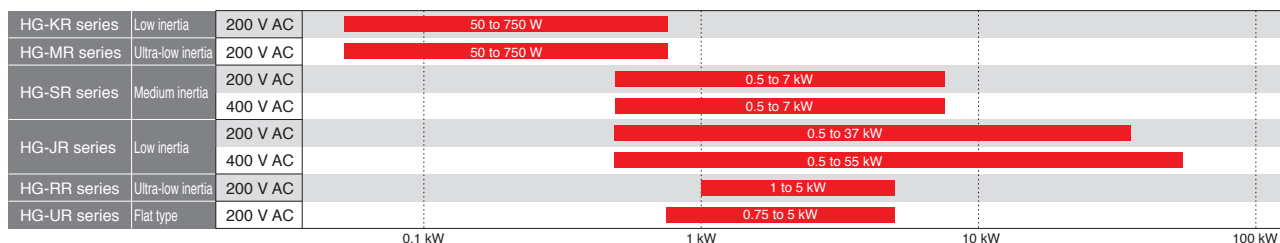
HG-UR Series

This medium capacity, flat type servo motor is well suited for situations where the installation space is limited.



Product Lines

Wide range of series and capacities are available.



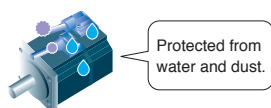
Equipped with High-resolution Absolute Position Encoder

Servo motors are equipped with a high-resolution absolute position encoder of 4,194,304 pulses/rev (22-bit) as standard. Positioning accuracy is increased.

Improved Environmental Safety

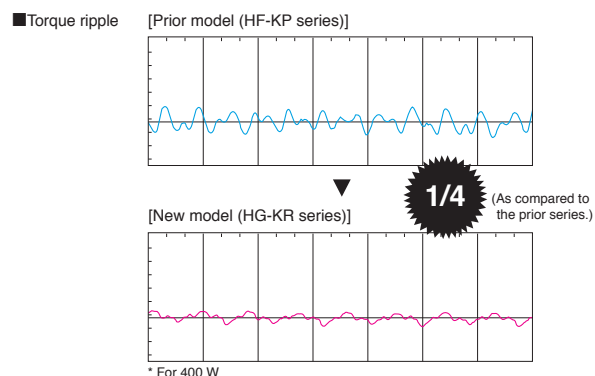
HG-KR/HG-MR/HG-RR/HG-UR and HG-SR/HG-JR are rated IP65 and IP67^{*1}, respectively.^{*2}

^{*1} HG-JR1000 r/min series 15 kW or larger, and HG-JR1500 r/min series 22 kW or larger are rated IP44.
^{*2} The shaft-through portion is excluded.



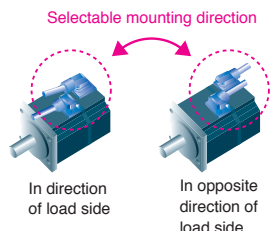
Reduced Torque Ripple during Conduction

By optimizing the combination of the number of motor poles and the number of slots, torque ripple during conduction is greatly reduced. Smooth constant-velocity operation of machine is achieved.



Cable Leading Direction

The power cable, the encoder cable, and the electromagnetic brake cable are led out to either in direction of or in opposite direction of the load side, depending on the selected cables. (HG-KR and HG-MR series)



Application Examples

For various applications of every kinds of machine.

Semiconductor/LCD/photovoltaic manufacturing systems 	Mounters/bonders 	X-Y tables 	Robots
Loaders/unloaders, feeders and sliders 	Food processing machines (filling machine, mixer, measuring machine, etc.) 	Food packaging machines 	Press machines

Servo motors for high-speed, high-accuracy, linear drive systems

Linear servo motor

LM Series



Sophisticated Performance

- Maximum speed: 3 m/s (LM-H3 series)
- Maximum thrust range: 150 N to 18000 N
Small size and high thrust are achieved by increasing the winding density and by optimizing core and magnet geometries using electromagnetic field analysis.
- Four series are available: core, liquid-cooling core, magnetic attraction counter-force core, and coreless types.
- The linear servo motors are compatible with a variety of serial interface linear encoders including A/B/Z-phase differential output type linear encoders*. The linear encoder resolution ranges from 0.005 μm and up.
* A/B/Z-phase differential output type linear encoder is compatible with MR-J4-B-RJ/MR-J4-A-RJ servo amplifier.
- High-performance systems such as high-accuracy tandem synchronous control are achieved using MR-J4 series servo amplifier and an SSCNET III/H compatible Motion controller.

Achieving High-performance Machine

For higher machine performance

- Improved productivity due to high-speed driving part.
- High-accuracy positioning by fully closed loop control system.

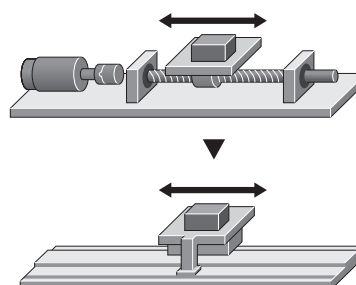
For easier use

- The linear servo motor enables simple and compact machine with high rigidity.
- Smooth operation and clean system are achieved.

For flexible machine configurations

- Multi-head and tandem systems are easily configured.
- The linear servo motor is suitable for long-stroke applications.

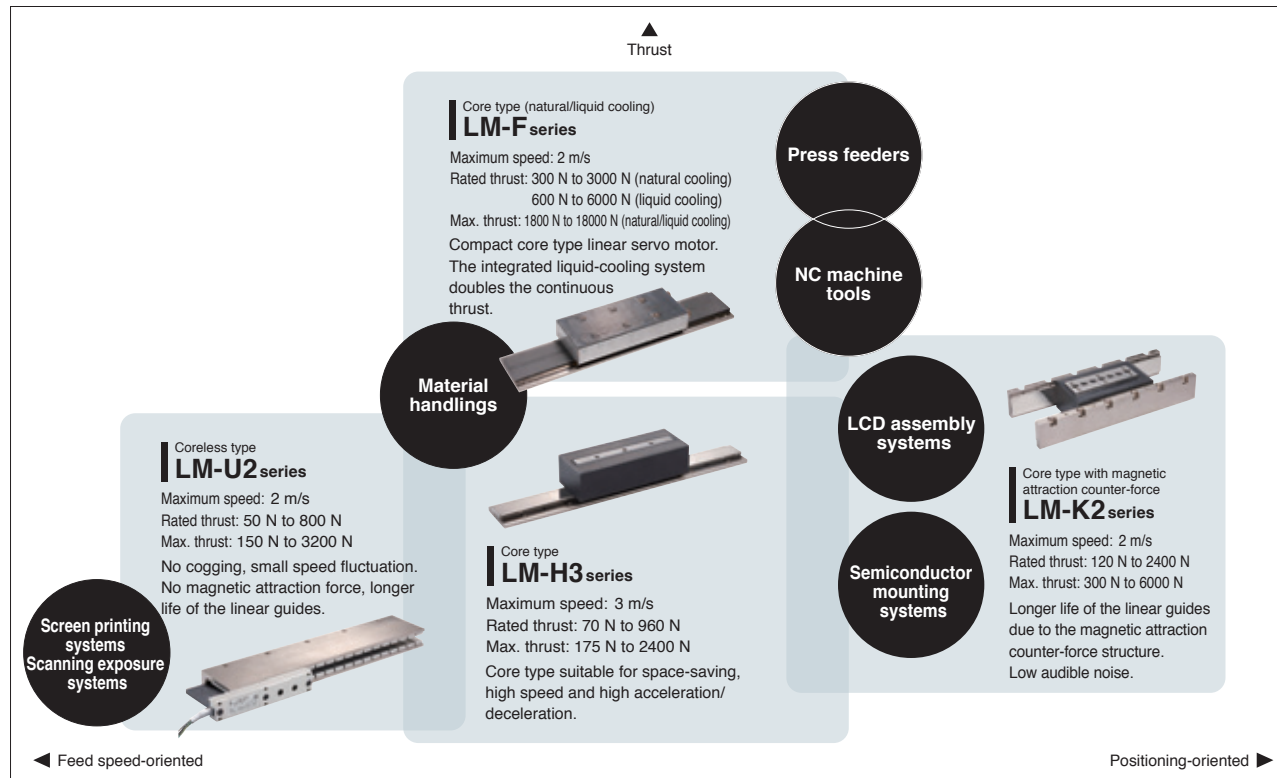
[Offers more advantage than conventional ball screw driving systems]





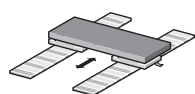
Product Lines

Four series are available depending on applications.



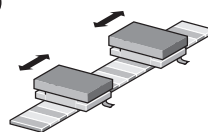
Application Examples

Optimum for a direct acting system which requires a high speed and high accuracy. Easily achieve a tandem configuration or multi-head configuration.



Tandem configuration

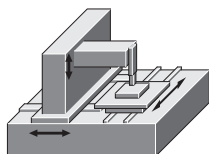
The linear servo motors configured in tandem are suitable for large systems that require highly accurate synchronous operation between two axes.



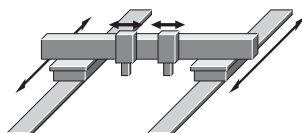
Multi-head configuration

Multi-head systems enable control of two motor coils independently, thereby simplifying machine mechanisms. This system is suitable for machines that require short tact time.

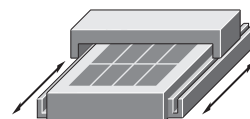
Machine tools XYZ stage



Semiconductor/LCD manufacturing systems
Electrical parts assembling/manufacturing systems



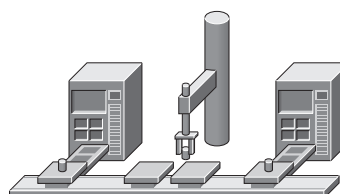
Screen printing systems and large LCD coaters



Material handling systems



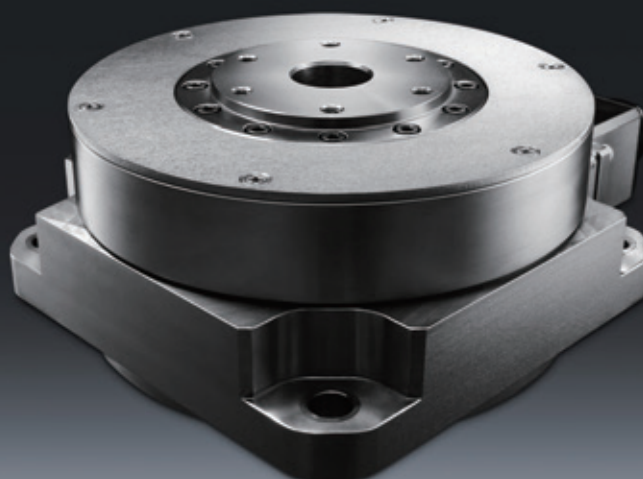
Multi-head material handling between machines



Compact and robust direct drive motors for high-accuracy applications

Direct drive motor

TM-RFM Series



Sophisticated Performance

High performance due to the latest technologies

Our latest magnetic design and winding technologies enable high torque density. In addition, extremely smooth rotation is achieved by minimizing torque ripple.

20-bit high-resolution absolute position encoder

The servo motor is equipped with 20-bit high-resolution absolute position encoder (1,048,576 pulses/rev) as standard. High-accuracy machine is achieved.

Compact and low-profile design

Due to high level of structural design technology, compact and low-profile design is achieved. This design enables a small mounting space and a low center of gravity.

Hollow shaft diameter range: $\phi 20$ mm to 104 mm

The motor is equipped with a large hollow shaft resulting from using bearing and encoder with large diameter. It allows cables and air tubing to pass through.

Achieving High-performance Machine

For higher machine performance

- Suitable for low-speed and high-torque operations.
- High-accuracy positioning is achieved because the motor is directly connected to the driving part.

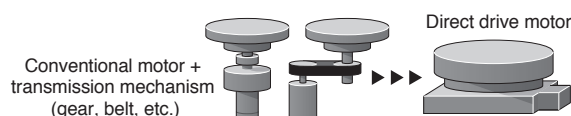
For easier use

- Since transmission mechanism is no longer required, no backlash and no abrasion occurs, enabling smooth operation with less audible noise, clean system, and easy maintenance.
- Less components are required for the system.

For flexible machine configurations

- Simple, compact, and rigid machine is achieved.
- Machine stability is enhanced due to the low-profile design and a low center of gravity.
- The motor has an inner rotor with hollow shaft that allows cables and pipes to pass through.

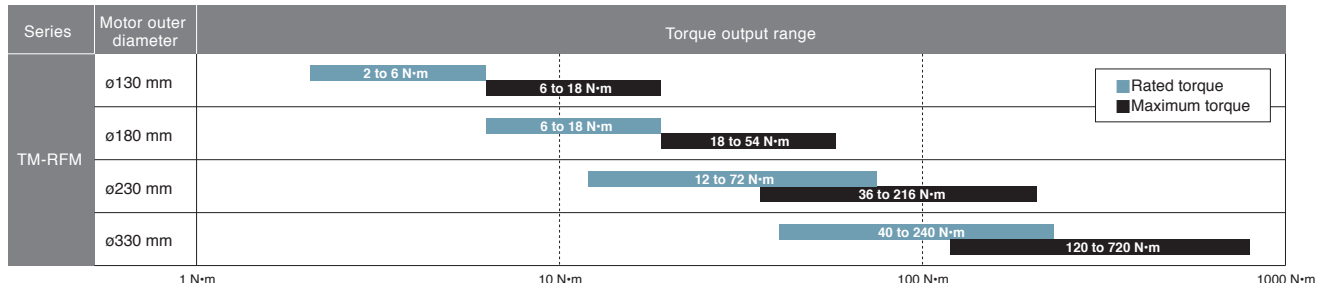
[No transmission mechanism contributing to no warp or distortion.]





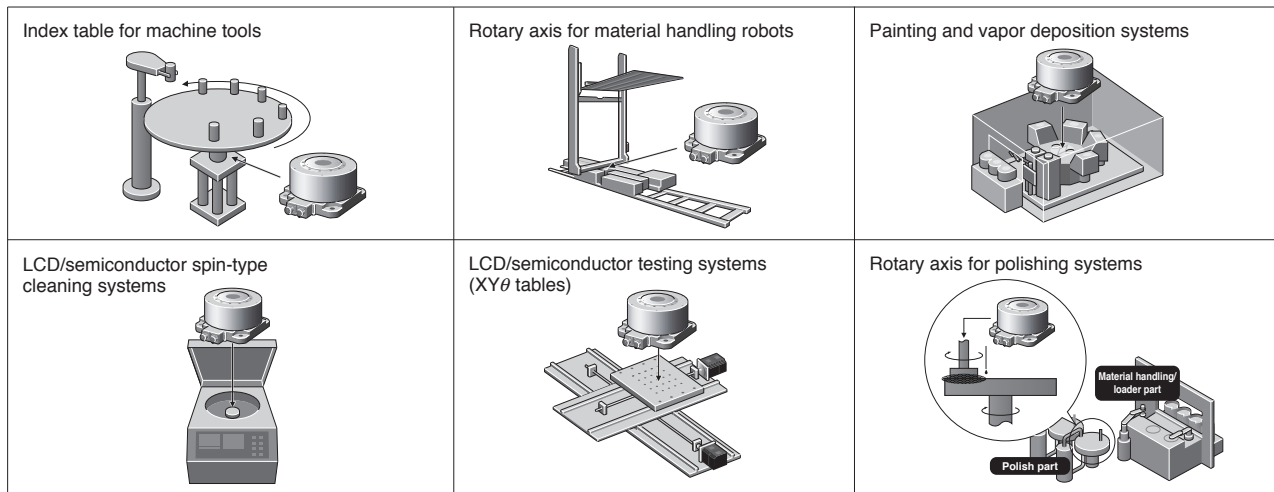
Product Lines

12 models with 4 different diameters are available.



Application Examples


Suitable for low speed and high torque applications.





MELSERIO-J4

Capacity Selection Software MRZJW3-MOTSZ111E


Select the most suitable servo amplifier, servo motor, and regenerative option for your machine just by setting machine specifications and operation pattern. Select the operation pattern from either position control mode or speed control mode. The capacity selection software is available for free download. Contact your local sales office for more details.









Amplifier series selection



Motor series selection



Operation pattern



Calculation result

- Horizontal ball screws, vertical ball screws, rack and pinions, roll feeds, rotating tables, carts, elevators, conveyors, linear servo, other devices
- Prints entered specifications, operating pattern, calculation process, graph of selection process feed speed and torque, and sizing results.

Motion controller



MELSEC iQ-R series

SSCNET III/H compatible
Motion controller
R32MTCPU
R16MTCPU

- Achieves the high-speed operation cycle of 0.222 ms/6 axes
- R32MTCPU controls up to 32 axes. (up to 96 axes by use of three modules of R32MTCPU)
- Supports the security key authentication

MELSEC-Q series

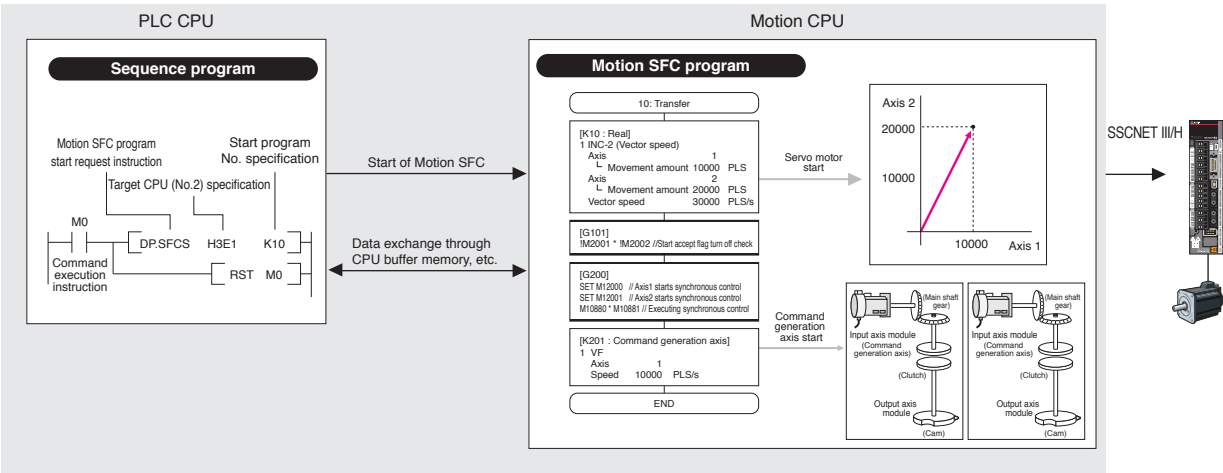
SSCNET III/H compatible
Stand-Alone Motion controller
Q170MSCPU
Q170MSCPU-S1

- Integrates a power supply, a PLC, and a Motion controller
- Equipped with an incremental synchronous encoder interface and the mark detection function
- Supports the vision system

Features of Motion Controller

The Motion controller is a CPU module used with PLC CPU for Motion control.

- Using Motion SFC programs, the Motion CPU separately operates controls from the PLC CPU. Thus CPU loads are distributed, achieving advanced Motion control.
- Various advanced Motion controls, such as advanced synchronous control, cam control, position follow-up, and tandem operation can be performed.
- COGNEX vision system can be directly connected to the controller with Ethernet.



Comparison with RD77MS: ■ Superior ■ Equivalent ■ Others						
	R32MTCPU	R16MTCPU	Q170MSCPU-S1	Q170MSCPU		
Number of control axes	Up to 32 axes		Up to 16 axes			
Operation cycle	0.222 ms or more		0.222 ms or more	Q06UDH or equivalent	0.222 ms or more	Q03UD or equivalent
Programming language	Motion SFC					
Control mode	Position control Advanced synchronous control	Speed control	Torque control	Tightening & press-fit control	Synchronous control	Cam control
Positioning control	Linear interpolation High-speed oscillation control	Circular interpolation Speed/position switching control	Trajectory control	Helical interpolation	Position follow-up control	Speed control with fixed position stop
Sub function	Forced stop Optional data monitor Vision system connection	Hardware stroke limit Mark detection Software security key	Software stroke limit ROM operation Cam auto-generation	Absolute position system M-code output High-speed reading	Amplifier-less operation Error history Limit switch output	Unlimited length feed Digital oscilloscope Safety observation



Simple Motion module



MELSEC iQ-R series

SSCNET III/H compatible
Simple Motion module

RD77MS16
RD77MS8
RD77MS4
RD77MS2

MELSEC-Q series

CC-Link IE Field Network
Simple Motion module

QD77GF16

MELSEC-L series

SSCNET III/H compatible
Simple Motion module

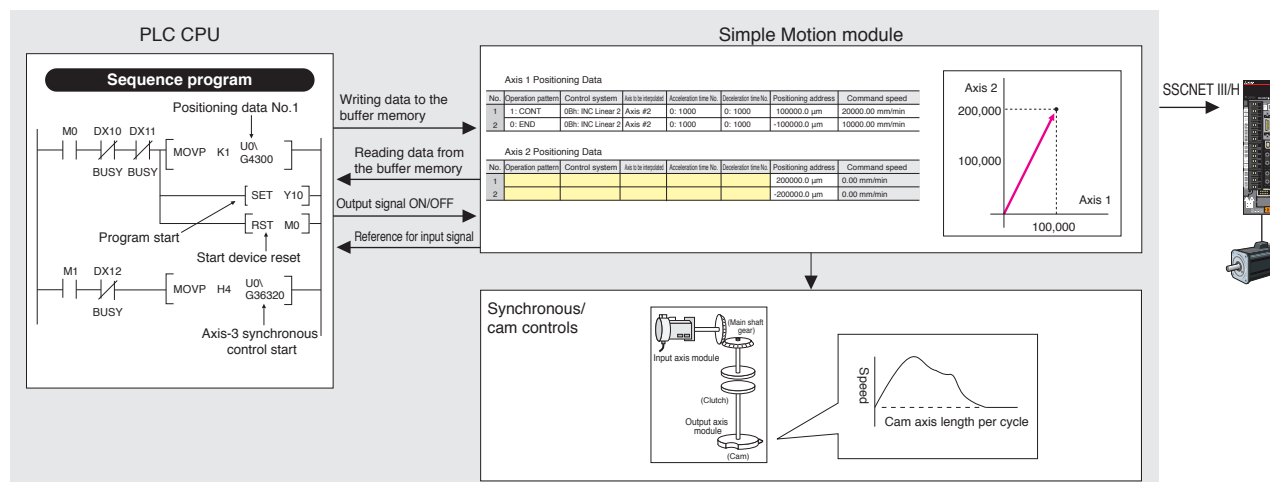
LD77MS16
LD77MS4
LD77MS2

MELSEC iQ-R series SSCNETIII/H compatible Simple Motion module RD77MS is newly released. The product line also includes MELSEC-L series Simple Motion module LD77MS and MELSEC-Q series CC-Link IE Field network compatible QD77GF.

Features of Simple Motion Module

The Simple Motion module is an intelligent function module which performs positioning control by following the instructions of PLC CPU.

- The positioning functions are used in the same manner as those of the Positioning module.
- Linear interpolation control and other controls can be achieved easily just by writing positioning data to the buffer memory with sequence programs.
- Positioning/advanced synchronous/cam controls are performed with simple parameter setting and a start from a sequence program.
- Supports GX Works3/GX Works2 as an engineering software.



	RD77MS16	RD77MS8	RD77MS4	RD77MS2	LD77MS16	LD77MS4	LD77MS2	QD77GF16
Number of control axes	Up to 16 axes	Up to 8 axes	Up to 4 axes	Up to 2 axes	Up to 16 axes	Up to 4 axes	Up to 2 axes	Up to 16 axes
Operation cycle	0.444 ms				0.888 / 1.777 ms	0.888 ms		0.888 / 1.777 / 3.555 ms
Programming language	—							
Control mode	Position control Advanced synchronous control	Speed control	Torque control	Tightening & press-fit control*			Cam control	
Positioning control	Linear interpolation	Circular interpolation Speed/position switching control (INC)	Trajectory control				Speed/position switching control (ABS)	
Sub function	Forced stop	Hardware stroke limit	Software stroke limit	Absolute position system	Amplifier-less operation*	Unlimited length feed		
	Optional data monitor*	Mark detection	Flash ROM backup	M-code output	Error history	Digital oscilloscope		
			Cam auto-generation			Safety observation*		

*1. Available only with RD77MS/LD77MS.

Positioning Module

The Positioning module is an intelligent function module which performs positioning control easily by following the instructions of PLC CPU. The Positioning module is compatible with the general-purpose pulse train as the command I/F and is used with MR-J4-A.



Pulse train compatible
MELSEC iQ-R series

RD75P4, RD75D4
RD75P2, RD75D2

- Maximum number of controlled axes:
4 axes (RD75P4), 2 axes (RD75P2), 4 axes (RD75D4), and
2 axes (RD75D2)
- Open-collector type or differential line driver type is selectable for
pulse train output
- Equipped with various positioning functions, such as circular
interpolation and target position change function



Pulse train compatible
MELSEC-L series

LD75P4, LD75D4
LD75P2, LD75D2
LD75P1, LD75D1

- Maximum number of controlled axes:
4 axes (LD75P4), 2 axes (LD75P2), 1 axis (LD75P1),
4 axes (LD75D4), 2 axes (LD75D2), and 1 axis (LD75D1)
- Open-collector type or differential line driver type is selectable for
pulse train output
- Equipped with various positioning functions, such as circular
interpolation and target position change function



Pulse train compatible
MELSEC-Q series

QD70P8, QD70D8
QD70P4, QD70D4

- Maximum number of controlled axes:
8 axes (QD70P8), 4 axes (QD70P4), 8 axes (QD70D8),
and 4 axes (QD70D4)
- Open-collector type or differential line driver type is selectable for
pulse train output
- Connectable to a stepping motor



Pulse train compatible
MELSEC-L series

L02SCPU, L02CPU
L02CPU-P, L06CPU
L26CPU, L26CPU-BT
L26CPU-PBT

- Controls up to 2 axes
- Supports S-curve acceleration/deceleration
- Equipped with various functions as standard, such as positioning,
high-speed counter, pulse catch, interrupt input, and general
input/output functions



Pulse train compatible
MELSEC-F series

FX_{2N}-20GM
FX_{2N}-10GM

- Maximum number of controlled axes:
2 axes (FX_{2N}-20GM), 1 axis (FX_{2N}-10GM)
- Equipped with various positioning operation modes



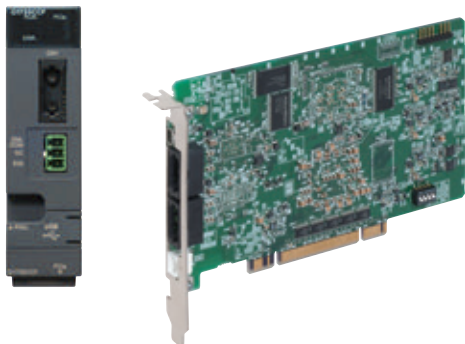
Pulse train compatible
MELSEC-F series

FX_{3UC}-32MT-LT
FX_{3UC}-32MT-LT-2

- Controls up to 3 axes
- Programmable controller equipped with the built-in positioning
function



C Controller/Personal Computer Embedded Type Servo System Controller



C Controller Interface Module

Q173SCCF

Connected directly to a C Controller through PCI Express®, this module is used for controlling MR-J4_-B, through a user program.

- High-speed access and interrupt detection are achieved with PCI Express®.
- Event-driven programs, which use interrupts, can be created.

SSCNET III/H compatible Position Board

MR-MC210 MR-MC211

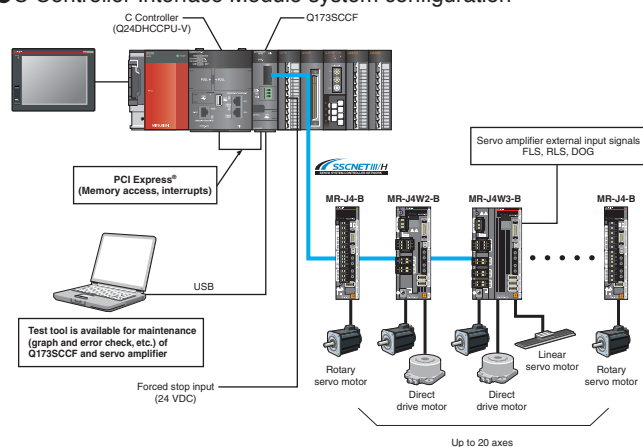
Connected to a personal computer through PCI bus, this board type controller is used for controlling MR-J4_-B, through a user program.

- Event-driven programs, which use interrupts, can be created.
- Various existing assets such as boards and programs for PC can be effectively used.
- Real-time OS is supported.

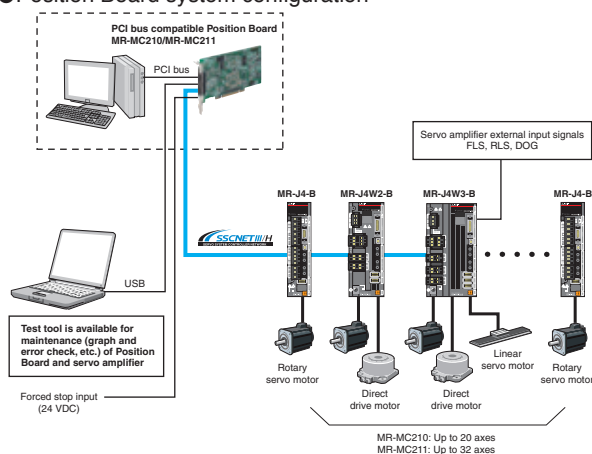
Features of C Controller/Personal Computer Embedded Type Servo System Controller

- Select from a combination of C Controller and the Interface Module or a personal computer and the Position Board
- Programmable controllers are not required in the system
- Equipped with Point to Point positioning functionality as standard (set with Point table)
- High-speed processing (1 cycle startup, 0.222 ms/8 axes)
- Various API functions and a test tool help user develop applications

● C Controller Interface Module system configuration



● Position Board system configuration



● Main basic functions

JOG operation, Incremental feed, Automatic operation, Linear interpolation, Home position return, Electronic gear, Speed units setting, Smoothing filter, S-curve acceleration/deceleration, Stop function, Command change, Stroke limit, Interlock, Rough match output, Torque limit, Backlash compensation, Interference check, Position switch, Home position search limit, Absolute position detection system, Other axes start, Tandem operation, Pass position interrupt, Log function, etc.

Related Catalogs



Mitsubishi Servo System
Controllers MELSEC iQ-R
series catalog
L(NA)03100ENG



Mitsubishi Servo System
Controllers catalog
L(NA)03062



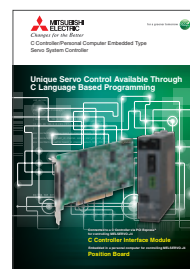
MELSEC iQ-R Series
iQ Platform-compatible PAC
catalog
L(NA)08298ENG



Programmable Controllers
MELSEC-L series catalog
L(NA)08159E



PROGRAMMABLE LOGIC
CONTROLLERS
MELSEC FX catalog
HIME-B213



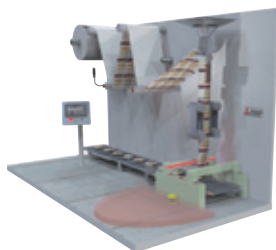
C Controller/Personal Computer
Embedded Type Servo System
Controller catalog
L(NA)03097

Our total solution for your satisfaction

MELSERVO Solution

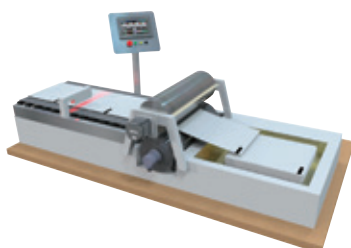
Introducing the MELSERVO solutions for problems in production sites.
We offer the optimal solutions for various problems in various production sites.

Vertical Form, Fill & Seal For food/beverage bag filling and packing



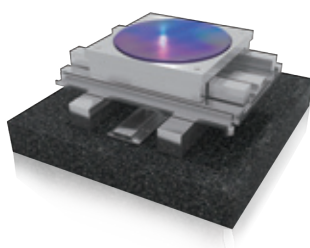
Solution 01	Stabilizing the packing quality ↳ Synchronous Control
Solution 02	Shorter tact time without increasing shock to a machine ↳ Cam Control
Solution 03	Creating a safety system ↳ Safety Observation Function

Rotary Knife For steel & paper cutting, stamping and labeling



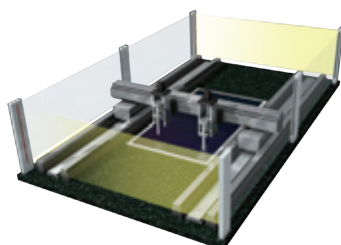
Solution 01	Cam creation on HMI screen ↳ Cam Auto-generation Function
Solution 02	Cutting the sheet using the registration mark as a reference ↳ Mark Detection Function

Motion Alignment(X-Y-θ) For equipment requiring more accurate positioning



Solution 01	More accurate positioning ↳ COGNEX Vision System
Solution 02	More precise drive operation ↳ Direct Drive Motor
Solution 03	Shorter tact time ↳ Target Position Change Function

Gantry Application For material handling, automatic assembly and scanning



Solution 01	Suppression of the machine vibration ↳ Vibration Suppression Functions
Solution 02	Simpler multi-head configuration ↳ Linear Servo Motor
Solution 03	Synchronized movement of axis-1 and axis-2 ↳ Tandem Configuration

Pick and Place Robot For material loading/unloading and sealing



Solution 01	Suppression of the machine vibration ↳ Advanced Vibration Suppression Control II
Solution 02	Simpler setting of the suppression function ↳ Machine Analyzer and Machine Resonance Suppression Filter
Solution 03	Smaller size machine ↳ 3-axis Type Servo Amplifier

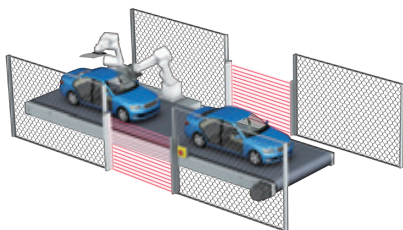


Press-fit Machine For pressing, bonding, clamping, and cap tightening



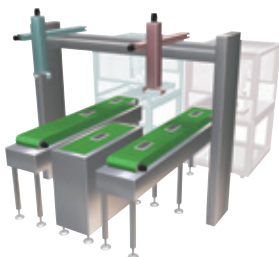
- | | |
|-----------------------|--|
| Solution
01 | Pressing of the material with less shock to a machine
↳ Tightening & Press-fit Control |
| Solution
02 | Monitoring of the machine movement
↳ Safety Signal Comparison Function |

Conveyor System Utilizing Safety Observation Function For safety observation of printing, packing, and other lines



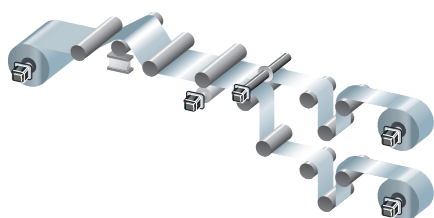
- | | |
|-----------------------|---|
| Solution
01 | Safety measures in case of a person entering in a restricted area
↳ Shut-off Function |
| Solution
02 | Ensuring safe speed for manned assembly line
↳ Speed Monitoring Function (SLS) |

Eco-friendly Conveyors and Product Handling Equipment For conveyors, Motion alignment, packing, and robots



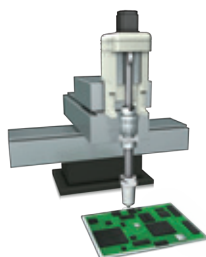
- | | |
|-----------------------|--|
| Solution
01 | Managing of total power consumption
↳ Power Monitor Function |
| Solution
02 | Reduction of power consumption
↳ Multi-axis Servo Amplifier |
| Solution
03 | Minimizing waste of power
↳ Capacity Selection Software |

Film Slitting Machine For equipment with rollers



- | | |
|-----------------------|---|
| Solution
01 | Sending film with a constant speed or tension
↳ Speed Control, Torque Control |
| Solution
02 | Utilizing regenerative energy
↳ PN Bus Voltage Connection + Power Regeneration Common Convert |

Screw Tightening Machine For tightening, pressing, and clamping



- | | |
|-----------------------|---|
| Solution
01 | Tightening screws without using a torque sensor
↳ Tightening & Press-fit Control |
| Solution
02 | Repeated accuracy in screw tightening operation
↳ Reduced Torque Ripple During Conduction |

Every production site has unique problems that require unique and innovative solutions. MELSERVO offers the best solutions you have been looking for.

Exceptional Solutions for All of Your Production Needs

Refer to "MELSERVO SOLUTIONS catalog (L(NA)03094)" for details.



MELSEC iQ-R series

Revolutionary, next-generation controllers
building a new era in automation



Refer to "MELSEC iQ-R Series iQ Platform-compatible PAC catalog" for details.

As the core for the next-generation automation environment, realizing an automation controller with added value while reducing TCO

To succeed in highly competitive markets, it's important to build automation systems that ensure high productivity and consistent product quality. The MELSEC iQ-R Series has been developed from the ground up based on common problems faced by customers and rationalizing them into seven key areas: Productivity, Engineering, Maintenance, Quality, Connectivity, Security and Compatibility. Mitsubishi Electric is taking a three-point approach to solving these problems: **Reduce TCO***, increasing **Reliability** and **Reuse** of existing assets.

As a bridge to the next generation in automation, the MELSEC iQ-R Series is a driving force behind **revolutionary** progress in the future of manufacturing.

*TCO: Total cost of ownership

MELSEC iQ-R series

Reduce TCO



Productivity

Improve productivity through advanced performance/functionality

- New high-speed system bus realizing shorter production cycle
- Super-high-accuracy motion control utilizing advanced multiple CPU features
- Inter-modular synchronization resulting in increased processing accuracy



Engineering

Reducing development costs through intuitive engineering

- Intuitive engineering environment covering the product development cycle
- Simple point-and-click programming architecture
- Understanding globalization by multiple language support



Maintenance

Reduce maintenance costs and downtime utilizing easier maintenance features

- Visualize entire plant data in real-time
- Extensive preventative maintenance functions embedded into modules



Connectivity

Seamless network reduces system costs

- Seamless connectivity within all levels of manufacturing
- High-speed and large data bandwidth ideal for large-scale control systems
- Easy connection of third-party components utilizing device library

Reuse



Compatibility

Extensive compatibility with existing products

- Utilize existing assets while taking advantage of cutting-edge technology
- Compatible with most existing MELSEC-Q Series I/O

Reliability



Security

Robust security that can be relied on

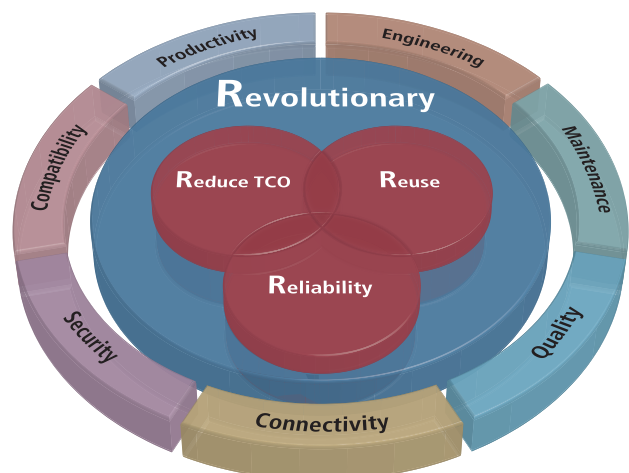
- Protect intellectual property
- Unauthorized access protection across distributed control network



Quality

Reliable and trusted MELSEC product quality

- Robust design ideal for harsh industrial environments
- Improve and maintain actual manufacturing quality
- Conforms to main international standards



One Software, Many Possibilities

GX Works3

Intuitive and easy engineering

With GX Works3 programming cannot be made any easier with various intuitive features such as graphic-based system configuration and an extensive module library provided as standard. In addition to multiple language support realizing a global engineering tool required for current automation needs.





GOT2000

Graphic Operation Terminal

Your window to better production control



Refer to "iQ Platform Graphic Operation Terminal GOT2000 Series catalog" for details.

The Mitsubishi Electric Graphic Operation Terminal GOT2000 series continues to impress with solutions that fulfill all demands.

The GOT2000 boasts advanced functionality, acts as a seamless gateway to other industrial automation devices, all while increasing productivity and efficiency. The high quality display is designed to optimize operator control and monitoring of device and line statuses. If you are looking for an intuitive operation terminal, the new tablet-like operability and the higher functionality of operation terminal makes the GOT2000 the ideal choice.

Graphic Operation Terminal

- GOT2000 series **GT27, GT25, GT23, GT21**
- GOT1000 series **GT16, GT15, GT14, GT12, GT11, GT10**

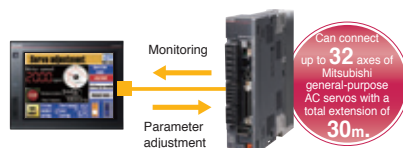
All models

GT27, GT25, GT23, GT16, GT15, GT14, GT12, GT11

GT27, GT25, GT16, GT15

Connection to AC servos

Direct connection to Mitsubishi AC servo amplifiers with RS-422 makes it easy to adjust parameter settings etc.



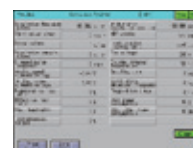
FA transparent function

The GOT acts as a transparent gateway to enable programming, start up, and adjustment of equipment using MT Works2, GX Configurator-QP, MR Configurator2, or GX Works2. Users do not have to bother with opening the cabinet or changing cable connections.



Servo amplifier monitor function

In a system which outputs pulse train, the GOT can be connected to a servo amplifier in a serial connection to perform the following operations: monitoring, alarm display, diagnosis, parameter setting, and test operations.



GT27, GT25, GT16, GT15

Q series motion monitor function

The GOT enables easy monitoring of Motion controllers (Q series), changing of servo parameters, and display of errors on the screen.



Q series Motion monitor window

GT27, GT25, GT16, GT15

Intelligent module monitor function

Buffer memory values of modules such as the QD77MS and I/O information can be monitored and changed.

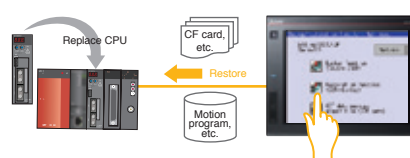


Intelligent module monitor window

GT27, GT25, GT23, GT16, GT15, GT14, GT12

Backup/restoration function

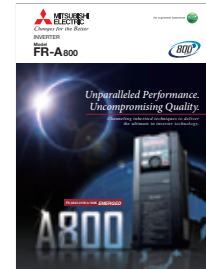
Motion controller (Q series) programs and parameters can be backed up to the CF card or USB memory in the GOT. Users can then perform batch operation to restore the data to the Motion controller.



FR-A800



Unparalleled Performance.
Uncompromising Quality.



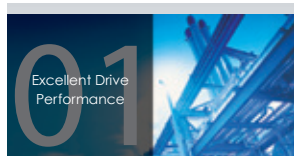
Refer to "Inverter FR-A800 catalog" for details.

Achieving higher drive performance and energy conservation with inverters

The inverter is a variable frequency power device that can easily and freely change the speed of a 3-phase induction motor. The Mitsubishi inverter is high-performance and environment-conscious, and complies with global standards. Select a model from our diverse lineup to match your needs.

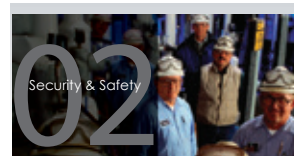
FR-A800 series

Introducing our high-value, next-generation inverter delivering outstanding drive performance in any environment, and a wealth of functionality covering startup to maintenance. We offer a comprehensive line-up in response to the challenges of globalization.



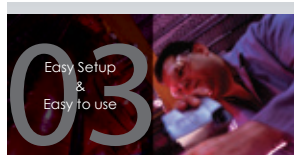
LEADING DRIVE PERFORMANCE

The new series is equipped with the new state-of-the-art high-speed processor developed by Mitsubishi. With better control performance and response level, safe and accurate operation is assured in a diverse range of applications.



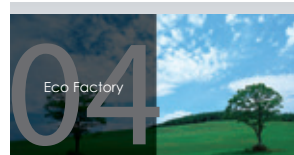
SECURITY & SAFETY

Swift recovery ensured by preventing trouble beforehand. The FR-A800 has been developed with reliability and safety foremost in mind.



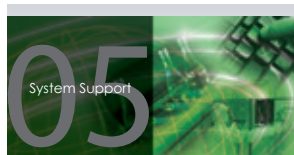
EASY SETUP & EASY TO USE

A range of equipment and functions are prepared allowing work to be performed anywhere to suit product life cycles.



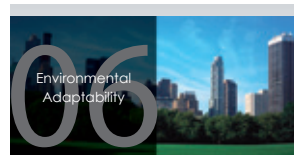
ECO-FRIENDLY FACTORIES

The power consumption by motors is said to amount about the half of all power consumption made by the Japanese manufacturing industry. Factories can save more energy without dropping their production. Less energy and more production—the FR-A800 series will help you to get the both.



SYSTEM SUPPORT

Numerous functions and the extensive lineup of models are ready to support various systems.



ENVIRONMENTAL ADAPTABILITY

The FR-A800 series complies with various standards and is usable in different scenes.



MELFA

Performing like humans and surpassing their abilities

The Mitsubishi Electric industrial robot will revolutionize your manufacturing site with faster, more intrinsic and simpler functions.

Mitsubishi Electric aims to easily achieve automated production equipment. We propose the "MELFA F series" which is equipped with the improved performance and with intelligent technology that we have developed and verified at our own production facilities.

The iQ Platform compatible robot controller increases the speed of data communications between CPUs and dramatically reduces I/O processing times using a high-speed standard base between multiple CPUs.

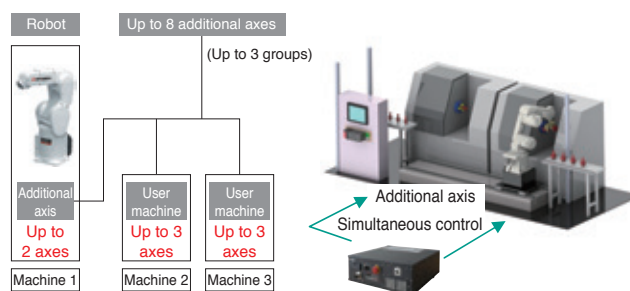


Refer to "Mitsubishi INDUSTRIAL ROBOT MELFA F Series catalog" for details.

Industrial robot MELFA F series

◎Additional axis function

- The layout can be set up to include the robot traveling axis and turntable as well as user machines separate from the robot such as loaders and positioning devices.
- Up to 8 additional axes can be controlled by the controller.
- Additional axes and user machines can be operated from the robot program and teaching pendant without any additional motion control hardware. The same JOG operation as for the robot can be used. Robot language can be used for control operations.
- The robot controller has plug-and-play compatibility with MR-J4-B. (J3 compatibility mode)
- Standard interface function (Separate servo amplifier and servo motor required.)



◎Intelligence solution

By utilizing the force sensor to adjust the power, automation of the procedures with high difficulty is now achieved.

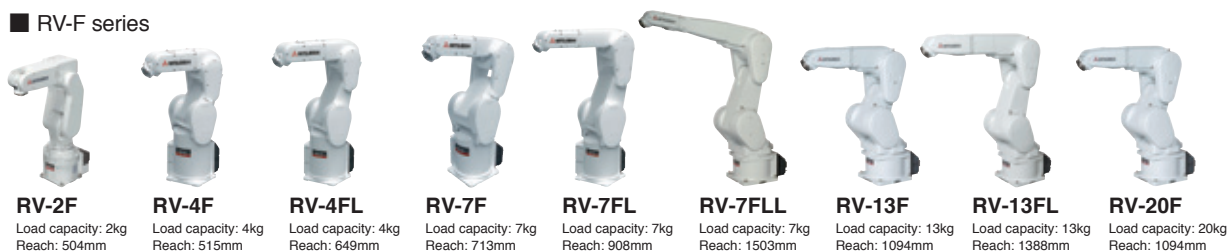
Force sensor

Collision avoidance

Coordinated control

Product lines

■ RV-F series



■ RH-F series



As a recognized leader in factory automation,
Mitsubishi Electric offers a world-class level of customer satisfaction.

Production/Development System

For more than 80 years from the start of operations in 1924, Mitsubishi Electric Nagoya Works has manufactured various universal devices including motors, programmable controllers and inverters. The history of AC servo production at Nagoya Works spans over 30 years. We have expanded our production system based on the technology and tradition amassed during this time, and have incorporated world-class research and development to create high-performance, high-quality products that can be supplied for a long time.

Production system

To guarantee the high quality and performance of MELSERVO, Mitsubishi Electric has built a cooperative system of three facilities - Shinshiro Factory, a branch factory of Nagoya Works; Mitsubishi Electric Automation Manufacturing (Changshu) Co., Ltd., a manufacturing base; and Nagoya Works at the core. Mitsubishi Electric responds to various needs throughout the world by uniting technologies and know-how of these facilities. Mitsubishi Electric's FA energy solutions, "e&eco-F@ctory", are at work in the servo motor factory at the Nagoya Works. They are being used to boost capacity utilization and product quality, and reduce energy consumption.



Mitsubishi Electric Nagoya Works



e&eco-F@ctory implementation

Development system

To spread advanced servo systems to the world as quickly as possible, Mitsubishi Electric has established FA-related development centers at its Nagoya Works, and in North America and Europe. Furthermore, we have established strong connections between our Advanced Technology R&D Center, which pushes technology development beyond the limits of FA, and Information Technology R&D Center. We are moving forward with the development of new products that reflect the latest technological directions and customer input.



FA Development Center



EDC (Europe Development Center)



Promoting the popularity of SSCNET in Japan and around the world

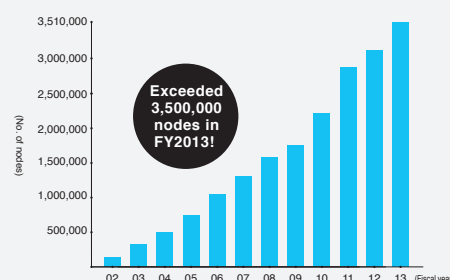
SSCNET Partner Association

The SSCNET Partner Association (SNP)
acting to spread SSCNET throughout the world.

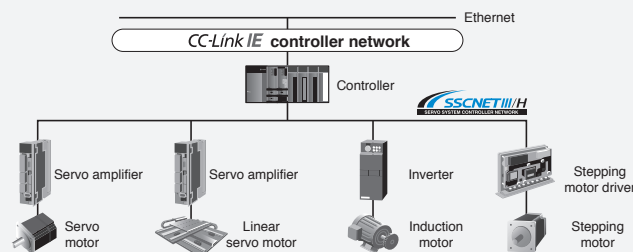


The SSCNET Partner Association (SNP) carries activities to introduce the advanced servo system controller network "SSCNET" and compatible products to many users. In cooperation with partner corporations, SNP widely promotes the performance attainable with SSCNET. In recent years, SNP holds partner meetings in Japan and other countries such as Taiwan and India. SNP aims to make "SSCNET" a more global servo system controller network.

■ Transition of number of SSCNET nodes introduced



"SSCNET" increases the freedom of system configurations with the Mitsubishi servo as well as the variety of SSCNET compatible partner products including stepping motors and direct drive motors.



Main membership benefits

- Access to the latest trends and information on motion network SSCNET and Mitsubishi Electric FA businesses
- Participation in partner meetings in Japan and overseas
- Expanding business opportunities
- Introduction of member products and SSCNET compatible products to various tools and media
- Free of registration fees and annual dues.

Members of The SSCNET Partner Association (in alphabetical order)

Asahi Engineering Co., Ltd.	GMC Hillstone Co., Ltd.	Hamamatsu Photonics K.K.	Harmonic Drive Systems Inc.	HOKUYO AUTOMATIC CO., LTD.	IAI Corporation
Mitsubishi Electric Corporation	Mitsubishi Electric Engineering Co., Ltd.	Murata Machinery, Ltd.	Nikki Denso Co., Ltd.	NIPPON THOMPSON CO., LTD.	NSD Corporation
ORIENTAL MOTOR Co., Ltd.	SANYO DENKI CO., LTD.	ShinMaywa Industries, Ltd.	TESSERA TECHNOLOGY INC.	THK CO., LTD.	238 corporations in Japan and other countries

A global support network for MELSERVO users

Global FA Center

Across the globe, FA Centers provide customers with local assistance for purchasing Mitsubishi Electric products and with after-sales service. To enable national branch offices and local representatives to work together in responding to local needs, we have developed a service network throughout the world. We provide repairs, on-site engineering support, and sales of replacement parts. We also provide various services from technical consulting services by our expert engineers to practical training for equipment operations.



Ratingen, Germany
Germany FA Center/
Europe Development Center



Krakowska, Poland
Europe FA Center (Poland)



St. Petersburg, Russia
Russia FA Center



**Pune/Gurgaon/Bangalore/
Chennai/Ahmadabad, India**
India FA Center



Bangkok, Thailand
Thailand FA Center



Hatfield, U.K.
UK FA Center



Praha, Czech Republic
Czech Republic FA Center



Istanbul, Turkey
Turkey FA Center

China (including Hong Kong District)



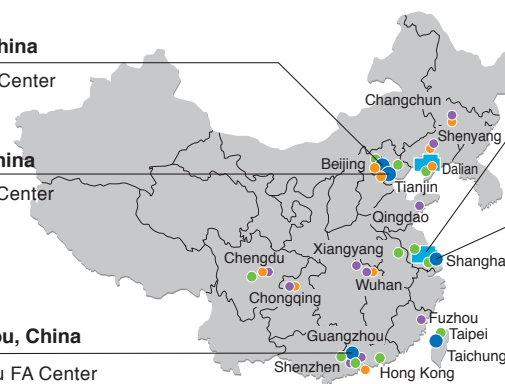
Beijing, China
Beijing FA Center



Tianjin, China
Tianjin FA Center



Guangzhou, China
Guangzhou FA Center



Changshu, China

China Local Factory
Mitsubishi Electric
Automation Manufacturing
(Changshu) Co., Ltd.



Shanghai, China

Shanghai FA Center



Complies with EN, UL, CSA (c-UL) standards,
and Korea Radio Wave Law (KC).



MELSERVO-J4 series conforms to global standards.

* This product is not subject to China Compulsory Certification (CCC).

* Refer to "Servo Amplifier Instruction Manual" and "EMC Installation Guidelines" when your system needs to meet the EMC directive.

* For corresponding standards and models, contact your local sales office.

- Global FA Center ● FA Center Satellite (China) ● Mechatronics Service Base (China) ● Mitsubishi Sales Offices
- Production Facility ◆ Development Center



Complies with Restriction of Hazardous Substances Directive (RoHS).

Human and environment-friendly MELSERVO-J4 series is compliant with RoHS Directive.

About RoHS directive

RoHS Directive requires member nations to guarantee that new electrical and electronic equipment sold in the market after July 1, 2006 do not contain lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants. <G> mark indicating RoHS Directive compliance is printed on the package.

* Refer to "Servo Amplifier Instruction Manual" and "EMC Installation Guidelines" when your system needs to meet the EMC directive.

Our optional cables and connectors comply with "Measures for Administration of the Pollution Control of Electronic Information Products" (Chinese RoHS).

Conformity with Global Standards and Regulations

MELSERVO-J4 series conforms to global standards.

For corresponding standards and models, contact your local sales office.



Servo amplifier

European EC directive	Low voltage directive	EN 61800-5-1
	EMC directive	EN 61800-3
	Machinery directive	EN ISO 13849-1 Category 3 PL d / IEC 61508 SIL 2 / EN 62061 SIL CL 2 / EN 61800-5-2 SIL 2
	RoHS directive	Compliant
UL standard		UL 508C
CSA standard		CSA C22.2 No.14
Measures for Administration of the Pollution Control of Electronic Information Products (Chinese RoHS)		Compliant (optional cables and connectors)
China Compulsory Certification (CCC)		N/A
Korea Radio Wave Law (KC)		Compliant

* MR-D30 has obtained the functional safety certification by TÜV SÜD.



Rotary servo motor

European EC directive	Low voltage directive	EN 60034-1
	EMC directive	EN 60034-1
	Machinery directive	-
	RoHS directive	Compliant
UL standard		UL 1004-1 / UL 1004-6
CSA standard		CSA C22.2 No.100
Measures for Administration of the Pollution Control of Electronic Information Products (Chinese RoHS)		Compliant (optional cables and connectors)
China Compulsory Certification (CCC)		N/A
Korea Radio Wave Law (KC)		N/A



Linear servo motor

European EC directive	Low voltage directive	DIN VDE 0580
	EMC directive	-
	Machinery directive	-
	RoHS directive	Compliant
UL standard		UL-1004-6
CSA standard		CSA C22.2 No.100
Measures for Administration of the Pollution Control of Electronic Information Products (Chinese RoHS)		Compliant (optional cables and connectors)
China Compulsory Certification (CCC)		N/A
Korea Radio Wave Law (KC)		N/A



Direct drive motor

European EC directive	Low voltage directive	EN 60034-1
	EMC directive	EN 60034-1
	Machinery directive	-
	RoHS directive	Compliant
UL standard		-
CSA standard		-
Measures for Administration of the Pollution Control of Electronic Information Products (Chinese RoHS)		Compliant (optional cables and connectors)
China Compulsory Certification (CCC)		N/A
Korea Radio Wave Law (KC)		N/A

1

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A MR-J4-A/MR-J4-DU_A A-RJ MR-J4-A-RJ/MR-J4-DU_A-RJ	

* Refer to p. 5-65 in this catalog for conversion of units.

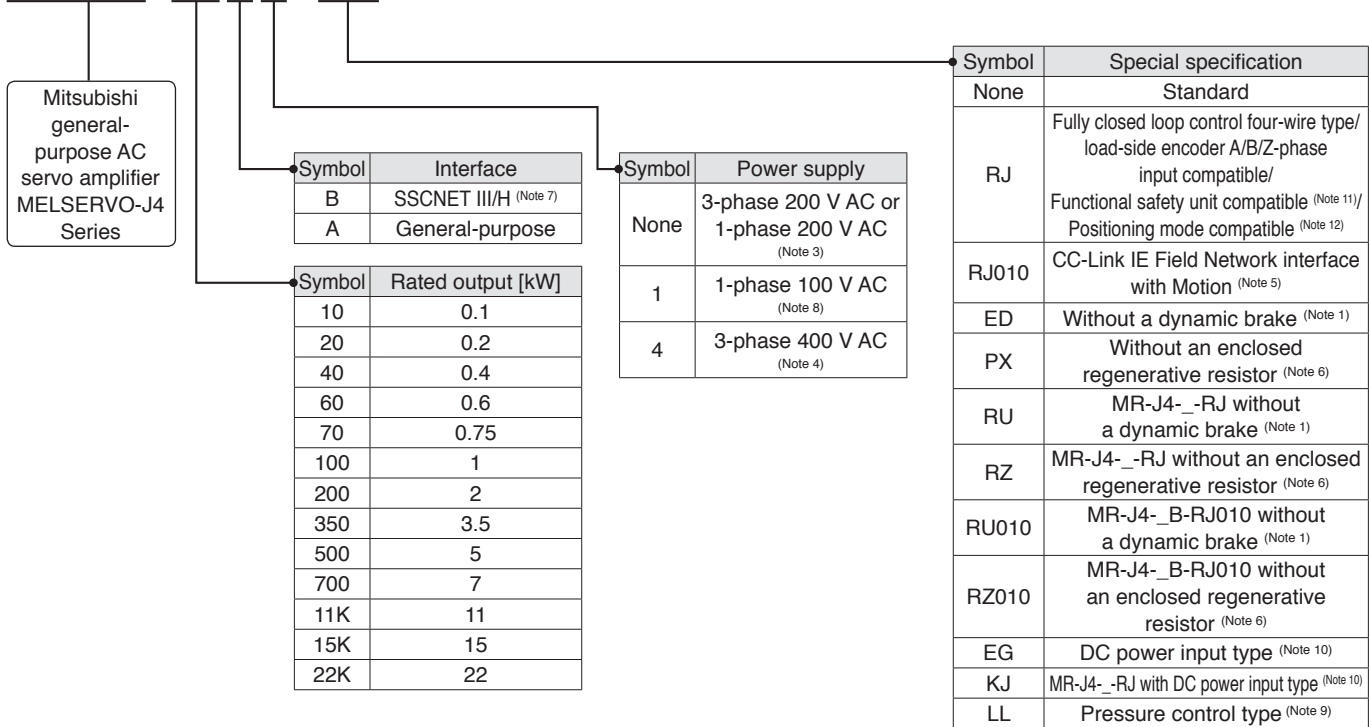
* In this section, a term of servo amplifier includes a combination of drive unit and converter unit.

Servo Amplifiers

1-Axis Servo Amplifier Model Designation

B B-RJ B-RJ010 A A-RJ

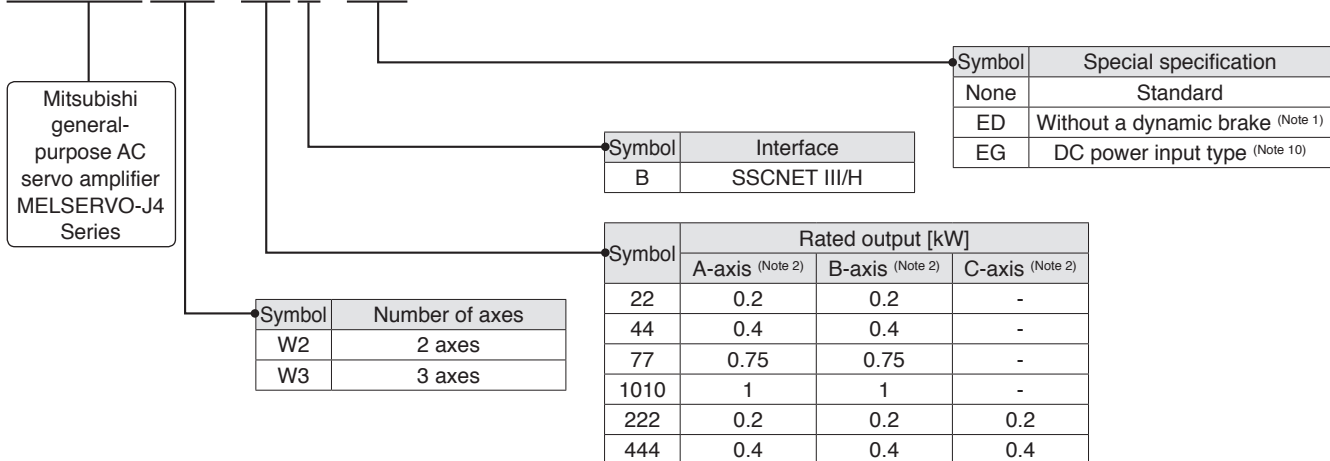
MR-J4-10B-



Multi-Axis Servo Amplifier Model Designation

WB

MR-J4W2-22B-



Notes: 1. Dynamic brake which is built in 7 kW or smaller servo amplifiers is removed. When using the servo amplifier without a dynamic brake, the servo motor does not stop immediately at alarm occurrence or power failure. Take measures to ensure safety on the entire system.

When the following servo motors are used, an electronic dynamic brake may operate at alarm occurrence.

HG-KR053, HG-KR13, HG-KR23, HG-KR43, HG-MR053, HG-MR13, HG-MR23, HG-MR43, HG-SR51, and HG-SR52

Disable the electronic dynamic brake by setting the following parameter to "___2."

For MR-J4-B/MR-J4-B-RJ/MR-J4-B-RJ010: [Pr. PF06]

For MR-J4W-_B: Disable the electronic dynamic brake for all axes with [Pr. PF06]

For MR-J4-A/MR-J4-A-RJ: [Pr. PF09]

In addition, when [Pr. PA04] is set to "2 ___" (initial value), the servo motor may be decelerated to a stop forcibly at alarm occurrence. The forced stop deceleration function will be disabled by setting [Pr. PA04] to "0 ___."

2. A-axis, B-axis, and C-axis indicate names of axes of the multi-axis servo amplifier. The C-axis is available for the 3-axis servo amplifier.

3. Servo amplifiers of 0.75 kW or smaller are available for 1-phase 200 V AC.

4. Servo amplifiers of 0.6 kW, and 1 kW or larger are available for 3-phase 400 V AC.

5. CC-Link IE Field Network interface with Motion is available only with MR-J4-_B-RJ010. CC-Link IE Field Network interface unit (MR-J3-T10) is required.

6. Available in 11 kW to 22 kW servo amplifier. A regenerative resistor (standard accessory) is not enclosed.

7. MR-J4-_B-RJ010 has CC-Link IE Field Network interface with Motion.

8. Servo amplifiers of 0.4 kW or smaller are available.

9. MR-J4-_B-_LL is available. Contact your local sales office for the pressure control compatible servo amplifiers.

10. Contact your local sales office for the DC power input type servo amplifier.

11. MR-D30 functional safety unit is compatible with MR-J4-B-RJ servo amplifiers. When using MR-D30, use MR-J4-B-RJ servo amplifier with software version B3 or later. MR-D30 will be compatible with MR-J4-B-RU/MR-J4-B-RZ/MR-J4-B-KJ servo amplifiers in the future.

12. The positioning mode is available with MR-J4-A-RJ servo amplifiers. Use MR-J4-A-RJ servo amplifiers with software version B3 or later.



Drive Unit Model Designation (Note 4)

B

B-RJ

A

A-RJ

MR-J4-DU30KB-

Mitsubishi
general-
purpose AC
servo amplifier
MELSERVO-J4
Series

Symbol	Power supply
None	3-phase 200 V AC (Note 1)
4	3-phase 400 V AC

Symbol	Interface
B	SSCNETIII/H
A	General-purpose

Symbol	Rated output [kW]
30K	30
37K	37
45K	45
55K	55

Symbol	Special specification
None	Standard
RJ (Note 2)	Fully closed loop control four-wire type/load-side encoder A/B/Z-phase input compatible/ Positioning mode compatible (Note 3)
LL	Pressure control type (Note 5)

Converter Unit Model Designation (Note 4)

MR-CR55K

Symbol	Power supply
None	3-phase 200 V AC
4	3-phase 400 V AC

Symbol	Rated output [kW]
55K	55

- Notes: 1. Drive units of 37 kW or smaller are available in 3-phase 200 V AC.
 2. MR-D30 functional safety unit is not compatible with the drive unit.
 3. Positioning mode is available with MR-J4-DU_A_-RJ drive unit.
 4. One unit of converter unit is required for each drive unit.
 5. MR-J4-DU_B_-LL is available. Contact your local sales office for the pressure control compatible drive units.

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral
Equipment

LVs/Wires

Product List

Cautions

Combinations of 1-Axis Servo Amplifier and Servo Motor

B
B-RJ
A
A-RJ

MR-J4-B/MR-J4-B-RJ/MR-J4-A/MR-J4-A-RJ (200 V)

Servo amplifier	Rotary servo motor	Linear servo motor (primary side) <small>(Note 1)</small>	Direct drive motor
MR-J4-10B(-RJ) MR-J4-10A(-RJ)	HG-KR053, 13 HG-MR053, 13	-	-
MR-J4-20B(-RJ) MR-J4-20A(-RJ)	HG-KR23 HG-MR23	LM-U2PAB-05M-0SS0 LM-U2PBB-07M-1SS0	TM-RFM002C20
MR-J4-40B(-RJ) MR-J4-40A(-RJ)	HG-KR43 HG-MR43	LM-H3P2A-07P-BSS0 LM-H3P3A-12P-CSS0 LM-K2P1A-01M-2SS1 LM-U2PAD-10M-0SS0 LM-U2PAF-15M-0SS0	TM-RFM004C20
MR-J4-60B(-RJ) MR-J4-60A(-RJ)	HG-SR51, 52 HG-JR53	LM-U2PBD-15M-1SS0	TM-RFM006C20 TM-RFM006E20
MR-J4-70B(-RJ) MR-J4-70A(-RJ)	HG-KR73 HG-MR73 HG-JR73 HG-UR72	LM-H3P3B-24P-CSS0 LM-H3P3C-36P-CSS0 LM-H3P7A-24P-ASS0 LM-K2P2A-02M-1SS1 LM-U2PBF-22M-1SS0	TM-RFM012E20 TM-RFM012G20 TM-RFM040J10
MR-J4-100B(-RJ) MR-J4-100A(-RJ)	HG-SR81, 102 HG-JR53 <small>(Note 2)</small> , 103	-	TM-RFM018E20
MR-J4-200B(-RJ) MR-J4-200A(-RJ)	HG-SR121, 201, 152, 202 HG-JR73 <small>(Note 2)</small> , 103 <small>(Note 2)</small> , 153, 203 HG-RR103, 153 HG-UR152	LM-H3P3D-48P-CSS0 LM-H3P7B-48P-ASS0 LM-H3P7C-72P-ASS0 LM-FP2B-06M-1SS0 LM-K2P1C-03M-2SS1 LM-U2P2B-40M-2SS0	-
MR-J4-350B(-RJ) MR-J4-350A(-RJ)	HG-SR301, 352 HG-JR153 <small>(Note 2)</small> , 203 <small>(Note 2)</small> , 353 HG-RR203 HG-UR202	LM-H3P7D-96P-ASS0 LM-K2P2C-07M-1SS1 LM-K2P3C-14M-1SS1 LM-U2P2C-60M-2SS0	TM-RFM048G20 TM-RFM072G20 TM-RFM120J10
MR-J4-500B(-RJ) MR-J4-500A(-RJ)	HG-SR421, 502 HG-JR353 <small>(Note 2)</small> , 503 HG-RR353, 503 HG-UR352, 502	LM-FP2D-12M-1SS0 LM-FP4B-12M-1SS0 LM-K2P2E-12M-1SS1 LM-K2P3E-24M-1SS1 LM-U2P2D-80M-2SS0	TM-RFM240J10
MR-J4-700B(-RJ) MR-J4-700A(-RJ)	HG-SR702 HG-JR503 <small>(Note 2)</small> , 703, 601, 701M	LM-FP2F-18M-1SS0 LM-FP4D-24M-1SS0	-
MR-J4-11KB(-RJ) MR-J4-11KA(-RJ)	HG-JR903, 801, 12K1, 11K1M	LM-FP4F-36M-1SS0	-
MR-J4-15KB(-RJ) MR-J4-15KA(-RJ)	HG-JR15K1, 15K1M	LM-FP4H-48M-1SS0	-
MR-J4-22KB(-RJ) MR-J4-22KA(-RJ)	HG-JR20K1, 25K1, 22K1M	-	-

Notes: 1. Models of the linear servo motor primary side are listed in this page. For compatible models of the secondary side, refer to "Combinations of Linear Servo Motor and Servo Amplifier" under section 3 Linear Servo Motor in this catalog.

2. The maximum torque can be increased from 300% to 400% of the rated torque with this combination.

MR-J4-DU_B/MR-J4-DU_B-RJ/MR-J4-DU_A/MR-J4-DU_A-RJ (200 V)

Drive unit	Rotary servo motor	Linear servo motor (primary side)	Direct drive motor
MR-J4-DU30KB(-RJ) MR-J4-DU30KA(-RJ)	HG-JR30K1 HG-JR30K1M	-	-
MR-J4-DU37KB(-RJ) MR-J4-DU37KA(-RJ)	HG-JR37K1 HG-JR37K1M	-	-



Combinations of 1-Axis Servo Amplifier and Servo Motor

B

B-RJ

A

A-RJ

MR-J4-B1/MR-J4-B1-RJ/MR-J4-A1/MR-J4-A1-RJ (100 V)

Servo amplifier	Rotary servo motor	Linear servo motor (primary side) (Note 1)	Direct drive motor
MR-J4-10B1(-RJ) MR-J4-10A1(-RJ)	HG-KR053, 13 HG-MR053, 13	-	-
MR-J4-20B1(-RJ) MR-J4-20A1(-RJ)	HG-KR23 HG-MR23	LM-U2PAB-05M-0SS0 LM-U2PBB-07M-1SS0	TM-RFM002C20
MR-J4-40B1(-RJ) MR-J4-40A1(-RJ)	HG-KR43 HG-MR43	LM-H3P2A-07P-BSS0 LM-H3P3A-12P-CSS0 LM-K2P1A-01M-2SS1 LM-U2PAD-10M-0SS0 LM-U2PAF-15M-0SS0	TM-RFM004C20

MR-J4-B4/MR-J4-B4-RJ/MR-J4-A4/MR-J4-A4-RJ (400 V)

Servo amplifier	Rotary servo motor	Linear servo motor (primary side) (Note 1)	Direct drive motor
MR-J4-60B4(-RJ) MR-J4-60A4(-RJ)	HG-SR524 HG-JR534	-	-
MR-J4-100B4(-RJ) MR-J4-100A4(-RJ)	HG-SR1024 HG-JR534 (Note 2), 734, 1034	-	-
MR-J4-200B4(-RJ) MR-J4-200A4(-RJ)	HG-SR1524, 2024 HG-JR734 (Note 2), 1034 (Note 2), 1534, 2034	-	-
MR-J4-350B4(-RJ) MR-J4-350A4(-RJ)	HG-SR3524 HG-JR1534 (Note 2), 2034 (Note 2), 3534	-	-
MR-J4-500B4(-RJ) MR-J4-500A4(-RJ)	HG-SR5024 HG-JR3534 (Note 2), 5034	-	-
MR-J4-700B4(-RJ) MR-J4-700A4(-RJ)	HG-SR7024 HG-JR5034 (Note 2), 7034, 6014, 701M4	-	-
MR-J4-11KB4(-RJ) MR-J4-11KA4(-RJ)	HG-JR9034, 8014, 12K14, 11K1M4	-	-
MR-J4-15KB4(-RJ) MR-J4-15KA4(-RJ)	HG-JR15K14, 15K1M4	-	-
MR-J4-22KB4(-RJ) MR-J4-22KA4(-RJ)	HG-JR20K14, 25K14, 22K1M4	LM-FP5H-60M-1SS0	-

MR-J4-DU_B4/MR-J4-DU_B4-RJ/MR-J4-DU_A4/MR-J4-DU_A4-RJ (400 V)

Drive unit	Rotary servo motor	Linear servo motor (primary side)	Direct drive motor
MR-J4-DU30KB4(-RJ) MR-J4-DU30KA4(-RJ)	HG-JR30K14 HG-JR30K1M4	-	-
MR-J4-DU37KB4(-RJ) MR-J4-DU37KA4(-RJ)	HG-JR37K14 HG-JR37K1M4	-	-
MR-J4-DU45KB4(-RJ) MR-J4-DU45KA4(-RJ)	HG-JR45K1M4	-	-
MR-J4-DU55KB4(-RJ) MR-J4-DU55KA4(-RJ)	HG-JR55K1M4	-	-

Notes: 1. Models of the linear servo motor primary side are listed in this page. For compatible models of the secondary side, refer to "Combinations of Linear Servo Motor and Servo Amplifier" under section 3 Linear Servo Motor in this catalog.

2. The maximum torque can be increased from 300% to 400% of the rated torque with this combination.

Combinations of 1-Axis Servo Amplifier and Servo Motor

B-RJ010

MR-J4-B-RJ010 (200 V)

Servo amplifier	Rotary servo motor
MR-J4-10B-RJ010	HG-KR053, 13 HG-MR053, 13
MR-J4-20B-RJ010	HG-KR23 HG-MR23
MR-J4-40B-RJ010	HG-KR43 HG-MR43
MR-J4-60B-RJ010	HG-SR51, 52 HG-JR53
MR-J4-70B-RJ010	HG-KR73 HG-MR73 HG-JR73 HG-UR72
MR-J4-100B-RJ010	HG-SR81, 102 HG-JR53 ^(Note 1) , 103
MR-J4-200B-RJ010	HG-SR121, 201, 152, 202 HG-JR73 ^(Note 1) , 103 ^(Note 1) , 153, 203 HG-RR103, 153 HG-UR152
MR-J4-350B-RJ010	HG-SR301, 352 HG-JR153 ^(Note 1) , 203 ^(Note 1) , 353 HG-RR203 HG-UR202
MR-J4-500B-RJ010	HG-SR421, 502 HG-JR353 ^(Note 1) , 503 HG-RR353, 503 HG-UR352, 502
MR-J4-700B-RJ010	HG-SR702 HG-JR503 ^(Note 1) , 703, 601, 701M
MR-J4-11KB-RJ010	HG-JR903, 801, 12K1, 11K1M
MR-J4-15KB-RJ010	HG-JR15K1, 15K1M
MR-J4-22KB-RJ010	HG-JR20K1, 25K1, 22K1M

MR-J4-B4-RJ010 (400 V)

Servo amplifier	Rotary servo motor
MR-J4-60B4-RJ010	HG-SR524 HG-JR534
MR-J4-100B4-RJ010	HG-SR1024 HG-JR534 ^(Note 1) , 734, 1034
MR-J4-200B4-RJ010	HG-SR1524, 2024 HG-JR734 ^(Note 1) , 1034 ^(Note 1) , 1534, 2034
MR-J4-350B4-RJ010	HG-SR3524 HG-JR1534 ^(Note 1) , 2034 ^(Note 1) , 3534
MR-J4-500B4-RJ010	HG-SR5024 HG-JR3534 ^(Note 1) , 5034
MR-J4-700B4-RJ010	HG-SR7024 HG-JR5034 ^(Note 1) , 7034, 6014, 701M4
MR-J4-11KB4-RJ010	HG-JR9034, 8014, 12K14, 11K1M4
MR-J4-15KB4-RJ010	HG-JR15K14, 15K1M4
MR-J4-22KB4-RJ010	HG-JR20K14, 25K14, 22K1M4

Notes: 1. The maximum torque can be increased from 300% to 400% of the rated torque with this combination.



Combinations of Multi-Axis Servo Amplifier and Servo Motors

MR-J4W2-B

Any combination of the servo motors with different series and capacities is possible as long as the servo motors are compatible with the servo amplifier.

Servo amplifier	Rotary servo motor	Linear servo motor (primary side) (Note 1)	Direct drive motor
MR-J4W2-22B	HG-KR053, 13, 23 HG-MR053, 13, 23	LM-U2PAB-05M-0SS0 LM-U2PBB-07M-1SS0	TM-RFM002C20
MR-J4W2-44B	HG-KR053, 13, 23, 43 HG-MR053, 13, 23, 43	LM-H3P2A-07P-BSS0 LM-H3P3A-12P-CSS0 LM-K2P1A-01M-2SS1 LM-U2PAB-05M-0SS0 LM-U2PAD-10M-0SS0 LM-U2PAF-15M-0SS0 LM-U2PBB-07M-1SS0	TM-RFM002C20 TM-RFM004C20
MR-J4W2-77B	HG-KR43, 73 HG-MR43, 73 HG-SR51, 52 HG-JR53, 73 HG-UR72	LM-H3P2A-07P-BSS0 LM-H3P3A-12P-CSS0 LM-H3P3B-24P-CSS0 LM-H3P3C-36P-CSS0 LM-H3P7A-24P-ASS0 LM-K2P1A-01M-2SS1 LM-K2P2A-02M-1SS1 LM-U2PAD-10M-0SS0 LM-U2PAF-15M-0SS0 LM-U2PBD-15M-1SS0 LM-U2PBF-22M-1SS0	TM-RFM004C20 TM-RFM006C20 TM-RFM006E20 TM-RFM012E20 TM-RFM012G20 TM-RFM040J10
MR-J4W2-1010B	HG-KR43, 73 HG-MR43, 73 HG-SR51, 81, 52, 102 HG-JR53 (Note 2), 73, 103 HG-UR72	LM-H3P2A-07P-BSS0 LM-H3P3A-12P-CSS0 LM-H3P3B-24P-CSS0 LM-H3P3C-36P-CSS0 LM-H3P7A-24P-ASS0 LM-K2P1A-01M-2SS1 LM-K2P2A-02M-1SS1 LM-U2PAD-10M-0SS0 LM-U2PAF-15M-0SS0 LM-U2PBD-15M-1SS0 LM-U2PBF-22M-1SS0	TM-RFM004C20 TM-RFM006C20 TM-RFM006E20 TM-RFM012E20 TM-RFM018E20 TM-RFM012G20 TM-RFM040J10

MR-J4W3-B

Any combination of the servo motors with different series and capacities is possible as long as the servo motors are compatible with the servo amplifier.

Servo amplifier	Rotary servo motor	Linear servo motor (primary side) (Note 1)	Direct drive motor
MR-J4W3-222B	HG-KR053, 13, 23 HG-MR053, 13, 23	LM-U2PAB-05M-0SS0 LM-U2PBB-07M-1SS0	TM-RFM002C20
MR-J4W3-444B	HG-KR053, 13, 23, 43 HG-MR053, 13, 23, 43	LM-H3P2A-07P-BSS0 LM-H3P3A-12P-CSS0 LM-K2P1A-01M-2SS1 LM-U2PAB-05M-0SS0 LM-U2PAD-10M-0SS0 LM-U2PAF-15M-0SS0 LM-U2PBB-07M-1SS0	TM-RFM002C20 TM-RFM004C20

Notes: 1. Models of the linear servo motor primary side are listed in this page. For compatible models of the secondary side, refer to "Combinations of Linear Servo Motor and Servo Amplifier" under section 3 Linear Servo Motor in this catalog.

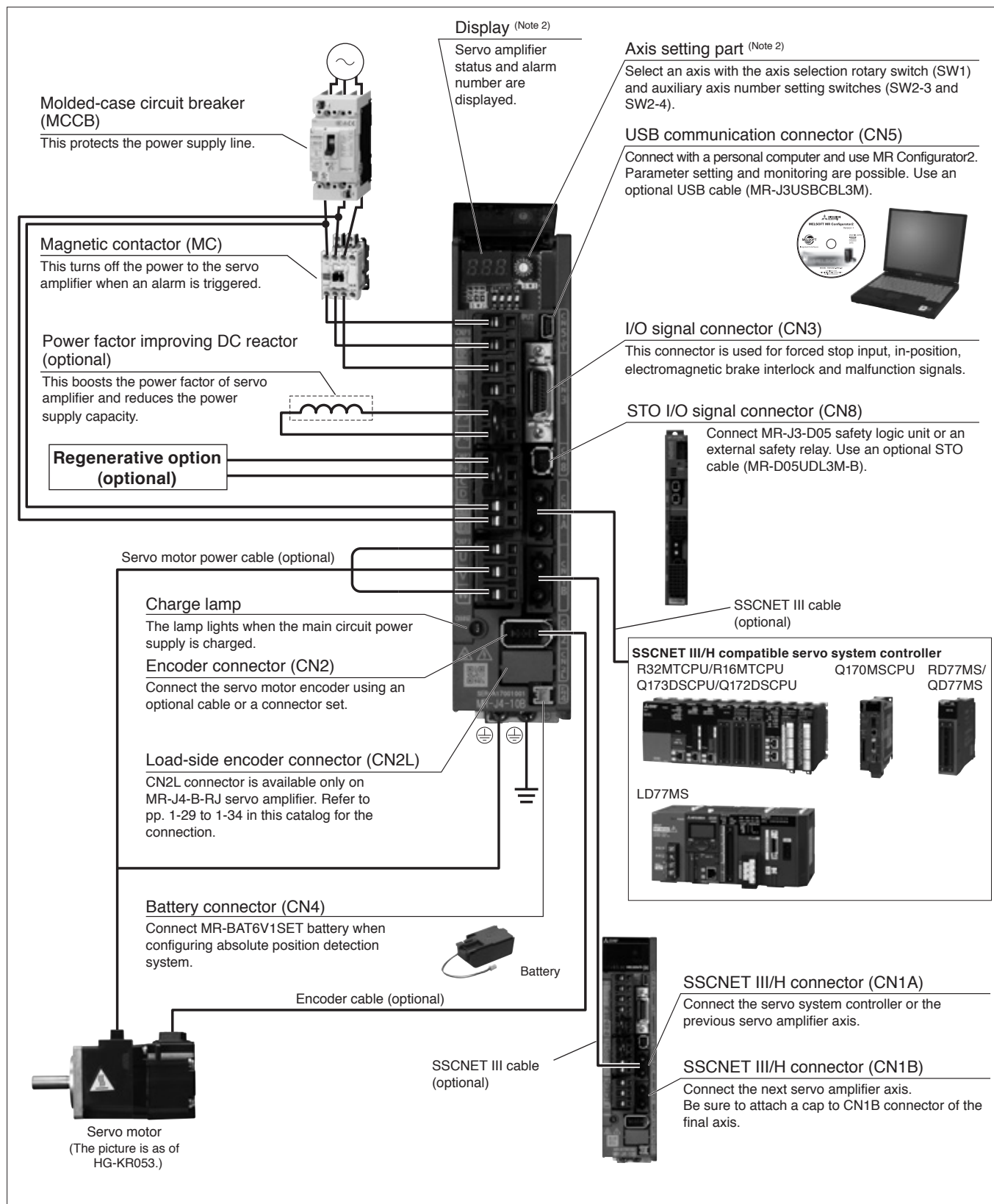
2. The maximum torque can be increased from 300% to 400% of the rated torque with this combination.

MR-J4-B/MR-J4-B-RJ Connections with Peripheral Equipment (Note 1)

B

B-RJ

Peripheral equipment is connected to MR-J4-B/MR-J4-B-RJ 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-J4-350B/MR-J4-350B-RJ or smaller servo amplifiers. Refer to "MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for the actual connections.

2. This picture shows when the display cover is open.

MR-J4-B(1)/MR-J4-B(1)-RJ (SSCNET III/H Interface) Specifications (200 V/100 V)

B B-RJ

Servo amplifier model MR-J4-_-(-RJ)		10B	20B	40B	60B	70B	100B	200B	350B	500B	700B	11KB	15KB	22KB	10B1	20B1	40B1
Output	Rated voltage	3-phase 170 V AC															
	Rated current [A]	1.1	1.5	2.8	3.2	5.8	6.0	11.0	17.0	28.0	37.0	68.0	87.0	126.0	1.1	1.5	2.8
Main circuit power supply input	Voltage/frequency <small>(Note 1)</small>	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								1-phase 100 V AC to 120 V AC, 50 Hz/60 Hz		
	Rated current <small>(Note 15)</small> [A]	0.9	1.5	2.6	3.2 <small>(Note 8)</small>	3.8	5.0	10.5	16.0	21.7	28.9	46.0	64.0	95.0	3.0	5.0	9.0
	Permissible voltage fluctuation	3-phase or 1-phase 170 V AC to 264 V AC					3-phase 170 V AC to 264 V AC								1-phase 85 V AC to 132 V AC		
	Permissible frequency fluctuation	±5% maximum															
	Voltage/frequency	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz													1-phase 100 V AC to 120 V AC, 50 Hz/60 Hz		
Control circuit power supply input	Rated current [A]	0.2								0.3				0.4			
	Permissible voltage fluctuation	1-phase 170 V AC to 264 V AC													1-phase 85 V AC to 132 V AC		
	Permissible frequency fluctuation	±5% maximum															
	Power consumption [W]	30								45				30			
	Interface power supply	24 V DC ± 10% (required current capacity: 0.3 A (including CN8 connector signals))															
Control method		Sine-wave PWM control/current control method															
Tolerable regenerative power	Built-in regenerative resistor <small>(Note 2, 3)</small> [W]	-	10	10	10	20	20	100	100	130	170	-	-	-	-	10	10
	External regenerative resistor (standard accessory) <small>(Note 2, 3, 11, 12)</small> [W]	-	-	-	-	-	-	-	-	-	-	500 (800)	850 (1300)	850 (1300)	-	-	-
Dynamic brake		Built-in <small>(Note 4)</small>										External option <small>(Note 13)</small>			Built-in <small>(Note 4)</small>		
SSCNET III/H command communication cycle <small>(Note 10)</small>		0.222 ms, 0.444 ms, 0.888 ms															
Communication function		USB: Connect a personal computer (MR Configurator2 compatible)															
Encoder output pulse		Compatible (A/B/Z-phase pulse)															
Analog monitor		2 channels															
Fully closed loop control	MR-J4-B(1)	Two-wire type communication method <small>(Note 9)</small>															
	MR-J4-B(1)-RJ	Two-wire/four-wire type communication method															
Servo function		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, tightening & press-fit control, machine diagnosis function, power monitoring function, master-slave operation function <small>(Note 14)</small> , scale measurement function <small>(Note 14)</small> , J3 compatibility mode, super trace control <small>(Note 16)</small> , lost motion compensation <small>(Note 16)</small>															
Load-side encoder interface	MR-J4-B(1)	Mitsubishi high-speed serial communication															
	MR-J4-B(1)-RJ	Mitsubishi high-speed serial communication, A/B/Z-phase differential input signal															
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, magnetic pole detection protection, linear servo control fault protection															
Functional safety		STO (IEC/EN 61800-5-2)															
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2															
	Response performance	8 ms or less (STO input OFF → energy shut-off)															
	Test pulse input (STO) <small>(Note 7)</small>	Test pulse interval: 1 Hz to 25 Hz, test pulse off time: 1 ms maximum															
	Mean time to dangerous failure (MTTFd)	100 years or longer															
	Diagnostic coverage (DC)	Medium (90% to 99%)															
	Probability of dangerous Failure per Hour (PFH)	1.68 × 10 ⁻¹⁰ [1/h]															
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.															
Structure (IP rating)		Natural cooling, open (IP20)				Force cooling, open (IP20)				Force cooling, open (IP20) <small>(Note 5)</small>				Natural cooling, open (IP20)			
Close mounting		Possible <small>(Note 6)</small>								Not possible				Possible <small>(Note 6)</small>			
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)															
	Ambient humidity	Operation/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/s² at 10 Hz to 55 Hz (directions of X, Y and Z axes)															
Mass [kg]		0.8	0.8	1.0	1.0	1.4	1.4	2.1	2.3	4.0	6.2	13.4	13.4	18.2	0.8	0.8	1.0

MR-J4-B(1)/MR-J4-B(1)-RJ (SSCNET III/H Interface) Specifications (200 V/100 V)

B**B-RJ**

- Notes: 1. Rated output and speed of a rotary servo motor and a direct drive motor; and continuous thrust and maximum speed of a linear 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-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio and the permissible load to mass ratio.
5. Terminal blocks are excluded.
6. 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.
7. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the servo amplifier instantaneously at regular intervals.
8. The rated current is 2.9 A when the servo amplifier is used with UL or CSA compliant servo motor.
9. Fully closed loop control is compatible with the servo amplifiers with software version A3 or later.
10. The command communication cycle depends on the controller specifications and the number of axes connected.
11. The value in brackets is applicable when cooling fans (2 units of 92 mm X 92 mm, minimum air flow: 1.0 m³/min) are installed, and then [Pr. PA02] is changed.
12. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "1-Axis Servo Amplifier Model Designation" in this catalog for details.
13. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system when not using the dynamic brake.
14. This function is available with the servo amplifiers with software version A8 or later.
15. This value is applicable for 750 W or smaller servo amplifiers in 200 V class when a 3-phase power supply is used.
16. This function is available with the servo amplifiers with software version B4 or later.

MR-J4-DU_B/MR-J4-DU_B-RJ (SSCNET III/H Interface) Specifications (200 V)

B

B-RJ

Drive unit model MR-J4-_-(-RJ)		DU30KB	DU37KB
Compatible converter unit model		MR-CR55K (Note 5)	
Output	Rated voltage	3-phase 170 V AC	
	Rated current [A]	174	204
Main circuit power supply input		Main circuit power is supplied from the converter unit to the drive unit (Note 5)	
Control circuit power supply input	Voltage/frequency	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz	
	Rated current [A]	0.3	
	Permissible voltage fluctuation	1-phase 170 V AC to 264 V AC	
	Permissible frequency fluctuation	±5% maximum	
	Power consumption [W]	45	
Interface power supply		24 V DC ± 10% (required current capacity: 0.3 A (including CN8 connector signals))	
Control method		Sine-wave PWM control/current control method	
Dynamic brake		External option (Note 4)	
SSCNET III/H command communication cycle (Note 3)		0.222 ms, 0.444 ms, 0.888 ms	
Communication function		USB: Connect a personal computer (MR Configurator2 compatible)	
Encoder output pulse		Compatible (A/B/Z-phase pulse)	
Analog monitor		2 channels	
Fully closed loop control	MR-J4-DU_B	Two-wire type communication method	
	MR-J4-DU_B-RJ	Two-wire/four-wire type communication method	
Servo function		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, tightening & press-fit control, machine diagnosis function, power monitoring function, master-slave operation function, scale measurement function, J3 compatibility mode, super trace control, lost motion compensation	
Load-side encoder interface	MR-J4-DU_B	Mitsubishi high-speed serial communication	
	MR-J4-DU_B-RJ	Mitsubishi high-speed serial communication, A/B/Z-phase differential input signal	
Protective functions		Overcurrent shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, undervoltage protection, instantaneous power failure protection, overspeed protection, error excessive protection,	
Functional safety		STO (IEC/EN 61800-5-2)	
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2	
	Response performance	8 ms or less (STO input OFF → energy shut-off)	
	Test pulse input (STO) (Note 2)	Test pulse interval: 1 Hz to 25 Hz, test pulse off time: 1 ms maximum	
	Mean time to dangerous failure (MTTFd)	100 years or longer	
	Diagnostic coverage (DC)	Medium (90% to 99%)	
	Probability of dangerous Failure per Hour (PFH)	1.68×10^{-10} [1/h]	
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.	
Structure (IP rating)		Force cooling, open (IP20) (Note 1)	
Close mounting		Not possible	
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)	
	Ambient humidity	Operation/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/s² at 10 Hz to 55 Hz (directions of X, Y and Z axes)	
Mass [kg]		21	

Notes: 1. Terminal blocks are excluded.

2. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the drive unit instantaneously at regular intervals.

3. The command communication cycle depends on the controller specifications and the number of axes connected.

4. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system when not using the dynamic brake.

5. One unit of converter unit is required for each drive unit. Refer to "MR-CR Converter Unit Specifications (200 V/400 V)" on p. 1-14 in this catalog for the specifications of the converter unit.

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LVs/Wires

Product List

Cautions

MR-J4-B4/MR-J4-B4-RJ (SSCNET III/H Interface) Specifications (400 V)

B
B-RJ

Servo amplifier model MR-J4-_-(-RJ)			60B4	100B4	200B4	350B4	500B4	700B4	11KB4	15KB4	22KB4
Output	Rated voltage		3-phase 323 V AC								
	Rated current [A]		1.5	2.8	5.4	8.6	14.0	17.0	32.0	41.0	63.0
Main circuit power supply input	Voltage/frequency ^(Note 1)		3-phase 380 V AC to 480 V AC, 50 Hz/60 Hz								
	Rated current [A]		1.4	2.5	5.1	7.9	10.8	14.4	23.1	31.8	47.6
	Permissible voltage fluctuation		3-phase 323 V AC to 528 V AC								
	Permissible frequency fluctuation		±5% maximum								
Control circuit power supply input	Voltage/frequency		1-phase 380 V AC to 480 V AC, 50 Hz/60 Hz								
	Rated current [A]		0.1			0.2					
	Permissible voltage fluctuation		1-phase 323 V AC to 528 V AC								
	Permissible frequency fluctuation		±5% maximum								
	Power consumption [W]		30			45					
Interface power supply			24 V DC ± 10% (required current capacity: 0.3 A (including CN8 connector signals))								
Control method			Sine-wave PWM control/current control method								
Tolerable regenerative power	Built-in regenerative resistor ^(Note 2, 3) [W]		15	15	100	100	130 ^(Note 11)	170 ^(Note 11)	-	-	-
	External regenerative resistor (standard accessory) ^(Note 2, 3, 8, 9) [W]		-	-	-	-	-	-	500 (800)	850 (1300)	850 (1300)
Dynamic brake			Built-in ^(Note 4)						External option ^(Note 10)		
SSCNET III/H command communication cycle ^(Note 7)			0.222 ms, 0.444 ms, 0.888 ms								
Communication function			USB: Connect a personal computer (MR Configurator2 compatible)								
Encoder output pulse			Compatible (A/B/Z-phase pulse)								
Analog monitor			2 channels								
Fully closed loop control	MR-J4-B4		Two-wire type communication method								
	MR-J4-B4-RJ		Two-wire/four-wire type communication method								
Servo function			Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, tightening & press-fit control, machine diagnosis function, power monitoring function, master-slave operation function ^(Note 12) , scale measurement function ^(Note 12) , J3 compatibility mode, super trace control ^(Note 13) , lost motion compensation ^(Note 13)								
Load-side encoder interface	MR-J4-B4		Mitsubishi high-speed serial communication								
	MR-J4-B4-RJ		Mitsubishi high-speed serial communication, A/B/Z-phase differential input signal								
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, magnetic pole detection protection, linear servo control fault protection								
Functional safety			STO (IEC/EN 61800-5-2)								
Safety performance	Standards certified by CB		EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2								
	Response performance		8 ms or less (STO input OFF → energy shut-off)								
	Test pulse input (STO) ^(Note 6)		Test pulse interval: 1 Hz to 25 Hz, test pulse off time: 1 ms maximum								
	Mean time to dangerous failure (MTTFd)		100 years or longer								
	Diagnostic coverage (DC)		Medium (90% to 99%)								
	Probability of dangerous Failure per Hour (PFH)		1.68 × 10 ⁻¹⁰ [1/h]								
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.								
Structure (IP rating)			Natural cooling, open (IP20)		Force cooling, open (IP20)		Force cooling, open (IP20) ^(Note 5)				
Close mounting			Not possible								
Environment	Ambient temperature		Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)								
	Ambient humidity		Operation/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]			1.7	1.7	2.1	3.6	4.3	6.5	13.4	13.4	18.2



MR-J4-B4/MR-J4-B4-RJ (SSCNET III/H Interface) Specifications (400 V)

B

B-RJ

- Notes: 1. Rated output and speed of a rotary servo motor, and continuous thrust and maximum speed of a linear 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-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio and the permissible load to mass ratio.
5. Terminal blocks are excluded.
6. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the servo amplifier instantaneously at regular intervals.
7. The command communication cycle depends on the controller specifications and the number of axes connected.
8. The value in brackets is applicable when cooling fans (2 units of 92 mm × 92 mm, minimum air flow: 1.0 m³/min) are installed, and then [Pr. PA02] is changed.
9. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "1-Axis Servo Amplifier Model Designation" in this catalog for details.
10. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system when not using the dynamic brake.
11. The servo amplifier built-in regenerative resistor is compatible with the maximum torque deceleration when the servo motor is used within the rated speed and the recommended load to motor inertia ratio. Contact your local sales office if the operating motor speed or the load to motor inertia ratio exceeds the rated speed or the recommended ratio.
12. This function is available with the servo amplifiers with software version A8 or later.
13. This function is available with the servo amplifiers with software version B4 or later.

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral
Equipment

LVS/Wires

Product List

Cautions

MR-J4-DU_B4/MR-J4-DU_B4-RJ (SSCNET III/H Interface) Specifications (400 V)

B
B-RJ

Drive unit model MR-J4-_-(-RJ)		DU30KB4	DU37KB4	DU45KB4	DU55KB4
Compatible converter unit model		MR-CR55K4 (Note 5)			
Output	Rated voltage	3-phase 323 V AC			
	Rated current [A]	87	102	131	143
Main circuit power supply input		Main circuit power is supplied from the converter unit to the drive unit (Note 5)			
Control circuit power supply input	Voltage/frequency	1-phase 380 V AC to 480 V AC, 50 Hz/60 Hz			
	Rated current [A]	0.2			
	Permissible voltage fluctuation	1-phase 323 V AC to 528 V AC			
	Permissible frequency fluctuation	±5% maximum			
	Power consumption [W]	45			
Interface power supply		24 V DC ± 10% (required current capacity: 0.3 A (including CN8 connector signals))			
Control method		Sine-wave PWM control/current control method			
Dynamic brake		External option (Note 4)			
SSCNET III/H command communication cycle (Note 3)		0.222 ms, 0.444 ms, 0.888 ms			
Communication function		USB: Connect a personal computer (MR Configurator2 compatible)			
Encoder output pulse		Compatible (A/B/Z-phase pulse)			
Analog monitor		2 channels			
Fully closed loop control	MR-J4-DU_B4	Two-wire type communication method			
	MR-J4-DU_B4-RJ	Two-wire/four-wire type communication method			
Servo function		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, tightening & press-fit control, machine diagnosis function, power monitoring function, master-slave operation function, scale measurement function, J3 compatibility mode, super trace control, lost motion compensation			
Load-side encoder interface	MR-J4-DU_B4	Mitsubishi high-speed serial communication			
	MR-J4-DU_B4-RJ	Mitsubishi high-speed serial communication, A/B/Z-phase differential input signal			
Protective functions		Overcurrent shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, undervoltage protection, instantaneous power failure protection, overspeed protection, error excessive protection,			
Functional safety		STO (IEC/EN 61800-5-2)			
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2			
	Response performance	8 ms or less (STO input OFF → energy shut-off)			
	Test pulse input (STO) (Note 2)	Test pulse interval: 1 Hz to 25 Hz, test pulse off time: 1 ms maximum			
	Mean time to dangerous failure (MTTFd)	100 years or longer			
	Diagnostic coverage (DC)	Medium (90% to 99%)			
	Probability of dangerous Failure per Hour (PFH)	1.68×10^{-10} [1/h]			
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.			
Structure (IP rating)		Force cooling, open (IP20) (Note 1)			
Close mounting		Not possible			
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)			
	Ambient humidity	Operation/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]		16		19	

Notes: 1. Terminal blocks are excluded.

2. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the drive unit instantaneously at regular intervals.

3. The command communication cycle depends on the controller specifications and the number of axes connected.

4. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system when not using the dynamic brake.

5. One unit of converter unit is required for each drive unit. Refer to "MR-CR Converter Unit Specifications (200 V/400 V)" on p. 1-14 in this catalog for the specifications of the converter unit.



MR-CR Converter Unit Specifications (200 V/400 V)

B

B-RJ

A

A-RJ

Converter unit model		MR-CR55K	MR-CR55K4
Output	Rated voltage	270 V DC to 324 V DC	513V DC to 648 V DC
	Rated current [A]	215.9	113.8
Main circuit power supply input	Voltage/frequency ^(Note 1)	3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz	3-phase 380 V AC to 480 V AC, 50 Hz/60 Hz
	Rated current [A]	191.3	100.7
	Permissible voltage fluctuation	3-phase 170 V AC to 264 V AC	3-phase 323 V AC to 528 V AC
	Permissible frequency fluctuation	±5% maximum	
Control circuit power supply input	Voltage/frequency	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz	1-phase 380 V AC to 480 V AC, 50 Hz/60 Hz
	Rated current [A]	0.3	0.2
	Permissible voltage fluctuation	1-phase 170 V AC to 264 V AC	1-phase 323 V AC to 528 V AC
	Permissible frequency fluctuation	±5% maximum	
	Power consumption [W]	45	
Interface power supply		24 V DC ± 10% (required current capacity: 0.15 A)	
Rated output [kW]		55	
Regenerative power (when regenerative option is used)		1300 W (one unit of MR-RB139) 3900 W (three units of MR-RB137)	1300 W (one unit of MR-RB137-4) 3900 W (three units of MR-RB13V-4)
Protective functions		Regenerative overvoltage shut-off, overload shut-off (electronic thermal), regenerative error protection, undervoltage protection, instantaneous power failure protection	
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.	
Structure (IP rating)		Force cooling, open (IP20) ^(Note 2)	
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)	
	Ambient humidity	Operation/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]		22	

Notes: 1. Rated output and speed of a rotary servo motor are applicable when the servo amplifier, combined with the rotary servo motor, is operated within the specified power supply voltage and frequency.

2. Terminal blocks are excluded.

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LV5/Wires

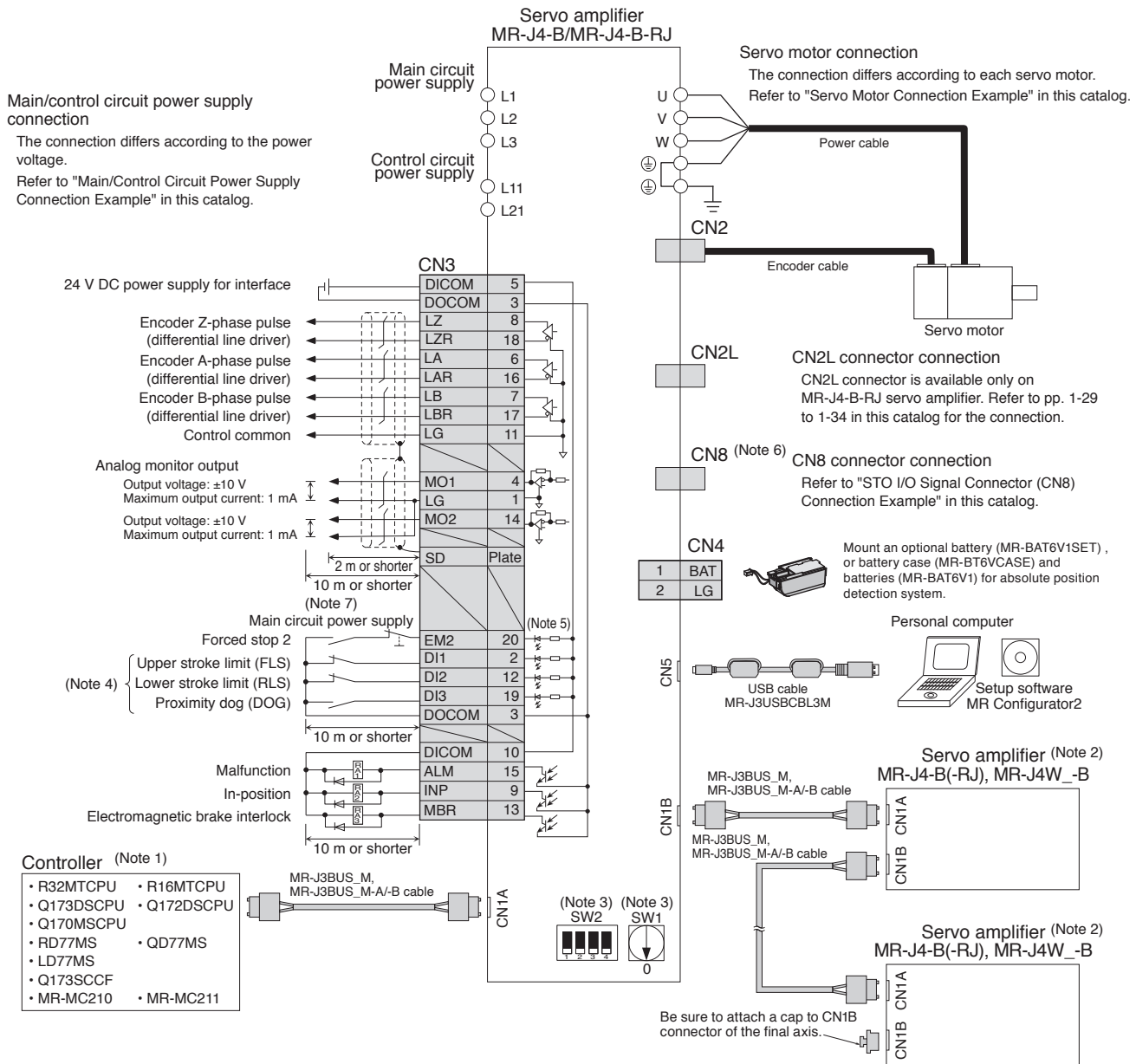
Product List

Cautions

MR-J4-B/MR-J4-B-RJ Standard Wiring Diagram Example (Note 8)

B

B-RJ



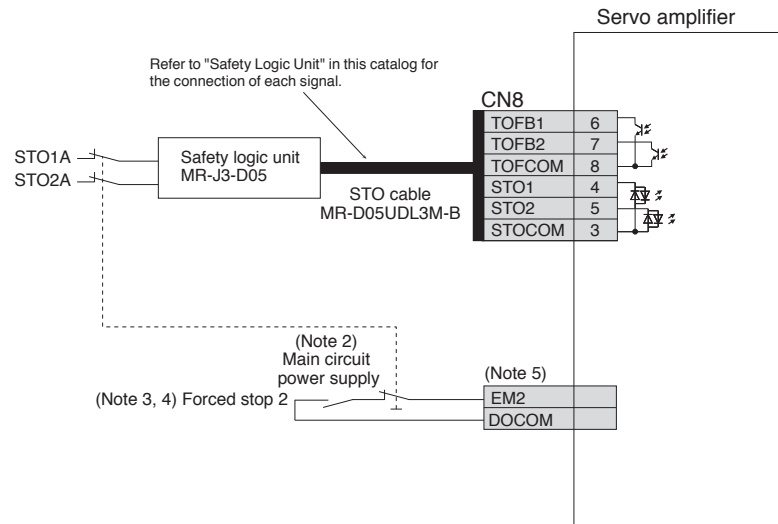
- Notes: 1. For details such as setting the controllers, refer to programming manual or user's manual for the controllers.
2. Connections for the second and following axes are omitted.
3. Up to 64 axes are set by using a combination of an axis selection rotary switch (SW1) and auxiliary axis number setting switches (SW2-3 and SW2-4). Note that the number of the connectable axes depends on the controller specifications.
4. Devices can be assigned for DI1, DI2 and DI3 with controller setting. Refer to the controller instruction manuals for details on setting.
5. This is for sink wiring. Source wiring is also possible.
6. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
7. Create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
8. This standard wiring diagram is common for 200 V AC, 100 V AC and 400 V AC type servo amplifiers.



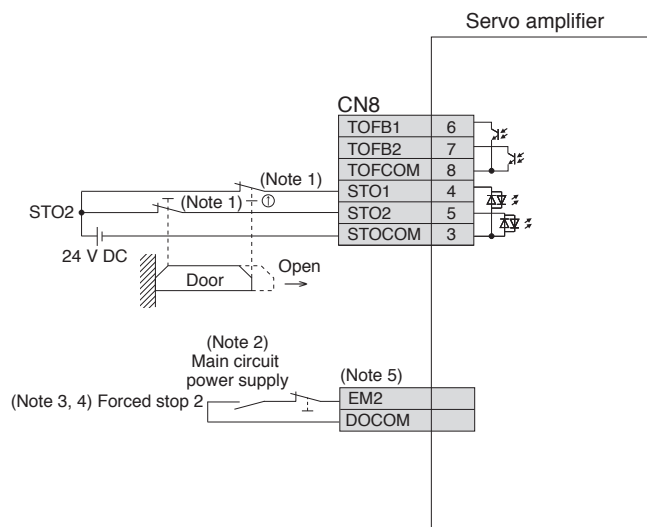
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

STO I/O Signal Connector (CN8) Connection Example

●When used with MR-J3-D05



●When using a safety door



- Notes: 1. When using the STO function, turn off STO1 and STO2 at the same time. Be sure to turn off STO1 and STO2 after the servo motor stops in servo-off state or after the servo motor stops with deceleration by turning off EM2 (Forced stop 2).
2. Create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
3. If the controller does not have a forced stop function, install a forced stop 2 switch (normally closed contact).
4. Turn on EM2 (Forced stop 2) before starting the operation.
5. The connector and the pin numbers for each signal vary depending on the servo amplifier. Refer to the standard wiring diagram example for relevant servo amplifier in this catalog for details.



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.

Main/Control Circuit Power Supply Connection Example (Note 7)

B

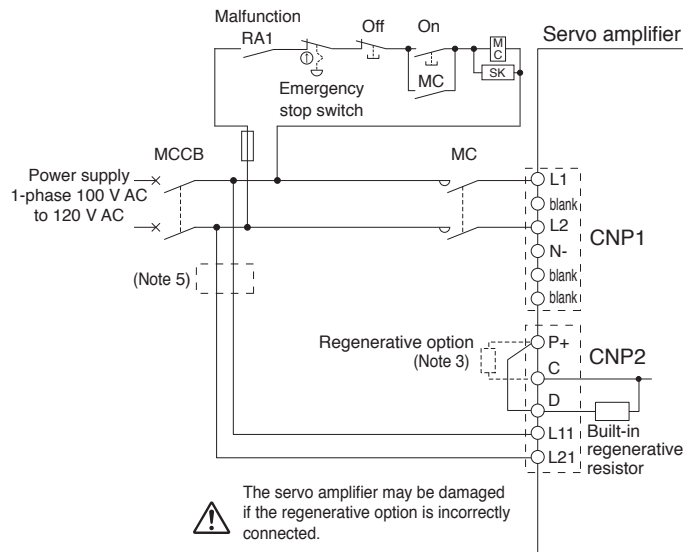
B-RJ

B-RJ010

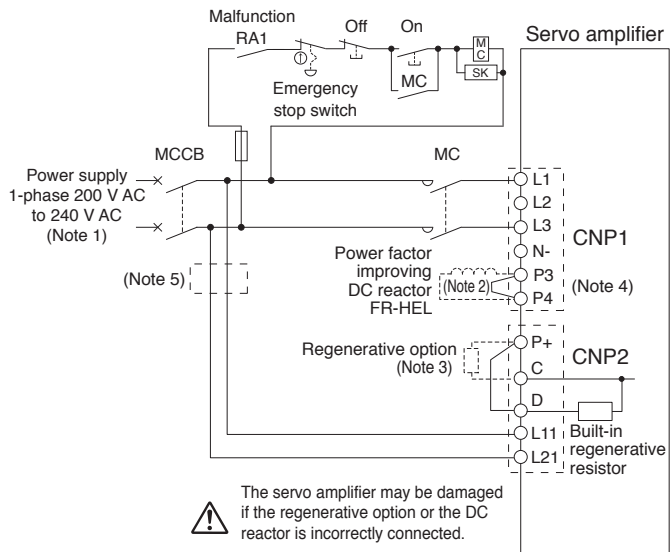
A

A-RJ

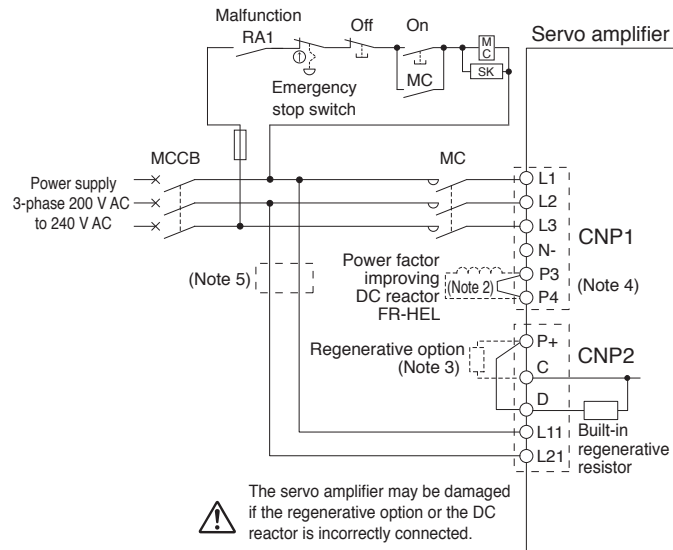
● For 1-phase 100 V AC



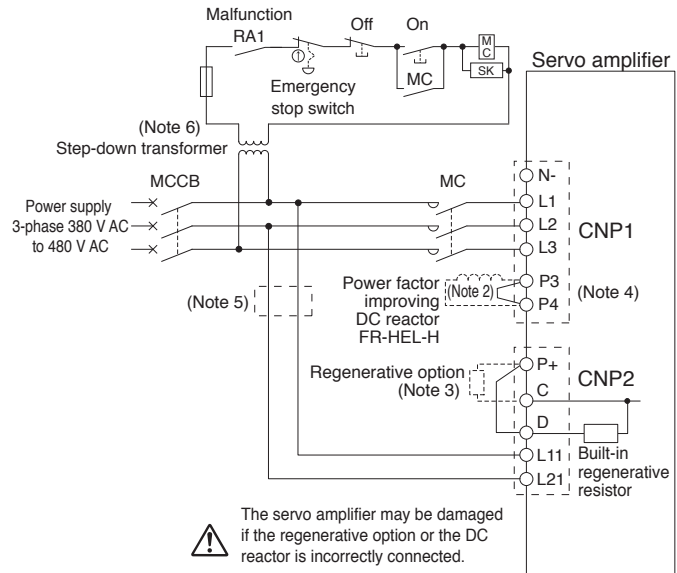
● For 1-phase 200 V AC



● For 3-phase 200 V AC, 3.5 kW or smaller



● For 3-phase 400 V AC, 3.5 kW or smaller



- 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-J3 series servo amplifiers. Be careful not to make a connection error when replacing MR-J3 with MR-J4.
 2. Disconnect a short-circuit bar between P3 and P4 when using the power factor improving DC reactor.
 3. Disconnect a short-circuit bar between P+ and D when connecting the regenerative option externally.
 4. MR-J4 series servo amplifiers have P3 and P4 in the upstream of the inrush current suppression circuit. They are different from P1 and P2 (downstream of the inrush current suppression circuit) of MR-J3 series servo amplifiers. Refer to relevant Servo Amplifier Instruction Manual for details.
 5. When wires used for L11 and L21 are thinner than those for L1, L2, and L3, use a molded-case circuit breaker.
 6. A step-down transformer is required if coil voltage of the magnetic contactor is in 200 V class.
 7. To control main circuit power supply on/off by DC power supply, refer to relevant Servo Amplifier Instruction Manual for details.



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.

Main/Control Circuit Power Supply Connection Example (Note 9)

B

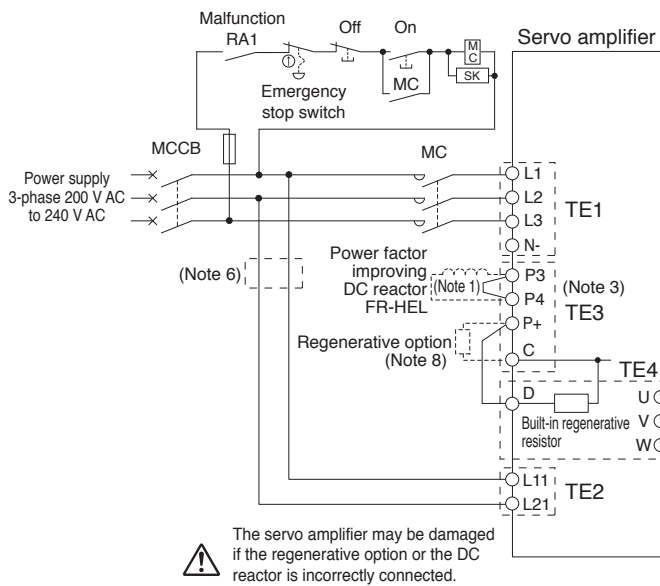
B-RJ

B-RJ010

A

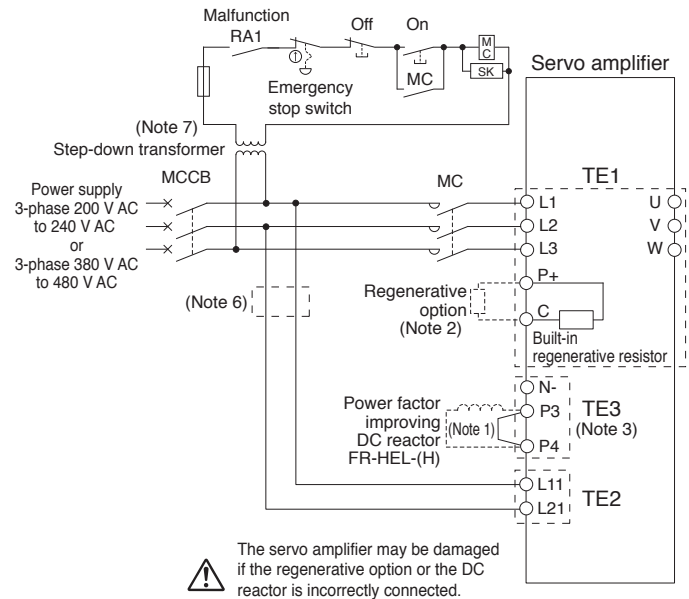
A-RJ

● For 3-phase 200 V AC, 5 kW

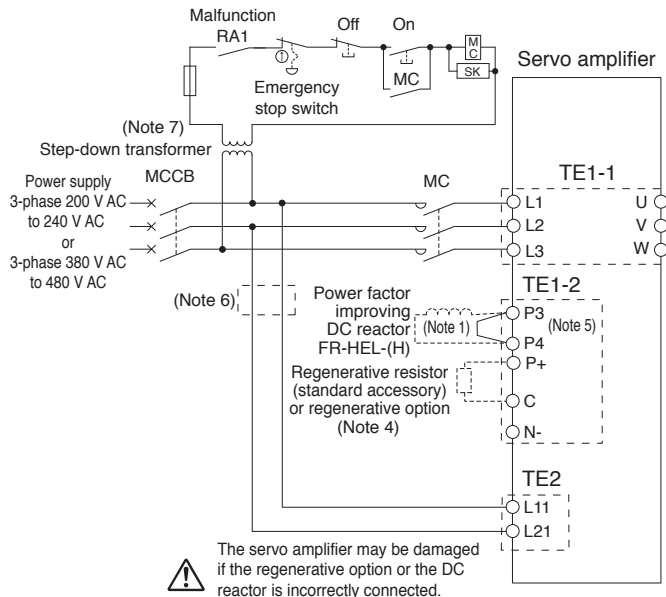


● For 3-phase 400 V AC, 5 kW

● For 3-phase 200 V AC/400 V AC, 7 kW



● For 3-phase 200 V AC/400 V AC, 11 kW to 22 kW



- Notes: 1. Disconnect a short-circuit bar between P3 and P4 when using the power factor improving DC reactor.
 2. Disconnect the wires for the built-in regenerative resistor (P+ and C) when connecting the regenerative option externally.
 3. MR-J4 series servo amplifiers have P3 and P4 in the upstream of the inrush current suppression circuit. They are different from P1 and P2 (downstream of the inrush current suppression circuit) of MR-J3 series servo amplifiers. Refer to relevant Servo Amplifier Instruction Manual for details.
 4. 11 kW or larger servo amplifiers do not have a built-in regenerative resistor.
 5. MR-J4 series servo amplifiers have P3 and P4 in the upstream of the inrush current suppression circuit. They are different from P1 and P (downstream of the inrush current suppression circuit) of MR-J3 series servo amplifiers. Refer to relevant Servo Amplifier Instruction Manual for details.
 6. When wires used for L11 and L21 are thinner than those for L1, L2, and L3, use a molded-case circuit breaker.
 7. A step-down transformer is required if the servo amplifier is in 400 V class, and coil voltage of the magnetic contactor is in 200 V class.
 8. Disconnect a short-circuit bar between P+ and D when connecting the regenerative option externally.
 9. To control main circuit power supply on/off by DC power supply, refer to relevant Servo Amplifier Instruction Manual for details.



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.

Main/Control Circuit Power Supply Connection Example ^(Note 8)

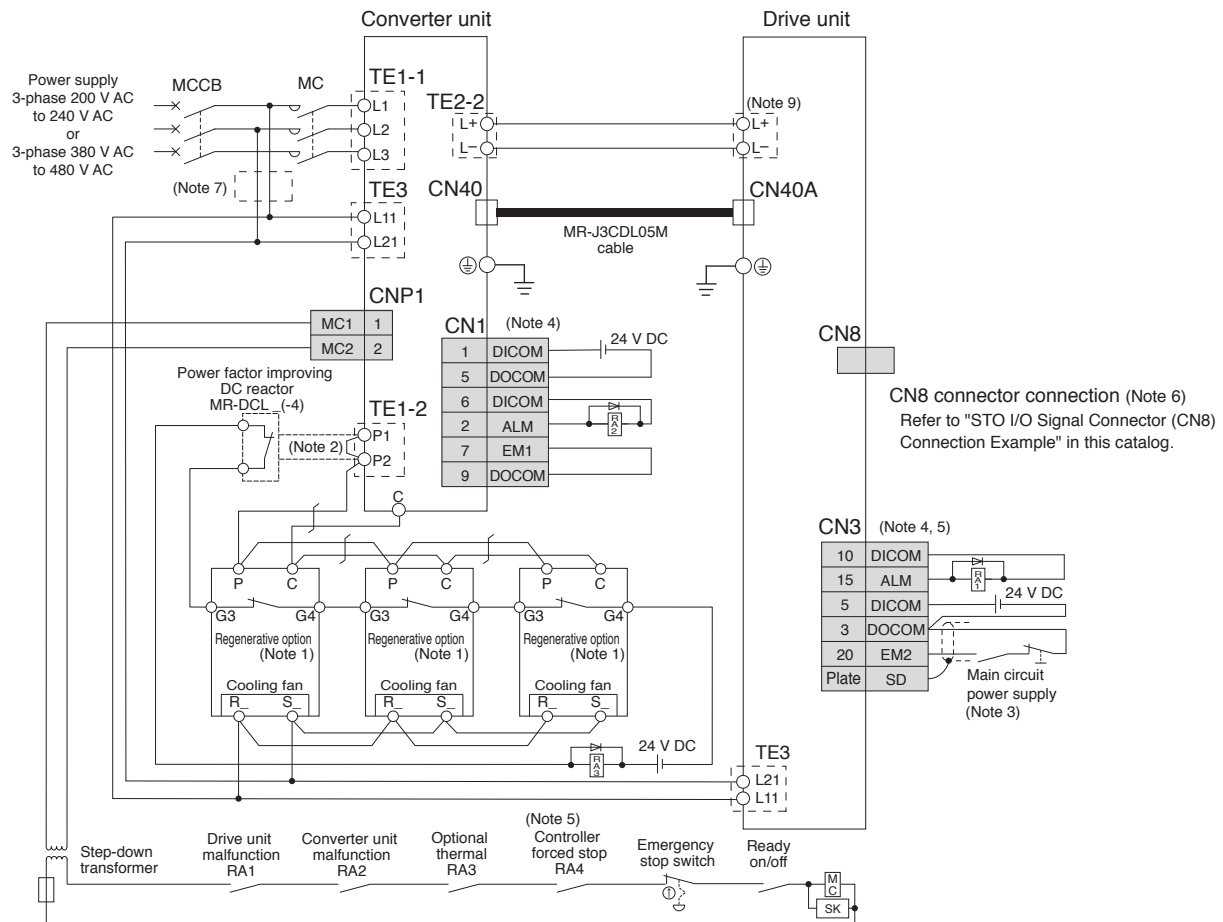
B

B-RJ

A

A-RJ

● For 3-phase 200 V AC/400 V AC, 30 kW or larger



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 (Rotary Servo Motor)

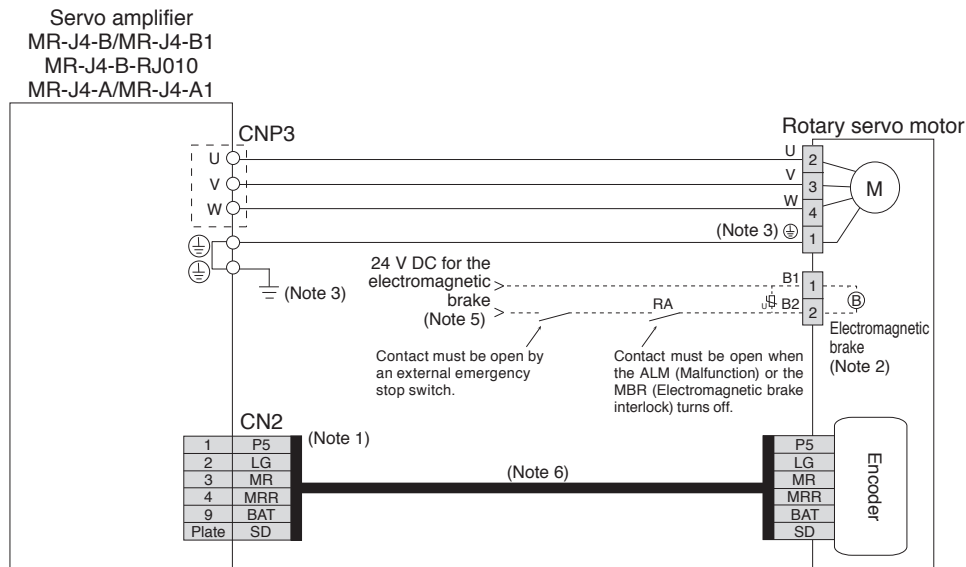
B

B-RJ010

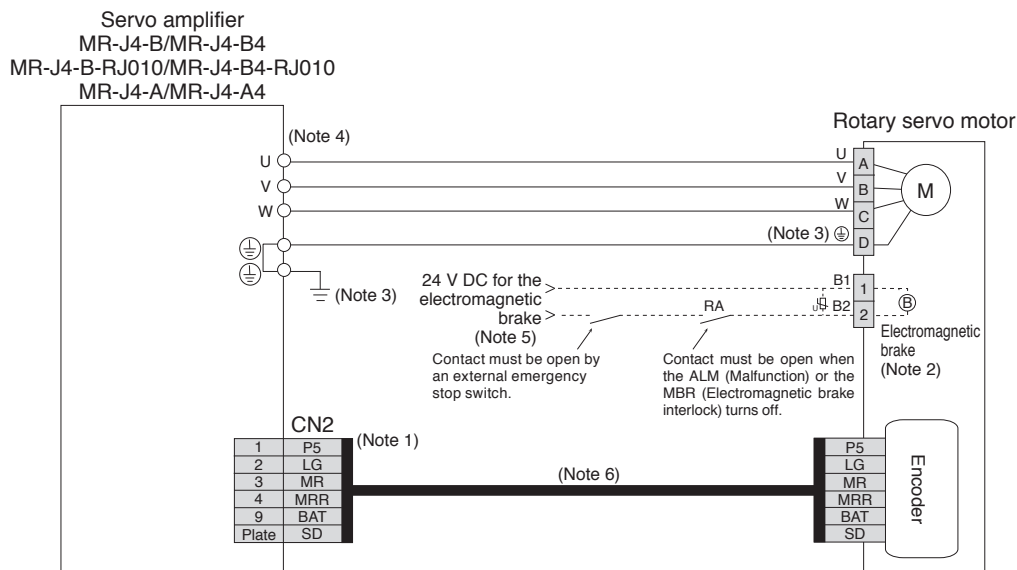
A

Semi Closed Loop Control System with MR-J4-B/MR-J4-B-RJ010/MR-J4-A

● For HG-KR/HG-MR series



● For HG-SR/HG-JR (9 kW or smaller) 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. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
 4. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
 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 "Servo Motor Instruction Manual (Vol. 3)" 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.

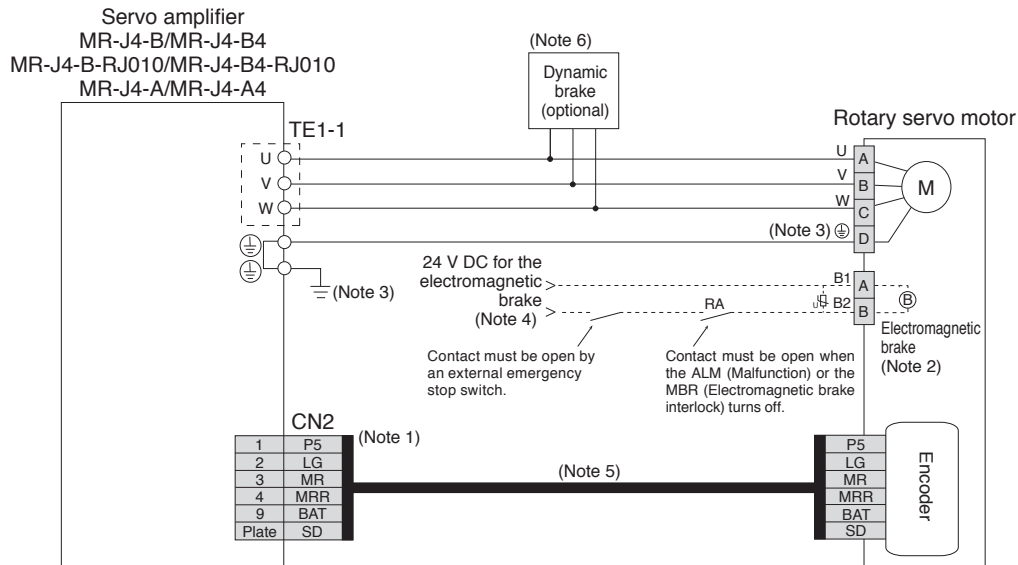
Servo Motor Connection Example (Rotary Servo Motor)

B-RJ010

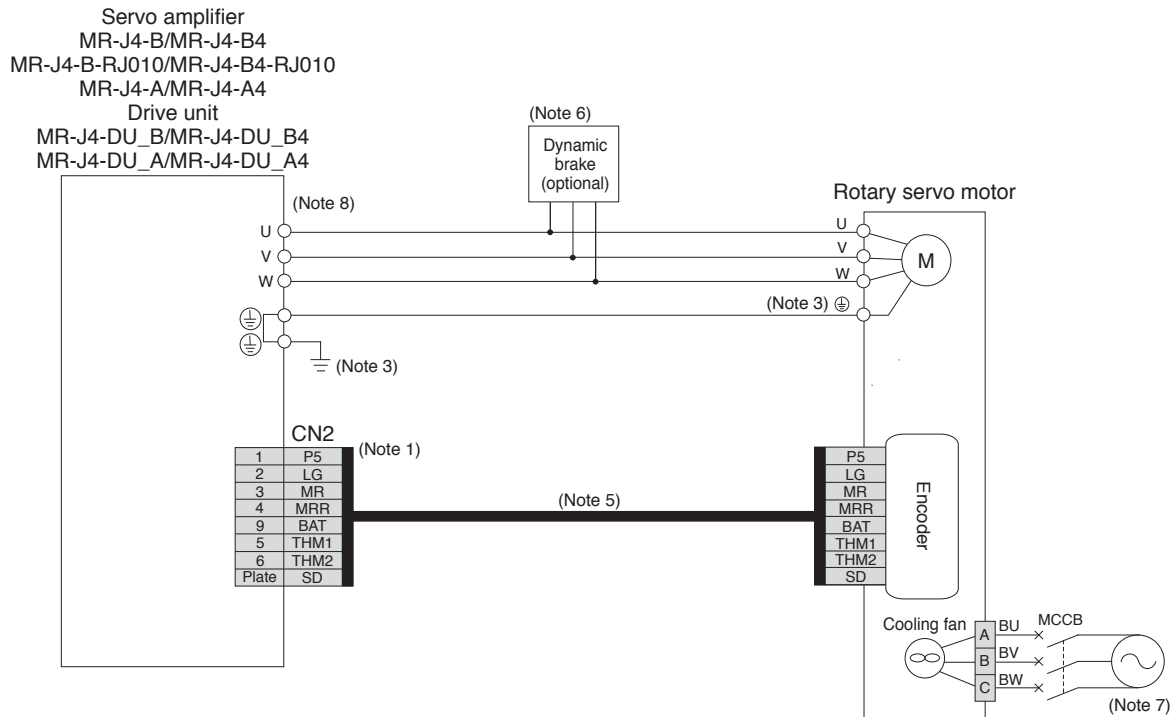
A

Semi Closed Loop Control System with MR-J4-B/MR-J4-B-RJ010/MR-J4-A

- For HG-JR 1500 r/min series (11 kW and 15 kW)



- For HG-JR 1000 r/min series (15 kW or larger) and HG-JR 1500r/min series (22 kW or larger)



Notes: 1. The signals shown is applicable when using a two-wire type encoder cable. Four-wire type is also compatible.

1. The signal 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. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.

4. Do not use the 24 V DC interface power supply for the electromagnetic brake. Provide a dedicated power supply to the electromagnetic brake.

5. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.

6. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Refer to relevant Servo Amplifier Instruction Manual when wiring the dynamic brake.

7. Be sure to supply power to the cooling fan terminals. Refer to the cooling fan power supply described in the servo motor specifications in this catalog for the required power.

8. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.



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 (Rotary Servo Motor)

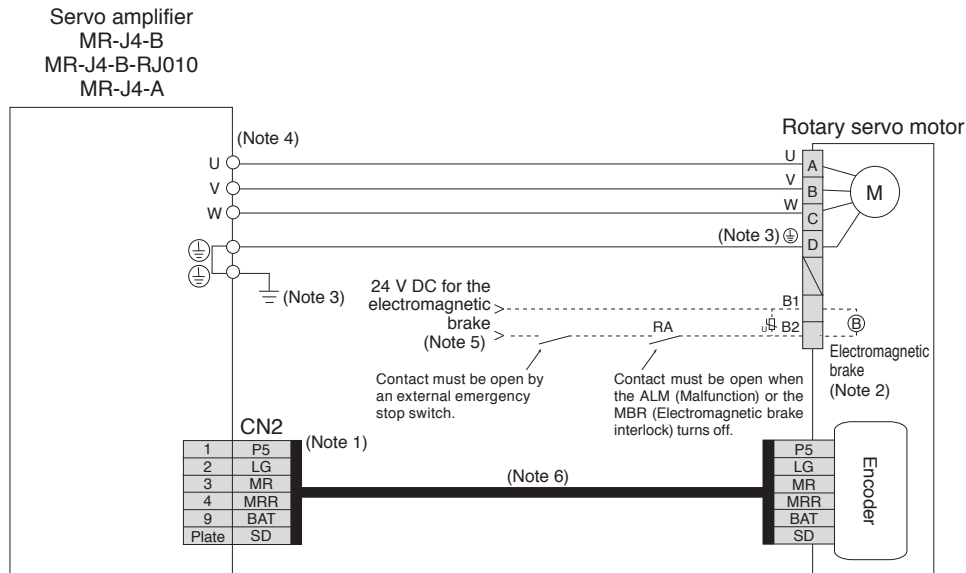
B

B-RJ010

A

Semi Closed Loop Control System with MR-J4-B/MR-J4-B-RJ010/MR-J4-A

● For HG-RR/HG-UR series



Notes: 1. The signals shown is applicable when using a two-wire type encoder cable. Four-wire type is also compatible.

- This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity. A separate connector from the motor power connector is prepared as an electromagnetic brake connector for HG-UR202B to HG-UR502B. The pin numbers vary depending on the servo motor capacity. Refer to the dimensions of the relevant servo motor in this catalog for details.
- Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
- Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
- Do not use the 24 V DC interface power supply for the electromagnetic brake. Provide a dedicated power supply to the electromagnetic brake.
- Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.



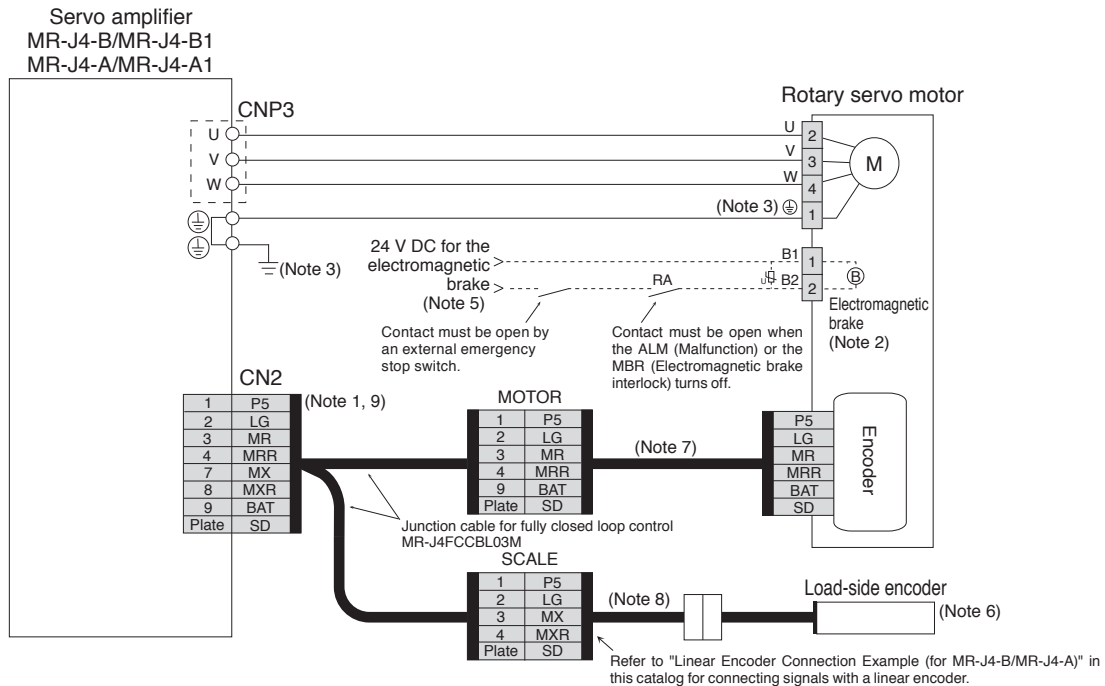
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

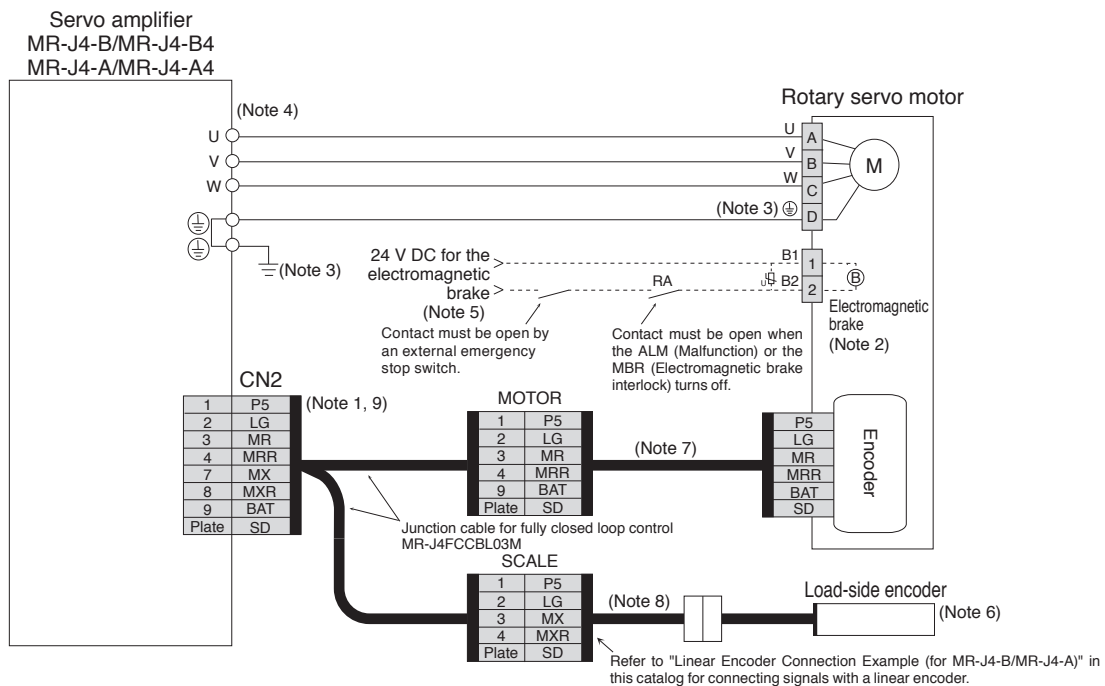
Fully Closed Loop Control System with MR-J4-B/MR-J4-A

A

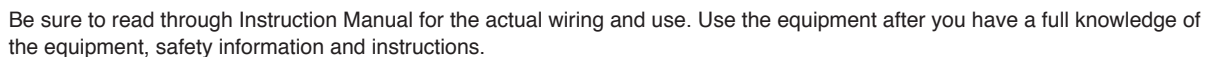
- For HG-KR/HG-MR series



- For HG-SR/HG-JR (9 kW or smaller) series

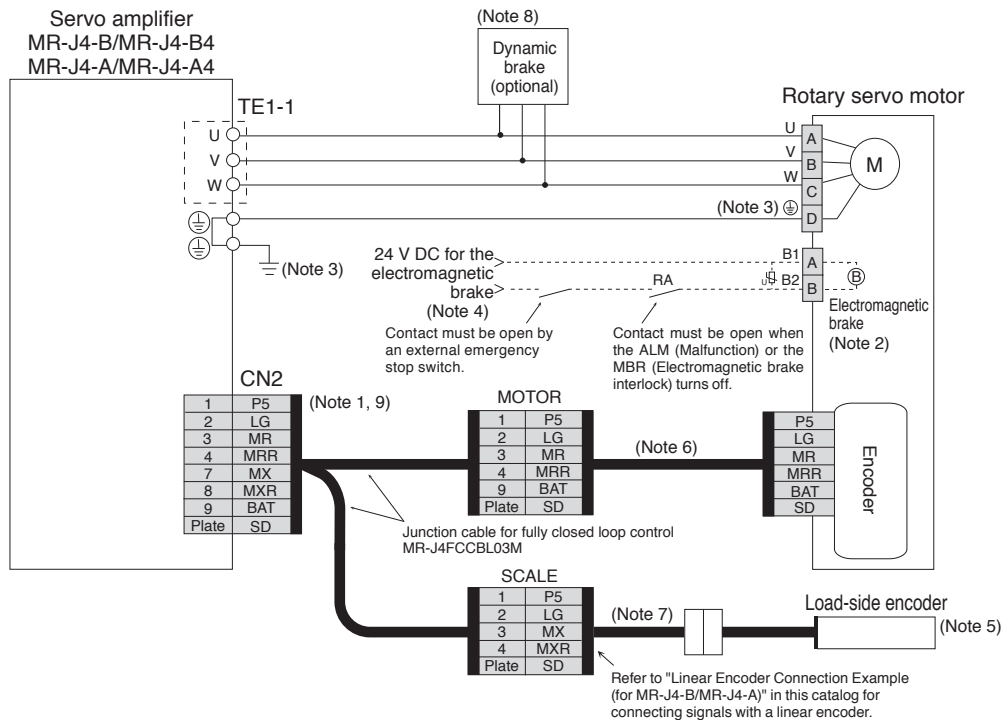


Notes: 1. For fully closed loop control, the load-side encoder and the servo motor encoder are compatible only with two-wire type communication method. Four-wire type cannot be used.
2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
4. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
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. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog. Refer to relevant Servo Amplifier Instruction Manual for the fully closed loop control with a rotary encoder.
7. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.
8. Necessary encoder cables vary depending on the load-side encoder. Refer to relevant Instruction Manual.
9. When configuring a fully closed loop control system with MR-J4-B_ or MR-J4-A_ servo amplifier, be sure to connect MR-J4FCCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set to CN2 connector.



Servo Motor Connection Example (Rotary Servo Motor) Fully Closed Loop Control System with MR-J4-B/MR-J4-A

● For HG-JR 1500 r/min series (11 kW and 15 kW)



- Notes: 1. For fully closed loop control, the load-side encoder and the servo motor encoder are compatible only with two-wire type communication method. Four-wire type cannot be used.
2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
4. Do not use the 24 V DC interface power supply for the electromagnetic brake. Provide a dedicated power supply to the electromagnetic brake.
5. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog. Refer to relevant Servo Amplifier Instruction Manual for the fully closed loop control with a rotary encoder.
6. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.
7. Necessary encoder cables vary depending on the load-side encoder. Refer to relevant Instruction Manual.
8. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Refer to relevant Servo Amplifier Instruction Manual when wiring the dynamic brake.
9. When configuring a fully closed loop control system with MR-J4-B_/MR-J4-A_ servo amplifier, be sure to connect MR-J4FCCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set to CN2 connector.

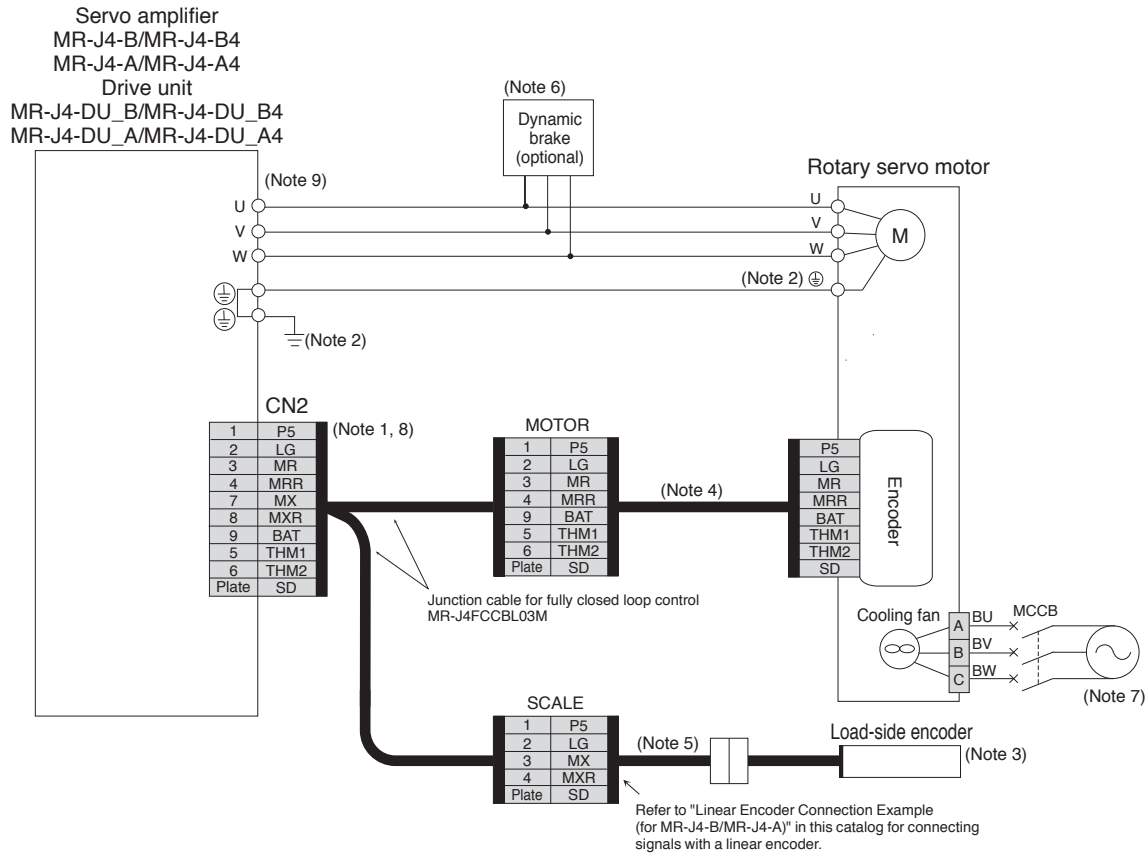


Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor) Fully Closed Loop Control System with MR-J4-B/MR-J4-A

B A

- For HG-JR 1000 r/min series (15 kW or larger) and HG-JR 1500r/min series (22 kW or larger)



- Notes: 1. For fully closed loop control, the load-side encoder and the servo motor encoder are compatible only with two-wire type communication method. Four-wire type cannot be used.
2. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
3. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog. Refer to relevant Servo Amplifier Instruction Manual for the fully closed loop control with a rotary encoder.
4. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.
5. Necessary encoder cables vary depending on the load-side encoder. Refer to relevant Instruction Manual.
6. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Refer to relevant Servo Amplifier Instruction Manual when wiring the dynamic brake.
7. Be sure to supply power to the cooling fan terminals. Refer to the cooling fan power supply described in the servo motor specifications in this catalog for the required power.
8. When configuring a fully closed loop control system with MR-J4-B_ /MR-J4-A_ servo amplifier, be sure to connect MR-J4FCCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set to CN2 connector.
9. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.

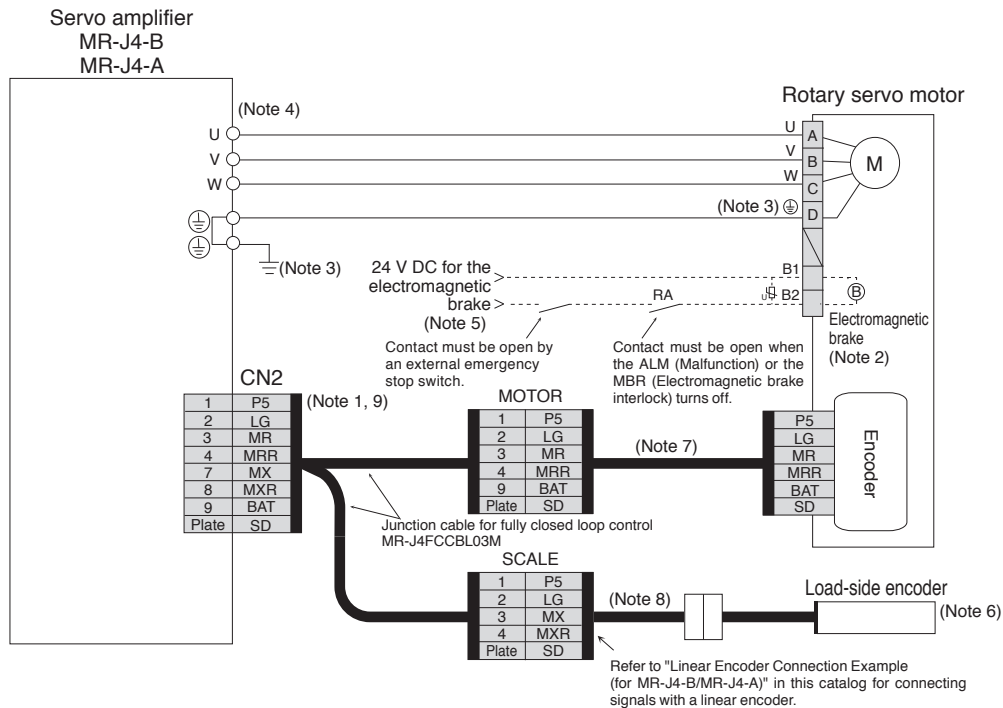


Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

Fully Closed Loop Control System with MR-J4-B/MR-J4-A

●For HG-RR/HG-UR series



Notes: 1. For fully closed loop control, the load-side encoder and the servo motor encoder are compatible only with two-wire type communication method. Four-wire type cannot be used.

2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity. A separate connector from the motor power connector is prepared as an electromagnetic brake connector for HG-UR202B to HG-UR502B. The pin numbers vary depending on the servo motor capacity. Refer to the dimensions of the relevant servo motor in this catalog for details.
3. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
4. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
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. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog. Refer to relevant Servo Amplifier Instruction Manual for the fully closed loop control with a rotary encoder.
7. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.
8. Necessary encoder cables vary depending on the load-side encoder. Refer to relevant Instruction Manual.
9. When configuring a fully closed loop control system with MR-J4-B/MR-J4-A servo amplifier, be sure to connect MR-J4FCCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set to CN2 connector.



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.

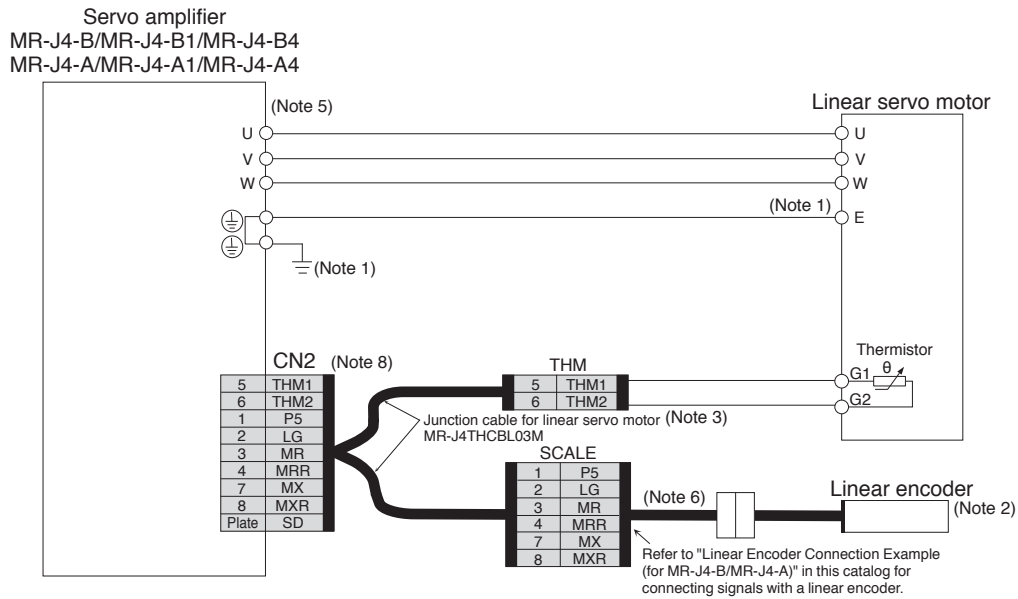
Servo Motor Connection Example (Linear Servo Motor)

B

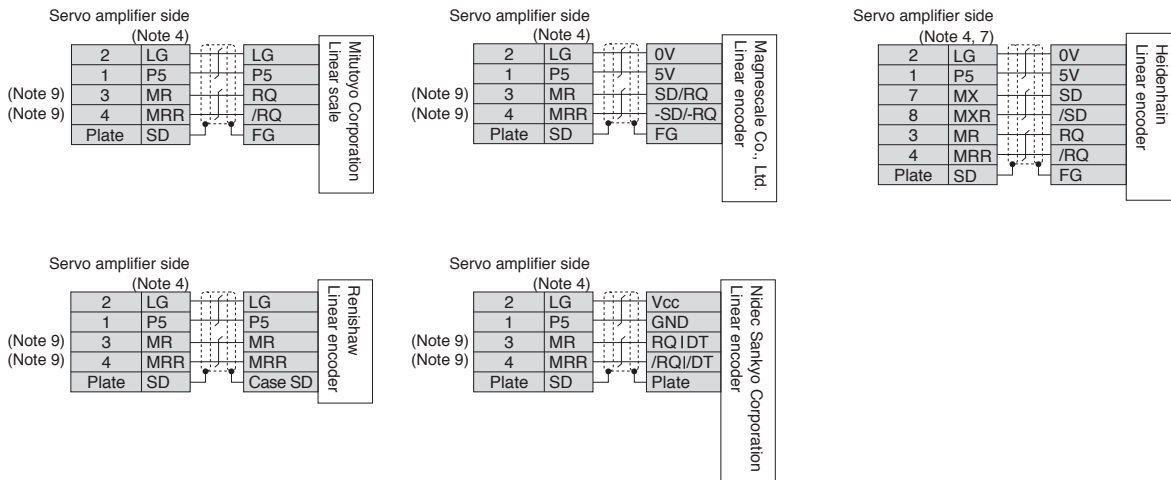
A

Linear Servo Motor System with MR-J4-B/MR-J4-A

● For LM-H3/LM-F/LM-K2/LM-U2 series



Linear Encoder Connection Example (for MR-J4-B/MR-J4-A)



- Notes:
1. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
 2. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog.
 3. MR-J4THCBL03M junction cable for linear servo motor is compatible with both two-wire and four-wire type linear encoders.
 4. For the number of the wire pairs for LG and P5, refer to "Linear Encoder Instruction Manual."
 5. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
 6. Necessary encoder cables vary depending on the linear encoder. Refer to relevant Instruction Manual.
 7. When fully closed loop control is configured with a rotary servo motor, the load-side encoder and the servo motor encoder are compatible only with two-wire type communication method. Four-wire type cannot be used.
 8. When using a linear servo motor with MR-J4-B_/MR-J4-A_ servo amplifier, be sure to connect MR-J4THCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set to CN2 connector.
 9. For the fully closed loop control, the signals of 3-pin and 4-pin are as follows:
3-pin: MX
4-pin: MXR



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 (Direct Drive Motor)

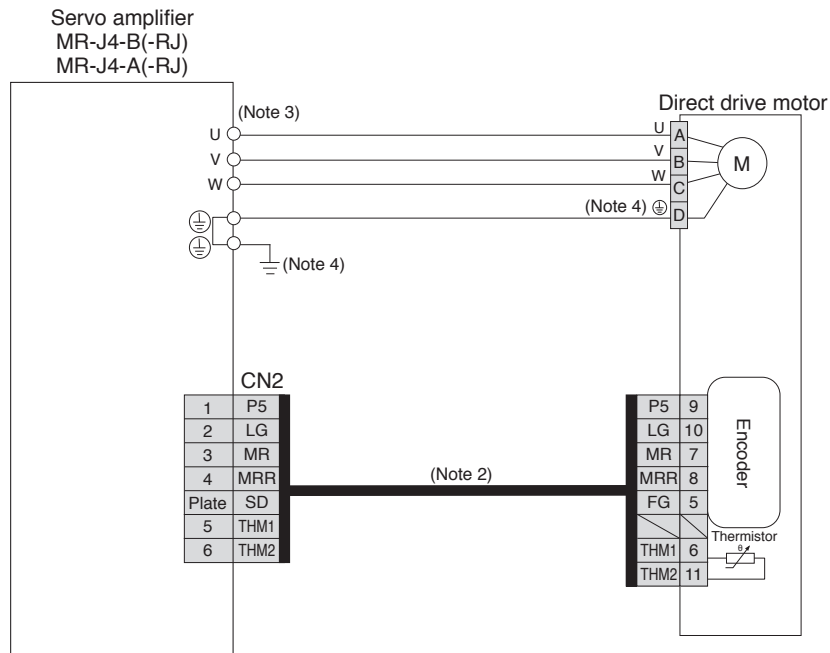
B

B-RJ

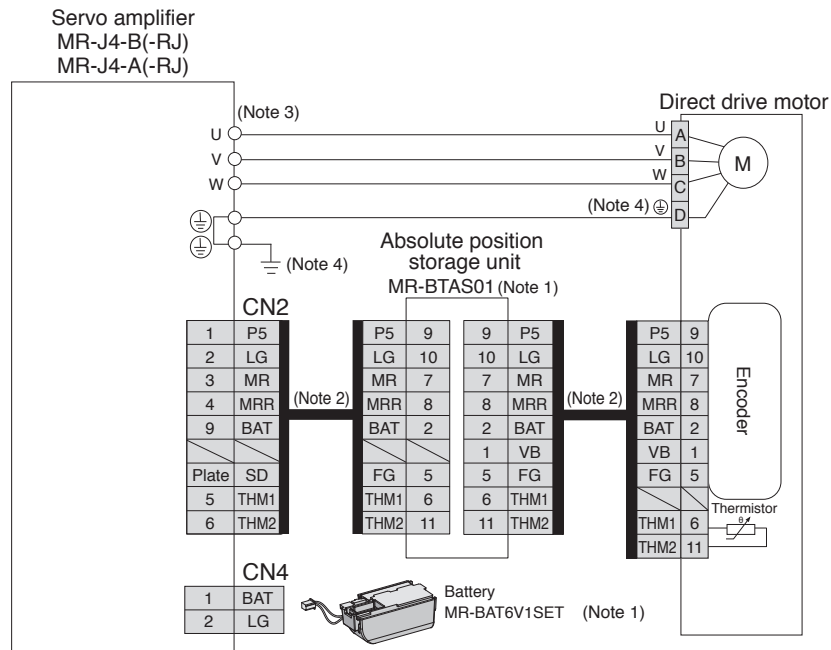
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A-RJ

● For TM-RFM series (incremental system)



● For TM-RFM series (absolute position detection system)



Notes: 1. Optional MR-BTAS01 absolute position storage unit and MR-BAT6V1SET battery are required for absolute position detection system. Refer to relevant Servo Amplifier Instruction Manual and "Direct Drive Motor Instruction Manual" for details.

2. Fabricate this encoder cable. Refer to "Direct Drive Motor Instruction Manual" for fabricating the encoder cable.

3. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.

4. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.



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.

Encoder Connection Specifications

B
B-RJ
WB
A
A-RJ

When configuring a linear servo motor system or a fully closed loop control system, or when using the scale measurement function, use the servo amplifier with the following software version.

Refer to the following tables for the encoder communication method compatible with each system and for the servo amplifier connector to which a load-side encoder should be connected.

Operation mode	External encoder communication method	Connector to be connected with the external encoder					
		MR-J4-B_ MR-J4-DU_B_	MR-J4-B_-RJ MR-J4-DU_B_-RJ	MR-J4-A_ MR-J4-DU_A_	MR-J4-A_-RJ MR-J4-DU_A_-RJ	MR-J4W2-B	MR-J4W3-B
Linear servo motor system (Note 9)	Two-wire type	CN2 (Note 1)	CN2 (Note 1)	CN2 (Note 1, 6)	CN2 (Note 1)	CN2A (Note 1) CN2B (Note 1)	CN2A (Note 1) CN2B (Note 1) CN2C (Note 1)
	Four-wire type						
	A/B/Z-phase differential output type		CN2L (Note 8)		CN2L (Note 8)		
Fully closed loop control system	Two-wire type	CN2 (Note 2, 3, 5)	CN2L	CN2 (Note 2, 3, 6)	CN2L	CN2A (Note 2, 4, 5) CN2B (Note 2, 4, 5)	
	Four-wire type						
	A/B/Z-phase differential output type						
Scale measurement function	Two-wire type	CN2 (Note 2, 3, 7)	CN2L (Note 7)			CN2A (Note 2, 4, 7) CN2B (Note 2, 4, 7)	
	Four-wire type						
	A/B/Z-phase differential output type						

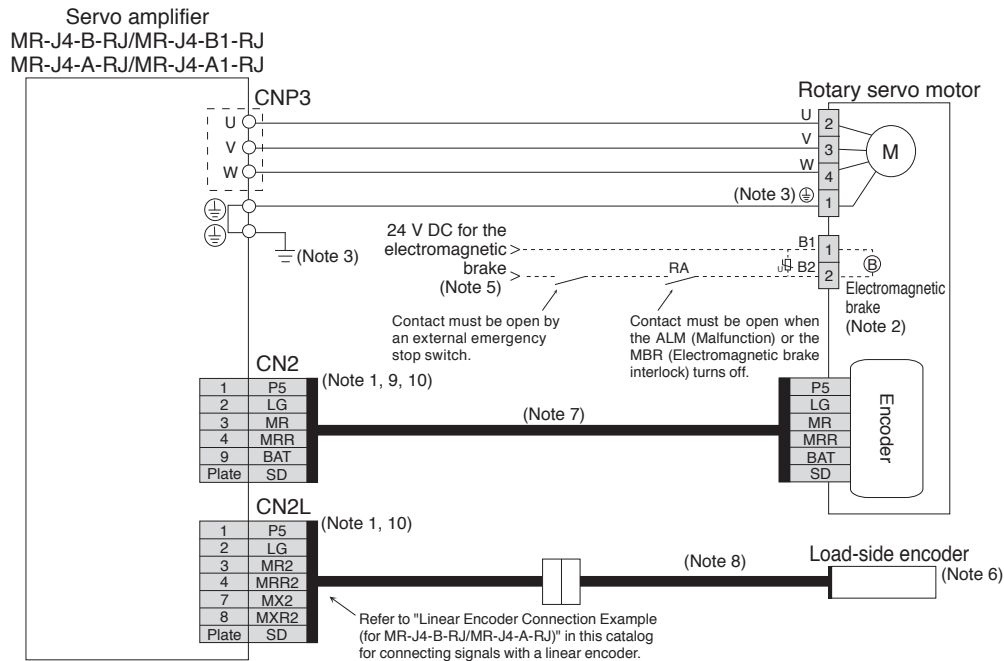
- Notes: 1. MR-J4THCBL03M junction cable is required.
2. MR-J4FCCBL03M junction cable is required.
3. MR-J4-B_/MR-DU_B_/MR-J4-A_/MR-J4-DU_A_ servo amplifier is not compatible with a servo motor encoder with four-wire type communication method.
Use MR-J4-B_-RJ/MR-DU_B_-RJ/MR-J4-A_-RJ/MR-J4-DU_A_-RJ servo amplifier.
4. MR-J4W2-B servo amplifier is not compatible with a servo motor encoder with four-wire communication method. Use MR-J4-B-RJ servo amplifier.
5. The servo amplifier with software version A3 or later is compatible.
6. The servo amplifier with software version A5 or later is compatible.
7. The servo amplifier with software version A8 or later is compatible.
8. Connect a thermistor to CN2 connector.
9. Refer to pp. 1-3 to 1-6 in this catalog for servo amplifier that is compatible with linear servo motors.

Servo Motor Connection Example (Rotary Servo Motor)

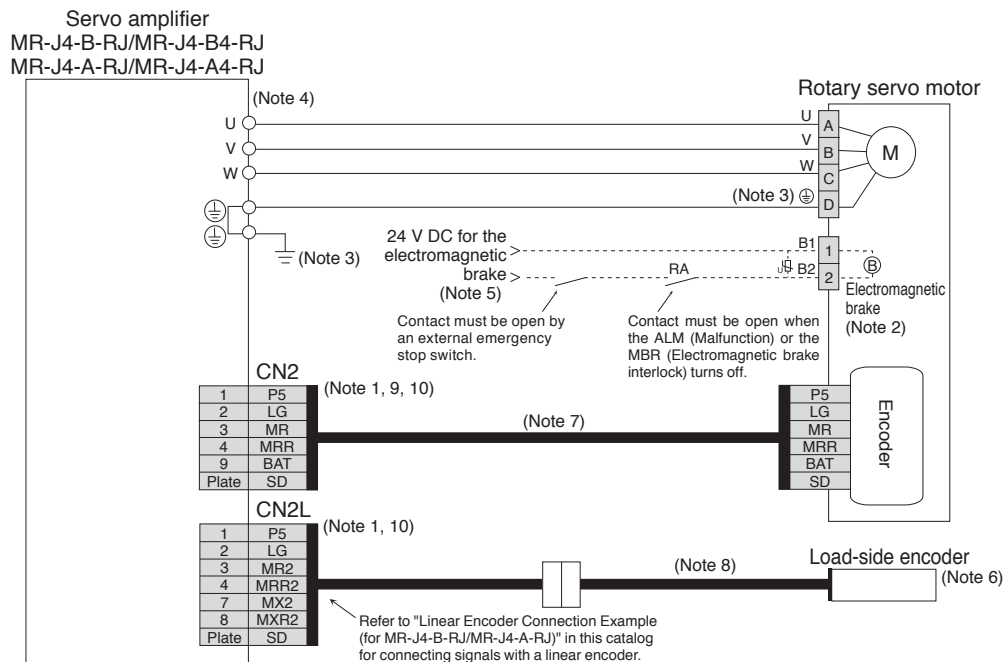
Fully Closed Loop Control System with MR-J4-B-RJ/MR-J4-A-RJ

B-RJ A-RJ

● For HG-KR/HG-MR series



● For HG-SR/HG-JR (9 kW or smaller) series



- Notes: 1. The load-side encoder and the servo motor encoder are compatible with both two-wire and four-wire type communication methods.
2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
4. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
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. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog. Refer to relevant Servo Amplifier Instruction Manual for the fully closed loop control with a rotary encoder.
7. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.
8. Necessary encoder cables vary depending on the load-side encoder. Refer to relevant Instruction Manual.
9. This wiring of the servo motor encoder is applicable for the two-wire type communication method.
10. When configuring a fully closed loop control system with MR-J4-B-RJ or MR-J4-A-RJ servo amplifier, be sure to connect a servo motor encoder to CN2 connector and a load-side encoder to CN2L connector. Do not use MR-J4FCCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set.



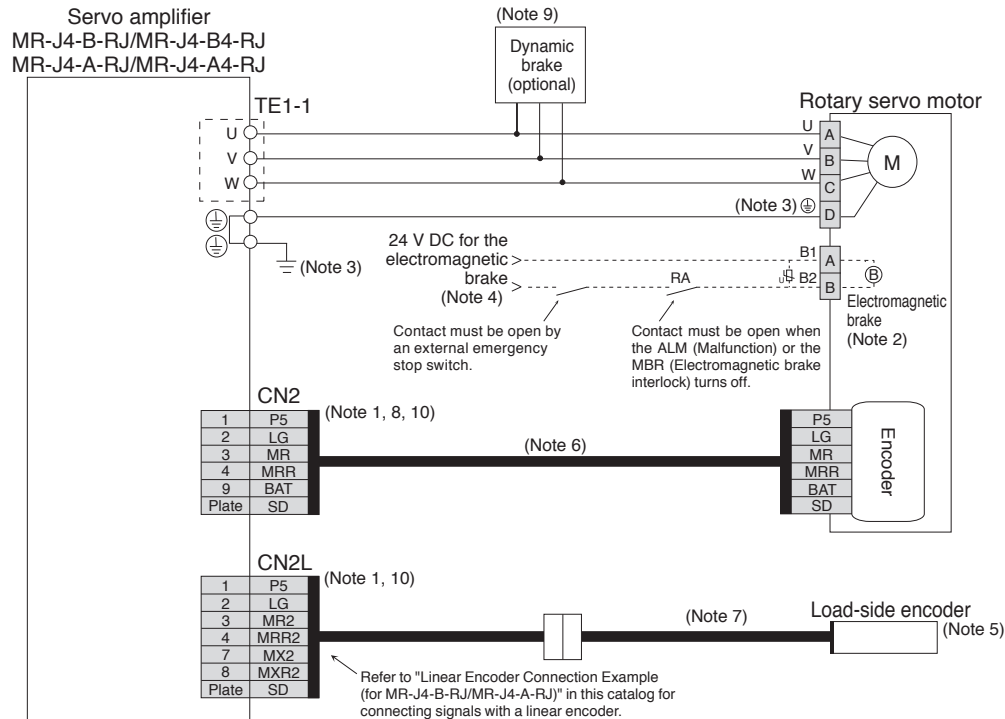
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

B-RJ A-RJ

Fully Closed Loop Control System with MR-J4-B-RJ/MR-J4-A-RJ

● For HG-JR 1500 r/min series (11 kW and 15 kW)



- Notes: 1. The load-side encoder and the servo motor encoder are compatible with both two-wire and four-wire type communication methods.
2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
4. Do not use the 24 V DC interface power supply for the electromagnetic brake. Provide a dedicated power supply to the electromagnetic brake.
5. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog. Refer to relevant Servo Amplifier Instruction Manual for the fully closed loop control with a rotary encoder.
6. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.
7. Necessary encoder cables vary depending on the load-side encoder. Refer to relevant Instruction Manual.
8. This wiring of the servo motor encoder is applicable for the two-wire type communication method.
9. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Refer to relevant Servo Amplifier Instruction Manual when wiring the dynamic brake.
10. When configuring a fully closed loop control system with MR-J4-B-RJ/MR-J4-A-RJ servo amplifier, be sure to connect a servo motor encoder to CN2 connector and a load-side encoder to CN2L connector. Do not use MR-J4FCCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set.



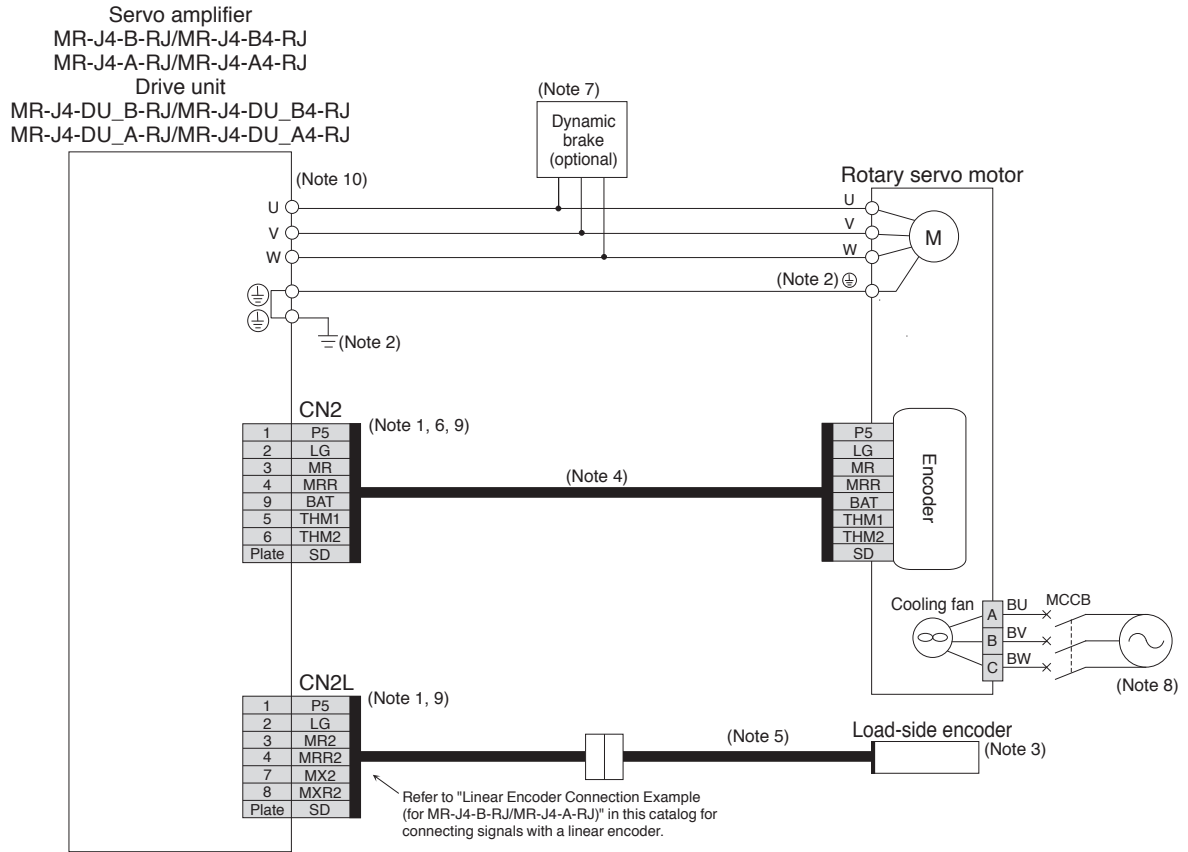
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

B-RJ A-RJ

Fully Closed Loop Control System with MR-J4-B-RJ/MR-J4-A-RJ

- For HG-JR 1000 r/min series (15 kW or larger) and HG-JR 1500r/min series (22 kW or larger)



- Notes: 1. The load-side encoder and the servo motor encoder are compatible with both two-wire and four-wire type communication methods.
2. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
3. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog. Refer to relevant Servo Amplifier Instruction Manual for the fully closed loop control with a rotary encoder.
4. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.
5. Necessary encoder cables vary depending on the load-side encoder. Refer to relevant Instruction Manual.
6. This wiring of the servo motor encoder is applicable for the two-wire type communication method.
7. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Refer to relevant Servo Amplifier Instruction Manual when wiring the dynamic brake.
8. Be sure to supply power to the cooling fan terminals. Refer to the cooling fan power supply described in the servo motor specifications in this catalog for the required power.
9. When configuring a fully closed loop control system with MR-J4-B-RJ/MR-J4-A-RJ servo amplifier, be sure to connect a servo motor encoder to CN2 connector and a load-side encoder to CN2L connector. Do not use MR-J4FCCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set.
10. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.



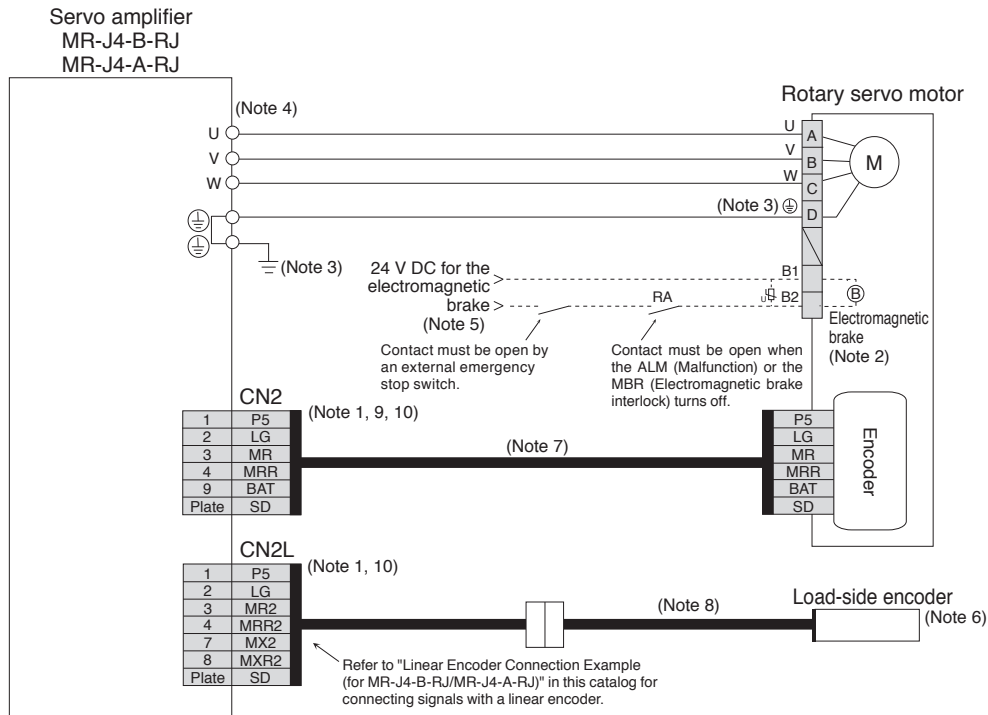
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

B-RJ A-RJ

Fully Closed Loop Control System with MR-J4-B-RJ/MR-J4-A-RJ

● For HG-RR/HG-UR series



- Notes: 1. The load-side encoder and the servo motor encoder are compatible with both two-wire and four-wire type communication methods.
2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity. A separate connector from the motor power connector is prepared as an electromagnetic brake connector for HG-UR202B to HG-UR502B. The pin numbers vary depending on the servo motor capacity. Refer to the dimensions of the relevant servo motor in this catalog for details.
3. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
4. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
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. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog. Refer to relevant Servo Amplifier Instruction Manual for the fully closed loop control with a rotary encoder.
7. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.
8. Necessary encoder cables vary depending on the load-side encoder. Refer to relevant Instruction Manual.
9. This wiring of the servo motor encoder is applicable for the two-wire type communication method.
10. When configuring a fully closed loop control system with MR-J4-B-RJ/MR-J4-A-RJ servo amplifier, be sure to connect a servo motor encoder to CN2 connector and a load-side encoder to CN2L connector. Do not use MR-J4FCCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set.



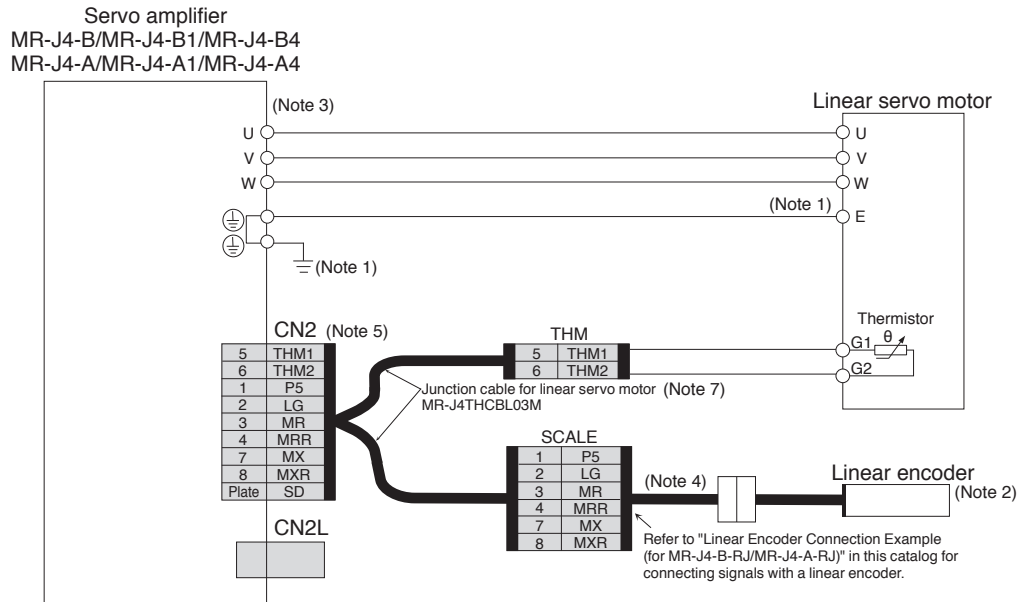
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Linear Servo Motor)

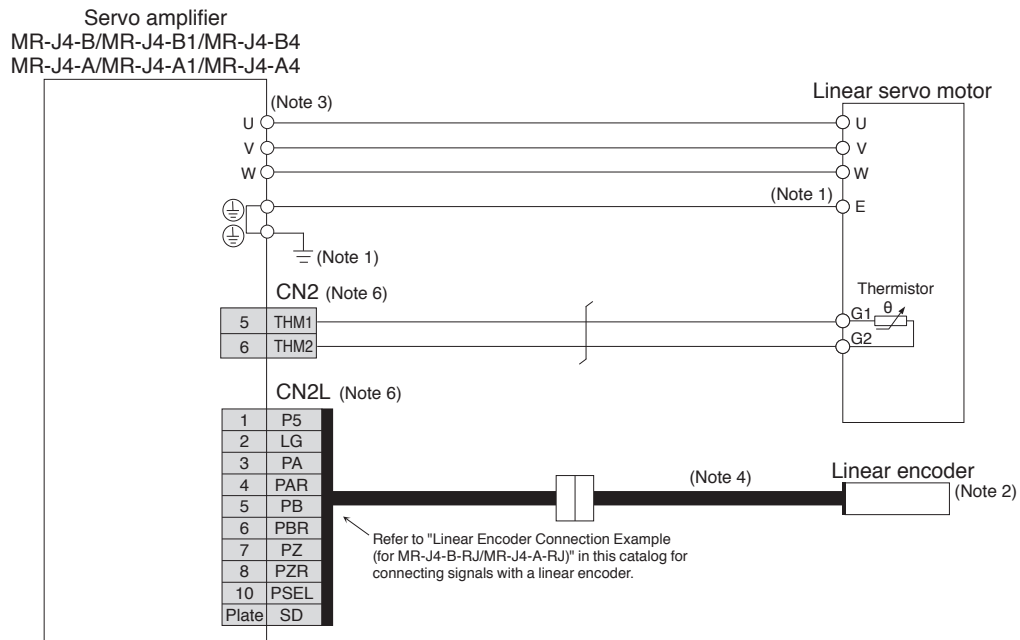
B-RJ A-RJ

Linear Servo Motor System with MR-J4-B-RJ/MR-J4-A-RJ (LM-H3, LM-F, LM-K2, LM-U2 Series)

●Connecting a serial linear encoder



●Connecting an A/B/Z-phase differential output linear encoder



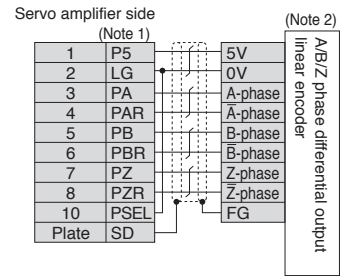
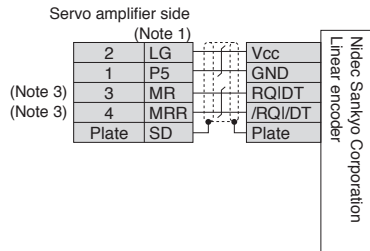
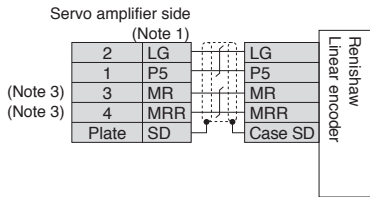
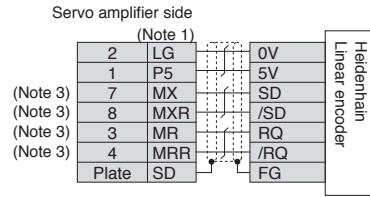
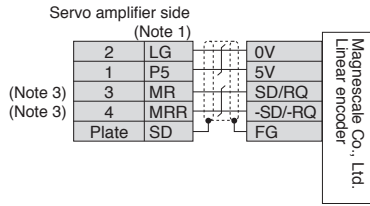
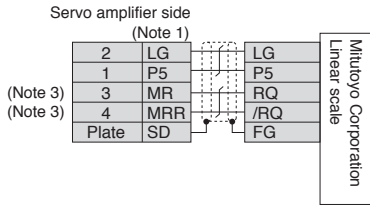
- Notes: 1. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
2. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog.
3. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
4. Necessary encoder cables vary depending on the linear encoder. Refer to "Linear Encoder Instruction Manual."
5. When configuring a linear servo system with MR-J4-B_-RJ/MR-J4-A_-RJ servo amplifier and a serial linear encoder, be sure to connect MR-J4THCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set to CN2 connector.
6. When configuring a linear servo system with MR-J4-B_-RJ/MR-J4-A_-RJ servo amplifier and an A/B/Z-phase differential output type linear encoder, be sure to connect a thermistor to CN2 connector and the linear encoder to CN2L connector. Do not use MR-J4THCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set.
7. MR-J4THCBL03M junction cable for linear servo motor is compatible with two-wire and four-wire type linear encoders.



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.

Linear Encoder Connection Example (for MR-J4-B-RJ/MR-J4-A-RJ)

B-RJ A-RJ



- Notes: 1. For the number of the wire pairs for LG and P5, refer to "Linear Encoder Instruction Manual."
 2. If the encoder's current consumption exceeds 350 mA, supply power from an external source.
 3. For CN2L connector, the signals of 3-pin, 4-pin, and 7-pin, and 8-pin are as follows:
 3-pin: MR2
 4-pin: MRR2
 7-pin: MX2
 8-pin: MXR2



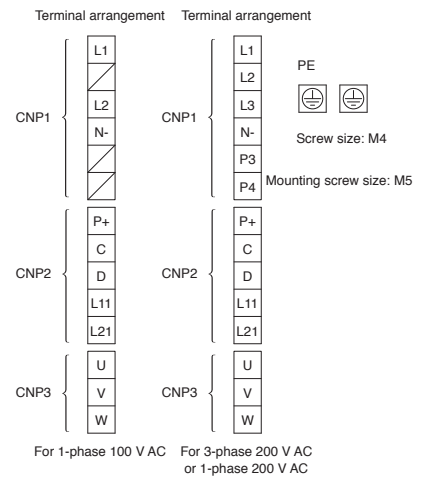
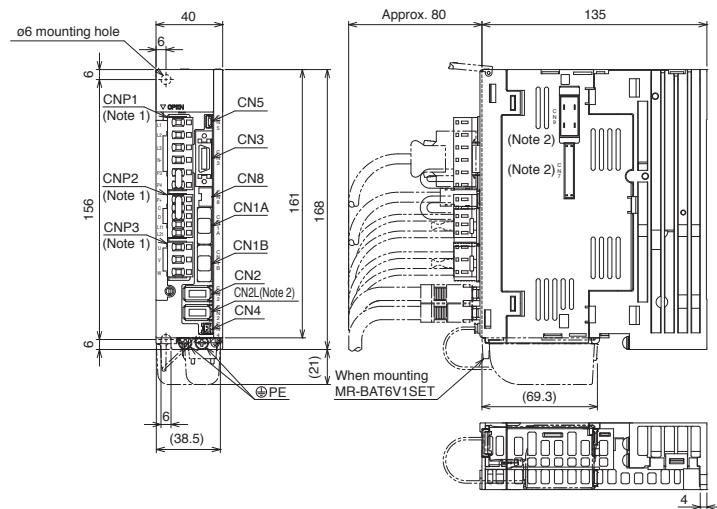
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

MR-J4-B/MR-J4-B-RJ Dimensions

B

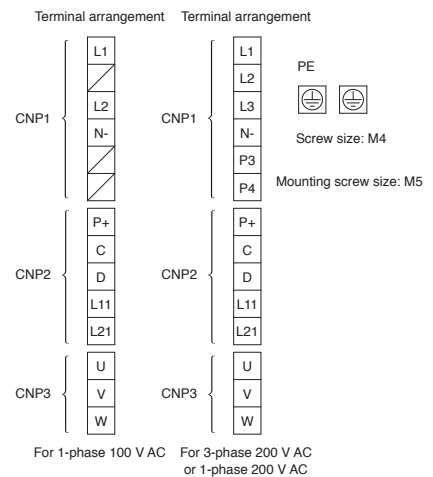
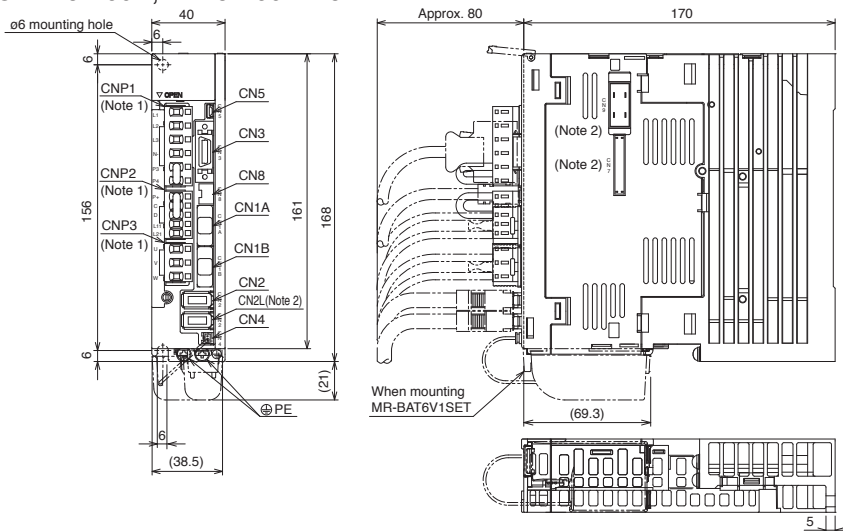
B-RJ

- MR-J4-10B, MR-J4-10B-RJ, MR-J4-10B1, MR-J4-10B1-RJ
●MR-J4-20B, MR-J4-20B-RJ, MR-J4-20B1, MR-J4-20B1-RJ



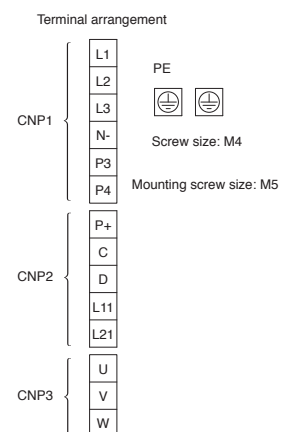
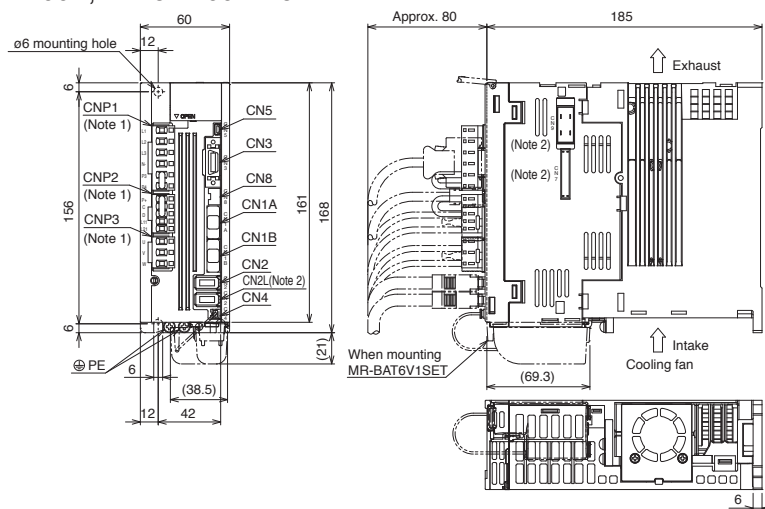
[Unit: mm]

- MR-J4-40B, MR-J4-40B-RJ, MR-J4-40B1, MR-J4-40B1-RJ
- MR-J4-60B, MR-J4-60B-RJ



[Unit: mm]

- MR-J4-70B, MR-J4-70B-RJ
- MR-J4-100B, MR-J4-100B-RJ



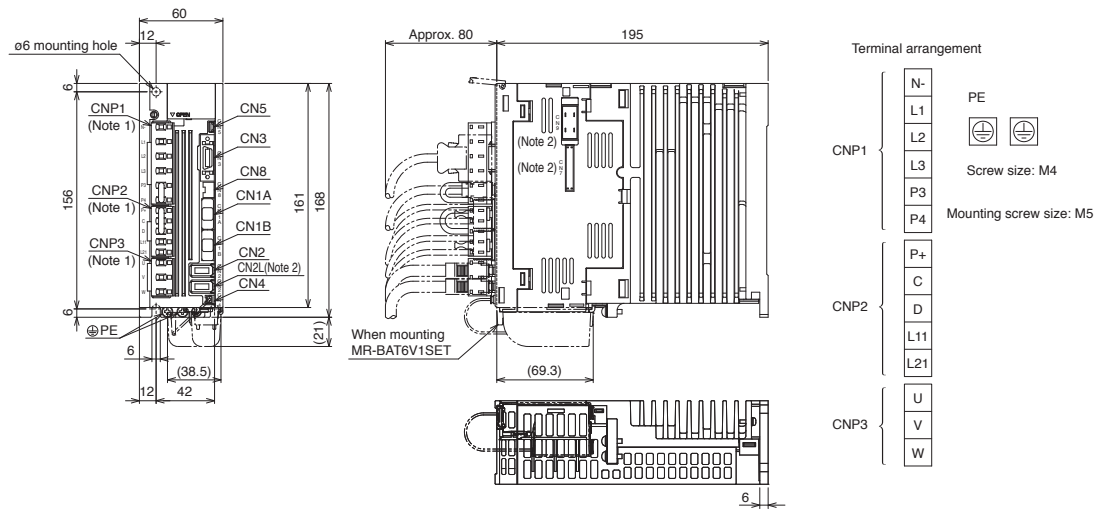
[Unit: mm]

Notes: 1. CNP1, CNP2 and CNP3 connectors (insertion type) are supplied with the servo amplifier.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-B servo amplifier.

MR-J4-B/MR-J4-B-RJ Dimensions

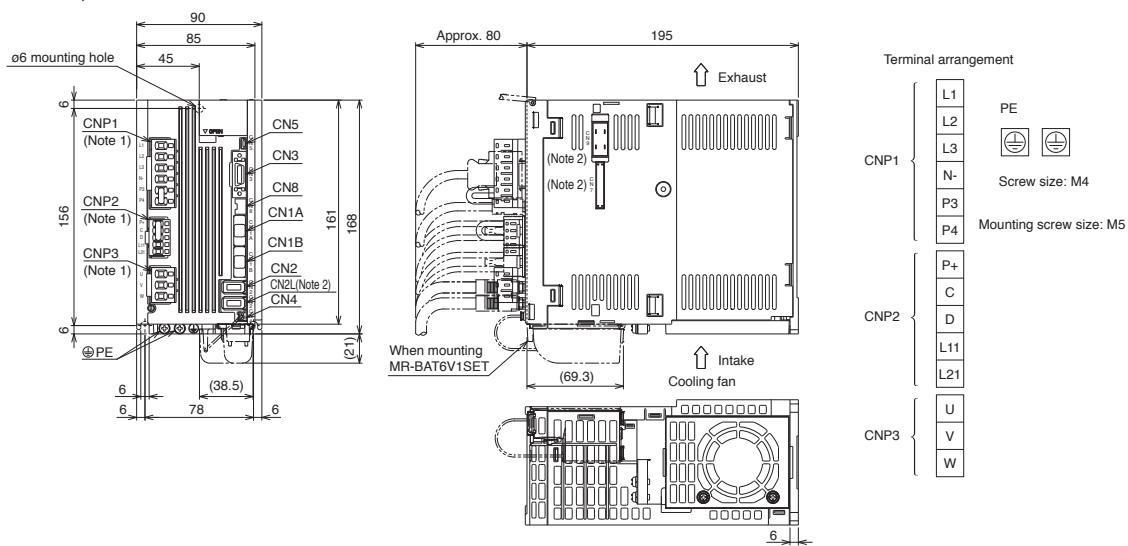
B-RJ

- MR-J4-60B4, MR-J4-60B4-RJ
- MR-J4-100B4, MR-J4-100B4-RJ



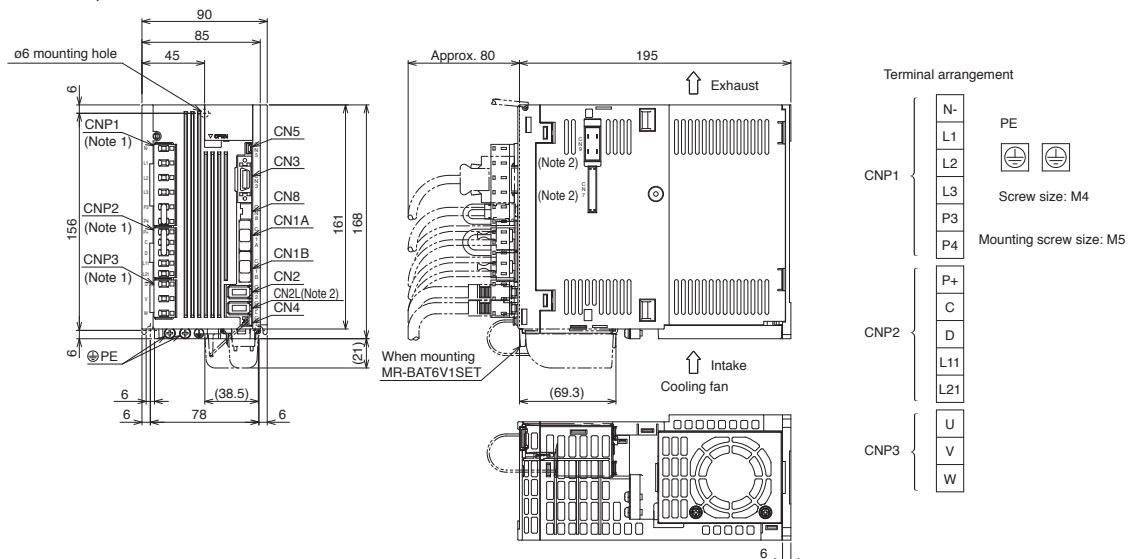
[Unit: mm]

- MR-J4-200B, MR-J4-200B-RJ



[Unit: mm]

- MR-J4-200B4, MR-J4-200B4-RJ



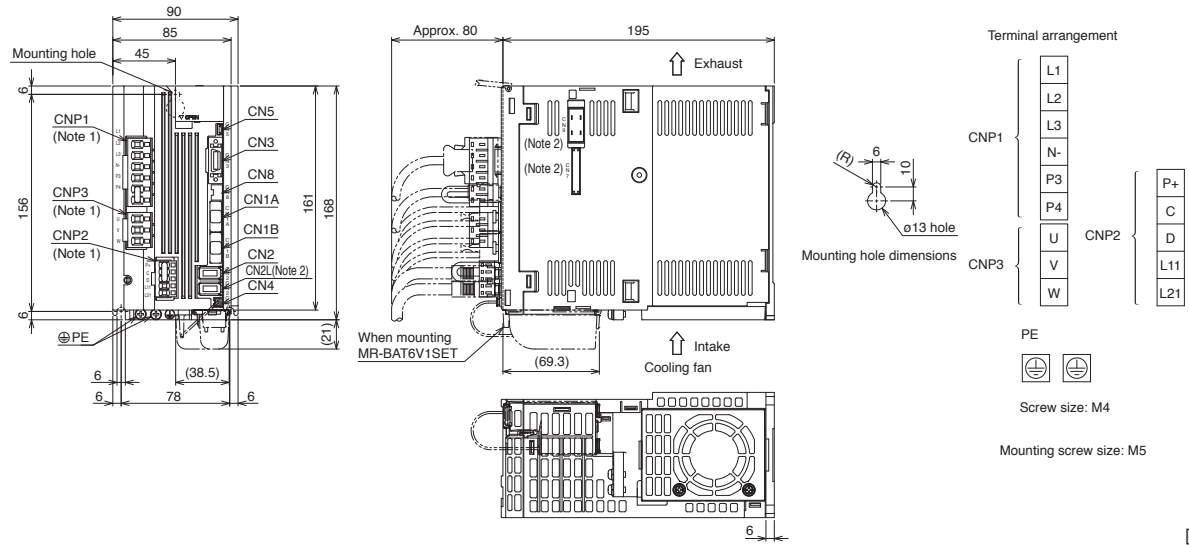
[Unit: mm]

Notes: 1. CNP1, CNP2 and CNP3 connectors (insertion type) are supplied with the servo amplifier.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-B servo amplifier.

MR-J4-B/MR-J4-B-RJ Dimensions

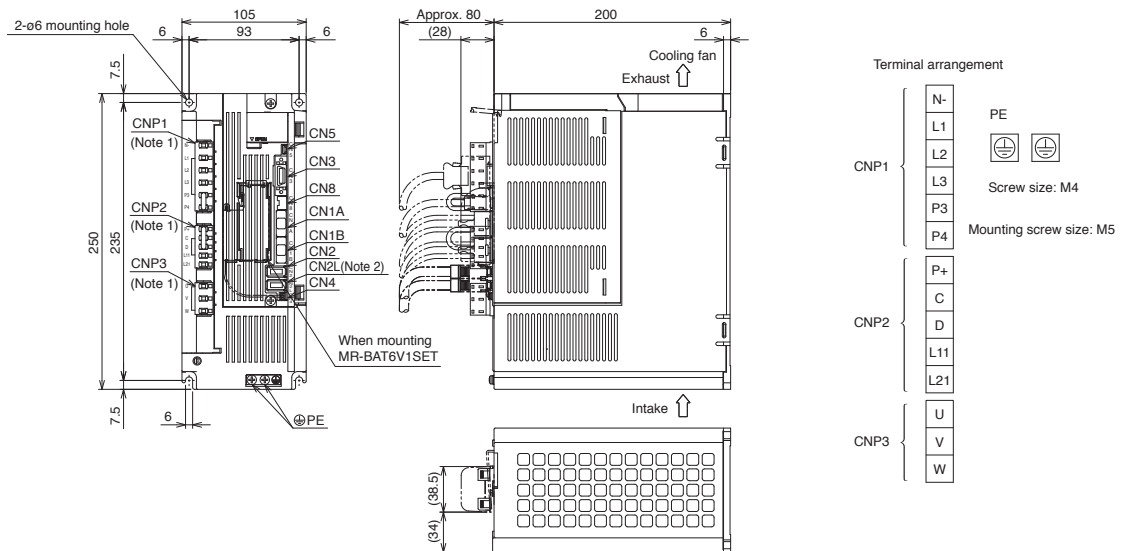
B **B-RJ**

●MR-J4-350B, MR-J4-350B-RJ



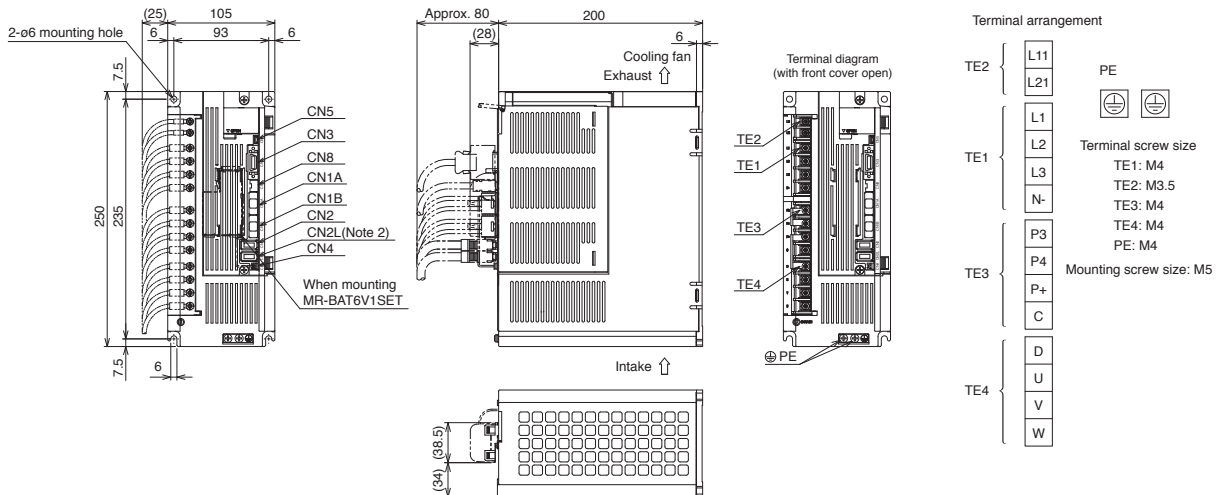
[Unit: mm]

●MR-J4-350B4, MR-J4-350B4-RJ



[Unit: mm]

●MR-J4-500B, MR-J4-500B-RJ



[Unit: mm]

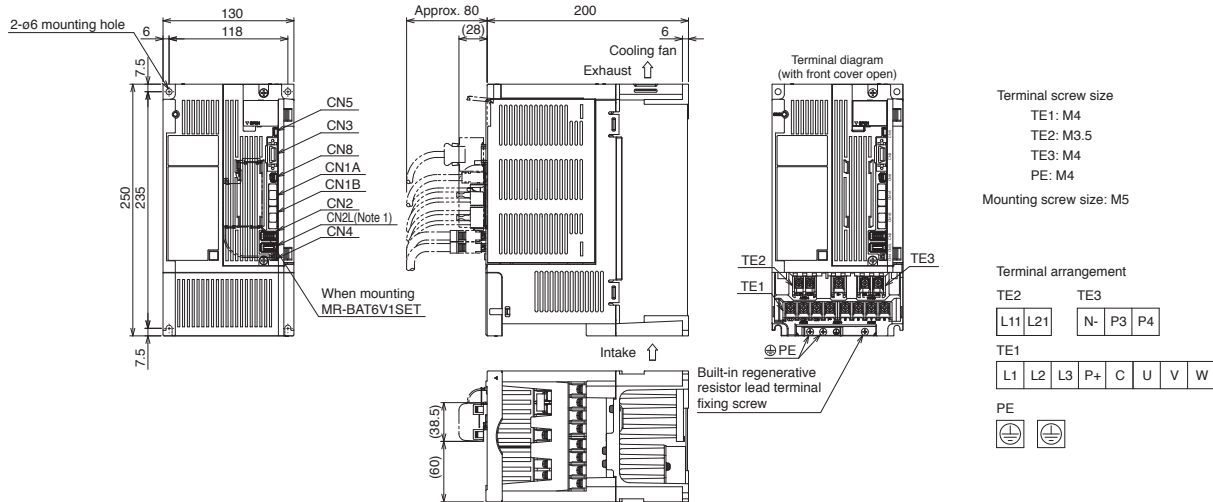
Notes: 1. CNP1, CNP2 and CNP3 connectors (insertion type) are supplied with the servo amplifier.
 2. CN2L, CN7, and CN9 connectors are not available for MR-J4-B servo amplifier.

MR-J4-B/MR-J4-B-RJ Dimensions

B

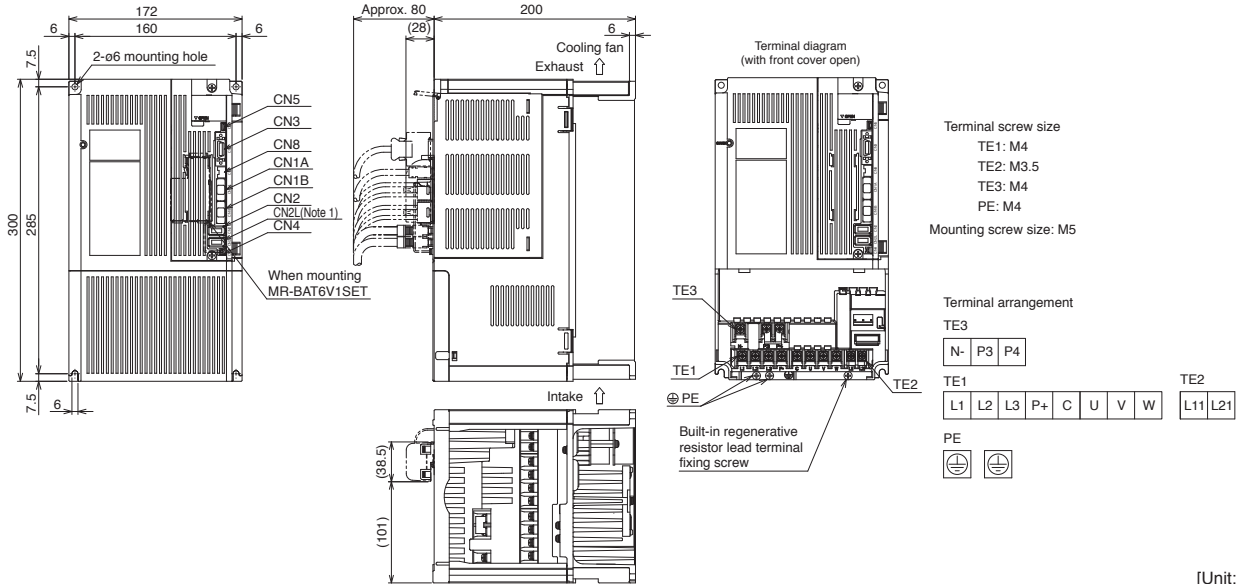
B-RJ

●MR-J4-500B4, MR-J4-500B4-RJ



[Unit: mm]

●MR-J4-700B, MR-J4-700B-RJ, MR-J4-700B4, MR-J4-700B4-RJ



[Unit: mm]

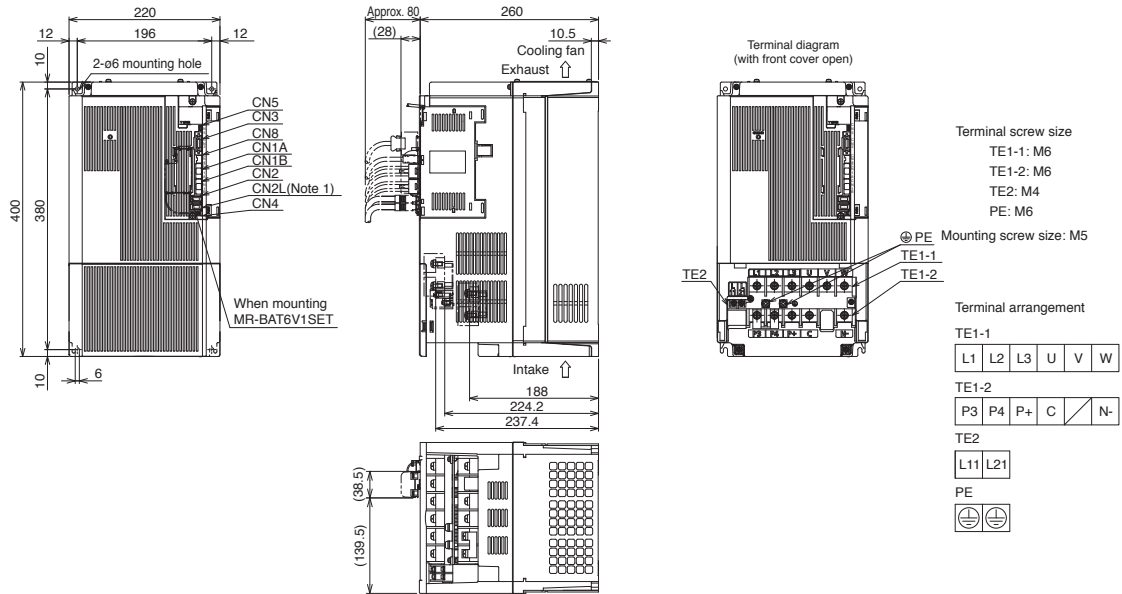
Notes: 1. CN2L, CN7, and CN9 connectors are not available for MR-J4-B servo amplifier.



MR-J4-B/MR-J4-B-RJ Dimensions

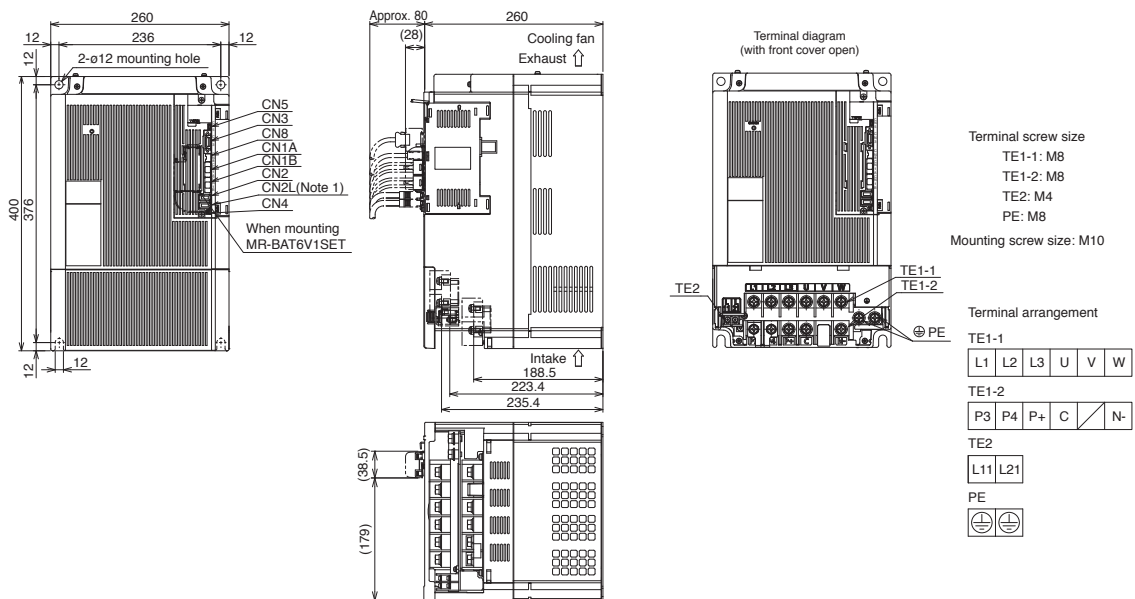
B B-RJ

- MR-J4-11KB, MR-J4-11KB-RJ, MR-J4-11KB4, MR-J4-11KB4-RJ
- MR-J4-15KB, MR-J4-15KB-RJ, MR-J4-15KB4, MR-J4-15KB4-RJ



[Unit: mm]

- MR-J4-22KB, MR-J4-22KB-RJ, MR-J4-22KB4, MR-J4-22KB4-RJ



[Unit: mm]

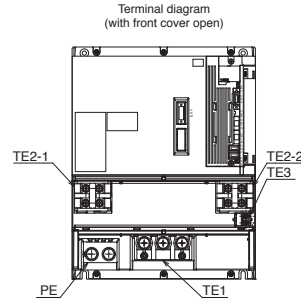
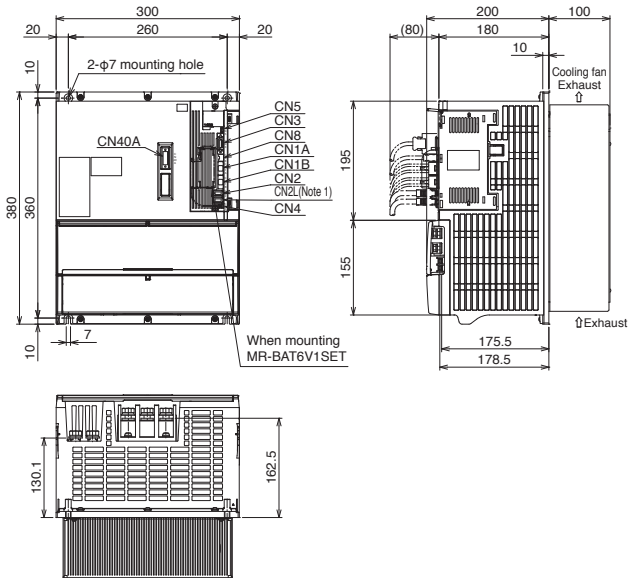
Notes: 1. CN2L, CN7, and CN9 connectors are not available for MR-J4-B servo amplifier.

MR-J4-DU_B/MR-J4-DU_B-RJ Dimensions

B

B-RJ

- MR-J4-DU30KB, MR-J4-DU30KB-RJ
- MR-J4-DU37KB, MR-J4-DU37KB-RJ
- MR-J4-DU45KB4, MR-J4-DU45KB4-RJ
- MR-J4-DU55KB4, MR-J4-DU55KB4-RJ



Terminal screw size

TE1: M10

TE2-1: M6

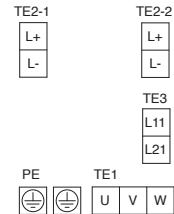
TE2-2: M6

TE3: M4

PE: M10

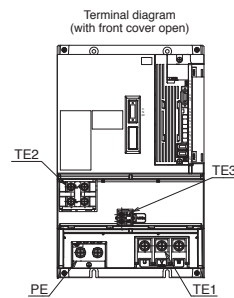
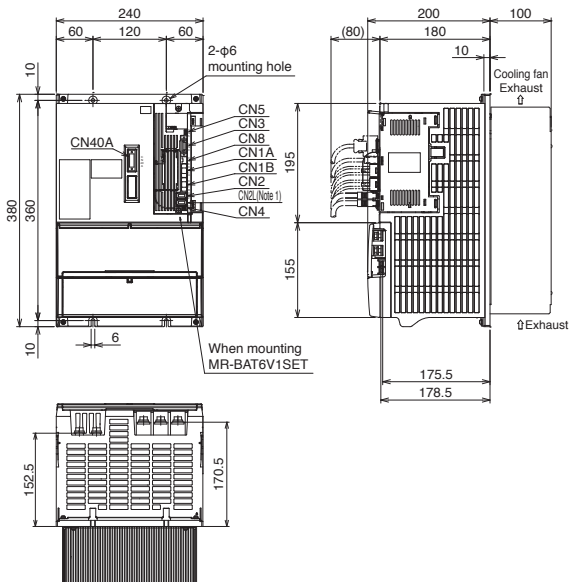
Mounting screw size: M6

Terminal arrangement



[Unit: mm]

- MR-J4-DU30KB4, MR-J4-DU30KB4-RJ
- MR-J4-DU37KB4, MR-J4-DU37KB4-RJ



Terminal screw size

TE1: M8

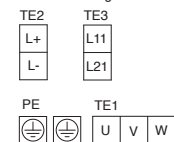
TE2: M6

TE3: M4

PE: M8

Mounting screw size: M5

Terminal arrangement



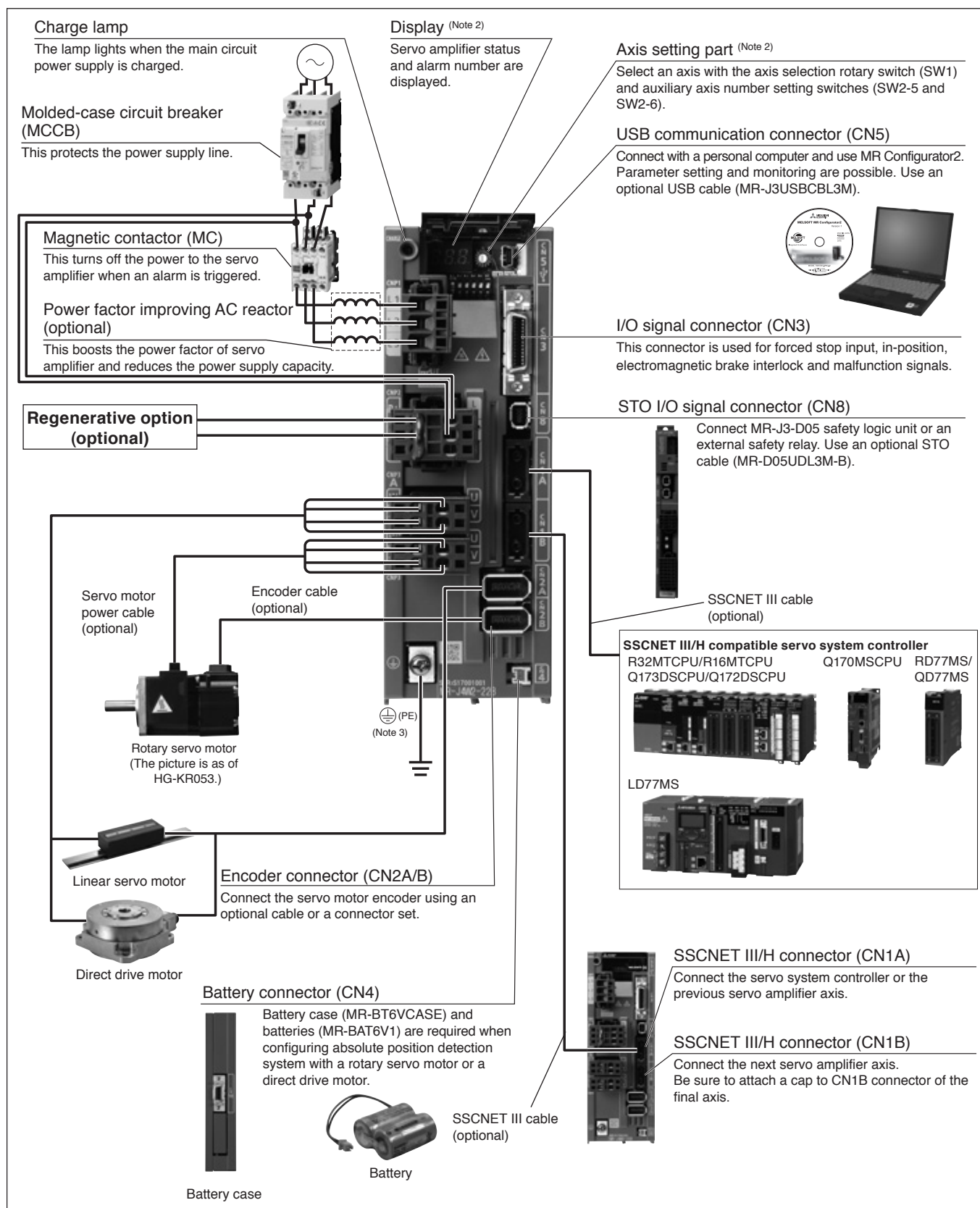
[Unit: mm]

Notes: 1. CN2L, CN7, and CN9 connectors are not available for MR-J4-DU_B_ drive unit.

MR-J4W_-B Connections with Peripheral Equipment (Note 1)

WB

Peripheral equipment is connected to MR-J4W_-B 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-J4W2-22B. CNP3C and CN2C connectors are available for MR-J4W3-B servo amplifier. Refer to "MR-J4W_-B Servo Amplifier Instruction Manual" for the actual connections of the multi-axis servo amplifier.

2. This picture shows when the display cover is open.

3. Connect the grounding terminal of the servo motor to (PE) of CNP3A, CNP3B, and CNP3C. Connect the protective earth (PE) terminal (PE) located on the lower front of the servo amplifier to the cabinet protective earth (PE).



MR-J4W2-B (2-axis, SSCNET III/H Interface) Specifications

WB

Servo amplifier model MR-J4W2-			22B	44B	77B	1010B
Output	Rated voltage		3-phase 170 V AC			
	Rated current (each axis) [A]		1.5	2.8	5.8	6.0
Main circuit power supply input	Voltage/frequency <small>(Note 1)</small>		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, 50Hz/60 Hz
	Rated current <small>(Note 15)</small> [A]		2.9	5.2	7.5	9.8
	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			
Control circuit power supply input	Voltage/frequency		1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz			
	Rated current [A]		0.4			
	Permissible voltage fluctuation		1-phase 170 V AC to 264 V AC			
	Permissible frequency fluctuation		±5% maximum			
	Power consumption [W]		55			
Interface power supply			24 V DC ± 10% (required current capacity: 0.35 A (including CN8 connector signals))			
Control method			Sine-wave PWM control/current control method			
Capacitor regeneration	Reusable regenerative energy <small>(Note 5)</small> [J]		17	21	44	
	Moment of inertia (J) equivalent to permissible charging amount <small>(Note 6)</small> [× 10 ⁻⁴ kg•m ²]		3.45	4.26	8.92	
	Mass equivalent to permissible charging amount <small>(Note 7)</small> [kg]	LM-H3	3.8	4.7	9.8	
		LM-K2	8.5	10.5	22.0	
		LM-U2				
Tolerable regenerative power of the built-in regenerative resistor <small>(Note 2, 3)</small> [W]			20		100	
Dynamic brake			Built-in <small>(Note 4)</small>			
SSCNET III/H command communication cycle <small>(Note 13)</small>			0.222 ms, 0.444 ms, 0.888 ms			
Communication function			USB: Connect a personal computer (MR Configurator2 compatible)			
Encoder output pulse			Compatible (A/B-phase pulse)			
Analog monitor			None			
Fully closed loop control <small>(Note 11)</small>			Available <small>(Note 12)</small>			
Servo function			Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, tightening & press-fit control, machine diagnosis function, power monitoring function, scale measurement function <small>(Note 14)</small> , J3 compatibility mode			
Load-side encoder interface <small>(Note 9)</small>			Mitsubishi high-speed serial communication			
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, magnetic pole detection protection, linear servo control fault protection			

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LV5/Wires

Product List

Cautions

MR-J4W2-B (2-axis, SSCNET III/H Interface) Specifications

WB

Servo amplifier model MR-J4W2-		22B	44B	77B	1010B
Functional safety		STO (IEC/EN 61800-5-2) <small>(Note 10)</small>			
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2			
	Response performance	8 ms or less (STO input OFF → energy shut-off)			
	Test pulse input (STO) <small>(Note 8)</small>	Test pulse interval: 1 Hz to 25 Hz, test pulse off time: 1 ms maximum			
	Mean time to dangerous failure (MTTFd)	100 years or longer			
	Diagnostic coverage (DC)	Medium (90% to 99%)			
	Probability of dangerous Failure per Hour (PFH)	1.68 × 10 ⁻¹⁰ [1/h]			
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.			
Structure (IP rating)		Natural cooling, open (IP20)	Force cooling, open (IP20)		
Close mounting		Possible			
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)			
	Ambient humidity	Operation/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]		1.5	1.5	2.0	2.0

- Notes: 1. Rated output and speed of a rotary servo motor and a direct drive motor; and continuous thrust and maximum speed of a linear 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-J4W_-B Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio and the permissible load to mass ratio.
5. Reusable regenerative energy is equivalent to the energy generated under the following conditions.
For rotary servo motor: the energy that is generated when the machine, whose moment of inertia is equivalent to the permissible charging amount, decelerates from the rated speed to a stop.
For linear servo motor: the energy that is generated when the machine, whose mass is equivalent to the permissible charging amount, decelerates from the maximum speed to a stop.
For direct drive motor: the energy that is generated when the machine, whose moment of inertia is equivalent to the permissible charging amount, decelerates from the rated speed to a stop.
6. This value is the moment of inertia when the rotary servo motor decelerates from the rated speed to a stop. When two axes are simultaneously decelerated, the permissible charging amount is equivalent to the total moments of inertia of the two axes. Otherwise, the permissible charging amount is equivalent to the moment of inertia of each axis. The value also applies to the direct drive motor.
7. This value is the mass when the linear servo motor decelerates from maximum speed to a stop. Mass of primary side (coil) is included. When two axes are simultaneously decelerated, the permissible charging amount is equivalent to the total masses of the two axes. Otherwise, the permissible charging amount is equivalent to the mass of each axis.
8. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the servo amplifier instantaneously at regular intervals.
9. Not compatible with pulse train interface (A/B/Z-phase differential output type).
10. STO is common for all axes.
11. The load-side encoder and the servo motor encoder are compatible only with two-wire type communication method.
12. Fully closed loop control is compatible with the servo amplifiers with software version A3 or later.
13. The command communication cycle depends on the controller specifications and the number of axes connected.
14. This function is available with the servo amplifiers with software version A8 or later.
15. This value is applicable when a 3-phase power supply is used.



MR-J4W3-B (3-axis, SSCNET III/H Interface) Specifications

WB

Servo amplifier model MR-J4W3-		222B	444B
Output	Rated voltage	3-phase 170 V AC	
	Rated current (each axis) [A]	1.5	2.8
Main circuit power supply input	Voltage/frequency (Note 1)	3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz	
	Rated current (Note 12) [A]	4.3	7.8
	Permissible voltage fluctuation	3-phase or 1-phase 170 V AC to 264 V AC	
	Permissible frequency fluctuation	±5% maximum	
Control circuit power supply input	Voltage/frequency	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz	
	Rated current [A]	0.4	
	Permissible voltage fluctuation	1-phase 170 V AC to 264 V AC	
	Permissible frequency fluctuation	±5% maximum	
	Power consumption [W]	55	
Interface power supply		24 V DC ± 10% (required current capacity: 0.45 A (including CN8 connector signals))	
Control method		Sine-wave PWM control/current control method	
Capacitor regeneration	Reusable regenerative energy (Note 5) [J]	21	30
	Moment of inertia (J) equivalent to permissible charging amount (Note 6) [× 10 ⁻⁴ kg·m ²]	4.26	6.08
	Mass equivalent to permissible charging amount (Note 7) [kg]	4.7	6.7
	LM-H3 LM-K2 LM-U2	10.5	15.0
Tolerable regenerative power of the built-in regenerative resistor (Note 2, 3) [W]		30	
Dynamic brake		Built-in (Note 4)	
SSCNET III/H command communication cycle (Note 10)		0.222 ms (Note 11), 0.444 ms, 0.888 ms	
Communication function		USB: Connect a personal computer (MR Configurator2 compatible)	
Encoder output pulse		Not compatible	
Analog monitor		None	
Fully closed loop control		Not compatible	
Servo function		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, tightening & press-fit control, machine diagnosis function, power monitoring function, J3 compatibility mode	
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, magnetic pole detection protection, linear servo control fault protection	

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LVS/Wires

Product List

Cautions

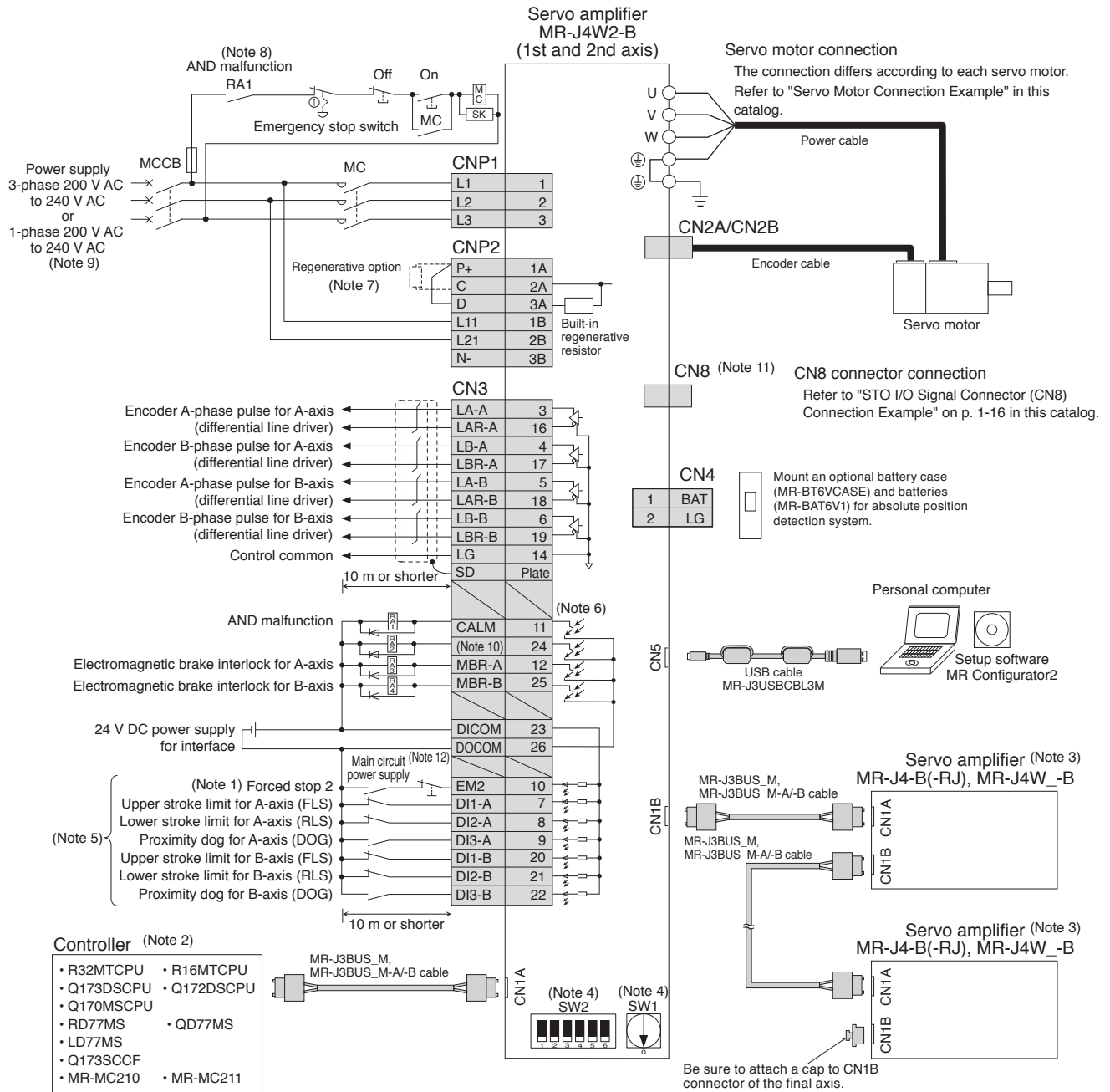
MR-J4W3-B (3-axis, SSCNET III/H Interface) Specifications

WB

Servo amplifier model MR-J4W3-		222B	444B
Functional safety		STO (IEC/EN 61800-5-2) ^(Note 9)	
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2	
	Response performance	8 ms or less (STO input OFF → energy shut-off)	
	Test pulse input (STO) ^(Note 8)	Test pulse interval: 1 Hz to 25 Hz Test pulse off time: 1 ms maximum	
	Mean time to dangerous failure (MTTFd)	100 years or longer	
	Diagnostic coverage (DC)	Medium (90% to 99%)	
	Probability of dangerous Failure per Hour (PFH)	1.68×10^{-10} [1/h]	
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.	
Structure (IP rating)		Force cooling, open (IP20)	
Close mounting		Possible	
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)	
	Ambient humidity	Operation/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]		1.9	1.9

- Notes: 1. Rated output and speed of a rotary servo motor and a direct drive motor; and continuous thrust and maximum speed of a linear 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-J4W_-B Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio and the permissible load to mass ratio.
5. Reusable regenerative energy is equivalent to the energy generated under the following conditions.
For rotary servo motor: the energy that is generated when the machine, whose moment of inertia is equivalent to the permissible charging amount, decelerates from the rated speed to a stop.
For linear servo motor: the energy that is generated when the machine, whose mass is equivalent to the permissible charging amount, decelerates from the maximum speed to a stop.
For direct drive motor: the energy that is generated when the machine, whose moment of inertia is equivalent to the permissible charging amount, decelerates from the rated speed to a stop.
6. This value is the moment of inertia when the rotary servo motor decelerates from the rated speed to a stop. When three axes are simultaneously decelerated, the permissible charging amount is equivalent to the total moments of inertia of the three axes. Otherwise, the permissible charging amount is equivalent to the moment of inertia of each axis. The value also applies to the direct drive motor.
7. This value is the mass when the linear servo motor decelerates from maximum speed to a stop. Mass of primary side (coil) is included. When three axes are simultaneously decelerated, the permissible charging amount is equivalent to the total masses of the three axes. Otherwise, the permissible charging amount is equivalent to the mass of each axis.
8. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the servo amplifier instantaneously at regular intervals.
9. STO is common for all axes.
10. The command communication cycle depends on the controller specifications and the number of axes connected.
11. Servo amplifier with software version A3 or later is compatible with the command communication cycle of 0.222 ms. However, note that the following functions are not available when 0.222 ms is used: auto tuning (real time, one-touch, and vibration suppression control), adaptive filter II, vibration tough drive, and power monitoring.
12. This value is applicable when a 3-phase power supply is used.

MR-J4W2-B Standard Wiring Diagram Example (Note 13)



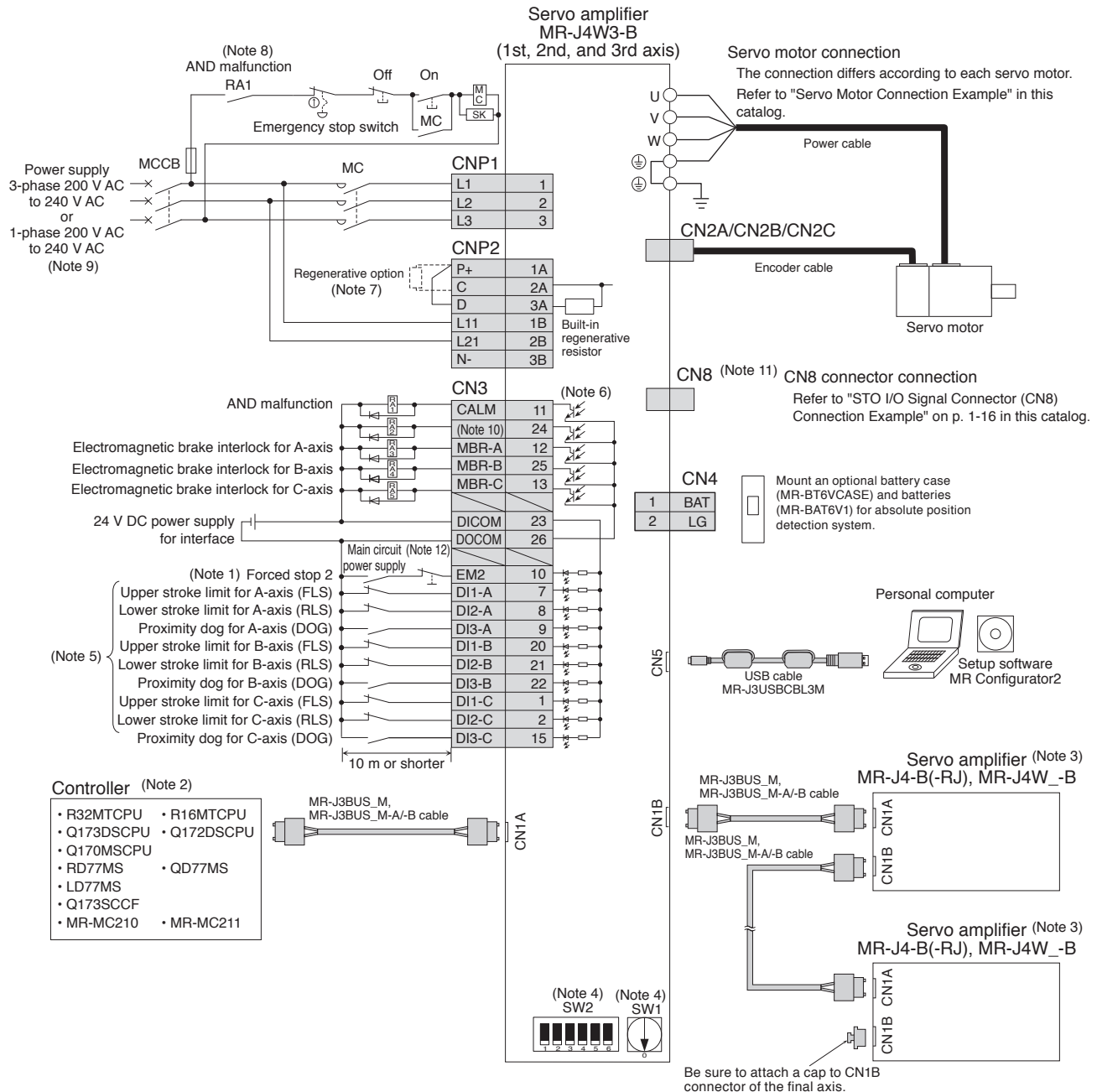
- Notes: 1. The forced stop signal is issued for two axes of the servo amplifier. For overall system, apply the emergency stop on the controller side.
2. For details such as setting the controllers, refer to programming manual or user's manual for the controllers.
3. Connections for the third and following axes are omitted.
4. Up to 64 axes can be set by using a combination of an axis selection rotary switch (SW1) and auxiliary axis number setting switches (SW2-5 and SW2-6). Note that the number of the connectable axes depends on the controller specifications.
5. Devices can be assigned for DI1-A/B, DI2-A/B and DI3-A/B with controller setting. Refer to the controller instruction manuals for details on setting.
6. This is for sink wiring. Source wiring is also possible.
7. When not using a regenerative option, connect a short-circuit bar between P+ and D to use the built-in regenerative resistor. When using a regenerative option, disconnect the short-circuit bar between P+ and D, and then connect the regenerative option to P+ and C.
8. Select either of the following functions for CALM (AND malfunction) with the controller.
1) The contact opens when an alarm occurs on one of the axes.
2) The contact opens when an alarm occurs on all axes.
9. 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-J3W-B series servo amplifiers. Be careful not to make a connection error when replacing MR-J3W-B with MR-J4W2-B. Refer to "MR-J4W2-B (2-axis, SSCNET III/H Interface) Specifications" in this catalog for power supply specifications.
10. CINP (AND in-position) is assigned to this pin as default. Device for this pin can be changed by [Pr. PD08].
11. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
12. Create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
13. To control main circuit power supply on/off by DC power supply, refer to relevant Servo Amplifier Instruction Manual for details.



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-J4W3-B Standard Wiring Diagram Example (Note 13)

WB



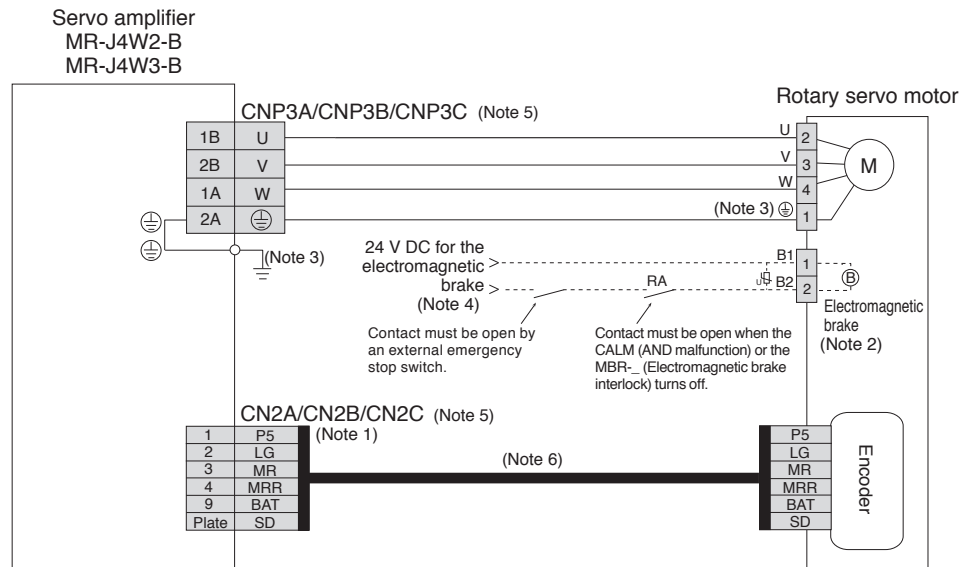
- Notes:
- The forced stop signal is issued for three axes of the servo amplifier. For overall system, apply the emergency stop on the controller side.
 - For details such as setting the controllers, refer to programming manual or user's manual for the controllers.
 - Connections for the fourth and following axes are omitted.
 - Up to 64 axes can be set by using a combination of an axis selection rotary switch (SW1) and auxiliary axis number setting switches (SW2-5 and SW2-6). Note that the number of the connectable axes depends on the controller specifications.
 - Devices can be assigned for DI1-A/B/C, DI2-A/B/C and DI3-A/B/C with controller setting. Refer to the controller instruction manuals for details on setting.
 - This is for sink wiring. Source wiring is also possible.
 - When not using a regenerative option, connect a short-circuit bar between P+ and D to use the built-in regenerative resistor. When using a regenerative option, disconnect the short-circuit bar between P+ and D, and then connect the regenerative option to P+ and C.
 - Select either of the following functions for CALM (AND malfunction) with the controller.
 - The contact opens when an alarm occurs on one of the axes.
 - The contact opens when an alarm occurs on all axes.
 - 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. Refer to "MR-J4W3-B (3-axis, SSCNET III/H Interface) Specifications" in this catalog for power supply specifications.
 - CINP (AND in-position) is assigned to this pin as default. Device for this pin can be changed by [Pr. PD08].
 - Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
 - Create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
 - To control main circuit power supply on/off by DC power supply, refer to relevant Servo Amplifier Instruction Manual for details.



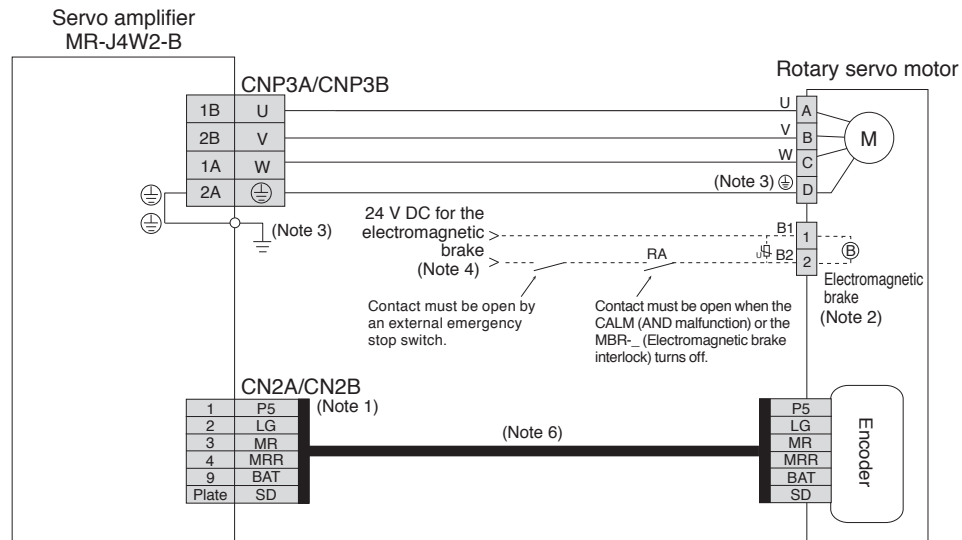
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor, Semi-Closed Loop Control System)

● For HG-KR/HG-MR series



● For HG-SR 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. Connect the grounding terminal of the servo motor to (PE) of CNP3A, CNP3B, and CNP3C. Connect the protective earth (PE) terminal (PE) located on the lower front of the servo amplifier to the cabinet protective earth (PE).
 4. Do not use the 24 V DC interface power supply for the electromagnetic brake. Provide a dedicated power supply to the electromagnetic brake.
 5. CNP3C and CN2C connectors are available for MR-J4W3-B servo amplifier.
 6. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.

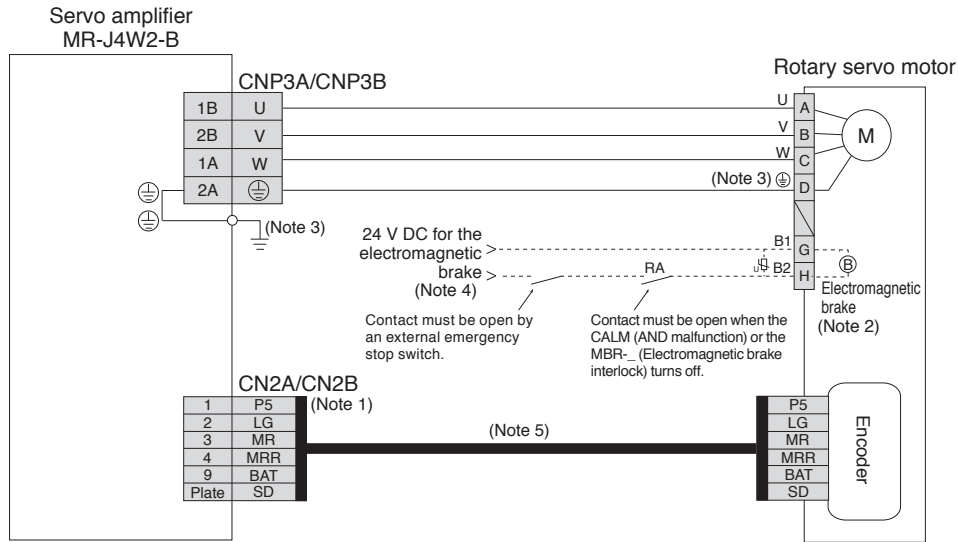


Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor, Semi-Closed Loop Control System)

WB

● For HG-UR 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. Connect the grounding terminal of the servo motor to ⊕ of CNP3A and CNP3B. Connect the protective earth (PE) terminal (⊕) located on the lower front of the servo amplifier to the cabinet protective earth (PE).
 4. Do not use the 24 V DC interface power supply for the electromagnetic brake. Provide a dedicated power supply to the electromagnetic brake.
 5. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.

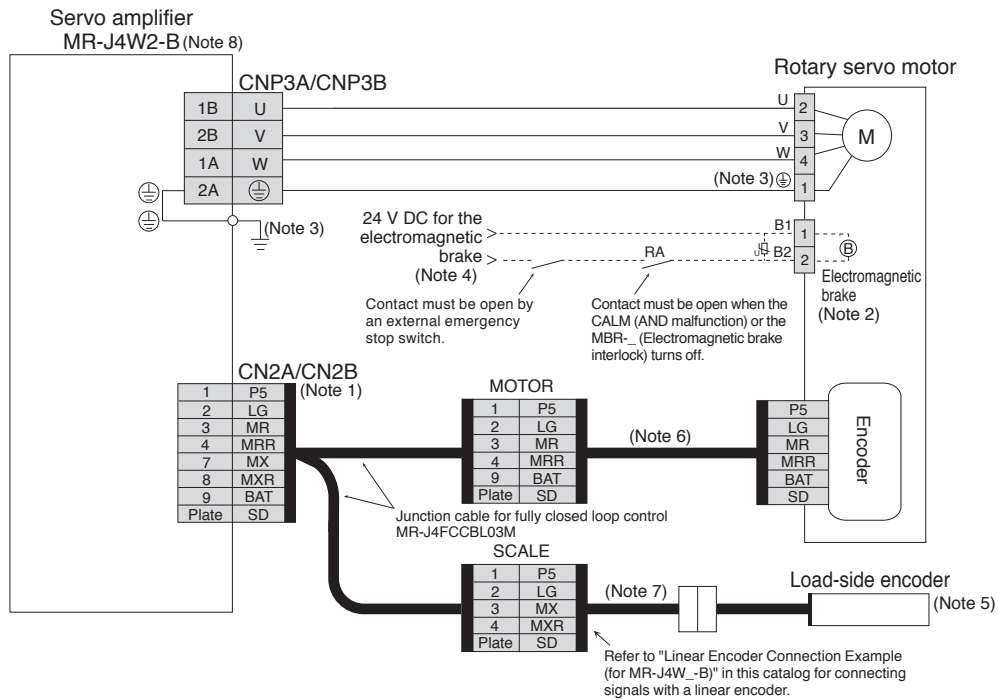


Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

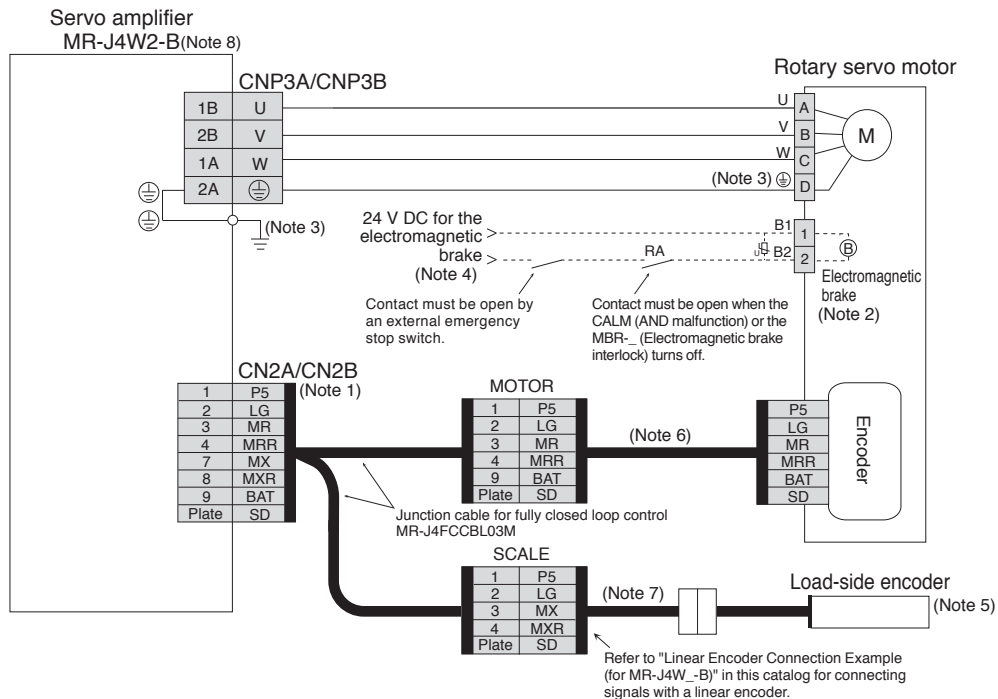
Servo Motor Connection Example (Rotary Servo Motor, Fully Closed Loop Control System)

WB

●For HG-KR/HG-MR series



●For HG-SR/HG-JR series



- Notes: 1. For fully closed loop control, the load-side encoder and the servo motor encoder are compatible only with two-wire type communication method. Four-wire type cannot be used.
2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Connect the grounding terminal of the servo motor to ⊕ of CNP3A, CNP3B, and CNP3C. Connect the protective earth (PE) terminal (⊕) located on the lower front of the servo amplifier to the cabinet protective earth (PE).
4. Do not use the 24 V DC interface power supply for the electromagnetic brake. Provide a dedicated power supply to the electromagnetic brake.
5. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog. Refer to "MR-J4W_-B Servo Amplifier Instruction Manual" for the fully closed loop control with rotary encoder.
6. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.
7. Necessary encoder cables vary depending on the load-side encoder. Refer to relevant Instruction Manual.
8. MR-J4W3-B is not compatible with fully closed loop control.

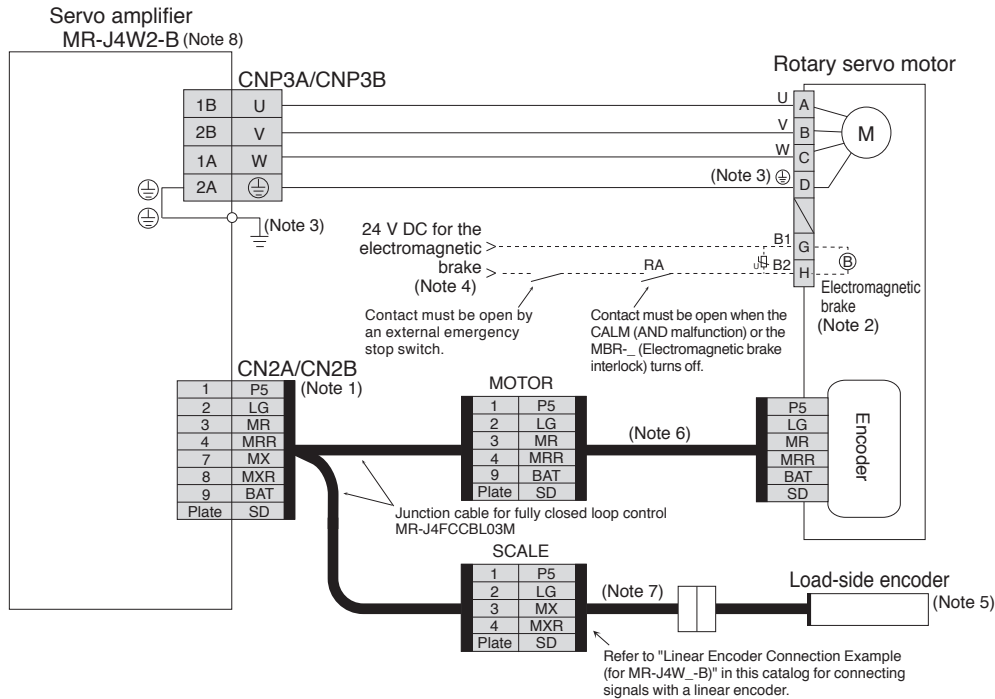


Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor, Fully Closed Loop Control System)

WB

● For HG-UR series



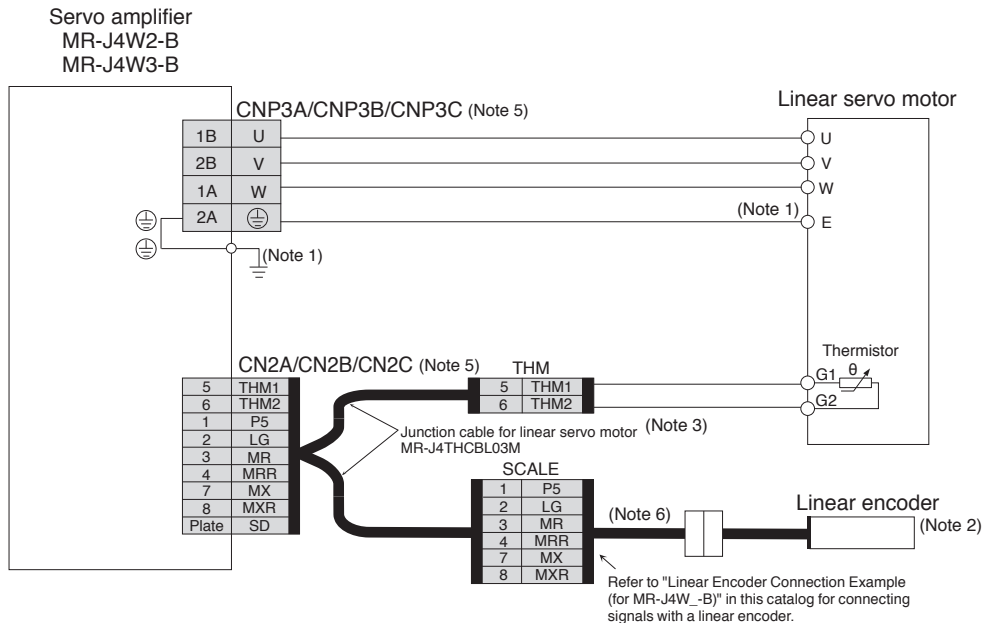
- Notes: 1. For fully closed loop control, the load-side encoder and the servo motor encoder are compatible only with two-wire type communication method. Four-wire type cannot be used.
2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Connect the grounding terminal of the servo motor to PE of CNP3A and CNP3B. Connect the protective earth (PE) terminal (PE) located on the lower front of the servo amplifier to the cabinet protective earth (PE).
4. Do not use the 24 V DC interface power supply for the electromagnetic brake. Provide a dedicated power supply to the electromagnetic brake.
5. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog. Refer to "MR-J4W_-B Servo Amplifier Instruction Manual" for the fully closed loop control with rotary encoder.
6. Encoder cable is available as an option. Refer to "Servo Motor Instruction Manual (Vol. 3)" when fabricating the cables.
7. Necessary encoder cables vary depending on the load-side encoder. Refer to relevant Instruction Manual.
8. MR-J4W3-B is not compatible with fully closed loop control.



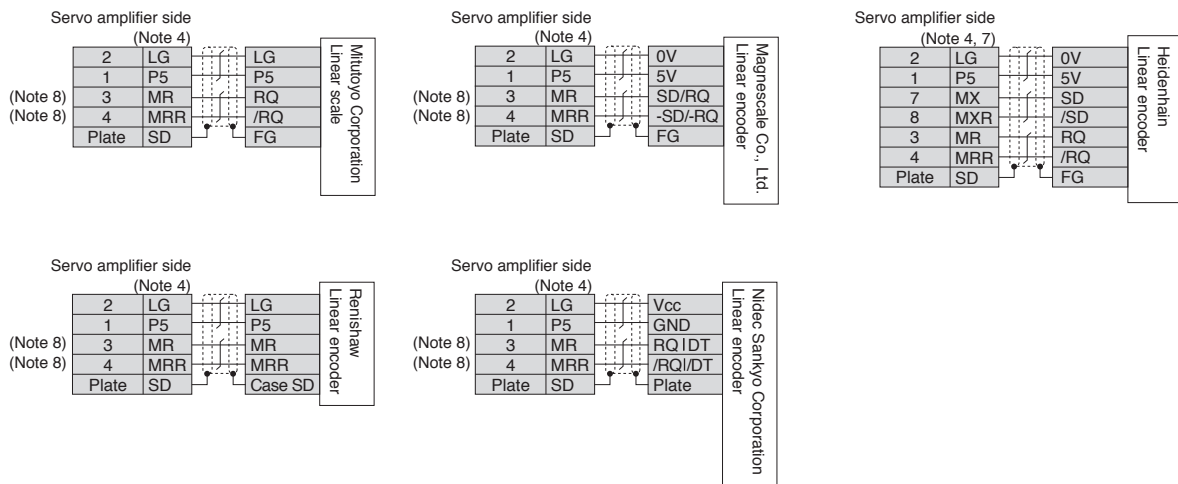
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Linear Servo Motor)

● For LM-H3/LM-K2/LM-U2 series



Linear Encoder Connection Example (for MR-J4W_-B)



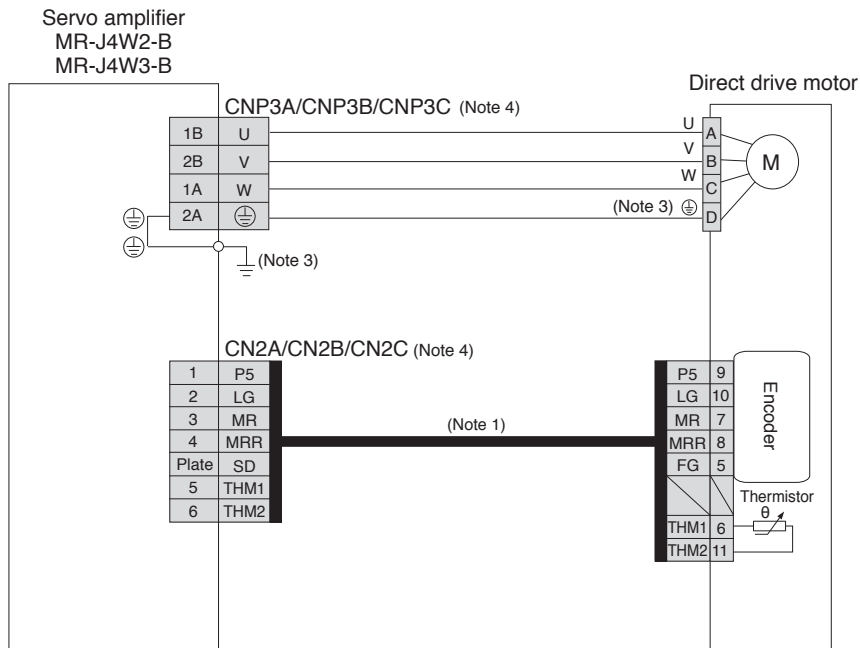
- Notes: 1. Connect the grounding terminal of the servo motor to (Note 1) of CNP3A, CNP3B, and CNP3C. Connect the protective earth (PE) terminal (Note 1) located on the lower front of the servo amplifier to the cabinet protective earth (PE).
2. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog.
3. MR-J4THCBL03M junction cable for linear servo motor is compatible with both two-wire and four-wire type linear encoders.
4. For the number of the wire pairs for LG and P5, refer to "Linear Encoder Instruction Manual."
5. CNP3C and CN2C connectors are available for MR-J4W3-B servo amplifier.
6. Necessary encoder cables vary depending on the linear encoder. Refer to relevant Instruction Manual.
7. For fully closed loop control, the load-side encoder and the servo motor encoder are compatible only with two-wire type communication method. Four-wire type cannot be used.
8. For the fully closed loop control, the signals of 3-pin and 4-pin are as follows:
3-pin: MX
4-pin: MXR



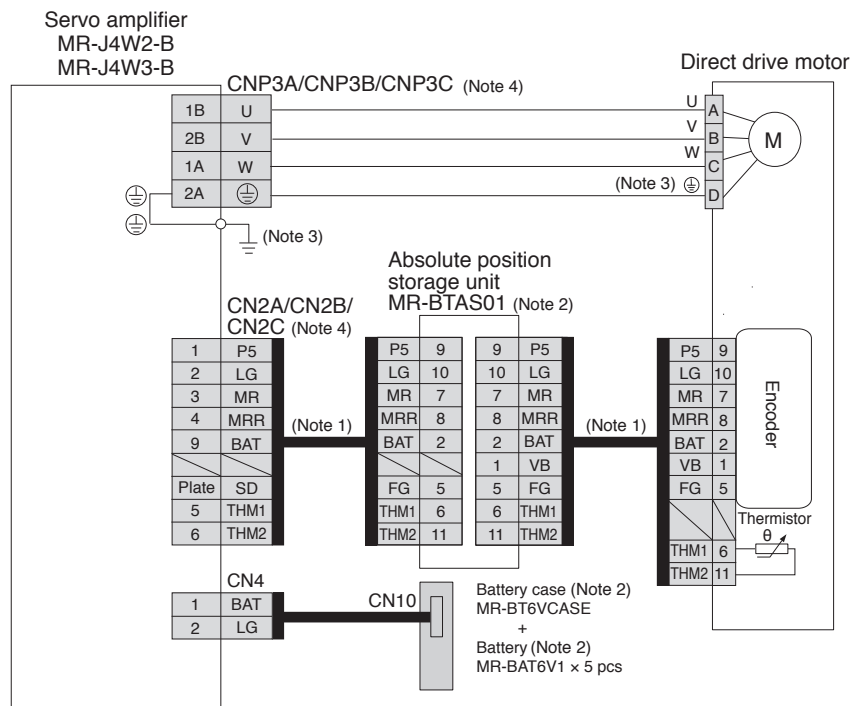
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Direct Drive Motor)

●For TM-RFM series (incremental system)



●For TM-RFM series (absolute position detection system)



- Notes: 1. Fabricate this encoder cable. Refer to "Direct Drive Motor Instruction Manual" for fabricating the encoder cable.
2. Optional MR-BTAS01 absolute position storage unit, MR-BT6VCASE battery case, and MR-BAT6V1 batteries are required for absolute position detection system. Refer to relevant Servo Amplifier Instruction Manual and "Direct Drive Motor Instruction Manual" for details.
3. Connect the grounding terminal of the servo motor to (PE) of CNP3A, CNP3B, and CNP3C. Connect the protective earth (PE) terminal (PE) located on the lower front of the servo amplifier to the cabinet protective earth (PE).
4. CNP3C and CN2C connectors are available for MR-J4W3-B servo amplifier.

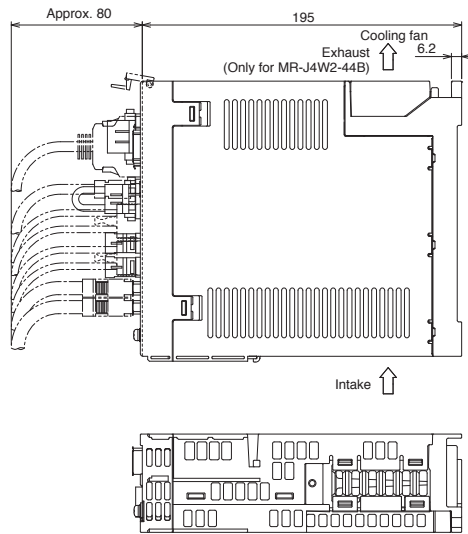
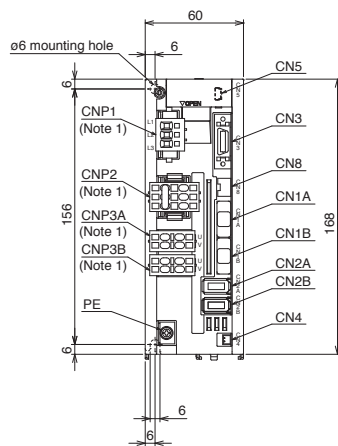


Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

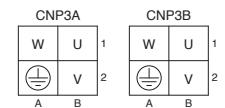
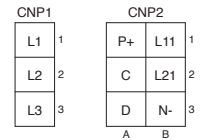
MR-J4W2-B Dimensions

●MR-J4W2-22B

●MR-J4W2-44B



Terminal arrangement



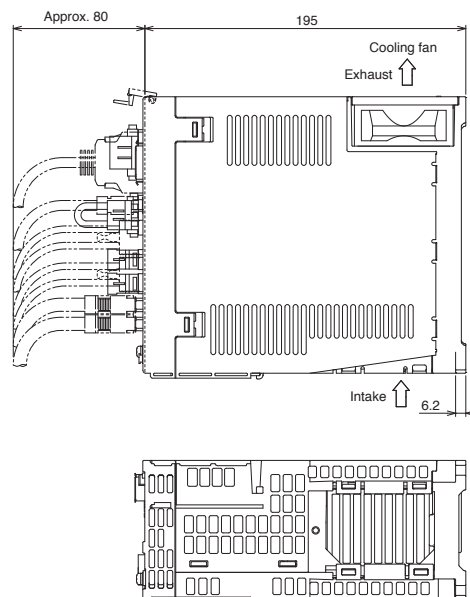
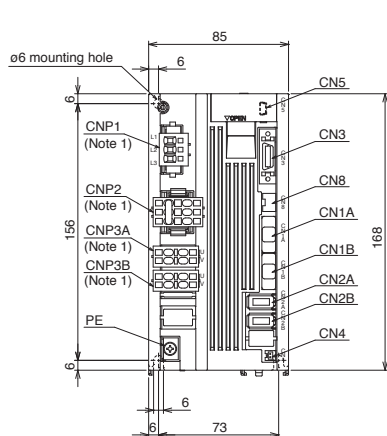
Screw size: M4

Mounting screw size: M5

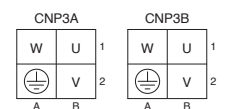
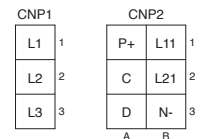
[Unit: mm]

●MR-J4W2-77B

●MR-J4W2-1010B



Terminal arrangement



Screw size: M4

Mounting screw size: M5

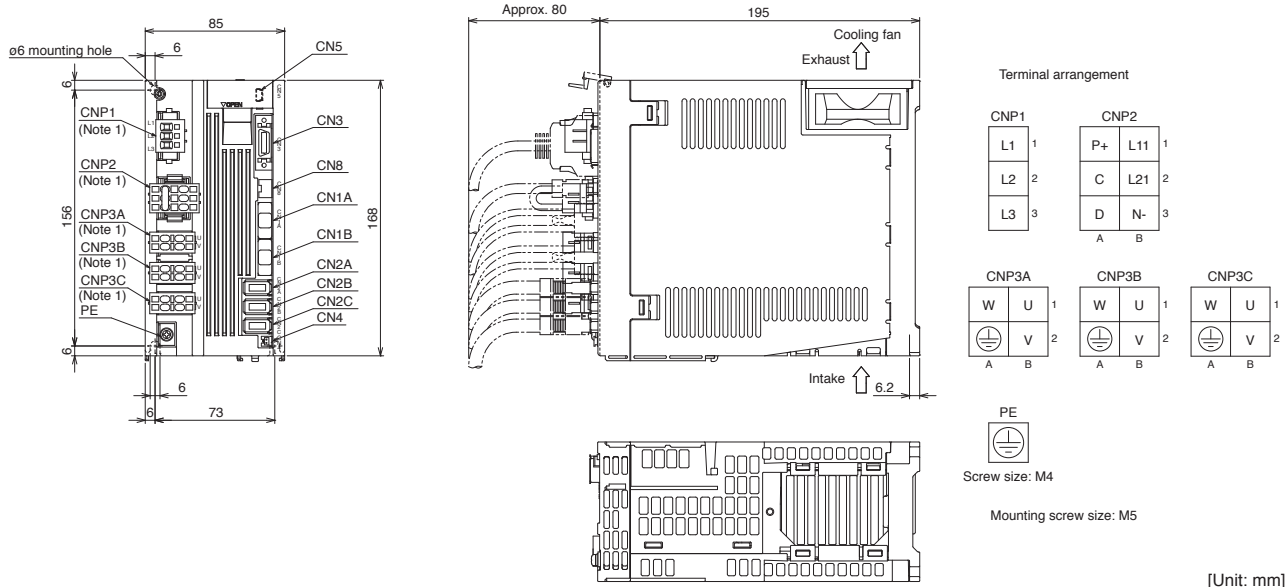
[Unit: mm]

Notes: 1. CNP1, CNP2, CNP3A and CNP3B connectors (insertion type) are supplied with the servo amplifier.

MR-J4W3-B Dimensions

●MR-J4W3-222B

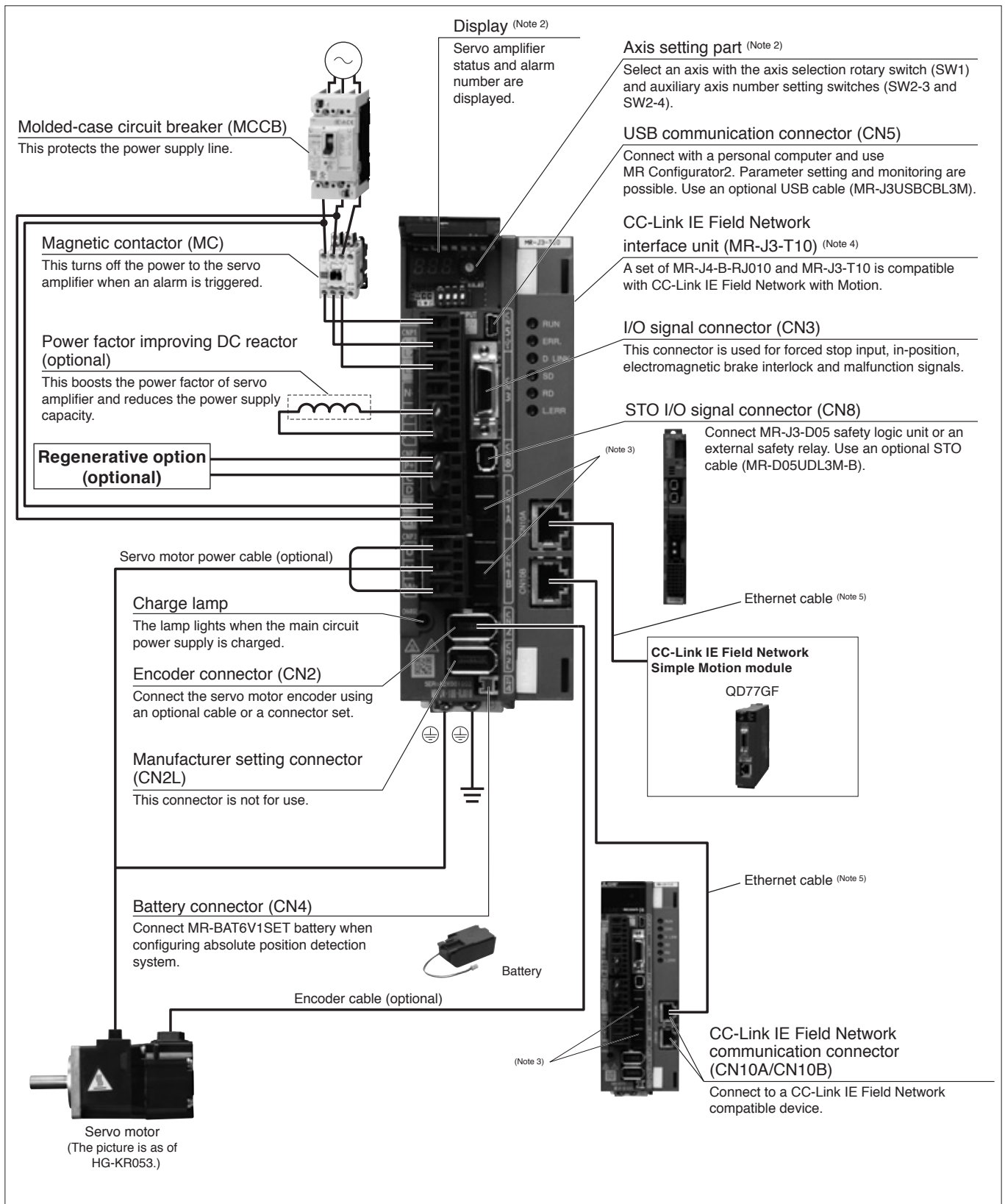
●MR-J4W3-444B



Notes: 1. CNP1, CNP2, CNP3A, CNP3B and CNP3C connectors (insertion type) are supplied with the servo amplifier.

MR-J4-B-RJ010 Connections with Peripheral Equipment (Note 1)

Peripheral equipment is connected to MR-J4-B-RJ010 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-J4-350B-RJ010 or smaller servo amplifiers. Refer to "MR-J4-_B_-RJ010 MR-J3-T10 Servo Amplifier Instruction Manual" for the actual connections.

2. This picture shows when the display cover is open.

3. This connector is not for use. Be sure to attach a cap supplied with the servo amplifier.

4. Refer to "CC-Link IE Field Network Interface Unit" in this catalog for details on CC-Link IE Field Network Interface Unit (MR-J3-T10).

5. For specifications of the Ethernet cable, refer to "Ethernet cable specifications" on p. 5-31 in this catalog.

MR-J4-B-RJ010

B-RJ010

(CC-Link IE Field Network interface with Motion) Specifications (200 V AC)

Servo amplifier model MR-J4-_-RJ010		10B	20B	40B	60B	70B	100B	200B	350B	500B	700B	11KB	15KB	22KB
Output	Rated voltage	3-phase 170 V AC												
	Rated current [A]	1.1	1.5	2.8	3.2	5.8	6.0	11.0	17.0	28.0	37.0	68.0	87.0	126.0
Main circuit power supply input	Voltage/frequency <small>(Note 1)</small>	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 <small>(Note 13)</small> [A]	0.9	1.5	2.6	3.2 <small>(Note 8)</small>	3.8	5.0	10.5	16.0	21.7	28.9	46.0	64.0	95.0
	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												
	Voltage/frequency	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz												
Control circuit power supply input	Rated current [A]	0.2								0.3				
	Permissible voltage fluctuation	1-phase 170 V AC to 264 V AC												
	Permissible frequency fluctuation	±5% maximum												
	Power consumption [W]	30								45				
	Interface power supply	24 V DC ± 10% (required current capacity: 0.3 A (including CN8 connector signals))												
Control method		Sine-wave PWM control/current control method												
Tolerable regenerative power	Built-in regenerative resistor <small>(Note 2, 3)</small> [W]	-	10	10	10	20	20	100	100	130	170	-	-	-
	External regenerative resistor (standard accessory) <small>(Note 2, 3, 9, 10)</small> [W]	-	-	-	-	-	-	-	-	-	-	500 (800)	850 (1300)	850 (1300)
Dynamic brake		Built-in <small>(Note 4)</small>										External option <small>(Note 11)</small>		
Communication function		USB: Connect a personal computer (MR Configurator2 compatible)												
Encoder output pulse		Compatible (A/B/Z-phase pulse)												
Analog monitor		2 channels												
Fully closed loop control		Not compatible												
Servo function		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, machine diagnosis function, power monitoring function												
Load-side encoder interface		Not compatible												
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												
Functional safety		STO (IEC/EN 61800-5-2)												
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2												
	Response performance	8 ms or less (STO input OFF → energy shut-off)												
	Test pulse input (STO) <small>(Note 7)</small>	Test pulse interval: 1 Hz to 25 Hz, test pulse off time: 1 ms maximum												
	Mean time to dangerous failure (MTTFd)	100 years or longer												
	Diagnostic coverage (DC)	Medium (90% to 99%)												
	Probability of dangerous Failure per Hour (PFH)	1.68 × 10 ⁻¹⁰ [1/h]												
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.												
Structure (IP rating)		Natural cooling, open (IP20)				Force cooling, open (IP20)				Force cooling, open (IP20) <small>(Note 5)</small>				
Close mounting		Possible <small>(Note 6)</small>								Not possible				
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)												
	Ambient humidity	Operation/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 <small>(Note 12)</small> [kg]		0.8	0.8	1.0	1.0	1.4	1.4	2.1	2.3	4.0	6.2	13.4	13.4	18.2



MR-J4-B-RJ010

B-RJ010

(CC-Link IE Field Network interface with Motion) Specifications (200 V AC)

- Notes: 1. Rated output and speed of a rotary servo motor are applicable when the servo amplifier, combined with the rotary 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-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio.
5. Terminal blocks are excluded.
6. 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.
7. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the servo amplifier instantaneously at regular intervals.
8. The rated current is 2.9 A when the servo amplifier is used with UL or CSA compliant servo motor.
9. The value in brackets is applicable when cooling fans (2 units of 92 mm × 92 mm, minimum air flow: 1.0 m³/min) are installed, and then [Pr. PA02] is changed.
10. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "1-Axis Servo Amplifier Model Designation" in this catalog for details.
11. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system when not using the dynamic brake.
12. The value is applicable for the MR-J4-_B_-RJ010 servo amplifier only.
13. This value is applicable for 750 W or smaller servo amplifiers in 200 V class when a 3-phase power supply is used.

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral
Equipment

LVSWires

Product List

Cautions

MR-J4-B4-RJ010

B-RJ010

(CC-Link IE Field Network interface with Motion) Specifications (400 V AC)

Servo amplifier model MR-J4-_-RJ010		60B4	100B4	200B4	350B4	500B4	700B4	11KB4	15KB4	22KB4
Output	Rated voltage	3-phase 323 V AC								
	Rated current [A]	1.5	2.8	5.4	8.6	14.0	17.0	32.0	41.0	63.0
Main circuit power supply input	Voltage/frequency ^(Note 1)	3-phase 380 V AC to 480 V AC, 50 Hz/60 Hz								
	Rated current [A]	1.4	2.5	5.1	7.9	10.8	14.4	23.1	31.8	47.6
	Permissible voltage fluctuation	3-phase 323 V AC to 528 V AC								
	Permissible frequency fluctuation	±5% maximum								
Control circuit power supply input	Voltage/frequency	1-phase 380 V AC to 480 V AC, 50 Hz/60 Hz								
	Rated current [A]	0.1			0.2					
	Permissible voltage fluctuation	1-phase 323 V AC to 528 V AC								
	Permissible frequency fluctuation	±5% maximum								
	Power consumption [W]	30			45					
Interface power supply		24 V DC ± 10% (required current capacity: 0.3 A (including CN8 connector signals))								
Control method		Sine-wave PWM control/current control method								
Tolerable regenerative power	Built-in regenerative resistor ^(Note 2, 3) [W]	15	15	100	100	130 ^(Note 10)	170 ^(Note 10)	-	-	-
	External regenerative resistor (standard accessory) ^(Note 2, 3, 7, 8) [W]	-	-	-	-	-	-	500 (800)	850 (1300)	850 (1300)
Dynamic brake		Built-in ^(Note 4)						External option ^(Note 9)		
Communication function		USB: Connect a personal computer (MR Configurator2 compatible)								
Encoder output pulse		Compatible (A/B/Z-phase pulse)								
Analog monitor		2 channels								
Fully closed loop control		Not compatible								
Servo function		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, machine diagnosis function, power monitoring function								
Load-side encoder interface		Not compatible								
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								
Functional safety		STO (IEC/EN 61800-5-2)								
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2								
	Response performance	8 ms or less (STO input OFF → energy shut-off)								
	Test pulse input (STO) ^(Note 6)	Test pulse interval: 1 Hz to 25 Hz, test pulse off time: 1 ms maximum								
	Mean time to dangerous failure (MTTFd)	100 years or longer								
	Diagnostic coverage (DC)	Medium (90% to 99%)								
	Probability of dangerous Failure per Hour (PFH)	1.68 × 10 ⁻¹⁰ [1/h]								
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.								
Structure (IP rating)		Natural cooling, open (IP20)		Force cooling, open (IP20)		Force cooling, open (IP20) ^(Note 5)				
Close mounting		Not possible								
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)								
	Ambient humidity	Operation/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/s² at 10 Hz to 55 Hz (directions of X, Y and Z axes)								
Mass ^(Note 11) [kg]		1.7	1.7	2.1	3.6	4.3	6.5	13.4	13.4	18.2

MR-J4-B4-RJ010

B-RJ010

(CC-Link IE Field Network interface with Motion) Specifications (400 V AC)

- Notes: 1. Rated output and speed of a rotary servo motor are applicable when the servo amplifier, combined with the rotary 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-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio and the permissible load to mass ratio.
5. Terminal blocks are excluded.
6. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the servo amplifier instantaneously at regular intervals.
7. The value in brackets is applicable when cooling fans (2 units of 92 mm × 92 mm, minimum air flow: 1.0 m³/min) are installed, and then [Pr. PA02] is changed.
8. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "1-Axis Servo Amplifier Model Designation" in this catalog for details.
9. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system when not using the dynamic brake.
10. The servo amplifier built-in regenerative resistor is compatible with the maximum torque deceleration when the servo motor is used within the rated speed and the recommended load to motor inertia ratio. Contact your local sales office if the operating motor speed or the load to motor inertia ratio exceeds the rated speed or the recommended ratio.
11. The value is applicable for the MR-J4-_B4-RJ010 servo amplifier only.

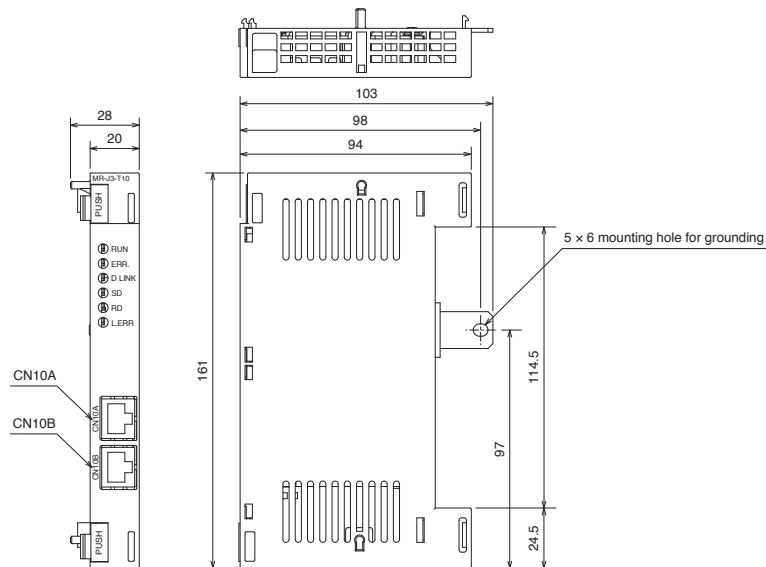
CC-Link IE Field Network Interface Unit (MR-J3-T10)

B-RJ010

Specifications

Item		Description
Model		MR-J3-T10
Control circuit power supply	Voltage	5 V DC (Control circuit power for the CC-Link IE Field Network interface unit is supplied from the servo amplifier.)
	Rated current [A]	0.8
Input/output interface		CC-Link IE Field Network
Number of communication ports		2 ports (CN10A and CN10B connectors)
Structure (IP rating)		Natural cooling, open (IP00)
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)
	Ambient humidity	Operation/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 [g]		150

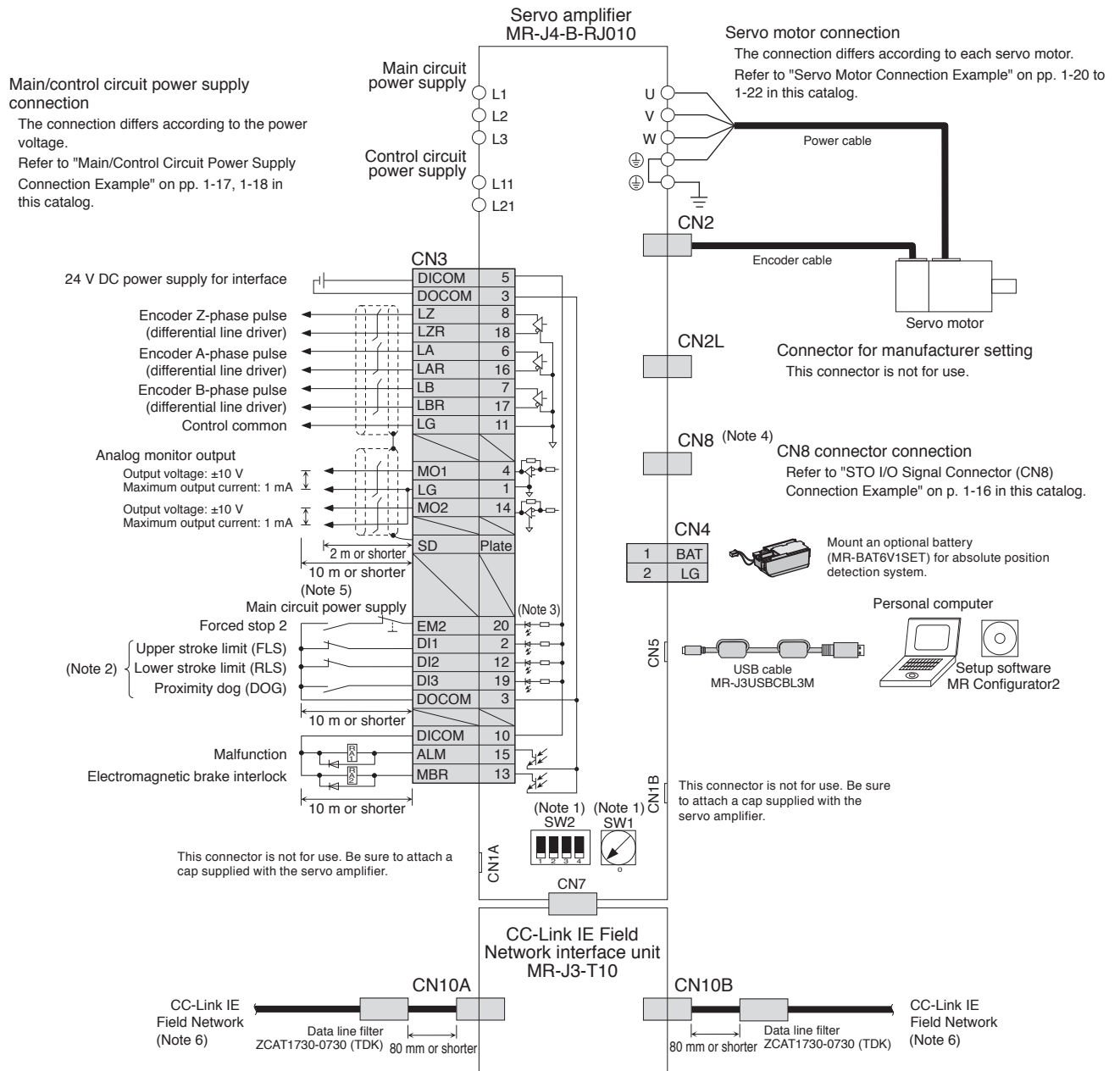
Dimensions



[Unit: mm]

MR-J4-B-RJ010 Standard Wiring Diagram Example (Note 7)

B-RJ010



- Notes: 1. Up to 63 stations are set by using a combination of a station selection rotary switch (SW1) and auxiliary station number setting switches (SW2-3 and SW2-4). Note that the number of the connectable stations depends on the controller specifications.
2. Devices can be assigned for DI1, DI2 and DI3 with controller setting. Refer to the controller instruction manuals for details on setting.
3. This is for sink wiring. Source wiring is also possible.
4. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
5. Create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
6. When branching off CC-Link IE Field Network with a switching HUB, use DT135TX (Mitsubishi Electric System & Service Co., Ltd.).
7. This standard wiring diagram is common for 200 V AC, 100 V AC and 400 V AC type servo amplifiers.

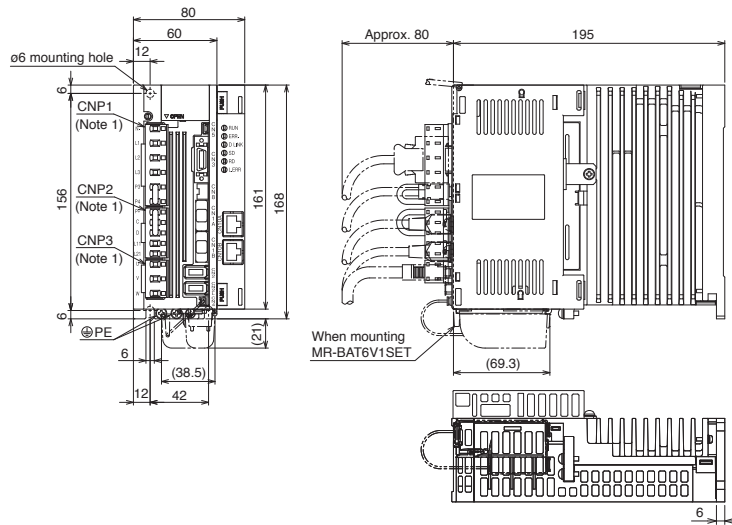


Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.


MR-J4-B-RJ010 Dimensions (Note 2)

B-RJ010

- MR-J4-60B4-RJ010
- MR-J4-100B4-RJ010

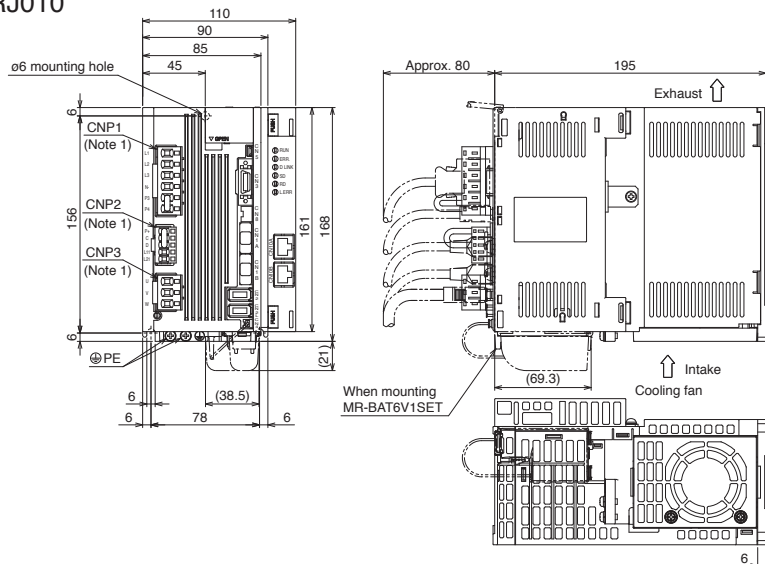


Terminal arrangement

CNP1	{	N-	<p>PE</p>  <p>Screw size: M4</p> <p>Mounting screw size: M5</p>
		L1	
		L2	
		L3	
		P3	
		P4	
CNP2	{	P+	
		C	
		D	
		L11	
		L21	
CNP3	{	U	
		V	
		W	

[Unit: mm]


●MR-J4-200B-RJ010



Terminal arrangement

CNP1 { L1
L2
L3
N-
P3
P4

PE



Screw size: M4

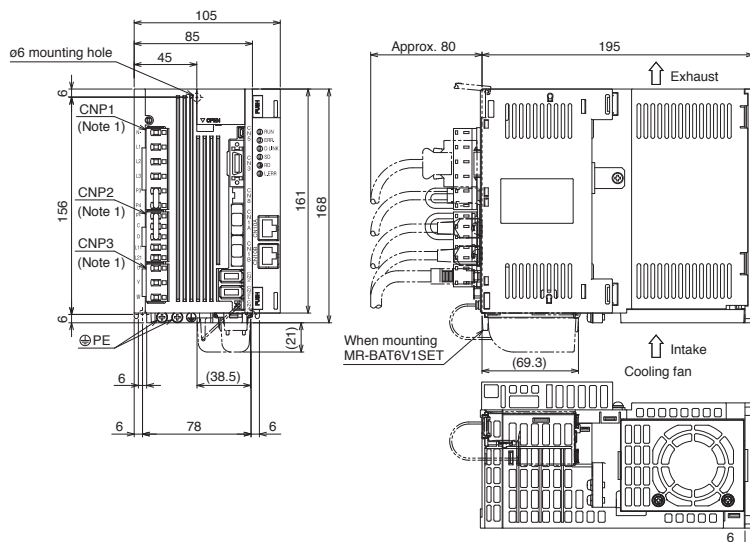
Mounting screw size: M5

CNP2 { P+
C
D
L11
L21


CNP3 { U
V
W

[Unit: mm]

●MR-J4-200B4-RJ010



Terminal arrangement

CNP1	N-	PE	
	L1		
	L2	Screw size: M4	
	L3		
	P3		
	P4		
CNP2	P+	Mounting screw size: M5	
	C		
	D		
	L11		
	L21		
CNP3	U		
	V		
	W		

[Unit: mm]

Notes: 1. CNP1, CNP2 and CNP3 connectors (insertion type) are supplied with the servo amplifier.

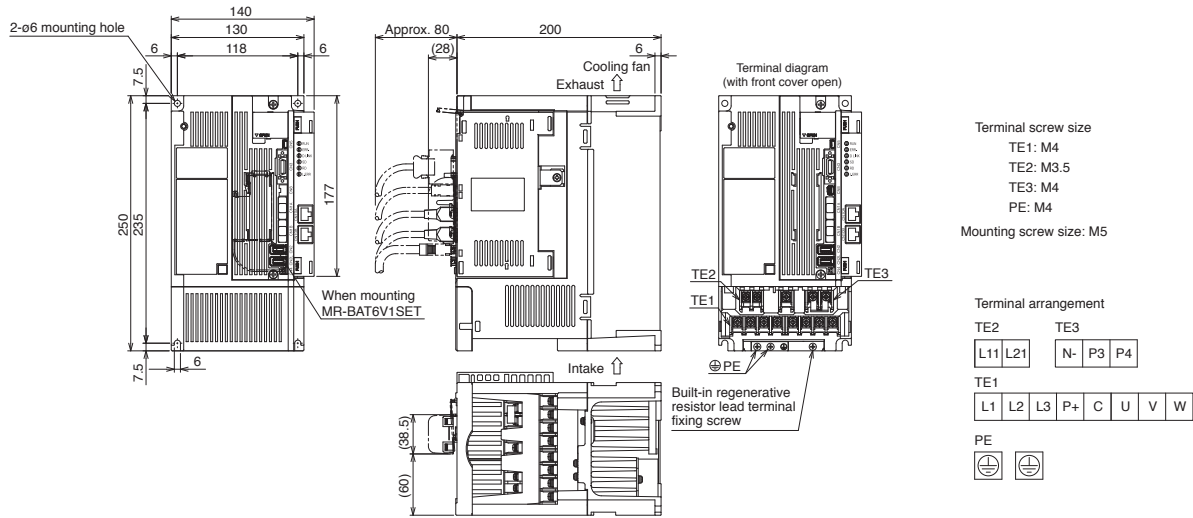
2. The dimensions are applicable when MR-J4-B-RJ010 and MR-J3-T10 are combined. Refer to "MR-J4-B/MR-J4-B-RJ Dimensions" in this catalog for the dimensions of MR-J4-B-RJ010 servo amplifiers alone.



MR-J4-B-RJ010 Dimensions (Note 1)

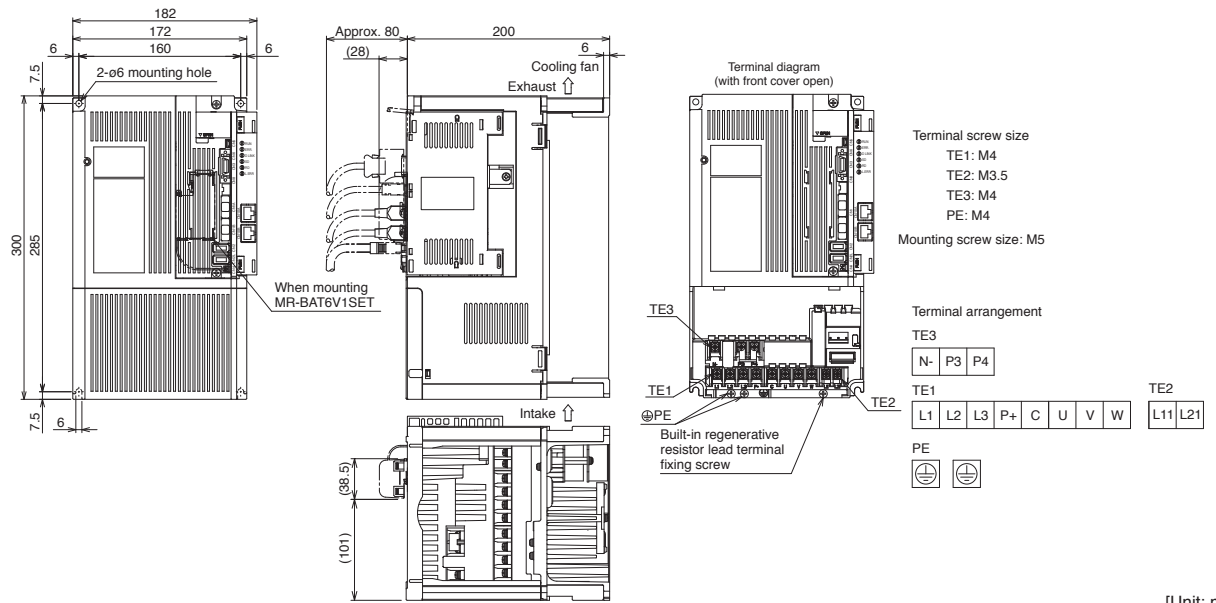
B-RJ010

●MR-J4-500B4-RJ010



[Unit: mm]

●MR-J4-700B-RJ010, MR-J4-700B4-RJ010



[Unit: mm]

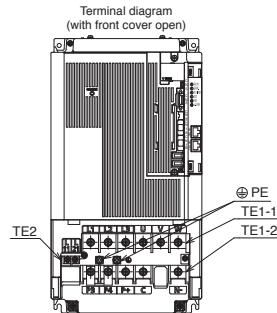
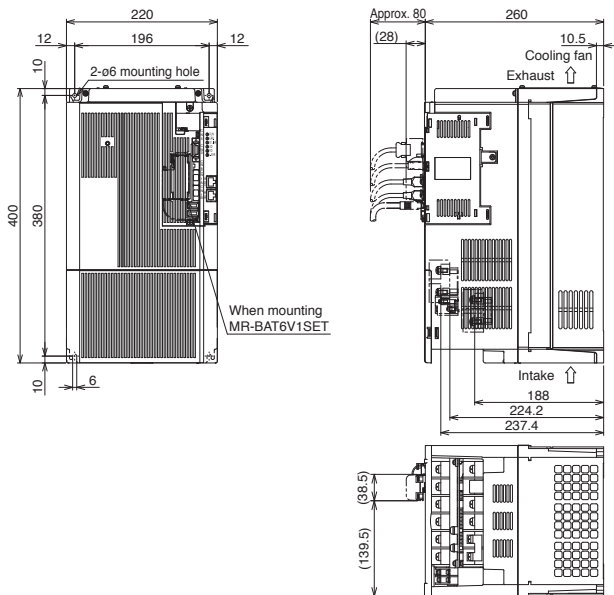
Notes: 1. The dimensions are applicable when MR-J4-B-RJ010 and MR-J3-T10 are combined. Refer to "MR-J4-B/MR-J4-B-RJ Dimensions" in this catalog for the dimensions of MR-J4-B-RJ010 servo amplifiers alone.

MR-J4-B-RJ010 Dimensions (Note 1)

B-RJ010

●MR-J4-11KB-RJ010, MR-J4-11KB4-RJ010

●MR-J4-15KB-RJ010, MR-J4-15KB4-RJ010



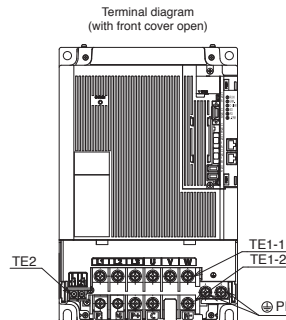
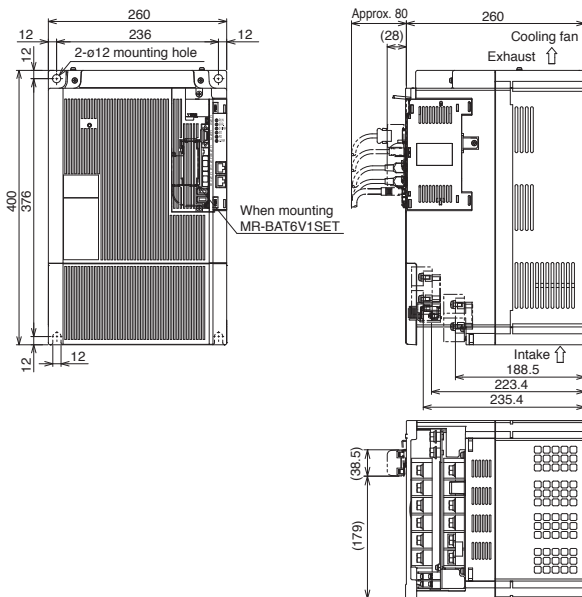
Terminal screw size
TE1-1: M6
TE1-2: M6
TE2: M4
PE: M6
Mounting screw size: M5

Terminal arrangement

TE1-1	L1	L2	L3	U	V	W
TE1-2	P3	P4	P+	C	N-	
TE2	L11	L21				
PE						

[Unit: mm]

●MR-J4-22KB-RJ010, MR-J4-22KB4-RJ010



Terminal screw size
TE1-1: M8
TE1-2: M8
TE2: M4
PE: M8
Mounting screw size: M10

Terminal arrangement

TE1-1	L1	L2	L3	U	V	W
TE1-2	P3	P4	P+	C	N-	
TE2	L11	L21				
PE						

[Unit: mm]

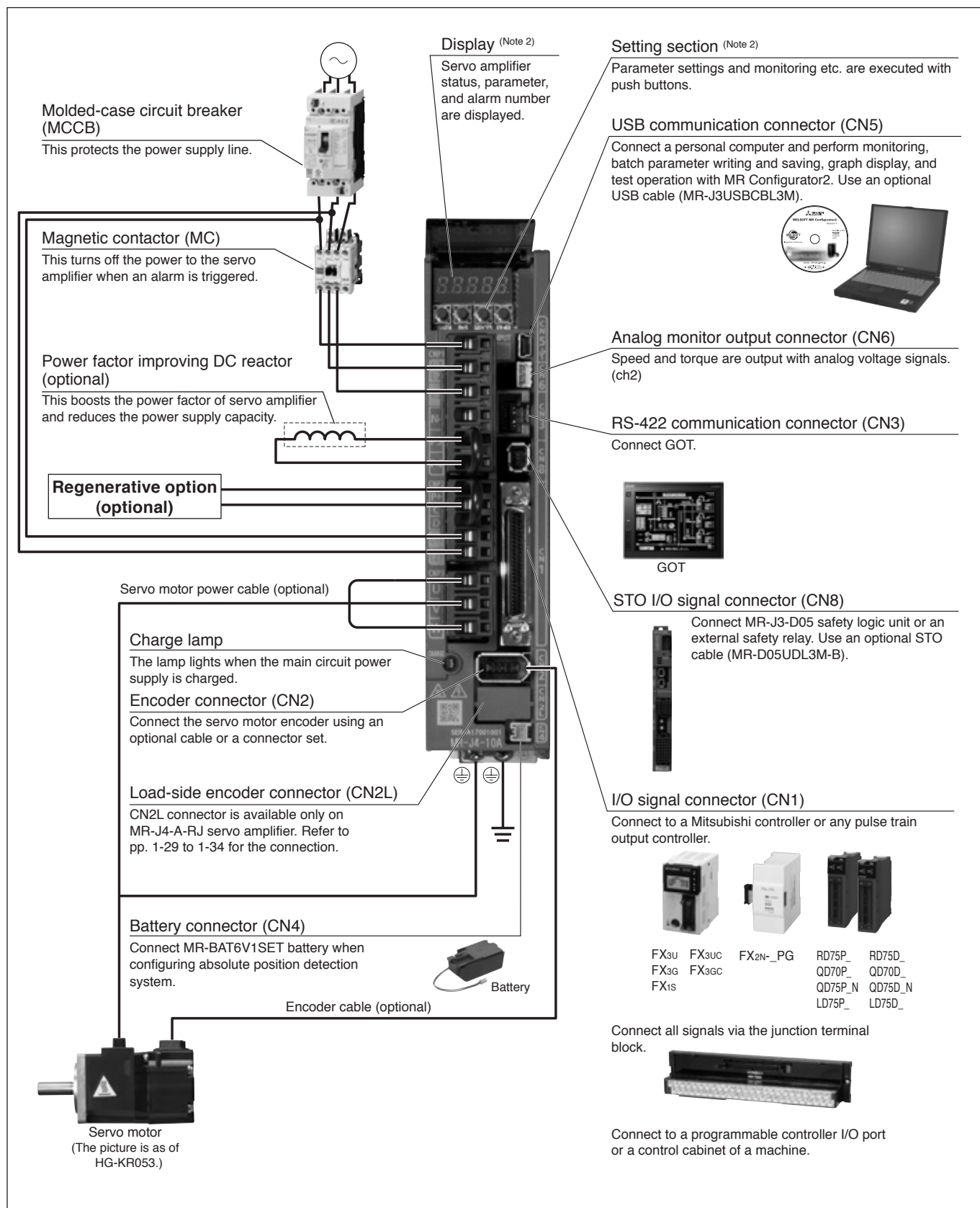
Notes: 1. The dimensions are applicable when MR-J4-B-RJ010 and MR-J3-T10 are combined. Refer to "MR-J4-B/MR-J4-B-RJ Dimensions" in this catalog for the dimensions of MR-J4-B-RJ010 servo amplifiers alone.

MR-J4-A/MR-J4-A-RJ Connections with Peripheral Equipment (Note 1)

A

A-RJ

Peripheral equipment is connected to MR-J4-A/MR-J4-A-RJ 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-J4-350A/MR-J4-350A-RJ or smaller servo amplifiers. Refer to "MR-J4-_A_(-RJ) Servo Amplifier Instruction Manual" for the actual connections.

2. This picture shows when the display cover is open.

MR-J4-A(1)/MR-J4-A(1)-RJ (General-purpose Interface) Specifications (200 V/100 V)

A
A-RJ

Servo amplifier model MR-J4-_-(-RJ)		10A	20A	40A	60A	70A	100A	200A	350A	500A	700A	11KA	15KA	22KA	10A1	20A1	40A1
Output	Rated voltage	3-phase 170 V AC															
	Rated current [A]	1.1	1.5	2.8	3.2	5.8	6.0	11.0	17.0	28.0	37.0	68.0	87.0	126.0	1.1	1.5	2.8
Main circuit 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								1-phase 100 V AC to 120 V AC, 50 Hz/60 Hz		
	Rated current ^(Note 14) [A]	0.9	1.5	2.6	3.2 ^(Note 8)	3.8	5.0	10.5	16.0	21.7	28.9	46.0	64.0	95.0	3.0	5.0	9.0
	Permissible voltage fluctuation	3-phase or 1-phase 170 V AC to 264 V AC					3-phase 170 V AC to 264 V AC								1-phase 85 V AC to 132 V AC		
	Permissible frequency fluctuation	±5% maximum															
Control circuit power supply input	Voltage/frequency	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz													1-phase 100 V AC to 120 V AC, 50 Hz/60 Hz		
	Rated current [A]	0.2								0.3					0.4		
	Permissible voltage fluctuation	1-phase 170 V AC to 264 V AC													1-phase 85 V AC to 132 V AC		
	Permissible frequency fluctuation	±5% maximum															
	Power consumption [W]	30								45					30		
Interface power supply		24 V DC ± 10% (required current capacity: 0.5 A (including CN8 connector signals))															
Control method		Sine-wave PWM control/current control method															
Tolerable regenerative power	Built-in regenerative resistor ^(Note 2, 3) [W]	-	10	10	10	20	20	100	100	130	170	-	-	-	-	10	10
	External regenerative resistor (standard accessory) ^(Note 2, 3, 11, 12) [W]	-	-	-	-	-	-	-	-	-	-	500 (800)	850 (1300)	850 (1300)	-	-	-
Dynamic brake		Built-in ^(Note 4)										External option ^(Note 13)			Built-in ^(Note 4)		
Communication function		USB: Connect a personal computer (MR Configurator2 compatible)															
		RS-422: 1 : n communication (up to 32 axes) ^(Note 10)															
Encoder output pulse		Compatible (A/B/Z-phase pulse)															
Analog monitor		2 channels															
Position control mode	Maximum input pulse frequency	4 Mpulses/s (when using differential receiver), 200 kpulses/s (when using open collector)															
	Positioning feedback pulse	Encoder resolution: 22 bits															
	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)															
Positioning mode		Point table method, program method, indexer (turret) method															
Fully closed loop control	MR-J4-A(1)	Two-wire type communication method ^(Note 9)															
	MR-J4-A(1)-RJ	Two-wire/four-wire type communication method															
Servo function		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, machine diagnosis function, power monitoring function, super trace control ^(Note 15) , lost motion compensation ^(Note 15)															
Load-side encoder interface	MR-J4-A(1)	Mitsubishi high-speed serial communication															
	MR-J4-A(1)-RJ	Mitsubishi high-speed serial communication, A/B/Z-phase differential input signal															
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, magnetic pole detection protection, linear servo control fault protection															



MR-J4-A(1)/MR-J4-A(1)-RJ (General-purpose Interface) Specifications (200 V/100 V)

A

A-RJ

Servo amplifier model MR-J4-_-(-RJ)		10A	20A	40A	60A	70A	100A	200A	350A	500A	700A	11KA	15KA	22KA	10A1	20A1	40A1
Functional safety		STO (IEC/EN 61800-5-2)															
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2															
	Response performance	8 ms or less (STO input OFF → energy shut-off)															
	Test pulse input (STO) ^(Note 7)	Test pulse interval: 1 Hz to 25 Hz, test pulse off time: 1 ms maximum															
	Mean time to dangerous failure (MTTFd)	100 years or longer															
	Diagnostic coverage (DC)	Medium (90% to 99%)															
	Probability of dangerous Failure per Hour (PFH)	1.68 × 10 ⁻¹⁰ [1/h]															
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.															
Structure (IP rating)		Natural cooling, open (IP20)				Force cooling, open (IP20)				Force cooling, open (IP20) ^(Note 5)				Natural cooling, open (IP20)			
Close mounting		Possible ^(Note 6)								Not possible				Possible ^(Note 6)			
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)															
	Ambient humidity	Operation/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/s² at 10 Hz to 55 Hz (directions of X, Y and Z axes)															
Mass [kg]		0.8	0.8	1.0	1.0	1.4	1.4	2.1	2.3	4.0	6.2	13.4	13.4	18.2	0.8	0.8	1.0

- Notes: 1. Rated output and speed of a rotary servo motor and a direct drive motor; and continuous thrust and maximum speed of a linear 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-J4-_(RJ) Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio and the permissible load to mass ratio.
5. Terminal blocks are excluded.
6. 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.
7. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the servo amplifier instantaneously at regular intervals.
8. The rated current is 2.9 A when the servo amplifier is used with UL or CSA compliant servo motor.
9. Fully closed loop control is compatible with the servo amplifiers with software version A5 or later.
10. RS-422 communication is compatible with the servo amplifiers with software version A3 or later.
11. The value in brackets is applicable when cooling fans (2 units of 92 mm × 92 mm, minimum air flow: 1.0 m³/min) are installed, and then [Pr. PA02] is changed.
12. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "1-Axis Servo Amplifier Model Designation" in this catalog for details.
13. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system when not using the dynamic brake.
14. This value is applicable for 750 W or smaller servo amplifiers in 200 V class when a 3-phase power supply is used.
15. This function is available with the servo amplifiers with software version B4 or later.

MR-J4-DU_A/MR-J4-DU_A-RJ (General-purpose Interface) Specifications (200 V)

A
A-RJ

Drive unit model MR-J4-_-(-RJ)		DU30KA	DU37KA
Compatible converter unit model		MR-CR55K ^(Note 4)	
Output	Rated voltage	3-phase 170 V AC	
	Rated current [A]	174	204
Main circuit power supply input		Main circuit power is supplied from the converter unit to the drive unit ^(Note 4)	
Control circuit power supply input	Voltage/frequency	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz	
	Rated current [A]	0.3	
	Permissible voltage fluctuation	1-phase 170 V AC to 264 V AC	
	Permissible frequency fluctuation	±5% maximum	
	Power consumption [W]	45	
Interface power supply		24 V DC ± 10% (required current capacity: 0.5 A (including CN8 connector signals))	
Control method		Sine-wave PWM control/current control method	
Dynamic brake		External option ^(Note 3)	
Communication function		USB: Connect a personal computer (MR Configurator2 compatible)	
		RS-422: 1 : n communication (up to 32 axes)	
Encoder output pulse		Compatible (A/B/Z-phase pulse)	
Analog monitor		2 channels	
Position control mode	Maximum input pulse frequency	4 Mpulses/s (when using differential receiver), 200 kpulses/s (when using open collector)	
	Positioning feedback pulse	Encoder resolution: 22 bits	
	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)	
Positioning mode		Point table method, program method, indexer (turret) method	
Fully closed loop control	MR-J4-DU_A	Two-wire type communication method	
	MR-J4-DU_A-RJ	Two-wire/four-wire type communication method	
Servo function		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, machine diagnosis function, power monitoring function, super trace control, lost motion compensation	
Load-side encoder interface	MR-J4-DU_A	Mitsubishi high-speed serial communication	
	MR-J4-DU_A-RJ	Mitsubishi high-speed serial communication, A/B/Z-phase differential input signal	
Protective functions		Overcurrent shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, undervoltage protection, instantaneous power failure protection, overspeed protection, error excessive protection	



MR-J4-DU_A/MR-J4-DU_A-RJ (General-purpose Interface) Specifications (200 V)

A

A-RJ

Drive unit model MR-J4-_-(-RJ)		DU30KA	DU37KA
Functional safety		STO (IEC/EN 61800-5-2)	
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2	
	Response performance	8 ms or less (STO input OFF → energy shut-off)	
	Test pulse input (STO) ^(Note 2)	Test pulse interval: 1 Hz to 25 Hz, test pulse off time: 1 ms maximum	
	Mean time to dangerous failure (MTTFd)	100 years or longer	
	Diagnostic coverage (DC)	Medium (90% to 99%)	
	Probability of dangerous Failure per Hour (PFH)	1.68×10^{-10} [1/h]	
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.	
Structure (IP rating)		Force cooling, open (IP20) ^(Note 1)	
Close mounting		Not possible	
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)	
	Ambient humidity	Operation/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]		21	

Notes: 1. Terminal blocks are excluded.

2. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the drive unit instantaneously at regular intervals.

3. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system when not using the dynamic brake.

4. One unit of converter unit is required for each drive unit. Refer to "MR-CR Converter Unit Specifications (200 V/400 V)" on p. 1-14 in this catalog for the specifications of the converter unit.

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LV5/Wires

Product List

Cautions

MR-J4-A4/MR-J4-A4-RJ (General-purpose Interface) Specifications (400 V)

A
A-RJ

Servo amplifier model MR-J4-_-(-RJ)		60A4	100A4	200A4	350A4	500A4	700A4	11KA4	15KA4	22KA4
Output	Rated voltage	3-phase 323 V AC								
	Rated current [A]	1.5	2.8	5.4	8.6	14.0	17.0	32.0	41.0	63.0
Main circuit power supply input	Voltage/frequency ^(Note 1)	3-phase 380 V AC to 480 V AC, 50 Hz/60 Hz								
	Rated current [A]	1.4	2.5	5.1	7.9	10.8	14.4	23.1	31.8	47.6
	Permissible voltage fluctuation	3-phase 323 V AC to 528 V AC								
	Permissible frequency fluctuation	±5% maximum								
Control circuit power supply input	Voltage/frequency	1-phase 380 V AC to 480 V AC, 50 Hz/60 Hz								
	Rated current [A]	0.1			0.2					
	Permissible voltage fluctuation	1-phase 323 V AC to 528 V AC								
	Permissible frequency fluctuation	±5% maximum								
	Power consumption [W]	30			45					
Interface power supply		24 V DC ± 10% (required current capacity: 0.5 A (including CN8 connector signals))								
Control method		Sine-wave PWM control/current control method								
Tolerable regenerative power	Built-in regenerative resistor ^(Note 2, 3) [W]	15	15	100	100	130 ^(Note 10)	170 ^(Note 10)	-	-	-
	External regenerative resistor (standard accessory) ^(Note 2, 3, 7, 8) [W]	-	-	-	-	-	-	500 (800)	850 (1300)	850 (1300)
Dynamic brake		Built-in ^(Note 4)						External option ^(Note 9)		
Communication function		USB: Connect a personal computer (MR Configurator2 compatible)								
		RS-422: 1 : n communication (up to 32 axes)								
Encoder output pulse		Compatible (A/B/Z-phase pulse)								
Analog monitor		2 channels								
Position control mode	Maximum input pulse frequency	4 Mpulses/s (when using differential receiver), 200 kpulses/s (when using open collector)								
	Positioning feedback pulse	Encoder resolution: 22 bits								
	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)								
Positioning mode		Point table method, program method, indexer (turret) method								
Fully closed loop control	MR-J4-A4	Two-wire type communication method								
	MR-J4-A4-RJ	Two-wire/four-wire type communication method								
Servo function		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, machine diagnosis function, power monitoring function, super trace control ^(Note 11) , lost motion compensation ^(Note 11)								
Load-side encoder interface	MR-J4-A4	Mitsubishi high-speed serial communication								
	MR-J4-A4-RJ	Mitsubishi high-speed serial communication, A/B/Z-phase differential input signal								
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, magnetic pole detection protection, linear servo control fault protection								



MR-J4-A4/MR-J4-A4-RJ (General-purpose Interface) Specifications (400 V)

A

A-RJ

Servo amplifier model MR-J4-_-(-RJ)		60A4	100A4	200A4	350A4	500A4	700A4	11KA4	15KA4	22KA4
Functional safety		STO (IEC/EN 61800-5-2)								
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2								
	Response performance	8 ms or less (STO input OFF → energy shut-off)								
	Test pulse input (STO) ^(Note 6)	Test pulse interval: 1 Hz to 25 Hz, test pulse off time: 1 ms maximum								
	Mean time to dangerous failure (MTTFd)	100 years or longer								
	Diagnostic coverage (DC)	Medium (90% to 99%)								
	Probability of dangerous Failure per Hour (PFH)	1.68 × 10 ⁻¹⁰ [1/h]								
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.								
Structure (IP rating)		Natural cooling, open (IP20)		Force cooling, open (IP20)		Force cooling, open (IP20) ^(Note 5)				
Close mounting		Not possible								
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)								
	Ambient humidity	Operation/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]		1.7	1.7	2.1	3.6	4.3	6.5	13.4	13.4	18.2

Notes: 1. Rated output and speed of a rotary servo motor, and continuous thrust and maximum speed of a linear 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-J4-_A_-(-RJ) Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio and the permissible load to mass ratio.

5. Terminal blocks are excluded.

6. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the servo amplifier instantaneously at regular intervals.

7. The value in brackets is applicable when cooling fans (2 units of 92 mm × 92 mm, minimum air flow: 1.0 m³/min) are installed, and then [Pr. PA02] is changed.

8. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "1-Axis Servo Amplifier Model Designation" in this catalog for details.

9. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system when not using the dynamic brake.

10. The servo amplifier built-in regenerative resistor is compatible with the maximum torque deceleration when the servo motor is used within the rated speed and the recommended load to motor inertia ratio. Contact your local sales office if the operating motor speed or the load to motor inertia ratio exceeds the rated speed or the recommended ratio.

11. This function is available with the servo amplifiers with software version B4 or later.

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LV/S/Wires

Product List

Cautions

MR-J4-DU_A4/MR-J4-DU_A4-RJ (General-purpose Interface) Specifications (400 V)

A
A-RJ

Drive unit model MR-J4-_-(-RJ)		DU30KA4	DU37KA4	DU45KA4	DU55KA4
Compatible converter unit model		MR-CR55K4 (Note 4)			
Output	Rated voltage	3-phase 323 V AC			
	Rated current [A]	87	102	131	143
Main circuit power supply input		Main circuit power is supplied from the converter unit to the drive unit (Note 4)			
Control circuit power supply input	Voltage/frequency	1-phase 380 V AC to 480 V AC, 50 Hz/60 Hz			
	Rated current [A]	0.2			
	Permissible voltage fluctuation	1-phase 323 V AC to 528 V AC			
	Permissible frequency fluctuation	±5% maximum			
	Power consumption [W]	45			
Interface power supply		24 V DC ± 10% (required current capacity: 0.5 A (including CN8 connector signals))			
Control method		Sine-wave PWM control/current control method			
Dynamic brake		External option (Note 3)			
Communication function		USB: Connect a personal computer (MR Configurator2 compatible)			
		RS-422: 1 : n communication (up to 32 axes)			
Encoder output pulse		Compatible (A/B/Z-phase pulse)			
Analog monitor		2 channels			
Position control mode	Maximum input pulse frequency	4 Mpulses/s (when using differential receiver), 200 kpulses/s (when using open collector)			
	Positioning feedback pulse	Encoder resolution: 22 bits			
	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)			
Positioning mode		Point table method, program method, indexer (turret) method			
Fully closed loop control	MR-J4-DU_A4	Two-wire type communication method			
	MR-J4-DU_A4-RJ	Two-wire/four-wire type communication method			
Servo function		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, machine diagnosis function, power monitoring function, super trace control, lost motion compensation			
Load-side encoder interface	MR-J4-DU_A4	Mitsubishi high-speed serial communication			
	MR-J4-DU_A4-RJ	Mitsubishi high-speed serial communication, A/B/Z-phase differential input signal			
Protective functions		Overcurrent shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, undervoltage protection, instantaneous power failure protection, overspeed protection, error excessive protection,			


MR-J4-DU_A4/MR-J4-DU_A4-RJ (General-purpose Interface) Specifications (400 V)
A**A-RJ**

Drive unit model MR-J4-_-(-RJ)		DU30KA4	DU37KA4	DU45KA4	DU55KA4
Functional safety		STO (IEC/EN 61800-5-2)			
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2			
	Response performance	8 ms or less (STO input OFF → energy shut-off)			
	Test pulse input (STO) ^(Note 2)	Test pulse interval: 1 Hz to 25 Hz, test pulse off time: 1 ms maximum			
	Mean time to dangerous failure (MTTFd)	100 years or longer			
	Diagnostic coverage (DC)	Medium (90% to 99%)			
		Probability of dangerous Failure per Hour (PFH)			
		1.68 × 10 ⁻¹⁰ [1/h]			
Compliance to standards		Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.			
Structure (IP rating)		Force cooling, open (IP20) ^(Note 1)			
Close mounting		Not possible			
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)			
	Ambient humidity	Operation/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]		16		19	

Notes: 1. Terminal blocks are excluded.

2. The test pulse is a signal for the external circuit to perform self-diagnosis by turning off the signals to the drive unit instantaneously at regular intervals.

3. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system when not using the dynamic brake.

4. One unit of converter unit is required for each drive unit. Refer to "MR-CR Converter Unit Specifications (200 V/400 V)" on p. 1-14 in this catalog for the specifications of the converter unit.

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LV5/Wires

Product List

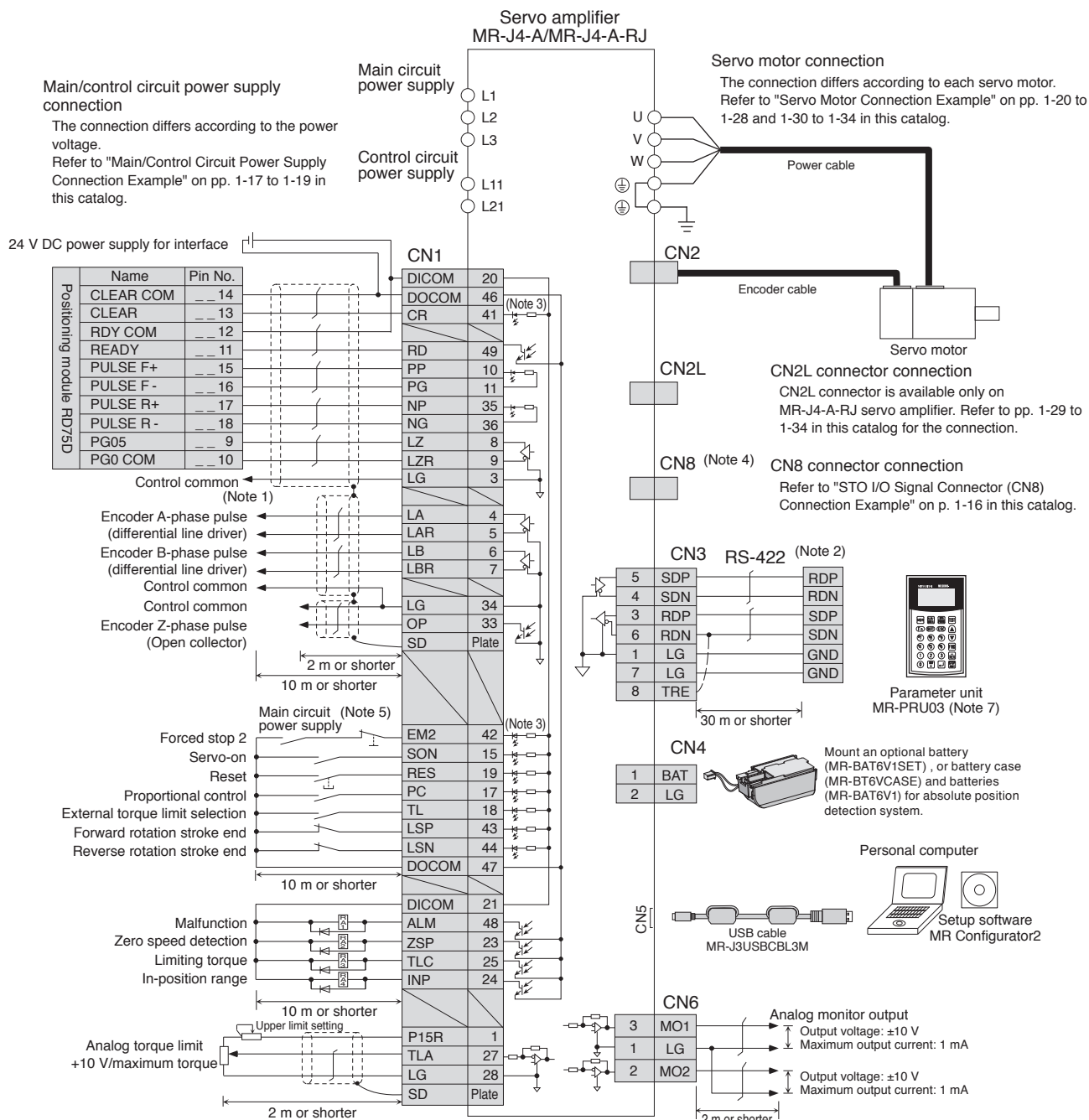
Cautions

MR-J4-A/MR-J4-A-RJ Standard Wiring Diagram Example: Position Control Operation ^(Note 6)

A

A-RJ

Connecting to RD75D (position servo, incremental)



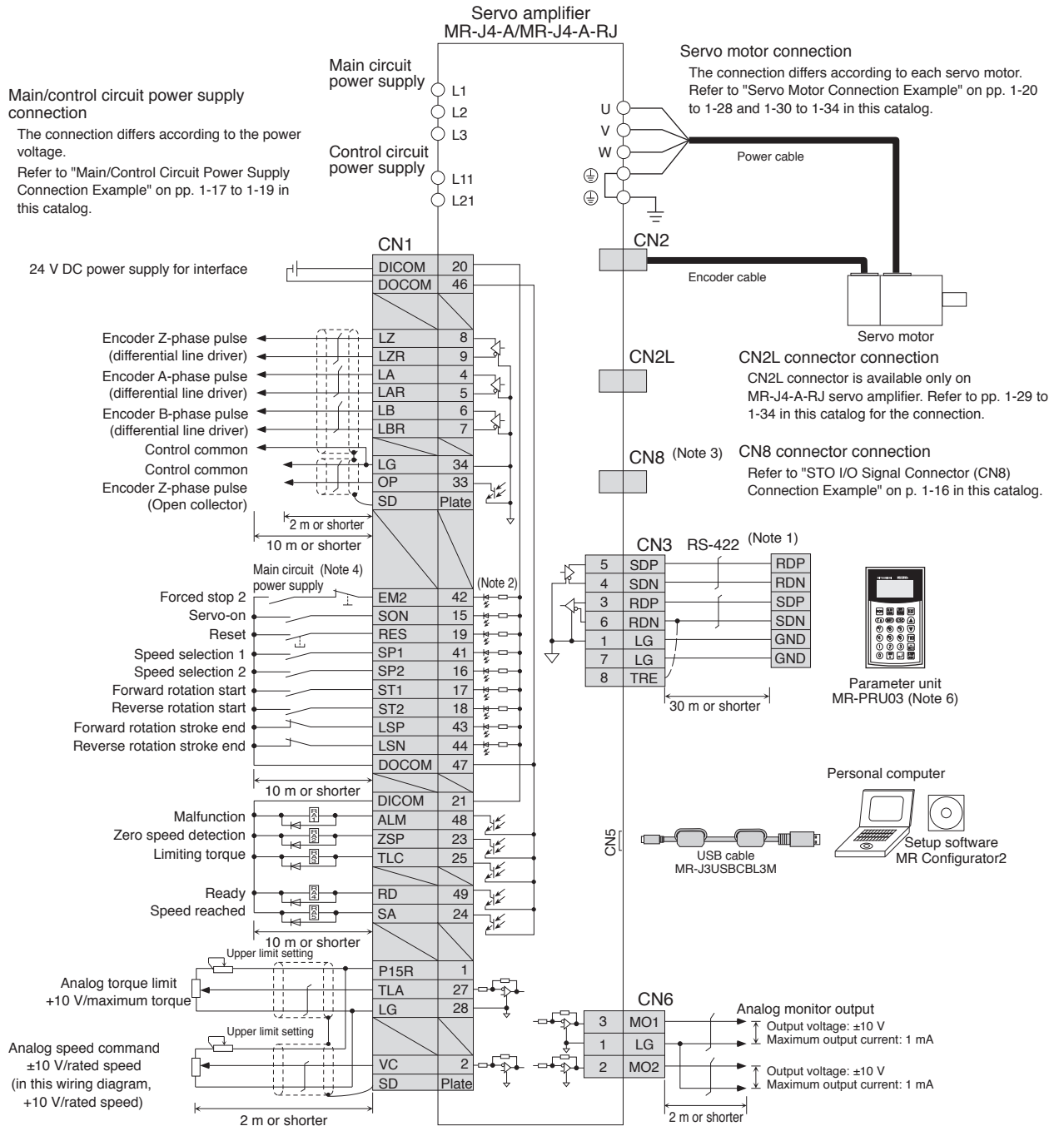
- Notes: 1. This connection is not necessary for RD75D Positioning module. Note that the connection between LG and control common terminal is recommended for some Positioning modules to improve noise tolerance.
2. It is also possible to connect a personal computer to CN3 connector with an RS-422/RS-232C conversion cable. However, USB interface (CN5 connector) and RS-422 interface (CN3 connector) are mutually exclusive. Do not use them at the same time. Refer to "Products on the Market for Servo Amplifiers" in this catalog for the RS-422/RS-232C conversion cable.
3. This is for sink wiring. Source wiring is also possible.
4. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
5. Create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
6. This standard wiring diagram is common for 200 V AC, 100 V AC and 400 V AC type servo amplifiers.
7. Use a commercial LAN cable (EIA568 compliant), and keep the wiring length to 10 m or less.



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-J4-A/MR-J4-A-RJ Standard Wiring Diagram Example: Speed Control Operation (Note 5)

A A-RJ

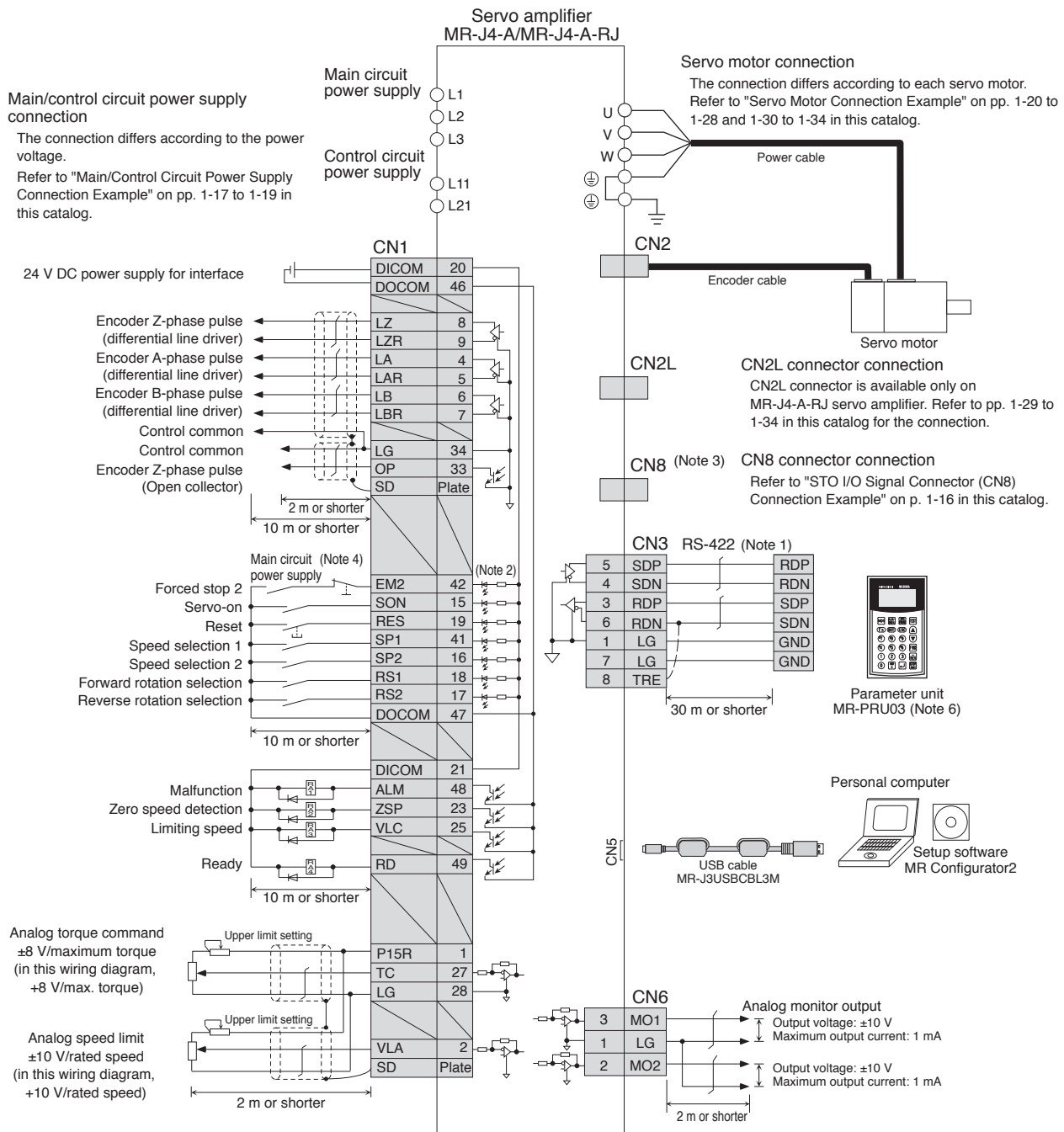


Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

MR-J4-A/MR-J4-A-RJ Standard Wiring Diagram Example: Torque Control Operation (Note 5)

A

A-RJ



- Notes: 1. It is also possible to connect a personal computer to CN3 connector with an RS-422/RS-232C conversion cable. However, USB interface (CN5 connector) and RS-422 interface (CN3 connector) are mutually exclusive. Do not use them at the same time. Refer to "Products on the Market for Servo Amplifiers" in this catalog for the RS-422/RS-232C conversion cable.
2. This is for sink wiring. Source wiring is also possible.
3. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
4. Create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
5. This standard wiring diagram is common for 200 V AC, 100 V AC and 400 V AC type servo amplifiers.
6. Use a commercial LAN cable (EIA568 compliant), and keep the wiring length to 10 m or less.



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-J4-A-RJ Positioning Function: Point Table Method

Positioning operation is executed by selecting the point table No. with a command interface signal according to the position and speed data set in the point table.

Item			Description
Command method	Command interface		DIO (input: 11 points (excluding forced stop input (EM2)), and output: 8 points), RS-422
	Operating specification		Positioning by specifying the point table No. (255 points)
	Position command input (Note 1)	Absolute value command method	Set in the point table. Setting range of feed length per point: -999999 to 999999 [$\times 10^{\text{STM}}$ μm], -99.9999 to 99.9999 [$\times 10^{\text{STM}}$ inch], -999999 to 999999 [pulse], Setting range of rotation angle: -360.000 to 360.000 [degree]
		Incremental value command method	Set in the point table. Setting range of feed length per point: 0 to 999999 [$\times 10^{\text{STM}}$ μm], 0 to 99.9999 [$\times 10^{\text{STM}}$ inch], 0 to 999999 [pulse], Setting range of rotation angle: 0 to 999.999 [degree]
	Speed command input		Set the acceleration/deceleration time constants in the point table. Set the S-pattern acceleration/deceleration time constants with [Pr. PC03].
	System		Signed absolute value command method, incremental value command method
	Analog override		0 V DC to ± 10 V DC/0% to 200%
	Torque limit		Set by parameters or external analog input (0 V DC to +10 V DC/maximum torque)
Operation mode	Automatic operation mode	Each positioning operation	Point table No. input, position data input method Each positioning operation is executed based on the position/speed commands.
		Automatic continuous positioning operation	Varying-speed operation (2 to 255 speeds), automatic continuous positioning operation (2 to 255 points)
	Manual operation mode	JOG operation	Inching operation is executed with DI or RS-422 communication function according to the speed command set with a parameter.
		Manual pulse generator operation	Manual feeding is executed with a manual pulse generator. Command pulse multiplication: select from $\times 1$, $\times 10$, and $\times 100$ with a parameter.
	Home position return mode	Dog type	Returns to home position upon Z-phase pulse after passing through proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Count type	Returns to home position upon the encoder pulse count after touching proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Data set type	Returns to home position without dog. Any position settable as a home position using manual operation, etc. Home position address settable
		Stopper type	Returns to home position upon hitting the stroke end. Home position return direction selectable, home position address settable
		Home position ignorance (servo-on position as home position)	Sets a home position where SON (Servo-on) signal turns on. Home position address settable
		Dog type rear end reference	Returns to home position with reference to the rear end of proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Count type front end reference	Returns to home position with reference to the front end of proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Dog cradle type	Returns to home position upon the first Z-phase pulse with reference to the front end of proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Dog type adjacent Z-phase reference (Note 2)	Returns to home position upon the last Z-phase pulse with reference to the front end of proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Dog type front end reference	Returns to home position to the front end of dog with reference to the front end of proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Dogless Z-phase reference (Note 2)	Returns to home position to Z-phase pulse with reference to the first Z-phase pulse. Home position return direction settable, home position shift distance settable, home position address settable
	Automatic positioning to home position function		High-speed automatic positioning to a defined home position
Other functions			Absolute position detection system, backlash compensation, overtravel prevention with external limit switches (LSP/LSN), teaching function, roll feed display function, software stroke limit, mark detection (current position latch) function, analog override function

Notes: 1. STM is the ratio to the setting value of the position data. STM can be changed with [Pr. PT03].

2. Home position return modes of dog type adjacent Z-phase reference and dogless Z-phase reference are not available when the direct drive motor or incremental type linear encoder is used.

MR-J4-A-RJ Positioning Function: Point Table Method

Absolute value command method: travels to a specified address (absolute value) with reference to the home position

Item	Setting range	Description
Point table No.	1 to 255	Specify a point table in which a target position, servo motor speed, acceleration/deceleration time constants, dwell, and sub function will be set.
Target position <small>(Note 1, 3)</small> (position data)	-999999 to 999999 [$\times 10^{\text{STM}}$ μm] -99.9999 to 99.9999 [$\times 10^{\text{STM}}$ inch] -360.000 to 360.000 [degree] -999999 to 999999 [pulse]	Set a travel distance. (1) When using as absolute value command method Set a target address (absolute value). (2) When using as incremental value command method Set a travel distance. Reverse rotation command is applied with a minus sign.
Servo motor speed <small>(Note 2)</small>	0 to permissible speed [r/min] [mm/s]	Set a command speed for the servo motor in positioning.
Acceleration time constant	0 to 20000 [ms]	Set a time period for the servo motor to reach the rated speed.
Deceleration time constant	0 to 20000 [ms]	Set a time period for the servo motor to decelerate from the rated speed to a stop.
Dwell	0 to 20000 [ms]	Set dwell. When the dwell is set, the position command for the next point table will be started after the position command for the selected point table is completed and the set dwell is passed. The dwell is disabled when 0 or 2 is set for the sub function. Varying-speed operation is enabled when 1, 3, 8, 9, 10, or 11 is set for the sub function and when 0 is set for the dwell.
Sub function	0 to 3, and 8 to 11	Set sub function. (1) When using as absolute value command method 0: Executes automatic operation for a selected point table. 1: Executes automatic continuous operation without stopping for the next point table. 8: Executes automatic continuous operation without stopping for the point table selected at the start. 9: Executes automatic continuous operation without stopping for the point table No. 1. (2) When using as incremental value command method 2: Executes automatic operation for a selected point table. 3: Executes automatic continuous operation without stopping for the next point table. 10: Executes automatic continuous operation without stopping for the point table selected at the start. 11: Executes automatic continuous operation without stopping for the point table No. 1.
M code	0 to 99	Set a code to be outputted when the positioning completes.

Notes: 1. Change the unit to $\mu\text{m}/\text{inch}/\text{degree}/\text{pulse}$ with [Pr. PT01].

2. The speed unit is r/min for the rotary servo motors and the direct drive motors, and mm/s for the linear servo motors.

3. STM is the ratio to the setting value of the position data. STM can be changed with [Pr. PT03].

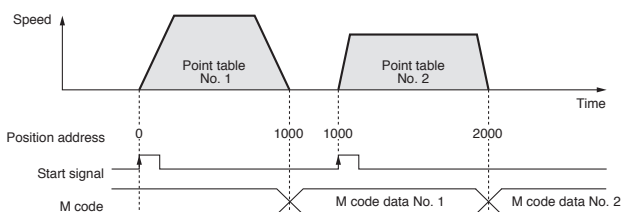
Example of setting point table data

Point table No.	Target position (position data) [$\times 10^{\text{STM}}$ μm] <small>(Note 1)</small>	Servo motor speed [r/min]	Acceleration time constant [ms]	Deceleration time constant [ms]	Dwell [ms]	Sub function	M code
1	1000	2000	200	200	0	*	1
2	2000	1600	100	100	0	0	2
:	:	:	:	:	:	:	:
255	3000	3000	100	100	0	2	99

* The operation of the next point table is set with the sub function.

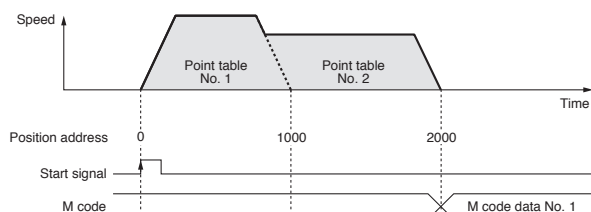
● When the sub function is set to 0:

Start signal is required for each point table.



● When the sub function is set to 1:

Automatic continuous operation is executed based on the point table.



Notes: 1. STM is the ratio to the setting value of the position data. STM can be changed with [Pr. PT03].

MR-J4-A-RJ Positioning Function: Point Table Method

Incremental value command method: travels from a current position according to the set position data

Item	Setting range	Description
Point table No.	1 to 255	Specify a point table in which a target position, servo motor speed, acceleration/deceleration time constants, dwell, and sub function will be set.
Target position ^(Note 1, 3) (position data)	0 to 999999 [$\times 10^{\text{STM}}$ μm] 0 to 99.9999 [$\times 10^{\text{STM}}$ inch] 0 to 999.999 [degree] 0 to 999999 [pulse]	Set a travel distance. Operation starts with ST1 (Forward rotation start) or ST2 (Reverse rotation start).
Servo motor speed ^(Note 2)	0 to permissible speed [r/min] [mm/s]	Set a command speed for the servo motor in positioning.
Acceleration time constant	0 to 20000 [ms]	Set a time period for the servo motor to reach the rated speed.
Deceleration time constant	0 to 20000 [ms]	Set a time period for the servo motor to decelerate from the rated speed to a stop.
Dwell	0 to 20000 [ms]	Set a dwell. When the dwell is set, the position command for the next point table will be started after the position command for the selected point table is completed and the set dwell is passed. The dwell is disabled when 0 is set for the sub function. Varying-speed operation is enabled when 1, 8, or 9 is set for the sub function and when 0 is set for the dwell.
Sub function	0, 1, 8, and 9	Set sub function. 0: Executes automatic operation for the selected point table. 1: Executes automatic continuous operation without stopping for the next point table. 8: Executes automatic continuous operation without stopping for the point table selected at the start. 9: Executes automatic continuous operation without stopping for the point table No. 1.
M code	0 to 99	Set a code to be outputted when the positioning completes.

Notes: 1. Change the unit to $\mu\text{m}/\text{inch}/\text{degree}/\text{pulse}$ with [Pr. PT01].

2. The speed unit is r/min for the rotary servo motors and the direct drive motors, and mm/s for the linear servo motors.

3. STM is the ratio to the setting value of the position data. STM can be changed with [Pr. PT03].

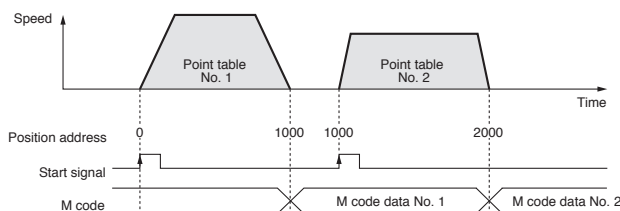
Example of setting point table data

Point table No.	Target position (position data) [$\times 10^{\text{STM}}$ μm] ^(Note 1)	Servo motor speed [r/min]	Acceleration time constant [ms]	Deceleration time constant [ms]	Dwell [ms]	Sub function	M code
1	1000	2000	200	200	0	*	1
2	1000	1600	100	100	0	0	2
:	:	:	:	:	:	:	:
255	3000	3000	100	100	0	0	99

* The operation of the next point table is set with the sub function.

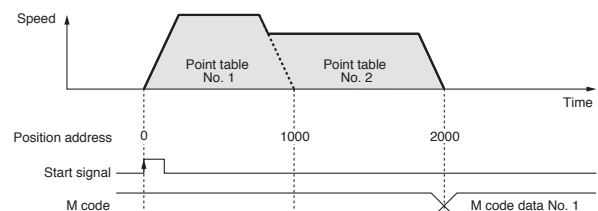
● When the sub function is set to 0:

Start signal is required for each point table.



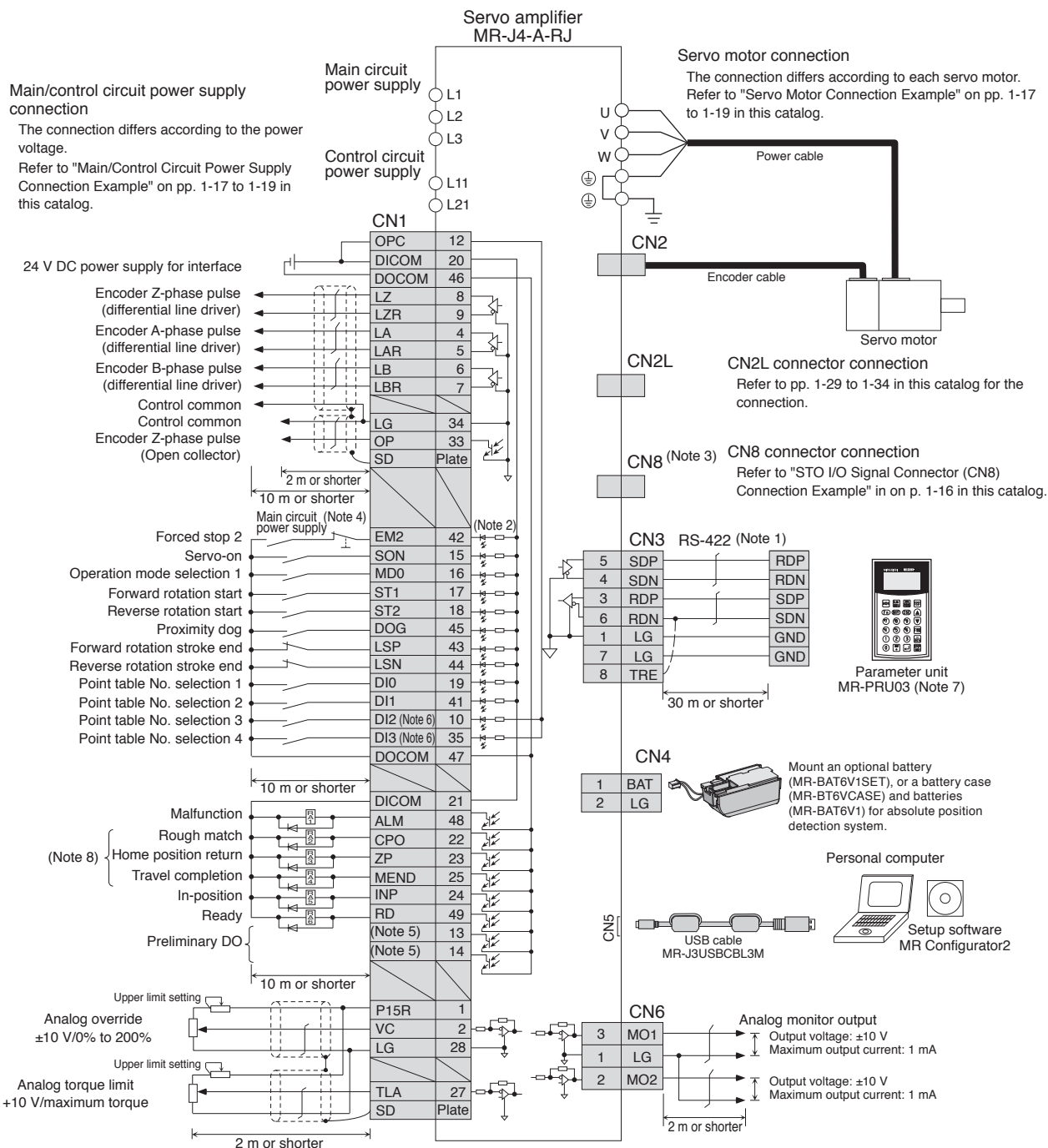
● When the sub function is set to 1:

Automatic continuous operation is executed based on the point table.



Notes: 1. STM is the ratio to the setting value of the position data. STM can be changed with [Pr. PT03].

MR-J4-A-RJ Standard Wiring Diagram Example: Point Table Method



- Notes: 1. It is also possible to connect a personal computer to CN3 connector with an RS-422/RS-232C conversion cable. However, USB interface (CN5 connector) and RS-422 interface (CN3 connector) are mutually exclusive. Do not use them at the same time. Refer to "Products on the Market for Servo Amplifiers" in this catalog for the RS-422/RS-232C conversion cable.
2. This is for sink wiring. Source wiring is also possible. However, when input devices are assigned to CN1-10 pin and CN1-35 pin, be sure to use sink wiring. Source wiring is not possible in this case. In the positioning mode, input devices are assigned in the initial setting. Refer to "MR-J4-A-RJ Servo Amplifier Instruction Manual (Positioning Mode)" for details.
3. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
4. Create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
5. No output device is assigned in the initial setting. Assign an output device with [Pr. PD47] as necessary.
6. DI2 and DI3 are assigned to CN1-10 pin and CN1-35 pin respectively in the initial setting. Change them with [Pr. PD44] and [Pr. PD46] when using a manual pulse generator.
7. Use a commercial LAN cable (EIA568 compliant), and keep the wiring distance within 10 m when using MR-PRU03 parameter unit.
8. Assign the output devices mentioned to CN1-22 pin, CN1-23 pin, and CN1-25 pin with [Pr. PD23], [Pr. PD24] and [Pr. PD26].



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-J4-A-RJ Positioning Function: Program Method

Positioning operation is executed by selecting programs with command signals. The programs including position data, servo motor speed, acceleration/deceleration time constants and others need to be created beforehand. The program method enables more complex positioning operation than the point table method. MR Configurator2 is required to create programs.

Item		Description
Command method	Command interface	DIO (input: 11 points (excluding forced stop input (EM2)), and output: 8 points), RS-422
	Operating specification	Program language (program with MR Configurator2) Program capacity: 640 steps (256 programs)
	Position command input (Note 1)	Absolute value command method Set with program language. Setting range of feed length: -999999 to 999999 [$\times 10^{\text{STM}}$ μm], -99.9999 to 99.9999 [$\times 10^{\text{STM}}$ inch], -999999 to 999999 [pulse], Setting range of rotation angle: -360.000 to 360.000 [degree]
		Incremental value command method Set with program language. Setting range of feed length: -999999 to 999999 [$\times 10^{\text{STM}}$ μm], -99.9999 to 99.9999 [$\times 10^{\text{STM}}$ inch], -999999 to 999999 [pulse], Setting range of rotation angle: -999.999 to 999.999 [degree]
	Speed command input	Set servo motor speed, acceleration/deceleration time constants, S-pattern acceleration/deceleration time constants with program language. S-pattern acceleration/deceleration time constants are also settable with [Pr. PC03].
	System	Signed absolute value command method/signed incremental value command method
	Analog override	0 V DC to ± 10 V DC/0% to 200%
	Torque limit	Set by parameters or external analog input (0 V DC to +10 V DC/maximum torque)
Operation mode	Automatic operation mode	Program Depends on the setting of the program language
	Manual operation mode	JOG operation Inching operation is executed with DI or RS-422 communication function according to the speed command set with a parameter.
		Manual pulse generator operation Manual feeding is executed with a manual pulse generator. Command pulse multiplication: select from $\times 1$, $\times 10$, and $\times 100$ with a parameter.
	Home position return mode	Dog type Returns to home position upon Z-phase pulse after passing through proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Count type Returns to home position upon the encoder pulse count after touching proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Data set type Returns to home position without dog. Any position settable as a home position using manual operation, etc. Home position address settable
		Stopper type Returns to home position upon hitting the stroke end. Home position return direction selectable, home position address settable
		Home position ignorance (servo-on position as home position) Sets a home position where SON (Servo-on) signal turns on. Home position address settable
		Dog type rear end reference Returns to home position with reference to the rear end of proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Count type front end reference Returns to home position with reference to the front end of proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Dog cradle type Returns to home position upon the first Z-phase pulse with reference to the front end of proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Dog type adjacent Z-phase reference (Note 2) Returns to home position upon the last Z-phase pulse with reference to the front end of proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Dog type front end reference Returns to home position to the front end of dog with reference to the front end of proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, automatic retract on dog back to home position, automatic stroke retract function
		Dogless Z-phase reference (Note 2) Returns to home position to Z-phase pulse with reference to the first Z-phase pulse. Home position return direction settable, home position shift distance settable, home position address settable
	Automatic positioning to home position function High-speed automatic positioning to a defined home position	
Other functions		Absolute position detection system, backlash compensation, overtravel prevention with external limit switches (LSP/LSN), roll feed display function, software stroke limit, mark detection (current position latch) function, analog override function

Notes: 1. STM is the ratio to the setting value of the position data. STM can be changed with [Pr. PT03].

2. Home position return modes of dog type adjacent Z-phase reference and dogless Z-phase reference are not available when the direct drive motor or incremental type linear encoder is used.

MR-J4-A-RJ Positioning Function: Program Method

Command List

Command	Name	Setting range	Description
SPN(setting value) (Note 2)	Servo motor speed	0 to instantaneous permissible speed [r/min] [mm/s]	Set a command speed for the servo motor in positioning. Do not set a value exceeding the instantaneous permissible speed of the servo motor.
STA(setting value) (Note 2)	Acceleration time constant	0 to 20000 [ms]	Set acceleration time constant. The setting value is a time period that the servo motor reaches the rated speed from a stop.
STB(setting value) (Note 2)	Deceleration time constant	0 to 20000 [ms]	Set deceleration time constant. The setting value is a time period that the servo motor stops from the rated speed.
STC(setting value) (Note 2)	Acceleration/ deceleration time constants	0 to 20000 [ms]	Set acceleration and deceleration time constants. The setting value is a time period that the servo motor reaches the rated speed from a stop and stops from the rated speed.
STD(setting value) (Note 2)	S-pattern acceleration/ deceleration time constants	0 to 1000 [ms]	Set S-pattern acceleration/deceleration time constants.
MOV(setting value) (Note 4, 5)	Absolute value travel command	-999999 to 999999 [$\times 10^{\text{STM}}$ μm] -99.9999 to 99.9999 [$\times 10^{\text{STM}}$ inch]	Travels according to the value set as an absolute value.
MOVA(setting value) (Note 4, 5)	Absolute value continuous travel command	-360.000 to 360.000 [degree] -999999 to 999999 [pulse]	Travels continuously according to the value set as an absolute value. Be sure to write this command after [MOV] command.
MOVI(setting value) (Note 4, 5)	Incremental value travel command	-999999 to 999999 [$\times 10^{\text{STM}}$ μm] -99.9999 to 99.9999 [$\times 10^{\text{STM}}$ inch]	Travels according to the value set as an incremental value.
MOVIA(setting value) (Note 4, 5)	Incremental value continuous travel command	-999999 to 999999 [degree] -999999 to 999999 [pulse]	Travels continuously according to the value set as an incremental value. Be sure to write this command after [MOVI] command.
SYNC(setting value) (Note 1)	Waiting for external signal to switch on	1 to 3	Stops the next step until PI1 (Program input 1) to PI3 (Program input 3) turn on after SOUT (SYNC synchronous output) is outputted.
OUTON(setting value) (Note 1)	External signal on output	1 to 3	Turns on OUT1 (Program output 1) to OUT3 (Program output 3).
OUTOF(setting value) (Note 1)	External signal off output	1 to 3	Turns off OUT1 (Program output 1) to OUT3 (Program output 3) which were turned on with [OUTON] command.
TRIP(setting value) (Note 1, 4, 5)	Absolute value trip point specification	-999999 to 999999 [$\times 10^{\text{STM}}$ μm] -99.9999 to 99.9999 [$\times 10^{\text{STM}}$ inch] -360.000 to 360.000 [degree] -999999 to 999999 [pulse]	Executes the next step after [MOV] or [MOVA] commands are started and then the servo motor moves for the travel amount set in [TRIP] command. Be sure to write this command after [MOV] or [MOVA] command.
TRIPi(setting value) (Note 1, 4, 5)	Incremental value trip point specification	-999999 to 999999 [$\times 10^{\text{STM}}$ μm] -99.9999 to 99.9999 [$\times 10^{\text{STM}}$ inch] -999999 to 999999 [degree] -999999 to 999999 [pulse]	Executes the next step after [MOVI] or [MOVIA] commands are started and then the servo motor moves for the travel amount set in [TRIPi] command. Be sure to write this command after [MOVI] or [MOVIA] command.
ITP(setting value) (Note 1, 3, 4, 5)	Interrupt positioning		Stops the operation after the servo motor moves for the travel amount set when the interrupt signal is inputted. Be sure to write this command after [SYNC] command.
COUNT(setting value) (Note 1)	External pulse count	-999999 to 999999 [pulse]	Executes the next step when the value of the pulse counter exceeds the count value set in [COUNT] command. [COUNT (0)] clears the pulse counter to zero.
FOR(setting value) NEXT	Step repeat command	0, and 1 to 10000 [number of times]	Repeats the steps between [FOR (setting value)] and [NEXT] commands for the number of times set. Repeats endlessly with [FOR (0) NEXT].
LPOS (Note 1)	Current position latch	-	Latches the current position with the rising edge of the LPS signal. The latched current position data can be read with the communication command.
TIM(setting value)	Dwell	1 to 20000 [ms]	Waits for the next step until the set time passes.
ZRT	Home position return	-	Executes a manual home position return.
TIMES(setting value)	Program count command	0, and 1 to 10000 [number of times]	Set the number of program execution by writing [TIMES (setting value)] command in the first line of the program. The setting is not required for executing once. Repeats endlessly with [TIMES (0)].
STOP	Program stop	-	Stops the program in execution. Be sure to write this command in the final line.

Notes: 1. [SYNC], [OUTON], [OUTOF], [TRIP], [TRIPi], [ITP], [COUNT], and [LPOS] commands are valid while the commands are outputted.

2. [SPN] command is valid while [MOV], [MOVA], [MOVI], or [MOVIA] command is in execution. [STA], [STB], [STC], and [STD] commands are valid while [MOV] or [MOVI] command is in execution.

3. [ITP] command will be skipped to the next step when the remaining distance equals to or less than the setting value, when the servo motor is not running, or when the servo motor is decelerating.

4. Change the unit to μm /inch/degree/pulse with [Pr. PT01].

5. STM is the ratio to the setting value of the position data. STM can be changed with [Pr. PT03].

MR-J4-A-RJ Positioning Function: Program Method

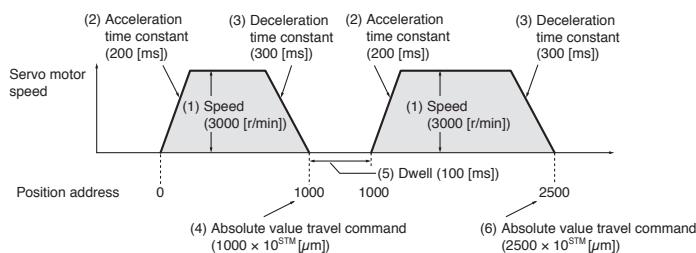
Command list

Command	Name	Setting range	Description
TLP(setting value)	Forward rotation torque limit	0, and 1 to 1000 [0.1%]	Limits the torque generated by the servo motor driving in CCW and regenerating in CW, as the maximum torque is 100%. The setting remains valid until the program is stopped. [TLP (0)] enables the setting of [Pr. PA11].
TLN(setting value)	Reverse rotation torque limit	0, and 1 to 1000 [0.1%]	Limits the torque generated by the servo motor driving in CW and regenerating in CCW, as the maximum torque is 100%. The setting remains valid until the program is stopped. [TLN (0)] enables the setting of [Pr. PA12].
TQL(setting value)	Torque limit	0, and 1 to 1000 [0.1%]	Limits the torque generated by the servo motor, as the maximum torque is 100%. The setting remains valid until the program is stopped. [TQL (0)] enables the settings of [Pr. PA11] and [Pr. PA12].

Program example 1

The following is an example of executing two types of operations with the same servo motor speed and acceleration/deceleration time constants but the different travel commands.

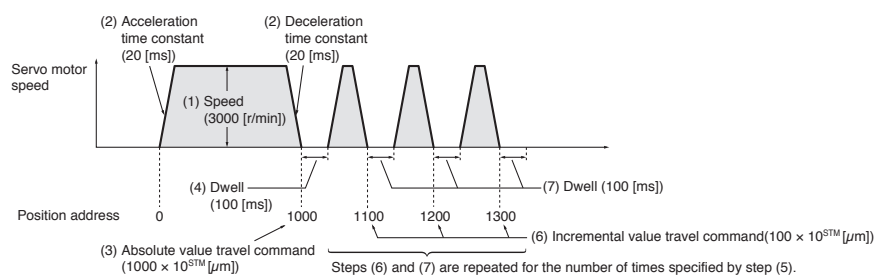
Step	Program (Note 1)	Description
(1)	SPN(3000)	Servo motor speed: 3000 [r/min]
(2)	STA(200)	Acceleration time constant: 200 [ms]
(3)	STB(300)	Deceleration time constant: 300 [ms]
(4)	MOV(1000)	Absolute value travel command: 1000 [$\times 10^{STM} \mu\text{m}$]
(5)	TIM(100)	Dwell: 100 [ms]
(6)	MOV(2500)	Absolute value travel command: 2500 [$\times 10^{STM} \mu\text{m}$]
(7)	STOP	Program stop



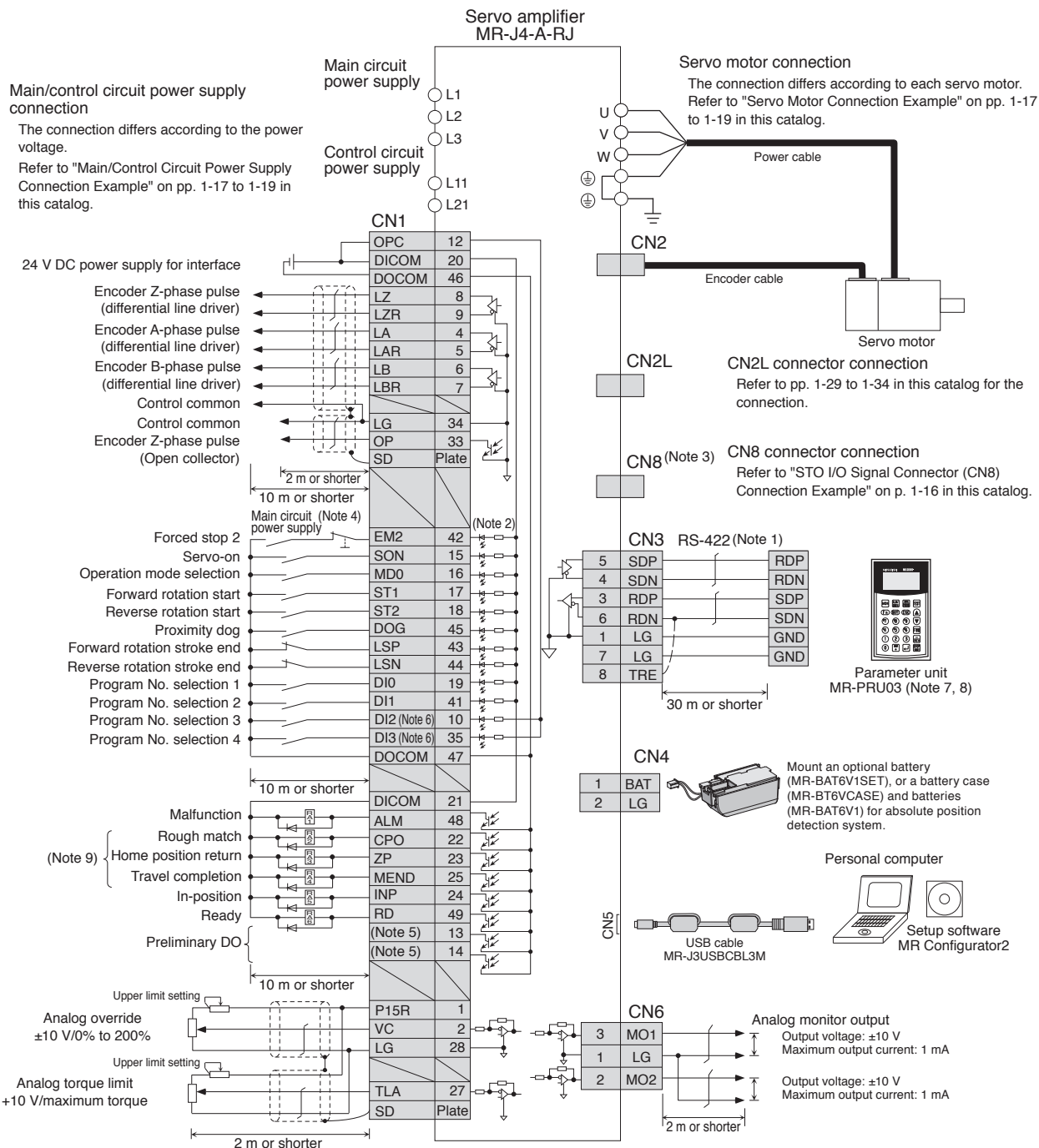
Program example 2

The following is an example of repeating the steps between [FOR (setting value)] and [NEXT] commands for the number of times set.

Step	Program (Note 1)	Description
(1)	SPN(3000)	Servo motor speed: 3000 [r/min]
(2)	STC(20)	Acceleration/deceleration time constants: 20 [ms]
(3)	MOV(1000)	Absolute value travel command: 1000 [$\times 10^{STM} \mu\text{m}$]
(4)	TIM(100)	Dwell: 100 [ms]
(5)	FOR(3)	Starting the step repeat command: 3 [number of times]
(6)	MOVI(100)	Incremental value travel command: 100 [$\times 10^{STM} \mu\text{m}$]
(7)	TIM(100)	Dwell: 100 [ms]
(8)	NEXT	Ending the step repeat command
(9)	STOP	Program stop



MR-J4-A-RJ Standard Wiring Diagram Example: Program Method



- Notes: 1. It is also possible to connect a personal computer to CN3 connector with an RS-422/RS-232C conversion cable. However, USB interface (CN5 connector) and RS-422 interface (CN3 connector) are mutually exclusive. Do not use them at the same time. Refer to "Products on the Market for Servo Amplifiers" in this catalog for the RS-422/RS-232C conversion cable.
2. This is for sink wiring. Source wiring is also possible. However, when input devices are assigned to CN1-10 pin and CN1-35 pin, be sure to use sink wiring. Source wiring is not possible in this case. In the positioning mode, input devices are assigned in the initial setting. Refer to "MR-J4-A-RJ Servo Amplifier Instruction Manual (Positioning Mode)" for details.
3. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
4. Create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
5. No output device is assigned in the initial setting. Assign an output device with [Pr. PD47] as necessary.
6. DI2 and DI3 are assigned to CN1-10 pin and CN1-35 pin respectively in the initial setting. Change them with [Pr. PD44] and [Pr. PD46] when using a manual pulse generator.
7. Use a commercial LAN cable (EIA568 compliant), and keep the wiring distance within 10 m when using MR-PRU03 parameter unit.
8. Programs cannot be edited with the parameter unit.
9. Assign the output devices mentioned to CN1-22 pin, CN1-23 pin, and CN1-25 pin with [Pr. PD23], [Pr. PD24] and [Pr. PD26].



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-J4-A-RJ Positioning Function: Indexer (Turret) Method

Positioning is executed by specifying stations (maximum of 255 stations).

Travel distance is automatically calculated with parameters by setting the numbers of stations.

Item		Description	
Command method		Command interface	DIO (input: 11 points (excluding forced stop input (EM2)), and output: 8 points), RS-422
		Operating specification	Positioning by specifying the station position The maximum number of divisions: 255
		Speed command input	Selects the rotation speed and acceleration/deceleration time
		System	Rotation direction specifying indexer, shortest rotating indexer
		Digital override	Selects the override multiplying factor by DI
		Torque limit	Set by parameters or external analog input (0 V DC to +10 V DC/maximum torque)
Operation mode	Automatic operation mode	Rotation direction specifying indexer	Positions to the specified station. Rotation direction settable
		Shortest rotating indexer	Positions to the specified station. Rotates in the shorter direction from the current position.
	Manual operation mode	JOG operation	Decelerates to a stop regardless of the station
		Station JOG operation	Rotates in a direction specified by the rotation direction decision when the start signal turns on. Positions to the nearest station where the servo motor can decelerate to a stop when the start signal turns off.
	Home position return mode	Torque limit changing dog type	Returns to home position upon Z-phase pulse after passing through the front end of proximity dog. Home position return direction selectable, home position shift distance settable, home position address settable, torque limit automatic switching function
		Torque limit changing data set type	Returns to home position without dog. Any position settable as home position, home position address settable, torque limit automatic switching function
Other functions		Absolute position detection system, backlash compensation, overtravel prevention with external limit switches (LSP/LSN), digital override function	

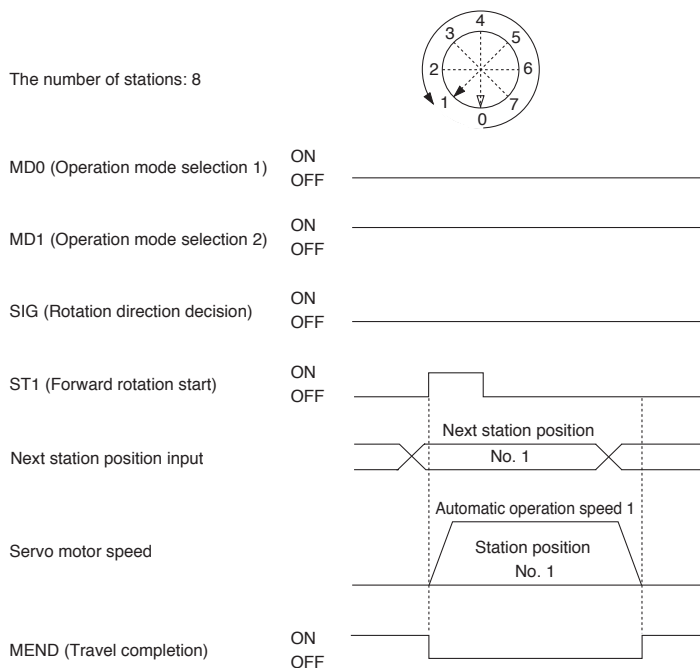
MR-J4-A-RJ Positioning Function: Indexer (Turret) Method

Rotation direction specifying indexer

In the rotation direction specifying indexer, the servo motor always rotates in a definite direction.

Turn off MD0 (Operation mode selection 1), and turn on MD1 (Operation mode selection 2). The servo motor moves in the station No. decreasing direction with SIG (Rotation direction decision) off, and in the increasing direction with SIG on. When ST1 (Forward rotation direction) turns on, the travel amount will be calculated from the current position and the next station position, and then the positioning will be executed to the direction specified by the rotation direction decision.

The following timing chart is an example of the operation executed from the station No. 0 where the servo motor is stopped at servo-on.

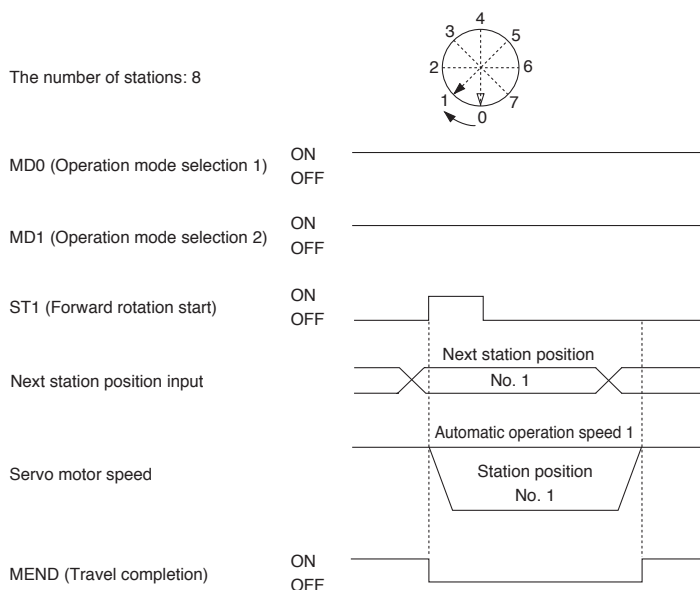


Shortest rotating indexer

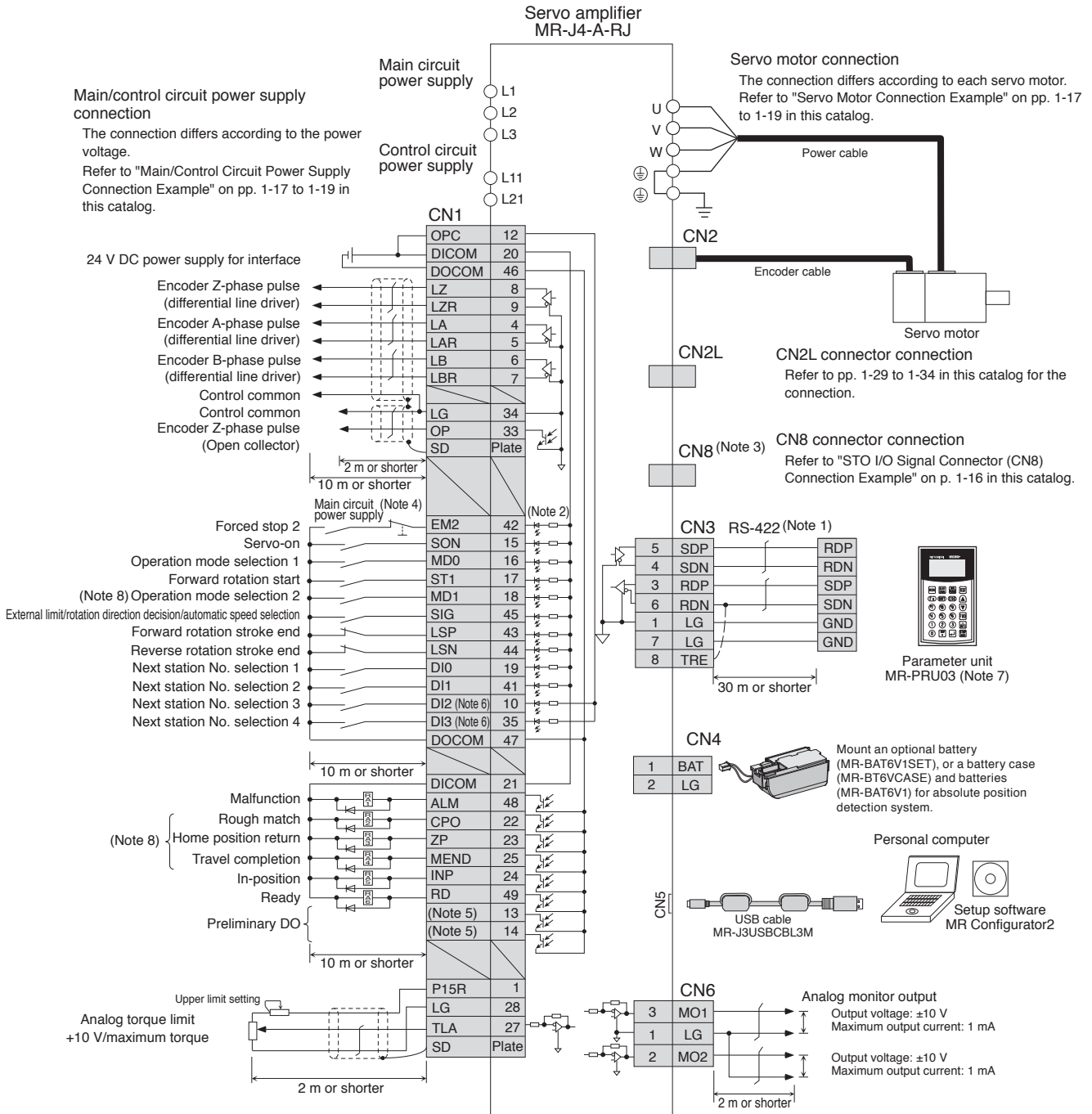
In the shortest rotating indexer, the servo motor automatically rotates in the shorter direction.

Turn on both MD0 (Operation mode selection 1) and MD1 (Operation mode selection 2). When ST1 (Forward rotation direction) turns on, the travel amount will be calculated from the current position and the next station position, and then the positioning will be executed in the shorter direction.

The following timing chart is an example of the operation executed from the station No. 0 where the servo motor is stopped at servo-on.



MR-J4-A-RJ Standard Wiring Diagram Example: Indexer (Turret) Method



- Notes: 1. It is also possible to connect a personal computer to CN3 connector with an RS-422/RS-232C conversion cable. However, USB interface (CN5 connector) and RS-422 interface (CN3 connector) are mutually exclusive. Do not use them at the same time. Refer to "Products on the Market for Servo Amplifiers" in this catalog for the RS-422/RS-232C conversion cable.
2. This is for sink wiring. Source wiring is also possible. However, when input devices are assigned to CN1-10 pin and CN1-35 pin, be sure to use sink wiring. Source wiring is not possible in this case. In the positioning mode, input devices are assigned in the initial setting. Refer to "MR-J4_A-RJ Servo Amplifier Instruction Manual (Positioning Mode)" for details.
3. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
4. Create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
5. No output device is assigned in the initial setting. Assign an output device with [Pr. PD47] as necessary.
6. DI2 and DI3 are assigned to CN1-10 pin and CN1-35 pin respectively in the initial setting. Change them with [Pr. PD44] and [Pr. PD46] when using a manual pulse generator.
7. Use a commercial LAN cable (EIA568 compliant), and keep the wiring distance within 10 m when using MR-PRU03 parameter unit.
8. Assign the output devices mentioned to CN1-18, CN1-22 pin, CN1-23 pin, and CN1-25 pin with [Pr. PD10], [Pr. PD23], [Pr. PD24] and [Pr. PD26].

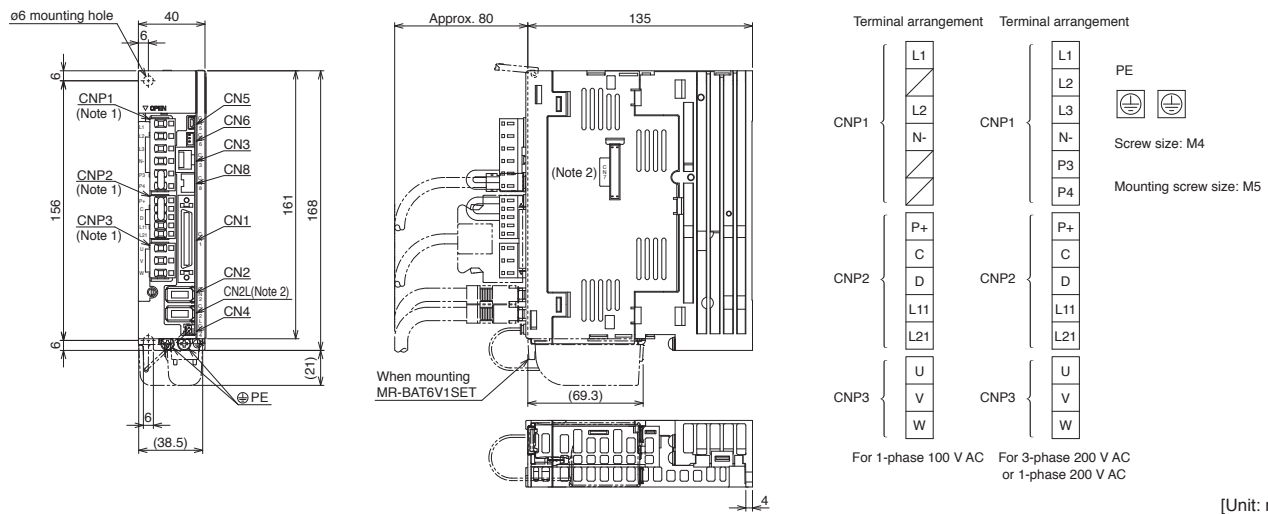


Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

MR-J4-A/MR-J4-A-RJ Dimensions

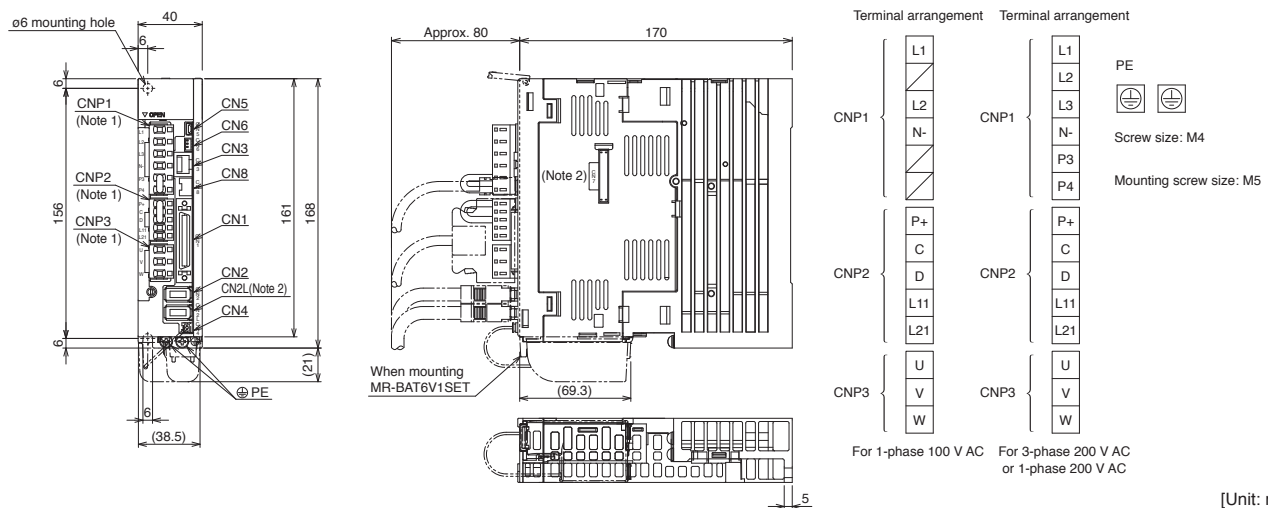
A-RJ

- MR-J4-10A, MR-J4-10A-RJ, MR-J4-10A1, MR-J4-10A1-RJ
●MR-J4-20A, MR-J4-20A-RJ, MR-J4-20A1, MR-J4-20A1-RJ



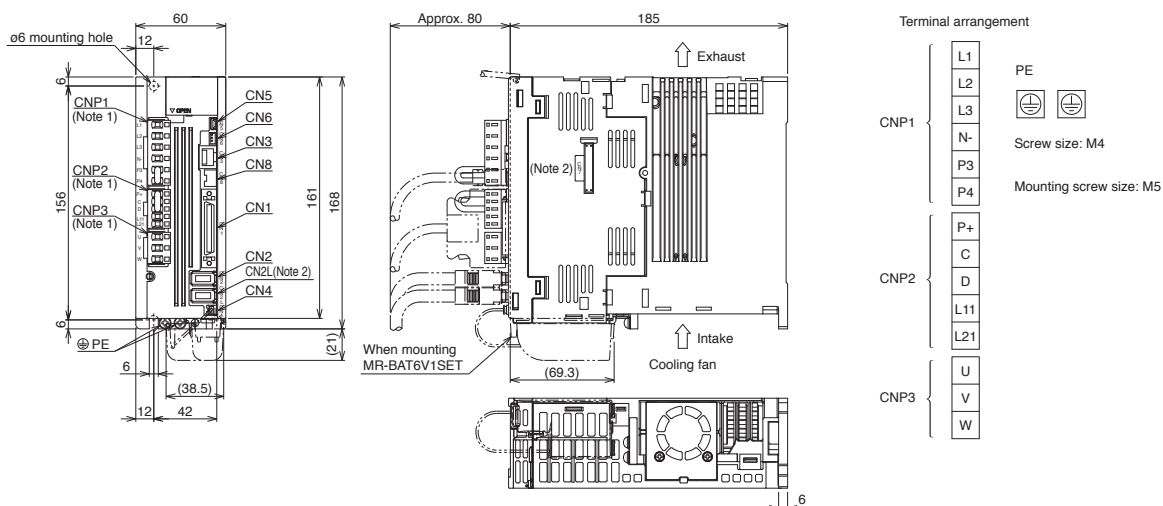
[Unit: mm]

- MR-J4-40A, MR-J4-40A-RJ, MR-J4-40A1, MR-J4-40A1-RJ
- MR-J4-60A, MR-J4-60A-RJ



[Unit: mm]

- MR-J4-70A, MR-J4-70A-RJ
- MR-J4-100A, MR-J4-100A-RJ

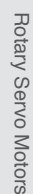


[Unit: mm]

Notes: 1. CNP1, CNP2 and CNP3 connectors (insertion type) are supplied with the servo amplifier.
2. CN2L and CN7 connectors are not available for MR-J4-A servo amplifier.

A A-RJ

- ## Servo Amplifiers



Linear Servo Motors

Direct Drive Motors

- Options/Peripherals
-
- Equipment



Product List

Cautions



1-94

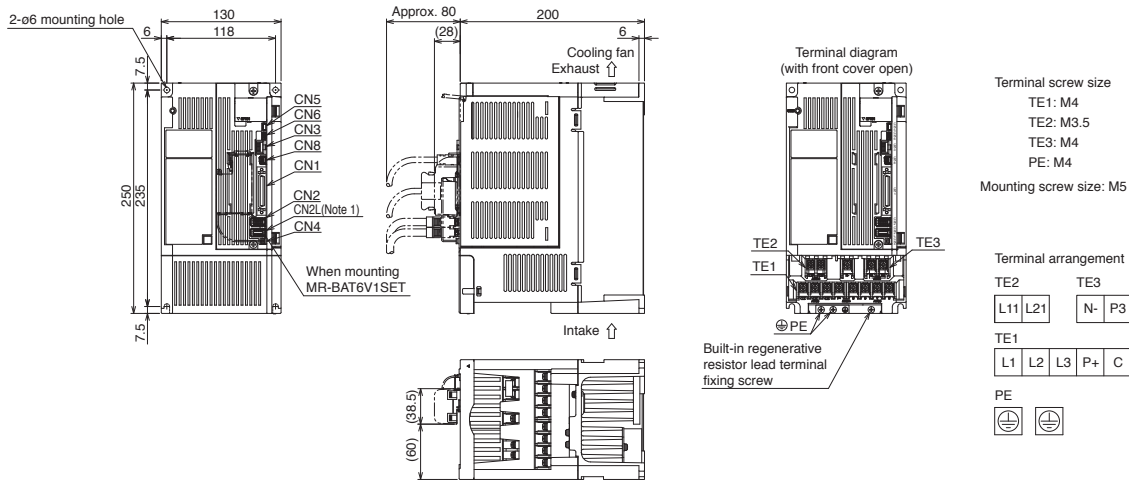


MR-J4-A/MR-J4-A-RJ Dimensions

A

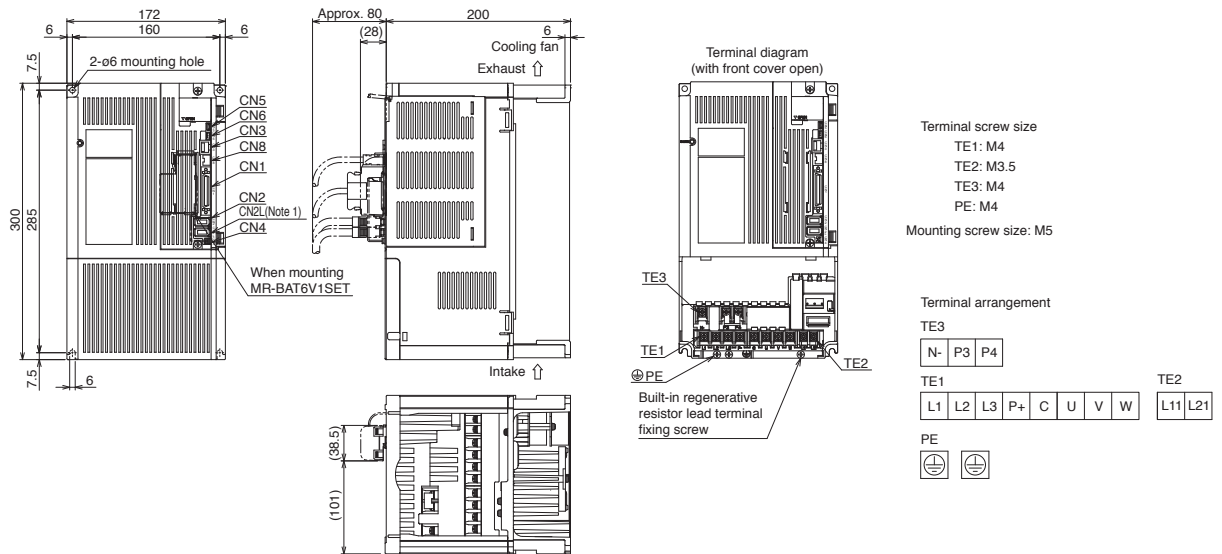
A-RJ

●MR-J4-500A4, MR-J4-500A4-RJ



[Unit: mm]

●MR-J4-700A, MR-J4-700A-RJ, MR-J4-700A4, MR-J4-700A4-RJ



[Unit: mm]

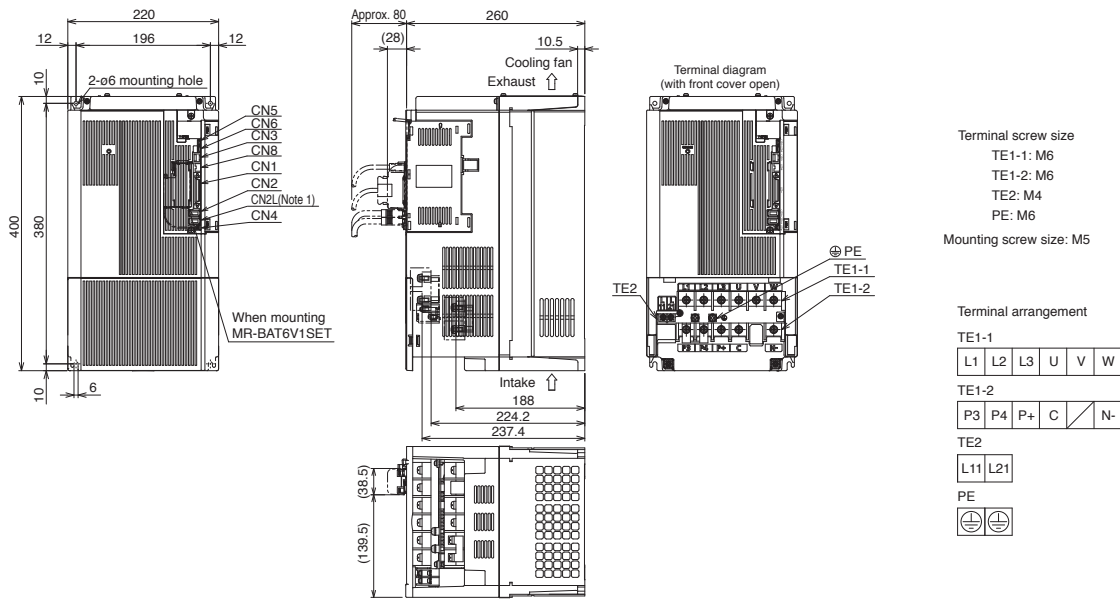
Notes: 1. CN2L and CN7 connectors are not available for MR-J4-A servo amplifier.

MR-J4-A/MR-J4-A-RJ Dimensions

A

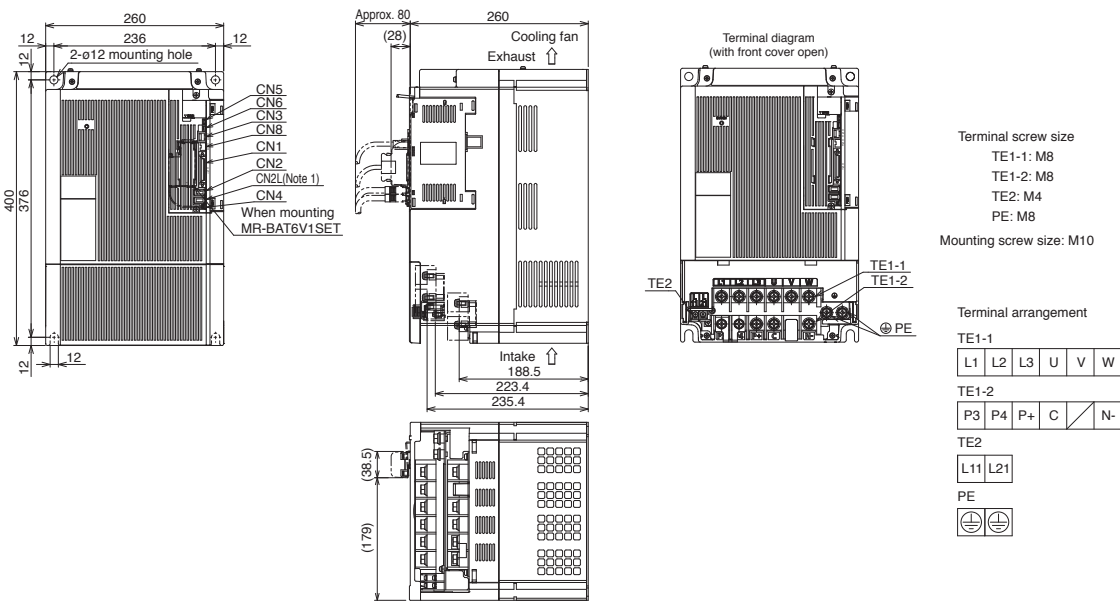
A-RJ

- MR-J4-11KA, MR-J4-11KA-RJ, MR-J4-11KA4, MR-J4-11KA4-RJ
- MR-J4-15KA, MR-J4-15KA-RJ, MR-J4-15KA4, MR-J4-15KA4-RJ



[Unit: mm]

- MR-J4-22KA, MR-J4-22KA-RJ, MR-J4-22KA4, MR-J4-22KA4-RJ



[Unit: mm]

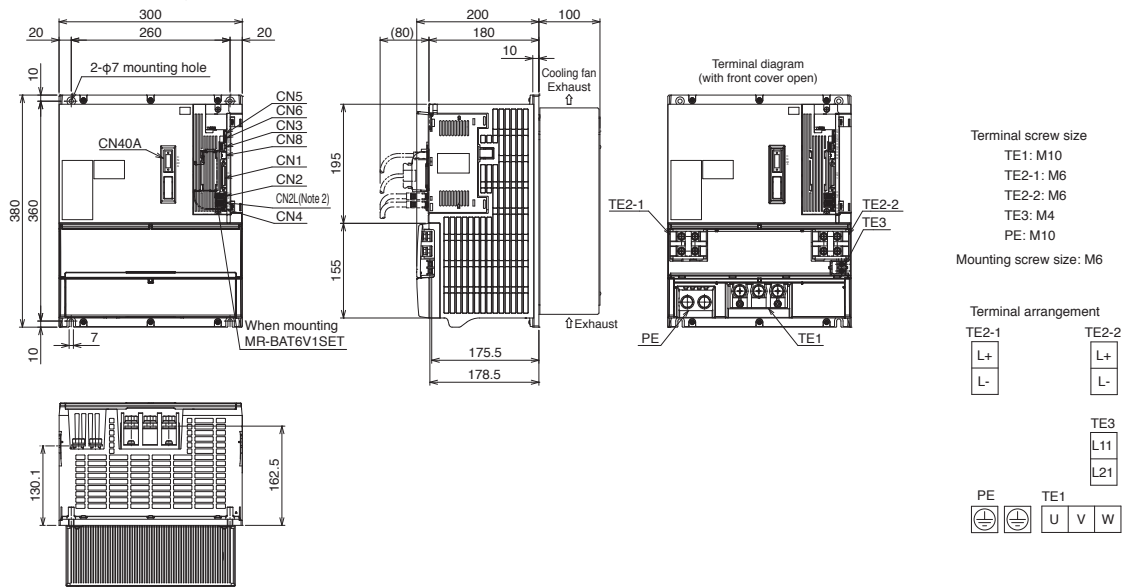
Notes: 1. CN2L and CN7 connectors are not available for MR-J4-A servo amplifier.



MR-J4-DU_A/MR-J4-DU_A-RJ Dimensions (Note 1)

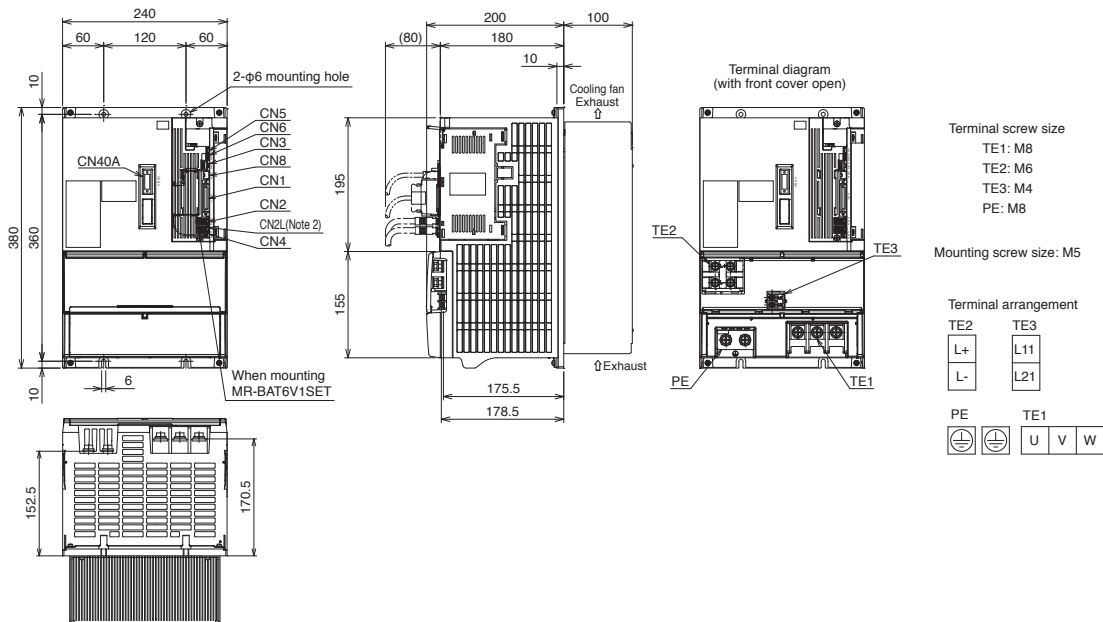
A A-RJ

- MR-J4-DU30KA, MR-J4-DU30KA-RJ
- MR-J4-DU37KA, MR-J4-DU37KA-RJ
- MR-J4-DU45KA4, MR-J4-DU45KA4-RJ
- MR-J4-DU55KA4, MR-J4-DU55KA4-RJ



[Unit: mm]

- MR-J4-DU30KA4, MR-J4-DU30KA4-RJ
- MR-J4-DU37KA4, MR-J4-DU37KA4-RJ



[Unit: mm]

Notes: 1. For the panel cut dimensions, refer to "Panel Cut Dimensions for Converter Unit and Drive Unit" in this catalog.
2. CN2L and CN7 connectors are not available for MR-J4-DU_A_ drive unit.

MEMO

2

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* Refer to p. 5-73 in this catalog for conversion of units.

Rotary Servo Motors

Model Designation

For 200 V class

H G - K R 0 5 3 B ☐ ☐ ☐

Symbol	Shaft end
None	Standard (Straight shaft) (Note 6)
K	Key shaft (with/without key) (Note 7)
D	D-cut shaft (Note 7)

Symbol	Reducer (Note 5)
None	None
G1	With reducer for general industrial machines, flange mounting
G1H	With reducer for general industrial machines, foot mounting
G5	With flange-output type reducer for high precision applications, flange mounting
G7	With shaft-output type reducer for high precision applications, flange mounting

Symbol	Oil seal
None	None (Note 8)
J	Installed (Note 2, 3, 4)

Symbol	Electromagnetic brake
None	None
B	Installed (Note 1)

Symbol	Rated speed [r/min]
1	1000
1M	1500
2	2000
3	3000

Symbol	Rated output [kW]	Symbol	Rated output [kW]
05	0.05	50	5.0
1	0.1	60	6.0
2	0.2	70	7.0
4	0.4	80	8.0
5	0.5	90	9.0
7	0.75	11K	11
8	0.85	12K	12
10	1.0	15K	15
12	1.2	20K	20
15	1.5	22K	22
20	2.0	25K	25
30	3.0	30K	30
35	3.5 (Note 9)	37K	37
42	4.2		

Symbol	Inertia/capacity
HG-KR	Low inertia, small capacity
HG-MR	Ultra-low inertia, small capacity
HG-SR	Medium inertia, medium capacity
HG-JR	Low inertia, medium-large capacity
HG-RR	Ultra-low inertia, medium capacity
HG-UR	Flat type, 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. Available in 0.1 kW or larger HG-KR/HG-MR series and all HG-SR series.

3. Oil seal is not installed in the geared servo motor.

4. Dimensions for HG-KR/HG-MR series with oil seal are different from those for the standard models. Contact your local sales office for more details.

5. Refer to "Geared Servo Motor Specifications" in this catalog for the available models and detailed specifications.

6. Standard HG-SR G1/G1H has a key shaft (with key).

7. Refer to special shaft end specifications of each servo motor series in this catalog for the available models and detailed specifications.

8. Oil seal is installed in HG-JR, HG-RR, and HG-UR series as a standard.

9. For HG-JR353(B), the rated output varies depending on the servo amplifier to be combined. Refer to "HG-JR 3000 r/min Series (Low Inertia, Medium Capacity) (200 V Class) Specifications" for details.

Model Designation

For 400 V class

H G - S R 5 2 4 B □ □ □

Symbol	Oil seal
None	None (Note 4)
J	Installed (Note 2, 3)

Symbol	Electromagnetic brake
None	None
B	Installed (Note 1)

Symbol	Rated speed [r/min]
1	1000
1M	1500
2	2000
3	3000

Symbol	Rated output [kW]	Symbol	Rated output [kW]
5	0.5	11K	11
7	0.75	12K	12
10	1.0	15K	15
15	1.5	20K	20
20	2.0	22K	22
35	3.5 (Note 8)	25K	25
50	5.0	30K	30
60	6.0	37K	37
70	7.0	45K	45
80	8.0	55K	55
90	9.0		

Symbol	Inertia/capacity
HG-SR	Medium inertia, medium capacity
HG-JR	Low inertia, medium-large capacity

Symbol	Reducer (Note 5)
None	None
G1	With reducer for general industrial machines, flange mounting
G1H	With reducer for general industrial machines, foot mounting
G5	With flange-output type reducer for high precision applications, flange mounting
G7	With shaft-output type reducer for high precision applications, flange mounting

Symbol	Shaft end
None	Standard (Straight shaft) (Note 6)
K	Key shaft (with/without key) (Note 7)

Notes: 1. Refer to electromagnetic brake specifications of each servo motor series in this catalog for the available models and detailed specifications.

2. Available in HG-SR series.

3. Oil seal is not installed in the geared servo motor.

4. Oil seal is installed in HG-JR series as a standard.

5. Refer to "Geared Servo Motor Specifications" in this catalog for the available models and detailed specifications.

6. Standard HG-SR G1/G1H has a key shaft (with key).

7. Refer to special shaft end specifications of each servo motor series in this catalog for the available models and detailed specifications.

8. For HG-JR3534(B), the rated output varies depending on the servo amplifier to be combined. Refer to "HG-JR 3000 r/min Series (Low Inertia, Medium Capacity) (400 V Class) Specifications" for details.

Combinations of Rotary Servo Motor and Servo Amplifier (200 V/100 V Class)

Rotary servo motor		Servo amplifier		
		MR-J4	MR-J4W2 (Note 1)	MR-J4W3 (Note 1)
HG-KR series	HG-KR053(B)	MR-J4-10B(-RJ), MR-J4-10B1(-RJ), MR-J4-10B-RJ010, MR-J4-10A(-RJ), MR-J4-10A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	HG-KR13(B)	MR-J4-10B(-RJ), MR-J4-10B1(-RJ), MR-J4-10B-RJ010, MR-J4-10A(-RJ), MR-J4-10A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	HG-KR23(B)	MR-J4-20B(-RJ), MR-J4-20B1(-RJ), MR-J4-20B-RJ010, MR-J4-20A(-RJ), MR-J4-20A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	HG-KR43(B)	MR-J4-40B(-RJ), MR-J4-40B1(-RJ), MR-J4-40B-RJ010, MR-J4-40A(-RJ), MR-J4-40A1(-RJ)	MR-J4W2-44B, MR-J4W2-77B, MR-J4W2-1010B	MR-J4W3-444B
	HG-KR73(B)	MR-J4-70B(-RJ), MR-J4-70B-RJ010, MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
HG-MR series	HG-MR053(B)	MR-J4-10B(-RJ), MR-J4-10B1(-RJ), MR-J4-10B-RJ010, MR-J4-10A(-RJ), MR-J4-10A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	HG-MR13(B)	MR-J4-10B(-RJ), MR-J4-10B1(-RJ), MR-J4-10B-RJ010, MR-J4-10A(-RJ), MR-J4-10A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	HG-MR23(B)	MR-J4-20B(-RJ), MR-J4-20B1(-RJ), MR-J4-20B-RJ010, MR-J4-20A(-RJ), MR-J4-20A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	HG-MR43(B)	MR-J4-40B(-RJ), MR-J4-40B1(-RJ), MR-J4-40B-RJ010, MR-J4-40A(-RJ), MR-J4-40A1(-RJ)	MR-J4W2-44B, MR-J4W2-77B, MR-J4W2-1010B	MR-J4W3-444B
	HG-MR73(B)	MR-J4-70B(-RJ), MR-J4-70B-RJ010, MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
HG-SR 1000 r/min series	HG-SR51(B)	MR-J4-60B(-RJ), MR-J4-60B-RJ010, MR-J4-60A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	HG-SR81(B)	MR-J4-100B(-RJ), MR-J4-100B-RJ010, MR-J4-100A(-RJ)	MR-J4W2-1010B	-
	HG-SR121(B)	MR-J4-200B(-RJ), MR-J4-200B-RJ010, MR-J4-200A(-RJ)	-	-
	HG-SR201(B)	MR-J4-200B(-RJ), MR-J4-200B-RJ010, MR-J4-200A(-RJ)	-	-
	HG-SR301(B)	MR-J4-350B(-RJ), MR-J4-350B-RJ010, MR-J4-350A(-RJ)	-	-
	HG-SR421(B)	MR-J4-500B(-RJ), MR-J4-500B-RJ010, MR-J4-500A(-RJ)	-	-
HG-SR 2000 r/min series	HG-SR52(B)	MR-J4-60B(-RJ), MR-J4-60B-RJ010, MR-J4-60A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	HG-SR102(B)	MR-J4-100B(-RJ), MR-J4-100B-RJ010, MR-J4-100A(-RJ)	MR-J4W2-1010B	-
	HG-SR152(B)	MR-J4-200B(-RJ), MR-J4-200B-RJ010, MR-J4-200A(-RJ)	-	-
	HG-SR202(B)	MR-J4-200B(-RJ), MR-J4-200B-RJ010, MR-J4-200A(-RJ)	-	-
	HG-SR352(B)	MR-J4-350B(-RJ), MR-J4-350B-RJ010, MR-J4-350A(-RJ)	-	-
	HG-SR502(B)	MR-J4-500B(-RJ), MR-J4-500B-RJ010, MR-J4-500A(-RJ)	-	-
	HG-SR702(B)	MR-J4-700B(-RJ), MR-J4-700B-RJ010, MR-J4-700A(-RJ)	-	-
HG-JR 3000 r/min series	HG-JR53(B)	MR-J4-60B(-RJ), MR-J4-60B-RJ010, MR-J4-60A(-RJ)	MR-J4W2-77B	-
	HG-JR73(B)	MR-J4-70B(-RJ), MR-J4-70B-RJ010, MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	HG-JR103(B)	MR-J4-100B(-RJ), MR-J4-100B-RJ010, MR-J4-100A(-RJ)	MR-J4W2-1010B	-

Notes: 1. Any combination of the servo motors is possible as long as the servo motors are compatible with the servo amplifier. Refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-6 in this catalog.



Combinations of Rotary Servo Motor and Servo Amplifier (200 V Class)

Rotary servo motor		Servo amplifier/drive unit		
		MR-J4	MR-J4W2 (Note 1)	MR-J4W3 (Note 1)
HG-JR 3000 r/min series	HG-JR153(B)	MR-J4-200B(-RJ), MR-J4-200B-RJ010, MR-J4-200A(-RJ)	-	-
	HG-JR203(B)	MR-J4-200B(-RJ), MR-J4-200B-RJ010, MR-J4-200A(-RJ)	-	-
	HG-JR353(B)	MR-J4-350B(-RJ), MR-J4-350B-RJ010, MR-J4-350A(-RJ)	-	-
	HG-JR503(B)	MR-J4-500B(-RJ), MR-J4-500B-RJ010, MR-J4-500A(-RJ)	-	-
	HG-JR703(B)	MR-J4-700B(-RJ), MR-J4-700B-RJ010, MR-J4-700A(-RJ)	-	-
	HG-JR903(B)	MR-J4-11KB(-RJ), MR-J4-11KB-RJ010, MR-J4-11KA(-RJ)	-	-
HG-JR 1000 r/min series	HG-JR601(B)	MR-J4-700B(-RJ), MR-J4-700B-RJ010, MR-J4-700A(-RJ)	-	-
	HG-JR801(B)	MR-J4-11KB(-RJ), MR-J4-11KB-RJ010, MR-J4-11KA(-RJ)	-	-
	HG-JR12K1(B)	MR-J4-11KB(-RJ), MR-J4-11KB-RJ010, MR-J4-11KA(-RJ)	-	-
	HG-JR15K1	MR-J4-15KB(-RJ), MR-J4-15KB-RJ010, MR-J4-15KA(-RJ)	-	-
	HG-JR20K1	MR-J4-22KB(-RJ), MR-J4-22KB-RJ010, MR-J4-22KA(-RJ)	-	-
	HG-JR25K1	MR-J4-22KB(-RJ), MR-J4-22KB-RJ010, MR-J4-22KA(-RJ)	-	-
	HG-JR30K1	MR-J4-DU30KB(-RJ), MR-J4-DU30KA(-RJ)	-	-
	HG-JR37K1	MR-J4-DU37KB(-RJ), MR-J4-DU37KA(-RJ)	-	-
HG-JR 1500 r/min series	HG-JR701M(B)	MR-J4-700B(-RJ), MR-J4-700B-RJ010, MR-J4-700A(-RJ)	-	-
	HG-JR11K1M(B)	MR-J4-11KB(-RJ), MR-J4-11KB-RJ010, MR-J4-11KA(-RJ)	-	-
	HG-JR15K1M(B)	MR-J4-15KB(-RJ), MR-J4-15KB-RJ010, MR-J4-15KA(-RJ)	-	-
	HG-JR22K1M	MR-J4-22KB(-RJ), MR-J4-22KB-RJ010, MR-J4-22KA(-RJ)	-	-
	HG-JR30K1M	MR-J4-DU30KB(-RJ), MR-J4-DU30KA(-RJ)	-	-
	HG-JR37K1M	MR-J4-DU37KB(-RJ), MR-J4-DU37KA(-RJ)	-	-
HG-RR series	HG-RR103(B)	MR-J4-200B(-RJ), MR-J4-200B-RJ010, MR-J4-200A(-RJ)	-	-
	HG-RR153(B)	MR-J4-200B(-RJ), MR-J4-200B-RJ010, MR-J4-200A(-RJ)	-	-
	HG-RR203(B)	MR-J4-350B(-RJ), MR-J4-350B-RJ010, MR-J4-350A(-RJ)	-	-
	HG-RR353(B)	MR-J4-500B(-RJ), MR-J4-500B-RJ010, MR-J4-500A(-RJ)	-	-
	HG-RR503(B)	MR-J4-500B(-RJ), MR-J4-500B-RJ010, MR-J4-500A(-RJ)	-	-
HG-UR series	HG-UR72(B)	MR-J4-70B(-RJ), MR-J4-70B-RJ010, MR-J4-70A(-RJ)	MR-J4W2-77B MR-J4W2-1010B	-
	HG-UR152(B)	MR-J4-200B(-RJ), MR-J4-200B-RJ010, MR-J4-200A(-RJ)	-	-
	HG-UR202(B)	MR-J4-350B(-RJ), MR-J4-350B-RJ010, MR-J4-350A(-RJ)	-	-
	HG-UR352(B)	MR-J4-500B(-RJ), MR-J4-500B-RJ010, MR-J4-500A(-RJ)	-	-
	HG-UR502(B)	MR-J4-500B(-RJ), MR-J4-500B-RJ010, MR-J4-500A(-RJ)	-	-

Notes: 1. Any combination of the servo motors is possible as long as the servo motors are compatible with the servo amplifier. Refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-6 in this catalog.

Combinations of Rotary Servo Motor and Servo Amplifier (400 V Class)

Rotary servo motor		Servo amplifier/drive unit		
		MR-J4	MR-J4W2	MR-J4W3
HG-SR 2000 r/min series	HG-SR524(B)	MR-J4-60B4(-RJ), MR-J4-60B4-RJ010, MR-J4-60A4(-RJ)	-	-
	HG-SR1024(B)	MR-J4-100B4(-RJ), MR-J4-100B4-RJ010, MR-J4-100A4(-RJ)	-	-
	HG-SR1524(B)	MR-J4-200B4(-RJ), MR-J4-200B4-RJ010, MR-J4-200A4(-RJ)	-	-
	HG-SR2024(B)	MR-J4-200B4(-RJ), MR-J4-200B4-RJ010, MR-J4-200A4(-RJ)	-	-
	HG-SR3524(B)	MR-J4-350B4(-RJ), MR-J4-350B4-RJ010, MR-J4-350A4(-RJ)	-	-
	HG-SR5024(B)	MR-J4-500B4(-RJ), MR-J4-500B4-RJ010, MR-J4-500A4(-RJ)	-	-
	HG-SR7024(B)	MR-J4-700B4(-RJ), MR-J4-700B4-RJ010, MR-J4-700A4(-RJ)	-	-
HG-JR 3000 r/min series	HG-JR534(B)	MR-J4-60B4(-RJ), MR-J4-60B4-RJ010, MR-J4-60A4(-RJ)	-	-
	HG-JR734(B)	MR-J4-100B4(-RJ), MR-J4-100B4-RJ010, MR-J4-100A4(-RJ)	-	-
	HG-JR1034(B)	MR-J4-100B4(-RJ), MR-J4-100B4-RJ010, MR-J4-100A4(-RJ)	-	-
	HG-JR1534(B)	MR-J4-200B4(-RJ), MR-J4-200B4-RJ010, MR-J4-200A4(-RJ)	-	-
	HG-JR2034(B)	MR-J4-200B4(-RJ), MR-J4-200B4-RJ010, MR-J4-200A4(-RJ)	-	-
	HG-JR3534(B)	MR-J4-350B4(-RJ), MR-J4-350B4-RJ010, MR-J4-350A4(-RJ)	-	-
	HG-JR5034(B)	MR-J4-500B4(-RJ), MR-J4-500B4-RJ010, MR-J4-500A4(-RJ)	-	-
	HG-JR7034(B)	MR-J4-700B4(-RJ), MR-J4-700B4-RJ010, MR-J4-700A4(-RJ)	-	-
	HG-JR9034(B)	MR-J4-11KB4(-RJ), MR-J4-11KB4-RJ010, MR-J4-11KA4(-RJ)	-	-
HG-JR 1000 r/min series	HG-JR6014(B)	MR-J4-700B4(-RJ), MR-J4-700B4-RJ010, MR-J4-700A4(-RJ)	-	-
	HG-JR8014(B)	MR-J4-11KB4(-RJ), MR-J4-11KB4-RJ010, MR-J4-11KA4(-RJ)	-	-
	HG-JR12K14(B)	MR-J4-11KB4(-RJ), MR-J4-11KB4-RJ010, MR-J4-11KA4(-RJ)	-	-
	HG-JR15K14	MR-J4-15KB4(-RJ), MR-J4-15KB4-RJ010, MR-J4-15KA4(-RJ)	-	-
	HG-JR20K14	MR-J4-22KB4(-RJ), MR-J4-22KB4-RJ010, MR-J4-22KA4(-RJ)	-	-
	HG-JR25K14	MR-J4-22KB4(-RJ), MR-J4-22KB4-RJ010, MR-J4-22KA4(-RJ)	-	-
	HG-JR30K14	MR-J4-DU30KB4(-RJ), MR-J4-DU30KA4(-RJ)	-	-
	HG-JR37K14	MR-J4-DU37KB4(-RJ), MR-J4-DU37KA4(-RJ)	-	-
HG-JR 1500 r/min series	HG-JR701M4(B)	MR-J4-700B4(-RJ), MR-J4-700B4-RJ010, MR-J4-700A4(-RJ)	-	-
	HG-JR11K1M4(B)	MR-J4-11KB4(-RJ), MR-J4-11KB4-RJ010, MR-J4-11KA4(-RJ)	-	-
	HG-JR15K1M4(B)	MR-J4-15KB4(-RJ), MR-J4-15KB4-RJ010, MR-J4-15KA4(-RJ)	-	-
	HG-JR22K1M4	MR-J4-22KB4(-RJ), MR-J4-22KB4-RJ010, MR-J4-22KA4(-RJ)	-	-
	HG-JR30K1M4	MR-J4-DU30KB4(-RJ), MR-J4-DU30KA4(-RJ)	-	-
	HG-JR37K1M4	MR-J4-DU37KB4(-RJ), MR-J4-DU37KA4(-RJ)	-	-
	HG-JR45K1M4	MR-J4-DU45KB4(-RJ), MR-J4-DU45KA4(-RJ)	-	-
	HG-JR55K1M4	MR-J4-DU55KB4(-RJ), MR-J4-DU55KA4(-RJ)	-	-



Combinations of HG-JR Servo Motor Series and Servo Amplifier (200 V Class) for Increasing the Maximum Torque to 400% of the Rated Torque

The following combination of the HG-JR servo motor and the servo amplifier increases the maximum torque from 300% to 400% of the rated torque.

Rotary servo motor		Servo amplifier		
		MR-J4	MR-J4W2 (Note 1)	MR-J4W3 (Note 1)
HG-JR 3000 r/min series	HG-JR53(B)	MR-J4-100B(-RJ/-RJ010), MR-J4-100A(-RJ)	MR-J4W2-1010B	-
	HG-JR73(B)	MR-J4-200B(-RJ/-RJ010), MR-J4-200A(-RJ)	-	-
	HG-JR103(B)	MR-J4-200B(-RJ/-RJ010), MR-J4-200A(-RJ)	-	-
	HG-JR153(B)	MR-J4-350B(-RJ/-RJ010), MR-J4-350A(-RJ)	-	-
	HG-JR203(B)	MR-J4-350B(-RJ/-RJ010), MR-J4-350A(-RJ)	-	-
	HG-JR353(B)	MR-J4-500B(-RJ/-RJ010), MR-J4-500A(-RJ)	-	-
	HG-JR503(B)	MR-J4-700B(-RJ/-RJ010), MR-J4-700A(-RJ)	-	-

Notes: 1. Any combination of the servo motors is possible as long as the servo motors are compatible with the servo amplifier. Refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-6 in this catalog.

Combinations of HG-JR Servo Motor Series and Servo Amplifier (400 V Class) for Increasing the Maximum Torque to 400% of the Rated Torque

The following combination of the HG-JR servo motor and the servo amplifier increases the maximum torque from 300% to 400% of the rated torque.

Rotary servo motor		Servo amplifier		
		MR-J4	MR-J4W2 (Note 1)	MR-J4W3 (Note 1)
HG-JR 3000 r/min series	HG-JR534(B)	MR-J4-100B4(-RJ/-RJ010), MR-J4-100A4(-RJ)	-	-
	HG-JR734(B)	MR-J4-200B4(-RJ/-RJ010), MR-J4-200A4(-RJ)	-	-
	HG-JR1034(B)	MR-J4-200B4(-RJ/-RJ010), MR-J4-200A4(-RJ)	-	-
	HG-JR1534(B)	MR-J4-350B4(-RJ/-RJ010), MR-J4-350A4(-RJ)	-	-
	HG-JR2034(B)	MR-J4-350B4(-RJ/-RJ010), MR-J4-350A4(-RJ)	-	-
	HG-JR3534(B)	MR-J4-500B4(-RJ/-RJ010), MR-J4-500A4(-RJ)	-	-
	HG-JR5034(B)	MR-J4-700B4(-RJ/-RJ010), MR-J4-700A4(-RJ)	-	-

Notes: 1. Any combination of the servo motors is possible as long as the servo motors are compatible with the servo amplifier. Refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-6 in this catalog.

HG-KR Series (Low Inertia, Small Capacity) Specifications

Rotary servo motor model			HG-KR	053(B)	13(B)	23(B)	43(B)	73(B)
Compatible servo amplifier model		MR-J4- MR-J4W_-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-3 in this catalog.					
Power supply capacity ^{*1}			[kVA]	0.3	0.3	0.5	0.9	1.3
Continuous running duty	Rated output	[W]	50	100	200	400	750	
	Rated torque ^(Note 3)	[N•m]	0.16	0.32	0.64	1.3	2.4	
Maximum torque			[N•m]	0.56	1.1	2.2	4.5	8.4
Rated speed			[r/min]	3000				
Maximum speed			[r/min]	6000				
Permissible instantaneous speed			[r/min]	6900				
Power rate at continuous rated torque	Standard	[kW/s]	5.63	13.0	18.3	43.7	45.2	
	With electromagnetic brake	[kW/s]	5.37	12.1	16.7	41.3	41.6	
Rated current			[A]	0.9	0.8	1.3	2.6	4.8
Maximum current			[A]	3.2	2.5	4.6	9.1	17
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	(Note 4)	(Note 4)	453	268	157	
	MR-J4W_-	[times/min]	2500	1350	451	268	393	
Moment of inertia J	Standard	[× 10 ⁻⁴ kg•m ²]	0.0450	0.0777	0.221	0.371	1.26	
	With electromagnetic brake	[× 10 ⁻⁴ kg•m ²]	0.0472	0.0837	0.243	0.393	1.37	
Recommended load to motor inertia ratio ^(Note 1)			17 times or less			26 times or less	25 times or less	17 times or less
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)					
Oil seal			None	None (Servo motors with oil seal are available. (HG-KR_J))				
Insulation class			130 (B)					
Structure			Totally enclosed, natural cooling (IP rating: IP65) ^(Note 2)					
Environment ^{*3}	Ambient temperature	Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)						
	Ambient humidity	Operation: 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 ^{*4}	X: 49 m/s ² Y: 49 m/s ²						
Vibration rank			V10 ^{*6}					
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.					
Permissible load for the shaft ^{*5}	L	[mm]	25	25	30	30	40	
	Radial	[N]	88	88	245	245	392	
	Thrust	[N]	59	59	98	98	147	
Mass	Standard	[kg]	0.34	0.54	0.91	1.4	2.8	
	With electromagnetic brake	[kg]	0.54	0.74	1.3	1.8	3.8	

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. For geared servo motor, IP rating of the reducer portion is equivalent to IP44. Refer to the asterisk 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine 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. When the servo motor decelerates to a stop from the maximum speed, the regenerative frequency will not be limited if the following requirements are met.

• HG-KR053(B): The load to motor inertia ratio is 8 times or less, and the effective torque is within the rated torque range.

• HG-KR13(B): The load to motor inertia ratio is 4 times or less, and the effective torque is within the rated torque range.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

HG-KR Series Electromagnetic Brake Specifications (Note 1)

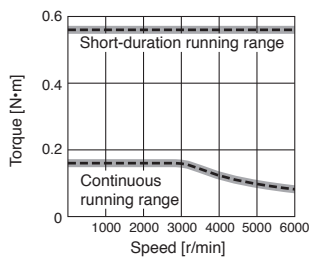
Model	HG-KR	053B	13B	23B	43B	73B
Type	Spring actuated type safety brake					
Rated voltage	24 V DC _{-10%} ^{0%}					
Power consumption [W] at 20 °C		6.3	6.3	7.9	7.9	10
Electromagnetic brake static friction torque [N·m]		0.32	0.32	1.3	1.3	2.4
Permissible braking work	Per braking [J]	5.6	5.6	22	22	64
	Per hour [J]	56	56	220	220	640
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000	20000	20000
	Work per braking [J]	5.6	5.6	22	22	64

Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.

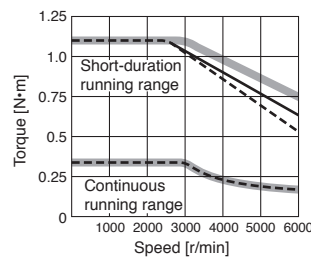
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-KR Series Torque Characteristics

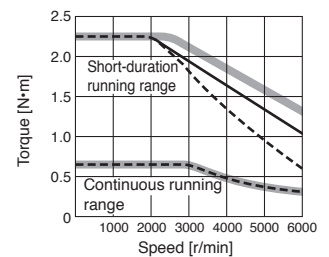
HG-KR053(B) (Note 1, 2, 3, 4)



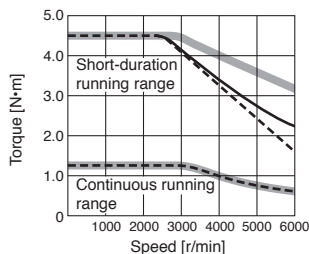
HG-KR13(B) (Note 1, 2, 3, 4)



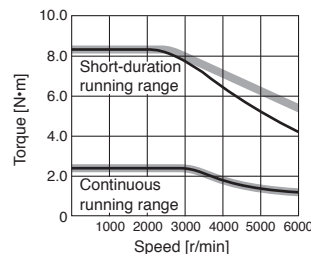
HG-KR23(B) (Note 1, 2, 3, 4)



HG-KR43(B) (Note 1, 2, 3, 4)



HG-KR73(B) (Note 1, 3, 4)

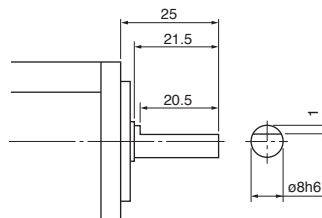


- Notes: 1. — : For 3-phase 200 V AC or 1-phase 230 V AC.
 2. - - - : For 1-phase 100 V AC.
 3. — : For 1-phase 200 V AC.
 This line is drawn only where it differs from the other two lines.
 4. Torque drops when the power supply voltage is below the specified value.

HG-KR Series Special Shaft End Specifications

Motors with the following specifications are also available.

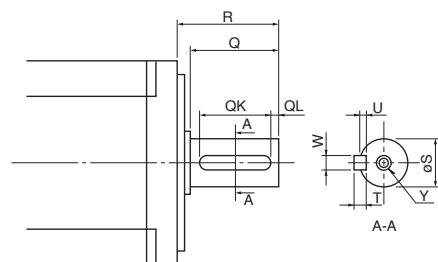
D-cut shaft (Note 1): 50 W and 100 W



[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
HG-KR23(B)K, 43(B)K	5	14h6	30	26	5	20	3	3	M4 screw Depth: 15
HG-KR73(B)K	6	19h6	40	36	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.

HG-MR Series (Ultra-low Inertia, Small Capacity) Specifications

Rotary servo motor model		HG-MR	053(B)	13(B)	23(B)	43(B)	73(B)
Compatible servo amplifier model		MR-J4- MR-J4W_-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-3 in this catalog.				
Power supply capacity ^{*1}		[kVA]	0.3	0.3	0.5	0.9	1.3
Continuous running duty	Rated output	[W]	50	100	200	400	750
	Rated torque ^(Note 3)	[N•m]	0.16	0.32	0.64	1.3	2.4
Maximum torque		[N•m]	0.48	0.95	1.9	3.8	7.2
Rated speed		[r/min]	3000				
Maximum speed		[r/min]	6000				
Permissible instantaneous speed		[r/min]	6900				
Power rate at continuous rated torque	Standard	[kW/s]	15.6	33.8	46.9	114.2	97.3
	With electromagnetic brake	[kW/s]	11.3	28.0	37.2	98.8	82.1
Rated current		[A]	1.0	0.9	1.5	2.6	5.8
Maximum current		[A]	3.1	2.5	5.3	9.0	20
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	(Note 4)	(Note 4)	1180	713	338
	MR-J4W_-	[times/min]	7310	3620	1170	710	846
Moment of inertia J	Standard	[× 10 ⁻⁴ kg•m ²]	0.0162	0.0300	0.0865	0.142	0.586
	With electromagnetic brake	[× 10 ⁻⁴ kg•m ²]	0.0224	0.0362	0.109	0.164	0.694
Recommended load to motor inertia ratio ^(Note 1)			35 times or less	32 times or less			
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)				
Oil seal			None	None (Servo motors with oil seal are available. (HG-MR_J))			
Insulation class			130 (B)				
Structure			Totally enclosed, natural cooling (IP rating: IP65) ^(Note 2)				
Environment ^{*3}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)				
	Ambient humidity		Operation: 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 ^{*4}		X: 49 m/s ² Y: 49 m/s ²				
Vibration rank			V10 ^{*6}				
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.				
Permissible load for the shaft ^{*5}	L	[mm]	25	25	30	30	40
	Radial	[N]	88	88	245	245	392
	Thrust	[N]	59	59	98	98	147
Mass	Standard	[kg]	0.34	0.54	0.91	1.4	2.8
	With electromagnetic brake	[kg]	0.54	0.74	1.3	1.8	3.8

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 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine 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.

When the servo motor decelerates to a stop from the maximum speed, the regenerative frequency will not be limited if the following requirements are met.

• HG-MR053(B): The load to motor inertia ratio is 24 times or less, and the effective torque is within the rated torque range.

• HG-MR13(B): The load to motor inertia ratio is 12 times or less, and the effective torque is within the rated torque range.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

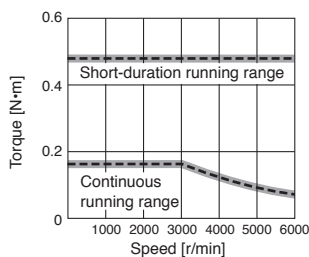
HG-MR Series Electromagnetic Brake Specifications (Note 1)

Model	HG-MR	053B	13B	23B	43B	73B
Type	Spring actuated type safety brake					
Rated voltage	24 V DC $_{-10}^{0\%}$					
Power consumption [W] at 20 °C		6.3	6.3	7.9	7.9	10
Electromagnetic brake static friction torque [N·m]		0.32	0.32	1.3	1.3	2.4
Permissible braking work	Per braking [J]	5.6	5.6	22	22	64
	Per hour [J]	56	56	220	220	640
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000	20000	20000
	Work per braking [J]	5.6	5.6	22	22	64

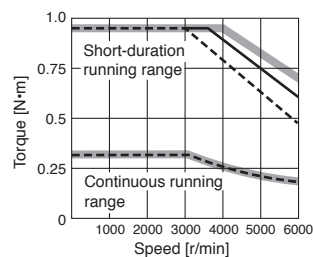
Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-MR Series Torque Characteristics

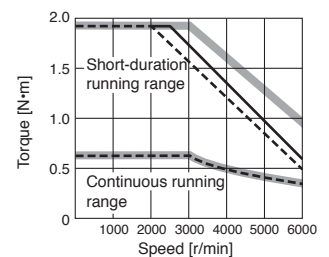
HG-MR053(B) (Note 1, 2, 3, 4)



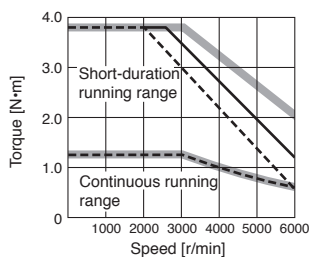
HG-MR13(B) (Note 1, 2, 3, 4)



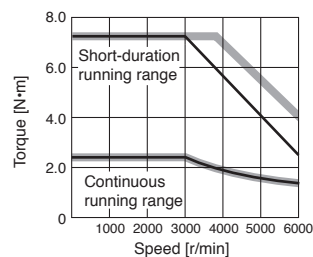
HG-MR23(B) (Note 1, 2, 3, 4)



HG-MR43(B) (Note 1, 2, 3, 4)



HG-MR73(B) (Note 1, 3, 4)

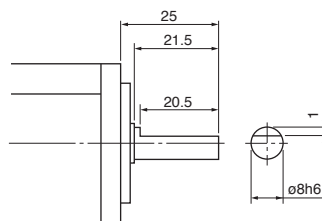


Notes: 1. — : For 3-phase 200 V AC or 1-phase 230 V AC.
2. - - - : For 1-phase 100 V AC.
3. — : For 1-phase 200 V AC.
This line is drawn only where differs from the other two lines.
4. Torque drops when the power supply voltage is below the specified value.

HG-MR Series Special Shaft End Specifications

Motors with the following specifications are also available.

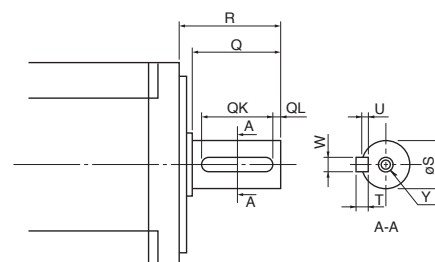
D-cut shaft (Note 1): 50 W and 100 W



[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
HG-MR23(B)K, 43(B)K	5	14h6	30	26	5	20	3	3	M4 screw Depth: 15
HG-MR73(B)K	6	19h6	40	36	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.

HG-SR 1000 r/min Series (Medium Inertia, Medium Capacity) Specifications

Rotary servo motor model			HG-SR	51(B)	81(B)	121(B)	201(B)	301(B)	421(B)
Compatible servo amplifier model		MR-J4- MR-J4W_-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-3 in this catalog.						
Power supply capacity ^{*1}			[kVA]	1.0	1.5	2.1	3.5	4.8	6.3
Continuous running duty	Rated output	[kW]	0.5	0.85	1.2	2.0	3.0	4.2	
	Rated torque ^(Note 3)	[N•m]	4.8	8.1	11.5	19.1	28.6	40.1	
Maximum torque			[N•m]	14.3	24.4	34.4	57.3	85.9	120
Rated speed			[r/min]	1000					
Maximum speed			[r/min]	1500					
Permissible instantaneous speed			[r/min]	1725					
Power rate at continuous rated torque	Standard	[kW/s]	19.7	41.2	28.1	46.4	82.3	107	
	With electromagnetic brake	[kW/s]	16.5	36.2	23.2	41.4	75.3	99.9	
Rated current			[A]	2.8	5.2	7.1	9.4	13	19
Maximum current			[A]	9.0	17	23	30	42	61
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	77	114	191	113	89	76	
	MR-J4W_-	[times/min]	392	286	-	-	-	-	
Moment of inertia J	Standard	[× 10 ⁻⁴ kg•m ²]	11.6	16.0	46.8	78.6	99.7	151	
	With electromagnetic brake	[× 10 ⁻⁴ kg•m ²]	13.8	18.2	56.5	88.2	109	161	
Recommended load to motor inertia ratio ^(Note 1)			17 times or less			15 times or less			
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)						
Oil seal			None (Servo motors with oil seal are available. (HG-SR_J))						
Insulation class			155 (F)						
Structure			Totally enclosed, natural cooling (IP rating: IP67) ^(Note 2)						
Environment ^{*3}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)						
	Ambient humidity		Operation: 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 ^{*4}		X: 24.5 m/s ² Y: 24.5 m/s ²			X: 24.5 m/s ² Y: 49 m/s ²		X: 24.5 m/s ² Y: 29.4 m/s ²	
Vibration rank			V10 ^{*6}						
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.						
Permissible load for the shaft ^{*5}	L	[mm]	55	55	79	79	79	79	
	Radial	[N]	980	980	2058	2058	2058	2058	
	Thrust	[N]	490	490	980	980	980	980	
Mass	Standard	[kg]	6.2	7.3	11	16	20	27	
	With electromagnetic brake	[kg]	8.2	9.3	17	22	26	33	

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. The servo motor with oil seal is rated IP67 as well (excluding the shaft-through portion). Refer to the asterisk 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

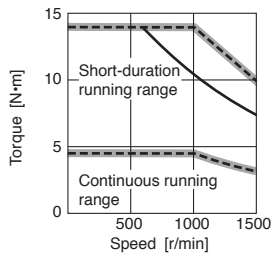
HG-SR 1000 r/min Series Electromagnetic Brake Specifications (Note 1)

Model	HG-SR	51B	81B	121B	201B	301B	421B
Type	Spring actuated type safety brake						
Rated voltage	24 V DC _{-10%}						
Power consumption [W] at 20 °C		20	20	34	34	34	34
Electromagnetic brake static friction torque [N·m]		8.5	8.5	44	44	44	44
Permissible braking work	Per braking [J]	400	400	4500	4500	4500	4500
	Per hour [J]	4000	4000	45000	45000	45000	45000
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000	20000	20000	20000
	Work per braking [J]	200	200	1000	1000	1000	1000

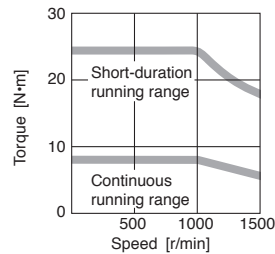
Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-SR 1000 r/min Series Torque Characteristics

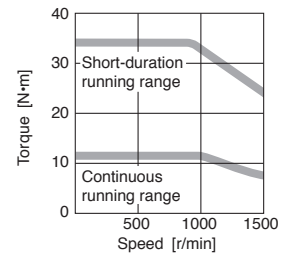
HG-SR51(B) (Note 1, 2, 3, 4)



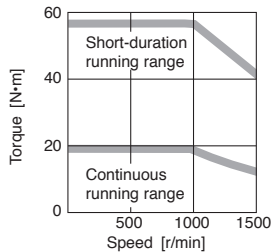
HG-SR81(B) (Note 1, 4)



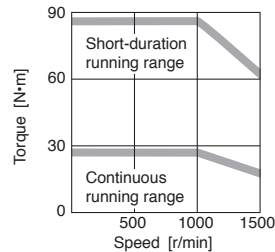
HG-SR121(B) (Note 1, 4)



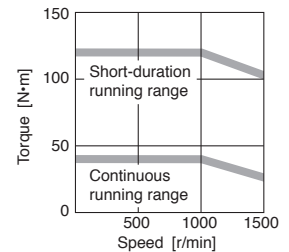
HG-SR201(B) (Note 1, 4)



HG-SR301(B) (Note 1, 4)



HG-SR421(B) (Note 1, 4)



Notes: 1. — : For 3-phase 200 V AC.
2. - - - : For 1-phase 230 V AC.
3. — : For 1-phase 200 V AC.
This line is drawn only where it differs from the other two lines.
4. Torque drops when the power supply voltage is below the specified value.

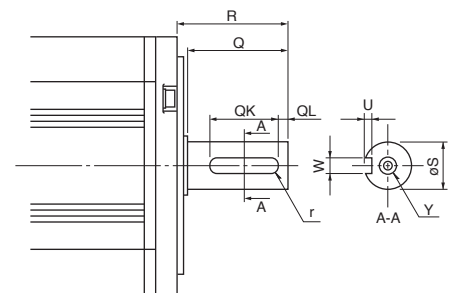
HG-SR 1000 r/min Series Special Shaft End Specifications

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
HG-SR51(B)K, 81(B)K	24h6	55	50	8 _{-0.036} ⁰	36	5	4 ₀ ^{+0.2}	4	M8 screw Depth: 20
HG-SR121(B)K, 201(B)K, 301(B)K, 421(B)K	35 ₀ ^{+0.010}	79	75	10 _{-0.036} ⁰	55	5	5 ₀ ^{+0.2}	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]

HG-SR 2000 r/min Series (Medium Inertia, Medium Capacity) (200 V Class) Specifications

Rotary servo motor model			HG-SR	52(B)	102(B)	152(B)	202(B)	352(B)	502(B)	702(B)
Compatible servo amplifier model		MR-J4- MR-J4W_-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-3 in this catalog.							
Power supply capacity ^{*1}			[kVA]	1.0	1.7	2.5	3.5	5.5	7.5	10
Continuous running duty	Rated output	[kW]	0.5	1.0	1.5	2.0	3.5	5.0	7.0	
	Rated torque ^(Note 3)	[N•m]	2.4	4.8	7.2	9.5	16.7	23.9	33.4	
Maximum torque			[N•m]	7.2	14.3	21.5	28.6	50.1	71.6	100
Rated speed			[r/min]	2000						
Maximum speed			[r/min]	3000						
Permissible instantaneous speed			[r/min]	3450						
Power rate at continuous rated torque	Standard	[kW/s]	7.85	19.7	32.1	19.5	35.5	57.2	74.0	
	With electromagnetic brake	[kW/s]	6.01	16.5	28.2	16.1	31.7	52.3	69.4	
Rated current			[A]	2.9	5.6	9.4	9.6	14	22	26
Maximum current			[A]	9.0	17	29	31	45	70	83
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	31	38	139	47	28	29	25	
	MR-J4W_-	[times/min]	154	96	-	-	-	-	-	
Moment of inertia J	Standard	[× 10 ⁻⁴ kg•m ²]	7.26	11.6	16.0	46.8	78.6	99.7	151	
	With electromagnetic brake	[× 10 ⁻⁴ kg•m ²]	9.48	13.8	18.2	56.5	88.2	109	161	
Recommended load to motor inertia ratio ^(Note 1)			15 times or less	17 times or less		15 times or less				
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)							
Oil seal			None (Servo motors with oil seal are available. (HG-SR_J))							
Insulation class			155 (F)							
Structure			Totally enclosed, natural cooling (IP rating: IP67) ^(Note 2)							
Environment ^{*3}	Ambient temperature	Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)								
	Ambient humidity	Operation: 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 ^{*4}	X: 24.5 m/s ² Y: 24.5 m/s ²					X: 24.5 m/s ² Y: 49 m/s ²		X: 24.5 m/s ² Y: 29.4 m/s ²	
Vibration rank			V10 ^{*6}							
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.							
Permissible load for the shaft ^{*5}	L	[mm]	55	55	55	79	79	79	79	
	Radial	[N]	980	980	980	2058	2058	2058	2058	
	Thrust	[N]	490	490	490	980	980	980	980	
Mass	Standard	[kg]	4.8	6.2	7.3	11	16	20	27	
	With electromagnetic brake	[kg]	6.7	8.2	9.3	17	22	26	33	

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. The servo motor with oil seal is rated IP67 as well (excluding the shaft-through portion), and for geared servo motor, IP rating of the reducer portion is equivalent to IP44. Refer to the asterisk 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

HG-SR 2000 r/min Series (200 V Class) Electromagnetic Brake Specifications (Note 1)

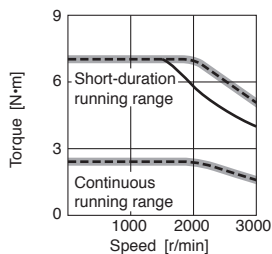
Model	HG-SR	52B	102B	152B	202B	352B	502B	702B
Type	Spring actuated type safety brake							
Rated voltage	24 V DC _{-10%} ^{0%}							
Power consumption [W] at 20 °C		20	20	20	34	34	34	34
Electromagnetic brake static friction torque [N·m]		8.5	8.5	8.5	44	44	44	44
Permissible braking work	Per braking [J]	400	400	400	4500	4500	4500	4500
	Per hour [J]	4000	4000	4000	45000	45000	45000	45000
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000	20000	20000	20000	20000
	Work per braking [J]	200	200	200	1000	1000	1000	1000

Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.

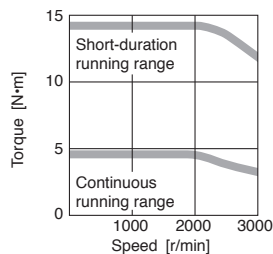
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-SR 2000 r/min Series (200 V Class) Torque Characteristics

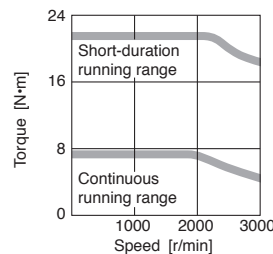
HG-SR52(B) (Note 1, 2, 3, 4)



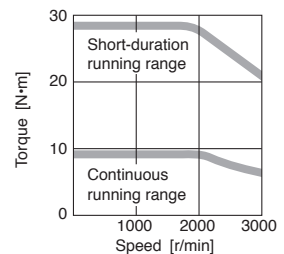
HG-SR102(B) (Note 1, 4)



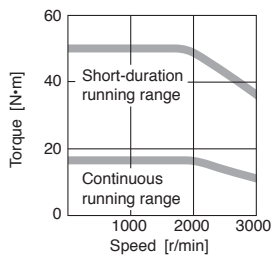
HG-SR152(B) (Note 1, 4)



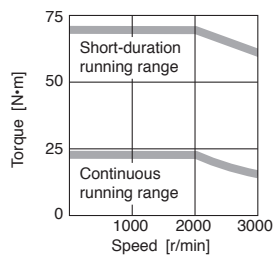
HG-SR202(B) (Note 1, 4)



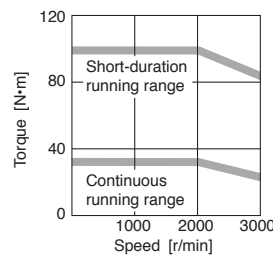
HG-SR352(B) (Note 1, 4)



HG-SR502(B) (Note 1, 4)



HG-SR702(B) (Note 1, 4)



Notes: 1. — : For 3-phase 200 V AC.

2. - - - : For 1-phase 230 V AC.

3. — : For 1-phase 200 V AC.

This line is drawn only where it differs from the other two lines.

4. Torque drops when the power supply voltage is below the specified value.

HG-SR 2000 r/min Series (200 V Class) Special Shaft End Specifications

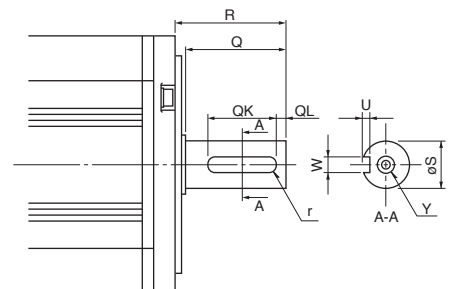
Motors with the following specifications are also available.

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

Model	Variable dimensions								
	S	R	Q	W	QK	QL	U	r	Y
HG-SR52(B)K, 102(B)K, 152(B)K	24h6	55	50	8 ⁰ _{-0.036}	36	5	4 ^{+0.2} ₀	4	M8 screw Depth: 20
HG-SR202(B)K, 352(B)K, 502(B)K, 702(B)K	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]

HG-SR 2000 r/min Series (Medium Inertia, Medium Capacity) (400 V Class) Specifications

Rotary servo motor model		HG-SR	524(B)	1024(B)	1524(B)	2024(B)	3524(B)	5024(B)	7024(B)
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-5 in this catalog.						
Power supply capacity ^{*1}		[kVA]	1.0	1.7	2.5	3.5	5.5	7.5	10
Continuous running duty	Rated output	[kW]	0.5	1.0	1.5	2.0	3.5	5.0	7.0
	Rated torque ^(Note 3)	[N·m]	2.4	4.8	7.2	9.5	16.7	23.9	33.4
Maximum torque		[N·m]	7.2	14.3	21.5	28.6	50.1	71.6	100
Rated speed		[r/min]	2000						
Maximum speed		[r/min]	3000						
Permissible instantaneous speed		[r/min]	3450						
Power rate at continuous rated torque	Standard	[kW/s]	7.85	19.7	32.1	19.5	35.5	57.2	74.0
	With electromagnetic brake	[kW/s]	6.01	16.5	28.2	16.1	31.7	52.3	69.4
Rated current		[A]	1.5	2.8	4.7	4.9	7.0	11	13
Maximum current		[A]	4.5	8.9	17	17	27	42	59
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	46	29	139	47	34	29	25
Moment of inertia J	Standard	[× 10 ⁻⁴ kg·m ²]	7.26	11.6	16.0	46.8	78.6	99.7	151
	With electromagnetic brake	[× 10 ⁻⁴ kg·m ²]	9.48	13.8	18.2	56.5	88.2	109	161
Recommended load to motor inertia ratio ^(Note 1)			15 times or less	17 times or less		15 times or less			
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)						
Oil seal			None (Servo motors with oil seal are available. (HG-SR_J))						
Insulation class			155 (F)						
Structure			Totally enclosed, natural cooling (IP rating: IP67) ^(Note 2)						
Environment ^{*3}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)						
	Ambient humidity		Operation: 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 ^{*4}			X: 24.5 m/s ² Y: 24.5 m/s ²			X: 24.5 m/s ² Y: 49 m/s ²		X: 24.5 m/s ² Y: 29.4 m/s ²	
Vibration rank			V10 ^{*6}						
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.						
Permissible load for the shaft ^{*5}	L	[mm]	55	55	55	79	79	79	79
	Radial	[N]	980	980	980	2058	2058	2058	2058
	Thrust	[N]	490	490	490	980	980	980	980
Mass	Standard	[kg]	4.8	6.2	7.3	11	16	20	27
	With electromagnetic brake	[kg]	6.7	8.2	9.3	17	22	26	33

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. The servo motor with oil seal is rated IP67 as well (excluding the shaft-through portion), and for geared servo motor, IP rating of the reducer portion is equivalent to IP44. Refer to the asterisk 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

HG-SR 2000 r/min Series (400 V Class) Electromagnetic Brake Specifications (Note 1)

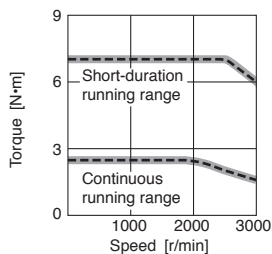
Model	HG-SR	524B	1024B	1524B	2024B	3524B	5024B	7024B
Type	Spring actuated type safety brake							
Rated voltage	24 V DC _{-10%} ^{0%}							
Power consumption [W] at 20 °C		20	20	20	34	34	34	34
Electromagnetic brake static friction torque [N·m]		8.5	8.5	8.5	44	44	44	44
Permissible braking work	Per braking [J]	400	400	400	4500	4500	4500	4500
	Per hour [J]	4000	4000	4000	45000	45000	45000	45000
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000	20000	20000	20000	20000
	Work per braking [J]	200	200	200	1000	1000	1000	1000

Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.

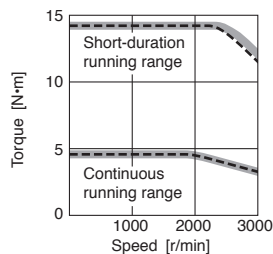
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-SR 2000 r/min Series (400 V Class) Torque Characteristics

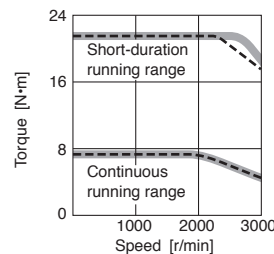
HG-SR524(B) (Note 1, 2, 3)



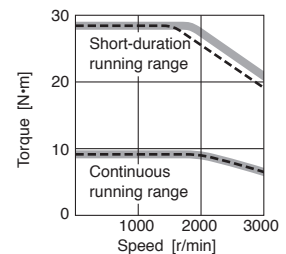
HG-SR1024(B) (Note 1, 2, 3)



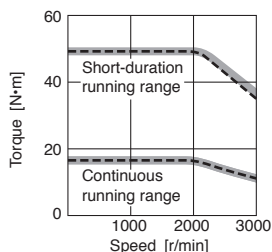
HG-SR1524(B) (Note 1, 2, 3)



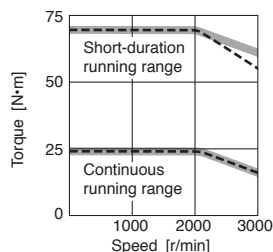
HG-SR2024(B) (Note 1, 2, 3)



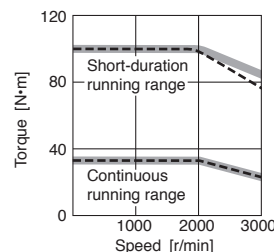
HG-SR3524(B) (Note 1, 2, 3)



HG-SR5024(B) (Note 1, 2, 3)



HG-SR7024(B) (Note 1, 2, 3)



Notes: 1. — : For 3-phase 400 V AC.

2. - - - : For 3-phase 380 V AC.

3. Torque drops when the power supply voltage is below the specified value.

HG-SR 2000 r/min Series (400 V Class) Special Shaft End Specifications

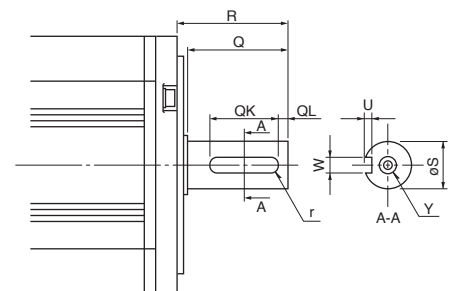
Motors with the following specifications are also available.

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

Model	Variable dimensions								
	S	R	Q	W	QK	QL	U	r	Y
HG-SR524(B)K, 1024(B)K, 1524(B)K	24h6	55	50	8 ⁰ _{-0.036}	36	5	4 ^{+0.2} ₀	4	M8 screw Depth: 20
HG-SR2024(B)K, 3524(B)K, 5024(B)K, 7024(B)K	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]

HG-JR 3000 r/min Series (Low Inertia, Medium Capacity) (200 V Class) Specifications

Rotary servo motor model		HG-JR	53(B)	73(B)	103(B)	153(B)	203(B)	353(B)	503(B)	703(B)	903(B)
Compatible servo amplifier model		MR-J4- MR-J4W_-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on pp. 2-3 and 2-4 in this catalog.								
Power supply capacity ^{*1}		[kVA]	1.0	1.3	1.7	2.5	3.5	5.5	7.5	10	13
Continuous running duty	Rated output	[kW]	0.5	0.75	1.0	1.5	2.0	3.3 <3.5> ^(Note 4)	5.0	7.0	9.0
	Rated torque ^(Note 3)	[N·m]	1.6	2.4	3.2	4.8	6.4	10.5 <11.1> ^(Note 4)	15.9	22.3	28.6
Maximum torque ^(Note 5)		[N·m]	4.8 <6.4>	7.2 <9.6>	9.6 <12.7>	14.3 <19.1>	19.1 <25.5>	32.0 <44.6>	47.7 <63.7>	66.8	85.8
Rated speed		[r/min]	3000								
Maximum speed		[r/min]	6000							5000	
Permissible instantaneous speed		[r/min]	6900							5750	
Power rate at continuous rated torque	Standard	[kW/s]	16.7	27.3	38.2	60.2	82.4	83.5	133	115	147
	With electromagnetic brake	[kW/s]	12.5	22.0	32.2	53.1	74.8	71.6	119	93.9	125
Rated current		[A]	3.0	5.6	5.6	11	11	17 <18> ^(Note 4)	27	34	41
Maximum current ^(Note 5)		[A]	9.0 <12>	17 <23>	17 <23>	32 <43>	32 <43>	51 <71>	81 <108>	103	134
Regenerative braking frequency ^{*2} ^(Note 5)	MR-J4-	[times/min]	67 <137>	98 <511>	76 <396>	271 <271>	206 <206>	73 <98>	68 <89>	56	204 ^(Note 6)
	MR-J4W_-	[times/min]	328 <328>	237	186	-	-	-	-	-	-
Moment of inertia J	Standard	[× 10 ⁻⁴ kg·m ²]	1.52	2.09	2.65	3.79	4.92	13.2	19.0	43.3	55.8
	With electromagnetic brake	[× 10 ⁻⁴ kg·m ²]	2.02	2.59	3.15	4.29	5.42	15.4	21.2	52.9	65.4
Recommended load to motor inertia ratio ^(Note 1)			10 times or less								
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)								
Oil seal			Attached								
Insulation class			155 (F)								
Structure			Totally enclosed, natural cooling (IP rating: IP67) ^(Note 2)								
Environment ^{*3}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)								
	Ambient humidity		Operation: 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 ^{*4}		X: 24.5 m/s ² Y: 24.5 m/s ²							X: 24.5 m/s ² Y: 29.4 m/s ²	
Vibration rank			V10 ^{*6}								
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.								
Permissible load for the shaft ^{*5}	L	[mm]	40	40	40	40	40	55	55	79	79
	Radial	[N]	323	323	323	323	323	980	980	2450	2450
	Thrust	[N]	284	284	284	284	284	490	490	980	980
Mass	Standard	[kg]	3.0	3.7	4.5	5.9	7.5	13	18	29	36
	With electromagnetic brake	[kg]	4.4	5.1	5.9	7.3	8.9	15	20	35	42

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 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.

4. The value in angle brackets is applicable when the servo motor is used with MR-J4-500B/MR-J4-500B-RJ/MR-J4-500B-RJ010/MR-J4-500A/MR-J4-500A-RJ.

5. The value in angle brackets is applicable when the maximum torque is increased. The maximum torque will be increased by changing the servo amplifier to be combined. Refer to "Combinations of HG-JR Servo Motor Series and Servo Amplifier (200 V Class) for Increasing the Maximum Torque to 400% of the Rated Torque" on p. 2-6 in this catalog for the available combinations.

6. The value is applicable when the external regenerative resistors, GRZG400-Ω (standard accessory) are used with cooling fans (2 units of 92 mm × 92 mm, minimum airflow: 1.0 m³/min). Note that [Pr. PA02] must be changed.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

HG-JR 3000 r/min Series (200 V Class) Electromagnetic Brake Specifications (Note 1)

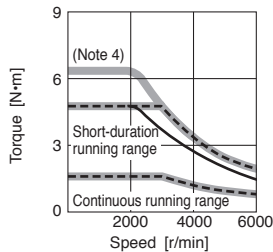
Model	HG-JR	53B	73B	103B	153B	203B	353B	503B	703B	903B
Type	Spring actuated type safety brake									
Rated voltage	24 V DC _{-10%}									
Power consumption [W] at 20 °C		11.7	11.7	11.7	11.7	11.7	23	23	34	34
Electromagnetic brake static friction torque [N·m]		6.6	6.6	6.6	6.6	6.6	16	16	44	44
Permissible braking work	Per braking [J]	64	64	64	64	64	400	400	4500	4500
	Per hour [J]	640	640	640	640	640	4000	4000	45000	45000
Electromagnetic brake life (Note 2)	Number of brakings [Times]	5000	5000	5000	5000	5000	5000	5000	20000	20000
	Work per braking [J]	64	64	64	64	64	400	400	1000	1000

Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.

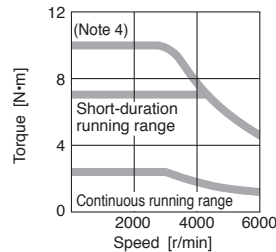
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 3000 r/min Series (200 V Class) Torque Characteristics

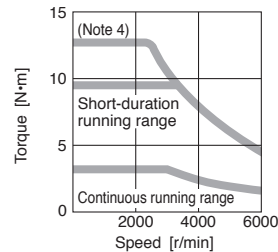
HG-JR53(B) (Note 1, 2, 3, 5)



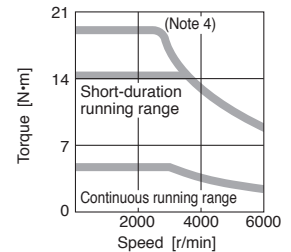
HG-JR73(B) (Note 1, 5)



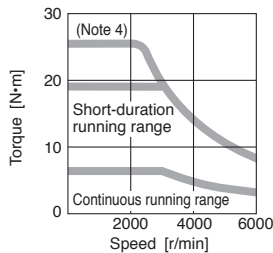
HG-JR103(B) (Note 1, 5)



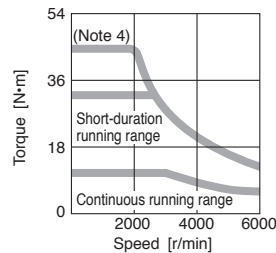
HG-JR153(B) (Note 1, 5)



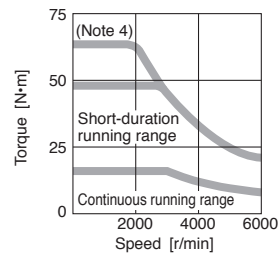
HG-JR203(B) (Note 1, 5)



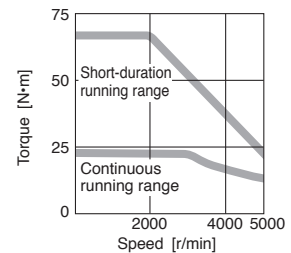
HG-JR353(B) (Note 1, 5)



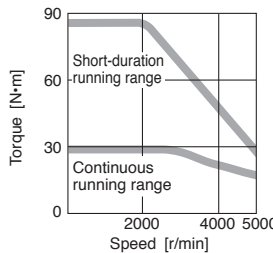
HG-JR503(B) (Note 1, 5)



HG-JR703(B) (Note 1, 5)



HG-JR903(B) (Note 1, 5)



Notes: 1. — : For 3-phase 200 V AC.

2. - - - : For 1-phase 230 V AC.

3. ··· : For 1-phase 200 V AC.

This line is drawn only where it differs from the other two lines.

4. This value is applicable when the torque is maximally increased. Refer to "Combinations of HG-JR Servo Motor Series and Servo Amplifier (200 V Class) for Increasing the Maximum Torque to 400% of the Rated Torque" on p. 2-6 in this catalog.

5. Torque drops when the power supply voltage is below the specified value.

HG-JR 3000 r/min Series (200 V Class) Special Shaft End Specifications

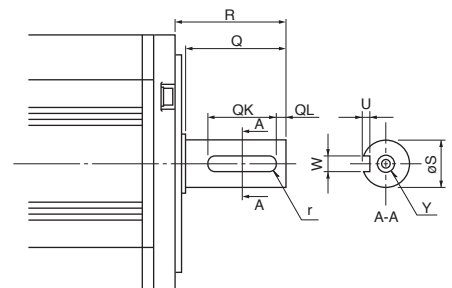
Motors with the following specifications are also available.

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

Model	Variable dimensions								
	S	R	Q	W	QK	QL	U	r	Y
HG-JR53(B)K, 73(B)K, 103(B)K, 153(B)K, 203(B)K	16h6	40	30	5 ⁰ _{-0.030}	25	2	3 ^{+0.1} ₀	2.5	M4 screw Depth: 15
HG-JR353(B)K, 503(B)K	28h6	55	50	8 ⁰ _{-0.036}	36	5	4 ^{+0.2} ₀	4	M8 screw Depth: 20
HG-JR703(B)K, 903(B)K	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]

HG-JR 3000 r/min Series (Low Inertia, Medium Capacity) (400 V Class) Specifications

Rotary servo motor model		HG-JR	534(B)	734(B)	1034(B)	1534(B)	2034(B)	3534(B)	5034(B)	7034(B)	9034(B)
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-5 in this catalog.								
Power supply capacity ^{*1}		[kVA]	1.0	1.3	1.7	2.5	3.5	5.5	7.5	10	13
Continuous running duty	Rated output	[kW]	0.5	0.75	1.0	1.5	2.0	3.3 <3.5> ^(Note 4)	5.0	7.0	9.0
	Rated torque ^(Note 3)	[N·m]	1.6	2.4	3.2	4.8	6.4	10.5 <11.1> ^(Note 4)	15.9	22.3	28.6
Maximum torque ^(Note 5)		[N·m]	4.8 <6.4>	7.2 <9.6>	9.6 <12.7>	14.3 <19.1>	19.1 <25.5>	32.0 <44.6>	47.7 <63.7>	66.8	85.8
Rated speed		[r/min]	3000								
Maximum speed		[r/min]	6000							5000	
Permissible instantaneous speed		[r/min]	6900							5750	
Power rate at continuous rated torque	Standard	[kW/s]	16.7	27.3	38.2	60.2	82.4	83.5	133	115	147
	With electromagnetic brake	[kW/s]	12.5	22.0	32.2	53.1	74.8	71.6	119	93.9	125
Rated current		[A]	1.5	2.8	2.8	5.4	5.4	8.3 <8.8> ^(Note 4)	14	17	21
Maximum current ^(Note 5)		[A]	4.5 <6.0>	8.4 <12>	8.4 <12>	17 <22>	17 <22>	26 <36>	41 <54>	52	67
Regenerative braking frequency ^{*2} <small>(Note 5)</small>	MR-J4-	[times/min]	99 <100>	72 <489>	56 <382>	265 <275>	203 <209>	75 <98>	68 <89>	56	205 <small>(Note 6)</small>
Moment of inertia J	Standard	[× 10 ⁻⁴ kg·m ²]	1.52	2.09	2.65	3.79	4.92	13.2	19.0	43.3	55.8
	With electromagnetic brake	[× 10 ⁻⁴ kg·m ²]	2.02	2.59	3.15	4.29	5.42	15.4	21.2	52.9	65.4
Recommended load to motor inertia ratio ^(Note 1)			10 times or less								
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)								
Oil seal			Attached								
Insulation class			155 (F)								
Structure			Totally enclosed, natural cooling (IP rating: IP67) ^(Note 2)								
Environment ^{*3}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)								
	Ambient humidity		Operation: 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 ^{*4}		X: 24.5 m/s ² Y: 24.5 m/s ²							X: 24.5 m/s ² Y: 29.4 m/s ²	
Vibration rank			V10 ^{*6}								
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.								
Permissible load for the shaft ^{*5}	L	[mm]	40	40	40	40	40	55	55	79	79
	Radial	[N]	323	323	323	323	323	980	980	2450	2450
	Thrust	[N]	284	284	284	284	284	490	490	980	980
Mass	Standard	[kg]	3.0	3.7	4.5	5.9	7.5	13	18	29	36
	With electromagnetic brake	[kg]	4.4	5.1	5.9	7.3	8.9	15	20	35	42

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 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.

4. The value in angle brackets is applicable when the servo motor is used with MR-J4-500B4/MR-J4-500B4-RJ/MR-J4-500A4/MR-J4-500A4-RJ.

5. The value in angle brackets is applicable when the maximum torque is increased. The maximum torque will be increased by changing the servo amplifier to be combined. Refer to "Combinations of HG-JR Servo Motor Series and Servo Amplifier (400 V Class) for Increasing the Maximum Torque to 400% of the Rated Torque" on p. 2-6 in this catalog for the available combinations.

6. The value is applicable when the external regenerative resistors, GRZG400-Ω (standard accessory) are used with cooling fans (2 units of 92 mm × 92 mm, minimum airflow: 1.0 m³/min). Note that [Pr. PA02] must be changed.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

HG-JR 3000 r/min Series (400 V Class) Electromagnetic Brake Specifications (Note 1)

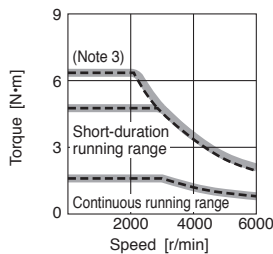
Model	HG-JR	534B	734B	1034B	1534B	2034B	3534B	5034B	7034B	9034B
Type	Spring actuated type safety brake									
Rated voltage	24 V DC _{-10%}									
Power consumption [W] at 20 °C		11.7	11.7	11.7	11.7	11.7	23	23	34	34
Electromagnetic brake static friction torque [N·m]		6.6	6.6	6.6	6.6	6.6	16	16	44	44
Permissible braking work	Per braking [J]	64	64	64	64	64	400	400	4500	4500
	Per hour [J]	640	640	640	640	640	4000	4000	45000	45000
Electromagnetic brake life (Note 2)	Number of brakings [Times]	5000	5000	5000	5000	5000	5000	5000	20000	20000
	Work per braking [J]	64	64	64	64	64	400	400	1000	1000

Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.

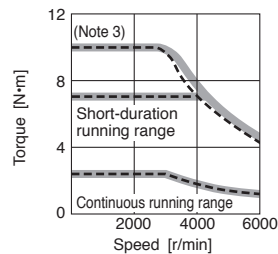
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 3000 r/min Series (400 V Class) Torque Characteristics

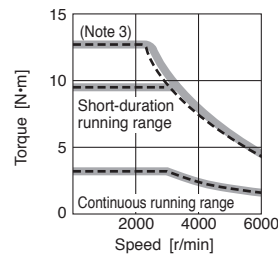
HG-JR534(B) (Note 1, 2, 4)



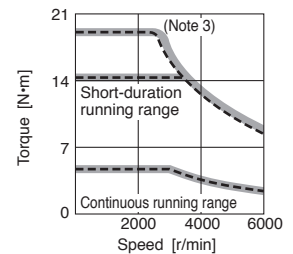
HG-JR734(B) (Note 1, 2, 4)



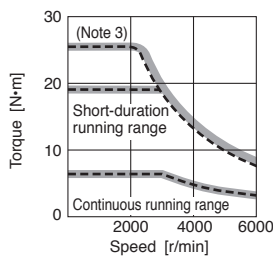
HG-JR1034(B) (Note 1, 2, 4)



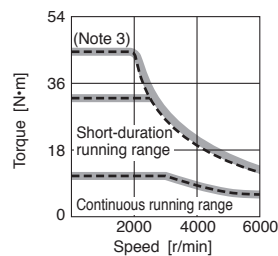
HG-JR1534(B) (Note 1, 2, 4)



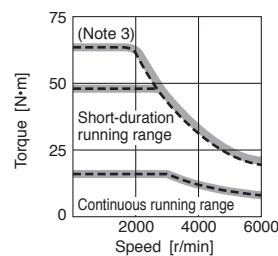
HG-JR2034(B) (Note 1, 2, 4)



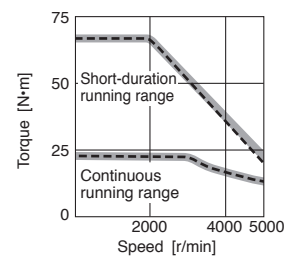
HG-JR3534(B) (Note 1, 2, 4)



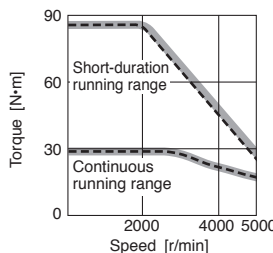
HG-JR5034(B) (Note 1, 2, 4)



HG-JR7034(B) (Note 1, 2, 4)



HG-JR9034(B) (Note 1, 2, 4)



Notes: 1. ——— : For 3-phase 400 V AC.
2. - - - - : For 3-phase 380 V AC.

3. This value is applicable when the torque is maximally increased. Refer to "Combinations of HG-JR Servo Motor Series and Servo Amplifier (400 V Class) for Increasing the Maximum Torque to 400% of the Rated Torque" on p. 2-6 in this catalog.
4. Torque drops when the power supply voltage is below the specified value.

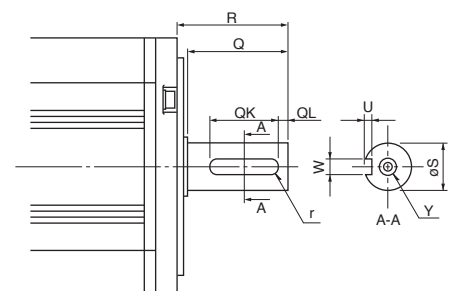
HG-JR 3000 r/min Series (400 V Class) Special Shaft End Specifications

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
HG-JR534(B)K, 734(B)K, 1034(B)K, 1534(B)K, 2034(B)K	16h6	40	30	5 ⁰ _{-0.030}	25	2	3 ^{+0.1} ₀	2.5	M4 screw Depth: 15
HG-JR3534(B)K, 5034(B)K	28h6	55	50	8 ⁰ _{-0.036}	36	5	4 ^{+0.2} ₀	4	M8 screw Depth: 20
HG-JR7034(B)K, 9034(B)K	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]

HG-JR 1000 r/min Series (Low Inertia, Medium/Large Capacity) (200 V Class) Specifications

Rotary servo motor model			HG-JR	601(B)	801(B)	12K1(B)	15K1	20K1	25K1	30K1	37K1
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-4 in this catalog.								
Power supply capacity ^{*1}			[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	
	Rated torque ^(Note 3)	[N·m]	57.3	76.4	115	143	191	239	286	353	
Maximum torque			[N·m]	172	229	345	429	573	717	858	1059
Rated speed			[r/min]	1000							
Maximum speed			[r/min]	2000				1500			
Permissible instantaneous speed			[r/min]	2300				1725			
Power rate at continuous rated torque	Standard	[kW/s]	187	265	420	418	582	748	594	761	
	With electromagnetic brake	[kW/s]	167	243	394	-	-	-	-	-	
Rated current			[A]	31	47	60	67	94	95	121	152
Maximum current			[A]	108	165	208	231	318	313	399	495
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	82	322 ^(Note 4)	224 ^(Note 4)	234 ^(Note 4)	183 ^(Note 4)	150 ^(Note 4)	-	-	
	Standard	[× 10 ⁻⁴ kg·m ²]	176	220	315	489	627	764	1377	1637	
Moment of inertia J	With electromagnetic brake	[× 10 ⁻⁴ kg·m ²]	196	240	336	-	-	-	-	-	
	Recommended load to motor inertia ratio ^(Note 1)		10 times or less								
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)								
Oil seal			Attached								
Insulation class			155 (F)								
Structure			Totally enclosed, natural cooling (IP rating: IP67) ^(Note 2)				Totally enclosed, force cooling (IP rating: IP44) ^(Note 2)				
Environment ^{*3}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)								
	Ambient humidity		Operation: 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 ^{*4}		X: 24.5 m/s ² Y: 24.5 m/s ²							X: 9.8 m/s ² Y: 9.8 m/s ²	
Vibration rank			V10 ^{*6}								
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.								
Permissible load for the shaft ^{*5}	L	[mm]	116	116	116	140	140	140	140	140	
	Radial	[N]	2940	2940	2940	3234	3234	3234	4900	4900	
	Thrust	[N]	980	980	980	1470	1470	1470	1960	1960	
Mass	Standard	[kg]	53	62	86	120	145	165	215	240	
	With electromagnetic brake	[kg]	65	74	97	-	-	-	-	-	
Cooling fan	Power supply	Voltage/ frequency	-	-	-	3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz					
		Input [W]	-	-	-	65 (50 Hz)/85 (60 Hz)			120 (50 Hz)/175 (60 Hz)		
	Rated current		[A]	-	-	-	0.20 (50 Hz)/0.22 (60 Hz)		0.39 (50 Hz)/0.52 (60 Hz)		

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 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.

4. The value is applicable when the external regenerative resistors, GRZG400-Ω (standard accessory) are used with cooling fans (2 units of 92 mm × 92 mm, minimum airflow: 1.0 m³/min). Note that [Pr. PA02] must be changed.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

HG-JR 1000 r/min Series (200 V Class) Electromagnetic Brake Specifications (Note 1)

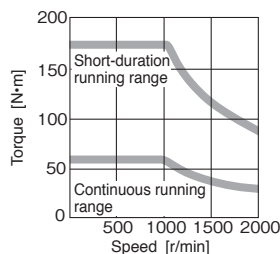
Model	HG-JR	601B	801B	12K1B
Type	Spring actuated type safety brake			
Rated voltage	24 V DC _{-10%} ^{0%}			
Power consumption [W] at 20 °C		32	32	32
Electromagnetic brake static friction torque [N·m]		126	126	126
Permissible braking work	Per braking [J]	5000	5000	5000
	Per hour [J]	45200	45200	45200
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000
	Work per braking [J]	400	400	400

Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.

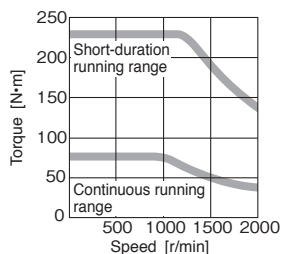
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 1000 r/min Series (200 V Class) Torque Characteristics

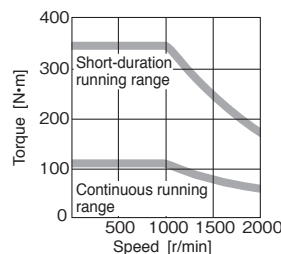
HG-JR601(B) (Note 1, 2)



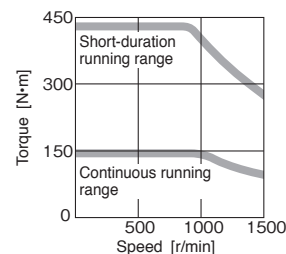
HG-JR801(B) (Note 1, 2)



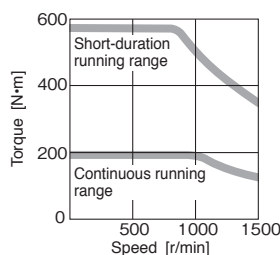
HG-JR12K1(B) (Note 1, 2)



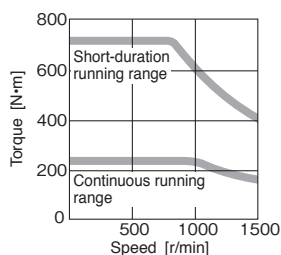
HG-JR15K1 (Note 1, 2)



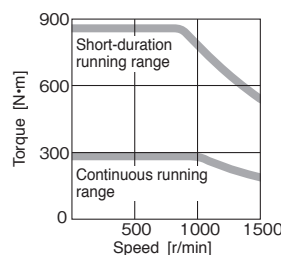
HG-JR20K1 (Note 1, 2)



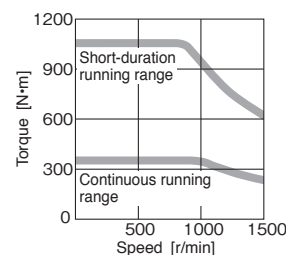
HG-JR25K1 (Note 1, 2)



HG-JR30K1 (Note 1, 2)



HG-JR37K1 (Note 1, 2)



Notes: 1. — : For 3-phase 200 V AC.

2. Torque drops when the power supply voltage is below the specified value.

HG-JR 1000 r/min Series (200 V Class) Special Shaft End Specifications

Motors with the following specifications are also available.

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

Model	Variable dimensions									Fig.
	S	R	Q	W	QK	QL	U	r	Y	
HG-JR601(B)K	42h6	85	79	12 ⁰ _{-0.040}	70	5	5 ^{+0.2} ₀	6	M8 screw Depth: 19.8	A
HG-JR801(B)K, 12K1(B)K	55m6	116	110	16 ⁰ _{-0.040}	90	5	6 ^{+0.2} ₀	8	M10 screw Depth: 27	
HG-JR15K1K, 20K1K, 25K1K	65m6	140	130	18 ⁰ _{-0.040}	120	5	7 ^{+0.2} ₀	9	M12 screw Depth: 25	
HG-JR30K1K, 37K1K	80m6	140	140	22 ⁰ _{-0.040}	132	7	9 ^{+0.2} ₀	11	M16 screw Depth: 30	

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.

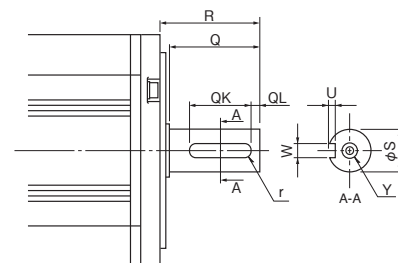


Fig. A

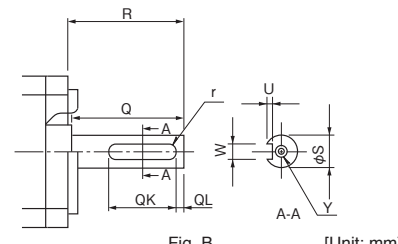


Fig. B

[Unit: mm]

HG-JR 1000 r/min Series (Low Inertia, Medium/Large Capacity) (400 V Class) Specifications

Rotary servo motor model			HG-JR	6014(B)	8014(B)	12K14(B)	15K14	20K14	25K14	30K14	37K14
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-5 in this catalog.								
Power supply capacity ^{*1}		[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	
	Rated torque ^(Note 3)	[N•m]	57.3	76.4	115	143	191	239	286	353	
Maximum torque		[N•m]	172	229	345	429	573	717	858	1059	
Rated speed		[r/min]	1000								
Maximum speed		[r/min]	2000				1500				
Permissible instantaneous speed		[r/min]	2300				1725				
Power rate at continuous rated torque	Standard	[kW/s]	187	265	420	418	582	748	594	761	
	With electromagnetic brake	[kW/s]	167	243	394	-	-	-	-	-	
Rated current		[A]	16	23	30	33	47	48	60	76	
Maximum current		[A]	54	80	104	114	161	160	202	248	
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	83	331 ^(Note 4)	229 ^(Note 4)	239 ^(Note 4)	187 ^(Note 4)	152 ^(Note 4)	-	-	
	Standard	[× 10 ⁻⁴ kg•m ²]	176	220	315	489	627	764	1377	1637	
Moment of inertia J	With electromagnetic brake	[× 10 ⁻⁴ kg•m ²]	196	240	336	-	-	-	-	-	
	Recommended load to motor inertia ratio ^(Note 1)		10 times or less								
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)								
Oil seal			Attached								
Insulation class			155 (F)								
Structure			Totally enclosed, natural cooling (IP rating: IP67) ^(Note 2)				Totally enclosed, force cooling (IP rating: IP44) ^(Note 2)				
Environment ^{*3}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)								
	Ambient humidity		Operation: 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 ^{*4}		X: 24.5 m/s² Y: 24.5 m/s²							X: 9.8 m/s² Y: 9.8 m/s²	
Vibration rank			V10 ^{*6}								
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.								
Permissible load for the shaft ^{*5}	L	[mm]	116	116	116	140	140	140	140	140	
	Radial	[N]	2940	2940	2940	3234	3234	3234	4900	4900	
	Thrust	[N]	980	980	980	1470	1470	1470	1960	1960	
Mass	Standard	[kg]	53	62	86	120	145	165	215	240	
	With electromagnetic brake	[kg]	65	74	97	-	-	-	-	-	
Cooling fan	Power supply	Voltage/frequency	-	-	-	3-phase 380 V AC to 480 V AC, 50 Hz/60 Hz			3-phase 380 V AC to 460 V AC, 50 Hz/60 Hz		
		Input [W]	-	-	-	65 (50 Hz)/85 (60 Hz)			110 (50 Hz)/150 (60 Hz)		
	Rated current		[A]	-	-	-	0.12 (50 Hz)/0.14 (60 Hz)			0.20 (50 Hz)/0.22 (60 Hz)	

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 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.

4. The value is applicable when the external regenerative resistors, GRZG400-Ω (standard accessory) are used with cooling fans (2 units of 92 mm × 92 mm, minimum airflow: 1.0 m³/min). Note that [Pr. PA02] must be changed.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

HG-JR 1000 r/min Series (400 V Class) Electromagnetic Brake Specifications (Note 1)

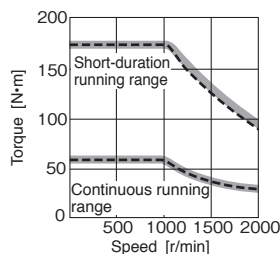
Model	HG-JR	6014B	8014B	12K14B
Type	Spring actuated type safety brake			
Rated voltage	24 V DC $\pm 10\%$			
Power consumption [W] at 20 °C		32	32	32
Electromagnetic brake static friction torque [N·m]		126	126	126
Permissible braking work	Per braking [J]	5000	5000	5000
	Per hour [J]	45200	45200	45200
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000
	Work per braking [J]	400	400	400

Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.

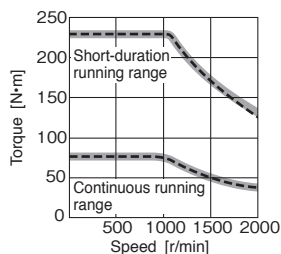
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 1000 r/min Series (400 V Class) Torque Characteristics

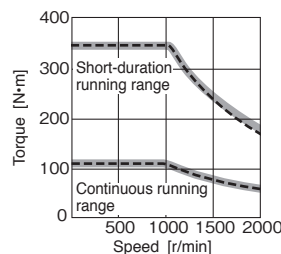
HG-JR6014(B) (Note 1, 2, 3)



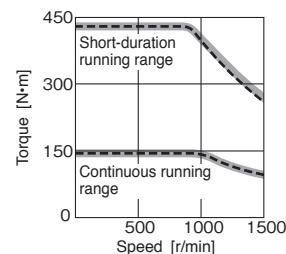
HG-JR8014(B) (Note 1, 2, 3)



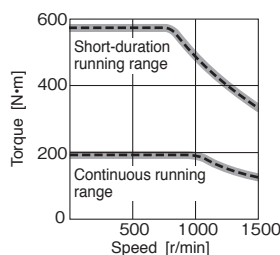
HG-JR12K14(B) (Note 1, 2, 3)



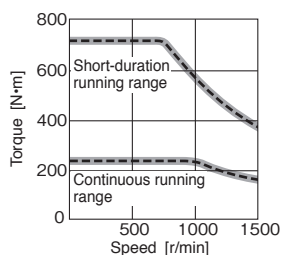
HG-JR15K14 (Note 1, 2, 3)



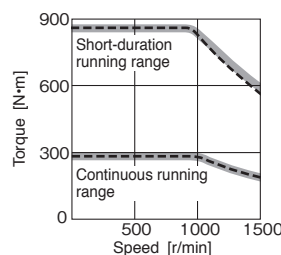
HG-JR20K14 (Note 1, 2, 3)



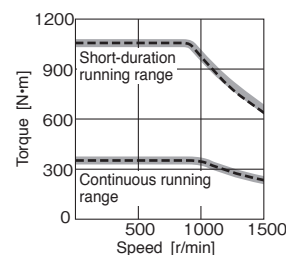
HG-JR25K14 (Note 1, 2, 3)



HG-JR30K14 (Note 1, 2, 3)



HG-JR37K14 (Note 1, 2, 3)



Notes: 1. ——— : For 3-phase 400 V AC.

2. - - - - : For 3-phase 380 V AC.

3. Torque drops when the power supply voltage is below the specified value.

HG-JR 1000 r/min Series (400 V Class) Special Shaft End Specifications

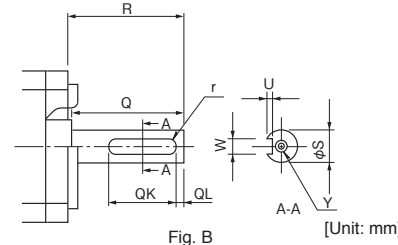
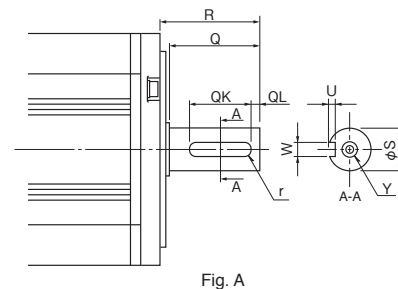
Motors with the following specifications are also available.

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

Model	Variable dimensions									Fig.
	S	R	Q	W	QK	QL	U	r	Y	
HG-JR6014(B)K	42h6	85	79	12 ⁰ _{-0.040}	70	5	5 ^{+0.2} ₀	6	M8 screw Depth: 19.8	A
HG-JR8014(B)K, 12K14(B)K	55m6	116	110	16 ⁰ _{-0.040}	90	5	6 ^{+0.2} ₀	8	M10 screw Depth: 27	
HG-JR15K14K, 20K14K, 25K14K	65m6	140	130	18 ⁰ _{-0.040}	120	5	7 ^{+0.2} ₀	9	M12 screw Depth: 25	
HG-JR30K14K, 37K14K	80m6	140	140	22 ⁰ _{-0.040}	132	7	9 ^{+0.2} ₀	11	M16 screw Depth: 30	B

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]

HG-JR 1500 r/min Series (Low Inertia, Medium/Large Capacity) (200 V Class) Specifications

Rotary servo motor model			HG-JR	701M(B)	11K1M(B)	15K1M(B)	22K1M	30K1M	37K1M
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-4 in this catalog.						
Power supply capacity ^{*1}		[kVA]	10	16	22	33	48	59	
Continuous running duty	Rated output	[kW]	7.0	11	15	22	30	37	
	Rated torque ^(Note 3)	[N·m]	44.6	70.0	95.5	140	191	236	
Maximum torque		[N·m]	134	210	286	420	573	707	
Rated speed		[r/min]	1500						
Maximum speed		[r/min]	3000			2500			
Permissible instantaneous speed		[r/min]	3450			2875			
Power rate at continuous rated torque	Standard	[kW/s]	113	223	289	401	582	726	
	With electromagnetic brake	[kW/s]	101	204	271	-	-	-	
Rated current		[A]	34	61	76	99	139	151	
Maximum current		[A]	111	200	246	315	479	561	
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	36	143 ^(Note 4)	162 ^(Note 4)	104 ^(Note 4)	-	-	
	Standard	[× 10 ⁻⁴ kg·m ²]	176	220	315	489	627	764	
Moment of inertia J	With electromagnetic brake	[× 10 ⁻⁴ kg·m ²]	196	240	336	-	-	-	
	Recommended load to motor inertia ratio ^(Note 1)		10 times or less						
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)						
Oil seal			Attached						
Insulation class			155 (F)						
Structure			Totally enclosed, natural cooling (IP rating: IP67) ^(Note 2)			Totally enclosed, force cooling (IP rating: IP44) ^(Note 2)			
Environment ^{*3}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)						
	Ambient humidity		Operation: 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 ^{*4}		X: 24.5 m/s ² Y: 24.5 m/s ²						
Vibration rank			V10 ^{*6}						
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.						
Permissible load for the shaft ^{*5}	L	[mm]	116	116	116	140	140	140	
	Radial	[N]	2940	2940	2940	3234	3234	3234	
	Thrust	[N]	980	980	980	1470	1470	1470	
Mass	Standard	[kg]	53	62	86	120	145	165	
	With electromagnetic brake	[kg]	65	74	97	-	-	-	
Cooling fan	Power supply	Voltage/frequency	-	-	-	3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz			
		Input [W]	-	-	-	65 (50 Hz)/85 (60 Hz)			
	Rated current		[A]	-	-	-	0.20 (50 Hz)/0.22 (60 Hz)		

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 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.

4. The value is applicable when the external regenerative resistors, GRZG400-Ω (standard accessory) are used with cooling fans (2 units of 92 mm × 92 mm, minimum airflow: 1.0 m³/min). Note that [Pr. PA02] must be changed.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

HG-JR 1500 r/min Series (200 V Class) Electromagnetic Brake Specifications (Note 1)

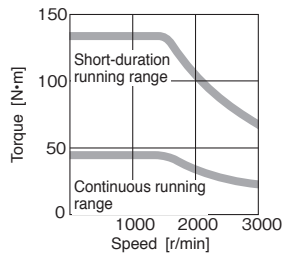
Model	HG-JR	701MB	11K1MB	15K1MB
Type	Spring actuated type safety brake			
Rated voltage	24 V DC _{-10%} ^{0%}			
Power consumption [W] at 20 °C		32	32	32
Electromagnetic brake static friction torque [N·m]		126	126	126
Permissible braking work	Per braking [J]	5000	5000	5000
	Per hour [J]	45200	45200	45200
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000
	Work per braking [J]	400	400	400

Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.

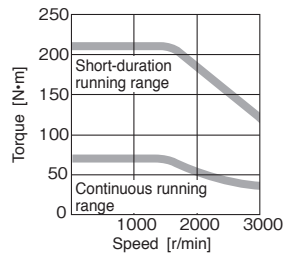
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 1500 r/min Series (200 V Class) Torque Characteristics

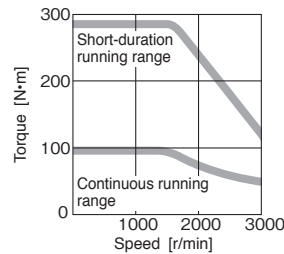
HG-JR701M(B) (Note 1, 2)



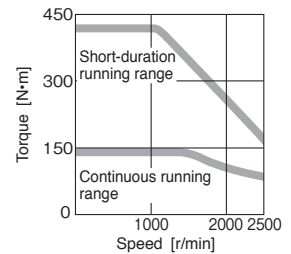
HG-JR11K1M(B) (Note 1, 2)



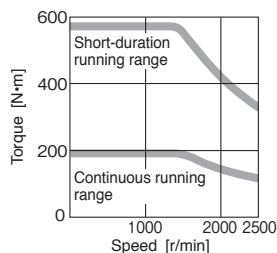
HG-JR15K1M(B) (Note 1, 2)



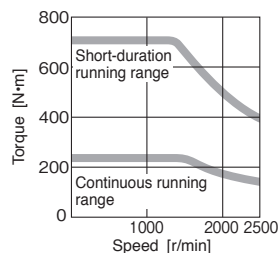
HG-JR22K1M (Note 1, 2)



HG-JR30K1M (Note 1, 2)



HG-JR37K1M (Note 1, 2)



Notes: 1. — : For 3-phase 200 V AC.

2. Torque drops when the power supply voltage is below the specified value.

HG-JR 1500 r/min Series (200 V Class) Special Shaft End Specifications

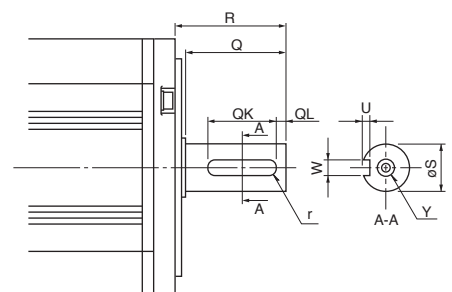
Motors with the following specifications are also available.

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

Model	Variable dimensions								
	S	R	Q	W	QK	QL	U	r	Y
HG-JR701M(B)K	42h6	85	79	12 _{-0.040} ⁰	70	5	5 ₀ ^{+0.2}	6	M8 screw Depth: 19.8
HG-JR11K1M(B)K, 15K1M(B)K	55m6	116	110	16 _{-0.040} ⁰	90	5	6 ₀ ^{+0.2}	8	M10 screw Depth: 27
HG-JR22K1MK, 30K1MK, 37K1MK	65m6	140	130	18 _{-0.040} ⁰	120	5	7 ₀ ^{+0.2}	9	M12 screw Depth: 25

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]

HG-JR 1500 r/min Series (Low Inertia, Medium/Large Capacity) (400 V Class) Specifications

Rotary servo motor model			HG-JR	701M4(B)	11K1M4(B)	15K1M4(B)	22K1M4	30K1M4	37K1M4	45K1M4	55K1M4
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-5 in this catalog.								
Power supply capacity ^{*1}			[kVA]	10	16	22	33	48	59	71	80
Continuous running duty	Rated output	[kW]	7.0	11	15	22	30	37	45	55	
	Rated torque ^(Note 3)	[N·m]	44.6	70.0	95.5	140	191	236	286	350	
Maximum torque			[N·m]	134	210	286	420	573	707	859	1050
Rated speed			[r/min]	1500							
Maximum speed			[r/min]	3000			2500				
Permissible instantaneous speed			[r/min]	3450			2875				
Power rate at continuous rated torque	Standard	[kW/s]	113	223	289	401	582	726	596	749	
	With electromagnetic brake	[kW/s]	101	204	271	-	-	-	-	-	
Rated current			[A]	17	31	38	50	68	79	85	110
Maximum current			[A]	56	100	123	170	235	263	288	357
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	36	143 ^(Note 4)	162 ^(Note 4)	104 ^(Note 4)	-	-	-	-	
	Standard	[× 10 ⁻⁴ kg·m ²]	176	220	315	489	627	764	1377	1637	
Moment of inertia J	With electromagnetic brake	[× 10 ⁻⁴ kg·m ²]	196	240	336	-	-	-	-	-	
	Recommended load to motor inertia ratio ^(Note 1)		10 times or less								
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)								
Oil seal			Attached								
Insulation class			155 (F)								
Structure			Totally enclosed, natural cooling (IP rating: IP67) ^(Note 2)				Totally enclosed, force cooling (IP rating: IP44) ^(Note 2)				
Environment ^{*3}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)								
	Ambient humidity		Operation: 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 ^{*4}		X: 24.5 m/s ² Y: 24.5 m/s ²							X: 9.8 m/s ² Y: 9.8 m/s ²	
Vibration rank			V10 ^{*6}								
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.								
Permissible load for the shaft ^{*5}	L	[mm]	116	116	116	140	140	140	140	140	
	Radial	[N]	2940	2940	2940	3234	3234	3234	4900	4900	
	Thrust	[N]	980	980	980	1470	1470	1470	1960	1960	
Mass	Standard	[kg]	53	62	86	120	145	165	215	240	
	With electromagnetic brake	[kg]	65	74	97	-	-	-	-	-	
Cooling fan	Power supply	Voltage/frequency	-	-	-	3-phase 380 V AC to 480 V AC, 50 Hz/60 Hz			3-phase 380 V AC to 460 V AC, 50 Hz/60 Hz		
		Input [W]	-	-	-	65 (50 Hz)/85 (60 Hz)			110 (50 Hz)/150 (60 Hz)		
	Rated current		[A]	-	-	-	0.12 (50 Hz)/0.14 (60 Hz)			0.20 (50 Hz)/0.22 (60 Hz)	

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 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.

4. The value is applicable when the external regenerative resistors, GRZG400-Ω (standard accessory) are used with cooling fans (2 units of 92 mm × 92 mm, minimum airflow: 1.0 m³/min). Note that [Pr. PA02] must be changed.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

HG-JR 1500 r/min Series (400 V Class) Electromagnetic Brake Specifications (Note 1)

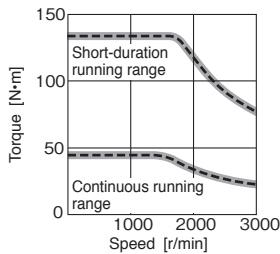
Model	HG-JR	701M4B	11K1M4B	15K1M4B
Type	Spring actuated type safety brake			
Rated voltage	24 V DC _{-10%}			
Power consumption [W] at 20 °C		32	32	32
Electromagnetic brake static friction torque [N·m]		126	126	126
Permissible braking work	Per braking [J]	5000	5000	5000
	Per hour [J]	45200	45200	45200
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000
	Work per braking [J]	400	400	400

Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.

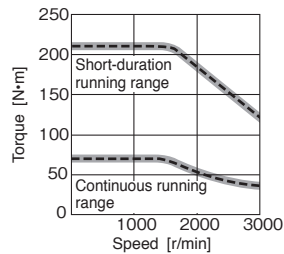
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 1500 r/min Series (400 V Class) Torque Characteristics

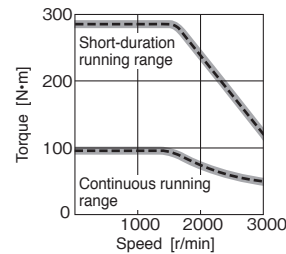
HG-JR701M4(B) (Note 1, 2, 3)



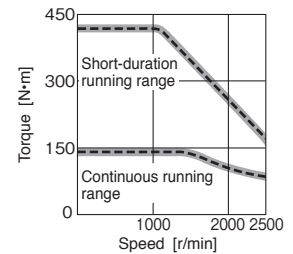
HG-JR11K1M4(B) (Note 1, 2, 3)



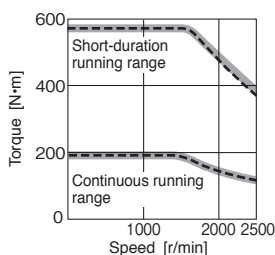
HG-JR15K1M4(B) (Note 1, 2, 3)



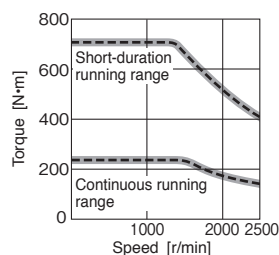
HG-JR22K1M4 (Note 1, 2, 3)



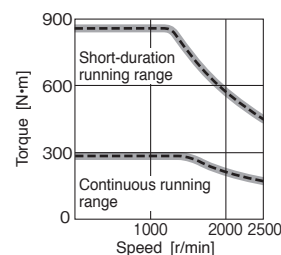
HG-JR30K1M4 (Note 1, 2, 3)



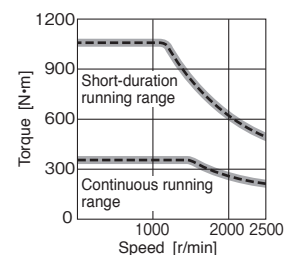
HG-JR37K1M4 (Note 1, 2, 3)



HG-JR45K1M4 (Note 1, 2, 3)



HG-JR55K1M4 (Note 1, 2, 3)



Notes: 1. ——— : For 3-phase 400 V AC.

2. - - - - : For 3-phase 380 V AC.

3. Torque drops when the power supply voltage is below the specified value.

HG-JR 1500 r/min Series (400 V Class) Special Shaft End Specifications

Motors with the following specifications are also available.

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

Model	Variable dimensions									Fig.
	S	R	Q	W	QK	QL	U	r	Y	
HG-JR701M4(B)K	42h6	85	79	12 ⁰ _{-0.040}	70	5	5 ^{+0.2} ₀	6	M8 screw Depth: 19.8	A
HG-JR11K1M4(B)K, 15K1M4(B)K	55m6	116	110	16 ⁰ _{-0.040}	90	5	6 ^{+0.2} ₀	8	M10 screw Depth: 27	
HG-JR22K1M4K, 30K1M4K, 37K1M4K	65m6	140	130	18 ⁰ _{-0.040}	120	5	7 ^{+0.2} ₀	9	M12 screw Depth: 25	
HG-JR45K1M4K, 55K1M4K	80m6	140	140	22 ⁰ _{-0.040}	132	7	9 ^{+0.2} ₀	11	M16 screw Depth: 30	

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.

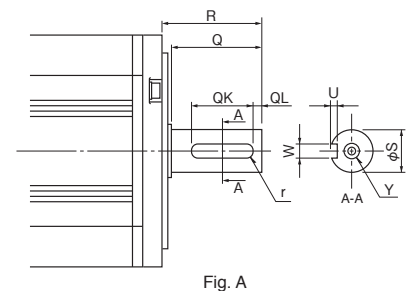


Fig. A

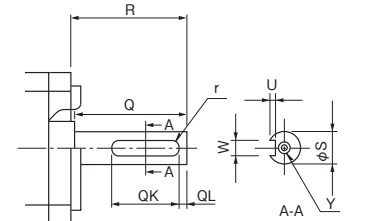


Fig. B

[Unit: mm]

HG-RR Series (Ultra-low Inertia, Medium Capacity) Specifications

Rotary servo motor model		HG-RR	103(B)	153(B)	203(B)	353(B)	503(B)
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-4 in this catalog.				
Power supply capacity ^{*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 ^(Note 3)	[N•m]	3.2	4.8	6.4	11.1	15.9
Maximum torque		[N•m]	8.0	11.9	15.9	27.9	39.8
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]	67.4	120	176	150	211
	With electromagnetic brake	[kW/s]	54.8	101	153	105	163
Rated current		[A]	6.1	8.8	14	23	28
Maximum current		[A]	18	23	37	58	70
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	1090	860	710	174	125
	Standard	[× 10 ⁻⁴ kg•m ²]	1.50	1.90	2.30	8.30	12.0
Moment of inertia J	With electromagnetic brake	[× 10 ⁻⁴ kg•m ²]	1.85	2.25	2.65	11.8	15.5
Recommended load to motor inertia ratio ^(Note 1)			5 times or less				
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)				
Oil seal			Attached				
Insulation class			155 (F)				
Structure			Totally enclosed, natural cooling (IP rating: IP65) ^(Note 2)				
Environment ^{*3}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)				
	Ambient humidity		Operation: 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 ^{*4}			X: 24.5 m/s ² Y: 24.5 m/s ²				
Vibration rank			V10 ^{*6}				
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.				
Permissible load for the shaft ^{*5}	L	[mm]	45	45	45	63	63
	Radial	[N]	686	686	686	980	980
	Thrust	[N]	196	196	196	392	392
Mass	Standard	[kg]	3.9	5.0	6.2	12	17
	With electromagnetic brake	[kg]	6.0	7.0	8.3	15	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 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

HG-RR Series Electromagnetic Brake Specifications (Note 1)

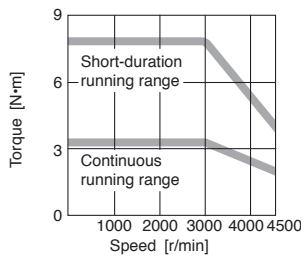
Model	HG-RR	103B	153B	203B	353B	503B
Type	Spring actuated type safety brake					
Rated voltage	24 V DC _{-10%} ^{0%}					
Power consumption [W] at 20 °C		19	19	19	23	23
Electromagnetic brake static friction torque [N·m]		7.0	7.0	7.0	17	17
Permissible braking work	Per braking [J]	400	400	400	400	400
	Per hour [J]	4000	4000	4000	4000	4000
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000	20000	20000
	Work per braking [J]	200	200	200	200	200

Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.

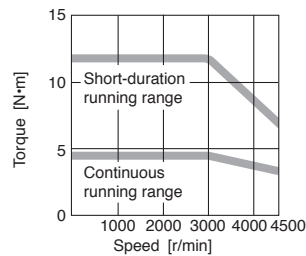
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-RR Series Torque Characteristics

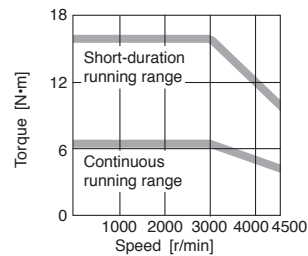
HG-RR103(B) (Note 1, 2)



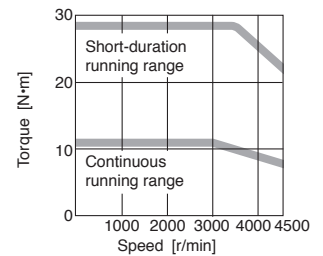
HG-RR153(B) (Note 1, 2)



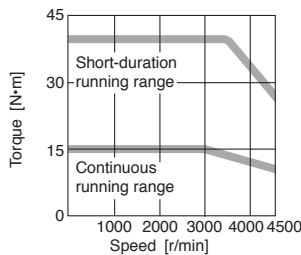
HG-RR203(B) (Note 1, 2)



HG-RR353(B) (Note 1, 2)



HG-RR503(B) (Note 1, 2)



Notes: 1. — : For 3-phase 200 V AC.

2. Torque drops when the power supply voltage is below the specified value.

HG-RR Series Special Shaft End Specifications

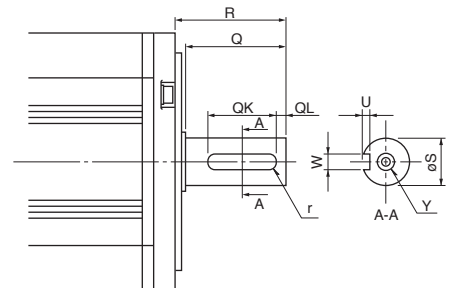
Motors with the following specifications are also available.

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

Model	Variable dimensions								
	S	R	Q	W	QK	QL	U	r	Y
HG-RR103(B)K, 153(B)K, 203(B)K	24h6	45	40	8 ⁰ _{-0.036}	25	5	4 ^{+0.2} ₀	4	M8 screw Depth: 20
HG-RR353(B)K, 503(B)K	28h6	63	58	8 ⁰ _{-0.036}	53	3	4 ^{+0.2} ₀	4	

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]

HG-UR Series (Flat Type, Medium Capacity) Specifications

Rotary servo motor model		HG-UR	72(B)	152(B)	202(B)	352(B)	502(B)
Compatible servo amplifier model		MR-J4- MR-J4W_-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-4 in this catalog.				
Power supply capacity ^{*1}		[kVA]	1.3	2.5	3.5	5.5	7.5
Continuous running duty	Rated output	[kW]	0.75	1.5	2.0	3.5	5.0
	Rated torque ^(Note 3)	[N•m]	3.6	7.2	9.5	16.7	23.9
Maximum torque		[N•m]	10.7	21.5	28.6	50.1	71.6
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]	12.3	23.2	23.9	36.5	49.6
	With electromagnetic brake	[kW/s]	10.3	21.2	19.5	32.8	46.0
Rated current		[A]	5.4	9.7	14	23	28
Maximum current		[A]	16	29	42	69	84
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	53	124	68	44	31
	MR-J4W_-	[times/min]	107	-	-	-	-
Moment of inertia J	Standard	[× 10 ⁻⁴ kg•m ²]	10.4	22.1	38.2	76.5	115
	With electromagnetic brake	[× 10 ⁻⁴ kg•m ²]	12.5	24.2	46.8	85.1	124
Recommended load to motor inertia ratio ^(Note 1)			15 times or less				
Speed/position detector			Absolute/incremental 22-bit encoder (resolution: 4194304 pulses/rev)				
Oil seal			Attached				
Insulation class			155 (F)				
Structure			Totally enclosed, natural cooling (IP rating: IP65) ^(Note 2)				
Environment ^{*3}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)				
	Ambient humidity		Operation: 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 ^{*4}			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 ^{*6}				
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.				
Permissible load for the shaft ^{*5}	L	[mm]	55	55	65	65	65
	Radial	[N]	637	637	882	1176	1176
	Thrust	[N]	490	490	784	784	784
Mass	Standard	[kg]	8.0	11	16	20	24
	With electromagnetic brake	[kg]	10	13	22	26	30

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 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the shaft-through portion.

3. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-33 in this catalog for the asterisks 1 to 6.

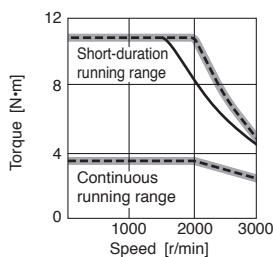
HG-UR Series Electromagnetic Brake Specifications (Note 1)

Model	HG-UR	72B	152B	202B	352B	502B
Type	Spring actuated type safety brake					
Rated voltage	24 V DC _{-10%}					
Power consumption [W] at 20 °C		19	19	34	34	34
Electromagnetic brake static friction torque [N·m]		8.5	8.5	44	44	44
Permissible braking work	Per braking [J]	400	400	4500	4500	4500
	Per hour [J]	4000	4000	45000	45000	45000
Electromagnetic brake life (Note 2)	Number of brakings [Times]	20000	20000	20000	20000	20000
	Work per braking [J]	200	200	1000	1000	1000

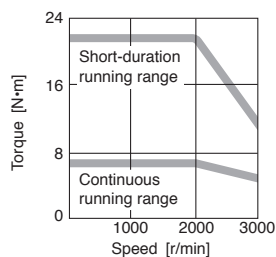
Notes: 1. The electromagnetic brake is for holding. It should not be used for deceleration applications.
 2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-UR Series Torque Characteristics

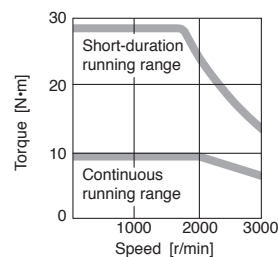
HG-UR72(B) (Note 1, 2, 3, 4)



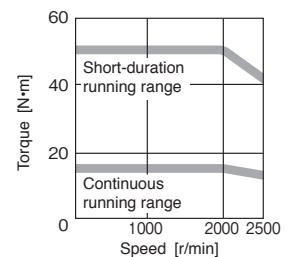
HG-UR152(B) (Note 1, 4)



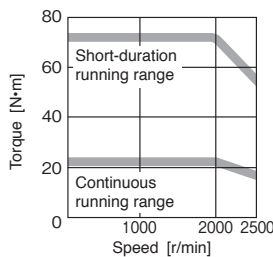
HG-UR202(B) (Note 1, 4)



HG-UR352(B) (Note 1, 4)



HG-UR502(B) (Note 1, 4)



Notes: 1. ——— : For 3-phase 200 V AC.
 2. - - - - : For 1-phase 230 V AC.
 3. ——— : For 1-phase 200 V AC.
 This line is drawn only where differs from the other two lines.
 4. Torque drops when the power supply voltage is below the specified value.

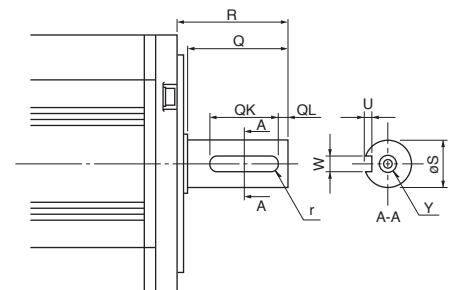
HG-UR Series Special Shaft End Specifications

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
HG-UR72(B)K	22h6	55	50	6 ⁰ _{-0.036}	42	3	3.5 ^{+0.1} ₀	3	M8 screw Depth: 20
HG-UR152(B)K	28h6	55	50	8 ⁰ _{-0.036}	40	3	4 ^{+0.2} ₀	4	
HG-UR202(B)K, 352(B)K, 502(B)K	35 ^{+0.010} ₀	65	60	10 ⁰ _{-0.036}	50	5	5 ^{+0.2} ₀	5	

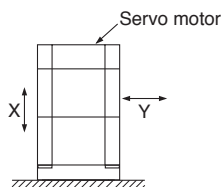
Notes: 1. The servo motors with special shaft end are not suitable for frequent start/stop applications.
 2. A key is not supplied with the servo motor. The key shall be installed by the user.



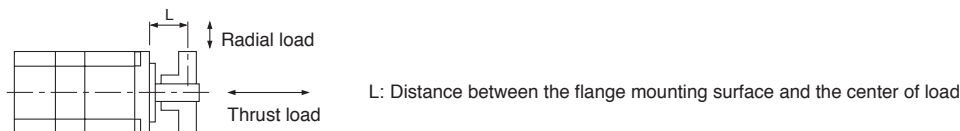
[Unit: mm]

Annotations for Rotary Servo Motor Specifications

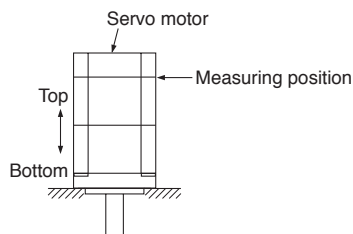
- * 1. The power supply capacity varies depending on the power supply impedance.
- * 2. The regenerative braking frequency shows the permissible frequency when the servo motor, without a load and a regenerative option, decelerates from the rated speed to a stop. When a load is connected; however, the 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. 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.
- * 4. 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.



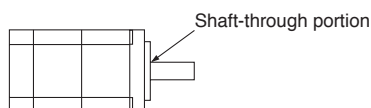
- * 5. Refer to the diagram below for the permissible load for the shaft. Do not apply a load exceeding the value specified in the table on the shaft. The values in the table are applicable when each load is applied singly.



- * 6. 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:

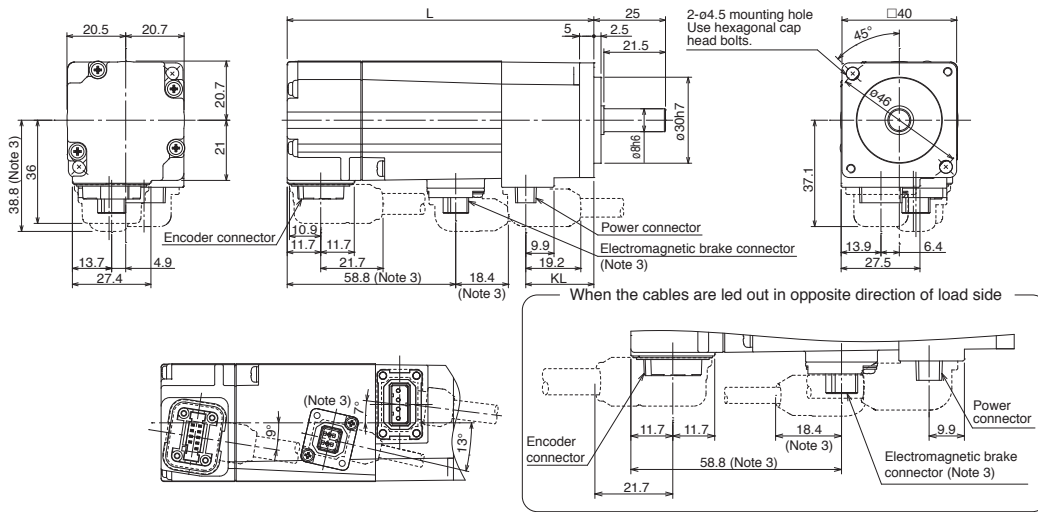


- * 7. Refer to the diagram below for shaft-through portion.



HG-KR/HG-MR Series Dimensions (Note 1, 5, 6)

- HG-KR053(B), HG-KR13(B)
- HG-MR053(B), HG-MR13(B)



Power connector



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

Electromagnetic brake connector (Note 2)

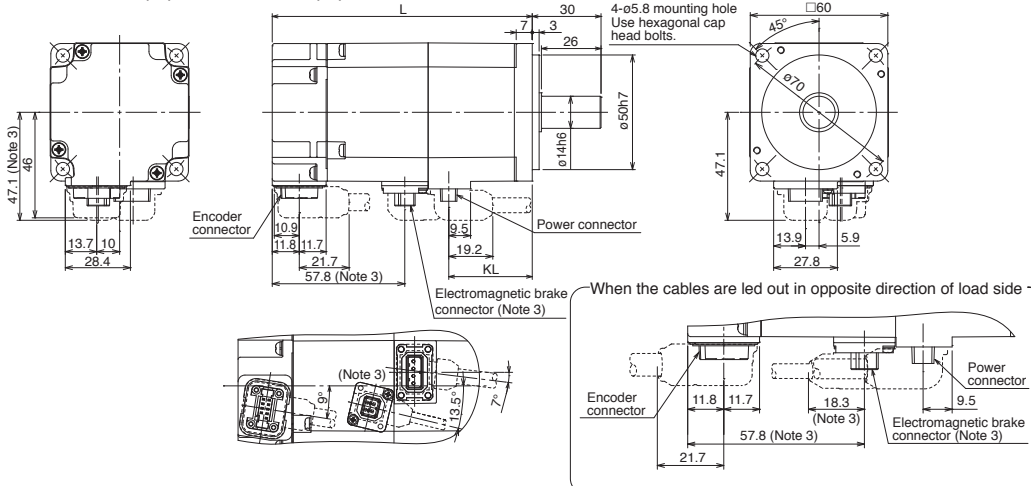


Pin No.	Signal name
1	B1
2	B2

Model	Variable dimensions (Note 4)	
	L	KL
HG-KR053(B) HG-MR053(B)	66.4 (107)	23.8
HG-KR13(B) HG-MR13(B)	82.4 (123)	39.8

[Unit: mm]

- HG-KR23(B), HG-KR43(B)
- HG-MR23(B), HG-MR43(B)



Power connector



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

Electromagnetic brake connector (Note 2)

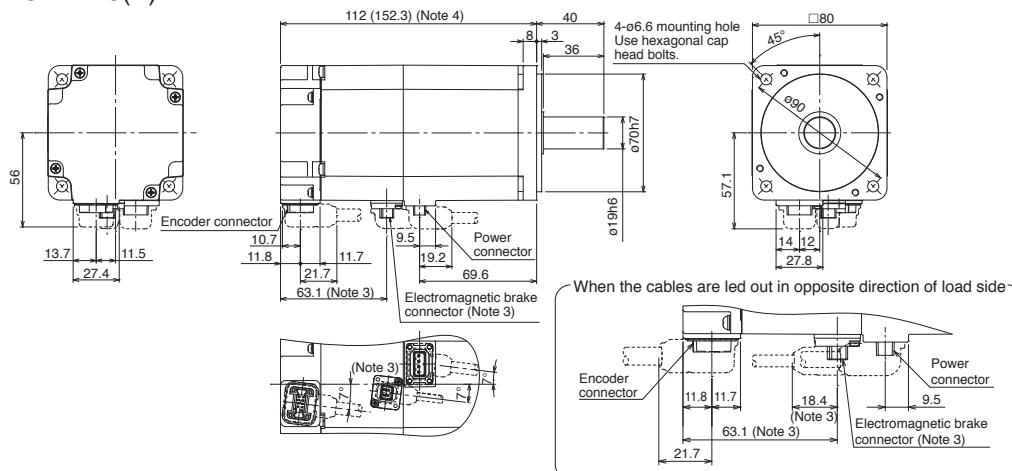


Pin No.	Signal name
1	B1
2	B2

Model	Variable dimensions (Note 4)	
	L	KL
HG-KR23(B) HG-MR23(B)	76.6 (113.4)	36.4
HG-KR43(B) HG-MR43(B)	98.3 (135.1)	58.1

[Unit: mm]

- HG-KR73(B)
- HG-MR73(B)



Power connector



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

Electromagnetic brake connector (Note 2)



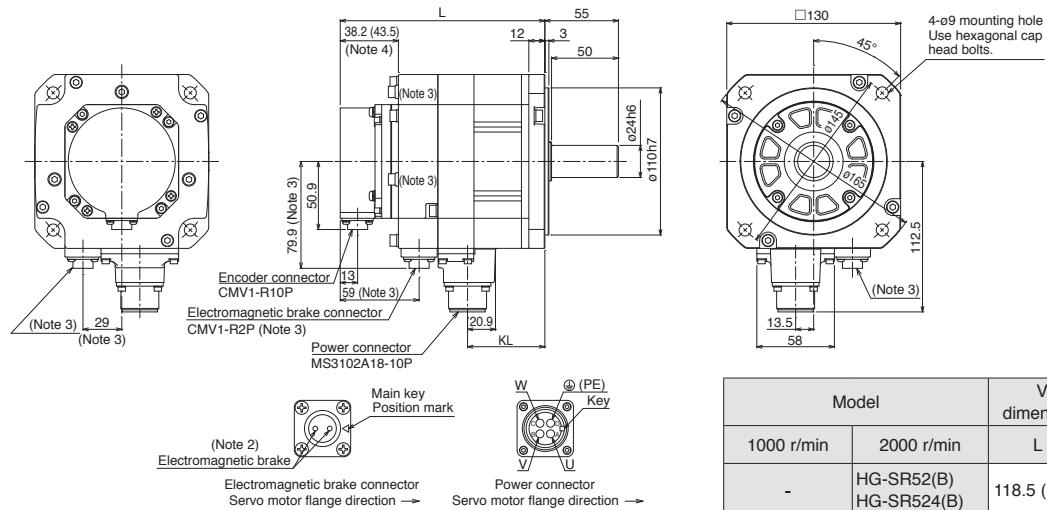
Pin No.	Signal name
1	B1
2	B2

[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.
 6. Servo motors with oil seal (HG-KR_J and HG-MR_J) have different dimensions. Contact your local sales office for more details.

HG-SR Series Dimensions (Note 1, 5)

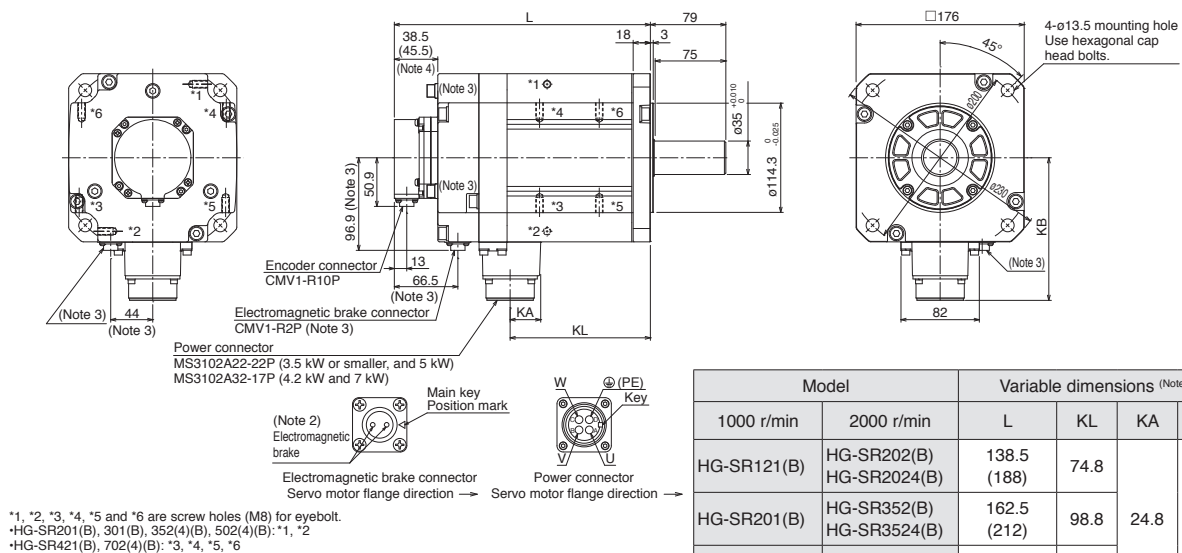
- HG-SR51(B), HG-SR81(B)
- HG-SR52(B), HG-SR102(B), HG-SR152(B),
HG-SR524(B), HG-SR1024(B), HG-SR1524(B)



Model		Variable dimensions (Note 4)	
1000 r/min	2000 r/min	L	KL
-	HG-SR52(B) HG-SR524(B)	118.5 (153)	57.8
HG-SR51(B)	HG-SR102(B) HG-SR1024(B)	132.5 (167)	71.8
HG-SR81(B)	HG-SR152(B) HG-SR1524(B)	146.5 (181)	85.8

[Unit: mm]

- HG-SR121(B), HG-SR201(B), HG-SR301(B), HG-SR421(B)
- HG-SR202(B), HG-SR352(B), HG-SR502(B), HG-SR702(B),
HG-SR2024(B), HG-SR3524(B), HG-SR5024(B), HG-SR7024(B)



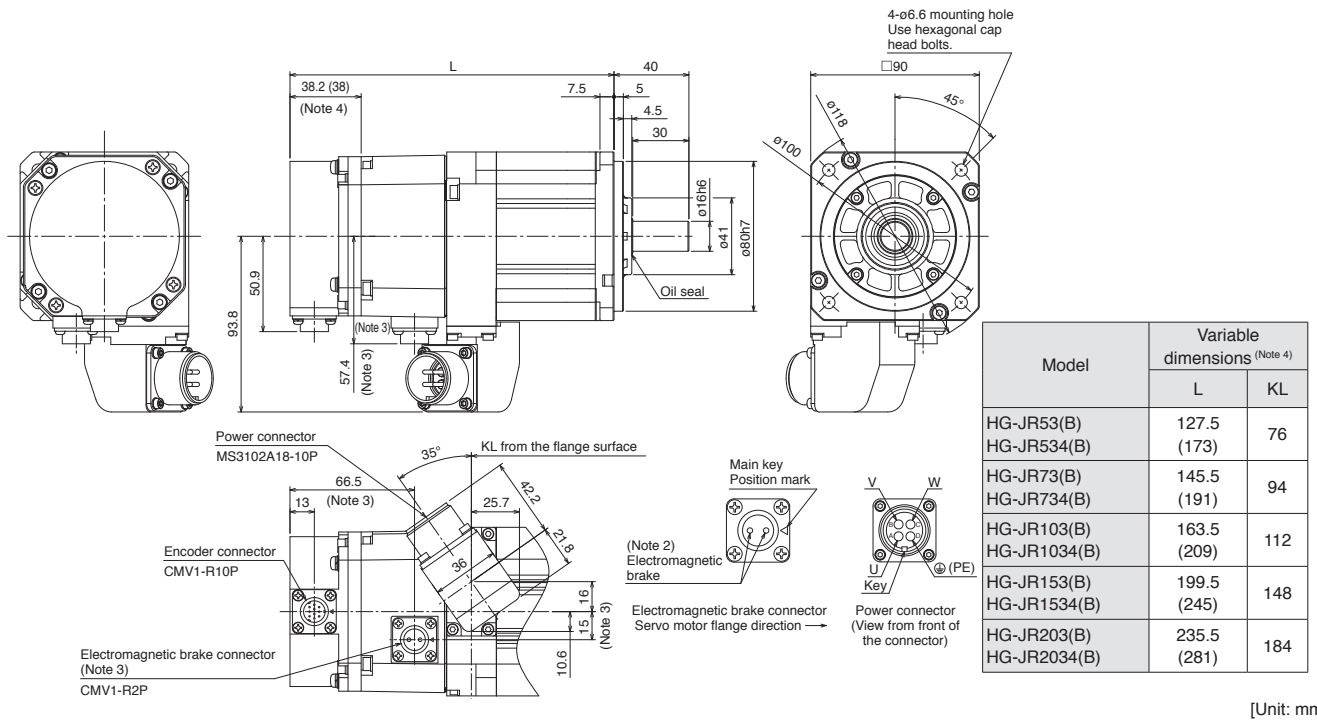
Model		Variable dimensions (Note 4)			
1000 r/min	2000 r/min	L	KL	KA	KB
HG-SR121(B)	HG-SR202(B) HG-SR2024(B)	138.5 (188)	74.8	24.8	140.9
HG-SR201(B)	HG-SR352(B) HG-SR3524(B)	162.5 (212)	98.8		
HG-SR301(B)	HG-SR502(B) HG-SR5024(B)	178.5 (228)	114.8	32	149.1
HG-SR421(B)	HG-SR702(B) HG-SR7024(B)	218.5 (268)	146.8		

[Unit: mm]

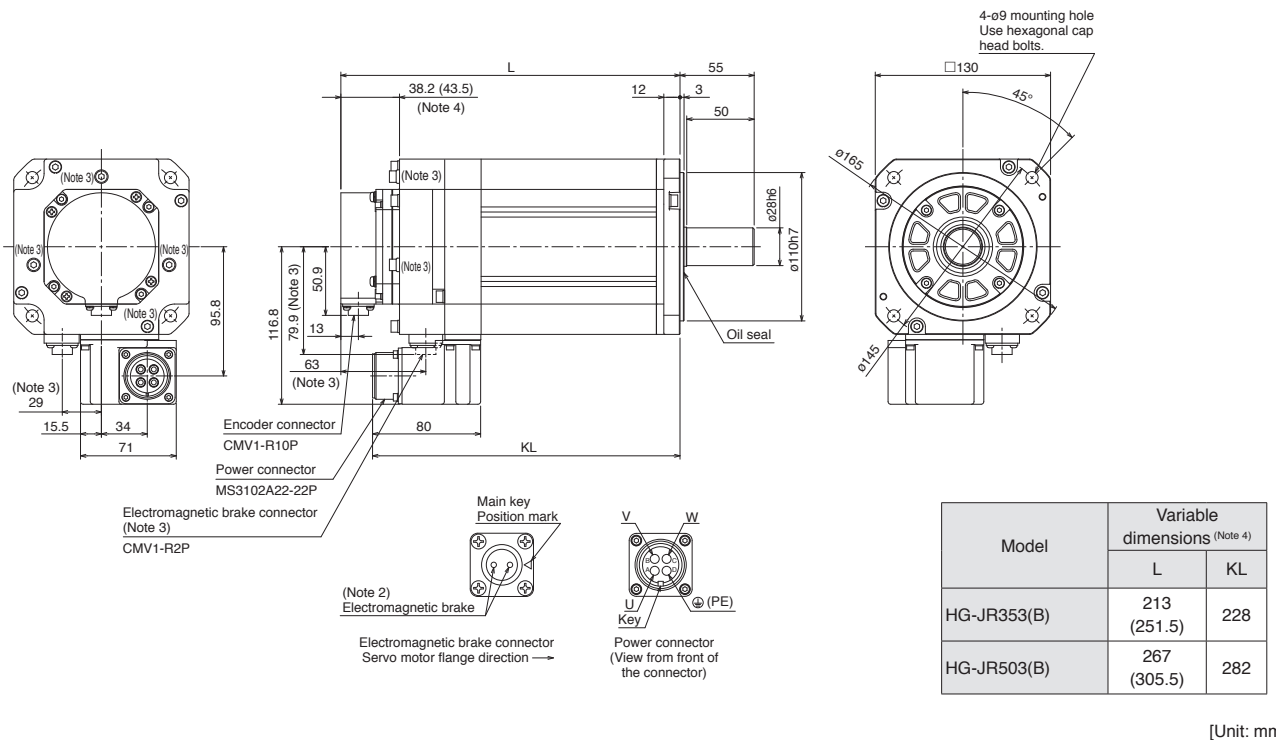
- Notes: 1. For dimensions without tolerance, general tolerance applies.
 2. The electromagnetic brake terminals do not have polarity.
 3. Only for the models with electromagnetic brake.
 4. Dimensions in brackets are for the models with electromagnetic brake.
 5. Use a friction coupling to fasten a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

HG-JR Series Dimensions (Note 1, 5)

- HG-JR53(B), HG-JR73(B), HG-JR103(B), HG-JR153(B), HG-JR203(B),
HG-JR534(B), HG-JR734(B), HG-JR1034(B), HG-JR1534(B), HG-JR2034(B)



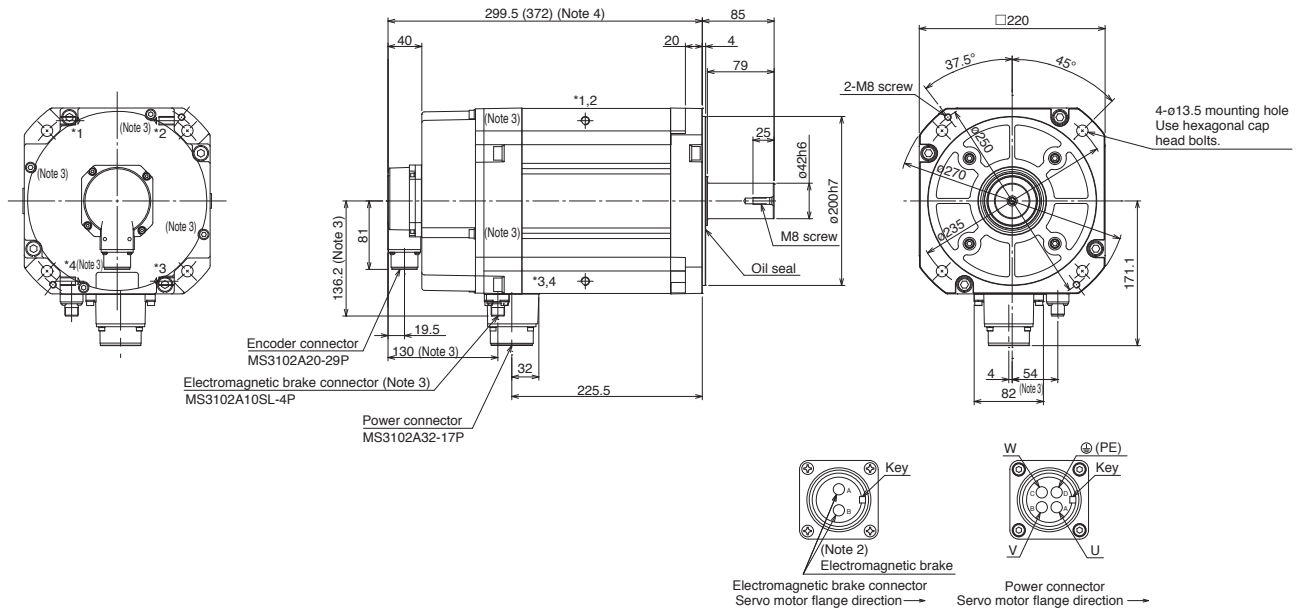
- HG-JR353(B), HG-JR503(B)



- Notes: 1. For dimensions without tolerance, general tolerance applies.
2. The electromagnetic brake terminals 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.

HG-JR Series Dimensions (Note 1, 5)

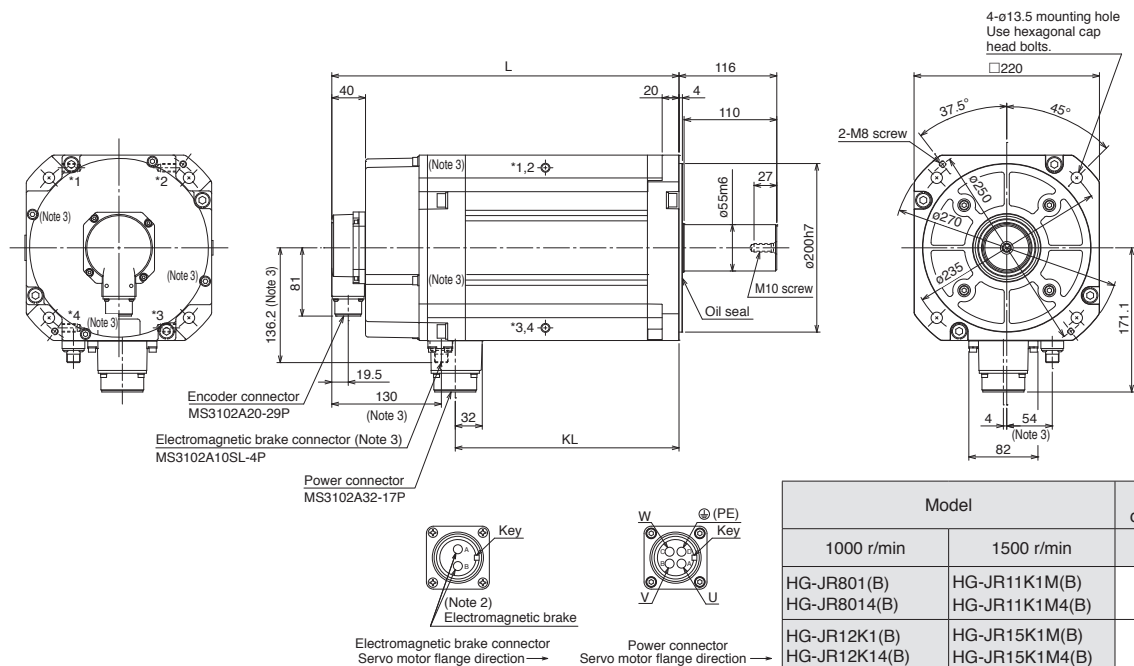
●HG-JR601(B), HG-JR701M(B), HG-JR6014(B), HG-JR701M4(B)



[Unit: mm]

●HG-JR801(B), HG-JR12K1(B), HG-JR8014(B), HG-JR12K14(B)

●HG-JR11K1M(B), HG-JR15K1M(B), HG-JR11K1M4(B), HG-JR15K1M4(B)



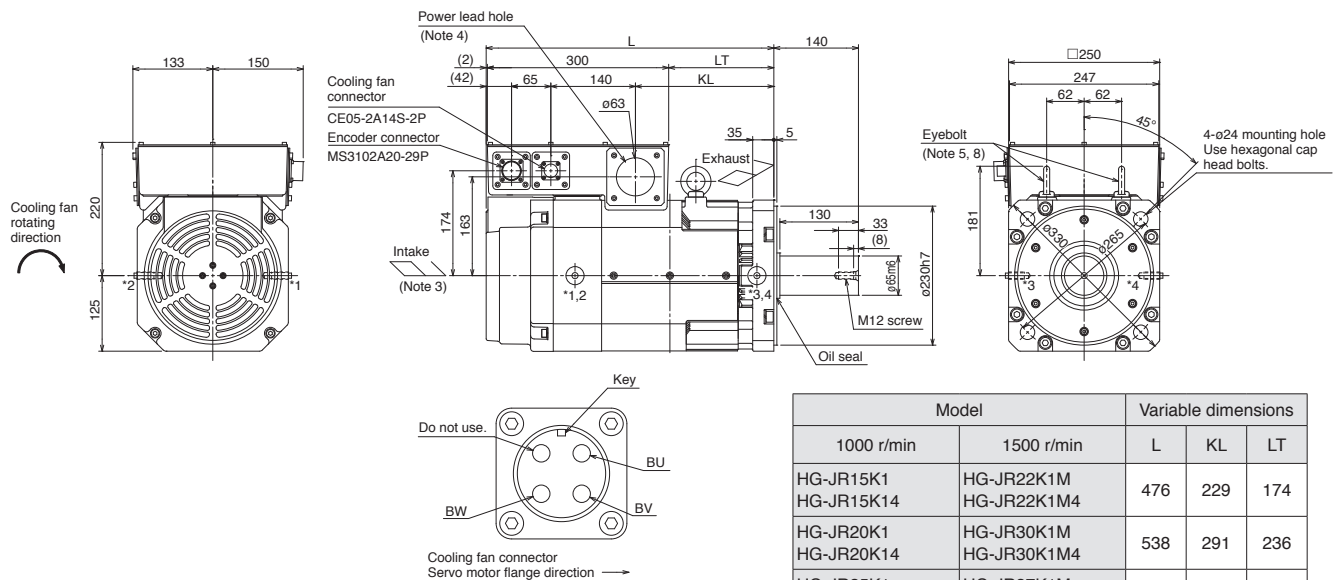
[Unit: mm]

- Notes: 1. For dimensions without tolerance, general tolerance applies.
 2. The electromagnetic brake terminals 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.

Model		Variable dimensions (Note 4)	
1000 r/min	1500 r/min	L	KL
HG-JR801(B)	HG-JR11K1M(B)	339.5	265.5
HG-JR8014(B)	HG-JR11K1M4(B)	(412)	
HG-JR12K1(B)	HG-JR15K1M(B)	439.5	365.5
HG-JR12K14(B)	HG-JR15K1M4(B)	(512)	

HG-JR Series Dimensions ^(Note 1, 2, 6)

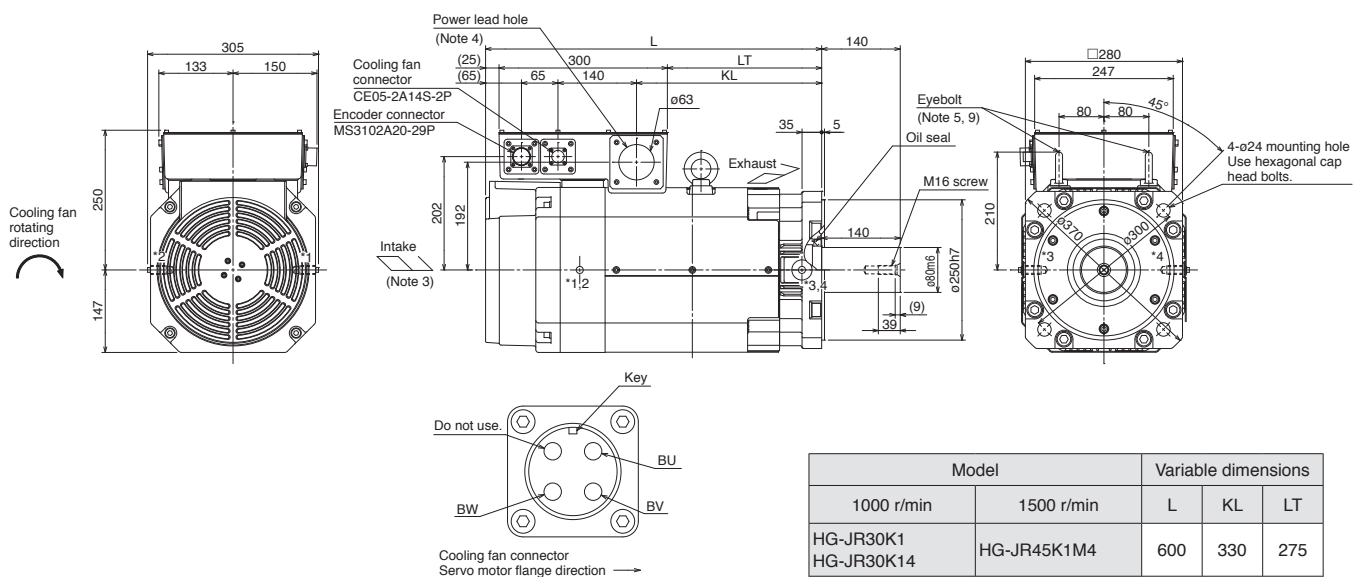
- HG-JR15K1, HG-JR20K1, HG-JR25K1, HG-JR15K14, HG-JR20K14, HG-JR25K14
●HG-JR22K1M (Note 7), HG-JR30K1M, HG-JR37K1M, HG-JR22K1M4 (Note 7), HG-JR30K1M4, HG-JR37K1M4



*1, *2, *3, and *4 are screw holes (M12) for eyebolt.

[Unit: mm]

- HG-JR30K1, HG-JR37K1, HG-JR30K14, HG-JR37K14
●HG-JR45K1M4, HG-JR55K1M4



*1, *2, *3, and *4 are screw holes (M16) for eyebolt.

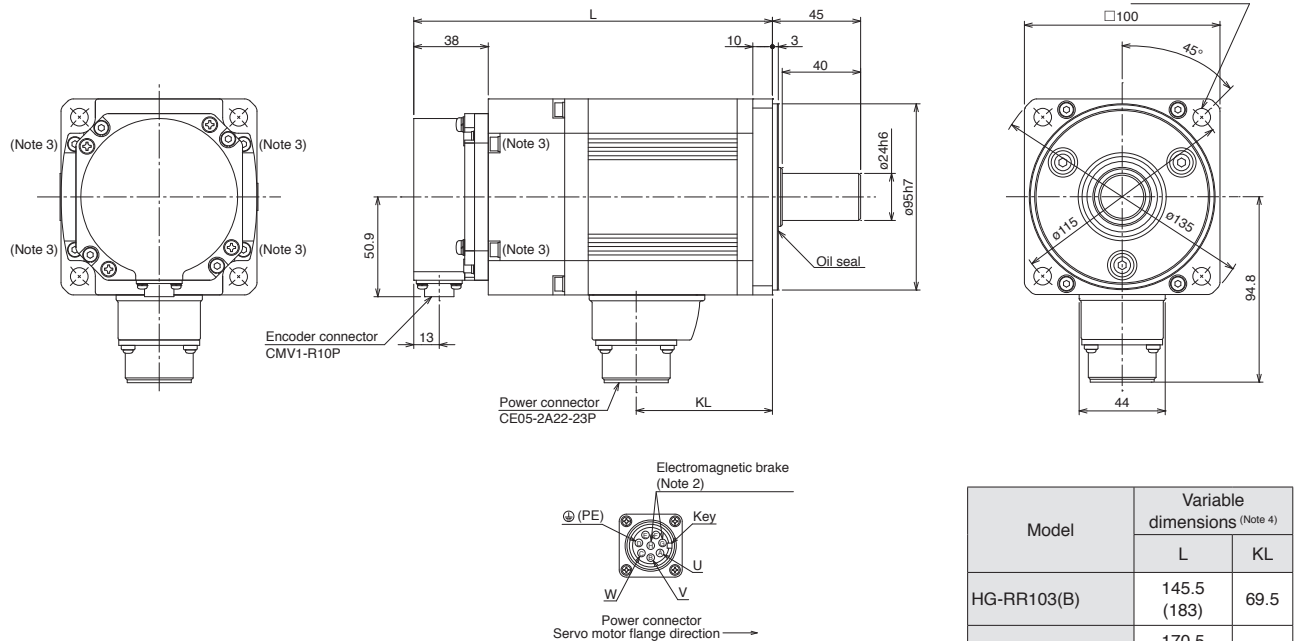
[Unit: mm]

- Notes: 1. For dimensions without tolerance, general tolerance applies.
2. Use a friction coupling to fasten a load.
3. Leave a clearance of at least 150 mm between the intake side of the servo motor and wall.
4. Prevent oil, water, dust, and other foreign matter from entering the servo motor through the lead hole.
5. A washer is placed between the eyebolt and the servo motor to adjust the bolt angle.

6. The terminal block in the terminal box consists of M10 screws for the motor power input (U, V, and W).
7. HG-JR22K1M/HG-JR22K1M4 have been modified from September 2014 production. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the previous dimensions.
8. When using the servo motor without the eyebolt, plug the threaded hole with a bolt of M12 x 20 or shorter.
9. When using the servo motor without the eyebolt, plug the threaded hole with a bolt of M16 x 20 or shorter.

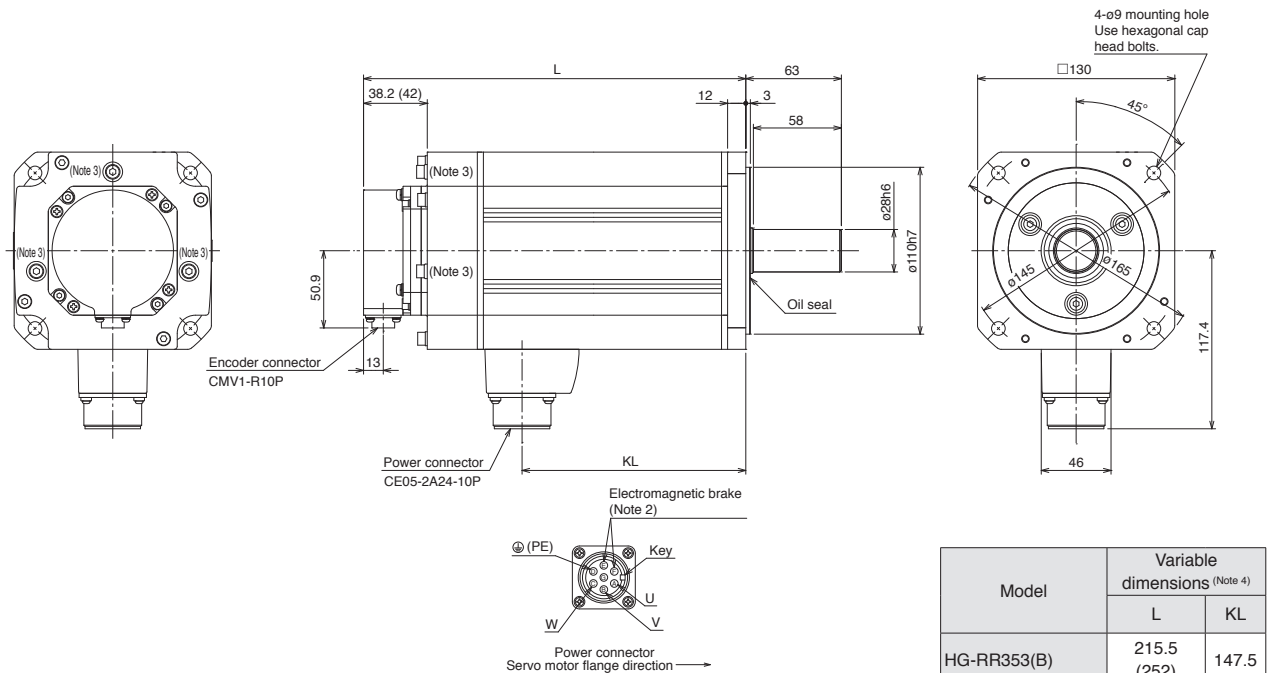
HG-RR Series Dimensions (Note 1, 5)

●HG-RR103(B), HG-RR153(B), HG-RR203(B)



[Unit: mm]

●HG-RR353(B), HG-RR503(B)

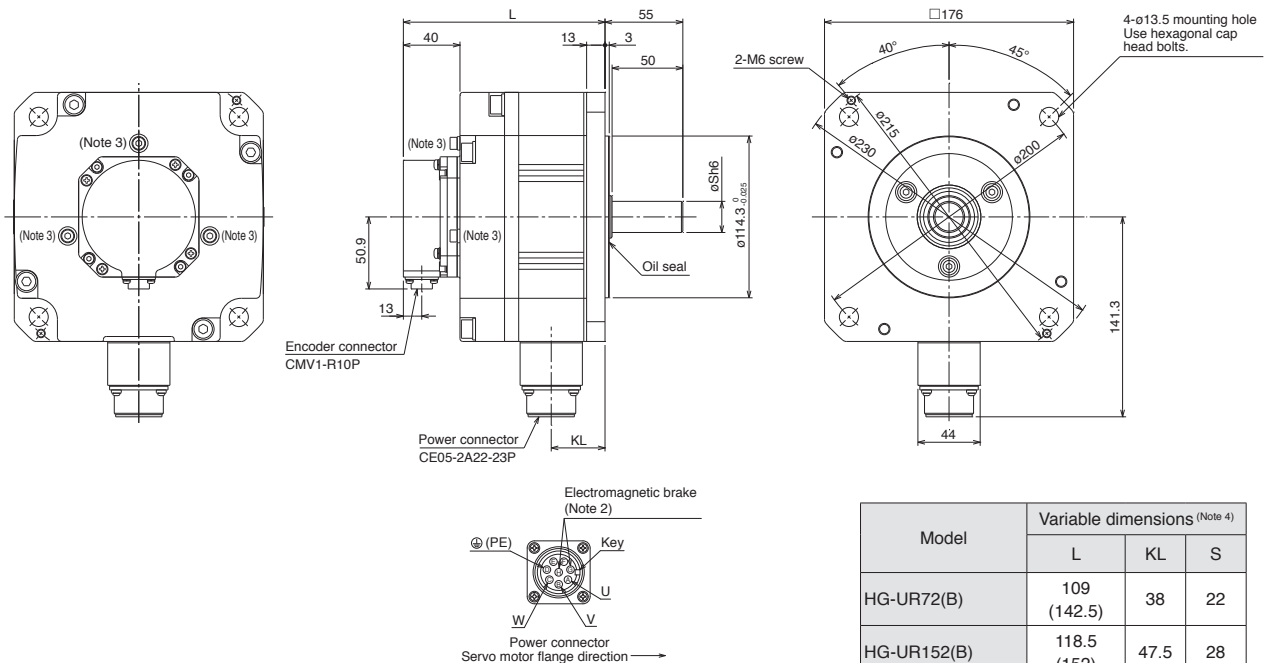


[Unit: mm]

- Notes: 1. For dimensions without tolerance, general tolerance applies.
 2. The electromagnetic brake terminals 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.

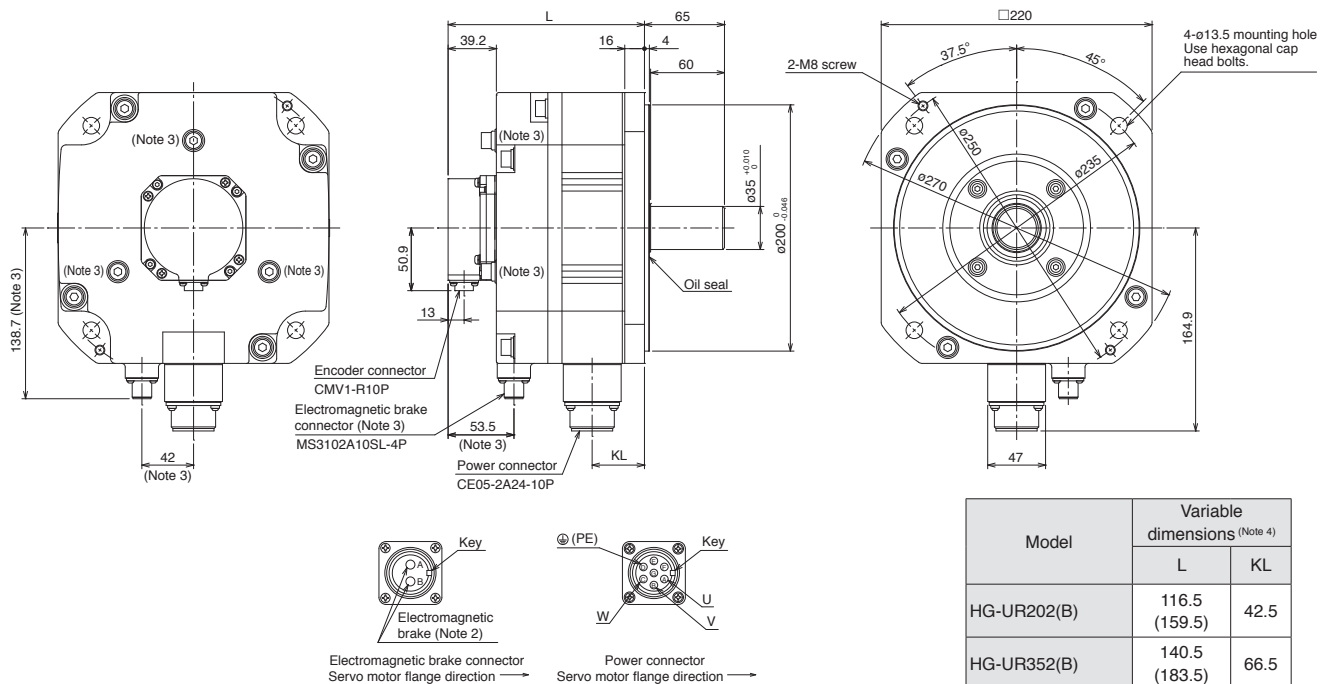
HG-UR Series Dimensions (Note 1, 5)

●HG-UR72(B), HG-UR152(B)



[Unit: mm]

●HG-UR202(B), HG-UR352(B), HG-UR502(B)



[Unit: mm]

Notes: 1. For dimensions without tolerance, general tolerance applies.
2. The electromagnetic brake terminals 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.



HG-KR Series Geared Servo Motor Specifications

With reducer for general industrial machines: G1

Model	Output [W]	Reduction ratio	Actual reduction ratio	Moment of inertia J [$\times 10^{-4}$ kg·m ²] (Note 1)		Permissible load to motor inertia ratio (Note 2) (when converted into the servo motor shaft)	Mass [kg]		Lubrication method	Mounting direction
				Standard	With electromagnetic brake		Standard	With electromagnetic brake		
HG-KR053(B)G1	50	1/5	9/44	0.0820	0.0840	5 times or less	1.4	1.6	Grease (filled)	Any direction
		1/12	49/576	0.104	0.106		1.8	2.0		
		1/20	25/484	0.0860	0.0880					
HG-KR13(B)G1	100	1/5	9/44	0.115	0.121	5 times or less	1.6	1.8		
		1/12	49/576	0.137	0.143		2.0	2.2		
		1/20	25/484	0.119	0.125					
HG-KR23(B)G1	200	1/5	19/96	0.375	0.397	7 times or less	3.3	3.7		
		1/12	961/11664	0.418	0.440		3.9	4.3		
		1/20	513/9984	0.391	0.413					
HG-KR43(B)G1	400	1/5	19/96	0.525	0.547	7 times or less	3.7	4.1		
		1/12	961/11664	0.568	0.590		4.3	4.7		
		1/20	7/135	0.881	0.903		5.4	5.8		
HG-KR73(B)G1	750	1/5	1/5	1.68	1.79	5 times or less	6.0	7.0		
		1/12	7/87	2.35	2.46		7.1	8.1		
		1/20	625/12544	2.41	2.52		10	11		

Item	Specifications
Mounting method	Flange mounting
Output shaft rotating direction	Same as the servo motor output shaft direction
Backlash (Note 4)	60 minutes or less at reducer output shaft
Maximum torque	Three times of the rated torque (Refer to HG-KR series specifications in this catalog for the rated torque.)
Permissible speed (at servo motor shaft)	4500 r/min (permissible instantaneous speed: 5175 r/min)
IP rating (reducer part)	Equivalent to IP44
Reducer efficiency (Note 3)	45% to 75%

Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft for the servo motor with reducer (and with electromagnetic brake).

2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.

3. The reducer efficiency varies depending on the reduction ratio. It also changes depending on the conditions of use, such as output torque, speed, and temperature.

The values in the table represent typical values at the rated torque and speed and at the normal temperature. They are not guaranteed values.

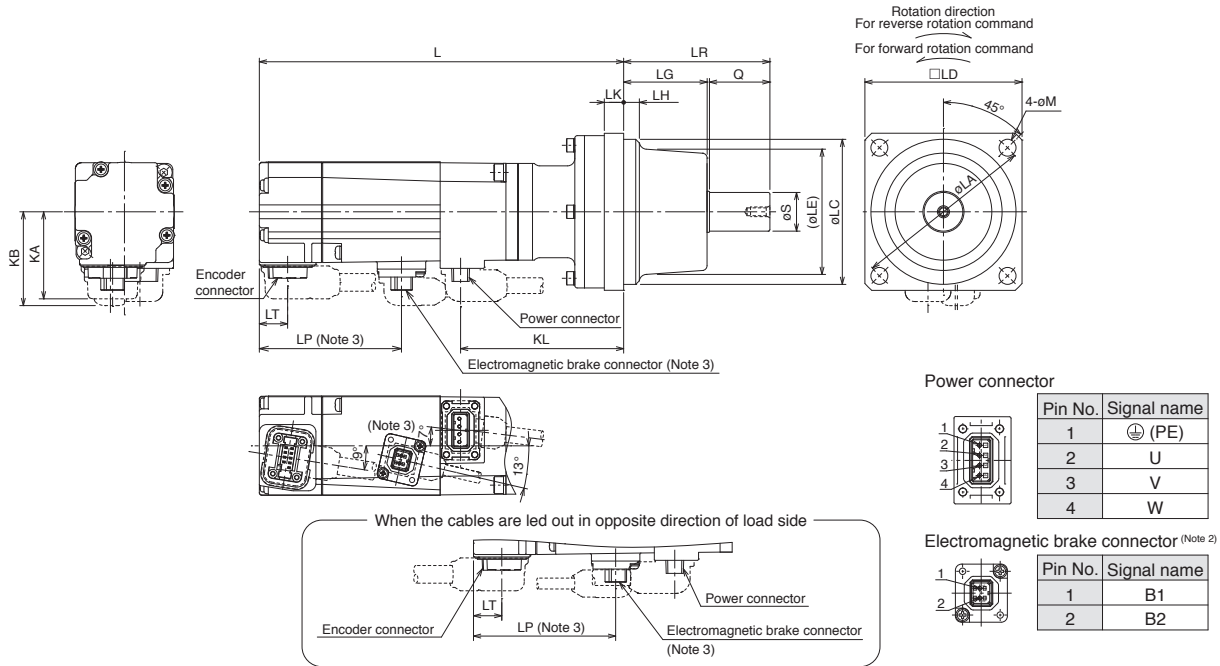
4. The backlash can be converted: 1 minute = 0.0167°

HG-KR Series Geared Servo Motor Dimensions (Note 1, 5)

With reducer for general industrial machines

●HG-KR_(B)G1

Drawing is schematic only, and the shapes or the mounting screws may differ from those of the actual servo motor. Refer to "Servo Motor Instruction Manual (Vol. 3)" for details.



[Unit: mm]

Model	Reduction ratio (Actual reduction ratio)	Variable dimensions (Note 4)																
		L	LA	LC	LD	LE	S	LH	LK	KL	LG	Q	LR	M	KA	KB	LT	LP
HG-KR053(B)G1	1/5 (9/44)	110.1 (150.7)	75	60h7	65	51	16h6	6.5	8	67.5	34.5	25	60.5	7	36	37.1 (38.8)	11.7	— (58.8)
	1/12 (49/576)	128.9 (169.5)								86.3								
	1/20 (25/484)																	
	1/5 (9/44)	126.1 (166.7)								83.5								
HG-KR13(B)G1	1/12 (49/576)	144.9 (185.5)	100	82h7	90	75	25h6	8	10	102.3	38	35	74	9	46	47.1 (47.1)	11.8	— (57.8)
	1/20 (25/484)																	
	1/5 (19/96)	129.8 (166.6)								89.6								
	1/12 (961/11664)	149.6 (186.4)								109.4								
HG-KR23(B)G1	1/20 (513/9984)		115	95h7	100	83	32h6	9.5	15	131.1	44.5	60	105.5	14	56	57.1 (57.1)	— (63.1)	
	1/5 (19/96)	151.5 (188.3)								111.3								
	1/12 (961/11664)	171.3 (208.1)								135.1								
	1/20 (7/135)	175.3 (212.1)								134.6								
HG-KR43(B)G1	1/5 (19/96)	177 (217.3)	140	115h7	120	98	40h6	11.5	15	156.6	44.5	60	105.5	14	56	57.1 (57.1)	— (63.1)	
	1/12 (7/87)	199 (239.3)								156.6								
	1/20 (625/12544)	212 (252.3)								169.6								
	1/5 (19/96)	151.5 (188.3)								111.3								

- Notes: 1. For dimensions without tolerance, general tolerance applies. The actual dimensions may be 1 mm to 3 mm larger than the dimensions indicated since the outer frame of the reducer is made by casting. Make allowance for the actual dimensions in the design of a machine.
 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.



HG-KR Series Geared Servo Motor Specifications

With flange-output type reducer for high precision applications, flange mounting: G5

Model	Output [W]	Reduction ratio	Moment of inertia J [× 10 ⁻⁴ kg·m ²] <small>(Note 1)</small>		Permissible load to motor inertia ratio <small>(Note 2)</small> (when converted into the servo motor shaft)	Mass [kg]		Lubrication method	Mounting direction
			Standard	With electromagnetic brake		Standard	With electromagnetic brake		
HG-KR053(B)G5	50	1/5 (40 × 40)	0.0485	0.0507	10 times or less	0.55	0.75	Grease (filled)	Any direction
		1/5 (60 × 60)	0.113	0.115		1.1	1.3		
		1/9	0.0475	0.0497		0.56	0.76		
		1/11	0.105	0.107		1.2	1.4		
		1/21	0.0960	0.0980					
		1/33	0.0900	0.0920					
		1/45	0.0900	0.0920					
HG-KR13(B)G5	100	1/5 (40 × 40)	0.0812	0.0872	10 times or less	0.75	0.95		
		1/5 (60 × 60)	0.146	0.152		1.3	1.5		
		1/11	0.138	0.144		1.4	1.6		
		1/21	0.129	0.135					
		1/33	0.140	0.146		2.6	2.8		
		1/45	0.139	0.145					
HG-KR23(B)G5	200	1/5	0.422	0.444	14 times or less	1.8	2.2		
		1/11	0.424	0.446		1.9	2.3		
		1/21	0.719	0.741		3.4	3.8		
		1/33	0.673	0.695					
		1/45	0.672	0.694					
HG-KR43(B)G5	400	1/5	0.572	0.594	14 times or less	2.3	2.7		
		1/11	0.947	0.969		3.9	4.3		
		1/21	0.869	0.891					
		1/33	0.921	0.943		6.0	6.4		
		1/45	0.915	0.937					
HG-KR73(B)G5	750	1/5	1.91	2.02	10 times or less	4.8	5.8		
		1/11	1.82	1.93		5.1	6.1		
		1/21	2.01	2.12		7.2	8.2		
		1/33	1.79	1.90					
		1/45	1.79	1.90					

Item	Specifications
Mounting method	Flange mounting
Output shaft rotating direction	Same as the servo motor output shaft direction
Backlash (Note 4)	3 minutes or less at reducer output shaft
Maximum torque	Three times of the rated torque (Refer to HG-KR series specifications in this catalog for the rated torque.)
Permissible speed (at servo motor shaft)	6000 r/min (permissible instantaneous speed: 6900 r/min)
IP rating (reducer part)	Equivalent to IP44
Reducer efficiency (Note 3)	1/5 (60 × 60), 1/11, 1/21, 1/33 and 1/45 of HG-KR053(B)G5: 22% to 41% 1/5 (40 × 40) and 1/9 of HG-KR053(B)G5, and HG-KR13(B)G5 to HG-KR73(B)G5: 58% to 87%

Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft for the servo motor with reducer (and with electromagnetic brake).

2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.

3. The reducer efficiency varies depending on the reduction ratio. It also changes depending on the conditions of use, such as output torque, speed, and temperature. The values in the table represent typical values at the rated torque and speed and at the normal temperature. They are not guaranteed values.

4. The backlash can be converted: 1 minute = 0.0167°



HG-KR Series Geared Servo Motor Specifications

With shaft-output type reducer for high precision applications, flange mounting: G7

Model	Output [W]	Reduction ratio	Moment of inertia J [× 10 ⁻⁴ kg·m ²] <small>(Note 1)</small>		Permissible load to motor inertia ratio <small>(Note 2)</small> (when converted into the servo motor shaft)	Mass [kg]		Lubrication method	Mounting direction
			Standard	With electromagnetic brake		Standard	With electromagnetic brake		
HG-KR053(B)G7	50	1/5 (40 × 40)	0.0512	0.0534	10 times or less	0.58	0.78	Grease (filled)	Any direction
		1/5 (60 × 60)	0.119	0.121		1.2	1.4		
		1/9	0.0492	0.0514		0.58	0.78		
		1/11	0.106	0.108		1.3	1.5		
		1/21	0.0960	0.0980					
		1/33	0.0900	0.0920					
		1/45	0.0900	0.0920					
HG-KR13(B)G7	100	1/5 (40 × 40)	0.0839	0.0899	10 times or less	0.78	0.98		
		1/5 (60 × 60)	0.152	0.158		1.4	1.6		
		1/11	0.139	0.145		1.5	1.7		
		1/21	0.129	0.135					
		1/33	0.141	0.147		3.0	3.2		
		1/45	0.139	0.145					
HG-KR23(B)G7	200	1/5	0.428	0.450	14 times or less	1.9	2.3		
		1/11	0.424	0.446		2.0	2.4		
		1/21	0.721	0.743		3.8	4.2		
		1/33	0.674	0.696					
		1/45	0.672	0.694					
HG-KR43(B)G7	400	1/5	0.578	0.600	14 times or less	2.4	2.8		
		1/11	0.955	0.977		4.3	4.7		
		1/21	0.871	0.893					
		1/33	0.927	0.949		7.4	7.8		
		1/45	0.918	0.940					
HG-KR73(B)G7	750	1/5	1.95	2.06	10 times or less	5.2	6.2		
		1/11	1.83	1.94		5.5	6.5		
		1/21	2.03	2.14		8.6	9.6		
		1/33	1.80	1.91					
		1/45	1.79	1.90					

Item	Specifications
Mounting method	Flange mounting
Output shaft rotating direction	Same as the servo motor output shaft direction
Backlash (Note 4)	3 minutes or less at reducer output shaft
Maximum torque	Three times of the rated torque (Refer to HG-KR series specifications in this catalog for the rated torque.)
Permissible speed (at servo motor shaft)	6000 r/min (permissible instantaneous speed: 6900 r/min)
IP rating (reducer part)	Equivalent to IP44
Reducer efficiency (Note 3)	1/5 (60 × 60), 1/11, 1/21, 1/33 and 1/45 of HG-KR053(B)G7: 22% to 41% 1/5 (40 × 40) and 1/9 of HG-KR053(B)G7, and HG-KR13(B)G7 to HG-KR73(B)G7: 58% to 87%

Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft for the servo motor with reducer (and with electromagnetic brake).

2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.

3. The reducer efficiency varies depending on the reduction ratio. It also changes depending on the conditions of use, such as output torque, speed, and temperature. The values in the table represent typical values at the rated torque and speed and at the normal temperature. They are not guaranteed values.

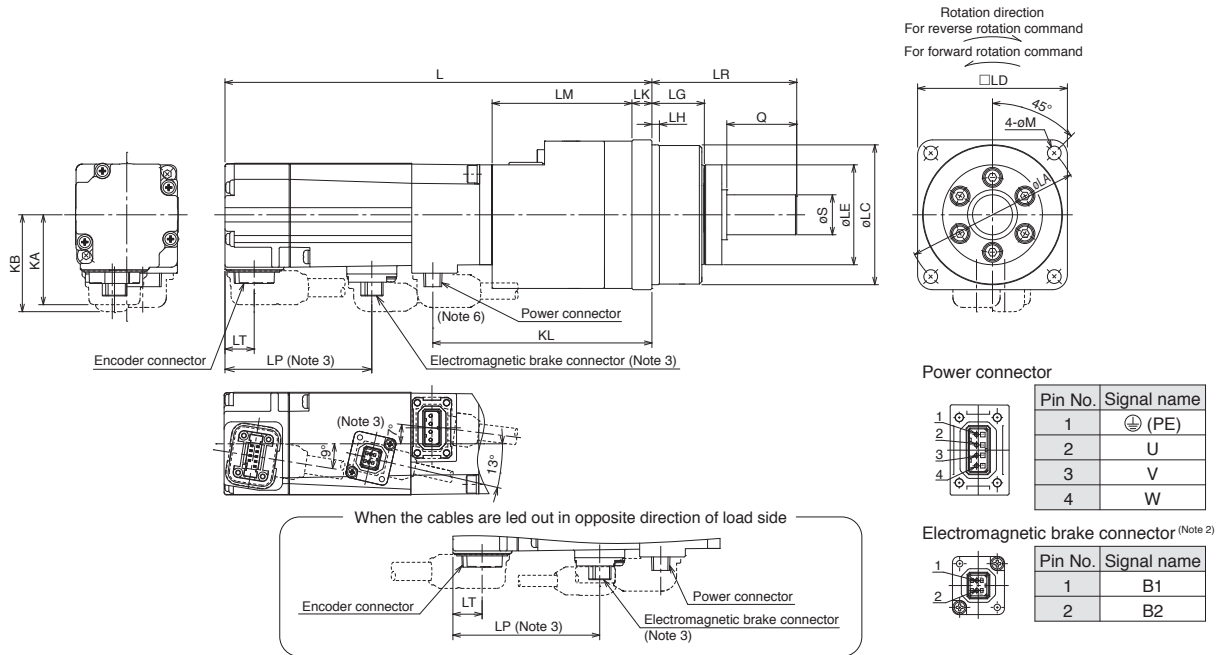
4. The backlash can be converted: 1 minute = 0.0167°

HG-KR Series Geared Servo Motor Dimensions (Note 1, 5, 7)

With shaft-output type reducer for high precision applications, flange mounting

●HG-KR_(B)G7

Drawing is schematic only, and the shapes or the mounting screws may differ from those of the actual servo motor. Refer to "Servo Motor Instruction Manual (Vol. 3)" for details.



[Unit: mm]																			
Model	Reduction ratio	Variable dimensions (Note 4)																	
		L	LA	LC	LD	LE	S	LG	LH	Q	LR	LK	LM	KL	M	KA	KB	LT	LP
HG-KR053(B)G7	1/5 (40 × 40)	105.9 (146.5)	46	40h7	40	29	10h7	15	2.5	20	42	5	34.5	63.3	3.4	36	37.1 (38.8)	11.7	(58.8)
	1/5 (60 × 60) (Note 6)	130.4 (171)	70	56h7	60	40	16h7	21	3	28	58	8	56	87.8	5.5				
	1/9	105.9 (146.5)	46	40h7	40	29	10h7	15	2.5	20	42	5	34.5	63.3	3.4				
	1/11 (Note 6)	130.4 (171)	70	56h7	60	40	16h7	21	3	28	58	8	56	87.8	5.5				
	1/21 (Note 6)																		
	1/33 (Note 6)																		
1/45 (Note 6)																			
HG-KR13(B)G7	1/5 (40 × 40)	121.9 (162.5)	46	40h7	40	29	10h7	15	2.5	20	42	5	34.5	79.3	3.4	46	47.1 (47.1)	11.8	— (57.8)
	1/5 (60 × 60) (Note 6)	146.4 (187)	70	56h7	60	40	16h7	21	3	28	58	8	56	103.8	5.5				
	1/11 (Note 6)	148.9 (189.5)	105	85h7	90	59	25h7	27	8	42	80	10	61	107.4	9				
	1/21 (Note 6)																		
	1/33 (Note 6)																		
	1/45 (Note 6)																		
HG-KR23(B)G7	1/5	140.6 (177.4)	70	56h7	60	40	16h7	21	3	28	58	8	56	100.4	5.5	56	57.1 (57.1)	— (63.1)	
	1/11	147.6 (184.4)	105	85h7	90	59	25h7	27	8	42	80	10	61	107.4	9				
	1/21 (Note 6)																		
	1/33 (Note 6)																		
	1/45 (Note 6)																		
	HG-KR43(B)G7	1/5	162.3 (199.1)	70	56h7	60	40	16h7	21	3	28	58	8	56	122.1				5.5	56	57.1 (57.1)	— (63.1)
1/11		169.3 (206.1)	105	85h7	90	59	25h7	27	8	42	80	61	129.1	9					
1/21		181.3 (218.1)	135	115h7	120	84	40h7	35	13	82	133	13	70	141.1	11				
1/33																			
1/45																			
HG-KR73(B)G7	1/5	190 (230.3)	105	85h7	90	59	25h7	27	8	42	80	10	68	147.6	9	56	57.1 (57.1)	— (63.1)	
	1/11	200 (240.3)	135	115h7	120	84	40h7	35	13	82	133	13	75	157.6	11				
	1/21																		
	1/33																		
	1/45																		

Notes: 1. For dimensions without tolerance, general tolerance applies. The actual dimensions may be 1 mm to 3 mm larger than the dimensions indicated since the outer frame of the reducer is made by casting. Make allowance for the actual dimensions in the design of a machine.

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.

5. Use a friction coupling to fasten a load.
6. Lead out the power cable in opposite direction of the motor shaft.

7. HG-KR (B)G7K is also available for key shaft motor (with key). Refer to the following page for the shaft-end shape.

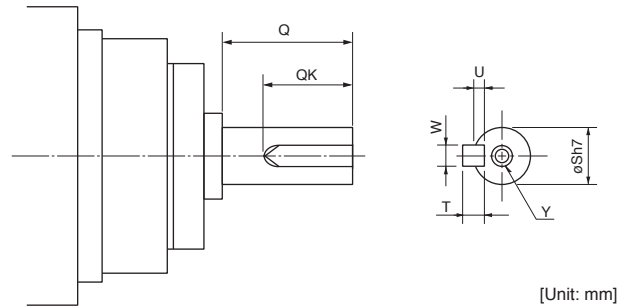
HG-KR Series Geared Servo Motor Special Shaft End Specifications

Standard HG-KR_(B)G1 (with reducer for general industrial machines) has a straight shaft. Key shaft (with key) is also available as a special specification. Contact your local sales office for more details.

Standard HG-KR_(B)G7 (with shaft-output type reducer for high precision applications, flange mounting) has a straight shaft. HG-KR_(B)G7K is also available for key shaft motor (with key). Refer to the following for the shaft-end shape.

Key shaft (with key) (Note 1, 2, 3)

Model	Reduction ratio	Variable dimensions						
		S	Q	W	QK	U	T	Y
HG-KR053(B)G7K	1/5 (40 × 40)	10	20	4	15	2.5	4	M3 screw Depth: 6
	1/5 (60 × 60)	16	28	5	25	3	5	M4 screw Depth: 8
	1/9	10	20	4	15	2.5	4	M3 screw Depth: 6
	1/11	16	28	5	25	3	5	M4 screw Depth: 8
	1/21							
	1/33							
	1/45							
HG-KR13(B)G7K	1/5 (40 × 40)	10	20	4	15	2.5	4	M3 screw Depth: 6
	1/5 (60 × 60)	16	28	5	25	3	5	M4 screw Depth: 8
	1/11	25	42	8	36	4	7	M6 screw Depth: 12
	1/21							
	1/33							
	1/45							
HG-KR23(B)G7K	1/5	16	28	5	25	3	5	M4 screw Depth: 8
	1/11	25	42	8	36	4	7	M6 screw Depth: 12
	1/21							
	1/33							
HG-KR43(B)G7K	1/5	16	28	5	25	3	5	M4 screw Depth: 8
	1/11	25	42	8	36	4	7	M6 screw Depth: 12
	1/21	40	82	12	70	5	8	M10 screw Depth: 20
	1/33							
HG-KR73(B)G7K	1/5	25	42	8	36	4	7	M6 screw Depth: 12
	1/11	40	82	12	70	5	8	M10 screw Depth: 20
	1/21							
	1/33							
	1/45							



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

2. Single pointed key is attached.

3. The dimensions not mentioned in the drawings are the same as those of the straight shaft. Refer to HG-KR_(B)G7 dimensions in this catalog.

HG-SR Series Geared Servo Motor Specifications

With reducer for general industrial machines, flange mounting: G1

Model	Output [kW]	Reduction ratio	Moment of inertia J [× 10 ⁻⁴ kg·m ²] <small>(Note 1)</small>		Permissible load to motor inertia ratio <small>(Note 2)</small> (when converted into the servo motor shaft)	Mass [kg]		Lubrication method <small>(Note 5)</small>	Mounting direction		
			Standard	With electromagnetic brake		Standard	With electromagnetic brake				
HG-SR52(B)G1 HG-SR524(B)G1	0.5	1/6	8.08	10.3	4 times or less	18	20	Grease (filled)	Any direction		
		1/11	7.65	9.85							
		1/17	7.53	9.73							
		1/29	7.47	9.67		27	29				
		1/35	8.26	10.5							
		1/43	8.22	10.4							
HG-SR102(B)G1 HG-SR1024(B)G1	1.0	1/59	8.18	10.4	4 times or less	30	32	Grease (filled)	Any direction		
		1/6	14.8	17.0							
		1/11	13.3	15.5							
		1/17	12.9	15.1		49	51				
		1/29	12.6	14.8							
		1/35	12.6	14.8							
HG-SR152(B)G1 HG-SR1524(B)G1	1.5	1/43	13.8	16.0	4 times or less	81	83	Oil <small>(Note 3)</small>	Shaft horizontal <small>(Note 4)</small>		
		1/59	19.1	21.3		31	33	Grease (filled)	Any direction		
		1/6	19.2	21.4							
		1/11	17.7	19.9							
		1/17	17.3	19.5		50	52				
		1/29	18.4	20.6							
HG-SR202(B)G1 HG-SR2024(B)G1	2.0	1/35	18.3	20.5	4 times or less			82	84	Oil <small>(Note 3)</small>	Shaft horizontal <small>(Note 4)</small>
		1/43	23.6	25.8							
		1/59	23.5	25.7							
		1/6	50.0	59.4		36	42				
		1/11	48.4	57.8							
		1/17	48.1	57.5		87	93				
HG-SR352(B)G1 HG-SR3524(B)G1	3.5	1/29	54.8	64.2	4 times or less			92	98	Oil <small>(Note 3)</small>	Shaft horizontal <small>(Note 4)</small>
		1/35	54.5	63.9							
		1/43	54.3	63.7							
		1/59	54.2	63.6		134	140				
		1/6	87.1	96.5							
		1/11	82.8	92.2							
HG-SR502(B)G1 HG-SR5024(B)G1	5.0	1/17	81.5	90.9	4 times or less	60	66	Oil <small>(Note 3)</small>	Shaft horizontal <small>(Note 4)</small>		
		1/29	86.6	96.0							
		1/35	86.3	95.7							
		1/43	105	114		96	102				
		1/59	104	113							
		1/6	126	135						165	171
HG-SR702(B)G1 HG-SR7024(B)G1	7.0	1/11	114	123	4 times or less	103	109	Oil <small>(Note 3)</small>	Shaft horizontal <small>(Note 4)</small>		
		1/17	110	119							
		1/29	141	150							
		1/35	140	150		145	151				
		1/43	139	149							
		1/59	138	147						172	178
HG-SR702(B)G1 HG-SR7024(B)G1	7.0	1/6	177	187	4 times or less	240	246	Oil <small>(Note 3)</small>	Shaft horizontal <small>(Note 4)</small>		
		1/11	190	199							
		1/17	182	192							
		1/29	192	202							
		1/35	192	201							
		1/43	267	277							
1/59	266	275									

- Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft for the servo motor with reducer (and with electromagnetic brake).
2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
3. Use the grease lubricated servo motor (special specification) instead of the oil lubricated for applications where the servo motor moves.
4. Do not mount the servo motor in a way tilted to the shaft direction or to the shaft rotation direction. Refer to the asterisk 1 of "Annotations for Geared Servo Motor Specifications" on p. 2-59 in this catalog. Note that servo motors with special specifications may be available to be mounted with other than the shaft horizontal. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the available models.
5. Be sure to fill the reducer with lubricant oil since the oil is removed before the shipment.



HG-SR Series Geared Servo Motor Specifications

With reducer for general industrial machines, flange mounting: G1

Item	Specifications
Mounting method	Flange mounting
Output shaft rotating direction	Opposite from the servo motor output shaft direction
Backlash ^(Note 3)	40 minutes to 2° at reducer output shaft ^(Note 2)
Maximum torque	Three times of the rated torque (Refer to HG-SR 2000 r/min series specifications in this catalog for the rated torque.)
Permissible speed (at servo motor shaft)	For grease lubrication: 3000 r/min (permissible instantaneous speed: 3450 r/min) For oil lubrication: 2000 r/min (permissible instantaneous speed: 2300 r/min)
IP rating (reducer part)	Equivalent to IP44
Reducer efficiency ^(Note 1)	85% to 94%

Notes: 1. The reducer efficiency varies depending on the reduction ratio. It also changes depending on the conditions of use, such as output torque, speed, and temperature.

The values in the table represent typical values at the rated torque and speed and at the normal temperature. They are not guaranteed values.

2. This is a designed value, not guaranteed value.

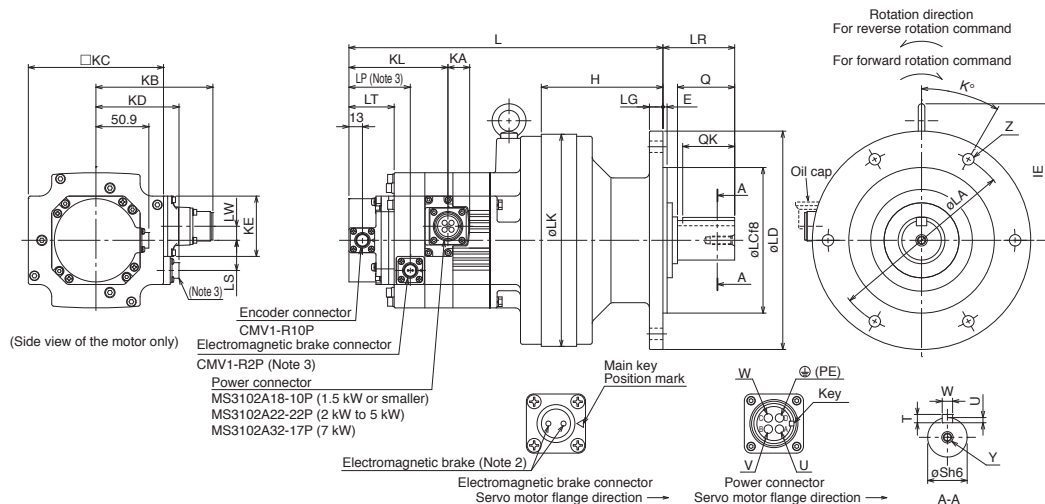
3. The backlash can be converted: 1 minute = 0.0167°

HG-SR Series Geared Servo Motor Dimensions (Note 1, 5)

With reducer for general industrial machines, flange mounting

●HG-SR_(B)G1

Drawing is schematic only, and the oil cap, the shapes, or the mounting screws may differ from those of the actual servo motor. Refer to "Servo Motor Instruction Manual (Vol. 3)" for details.



[Unit: mm]

[illegible]

Notes: 1. For dimensions without tolerance, general tolerance applies. The actual dimensions may be 1 mm to 3 mm larger than the dimensions indicated since the outer frame of the reducer is made by casting. Make allowance for the actual dimensions in the design of a machine.

2. The electromagnetic brake terminals do not have polarity.

3. Only for the models with electromagnetic brake.

4. Dimensions in brackets are for the models with electromagnetic brake.

5. Be sure to fill the reducer with lubricant oil since the oil is removed before the shipment.



HG-SR Series Geared Servo Motor Specifications

With reducer for general industrial machines, foot mounting: G1H

Model	Output [kW]	Reduction ratio	Moment of inertia J [× 10 ⁻⁴ kg·m ²] <small>(Note 1)</small>		Permissible load to motor inertia ratio <small>(Note 2)</small> (when converted into the servo motor shaft)	Mass [kg]		Lubrication method <small>(Note 5)</small>	Mounting direction
			Standard	With electromagnetic brake		Standard	With electromagnetic brake		
HG-SR52(B)G1H HG-SR524(B)G1H	0.5	1/6	8.08	10.3	4 times or less	20	22	Grease (filled)	Any direction
		1/11	7.65	9.85					
		1/17	7.53	9.73					
		1/29	7.47	9.67		28	30		
		1/35	8.26	10.5					
		1/43	8.22	10.4					
		1/59	8.18	10.4					
HG-SR102(B)G1H HG-SR1024(B)G1H	1.0	1/6	14.8	17.0	4 times or less	31	33	Grease (filled)	Any direction
		1/11	13.3	15.5					
		1/17	12.9	15.1					
		1/29	12.6	14.8		50	52		
		1/35	12.6	14.8					
		1/43	13.8	16.0					
		1/59	19.1	21.3					
HG-SR152(B)G1H HG-SR1524(B)G1H	1.5	1/6	19.2	21.4	4 times or less	32	34	Grease (filled)	Any direction
		1/11	17.7	19.9					
		1/17	17.3	19.5					
		1/29	18.4	20.6		51	53		
		1/35	18.3	20.5					
		1/43	23.6	25.8					
		1/59	23.5	25.7					
HG-SR202(B)G1H HG-SR2024(B)G1H	2.0	1/6	50.0	59.4	4 times or less	37	43	Grease (filled)	Any direction
		1/11	48.4	57.8					
		1/17	48.1	57.5					
		1/29	54.8	64.2		92	98		
		1/35	54.5	63.9					
		1/43	54.3	63.7					
		1/59	54.2	63.6					
HG-SR352(B)G1H HG-SR3524(B)G1H	3.5	1/6	87.1	96.5	4 times or less	61	67	Oil <small>(Note 3)</small>	Shaft horizontal <small>(Note 4)</small>
		1/11	82.8	92.2					
		1/17	81.5	90.9					
		1/29	86.6	96.0		97	103		
		1/35	86.3	95.7					
		1/43	105	114					
		1/59	104	113					
HG-SR502(B)G1H HG-SR5024(B)G1H	5.0	1/6	126	135	4 times or less	101	107	Oil <small>(Note 3)</small>	Shaft horizontal <small>(Note 4)</small>
		1/11	114	123					
		1/17	110	119					
		1/29	141	150		178	184		
		1/35	140	150					
		1/43	139	149					
		1/59	138	147					
HG-SR702(B)G1H HG-SR7024(B)G1H	7.0	1/6	177	187	4 times or less	108	114	Oil <small>(Note 3)</small>	Shaft horizontal <small>(Note 4)</small>
		1/11	190	199					
		1/17	182	192					
		1/29	192	202		185	191		
		1/35	192	201					
		1/43	267	277					
		1/59	266	275					

Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft for the servo motor with reducer (and with electromagnetic brake).

2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.

3. Use the grease lubricated servo motor (special specification) instead of the oil lubricated for applications where the servo motor moves.

4. Do not mount the servo motor in a way tilted to the shaft direction or to the shaft rotation direction. Refer to the asterisk 1 of "Annotations for Geared Servo Motor Specifications" on p. 2-59 in this catalog. Note that servo motors with special specifications may be available to be mounted with other than the shaft horizontal. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the available models.

5. Be sure to fill the reducer with lubricant oil since the oil is removed before the shipment.

HG-SR Series Geared Servo Motor Specifications

With reducer for general industrial machines, foot mounting: G1H

Item	Specifications
Mounting method	Foot mounting
Output shaft rotating direction	Opposite from the servo motor output shaft direction
Backlash ^(Note 3)	40 minutes to 2° at reducer output shaft ^(Note 2)
Maximum torque	Three times of the rated torque (Refer to HG-SR 2000 r/min series specifications in this catalog for the rated torque.)
Permissible speed (at servo motor shaft)	For grease lubrication: 3000 r/min (permissible instantaneous speed: 3450 r/min) For oil lubrication: 2000 r/min (permissible instantaneous speed: 2300 r/min)
IP rating (reducer part)	Equivalent to IP44
Reducer efficiency ^(Note 1)	85% to 94%

Notes: 1. The reducer efficiency varies depending on the reduction ratio. It also changes depending on the conditions of use, such as output torque, speed, and temperature.
The values in the table represent typical values at the rated torque and speed and at the normal temperature. They are not guaranteed values.

2. This is a designed value, not guaranteed value.

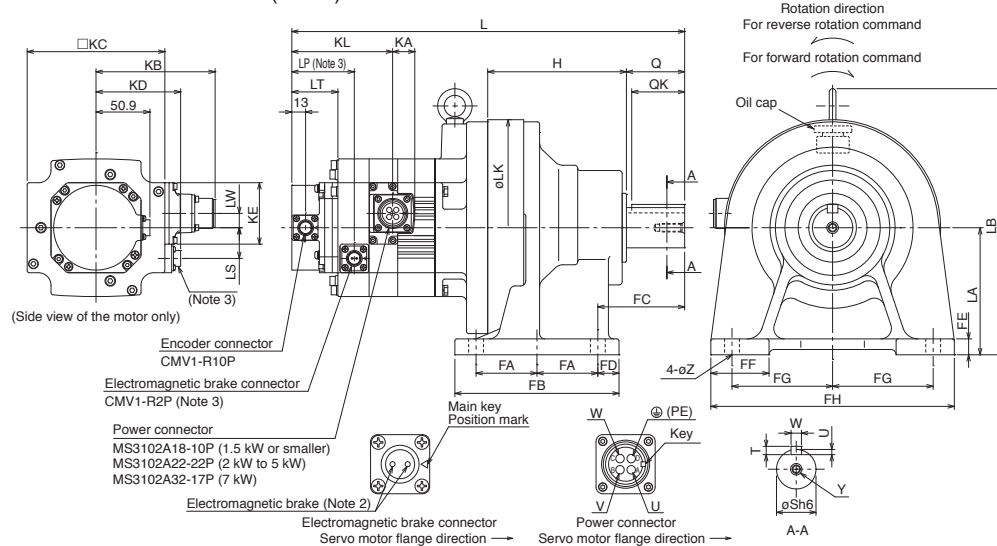
3. The backlash can be converted: 1 minute = 0.0167°

HG-SR Series Geared Servo Motor Dimensions (Note 1, 5)

With reducer for general industrial machines, foot mounting

●HG-SR_(B)G1H

Drawing is schematic only, and the oil cap, the shapes, or the mounting screws may differ from those of the actual servo motor. Refer to "Servo Motor Instruction Manual (Vol. 3)" for details.



[Unit: mm]

Model	Reduction ratio	Variable dimensions (Note 4)																														
		L	LA	LB	LK	LS	LT	LP	LW	H	KL	KA	KB	KD	KC	KE	Z	FA	FB	FC	FD	FE	FF	FG	FH	Q	QK	S	T	U	W	Y
HG-SR52(B)G1H HG-SR524(B)G1H	1/6																															
	1/11	323	100	219	150	(29)	38.2	(59)	13.5	121	60.7	20.9	112.5	(79.9)	130	58	11	45	135	60	15	12	40	75	180	35	32	28	7	4	8	M8 screw Depth: 20
	1/17	(357.5)					(43.5)				(95.2)																					
	1/29																															
	1/35	336.5	120	252	204	(29)	38.2	(59)	13.5	131	60.7	20.9	112.5	(79.9)	130	58	14	57.5	155	82	20	15	55	95	230	55	50	38	8	5	10	
	1/43	(371)					(43.5)				(95.2)																					
HG-SR102(B)G1H HG-SR1024(B)G1H	1/6																															
	1/11	350.5	120	252	204	(29)	38.2	(59)	13.5	131	60.7	20.9	112.5	(79.9)	130	58	14	57.5	155	82	20	15	55	95	230	55	50	38	8	5	10	M8 screw Depth: 20
	1/17	(385)					(43.5)				(95.2)																					
	1/29																															
	1/35																															
	1/43	403	150	295	230	(29)	38.2	(59)	13.5	170	60.7	20.9	112.5	(79.9)	130	58	18	72.5	195	100	25	22	65	145	330	70	56	50	9	5.5	14	
HG-SR152(B)G1H HG-SR1524(B)G1H	1/6																															
	1/11	364.5	120	252	204	(29)	38.2	(59)	13.5	131	60.7	20.9	112.5	(79.9)	130	58	14	57.5	155	82	20	15	55	95	230	55	50	38	8	5	10	M8 screw Depth: 20
	1/17	(399)					(43.5)				(95.2)																					
	1/29	417	150	295	230	(29)	38.2	(59)	13.5	170	60.7	20.9	112.5	(79.9)	130	58	18	72.5	195	100	25	22	65	145	330	70	56	50	9	5.5	14	
	1/35	(451.5)					(43.5)				(95.2)																					
	1/43	487.5	160	352	300	(29)	38.2	(59)	13.5	218	60.7	20.9	112.5	(79.9)	130	58	18	75	238	139	44	25	75	185	410	90	80	60	11	7	18	
HG-SR202(B)G1H HG-SR2024(B)G1H	1/6																															
	1/11	374.5	120	262	204	(44)	38.5	(66.5)	0	131	63.7	24.8	140.9	(96.9)	176	82	14	57.5	155	82	20	15	55	95	230	55	50	38	8	5	10	M8 screw Depth: 20
	1/17	(424)					(45.5)				(113.2)																					
	1/29																															
	1/35	491.5	160	341	300	(44)	38.5	(66.5)	0	218	63.7	24.8	140.9	(96.9)	176	82	18	75	238	139	44	25	75	185	410	90	80	60	11	7	18	
	1/43	(541)					(45.5)				(113.2)																					
HG-SR352(B)G1H HG-SR3524(B)G1H	1/6																															
	1/11	448	150	295	230	(44)	38.5	(66.5)	0	170	63.7	24.8	140.9	(96.9)	176	82	18	72.5	195	100	25	22	65	145	330	70	56	50	9	5.5	14	M10 screw Depth: 18
	1/17	(497.5)					(45.5)				(113.2)																					
	1/29	515.5	160	341	300	(44)	38.5	(66.5)	0	218	63.7	24.8	140.9	(96.9)	176	82	18	75	238	139	44	25	75	185	410	90	80	60	11	7	18	
	1/35	(565)					(45.5)				(113.2)																					
	1/43	560	200	381	340	(44)	38.5	(66.5)	0	262	63.7	24.8	140.9	(96.9)	176	82	22	137.5	335	125	30	30	80	190	430	90	80	70	12	7.5	20	
HG-SR502(B)G1H HG-SR5024(B)G1H	1/6																															
	1/11	531.5	160	341	300	(44)	38.5	(66.5)	0	218	63.7	24.8	140.9	(96.9)	176	82	18	75	238	139	44	25	75	185	410	90	80	60	11	7	18	M10 screw Depth: 18
	1/17	(581)					(45.5)				(113.2)																					
	1/29																															
	1/35	616	220	405	370	(44)	38.5	(66.5)	0	279	63.7	24.8	140.9	(96.9)	176	82	22	160	380	145	30	30	85	210	470	110	100	80	14	9	22	
	1/43	(665.5)					(45.5)				(113.2)																					
HG-SR702(B)G1H HG-SR7024(B)G1H	1/6	571.5	160	341	300	(44)	38.5	(66.5)	0	218	71.7	32	149.1	(96.9)	176	82	18	75	238	139	44	25	75	185	410	90	80	60	11	7	18	M10 screw Depth: 18
	1/11	(621)					(45.5)				(121.2)																					
	1/17	616	200	381	340	(44)	38.5	(66.5)	0	262	71.7	32	149.1	(96.9)	176	82	22	137.5	335	125	30	30	80	190	430	90	80	70	12	7.5	20	
	1/29	(665.5)					(45.5)				(121.2)																					
	1/35	656	220	405	370	(44)	38.5	(66.5)	0	279	71.7	32	149.1	(96.9)	176	82	22	160	380	145	30	30	85	210	470	110	100	80	14	9	22	
	HG-SR702(B)G1H HG-SR7024(B)G1H	1/43	(796.5)					(45.5)				(121.2)																				
1/59		747	250	465	430	(44)	38.5	(66.5)	0	330	71.7	32	149.1	(96.9)	176	82	26	190	440	170	30	35	90	240	530	135	125	95	14	9	25	
1/59		(796.5)					(45.5)				(121.2)																					

- Notes: 1. For dimensions without tolerance, general tolerance applies. The actual dimensions may be 1 mm to 3 mm larger than the dimensions indicated since the outer frame of the reducer is made by casting. Make allowance for the actual dimensions in the design of a machine.
 2. The electromagnetic brake terminals do not have polarity.
 3. Only for the models with electromagnetic brake.
 4. Dimensions in brackets are for the models with electromagnetic brake.
 5. Be sure to fill the reducer with lubricant oil since the oil is removed before the shipment.

HG-SR Series Geared Servo Motor Specifications

With flange-output type reducer for high precision applications, flange mounting: G5

Model	Output [kW]	Reduction ratio	Moment of inertia J [× 10 ⁻⁴ kg·m ²] <small>(Note 1)</small>		Permissible load to motor inertia ratio <small>(Note 2)</small> (when converted into the servo motor shaft)	Mass [kg]		Lubrication method	Mounting direction	
			Standard	With electromagnetic brake		Standard	With electromagnetic brake			
HG-SR52(B)G5 HG-SR524(B)G5	0.5	1/5	7.91	10.1	10 times or less	7.6	9.5	Grease (filled)	Any direction	
		1/11	7.82	10.0		7.8	9.7			
		1/21	10.2	12.4		12	14			
		1/33	9.96	12.2						
		1/45	9.96	12.2						
HG-SR102(B)G5 HG-SR1024(B)G5	1.0	1/5	12.3	14.5	10 times or less	9.0	11			
		1/11	14.9	17.1		13	15			
		1/21	14.5	16.7						
		1/33	16.3	18.5		23	25			
		1/45	16.2	18.4						
HG-SR152(B)G5 HG-SR1524(B)G5	1.5	1/5	16.7	18.9	10 times or less	11	13			
		1/11	19.3	21.5		14	16			
		1/21	21.7	23.9		24	26			
		1/33	20.7	22.9						
		1/45	20.6	22.8						
HG-SR202(B)G5 HG-SR2024(B)G5	2.0	1/5	51.4	61.1	10 times or less	19	25			
		1/11	51.2	60.9		29	35			
		1/21	53.2	62.9						
		1/33	52.2	61.9						
		1/45	52.2	61.9						
HG-SR352(B)G5 HG-SR3524(B)G5	3.5	1/5	83.2	92.8	10 times or less	24	30			
		1/11	86.7	96.3		34	40			
		1/21	85.0	94.6						
HG-SR502(B)G5 HG-SR5024(B)G5	5.0	1/5	110	119	10 times or less	36	42			
		1/11	108	117		38	44			
HG-SR702(B)G5 HG-SR7024(B)G5	7.0	1/5	161	171	10 times or less	43	49			

Item	Specifications
Mounting method	Flange mounting
Output shaft rotating direction	Same as the servo motor output shaft direction
Backlash (Note 4)	3 minutes or less at reducer output shaft
Maximum torque	Three times of the rated torque (Refer to HG-SR 2000 r/min series specifications in this catalog for the rated torque.)
Permissible speed (at servo motor shaft)	3000 r/min (permissible instantaneous speed: 3450 r/min)
IP rating (reducer part)	Equivalent to IP44
Reducer efficiency (Note 3)	77% to 92%

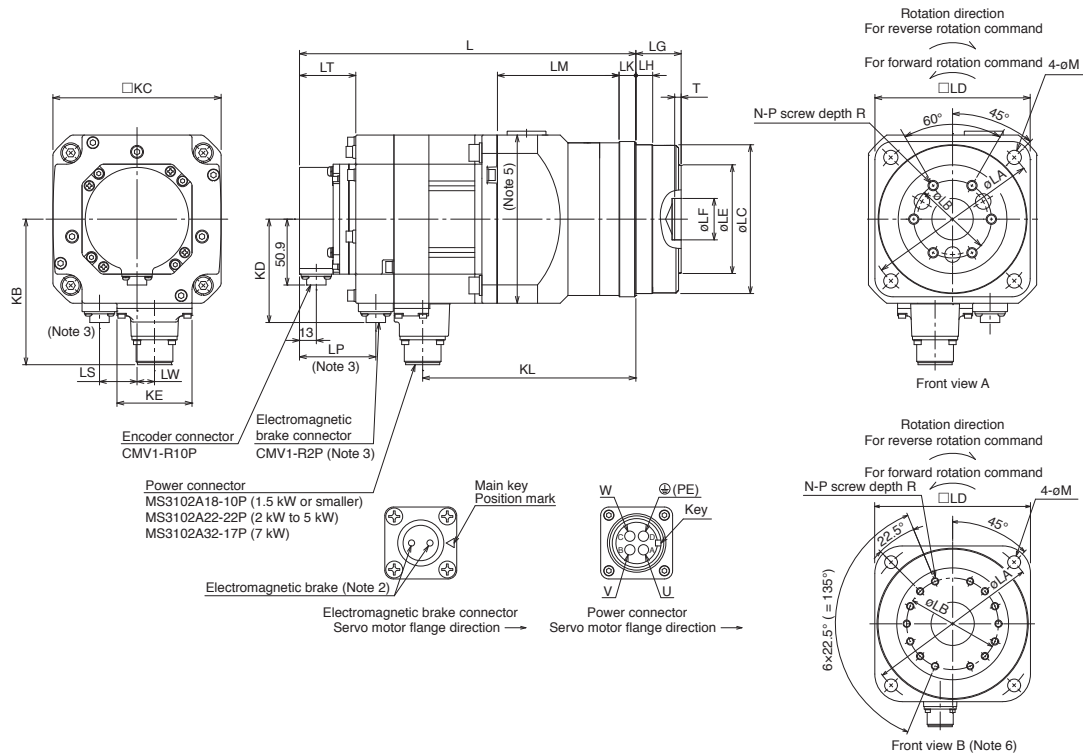
Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft for the servo motor with reducer (and with electromagnetic brake).
2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
3. The reducer efficiency varies depending on the reduction ratio. It also changes depending on the conditions of use, such as output torque, speed, and temperature.
The values in the table represent typical values at the rated torque and speed and at the normal temperature. They are not guaranteed values.
4. The backlash can be converted: 1 minute = 0.0167°

HG-SR Series Geared Servo Motor Dimensions (Note 1)

With flange-output type reducer for high precision applications, flange mounting

●HG-SR_(B)G5

Drawing is schematic only, and the shapes or the mounting screws may differ from those of the actual servo motor. Refer to "Servo Motor Instruction Manual (Vol. 3)" for details.



[Unit: mm]																											
Model	Reduction ratio	Variable dimensions (Note 4)																								Front view	
		L	LA	LB	LC	LD	LE	LF	LG	LH	LK	LM	LT	KL	LP	LW	LS	T	N	P	R	M	KB	KD	KC		KE
HG-SR52(B)G5 HG-SR524(B)G5	1/5	213.5 (248)	105	45	85h7	90	59	24H7	27 ^{+0.4 -0.5}	8	10	85	38.2 (43.5)	152.8	(59)	13.5	(29)	5	6	M6	10	9	112.5	(79.9)	130	58	A
	1/11																										
	1/21																										
	1/33	225.5 (260)	135	60	115h7	120	84	32H7	35 ^{+0.4 -0.5}	13	13	94	38.2 (43.5)	164.8	(59)	13.5	(29)	5	6	M8	12	11	112.5	(79.9)	130	58	A
	1/45																										
HG-SR102(B)G5 HG-SR1024(B)G5	1/5	227.5 (262)	105	45	85h7	90	59	24H7	27 ^{+0.4 -0.5}	8	10	85	38.2 (43.5)	166.8	(59)	13.5	(29)	5	6	M6	10	9	112.5	(79.9)	130	58	A
	1/11																										
	1/21	239.5 (274)	135	60	115h7	120	84	32H7	35 ^{+0.4 -0.5}	13	13	94	38.2 (43.5)	178.8	(59)	13.5	(29)	5	6	M8	12	11	112.5	(79.9)	130	58	A
	1/33	255.5 (290)	190	100	165h8	170	122	47H7	53 ^{+0.5 -0.8}	13	16	107	38.2 (43.5)	194.8	(59)	13.5	(29)	7	14	M8	12	14	112.5	(79.9)	130	58	B
	1/45																										
HG-SR152(B)G5 HG-SR1524(B)G5	1/5	241.5 (276)	105	45	85h7	90	59	24H7	27 ^{+0.4 -0.5}	8	10	85	38.2 (43.5)	180.8	(59)	13.5	(29)	5	6	M6	10	9	112.5	(79.9)	130	58	A
	1/11																										
	1/21	253.5 (288)	135	60	115h7	120	84	32H7	35 ^{+0.4 -0.5}	13	13	94	38.2 (43.5)	192.8	(59)	13.5	(29)	5	6	M8	12	11	112.5	(79.9)	130	58	A
	1/33	269.5 (304)	190	100	165h8	170	122	47H7	53 ^{+0.5 -0.8}	13	16	107	38.2 (43.5)	208.8	(59)	13.5	(29)	7	14	M8	12	14	112.5	(79.9)	130	58	B
	1/45																										
HG-SR202(B)G5 HG-SR2024(B)G5	1/5	267.5 (317)	135	60	115h7	120	84	32H7	35 ^{+0.4 -0.5}	13	13	116 (Note 5)	38.5 (45.5)	203.8	(66.5)	0	(44)	5	6	M8	12	11	140.9	(96.9)	176	82	A
	1/11																										
	1/21																										
	1/33	287.5 (337)	190	100	165h8	170	122	47H7	53 ^{+0.5 -0.8}	13	16	133 (Note 5)	38.5 (45.5)	223.8	(66.5)	0	(44)	7	14	M8	12	14	140.9	(96.9)	176	82	B
	1/45																										
HG-SR352(B)G5 HG-SR3524(B)G5	1/5	291.5 (341)	135	60	115h7	120	84	32H7	35 ^{+0.4 -0.5}	13	13	116 (Note 5)	38.5 (45.5)	227.8	(66.5)	0	(44)	5	6	M8	12	11	140.9	(96.9)	176	82	A
	1/11	311.5 (361)	190	100	165h8	170	122	47H7	53 ^{+0.5 -0.8}	13	16	133 (Note 5)	38.5 (45.5)	247.8	(66.5)	0	(44)	7	14	M8	12	14	140.9	(96.9)	176	82	B
	1/21																										
HG-SR502(B)G5 HG-SR5024(B)G5	1/5	327.5 (377)	190	100	165h8	170	122	47H7	53 ^{+0.5 -0.8}	13	16	133 (Note 5)	38.5 (45.5)	263.8	(66.5)	0	(44)	7	14	M8	12	14	140.9	(96.9)	176	82	B
	1/11																										
HG-SR702(B)G5 HG-SR7024(B)G5	1/5	367.5 (417)	190	100	165h8	170	122	47H7	53 ^{+0.5 -0.8}	13	16	133 (Note 5)	38.5 (45.5)	295.8	(66.5)	0	(44)	7	14	M8	12	14	149.1	(96.9)	176	82	B
	1/11																										

Notes: 1. For dimensions without tolerance, general tolerance applies. The actual dimensions may be 1 mm to 3 mm larger than the dimensions indicated since the outer frame of the reducer is made by casting. Make allowance for the actual dimensions in the design of a machine.

2. The electromagnetic brake terminals do not have polarity.

3. Only for the models with electromagnetic brake.

4. Dimensions in brackets are for the models with electromagnetic brake.

5. The models with (Note 5) in the LM column of the variable dimension table have the maximum dimension of 180 mm × 180 mm in this part.

6. For the front view B, the screws are not placed at equal intervals.

HG-SR Series Geared Servo Motor Specifications

With shaft-output type reducer for high precision applications, flange mounting: G7

Model	Output [kW]	Reduction ratio	Moment of inertia J [x 10 ⁻⁴ kg·m ²] <small>(Note 1)</small>		Permissible load to motor inertia ratio <small>(Note 2)</small> (when converted into the servo motor shaft)	Mass [kg]		Lubrication method	Mounting direction
			Standard	With electromagnetic brake		Standard	With electromagnetic brake		
HG-SR52(B)G7 HG-SR524(B)G7	0.5	1/5	7.95	10.2	10 times or less	8.0	9.9	Grease (filled)	Any direction
		1/11	7.82	10.0		8.2	11		
		1/21	10.2	12.4		13	15		
		1/33	9.96	12.2					
		1/45	9.96	12.2					
HG-SR102(B)G7 HG-SR1024(B)G7	1.0	1/5	12.3	14.5	10 times or less	9.4	12		
		1/11	15.0	17.2		15	17		
		1/21	14.5	16.7					
		1/33	16.3	18.5		26	28		
		1/45	16.3	18.5					
HG-SR152(B)G7 HG-SR1524(B)G7	1.5	1/5	16.7	18.9	10 times or less	11	13		
		1/11	19.4	21.6		16	18		
		1/21	21.7	23.9		27	29		
		1/33	20.7	22.9					
		1/45	20.7	22.9					
HG-SR202(B)G7 HG-SR2024(B)G7	2.0	1/5	51.7	61.4	10 times or less	20	26		
		1/11	51.3	61.0		21	27		
		1/21	53.3	63.0		32	38		
		1/33	52.2	61.9					
		1/45	52.2	61.9					
HG-SR352(B)G7 HG-SR3524(B)G7	3.5	1/5	83.5	93.1	10 times or less	25	31		
		1/11	87.0	96.6		37	43		
		1/21	85.1	94.7					
HG-SR502(B)G7 HG-SR5024(B)G7	5.0	1/5	111	121	10 times or less	39	45		
		1/11	108	117		41	47		
HG-SR702(B)G7 HG-SR7024(B)G7	7.0	1/5	163	173	10 times or less	46	52		

Item	Specifications
Mounting method	Flange mounting
Output shaft rotating direction	Same as the servo motor output shaft direction
Backlash (Note 4)	3 minutes or less at reducer output shaft
Maximum torque	Three times of the rated torque (Refer to HG-SR 2000 r/min series specifications in this catalog for the rated torque.)
Permissible speed (at servo motor shaft)	3000 r/min (permissible instantaneous speed: 3450 r/min)
IP rating (reducer part)	Equivalent to IP44
Reducer efficiency (Note 3)	77% to 92%

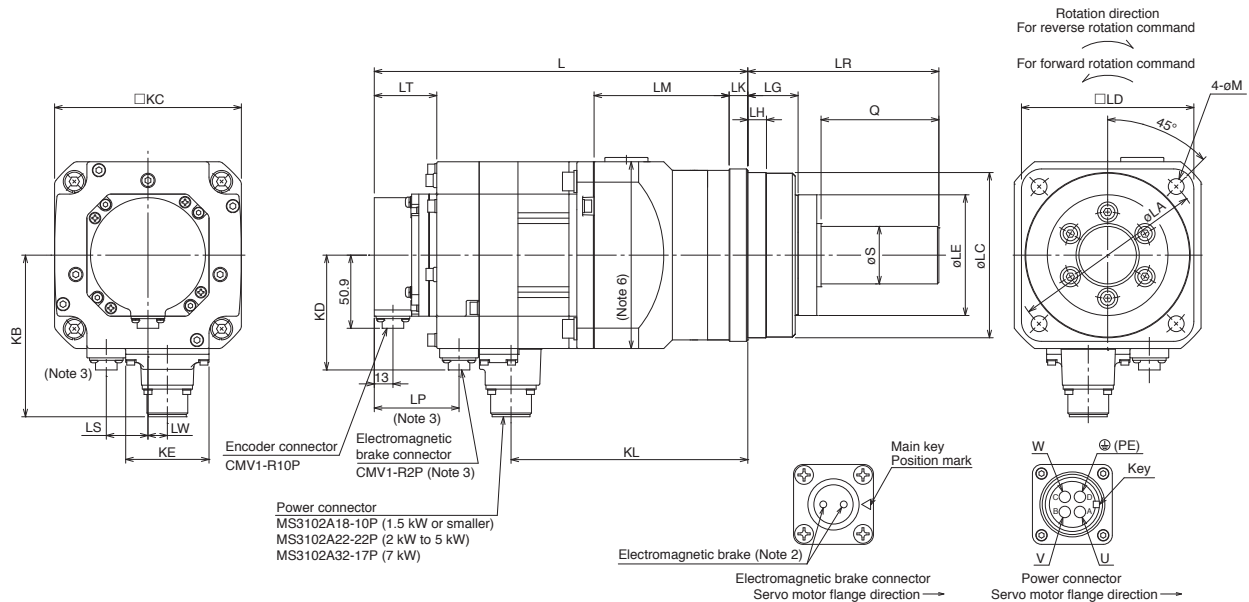
Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft for the servo motor with reducer (and with electromagnetic brake).
2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
3. The reducer efficiency varies depending on the reduction ratio. It also changes depending on the conditions of use, such as output torque, speed, and temperature.
The values in the table represent typical values at the rated torque and speed and at the normal temperature. They are not guaranteed values.
4. The backlash can be converted: 1 minute = 0.0167°

HG-SR Series Geared Servo Motor Dimensions (Note 1, 5, 7)

With shaft-output type reducer for high precision applications, flange mounting

●HG-SR_(B)G7

Drawing is schematic only, and the shapes or the mounting screws may differ from those of the actual servo motor. Refer to "Servo Motor Instruction Manual (Vol. 3)" for details.



[Unit: mm]																							
Model	Reduction ratio	Variable dimensions (Note 4)																					
		L	LA	LC	LD	LE	S	LG	LH	Q	LR	LK	LM	LT	KL	LP	LW	LS	M	KB	KD	KC	KE
HG-SR52(B)G7 HG-SR524(B)G7	1/5	213.5 (248)	105	85h7	90	59	25h7	27	8	42	80	10	85	38.2 (43.5)	152.8	(59)	13.5	(29)	9	112.5	(79.9)	130	58
	1/11																						
	1/21																						
	1/33	225.5 (260)	135	115h7	120	84	40h7	35	13	82	133	13	94	38.2 (43.5)	164.8	(59)	13.5	(29)	11	112.5	(79.9)	130	58
HG-SR102(B)G7 HG-SR1024(B)G7	1/45																						
	1/5	227.5 (262)	105	85h7	90	59	25h7	27	8	42	80	10	85	38.2 (43.5)	166.8	(59)	13.5	(29)	9	112.5	(79.9)	130	58
	1/11	239.5 (274)	135	115h7	120	84	40h7	35	13	82	133	13	94	38.2 (43.5)	178.8	(59)	13.5	(29)	11	112.5	(79.9)	130	58
	1/21																						
HG-SR152(B)G7 HG-SR1524(B)G7	1/33	255.5 (290)	190	165h8	170	122	50h7	53	13	82	156	16	107	38.2 (43.5)	194.8	(59)	13.5	(29)	14	112.5	(79.9)	130	58
	1/45																						
	1/5	241.5 (276)	105	85h7	90	59	25h7	27	8	42	80	10	85	38.2 (43.5)	180.8	(59)	13.5	(29)	9	112.5	(79.9)	130	58
	1/11	253.5 (288)	135	115h7	120	84	40h7	35	13	82	133	13	94	38.2 (43.5)	192.8	(59)	13.5	(29)	11	112.5	(79.9)	130	58
HG-SR202(B)G7 HG-SR2024(B)G7	1/21																						
	1/33	269.5 (304)	190	165h8	170	122	50h7	53	13	82	156	16	107	38.2 (43.5)	208.8	(59)	13.5	(29)	14	112.5	(79.9)	130	58
	1/45																						
	1/5	267.5 (317)	135	115h7	120	84	40h7	35	13	82	133	13	116 (Note 6)	38.5 (45.5)	203.8	(66.5)	0	(44)	11	140.9	(96.9)	176	82
HG-SR352(B)G7 HG-SR3524(B)G7	1/11																						
	1/21																						
	1/33	287.5 (337)	190	165h8	170	122	50h7	53	13	82	156	16	133 (Note 6)	38.5 (45.5)	223.8	(66.5)	0	(44)	14	140.9	(96.9)	176	82
	1/45																						
HG-SR502(B)G7 HG-SR5024(B)G7	1/5	291.5 (341)	135	115h7	120	84	40h7	35	13	82	133	13	116 (Note 6)	38.5 (45.5)	227.8	(66.5)	0	(44)	11	140.9	(96.9)	176	82
	1/11	311.5 (361)	190	165h8	170	122	50h7	53	13	82	156	16	133 (Note 6)	38.5 (45.5)	247.8	(66.5)	0	(44)	14	140.9	(96.9)	176	82
	1/21																						
HG-SR702(B)G7 HG-SR7024(B)G7	1/33	327.5 (377)	190	165h8	170	122	50h7	53	13	82	156	16	133 (Note 6)	38.5 (45.5)	263.8	(66.5)	0	(44)	14	140.9	(96.9)	176	82
	1/45																						
HG-SR702(B)G7 HG-SR7024(B)G7	1/5	367.5 (417)	190	165h8	170	122	50h7	53	13	82	156	16	133 (Note 6)	38.5 (45.5)	295.8	(66.5)	0	(44)	14	149.1	(96.9)	176	82
	1/11																						

Notes: 1. For dimensions without tolerance, general tolerance applies. The actual dimensions may be 1 mm to 3 mm larger than the dimensions indicated since the outer frame of the reducer is made by casting. Make allowance for the actual dimensions in the design of a machine.

2. The electromagnetic brake terminals 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.

6. The models with (Note 6) in the LM column of the variable dimension table have the maximum dimension of 180 mm x 180 mm in this part.

7. HG-SR_(B)G7K is also available for key shaft motor (with key). Refer to the following page for the shaft-end shape.

HG-SR Series Geared Servo Motor Special Shaft End Specifications

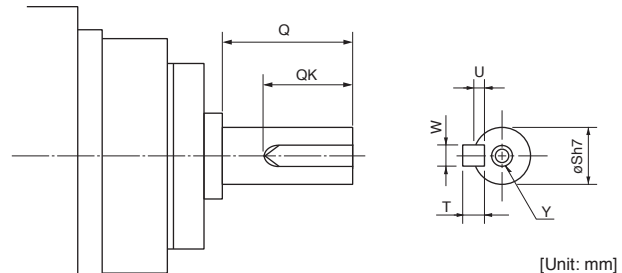
Standard HG-SR_(B)G1/G1H (with reducer for general industrial machines) has a key shaft (with key).

Standard HG-SR_(B)G7 (with shaft-output type reducer for high precision applications, flange mounting) has a straight shaft.

HG-SR_(B)G7K is also available for key shaft motor (with key). Refer to the following for the shaft-end shape.

Key shaft (with key) (Note 1, 2, 3)

Model	Reduction ratio	Variable dimensions							
		S	Q	W	QK	U	T	Y	
HG-SR52(B)G7K HG-SR524(B)G7K	1/5	25	42	8	36	4	7	M6 screw Depth: 12	
	1/11								
	1/21								
	1/33	40	82	12	70	5	8	M10 screw Depth: 20	
	1/45								
HG-SR102(B)G7K HG-SR1024(B)G7K	1/5	25	42	8	36	4	7	M6 screw Depth: 12	
	1/11	40	82	12	70	5	8	M10 screw Depth: 20	
	1/21	50	82	14	70	5.5	9	M10 screw Depth: 20	
	1/33								
	1/45								
HG-SR152(B)G7K HG-SR1524(B)G7K	1/5	25	42	8	36	4	7	M6 screw Depth: 12	
	1/11	40	82	12	70	5	8	M10 screw Depth: 20	
	1/21	50	82	14	70	5.5	9	M10 screw Depth: 20	
	1/33								
	1/45								
HG-SR202(B)G7K HG-SR2024(B)G7K	1/5	40	82	12	70	5	8	M10 screw Depth: 20	
	1/11	50	82	14	70	5.5	9	M10 screw Depth: 20	
	1/21								
	1/33								
	1/45								
HG-SR352(B)G7K HG-SR3524(B)G7K	1/5	40	82	12	70	5	8	M10 screw Depth: 20	
	1/11								
	1/21								
	HG-SR502(B)G7K HG-SR5024(B)G7K	1/5	50	82	14	70	5.5	9	M10 screw Depth: 20
	1/11								
HG-SR702(B)G7K HG-SR7024(B)G7K	1/5								



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

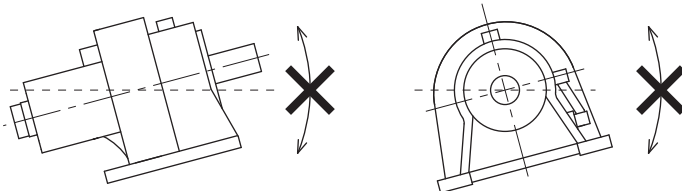
2. Single pointed key is attached.

3. The dimensions not mentioned in the drawings are the same as those of the straight shaft. Refer to HG-SR_(B)G7 dimensions in this catalog.

Annotations for Geared Servo Motor Specifications

* 1. Do not mount the following servo motor in a way tilted to the shaft direction or to the shaft rotation direction.

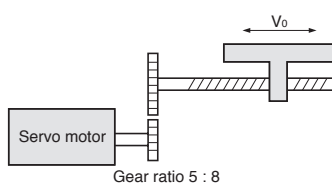
- HG-SR102(4)(B)G1/G1H 1/43, 1/59
- HG-SR152(4)(B)G1/G1H 1/29, 1/35, 1/43, 1/59
- HG-SR202(4)(B)G1/G1H 1/29, 1/35, 1/43, 1/59
- HG-SR352(4)(B)G1/G1H all reduction ratios
- HG-SR502(4)(B)G1/G1H all reduction ratios
- HG-SR702(4)(B)G1/G1H all reduction ratios



Rotary Servo Motor Sizing Example

1. Selection criteria

(1) Configurations



Feed speed of moving part	$V_0 = 30000 \text{ mm/min}$	D_B = ball screw diameter	20 mm
Feed length per cycle	$\ell = 400 \text{ mm}$	L_B = ball screw length	500 mm
Positioning time	$t_0 = \text{within } 1 \text{ s}$	D_{G1} = gear diameter (servo motor shaft)	25 mm
Number of feed times (Operating cycle)	40 times/min	D_{G2} = gear diameter (load shaft)	40 mm
Reduction ratio	$t_r = 1.5 \text{ s}$	L_G = gear tooth thickness	10 mm
Moving part mass	$1/n = 5/8$		
Drive system efficiency	$W = 60 \text{ kg}$		
Friction coefficient	$\eta = 0.8$		
Ball screw lead	$\mu = 0.2$		
	$P_B = 16 \text{ mm}$		

(2) Servo motor speed

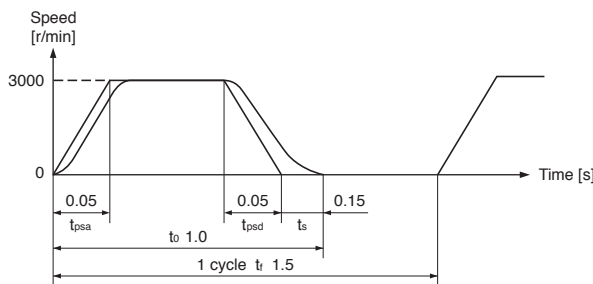
$$N_0 = \frac{V_0}{P_B} \times \frac{1}{1/n} = \frac{30000}{16} \times \frac{8}{5} = 3000 \text{ r/min}$$

(3) Acceleration/deceleration time constant

$$t_{psa} = t_{psd} = t_0 - \frac{\ell}{V_0/60} - t_s = 0.05 \text{ s}$$

t_s : settling time. Here assumed 0.15 s.

(4) Operating pattern



(3) Select a servo motor

Selection criteria

Load torque < Rated torque of servo motor

Moment of inertia of all loads < J_R × Moment of inertia of servo motor

J_R : Recommended load to motor inertia ratio

Select the following servo motor to meet the criteria above.

HG-KR23 (rated torque: 0.64 N·m, max. torque: 2.2 N·m, moment of inertia: $0.221 \times 10^{-4} \text{ kg} \cdot \text{m}^2$)

(4) Acceleration/deceleration torque

Torque required during acceleration

$$T_{Ma} = \frac{(J_L / \eta + J_M) \times N_0}{9.55 \times 10^4 \times t_{psa}} + T_L = 1.84 \text{ N} \cdot \text{m}$$

J_M : moment of inertia of servo motor

Torque required during deceleration

$$T_{Md} = -\frac{(J_L \times \eta + J_M) \times N_0}{9.55 \times 10^4 \times t_{psd}} + T_L = -0.85 \text{ N} \cdot \text{m}$$

Torque required during acceleration/deceleration must be equal to or lower than the max. torque of the servo motor.

2. Selecting rotary servo motor

(1) Load torque (converted into the servo motor shaft)

Travel distance per servo motor revolution

$$\Delta S = P_B \times \frac{1}{n} = 10 \text{ mm}$$

$$T_L = \frac{\mu \times W \times g \times \Delta S}{2 \times 10^3 \pi \eta} = 0.23 \text{ N} \cdot \text{m}$$

(2) Moment of inertia of load (converted into the servo motor shaft)

Moving part

$$J_{L1} = W \times \left(\frac{\Delta S \times 10^{-3}}{2 \pi} \right)^2 = 1.52 \times 10^{-4} \text{ kg} \cdot \text{m}^2$$

Ball screw

$$J_{L2} = \frac{\pi \times \rho \times L_B}{32} \times D_B^4 \times \left(\frac{1}{n} \right)^2 = 0.24 \times 10^{-4} \text{ kg} \cdot \text{m}^2$$

$\rho = 7.8 \times 10^3 \text{ kg/m}^3$ (iron)

Gear (servo motor shaft)

$$J_{L3} = \frac{\pi \times \rho \times L_G}{32} \times D_{G1}^4 = 0.03 \times 10^{-4} \text{ kg} \cdot \text{m}^2$$

Gear (load shaft)

$$J_{L4} = \frac{\pi \times \rho \times L_G}{32} \times D_{G2}^4 \times \left(\frac{1}{n} \right)^2 = 0.08 \times 10^{-4} \text{ kg} \cdot \text{m}^2$$

Moment of inertia of all loads (converted into the servo motor shaft)

$$J_L = J_{L1} + J_{L2} + J_{L3} + J_{L4} = 1.87 \times 10^{-4} \text{ kg} \cdot \text{m}^2$$

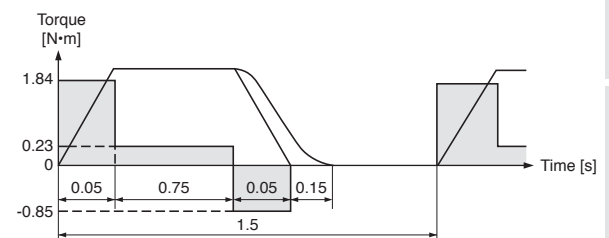
(5) Continuous effective load torque

$$T_{rms} = \sqrt{\frac{T_{Ma}^2 \times t_{psa} + T_L^2 \times t_c + T_{Md}^2 \times t_{psd}}{t_r}} = 0.40 \text{ N} \cdot \text{m}$$

$t_c = t_0 - t_s - t_{psa} - t_{psd}$

Continuous effective load torque must be equal to or lower than the rated torque of the servo motor.

(6) Torque pattern



(7) Result

Select the following:

Servo motor: HG-KR23

Servo amplifier: MR-J4-20B

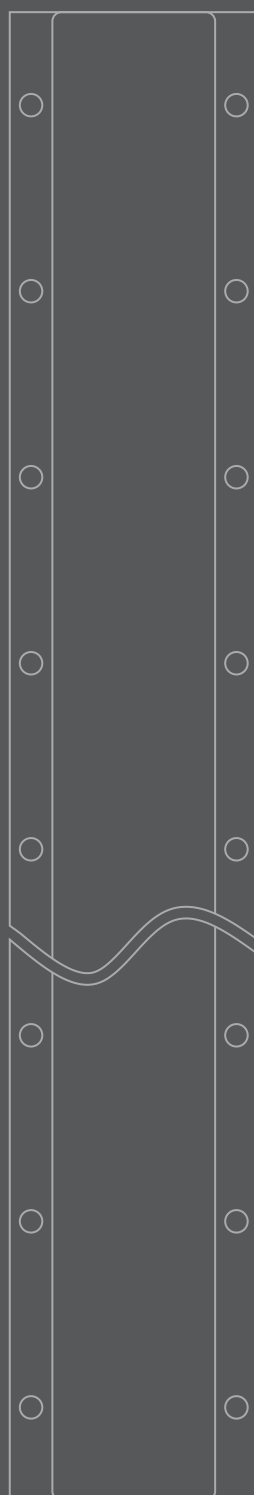
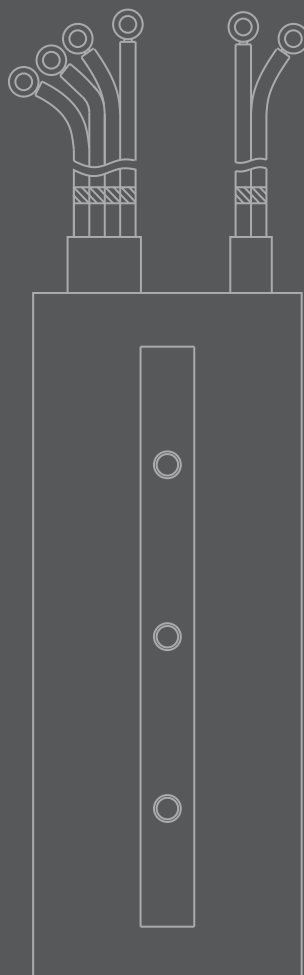
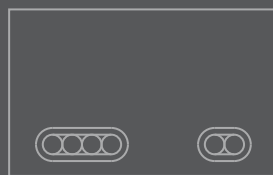
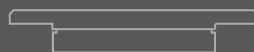
[Free capacity selection software]

Capacity selection software (MRZJW3-MOTSZ111E) does all the calculations for you. The capacity selection software is available for free download. Contact your local sales office for more details.

* Be sure to update your MRZJW3-MOTSZ111E to the latest version.

MEMO

3



Model Designation.....3-1

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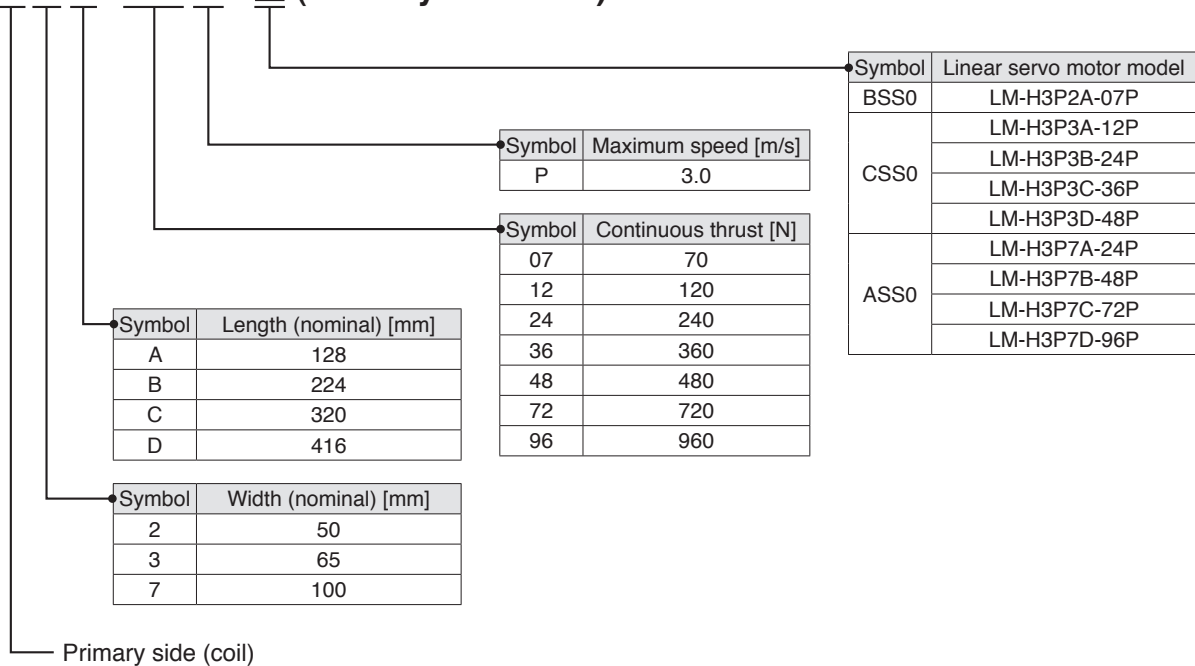
* Refer to p. 5-65 in this catalog for conversion of units.

Linear Servo Motors

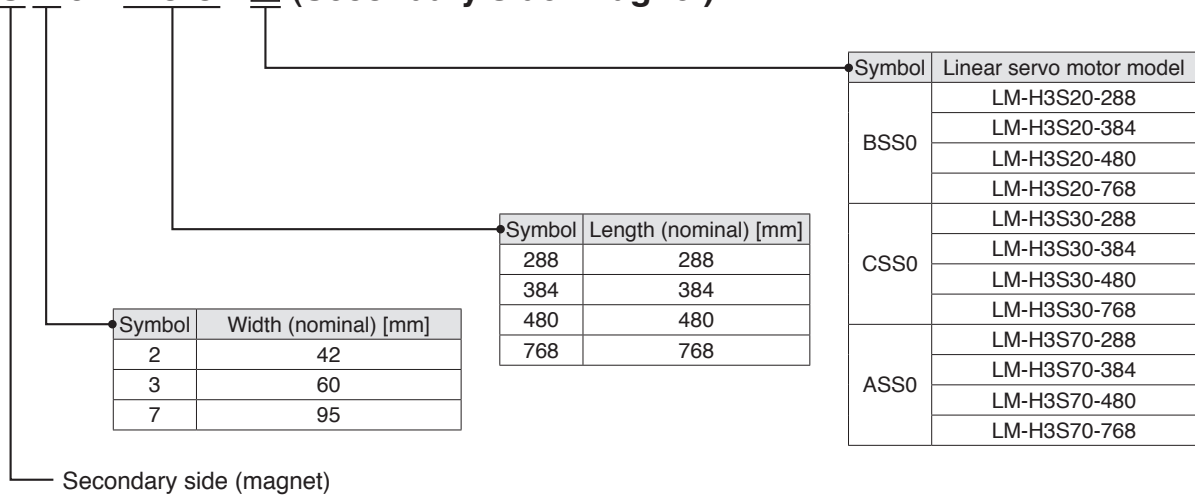
Model Designation

● LM-H3 series

L M - H 3 P 2 A - 0 7 P - □ (Primary side: coil)



L M - H 3 S 2 0 - 2 8 8 - □ (Secondary side: magnet)

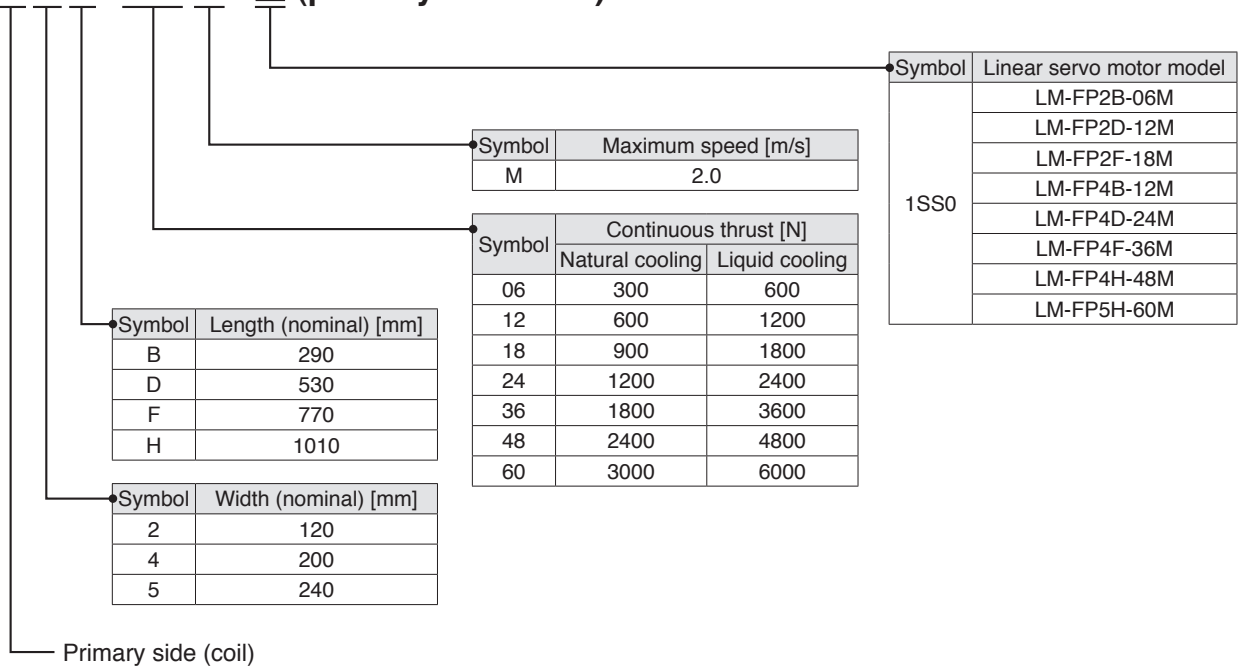




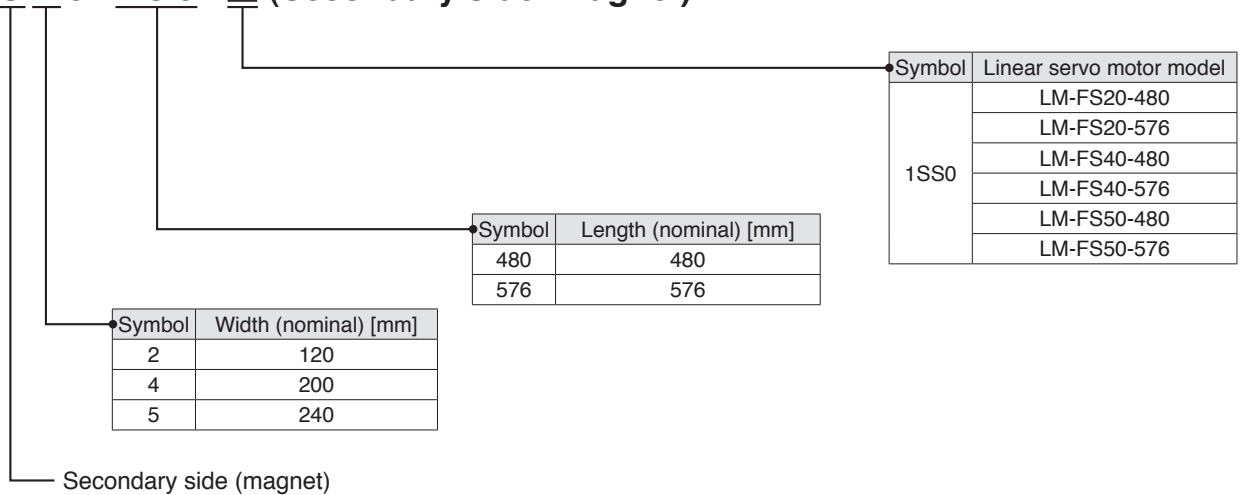
Model Designation

● LM-F series

L M - F P 2 B - 0 6 M - □ (primary side: coil)



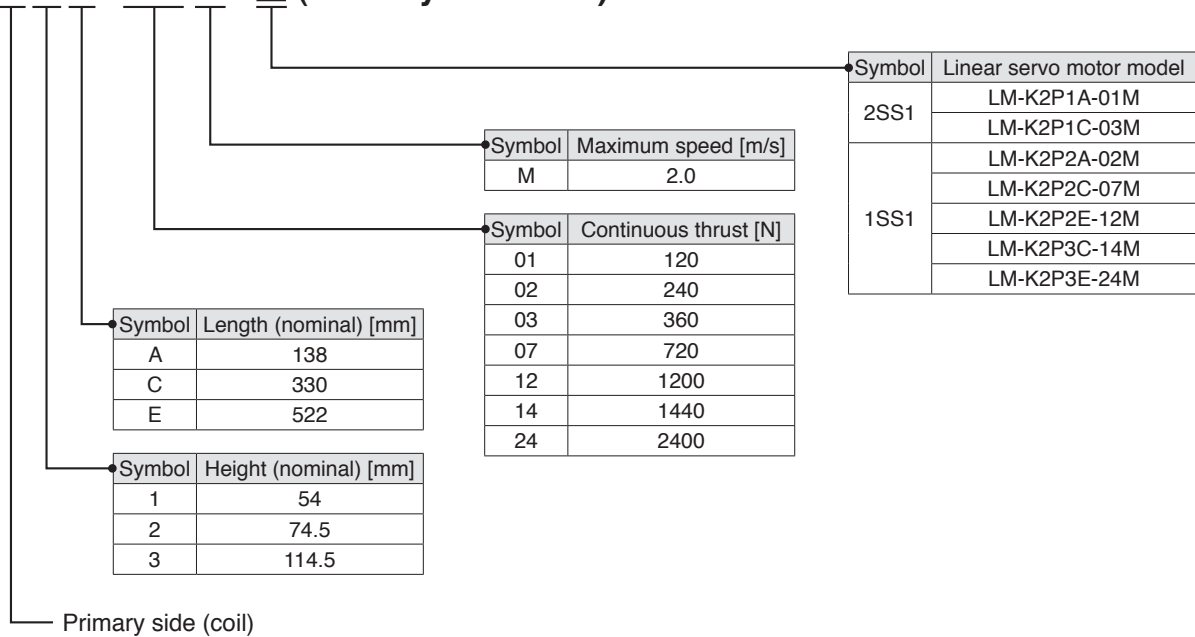
L M - F S 2 0 - 4 8 0 - □ (Secondary side: magnet)



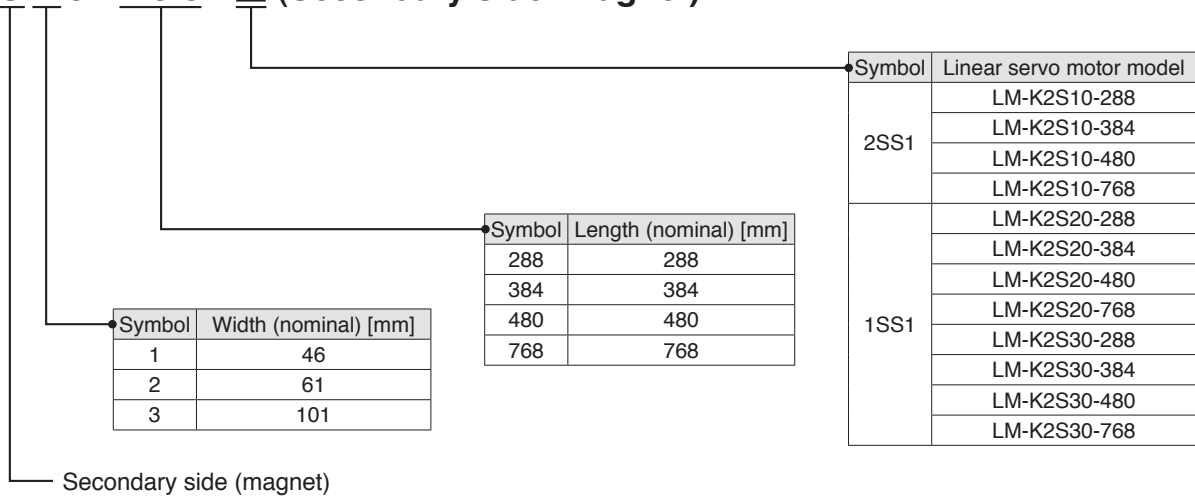
Model Designation

● LM-K2 series

L M - K 2 P 1 A - 0 1 M - □ (Primary side: coil)



L M - K 2 S 1 0 - 2 8 8 - □ (Secondary side: magnet)





Model Designation

●LM-U2 (medium thrust) series

LM - U 2 P A B - 0 5 M - □ (Primary side: coil)

Primary side (coil)	Symbol	Length (nominal) [mm]	Symbol	Maximum speed [m/s]	Symbol	Linear servo motor model
	B	130	M	2.0	0SS0	LM-U2PAB-05M
	D	250				LM-U2PAD-10M
Primary side (coil)	F	370				LM-U2PAF-15M
	Symbol	Width (nominal) [mm]	Symbol	Continuous thrust [N]	1SS0	LM-U2PBB-07M
	A	66.5	05	50		LM-U2PBD-15M
	B	86.5	07	75		LM-U2PBF-22M
			10	100		
			15	150		
			22	225		

LM - U 2 S A 0 - 2 4 0 - □ (Secondary side: magnet)

Secondary side (magnet)	Symbol	Width (nominal) [mm]	Symbol	Length (nominal) [mm]	Symbol	Linear servo motor model
	A	62	240	240	0SS0	LM-U2SA0-240
	B	82	300	300		LM-U2SA0-300
			420	420		LM-U2SA0-420
					1SS0	LM-U2SB0-240
						LM-U2SB0-300
						LM-U2SB0-420

●LM-U2 (large thrust) series

LM - U 2 P 2 B - 4 0 M - □ (Primary side: coil)

Primary side (coil)	Symbol	Length (nominal) [mm]	Symbol	Maximum speed [m/s]	Symbol	Linear servo motor model
	B	286	M	2.0	2SS0	LM-U2P2B-40M
	C	406				LM-U2P2C-60M
	D	526				LM-U2P2D-80M
	Symbol	Continuous thrust [N]	Symbol			
		400	40	400		
		600	60	600		
		800	80	800		

LM - U 2 S 2 0 - 3 0 0 - □ (Secondary side: magnet)

Secondary side (magnet)	Symbol	Length (nominal) [mm]	Symbol	Linear servo motor model
	300	300	2SS0	LM-U2S20-300
	480	480		LM-U2S20-480

Combinations of Linear Servo Motor and Servo Amplifier

	Linear servo motor		Servo amplifier		
	Primary side (coil)	Secondary side (magnet)	MR-J4	MR-J4W2 (Note 1)	MR-J4W3 (Note 1)
LM-H3 series	LM-H3P2A-07P-BSS0	LM-H3S20-288-BSS0, LM-H3S20-384-BSS0, LM-H3S20-480-BSS0, LM-H3S20-768-BSS0	MR-J4-40B(-RJ), MR-J4-40B1(-RJ), MR-J4-40A(-RJ), MR-J4-40A1(-RJ)	MR-J4W2-44B, MR-J4W2-77B, MR-J4W2-1010B	MR-J4W3-444B
	LM-H3P3A-12P-CSS0	LM-H3S30-288-CSS0, LM-H3S30-384-CSS0, LM-H3S30-480-CSS0, LM-H3S30-768-CSS0	MR-J4-40B(-RJ), MR-J4-40B1(-RJ), MR-J4-40A(-RJ), MR-J4-40A1(-RJ)	MR-J4W2-44B, MR-J4W2-77B, MR-J4W2-1010B	MR-J4W3-444B
	LM-H3P3B-24P-CSS0		MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-H3P3C-36P-CSS0		MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-H3P3D-48P-CSS0		MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	LM-H3P7A-24P-ASS0	LM-H3S70-288-ASS0, LM-H3S70-384-ASS0, LM-H3S70-480-ASS0, LM-H3S70-768-ASS0	MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-H3P7B-48P-ASS0		MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	LM-H3P7C-72P-ASS0		MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	LM-H3P7D-96P-ASS0		MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
LM-F series	LM-FP2B-06M-1SS0	LM-FS20-480-1SS0, LM-FS20-576-1SS0	MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	LM-FP2D-12M-1SS0		MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
	LM-FP2F-18M-1SS0		MR-J4-700B(-RJ), MR-J4-700A(-RJ)	-	-
	LM-FP4B-12M-1SS0	LM-FS40-480-1SS0, LM-FS40-576-1SS0	MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
	LM-FP4D-24M-1SS0		MR-J4-700B(-RJ), MR-J4-700A(-RJ)	-	-
	LM-FP4F-36M-1SS0		MR-J4-11KB(-RJ), MR-J4-11KA(-RJ)	-	-
	LM-FP4H-48M-1SS0		MR-J4-15KB(-RJ), MR-J4-15KA(-RJ)	-	-
	LM-FP5H-60M-1SS0	LM-FS50-480-1SS0, LM-FS50-576-1SS0	MR-J4-22KB4(-RJ), MR-J4-22KA4(-RJ)	-	-

Notes: 1. Any combination of the servo motors is available. Refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-6 in this catalog.



Combinations of Linear Servo Motor and Servo Amplifier

Linear servo motor			Servo amplifier		
	Primary side (coil)	Secondary side (magnet)	MR-J4	MR-J4W2 (Note 1)	MR-J4W3 (Note 1)
LM-K2 series	LM-K2P1A-01M-2SS1	LM-K2S10-288-2SS1, LM-K2S10-384-2SS1, LM-K2S10-480-2SS1,	MR-J4-40B(-RJ), MR-J4-40B1(-RJ), MR-J4-40A(-RJ), MR-J4-40A1(-RJ)	MR-J4W2-44B, MR-J4W2-77B, MR-J4W2-1010B	MR-J4W3-444B
	LM-K2P1C-03M-2SS1	LM-K2S10-768-2SS1	MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	LM-K2P2A-02M-1SS1	LM-K2S20-288-1SS1,	MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-K2P2C-07M-1SS1	LM-K2S20-384-1SS1, LM-K2S20-480-1SS1,	MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	LM-K2P2E-12M-1SS1	LM-K2S20-768-1SS1	MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
	LM-K2P3C-14M-1SS1	LM-K2S30-288-1SS1, LM-K2S30-384-1SS1,	MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	LM-K2P3E-24M-1SS1	LM-K2S30-480-1SS1, LM-K2S30-768-1SS1	MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
LM-U2 series	LM-U2PAB-05M-0SS0	LM-U2SA0-240-0SS0, LM-U2SA0-300-0SS0, LM-U2SA0-420-0SS0	MR-J4-20B(-RJ), MR-J4-20B1(-RJ), MR-J4-20A(-RJ), MR-J4-20A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	LM-U2PAD-10M-0SS0		MR-J4-40B(-RJ), MR-J4-40B1(-RJ), MR-J4-40A(-RJ), MR-J4-40A1(-RJ)	MR-J4W2-44B, MR-J4W2-77B, MR-J4W2-1010B	MR-J4W3-444B
	LM-U2PAF-15M-0SS0		MR-J4-40B(-RJ), MR-J4-40B1(-RJ), MR-J4-40A(-RJ), MR-J4-40A1(-RJ)	MR-J4W2-44B, MR-J4W2-77B, MR-J4W2-1010B	MR-J4W3-444B
	LM-U2PBB-07M-1SS0	LM-U2SB0-240-1SS0, LM-U2SB0-300-1SS0, LM-U2SB0-420-1SS0	MR-J4-20B(-RJ), MR-J4-20B1(-RJ), MR-J4-20A(-RJ), MR-J4-20A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	LM-U2PBD-15M-1SS0		MR-J4-60B(-RJ), MR-J4-60A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-U2PBF-22M-1SS0		MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-U2P2B-40M-2SS0	LM-U2S20-300-2SS0, LM-U2S20-480-2SS0	MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	LM-U2P2C-60M-2SS0		MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	LM-U2P2D-80M-2SS0		MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-

Notes: 1. Any combination of the servo motors is available. Refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-6 in this catalog.

LM-H3 Series Specifications

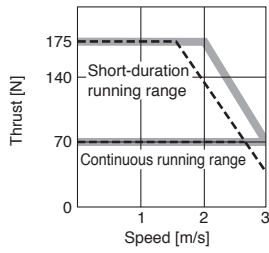
	Primary side (coil)	LM-H3	P2A-07P- BSS0	P3A-12P- CSS0	P3B-24P- CSS0	P3C-36P- CSS0	P3D-48P- CSS0	P7A-24P- ASS0	P7B-48P- ASS0	P7C-72P- ASS0	P7D-96P- ASS0
Linear servo motor model	Secondary side (magnet)	LM-H3	S20-288-BSS0 S20-384-BSS0 S20-480-BSS0 S20-768-BSS0	S30-288-CSS0 S30-384-CSS0 S30-480-CSS0 S30-768-CSS0				S70-288-ASS0 S70-384-ASS0 S70-480-ASS0 S70-768-ASS0			
Compatible servo amplifier model		MR-J4- MR-J4W_-	Refer to "Combinations of Linear Servo Motor and Servo Amplifier" on p. 3-5 in this catalog.								
Power supply capacity [kVA]			0.9	0.9	1.3	1.9	3.5	1.3	3.5	3.8	5.5
Cooling method			Natural cooling								
Thrust	Continuous ^(Note 5)	[N]	70	120	240	360	480	240	480	720	960
	Maximum	[N]	175	300	600	900	1200	600	1200	1800	2400
Maximum speed ^(Note 1) [m/s]			3.0								
Magnetic attraction force [N]			630	1100	2200	3300	4400	2200	4400	6600	8800
Rated current [A]			1.8	1.7	3.4	5.1	6.8	3.4	6.8	10.2	13.6
Maximum current [A]			5.8	5.0	9.9	14.9	19.8	9.6	19.1	28.6	38.1
Regenerative braking frequency ^(Note 2)	MR-J4-	[times/min]	175	95	108	78	300	108	308	210	159
	MR-J4W_-	[times/min]	173 ^(Note 3)	95 ^(Note 4)	271	197	-	241	-	-	-
Recommended load to motor mass ratio			Maximum of 35 times the mass of the linear servo motor primary side								
Insulation class			155 (F)								
Structure			Open (IP rating: IP00)								
Environment	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)								
	Ambient humidity		Operation: 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		49 m/s²								
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.								
Mass	Primary side (coil)	[kg]	0.9	1.3	2.3	3.3	4.3	2.2	3.9	5.6	7.3
	Secondary side (magnet)	[kg]	288 mm/ pc: 0.7 384 mm/ pc: 0.9 480 mm/ pc: 1.1 768 mm/ pc: 1.8	288 mm/pc: 1.0 384 mm/pc: 1.4 480 mm/pc: 1.7 768 mm/pc: 2.7				288 mm/pc: 2.8 384 mm/pc: 3.7 480 mm/pc: 4.7 768 mm/pc: 7.4			

- Notes: 1. The maximum speed of the linear servo motor or the rated speed of the linear encoder, whichever is smaller, is the upper limit of the linear servo motor speed.
2. The regenerative braking frequency shows the permissible frequency when the linear servo motor, without a load and a regenerative option, decelerates from the maximum speed to a stop. When a load is connected; however, the value will be the table value/(m+1), where m = Mass of load/Mass of motor primary side (coil). 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. This value is applicable when MR-J4W2-44B or MR-J4W3-444B is used. The value is 942 for MR-J4W2-77B or MR-J4W2-1010B.
4. This value is applicable when MR-J4W2-44B or MR-J4W3-444B is used. The value is 497 for MR-J4W2-77B or MR-J4W2-1010B.
5. Use the linear servo motor with 70% or less of the effective load ratio when it is in the servo lock state or in a small reciprocating motion.

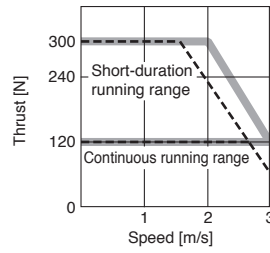


LM-H3 Series Thrust Characteristics

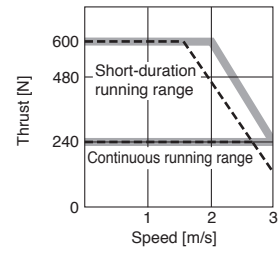
LM-H3P2A-07P-BSS0 (Note 1, 2, 4)



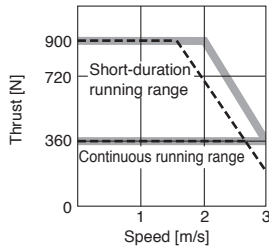
LM-H3P3A-12P-CSS0 (Note 1, 2, 4)



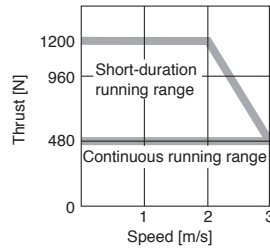
LM-H3P3B-24P-CSS0 (Note 1, 3, 4)



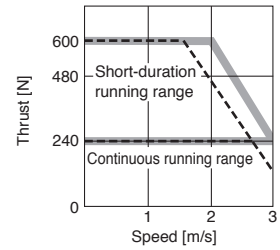
LM-H3P3C-36P-CSS0 (Note 1, 3, 4)



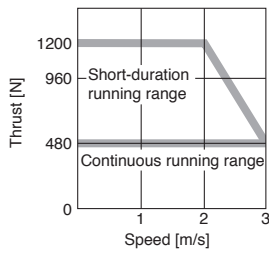
LM-H3P3D-48P-CSS0 (Note 1, 4)



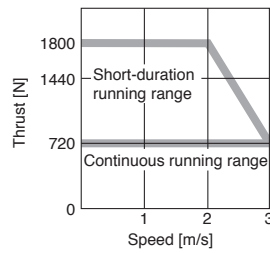
LM-H3P7A-24P-ASS0 (Note 1, 3, 4)



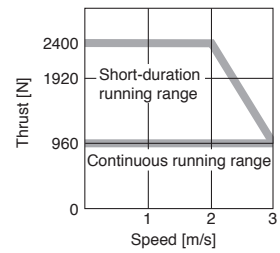
LM-H3P7B-48P-ASS0 (Note 1, 4)



LM-H3P7C-72P-ASS0 (Note 1, 4)



LM-H3P7D-96P-ASS0 (Note 1, 4)



- Notes: 1. — : For 3-phase 200 V AC.
 2. - - - : For 1-phase 200 V AC or 1-phase 100 V AC.
 3. - - - : For 1-phase 200 V AC.
 4. Thrust drops when the power supply voltage is below the specified value.

LM-F Series Specifications

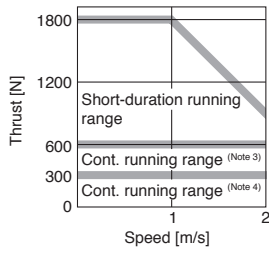
	Primary side (coil)	LM-F	P2B-06M-1SS0	P2D-12M-1SS0	P2F-18M-1SS0	P4B-12M-1SS0	P4D-24M-1SS0	P4F-36M-1SS0	P4H-48M-1SS0	P5H-60M-1SS0 <small>(Note 3)</small>
Linear servo motor model	Secondary side (magnet)	LM-F	S20-480-1SS0 S20-576-1SS0			S40-480-1SS0 S40-576-1SS0				S50-480-1SS0 <small>(Note 3)</small> S50-576-1SS0 <small>(Note 3)</small>
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Linear Servo Motor and Servo Amplifier" on p. 3-5 in this catalog.							
Power supply capacity		[kVA]	3.5	7.5	10	7.5	10	14	18	22
Cooling method			Natural cooling or liquid cooling							
Thrust	Continuous (natural cooling) <small>(Note 4)</small>	[N]	300	600	900	600	1200	1800	2400	3000
	Continuous (liquid cooling) <small>(Note 4)</small>	[N]	600	1200	1800	1200	2400	3600	4800	6000
	Maximum	[N]	1800	3600	5400	3600	7200	10800	14400	18000
Maximum speed <small>(Note 1)</small>		[m/s]	2.0							
Magnetic attraction force		[N]	4500	9000	13500	9000	18000	27000	36000	45000
Rated current	Natural cooling	[A]	4.0	7.8	12	7.8	15	21	28	22
	Liquid cooling	[A]	7.8	16	23	17	31	44	59	45
Maximum current		[A]	30	58	87	57	109	159	212	157
Regenerative braking frequency <small>(Note 2)</small>	MR-J4-	Natural cooling [times/min]	348	264	318	393	169	577	715	4230
		Liquid cooling [times/min]	671	396	No limit	366	224	859	1050	No limit
Recommended load to motor mass ratio			Maximum of 15 times the mass of the linear servo motor primary side							
Insulation class			155 (F)							
Structure			Open (IP rating: IP00)							
Environment	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)							
	Ambient humidity		Operation: 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		49 m/s ²							
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.							
Mass	Primary side (coil)	[kg]	9.0	18	27	14	28	42	56	67
	Secondary side (magnet)	[kg]	480 mm/pc: 7.0 576 mm/pc: 9.0			480 mm/pc: 12 576 mm/pc: 15				480 mm/pc: 20 576 mm/pc: 24

- Notes: 1. The maximum speed of the linear servo motor or the rated speed of the linear encoder, whichever is smaller, is the upper limit of the linear servo motor speed.
2. The regenerative braking frequency shows the permissible frequency when the linear servo motor, without a load and a regenerative option, decelerates from the maximum speed to a stop. When a load is connected; however, the value will be the table value/(m+1), where m = Mass of load/Mass of motor primary side (coil). 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. Use 400 V AC type servo amplifier for this linear servo motor.
4. Use the linear servo motor with 70% or less of the effective load ratio when it is in the servo lock state or in a small reciprocating motion.

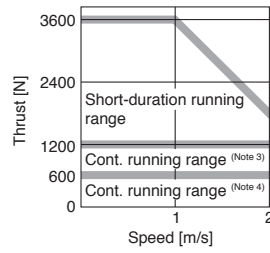


LM-F Series Thrust Characteristics

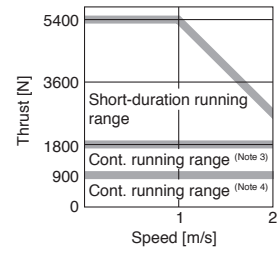
LM-FP2B-06M-1SS0 (Note 1, 5)



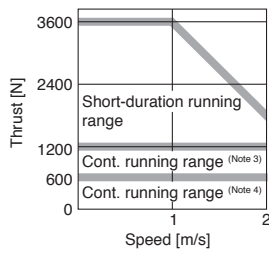
LM-FP2D-12M-1SS0 (Note 1, 5)



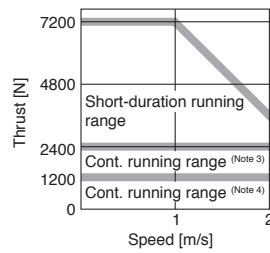
LM-FP2F-18M-1SS0 (Note 1, 5)



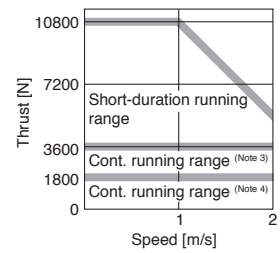
LM-FP4B-12M-1SS0 (Note 1, 5)



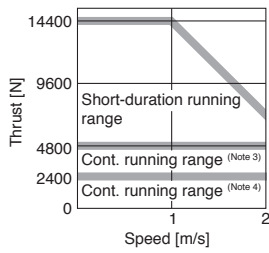
LM-FP4D-24M-1SS0 (Note 1, 5)



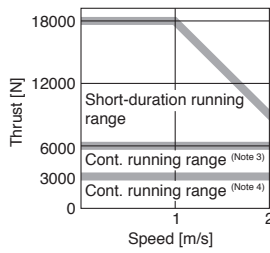
LM-FP4F-36M-1SS0 (Note 1, 5)



LM-FP4H-48M-1SS0 (Note 1, 5)



LM-FP5H-60M-1SS0 (Note 2, 5)



- Notes: 1. — : For 3-phase 200 V AC.
 2. — : For 3-phase 400 V AC.
 3. Continuous running range (liquid cooling)
 4. Continuous running range (natural cooling)
 5. Thrust drops when the power supply voltage is below the specified value.

LM-K2 Series Specifications

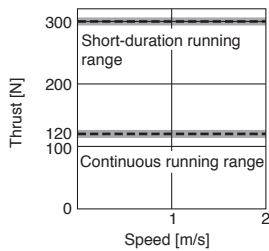
Linear servo motor model	Primary side (coil)	LM-K2	P1A-01M-2SS1	P1C-03M-2SS1	P2A-02M-1SS1	P2C-07M-1SS1	P2E-12M-1SS1	P3C-14M-1SS1	P3E-24M-1SS1
	Secondary side (magnet) (Note 4)	LM-K2	S10-288-2SS1 S10-384-2SS1 S10-480-2SS1 S10-768-2SS1			S20-288-1SS1 S20-384-1SS1 S20-480-1SS1 S20-768-1SS1		S30-288-1SS1 S30-384-1SS1 S30-480-1SS1 S30-768-1SS1	
Compatible servo amplifier model		MR-J4- MR-J4W_-	Refer to "Combinations of Linear Servo Motor and Servo Amplifier" on p. 3-6 in this catalog.						
Power supply capacity		[kVA]	0.9	3.5	1.3	5.5	7.5	5.5	7.5
Cooling method			Natural cooling						
Thrust	Continuous (Note 5)	[N]	120	360	240	720	1200	1440	2400
	Maximum	[N]	300	900	600	1800	3000	3600	6000
Maximum speed (Note 1)		[m/s]	2.0						
Magnetic attraction force		[N]	0						
Rated current		[A]	2.3	6.8	3.7	12	19	15	25
Maximum current		[A]	7.6	23	13	39	65	47	79
Regenerative braking frequency (Note 2)	MR-J4-	[times/min]	111	427	142	281	226	152	124
	MR-J4W_-	[times/min]	110 (Note 3)	-	355	-	-	-	-
Recommended load to motor mass ratio			Maximum of 30 times the mass of the linear servo motor primary side						
Insulation class			155 (F)						
Structure			Open (IP rating: IP00)						
Environment	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)						
	Ambient humidity		Operation: 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		49 m/s ²						
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.						
Mass	Primary side (coil)	[kg]	2.5	6.5	4.0	10	16	18	27
	Secondary side (magnet)	[kg]	288 mm/pc: 1.5 384 mm/pc: 2.0 480 mm/pc: 2.5 768 mm/pc: 3.9			288 mm/pc: 1.9 384 mm/pc: 2.5 480 mm/pc: 3.2 768 mm/pc: 5.0		288 mm/pc: 5.5 384 mm/pc: 7.3 480 mm/pc: 9.2 768 mm/pc: 14.6	

- Notes: 1. The maximum speed of the linear servo motor or the rated speed of the linear encoder, whichever is smaller, is the upper limit of the linear servo motor speed.
2. The regenerative braking frequency shows the permissible frequency when the linear servo motor, without a load and a regenerative option, decelerates from the maximum speed to a stop. When a load is connected; however, the value will be the table value/(m+1), where m = Mass of load/Mass of motor primary side (coil). 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. This value is applicable when MR-J4W2-44B or MR-J4W3-444B is used. The value is 584 for MR-J4W2-77B or MR-J4W2-1010B.
4. LM-K2 series has a structure of magnetic attraction counter-force and requires at least two blocks of identical secondary side (magnet).
5. Use the linear servo motor with 70% or less of the effective load ratio when it is in the servo lock state or in a small reciprocating motion.

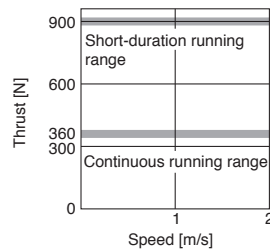


LM-K2 Series Thrust Characteristics

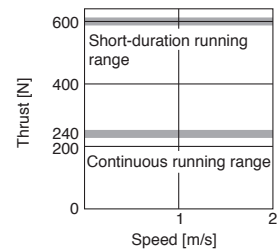
LM-K2P1A-01M-2SS1 (Note 1, 3, 4)



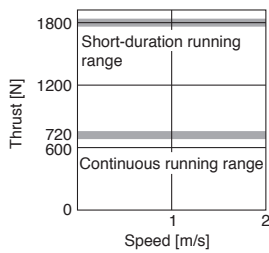
LM-K2P1C-03M-2SS1 (Note 2, 4)



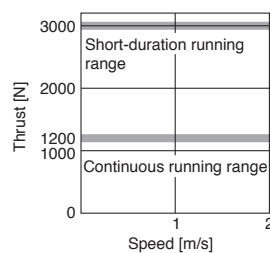
LM-K2P2A-02M-1SS1 (Note 1, 4)



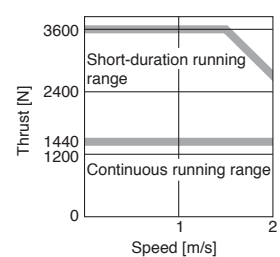
LM-K2P2C-07M-1SS1 (Note 2, 4)



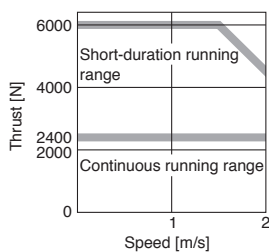
LM-K2P2E-12M-1SS1 (Note 2, 4)



LM-K2P3C-14M-1SS1 (Note 2, 4)



LM-K2P3E-24M-1SS1 (Note 2, 4)



- Notes: 1. — : For 3-phase 200 V AC or 1-phase 200 V AC.
 2. — : For 3-phase 200 V AC.
 3. - - - : For 1-phase 100 V AC.
 4. Thrust drops when the power supply voltage is below the specified value.

LM-U2 Series Specifications

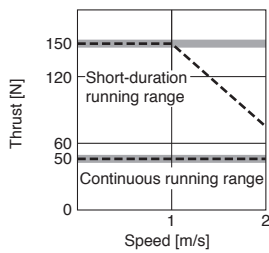
	Primary side (coil)	LM-U2	PAB-05M-0SS0	PAD-10M-0SS0	PAF-15M-0SS0	PBB-07M-1SS0	PBD-15M-1SS0	PBF-22M-1SS0	P2B-40M-2SS0	P2C-60M-2SS0	P2D-80M-2SS0
Linear servo motor model	Secondary side (magnet)	LM-U2	SA0-240-0SS0 SA0-300-0SS0 SA0-420-0SS0			SB0-240-1SS0 SB0-300-1SS0 SB0-420-1SS0			S20-300-2SS0 S20-480-2SS0		
	Compatible servo amplifier model	MR-J4- MR-J4W_-	Refer to "Combinations of Linear Servo Motor and Servo Amplifier" on p. 3-6 in this catalog.								
Power supply capacity [kVA]			0.5	0.9	0.9	0.5	1.0	1.3	3.5	5.5	7.5
Cooling method			Natural cooling								
Thrust	Continuous ^(Note 3)	[N]	50	100	150	75	150	225	400	600	800
	Maximum	[N]	150	300	450	225	450	675	1600	2400	3200
Maximum speed ^(Note 1) [m/s]			2.0								
Magnetic attraction force [N]			0								
Rated current [A]			0.9	1.9	2.7	1.5	3.0	4.6	6.6	9.8	13.1
Maximum current [A]			2.7	5.5	8.3	4.5	8.9	13.7	26.7	40.3	53.7
Regenerative braking frequency ^(Note 2)	MR-J4-	[times/min]	No limit	No limit	No limit	No limit	3480	No limit	1820	2800	1190
	MR-J4W_-	[times/min]	No limit	No limit	No limit	6030	No limit	No limit	-	-	-
Recommended load to motor mass ratio			Maximum of 30 times the mass of the linear servo motor primary side								
Insulation class			155 (F)								
Structure			Open (IP rating: IP00)								
Environment	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)								
	Ambient humidity		Operation: 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		49 m/s ²								
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.								
Mass	Primary side (coil)	[kg]	0.3	0.6	0.8	0.4	0.8	1.1	2.9	4.2	5.5
	Secondary side (magnet)	[kg]	240 mm/pc: 2.0 300 mm/pc: 2.5 420 mm/pc: 3.5			240 mm/pc: 2.6 300 mm/pc: 3.2 420 mm/pc: 4.5			300 mm/pc: 9.6 480 mm/pc: 15.3		

- Notes: 1. The maximum speed of the linear servo motor or the rated speed of the linear encoder, whichever is smaller, is the upper limit of the linear servo motor speed.
2. The regenerative braking frequency shows the permissible frequency when the linear servo motor, without a load and a regenerative option, decelerates from the maximum speed to a stop. When a load is connected; however, the value will be the table value/(m+1), where m = Mass of load/Mass of motor primary side (coil). 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. Use the linear servo motor with 70% or less of the effective load ratio when it is in the servo lock state or in a small reciprocating motion.

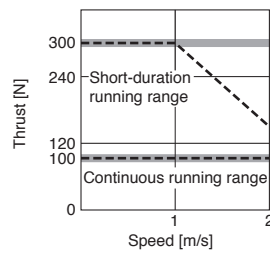


LM-U2 Series Thrust Characteristics

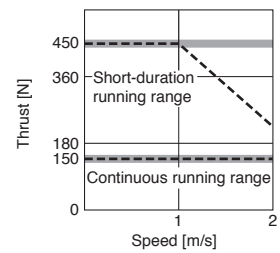
LM-U2PAB-05M-0SS0 (Note 1, 3, 4)



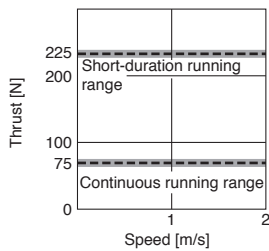
LM-U2PAD-10M-0SS0 (Note 1, 3, 4)



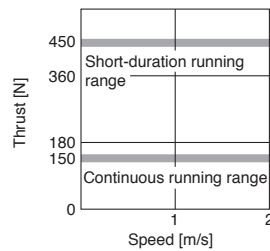
LM-U2PAF-15M-0SS0 (Note 1, 3, 4)



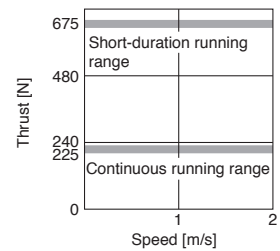
LM-U2PBB-07M-1SS0 (Note 1, 3, 4)



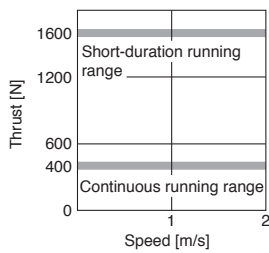
LM-U2PBD-15M-1SS0 (Note 1, 4)



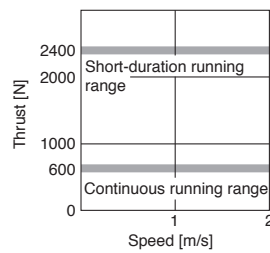
LM-U2PBF-22M-1SS0 (Note 1, 4)



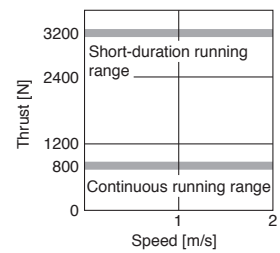
LM-U2P2B-40M-2SS0 (Note 2, 4)



LM-U2P2C-60M-2SS0 (Note 2, 4)



LM-U2P2D-80M-2SS0 (Note 2, 4)



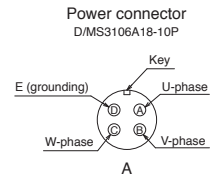
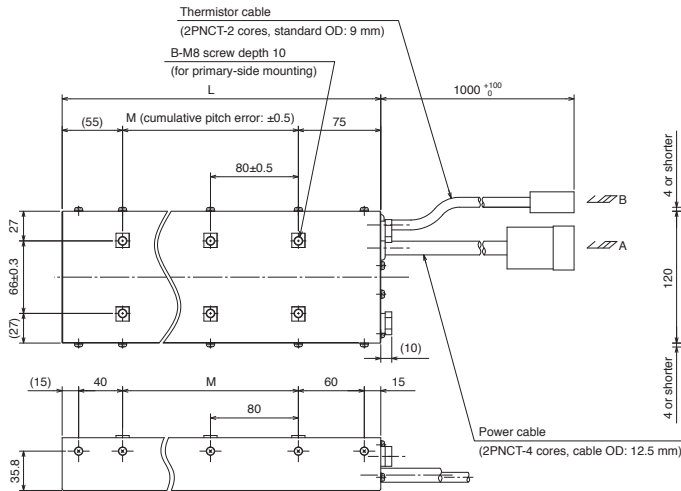
- Notes: 1. — : For 3-phase 200 V AC or 1-phase 200 V AC.
 2. — : For 3-phase 200 V AC.
 3. - - - : For 1-phase 100 V AC.
 4. Thrust drops when the power supply voltage is below the specified value.

LM-F Series Primary Side (Coil) Dimensions (Note 1, 2)

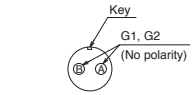
●LM-FP2B-06M-1SS0

●LM-FP2D-12M-1SS0

●LM-FP2F-18M-1SS0



Power connector
D/MS3106A18-10P



Thermistor connector
D/MS3106A14S-9P

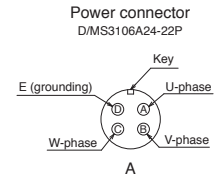
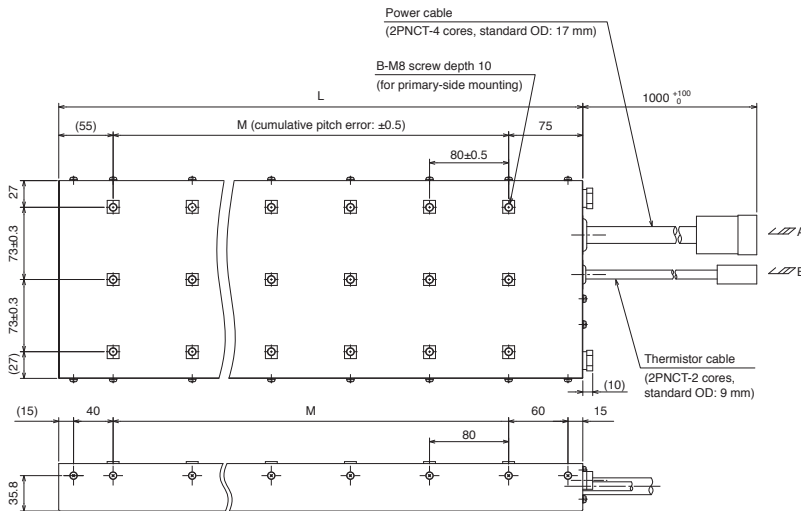
Model	Variable dimensions		
	L	M	B
LM-FP2B-06M-1SS0	290	2 × 80 = 160	2 × 3
LM-FP2D-12M-1SS0	530	5 × 80 = 400	2 × 6
LM-FP2F-18M-1SS0	770	8 × 80 = 640	2 × 9

●LM-FP4B-12M-1SS0

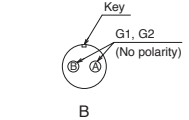
●LM-FP4D-24M-1SS0

●LM-FP4F-36M-1SS0

●LM-FP4H-48M-1SS0



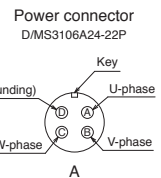
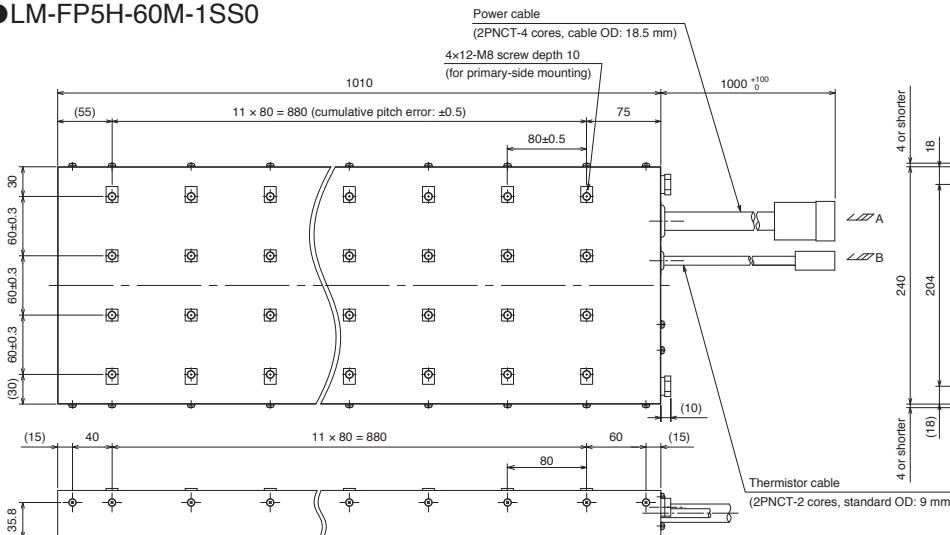
Power connector
D/MS3106A24-22P



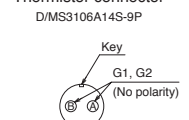
Thermistor connector
D/MS3106A14S-9P

Model	Variable dimensions		
	L	M	B
LM-FP4B-12M-1SS0	290	2 × 80 = 160	3 × 3
LM-FP4D-24M-1SS0	530	5 × 80 = 400	3 × 6
LM-FP4F-36M-1SS0	770	8 × 80 = 640	3 × 9
LM-FP4H-48M-1SS0	1010	11 × 80 = 880	3 × 12

●LM-FP5H-60M-1SS0



Power connector
D/MS3106A24-22P



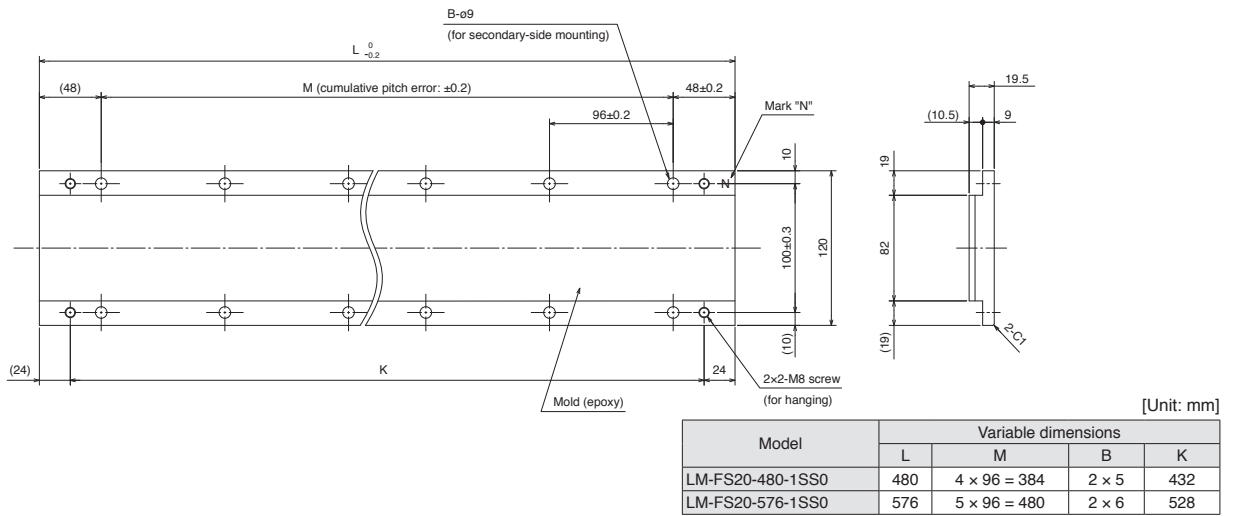
Thermistor connector
D/MS3106A14S-9P

Model	Variable dimensions		
	L	M	B
LM-FP5H-60M-1SS0	1010	11 × 80 = 880	3 × 12

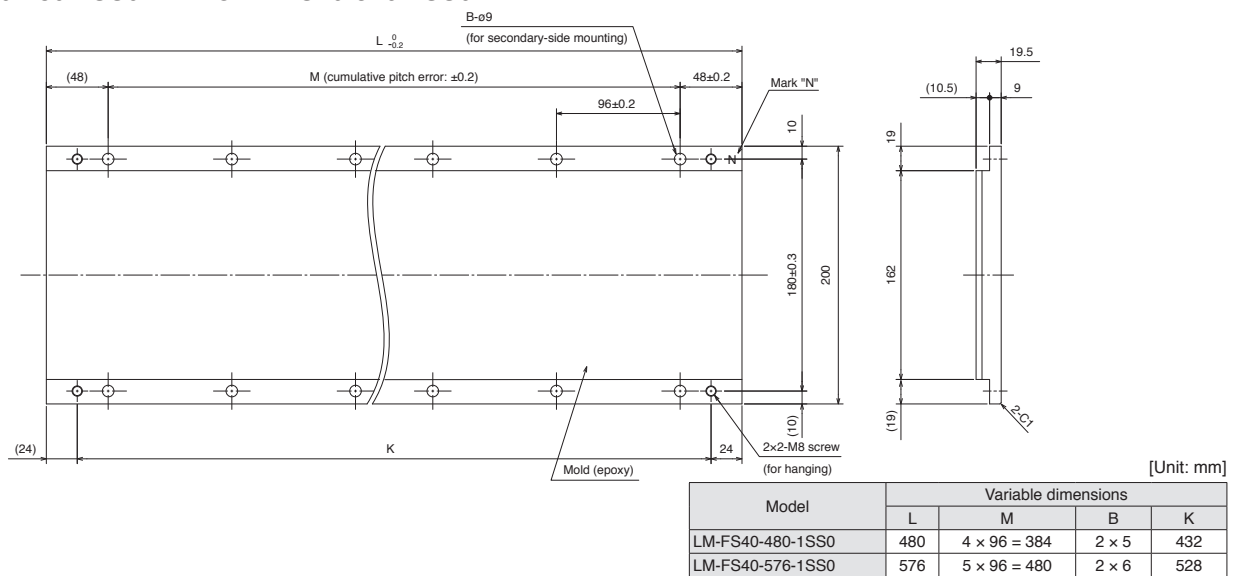
Notes: 1. Power and thermistor cables do not have a long bending life. Fix the cables led from the primary side (coil) to a moving part to prevent the cables from repetitive bending.
2. Minimum bending radius of the cable equals to six times the standard overall diameter of the cable.

LM-F Series Secondary Side (Magnet) Dimensions

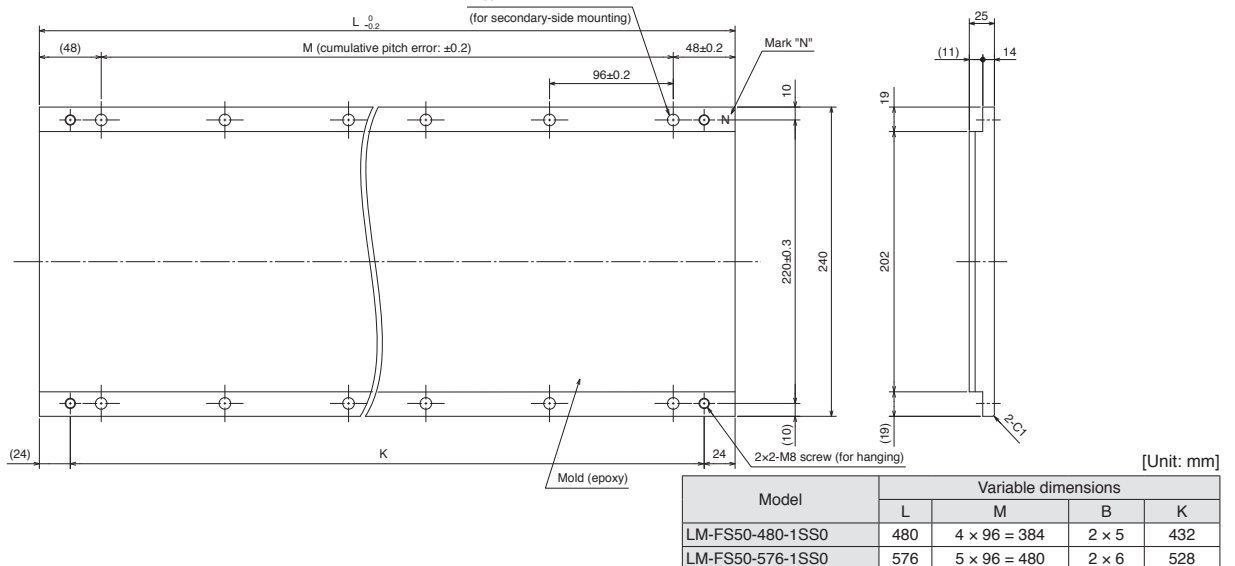
- LM-FS20-480-1SS0 ●LM-FS20-576-1SS0



- LM-FS40-480-1SS0 ●LM-FS40-576-1SS0



- LM-FS50-480-1SS0 ●LM-FS50-576-1SS0_{B-09}

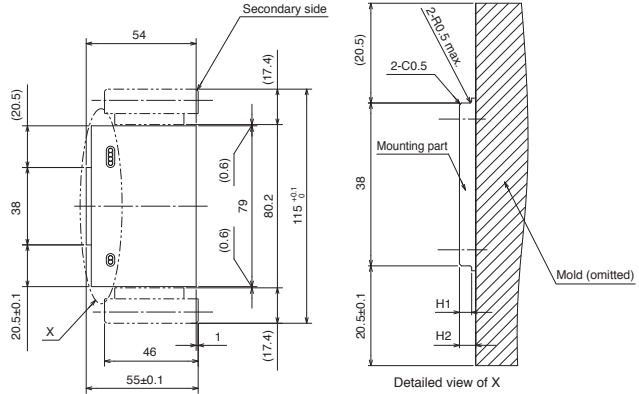
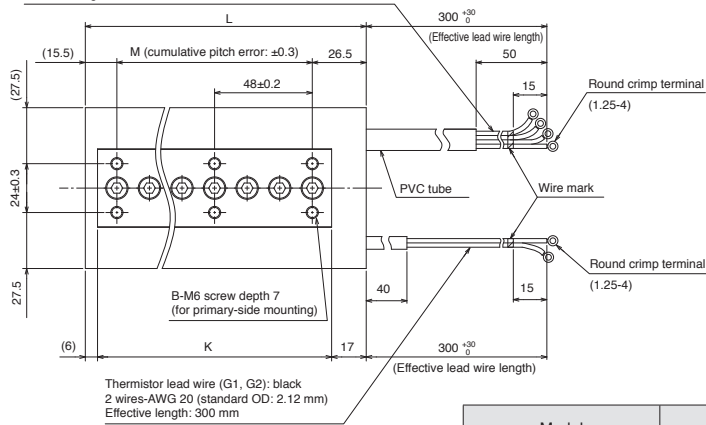


LM-K2 Series Primary Side (Coil) Dimensions (Note 1, 2)

●LM-K2P1A-01M-2SS1

●LM-K2P1C-03M-2SS1

Power lead wire (U, V, and W): black, Grounding lead wire (E): green/yellow
Effective length: 300 mm



[Unit: mm]

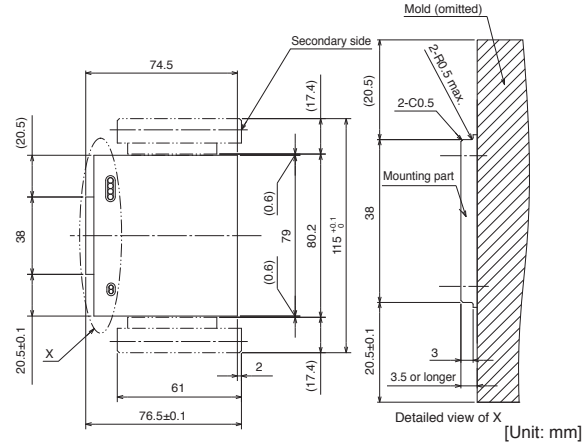
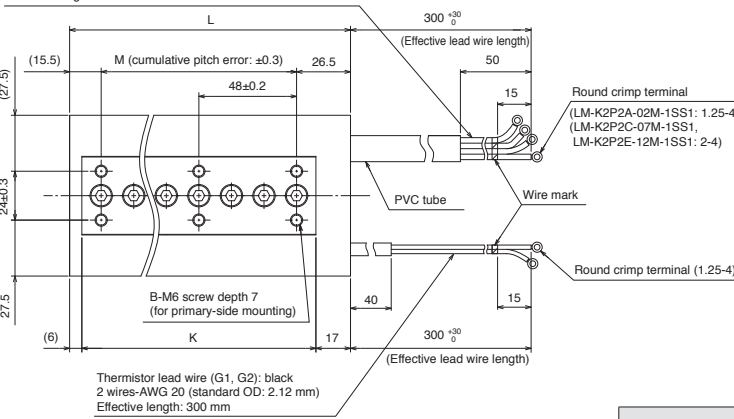
Model	Variable dimensions						Power/grounding lead wire	
	L	M	K	B	H1	H2	Size	Standard OD
LM-K2P1A-01M-2SS1	138	2 × 48 = 96	115	2 × 3	3	3.5 or longer	AWG 20	2.12
LM-K2P1C-03M-2SS1	330	6 × 48 = 288	307	2 × 7	1.5	2.5 or longer	AWG 16	2.7

●LM-K2P2A-02M-1SS1

●LM-K2P2C-07M-1SS1

●LM-K2P2E-12M-1SS1

Power lead wire (U, V, and W): black, Grounding lead wire (E): green/yellow
Effective length: 300 mm



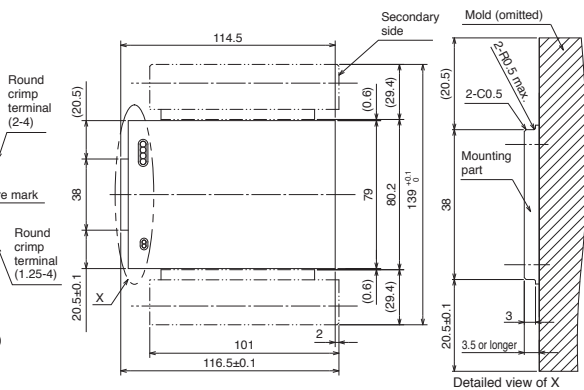
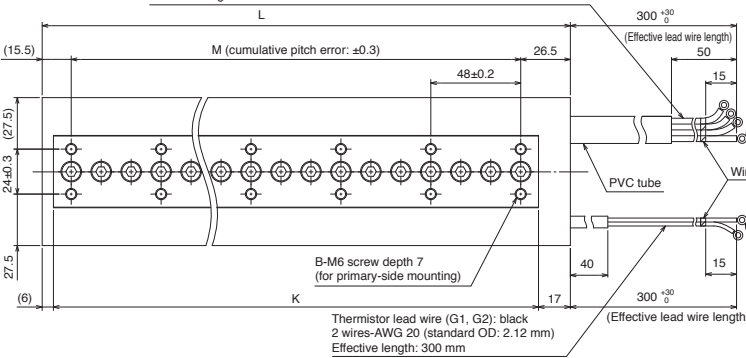
[Unit: mm]

Model	Variable dimensions					Power/grounding lead wire	
	L	M	K	B		Size	Standard OD
LM-K2P2A-02M-1SS1	138	2 × 48 = 96	115	2 × 3		AWG 16	2.7
LM-K2P2C-07M-1SS1	330	6 × 48 = 288	307	2 × 7		AWG 14	3.12
LM-K2P2E-12M-1SS1	522	10 × 48 = 480	499	2 × 11			

●LM-K2P3C-14M-1SS1

●LM-K2P3E-24M-1SS1

Power lead wire (U, V, and W): black, Grounding lead wire (E): green/yellow
Effective length: 300 mm



[Unit: mm]

Model	Variable dimensions					Power/grounding lead wire	
	L	M	K	B		Size	Standard OD
LM-K2P3C-14M-1SS1	330	6 × 48 = 288	307	2 × 7		AWG 14	3.12
LM-K2P3E-24M-1SS1	522	10 × 48 = 480	499	2 × 11			

Notes: 1. Power, grounding and thermistor lead wires do not have a long bending life. Fix the lead wires led from the primary side (coil) to a moving part to prevent the lead wires from repetitive bending.

2. Minimum bending radius of the lead wire equals to six times the standard overall diameter of the lead wire.

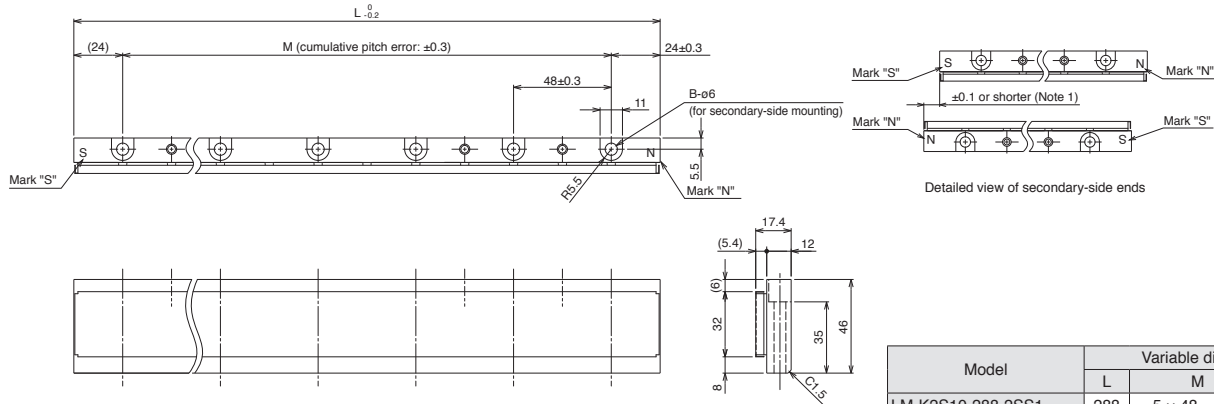
LM-K2 Series Secondary Side (Magnet) Dimensions

●LM-K2S10-288-2SS1

●LM-K2S10-384-2SS1

●LM-K2S10-480-2SS1

●LM-K2S10-768-2SS1



[Unit: mm]

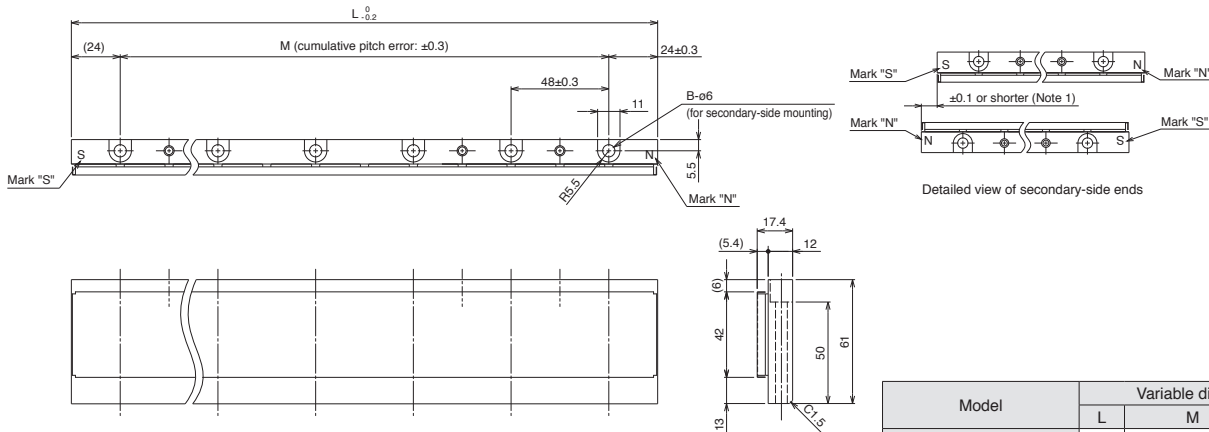
Model	Variable dimensions		
	L	M	B
LM-K2S10-288-2SS1	288	$5 \times 48 = 240$	6
LM-K2S10-384-2SS1	384	$7 \times 48 = 336$	8
LM-K2S10-480-2SS1	480	$9 \times 48 = 432$	10
LM-K2S10-768-2SS1	768	$15 \times 48 = 720$	16

●LM-K2S20-288-1SS1

●LM-K2S20-384-1SS1

●LM-K2S20-480-1SS1

●LM-K2S20-768-1SS1



[Unit: mm]

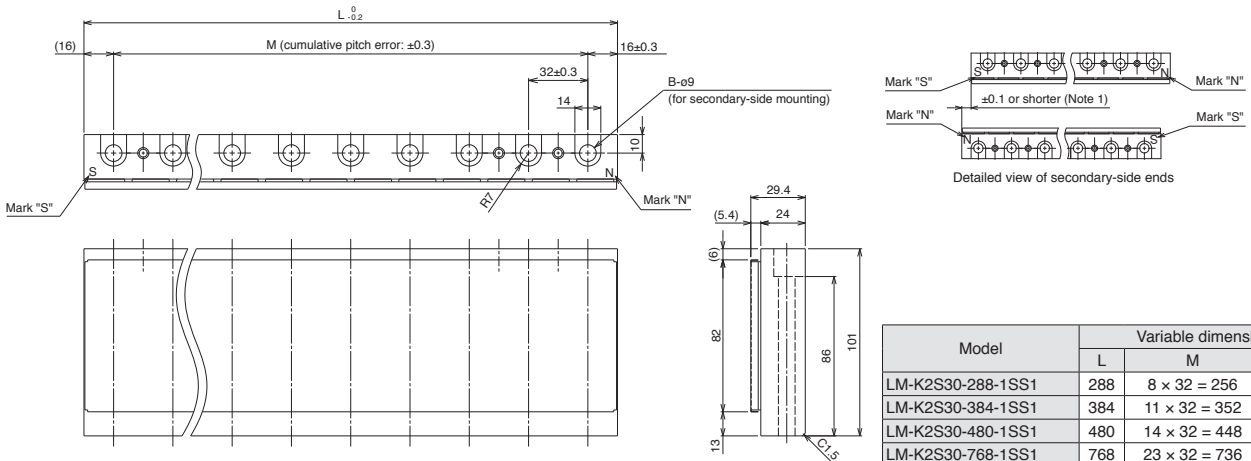
Model	Variable dimensions		
	L	M	B
LM-K2S20-288-1SS1	288	$5 \times 48 = 240$	6
LM-K2S20-384-1SS1	384	$7 \times 48 = 336$	8
LM-K2S20-480-1SS1	480	$9 \times 48 = 432$	10
LM-K2S20-768-1SS1	768	$15 \times 48 = 720$	16

●LM-K2S30-288-1SS1

●LM-K2S30-384-1SS1

●LM-K2S30-480-1SS1

●LM-K2S30-768-1SS1



[Unit: mm]

Model	Variable dimensions		
	L	M	B
LM-K2S30-288-1SS1	288	$8 \times 32 = 256$	9
LM-K2S30-384-1SS1	384	$11 \times 32 = 352$	12
LM-K2S30-480-1SS1	480	$14 \times 32 = 448$	15
LM-K2S30-768-1SS1	768	$23 \times 32 = 736$	24

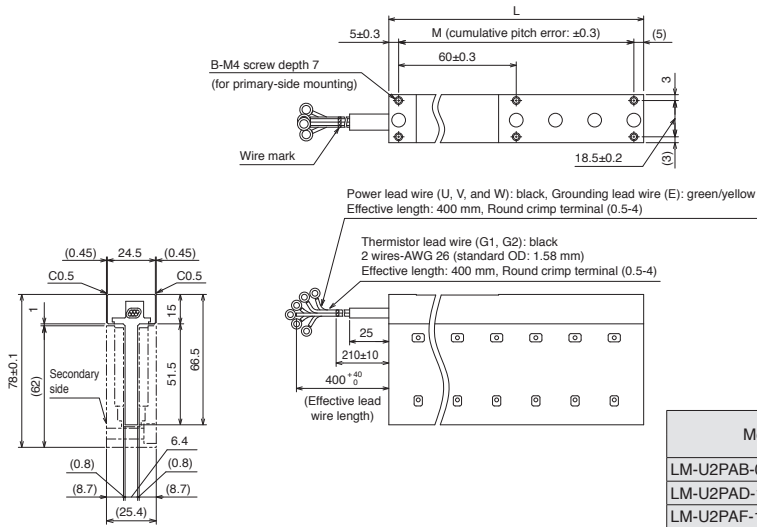
Notes: 1. Longitudinal deviation of the secondary side must be within ± 0.1 mm.

LM-U2 Series Primary Side (Coil) Dimensions (Note 1, 2)

●LM-U2PAB-05M-0SS0

●LM-U2PAD-10M-0SS0

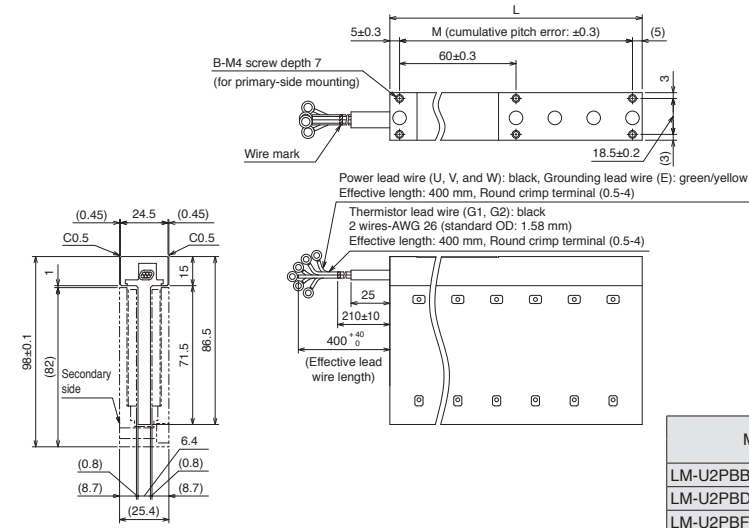
●LM-U2PAF-15M-0SS0



●LM-U2PBB-07M-1SS0

●LM-U2PBD-15M-1SS0

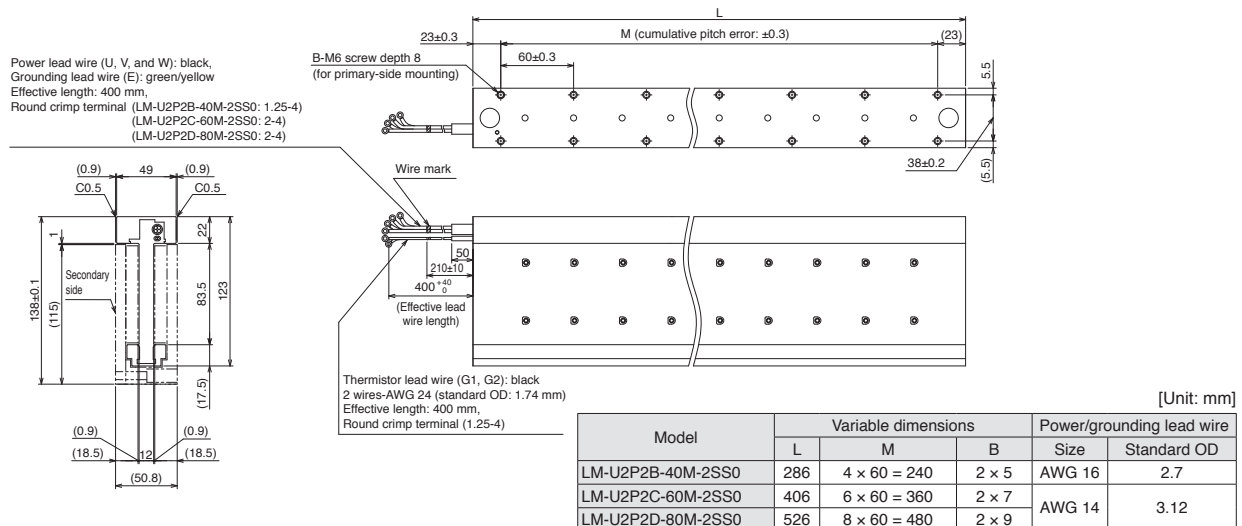
●LM-U2PBF-22M-1SS0



●LM-U2P2B-40M-2SS0

●LM-U2P2C-60M-2SS0

●LM-U2P2D-80M-2SS0



Notes: 1. Power, grounding and thermistor lead wires do not have a long bending life. Fix the lead wires led from the primary side (coil) to a moving part to prevent the lead wires from repetitive bending.

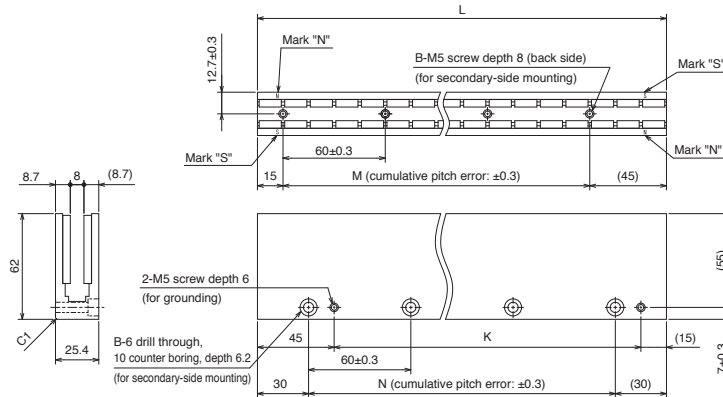
2. Minimum bending radius of the lead wire equals to six times the standard overall diameter of the lead wire.

LM-U2 Series Secondary Side (Magnet) Dimensions

●LM-U2SA0-240-0SS0

●LM-U2SA0-300-0SS0

●LM-U2SA0-420-0SS0



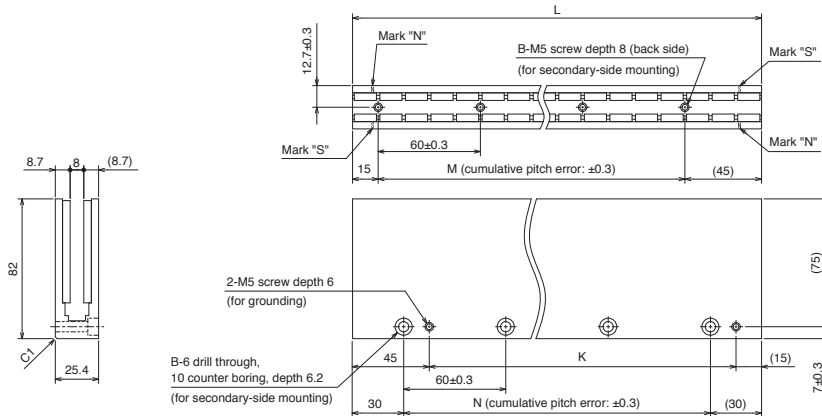
[Unit: mm]

Model	Variable dimensions				
	L	M	B	K	N
LM-U2SA0-240-0SS0	240	3 × 60 = 180	4	180	3 × 60 = 180
LM-U2SA0-300-0SS0	300	4 × 60 = 240	5	240	4 × 60 = 240
LM-U2SA0-420-0SS0	420	6 × 60 = 360	7	360	6 × 60 = 360

●LM-U2SB0-240-1SS0

●LM-U2SB0-300-1SS0

●LM-U2SB0-420-1SS0

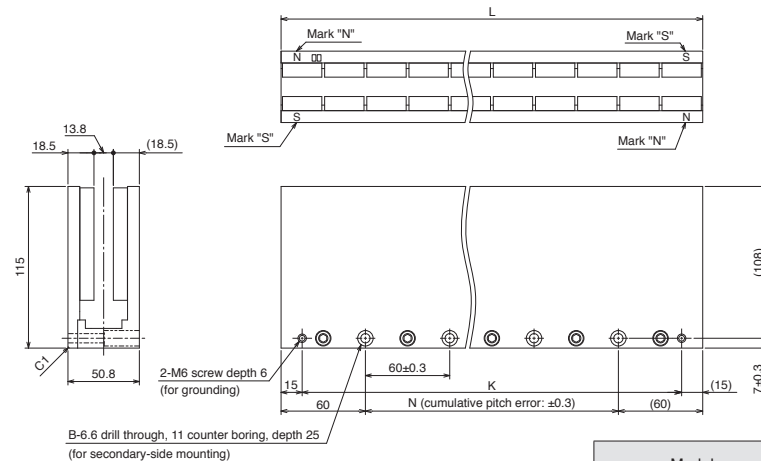


[Unit: mm]

Model	Variable dimensions				
	L	M	B	K	N
LM-U2SB0-240-1SS0	240	3 × 60 = 180	4	180	3 × 60 = 180
LM-U2SB0-300-1SS0	300	4 × 60 = 240	5	240	4 × 60 = 240
LM-U2SB0-420-1SS0	420	6 × 60 = 360	7	360	6 × 60 = 360

●LM-U2S20-300-2SS0

●LM-U2S20-480-2SS0



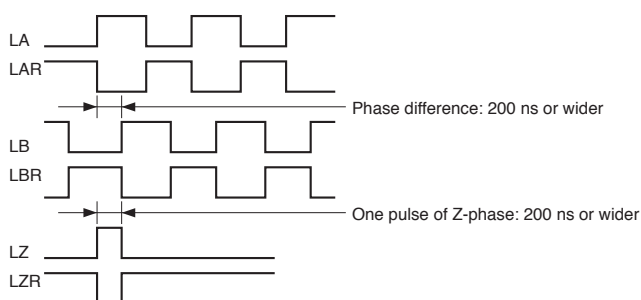
[Unit: mm]

Model	Variable dimensions			
	L	N	B	K
LM-U2S20-300-2SS0	300	3 × 60 = 180	4	270
LM-U2S20-480-2SS0	480	6 × 60 = 360	7	450

List of Linear Encoders (Note 1)

Linear encoder type		Manufacturer	Model		Resolution	Rated speed (Note 2)	Maximum effective measurement length (Note 3)	Communication method	
Mitsubishi serial interface compatible	Absolute type	Magnescale Co., Ltd.	SR77		0.05 μm/0.01 μm	3.3 m/s	2040 mm	Two-wire type	
			SR87				3040 mm		
		Mitutoyo Corporation	AT343A		0.05 μm	2.0 m/s	3000 mm	Two-wire type	
			AT543A-SC			2.5 m/s	2200 mm		
			AT545A-SC		20 μm/4096 (Approx. 0.005 μm)	2.5 m/s	2200 mm		
			ST741A		0.5 μm	4.0 m/s	6000 mm		
			ST742A						
			ST743A		0.1 μm				
			ST744A						
			ST748A						
		Renishaw	RESOLUTE RL40M		1 nm/50 nm	4.0 m/s	10000 mm	Two-wire type	
	Heidenhain	LC 493M		0.05 μm/0.01 μm	3.0 m/s	2040 mm	Four-wire type (Note 4)		
		LC 193M				4240 mm			
		LIC 4193M		0.01 μm	4.0 m/s	3040 mm	Two-wire/ Four-wire type (Note 4)		
		LIC 4195M				28040 mm			
		LIC 4197M				6040 mm			
		LIC 4199M				1020 mm			
	Incremental type	Magnescale Co., Ltd.	SR75		0.05 μm/0.01 μm	3.3 m/s	2040 mm	Two-wire type	
			SR85				3040 mm		
			SL710 + PL101-RM/RHM		0.1 μm	4.0 m/s	100000 mm		
		Heidenhain	LIDA 483		+ EIB 392M (/16384)	20 μm/16384 (Approx. 1.22 nm)	4.0 m/s	3040 mm	Four-wire type (Note 4)
			LIDA 485					30040 mm	
			LIDA 487					6040 mm	
			LIDA 489					1020 mm	
			LIDA 287		+ EIB 392M (/16384)	200 μm/16384 (Approx. 12.2 nm)	10000 mm		
			LIDA 289						
			LIF 481		+ EIB 392M (/4096)	4 μm/4096 (Approx. 0.977 nm)	1.2 m/s	1020 mm	
			LIP 581					1440 mm	
		Nidec Sankyo Corporation	PSLH041 (Note 7)		0.1 μm	5.0 m/s	2400 mm	Two-wire type	
A/B/Z-phase differential output type (Note 5, 8)		Not designated	-		0.001 μm to 5 μm (Note 6)	Depends on the linear encoder	Depends on the linear encoder	A/B/Z-phase differential output method	

- Notes: 1. Contact the relevant linear encoder manufacturer for details on operating environment and specifications of the linear encoder such as ambient temperature, vibration resistance and IP rating.
2. The rated speed of the linear encoder is applicable when the linear encoder is used with MR-J4 series servo amplifier. The values may differ from the manufacturers' specifications.
3. The length is specified by the linear encoder manufacturers. The maximum length of the encoder cable between linear encoder and servo amplifier is 30 m.
4. When using the four-wire type linear encoder in fully closed loop control system, use MR-J4-B-RJ or MR-J4-A-RJ servo amplifier. When using four-wire type linear encoder with the scale measurement function, use MR-J4-B-RJ servo amplifier.
5. When using the A/B/Z-phase differential output type linear encoder, use MR-J4-B-RJ or MR-J4-A-RJ servo amplifier.
6. Select the linear encoder within this range.
7. Use servo amplifier with software version B3 or later.
8. Output A-phase, B-phase, and Z-phase signals in the differential line driver. The phase difference of the A-phase pulse and the B-phase pulse, and the width of the Z-phase pulse must be 200 ns or wider. The output pulse of A-phase and B-phase of the A/B/Z-phase differential output linear encoder is in the multiply-by-four count method. Home position return is not possible with a linear encoder without Z-phase.



Selecting Linear Servo Motor

- Linear servo motor must be selected according to the purpose of the application.

Select the optimal linear servo motor after completely understanding the characteristics of the guides, the linear encoders and the linear servo motors.

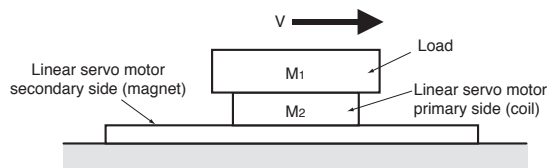
- The maximum speed is 3.0 m/s for LM-H3 series, and 2.0 m/s for LM-F, LM-K2 and LM-U2 series.
Note that the maximum speed may not be reached, depending on the selected linear encoder.

Linear Servo Motor Sizing Example

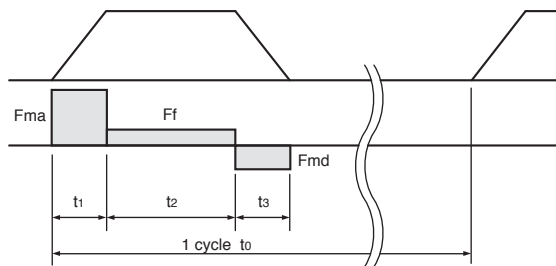
- In order to select a suitable linear servo motor, it is necessary to calculate the maximum thrust required during acceleration/deceleration and the continuous effective load thrust according to the machine specifications and the operating patterns. Here the linear servo motor is selected according to linear acceleration/deceleration operating patterns.

1. Selection criteria

(1) Configurations



(2) Operating pattern



Load mass	$M_1 = 20 \text{ kg}$
Linear servo motor primary-side (coil) mass (Determined after the motor is selected.)	$M_2 = \text{ kg}$
Acceleration	$a = 14.4 \text{ m/s}^2$
Deceleration	$d = 14.4 \text{ m/s}^2$
Resistive force (including friction, unbalance and cable chain) (Determined after the motor is selected.)	$F_f = \text{ N}$
Feed speed	$V = 1.8 \text{ m/s}$
Operating cycle	$t_0 = 2 \text{ s}$
Acceleration time	$t_1 = 0.125 \text{ s}$
Constant velocity time	$t_2 = 0.75 \text{ s}$
Deceleration time	$t_3 = 0.125 \text{ s}$
Mechanical efficiency	$\eta = 1.0$
Friction coefficient	$\mu = 0.020 \text{ (for iron)}$

2. Method of selecting linear servo motor (theoretical value)

(1) Select a linear servo motor

From the linear servo motor series that is suitable for your application or machine, select a linear servo motor with the mass ratio of load to primary side (coil) which is equal to or less than the recommended load to motor mass ratio.

For LM-H3 series: 35 times (Note 1) $\geq M_1/M_2$

Select linear servo motors that satisfy the above formula, e.g., LM-H3P2A-07P-BSS0, LM-H3P3A-12P-CSS0, and LM-H3P3B-24P-CSS0. Calculate thrusts during acceleration and deceleration, and continuous effective load thrust for each linear servo motor selected in (1).

The following is an example of calculation for LM-H3P3B-24P-CSS0.

(2) Calculate necessary thrust

Resistive force

$$M = M_1 + M_2 = 22.3 \text{ kg}$$

$$F_f = \mu \cdot (M \cdot 9.8 + \text{Magnetic attraction force [N]}) \text{ (when considering friction only)} = 48.4 \text{ N}$$

Thrust during acceleration and deceleration

$$F_{ma} = M \cdot a + F_f = 369.5 \text{ N}$$

$$F_{md} = -M \cdot d + F_f = -272.7 \text{ N}$$

Continuous effective load thrust

$$F_{rms} = \sqrt{(F_{ma}^2 \cdot t_1 + F_{f2}^2 \cdot t_2 + F_{md}^2 \cdot t_3) / t_0} = 118.6 \text{ N}$$

(3) Verify the selected linear servo motor.

$$F_{rms}/\eta \leq \text{Continuous thrust [N] of the selected linear servo motor}$$

$$F_{ma}/\eta \leq \text{Maximum thrust [N] of the selected linear servo motor}$$

If the above criteria are not satisfied, select one rank larger capacity linear servo motor and recalculate.

(4) Result

Select the following:

Linear servo motor: LM-H3P3B-24P-CSS0

Servo amplifier: MR-J4-70B

Notes: 1. The ratio of 35 times is applicable for LM-H3 series. Select a linear servo motor with the mass ratio of 30 times or less for LM-K2 or LM-U2 series, and 15 times or less for LM-F series.

[Free capacity selection software]

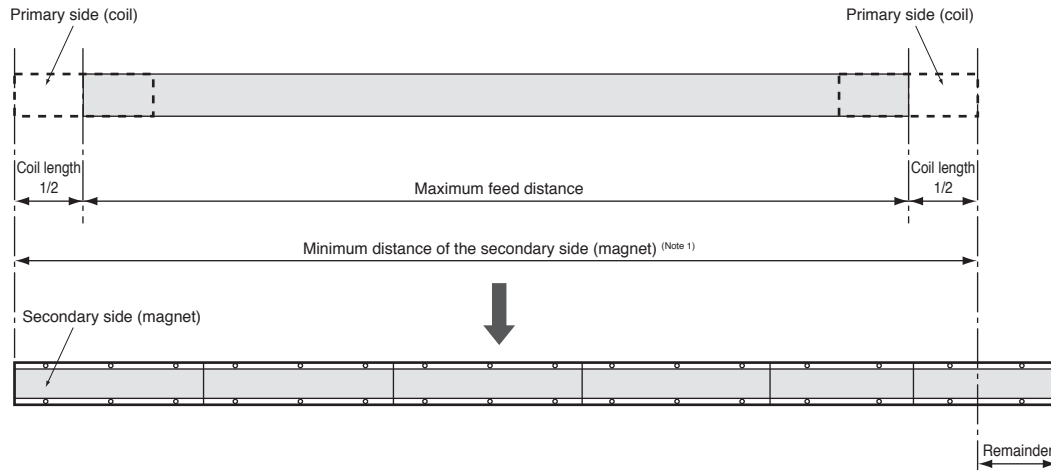
Capacity selection software (MRZJW3-MOTSZ111E) does all the calculations for you. The capacity selection software is available for free download. Contact your local sales office for more details.

* Be sure to update your MRZJW3-MOTSZ111E to the latest version.

3. Determining the number of the secondary-side (magnet) blocks

The number of the secondary-side (magnet) blocks is determined according to the total distance calculated from the following equation (Note 2) :

$$(\text{Total length of aligned secondary side (magnet)}) \geq (\text{Maximum feed distance}) + (\text{Length of the primary side (coil)})$$



- Notes: 1. Keep the cumulative pitch error of the mounting screw holes within ± 0.2 mm. When two or more secondary sides (magnets) are aligned, spaces may exist between each secondary side (magnet) block, depending on the mounting method and the number of the secondary-side blocks.
2. LM-K2 series has a structure of magnetic attraction counter-force and requires at least two blocks of identical secondary side (magnet). Therefore, the total number of the secondary side necessary equals to twice the number determined from the equation.

4. Selecting regenerative option

The following table shows the energy charged into the capacitor of the servo amplifier and the inverse efficiency of the linear servo motor.

The energy consumed by a regenerative resistor is calculated as follows:

$$\text{Regenerative energy } P \text{ [W]} = \{-Fmd \cdot (t_3 \cdot \text{Speed}/2) \cdot (\text{Inverse efficiency}/100) - \text{Capacitor charging}\} / t_0$$

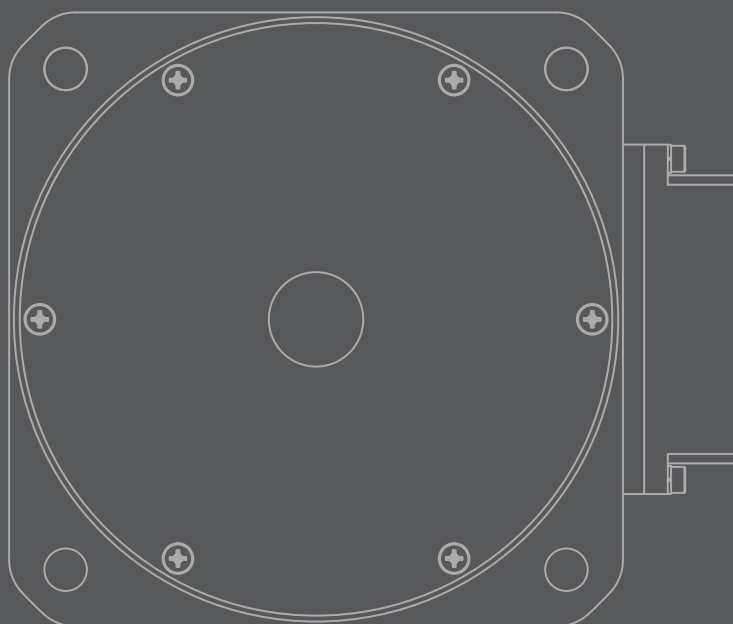
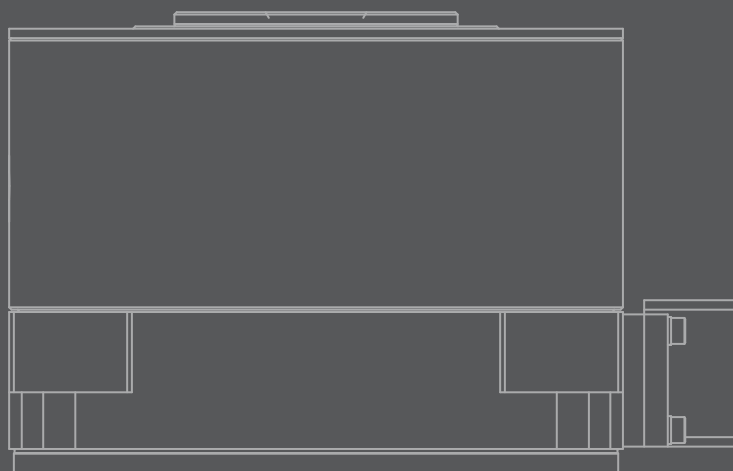
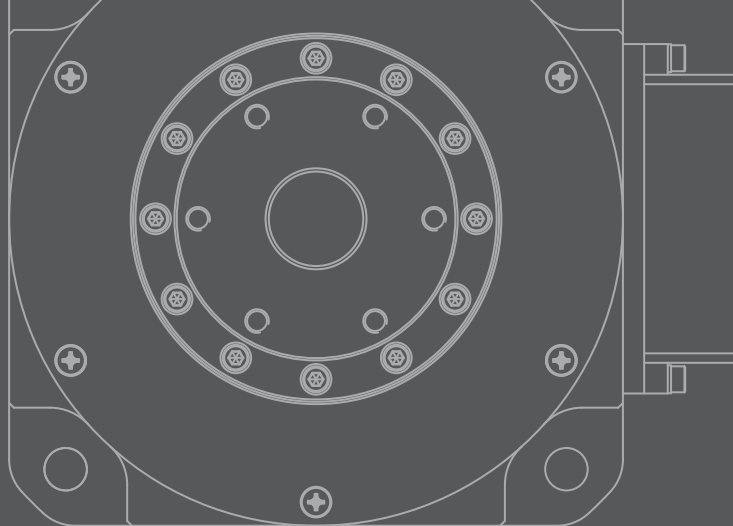
Select a suitable regenerative option as necessary to keep the consumed regenerative energy below the regenerative power shown in the following table:

Servo Amplifier (Note 2)	Capacitor charging [J]	Inverse efficiency [%]	Tolerable regenerative power of built- in regenerative resistor [W]	Tolerable regenerative power of external regenerative resistor (standard accessory) [W] (Note 4)	Tolerable regenerative power of regenerative option [W]											
					MR-RB (Note 3)											
					032	12	30	3N	31	32	50 (Note 1)	5N (Note 1)	51 (Note 1)	5R (Note 4)	9F (Note 4)	6K-4 (Note 4)
					40 Ω	40 Ω	13 Ω	9 Ω	6.7 Ω	40 Ω	13 Ω	9 Ω	6.7 Ω	3.2 Ω	3 Ω	10 Ω
MR-J4-20_(-RJ) MR-J4-20_1(-RJ)	9	75	10	-	30	100	-	-	-	-	-	-	-	-	-	-
MR-J4-40_(-RJ) MR-J4-40_1(-RJ)	11	85	10	-	30	100	-	-	-	-	-	-	-	-	-	-
MR-J4-60_(-RJ)	11	85	10	-	30	100	-	-	-	-	-	-	-	-	-	-
MR-J4-70_(-RJ)	18	85	20	-	30	100	-	-	-	300	-	-	-	-	-	-
MR-J4-200_(-RJ)	36	85	100	-	-	-	300	-	-	-	500	-	-	-	-	-
MR-J4-350_(-RJ)	40	85	100	-	-	-	-	300	-	-	-	500	-	-	-	-
MR-J4-500_(-RJ)	45	90	130	-	-	-	-	-	300	-	-	-	500	-	-	-
MR-J4-700_(-RJ)	70	90	170	-	-	-	-	-	300	-	-	-	500	-	-	-
MR-J4-11K_(-RJ)	120	90	-	500 (800)	-	-	-	-	-	-	-	-	-	500 (800)	-	-
MR-J4-15K_(-RJ)	170	90	-	850 (1300)	-	-	-	-	-	-	-	-	-	-	850 (1300)	-
MR-J4-22K_4(-RJ)	250	90	-	850 (1300)	-	-	-	-	-	-	-	-	-	-	-	850 (1300)

- Notes: 1. Be sure to cool the unit forcibly with a cooling fan (92 mm × 92 mm, minimum air flow: 1.0 m³/min). The cooling fan must be prepared by user.
2. For selecting a regenerative option for MR-J4W_-B, refer to "MR-J4W_-B Servo Amplifier Instruction Manual" for details.
3. Refer to "Regenerative Option" in this catalog for details on the regenerative option.
4. The value in brackets is applicable when cooling fans (two units of 92 mm × 92 mm, minimum air flow: 1.0 m³/min) are installed, and then [Pr. PA02] is changed.

4

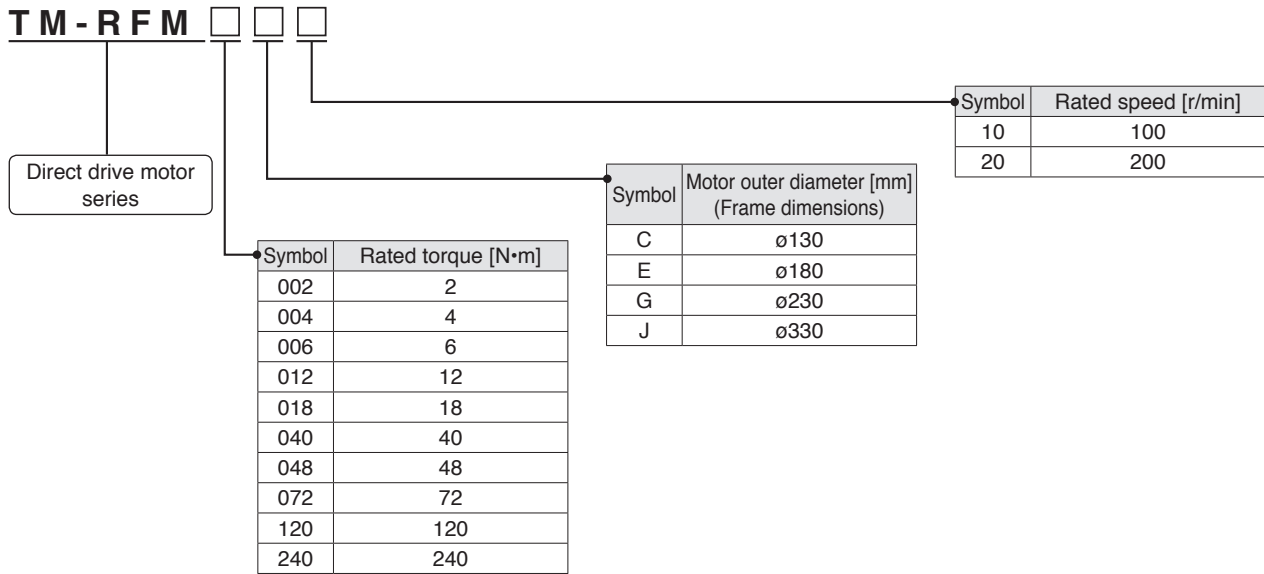
Model Designation.....	4-1
Combinations of Direct Drive Motor and Servo Amplifier	4-1
Specifications	4-2
Torque Characteristics.....	4-4
Machine Accuracy	4-5
Dimensions.....	4-6
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* Refer to p. 5-65 in this catalog for conversion of units.

Direct Drive Motors

Model Designation



Combinations of Direct Drive Motor and Servo Amplifier

Direct drive motor		Servo amplifier		
		MR-J4	MR-J4W2 (Note 1)	MR-J4W3 (Note 1)
TM-RFM series	TM-RFM002C20	MR-J4-20B(-RJ), MR-J4-20B1(-RJ), MR-J4-20A(-RJ), MR-J4-20A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	TM-RFM004C20	MR-J4-40B(-RJ), MR-J4-40B1(-RJ), MR-J4-40A(-RJ), MR-J4-40A1(-RJ)	MR-J4W2-44B, MR-J4W2-77B MR-J4W2-1010B	MR-J4W3-444B
	TM-RFM006C20	MR-J4-60B(-RJ), MR-J4-60A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	TM-RFM006E20	MR-J4-60B(-RJ), MR-J4-60A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	TM-RFM012E20	MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	TM-RFM018E20	MR-J4-100B(-RJ), MR-J4-100A(-RJ)	MR-J4W2-1010B	-
	TM-RFM012G20	MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	TM-RFM048G20	MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	TM-RFM072G20	MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	TM-RFM040J10	MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	TM-RFM120J10	MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	TM-RFM240J10	MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-

Notes: 1. Any combination of the servo motors is available. Refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-6 in this catalog.



TM-RFM Series Specifications

Direct drive motor model		TM-RFM	002C20	004C20	006C20	006E20	012E20	018E20
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Direct Drive Motor and Servo Amplifier" on p. 4-1 in this catalog.					
		MR-J4W_-						
Motor outer diameter (frame dimensions)		[mm]	ø130			ø180		
Power supply capacity ^{*1}		[kVA]	0.25	0.38	0.53	0.46	0.81	1.3
Continuous running duty	Rated output	[W]	42	84	126	126	251	377
	Rated torque ^(Note 3)	[N·m]	2	4	6	6	12	18
Maximum torque		[N·m]	6	12	18	18	36	54
Rated speed		[r/min]	200					
Maximum speed		[r/min]	500					
Permissible instantaneous speed		[r/min]	575					
Power rate at continuous rated torque		[kW/s]	3.7	9.6	16.1	4.9	12.9	21.8
Rated current		[A]	1.3	2.1	3.2	3.2	3.8	5.9
Maximum current		[A]	3.9	6.3	9.6	9.6	12	18
Regenerative braking frequency ^{*2}	MR-J4-	[times/min]	No limit	5830	2950	464	572	421
	MR-J4W_-	[times/min]	No limit	5620	No limit	2370	1430	1050
Moment of inertia J		[× 10 ⁻⁴ kg·m ²]	10.9	16.6	22.4	74.0	111	149
Recommended load to motor inertia ratio ^(Note 1)			50 times or less					
Absolute accuracy		[s]	±15			±12.5		
Speed/position detector			Absolute/incremental 20-bit encoder ^{*3} (resolution: 1048576 pulses/rev)					
Insulation class			155 (F)					
Structure			Totally enclosed, natural cooling (IP rating: IP42) ^(Note 2)					
Environment ^{*4}	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)					
	Ambient humidity		Operation: 80 %RH maximum (non-condensing), storage: 90 %RH maximum (non-condensing)					
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or splash of oil or water					
	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. 57 in this catalog.					
Rotor permissible load ^{*6}	Moment load	[N·m]	22.5			70		
	Axial load	[N]	1100			3300		
Mass		[kg]	5.2	6.8	8.4	11	15	18

Notes: 1. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.

2. Connectors and gap between rotor and stator are excluded.

3. When unbalanced torque is generated, such as in a vertical lift machine, be sure to use the absolute position detection system, and keep the unbalanced torque under 70% of the servo motor rated torque.

Refer to "Annotations for Direct Drive Motor Specifications" on p. 4-5 in this catalog for the asterisks 1 to 7.

TM-RFM Series Specifications

Direct drive motor model		TM-RFM	012G20	048G20	072G20	040J10	120J10	240J10
Compatible servo amplifier model		MR-J4- MR-J4W_-	Refer to "Combinations of Direct Drive Motor and Servo Amplifier" on p. 4-1 in this catalog.					
Motor outer diameter (frame dimensions)		[mm]	ø230			ø330		
Power supply capacity *1		[kVA]	0.71	2.7	3.8	1.2	3.4	6.6
Continuous running duty	Rated output	[W]	251	1005	1508	419	1257	2513
	Rated torque ^(Note 3)	[N•m]	12	48	72	40	120	240
Maximum torque		[N•m]	36	144	216	120	360	720
Rated speed		[r/min]	200			100		
Maximum speed		[r/min]	500			200		
Permissible instantaneous speed		[r/min]	575			230		
Power rate at continuous rated torque		[kW/s]	6.0	37.5	59.3	9.4	40.9	91.4
Rated current		[A]	3.6	11	16	4.3	11	19
Maximum current		[A]	11	33	48	13	33	57
Regenerative braking frequency *2	MR-J4-	[times/min]	202	373	251	125	281	171
	MR-J4W_-	[times/min]	507	-	-	313	-	-
Moment of inertia J		[× 10 ⁻⁴ kg•m ²]	238	615	875	1694	3519	6303
Recommended load to motor inertia ratio ^(Note 1)			50 times or less					
Absolute accuracy		[s]	±12.5			±10		
Speed/position detector			Absolute/incremental 20-bit encoder *3 (resolution: 1048576 pulses/rev)					
Insulation class			155 (F)					
Structure			Totally enclosed, natural cooling (IP rating: IP42) ^(Note 2)					
Environment *4	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)					
	Ambient humidity		Operation: 80 %RH maximum (non-condensing), storage: 90 %RH maximum (non-condensing)					
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or splash of oil or water					
	Altitude		1000 m or less above sea level					
	Vibration resistance *5		X: 49 m/s ² Y: 49 m/s ²			X: 24.5 m/s ² Y: 24.5 m/s ²		
Vibration rank			V10 *7					
Compliance to standards			Refer to "Conformity with Global Standards and Regulations" on p. 57 in this catalog.					
Rotor permissible load *6	Moment load	[N•m]	93			350		
	Axial load	[N]	5500			16000		
Mass		[kg]	17	38	52	48	85	150

Notes: 1. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.

2. Connectors and gap between rotor and stator are excluded.

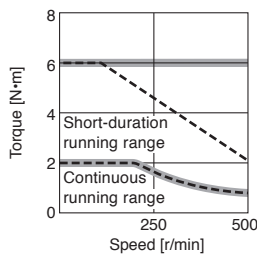
3. When unbalanced torque is generated, such as in a vertical lift machine, be sure to use the absolute position detection system, and keep the unbalanced torque under 70% of the servo motor rated torque.

Refer to "Annotations for Direct Drive Motor Specifications" on p. 4-5 in this catalog for the asterisks 1 to 7.

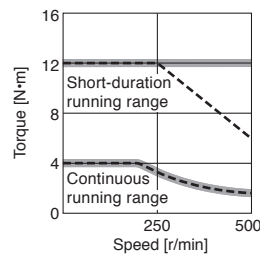


TM-RFM Series Torque Characteristics

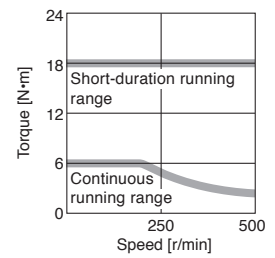
TM-RFM002C20 (Note 1, 2, 4)



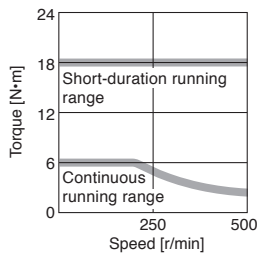
TM-RFM004C20 (Note 1, 2, 4)



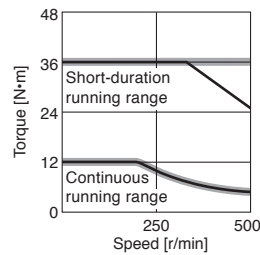
TM-RFM006C20 (Note 1, 3, 4)



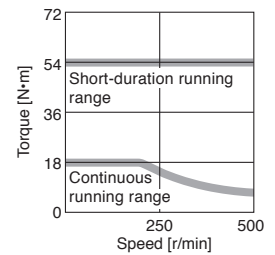
TM-RFM006E20 (Note 1, 3, 4)



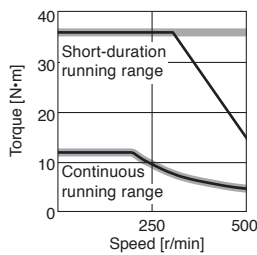
TM-RFM012E20 (Note 1, 3, 4)



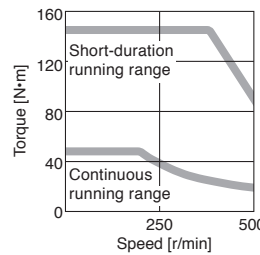
TM-RFM018E20 (Note 1, 4)



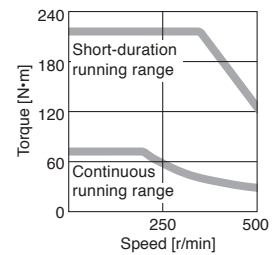
TM-RFM012G20 (Note 1, 3, 4)



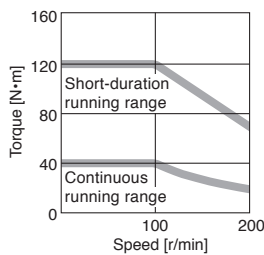
TM-RFM048G20 (Note 1, 4)



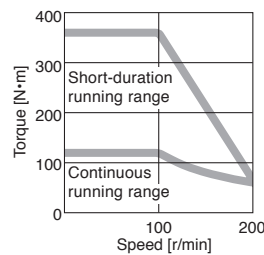
TM-RFM072G20 (Note 1, 4)



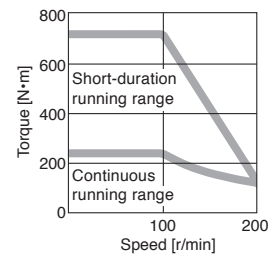
TM-RFM040J10 (Note 1, 3, 4)



TM-RFM120J10 (Note 1, 4)



TM-RFM240J10 (Note 1, 4)



Notes: 1. — : For 3-phase 200 V AC or 1-phase 230 V AC.

The following direct drive motors are compatible with 1-phase 230 V AC:

TM-RFM002C20, TM-RFM004C20, TM-RFM006C20, TM-RFM006E20, TM-RFM012E20, TM-RFM012G20, TM-RFM040J10

2. - - - : For 1-phase 200 V AC or 1-phase 100 V AC.

3. — : For 1-phase 200 V AC.

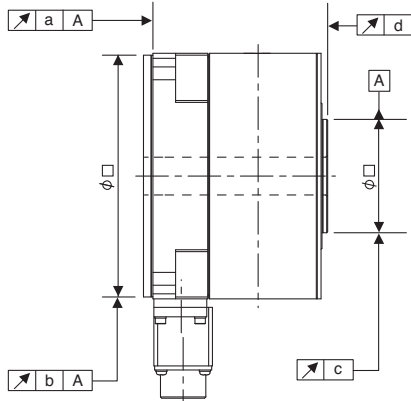
This line is drawn only where it differs from the other two lines.

4. Torque drops when the power supply voltage is below the specified value.

Direct Drive Motor Machine Accuracy

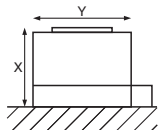
The machine accuracy related to the direct drive motor rotor (output shaft) and installation is indicated below:

Item	Measuring position	Accuracy [mm]
Runout of flange surface about rotor (output shaft)	a	0.05
Runout of fitting outer diameter of flange surface	b	0.07
Runout of rotor (output shaft)	c	0.04
Runout of rotor (output shaft) end	d	0.02

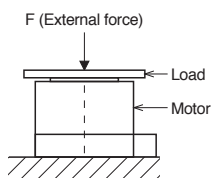


Annotations for Direct Drive Motor Specifications

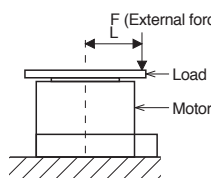
- * 1. The power supply capacity varies depending on the power supply impedance.
- * 2. The regenerative braking frequency shows the permissible frequency when the direct drive motor, without a load and a regenerative option, decelerates from the rated speed to a stop. When a load is connected; however, the value will be the table value/(m + 1), where m = Moment of inertia of load/Moment of inertia of direct drive 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. Be sure to connect the following options for absolute position detection system.
 - MR-J4: battery (MR-BAT6V1SET) and absolute position storage unit (MR-BTAS01)
 - MR-J4W_: battery case (MR-BT6VCASE), battery (MR-BAT6V1) × 5 pcs, and absolute position storage unit (MR-BTAS01).
 Refer to relevant Servo Amplifier Instruction Manual for details.
- * 4. In the environment where the direct drive motor is exposed to oil mist, oil and/or water, a standard specification direct drive 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. Fretting more likely occurs on the bearing when the direct drive motor stops. Thus, maintain vibration level at approximately one-half of the allowable value.



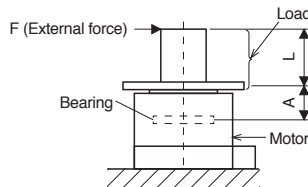
- * 6. The following is calculation examples of axial and moment loads to the rotor (output shaft) of the direct drive motor. The axial and moment loads must be maintained equal to or below the permissible value.



Axial load
= F + Load mass



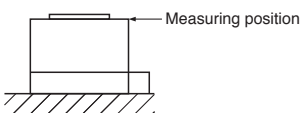
Axial load
= F + Load mass
Moment load
= F × L



Axial load = Load mass
Moment load = F × (L + A)

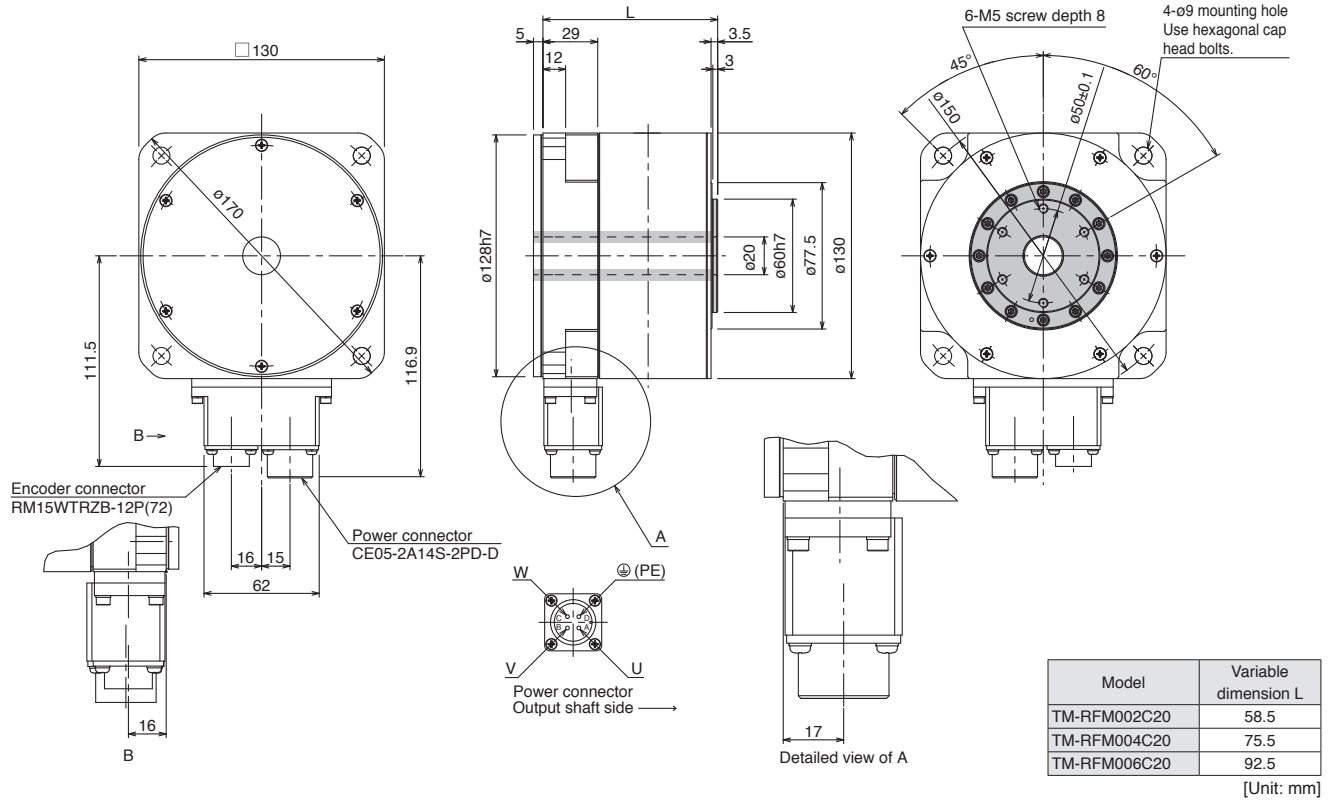
Motor outer diameter [mm] (Frame dimensions)	Dimension A [mm]
ø130	19.1
ø180	20.2
ø230	24.4
ø330	32.5

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

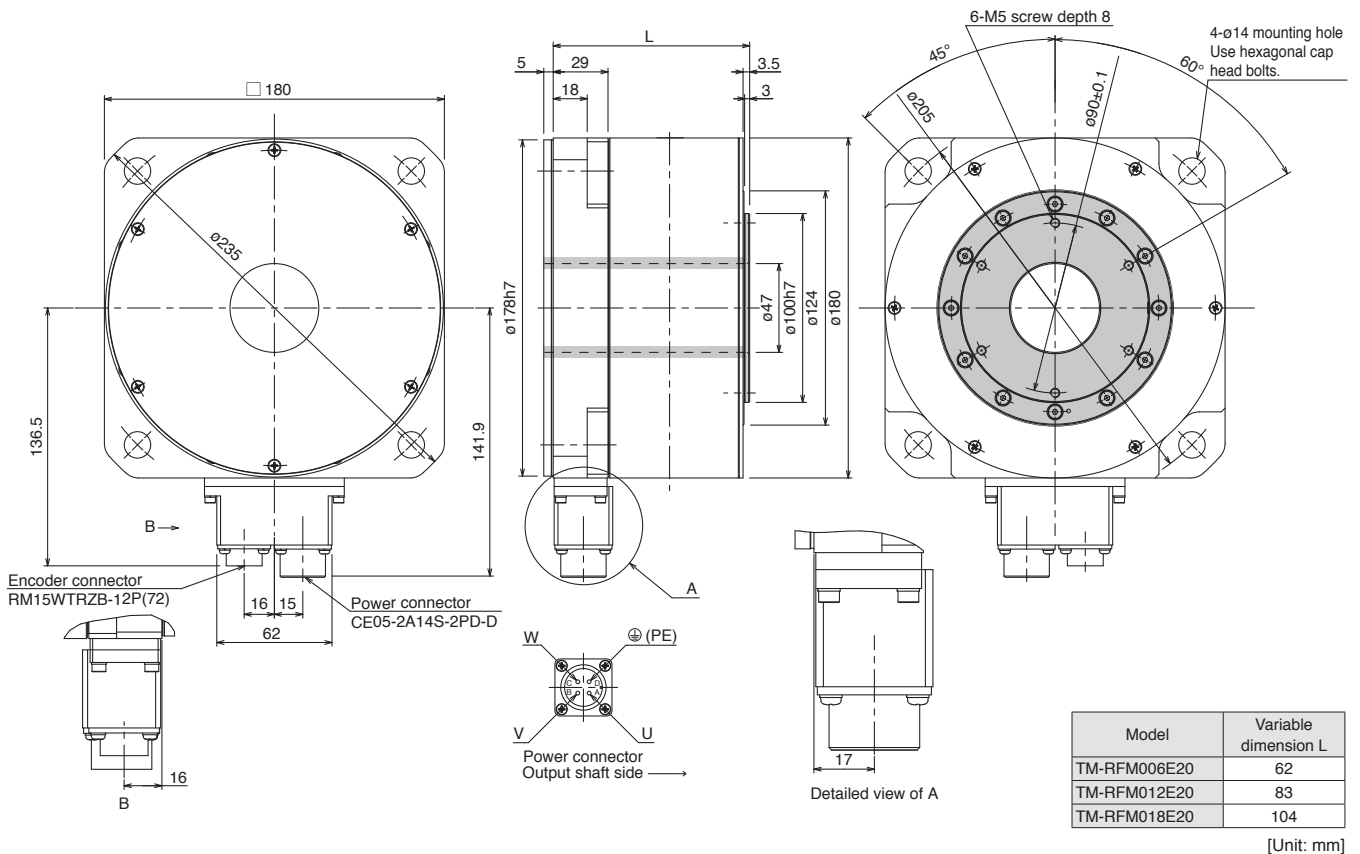


TM-RFM Series Dimensions (Note 1, 2)

● TM-RFM002C20, TM-RFM004C20, TM-RFM006C20



● TM-RFM006E20, TM-RFM012E20, TM-RFM018E20

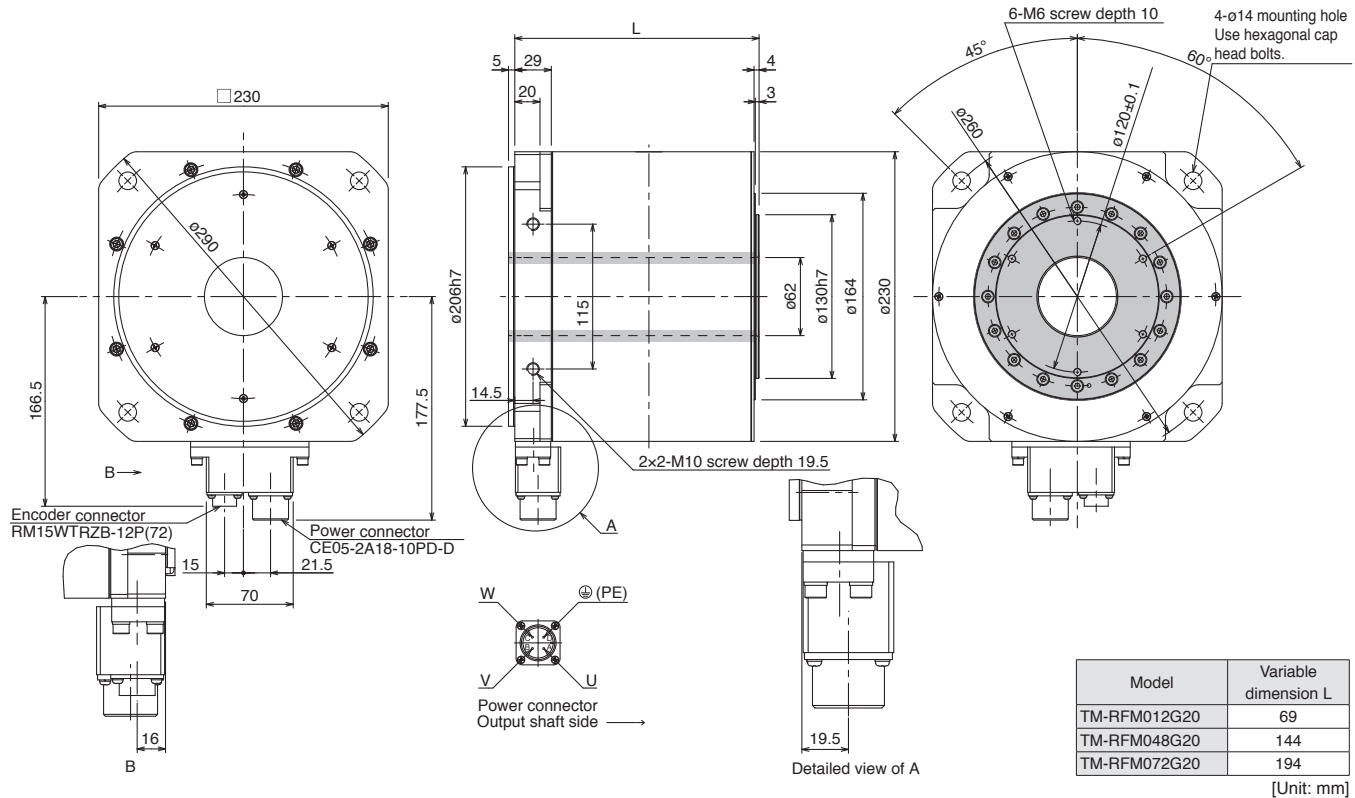


Notes: 1. For dimensions without tolerance, general tolerance applies. The actual dimensions may be 1 mm to 3 mm larger than the dimensions indicated. Make allowances for the tolerance when designing a machine.

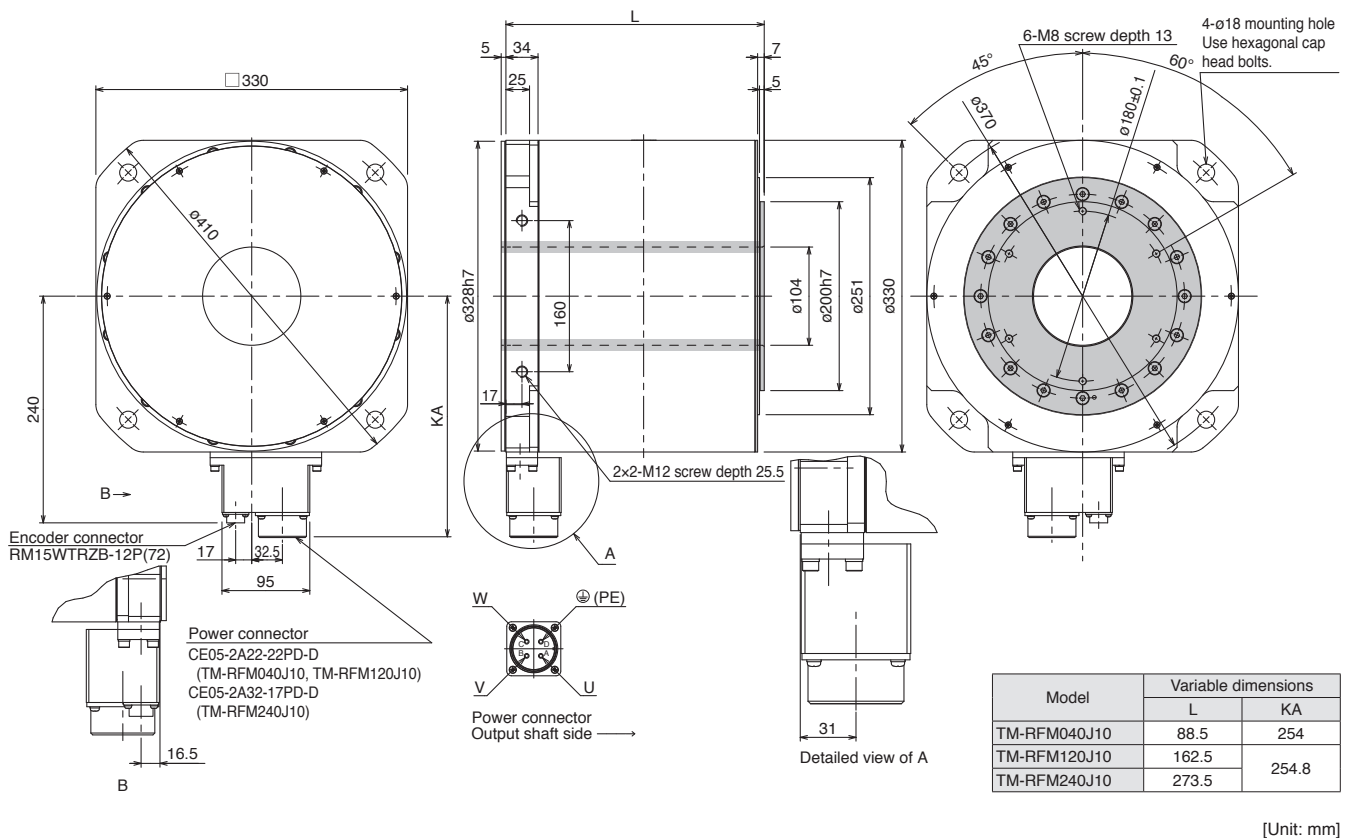
2. ■ indicates rotor.

TM-RFM Series Dimensions (Note 1, 2)

● TM-RFM012G20, TM-RFM048G20, TM-RFM072G20



● TM-RFM040J10, TM-RFM120J10, TM-RFM240J10



Notes: 1. For dimensions without tolerance, general tolerance applies. The actual dimensions may be 1 mm to 3 mm larger than the dimensions indicated. Make allowances for the tolerance when designing a machine.
2. ■ indicates rotor.

Direct Drive Motor Sizing Example

1. Selection criteria

(1) Configurations

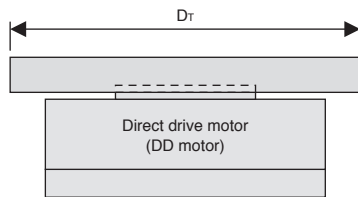


Table mass	W	= 19 kg
Rotation table diameter	D_T	= 300 mm
Rotation angle per cycle	θ	= 270 deg
Positioning time	t_0	= Within 0.45 s
Acceleration/deceleration time	$t_p = t_{psa} = t_{psd}$	= 0.125 s
Operating cycle	t_i	= 2.0 s
Load torque	T_L	= 0 N·m

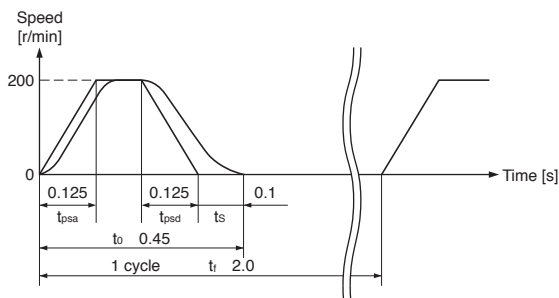
(2) Direct drive motor speed

$$N_0 = \frac{\theta}{360} \times \frac{60}{(t_0 - t_p - t_s)}$$

$$= \frac{270}{360} \times \frac{60}{(0.45 - 0.125 - 0.1)} = 200 \text{ r/min}$$

t_s : settling time. Here assumed 0.1 s.

(3) Operating pattern



(4) Acceleration/deceleration torque

Torque required during acceleration

$$T_{Ma} = \frac{(J_L + J_M) \times N_0}{9.55 \times t_{psa}} = 38.3 \text{ N·m}$$

J_M : moment of inertia of DD motor

Torque required during deceleration

$$T_{Md} = - \frac{(J_L + J_M) \times N_0}{9.55 \times t_{psd}} = -38.3 \text{ N·m}$$

Torque required during acceleration/deceleration must be equal to or lower than the max. torque of the DD motor.

(5) Continuous effective load torque

$$T_{rms} = \sqrt{\frac{T_{Ma}^2 \times t_{psa} + T_L^2 \times t_c + T_{Md}^2 \times t_{psd}}{t_i}} = 13.5 \text{ N·m}$$

$$t_c = t_0 - t_s - t_{psa} - t_{psd}$$

Continuous effective load torque must be equal to or lower than the rated torque of the DD motor.

2. Selecting direct drive motor

(1) Moment of inertia of load

$$J_L = \frac{1}{8} \times D_T^2 \times W$$

$$= \frac{1}{8} \times (300 \times 10^{-3})^2 \times 19 = 0.214 \text{ kg·m}^2$$

(2) Torque required to accelerate/decelerate load

$$T_a = J_L \times \left(\frac{2\pi}{60} \times N_0 \right) \div t_p$$

$$= \frac{J_L \times N_0}{\frac{60}{2\pi} \times t_p}$$

$$= \frac{0.214 \times 200}{9.55 \times 0.125}$$

$$= 35.9 \text{ N·m}$$

(3) Select a direct drive motor

Selection criteria

Load torque during accel./decel. < Max. torque of DD motor

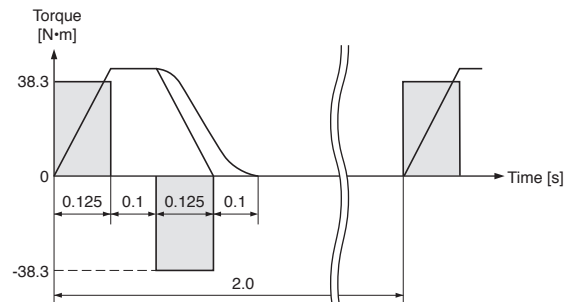
Moment of inertia of load < J_R × Moment of inertia of DD motor

J_R : Recommended load to motor inertia ratio

Select the following direct drive motor to meet the criteria above.

TM-RFM018E20 (rated torque: 18 N·m, max. torque: 54 N·m, moment of inertia: $149 \times 10^{-4} \text{ kg·m}^2$)

(6) Torque pattern



(7) Result

Select the following:

Direct drive motor: TM-RFM018E20

Servo amplifier: MR-J4-100B

[Free capacity selection software]

Capacity selection software (MRZJW3-MOTSZ111E) does all the calculations for you. The capacity selection software is available for free download. Contact your local sales office for more details.

* Be sure to update your MRZJW3-MOTSZ111E to the latest version.

MEMO

5

	Servo amplifier						
	B	B-RJ	WB	B-RJ010	A	A-RJ	●: Applicable
Introducing MELSERVO-J4 Model Selection System	●	●	●	●	●	●	..... 5-1
Basic Cable Configurations for Servo Motors	●	●	●	●	●	●	..... 5-2
Configuration Example for Servo Motors	●	●	●	●	●	●	..... 5-4
Details of Optional Cables and Connectors for Servo Motors	●	●	●	●	●	●	..... 5-18
Products on the Market for Servo Motors	●	●	●	●	●	●	..... 5-22
Configuration Example for MR-J4-_B_(-RJ)/MR-J4-DU_B_(-RJ)	●	●					..... 5-30
Configuration Example for MR-J4W2-_B_/MR-J4W3-_B_			●				..... 5-31
Configuration Example for MR-J4-_B_-RJ010				●			..... 5-32
Configuration Example for MR-J4-_A_(-RJ)/MR-J4-DU_A_(-RJ)					●	●	..... 5-33
Configuration Example for MR-J3-D05	●	●	●	●	●	●	..... 5-37
Details of Optional Cables and Connectors for Servo Amplifiers	●	●	●	●	●	●	..... 5-38
Details of Optional Connector for MR-D30		●					..... 5-40
Details of Optional Cables and Connectors for MR-J3-D05	●	●	●	●	●	●	..... 5-40
Products on the Market for Servo Amplifiers	●	●	●	●	●	●	..... 5-41
Functional Safety Unit (MR-D30)		●					..... 5-42
Safety Logic Unit (MR-J3-D05)	●	●	●	●	●	●	..... 5-46
Regenerative Option	●	●	●	●	●	●	..... 5-48
Power Regeneration Common Converter	●	●		●	●	●	..... 5-54
Dynamic Brake	●	●		●	●	●	..... 5-56
Battery	●	●		●	●	●	..... 5-57
Battery for Junction Battery Cable and Junction Battery Cable	●	●		●	●	●	..... 5-57
Battery Case and Battery	●	●	●	●	●	●	..... 5-58
Absolute Position Storage Unit	●	●	●		●	●	..... 5-59
Heat Sink Outside Mounting Attachment	●	●		●	●	●	..... 5-59
Junction Terminal Block			●		●	●	..... 5-60
Parameter Unit					●	●	..... 5-61
Radio Noise Filter/Line Noise Filter/Data Line Filter	●	●	●	●	●	●	..... 5-62
Surge Killer	●	●	●	●	●	●	..... 5-62
EMC Filter	●	●	●	●	●	●	..... 5-63
Power Factor Improving Reactor	●	●	●	●	●	●	..... 5-65
Servo Support Software	●	●	●	●	●	●	..... 5-71
Unit Conversion Table	●	●	●	●	●	●	..... 5-73

B MR-J4-B **B-RJ** MR-J4-B-RJ **WB** MR-J4W2-B/MR-J4W3-B **B-RJ010** MR-J4-B-RJ010 **A** MR-J4-A **A-RJ** MR-J4-A-RJ

* Only MR-J4-B and MR-J4-A servo amplifiers are mentioned in this section. Note that options necessary for MR-J4-B-RJ and MR-J4-B-RJ010 are the same as those for MR-J4-B, and MR-J4-A-RJ for MR-J4-A. For the options for MR-J4-B-RJ, MR-J4-B-RJ010, and MR-J4-A-RJ, refer to those for MR-J4-B and MR-J4-A with the same rated capacity.

* Refer to p. 5-73 in this catalog for conversion of units.

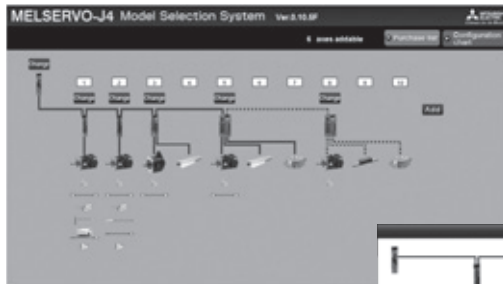
* In this section, a term of servo amplifier includes a combination of drive unit and converter unit.

Options/Peripheral Equipment

Introducing MELSERVO-J4 Model Selection System

MR-J4 Model Selection System is now available for supporting you to select options such as encoder cables and power cables which are required to use with controllers, servo motors, servo amplifiers, and regenerative options of your choice.

When you select a controller, compatible servo motors are shown in a list. Just follow a guide of selecting servo motor series, rated output, rated speed and others, compatible servo amplifier and regenerative option will be listed along with necessary options, and then a system configuration will be complete.



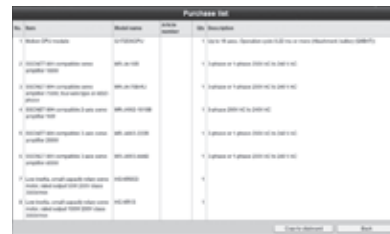
Model Selection System main window
(System configuration diagram)

In the configuration system diagram, a controller, servo amplifiers, servo motors, and regenerative options are visually displayed. You will know the necessary components for each axis in your application at glance.

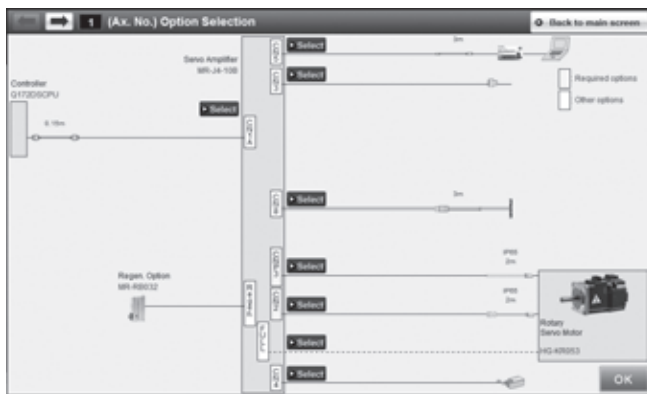
Moreover, making a purchase list is just a click away, and the purchase list is enabled for copying and pasting to Microsoft Excel. No more wasting time in selecting components and making a list.



Configuration print window



Purchase list window



Option selection window

In the option selection window, servo motor power cable, encoder cable, electromagnetic cable and other options are selectable for each axis. Mandatory options are shown in yellow; thus, it is very clear which option must be purchased. Additionally, only connectable options are listed in each option selection window, preventing selection errors.



Each option selection window

Notes: 1. This system is designed for reference only for selecting MELSERVO-J4 series. Therefore, please use the results as reference and be sure to check this catalog and relevant Instruction Manuals.

Basic Cable Configurations for Servo Motors

Necessary optional cables and connectors vary depending on the servo motor series.
Refer to the following tables for necessary options.

Selecting options for servo motor

Use the cables in the following tables.

For the cable descriptions, refer to the relevant numbers in each list.

Capacity	Servo motor	Reference list		
		Encoder cable	Servo motor power cable	Electromagnetic brake cable ^(Note 1)
Small capacity	HG-KR	Column A in encoder cable list	Column A in servo motor power cable list	Column A in electromagnetic brake cable list
	HG-MR	Column A in encoder cable list	Column A in servo motor power cable list	Column A in electromagnetic brake cable list
Medium capacity	HG-SR	Column B in encoder cable list	Column B in servo motor power cable list	Column B in electromagnetic brake cable list
	HG-JR 3000 r/min series	Column B in encoder cable list	Column B in servo motor power cable list	Column B in electromagnetic brake cable list
	HG-RR	Column B in encoder cable list	Column C in servo motor power cable list	- ^(Note 2)
	HG-UR	Column B in encoder cable list	Column C in servo motor power cable list	Column C in electromagnetic brake cable list ^(Note 2)
Large capacity	HG-JR 1000 r/min series 6 kW to 12 kW HG-JR 1500 r/min series 7 kW to 15 kW	Column C in encoder cable list	Column B in servo motor power cable list	Column C in electromagnetic brake cable list
	HG-JR 1000 r/min series 15 kW to 37 kW HG-JR 1500 r/min series 22 kW to 55 kW	Column C in encoder cable list	-	-

Notes: 1. An electromagnetic brake cable is required only for servo motor with electromagnetic brake.

2. An electromagnetic brake connector set is not required for HG-UR series of 1.5 kW or smaller, and HG-RR series as the power connector has electromagnetic brake terminals.

Encoder cable list

	Cable length	IP rating (Note 1)	Cable lead out direction	Bending life	Model	Reference	Note
A	10 m or shorter (direct connection type)	IP65	In direction of load side	Long bending life	MR-J3ENCBL_M-A1-H	p. 5-12	Select one from this list.
				Standard	MR-J3ENCBL_M-A1-L		
			In opposite direction of load side	Long bending life	MR-J3ENCBL_M-A2-H	p. 5-12	
				Standard	MR-J3ENCBL_M-A2-L		
	Exceeding 10 m (junction type)	IP20	In direction of load side	Long bending life	Two types of cables are required: MR-J3JCBL03M-A1-L, MR-EKCBL_M-H	p. 5-12	
				Standard	Two types of cables are required: MR-J3JCBL03M-A1-L, MR-EKCBL_M-L		
			In opposite direction of load side	Long bending life	Two types of cables are required: MR-J3JCBL03M-A2-L, MR-EKCBL_M-H	p. 5-12	
				Standard	Two types of cables are required: MR-J3JCBL03M-A2-L, MR-EKCBL_M-L		
		IP65	In direction of load side	Long bending life	Two types of cables are required: MR-J3JSCBL03M-A1-L, MR-J3JSCBL_M-H	pp. 5-12 and 5-13	
				Standard	Two types of cables are required: MR-J3JSCBL03M-A1-L, MR-J3JSCBL_M-L		
			In opposite direction of load side	Long bending life	Two types of cables are required: MR-J3JSCBL03M-A2-L, MR-J3JSCBL_M-H	pp. 5-12 and 5-13	
				Standard	Two types of cables are required: MR-J3JSCBL03M-A2-L, MR-J3JSCBL_M-L		
B	2 m to 50 m	IP67	-	Long bending life	MR-J3JSCBL_M-H	p. 5-13	
	2 m to 30 m			Standard	MR-J3JSCBL_M-L		
C	2 m to 50 m	IP67	-	Long bending life	MR-ENECBL_M-H-MTH	p. 5-14	-

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

Servo motor power cable list

	Cable length	IP rating (Note 1)	Cable lead out direction	Bending life	Model	Reference	Note
A	10 m or shorter (direct connection type)	IP65	In direction of load side	Long bending life	MR-PWS1CBL_M-A1-H	p. 5-15	Select one from this list.
				Standard	MR-PWS1CBL_M-A1-L		
			In opposite direction of load side	Long bending life	MR-PWS1CBL_M-A2-H	p. 5-15	
				Standard	MR-PWS1CBL_M-A2-L		
	Exceeding 10 m (junction type)	IP55	In direction of load side	Standard	Connect a user-fabricated cable to MR-PWS2CBL03M-A1-L (optional cable).	p. 5-15	
			In opposite direction of load side		Connect a user-fabricated cable to MR-PWS2CBL03M-A2-L (optional cable).	p. 5-15	

	IP rating ^(Note 1)	Compatible servo motor	Model	Reference	Note
B	IP67	HG-SR51, 81, 52(4), 102(4), 152(4)/ HG-JR53(4), 73(4), 103(4), 153(4), 203(4), 3534, 5034	Fabricate a cable that fits to MR-PWCNS4 (optional connector set).	p. 5-15	Select one that is compatible with the servo motor.
		HG-SR121, 201, 301, 202(4), 352(4), 502(4)/HG-JR353, 503	Fabricate a cable that fits to MR-PWCNS5 (optional connector set).	p. 5-15	
		HG-SR421, 702(4)/ HG-JR703(4), 903(4), 601(4), 801(4), 12K1(4), 701M(4), 11K1M(4), 15K1M(4)	Fabricate a cable that fits to MR-PWCNS3 (optional connector set).	p. 5-15	
C	IP67	HG-RR103, 153, 203/ HG-UR72, 152	Fabricate a cable that fits to MR-PWCNS1 (optional connector set).	p. 5-16	
		HG-RR353, 503/ HG-UR202, 352, 502	Fabricate a cable that fits to MR-PWCNS2 (optional connector set).	p. 5-16	

Electromagnetic brake cable list

	Cable length	IP rating ^(Note 1)	Cable lead out direction	Bending life	Model	Reference	Note
A	10 m or shorter (direct connection type)	IP65	In direction of load side	Long bending life	MR-BKS1CBL_M-A1-H	p. 5-17	Select one from this list.
				Standard	MR-BKS1CBL_M-A1-L		
			In opposite direction of load side	Long bending life	MR-BKS1CBL_M-A2-H	p. 5-17	
				Standard	MR-BKS1CBL_M-A2-L		
	Exceeding 10 m (junction type)	IP55	In direction of load side	Standard	Connect a user-fabricated cable to MR-BKS2CBL03M-A1-L (optional cable).	p. 5-17	
			In opposite direction of load side		Connect a user-fabricated cable to MR-BKS2CBL03M-A2-L (optional cable).	p. 5-17	

	IP rating ^(Note 1)	Compatible servo motor	Model	Reference	Note
B	IP67	HG-SR series HG-JR53(4)B, 73(4)B, 103(4)B, 153(4)B, 203(4)B, 353(4)B, 503(4)B, 703(4)B, 903(4)B	Fabricate a cable that fits to MR-BKCNS1 or MR-BKCNS2 (optional connector set) (straight type).	p. 5-17	Select one that is compatible with the servo motor.
			Fabricate a cable that fits to MR-BKCNS1A or MR-BKCNS2A (optional connector set) (angle type).	p. 5-17	
C	IP67	HG-JR601(4)B, 801(4)B, 12K1(4)B, 701M(4)B, 11K1M(4)B, 15K1M(4)B/ HG-UR202B, 352B, 502B	Fabricate a cable that fits to MR-BKCN (optional connector set).	p. 5-17	

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

Configuration Example for Servo Motors

B

B-RJ

WB

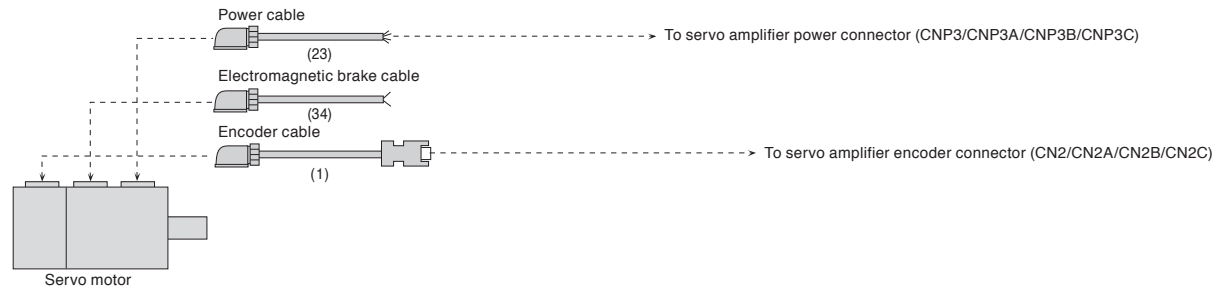
B-RJ010

A

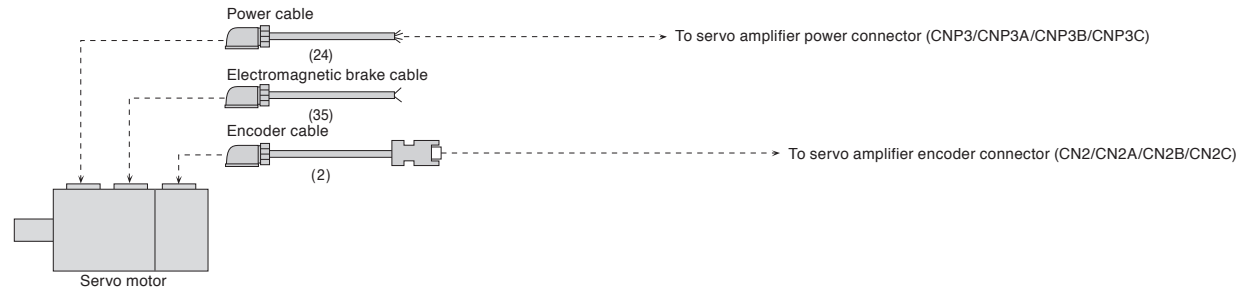
A-RJ

For HG-KR/HG-MR rotary servo motor series: encoder cable length 10 m or shorter

- For leading the cables out in direction of load side ^(Note 1)



- For leading the cables out in opposite direction of load side ^(Note 1)



Notes: 1. Cables for leading two different directions may be used for one servo motor.

Configuration Example for Servo Motors (Note 5)

B

B-RJ

WB

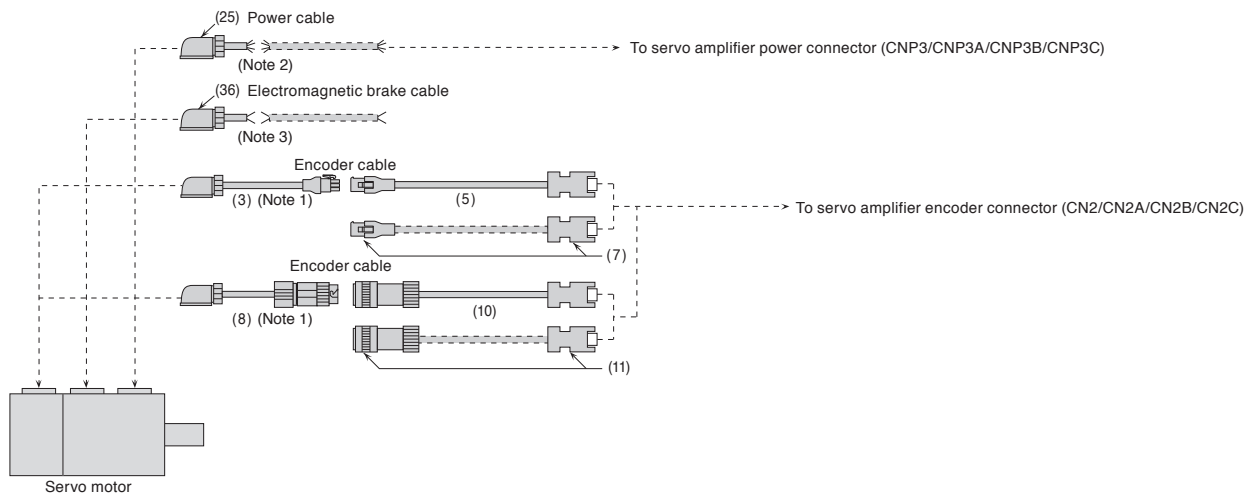
B-RJ010

A

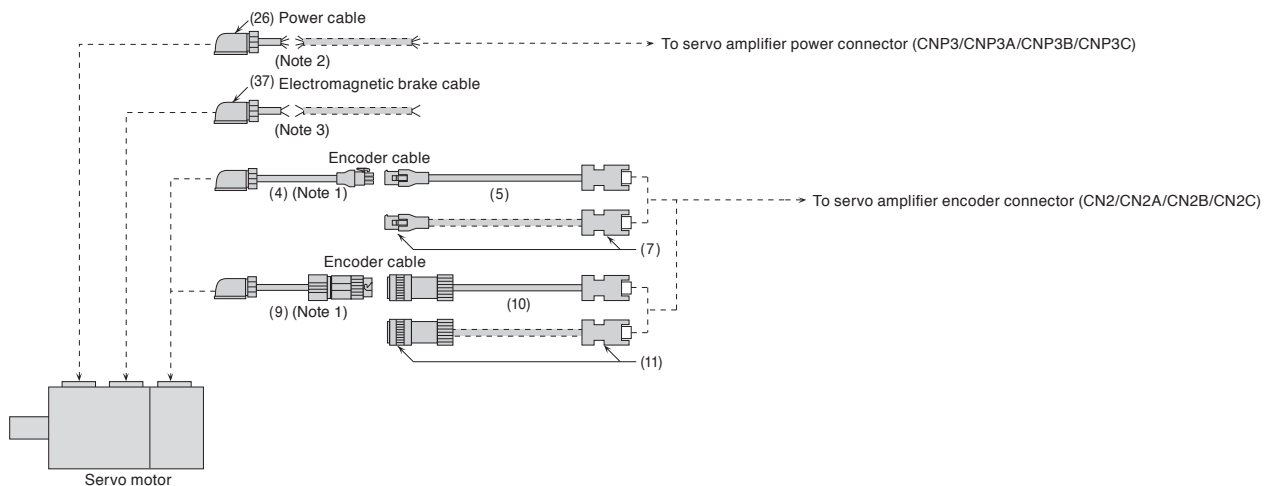
A-RJ

For HG-KR/HG-MR rotary servo motor series: encoder cable length over 10 m

● For leading the cables out in direction of load side (Note 4)



● For leading the cables out in opposite direction of load side (Note 4)



Notes: 1. This cable does not have a long bending life. Thus, be sure to fix the cable before using.

2. Relay a cable using MR-PWS2CBL03M-A1-L or MR-PWS2CBL03M-A2-L. This cable does not have a long bending life. Thus, be sure to fix the cable before using.

3. Relay a cable using MR-BKS2CBL03M-A1-L or MR-BKS2CBL03M-A2-L. This cable does not have a long bending life. Thus, be sure to fix the cable before using.

4. Cables for leading two different directions may be used for one servo motor.

5. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction Manual for fabricating the cables.

Configuration Example for Servo Motors (Note 1)

B

B-RJ

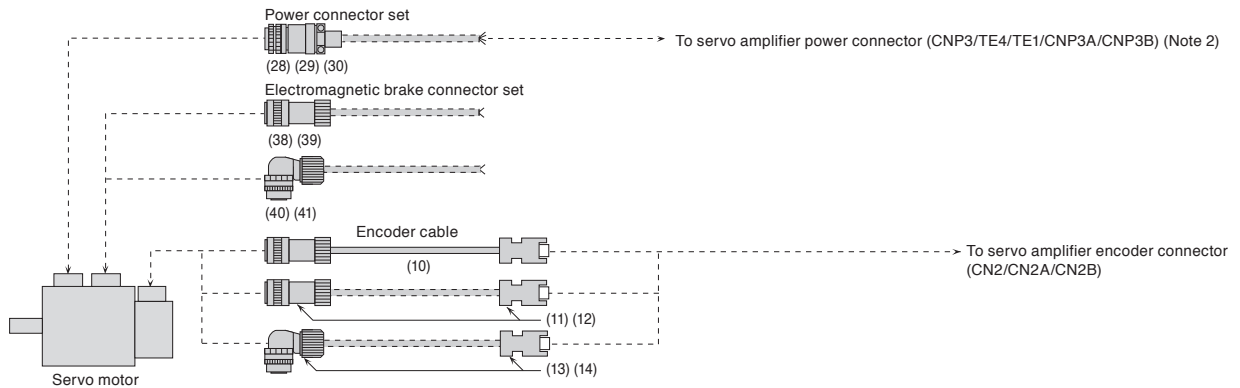
WB

B-RJ010

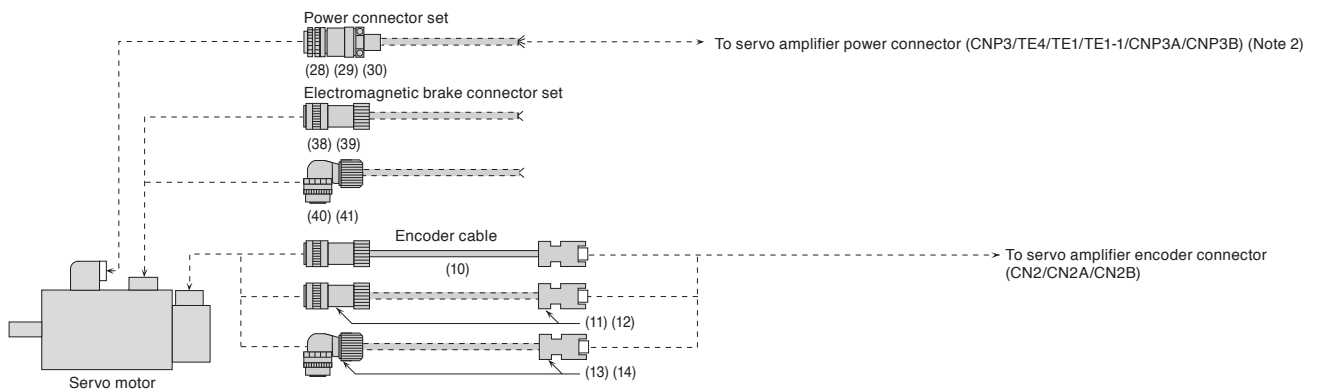
A

A-RJ

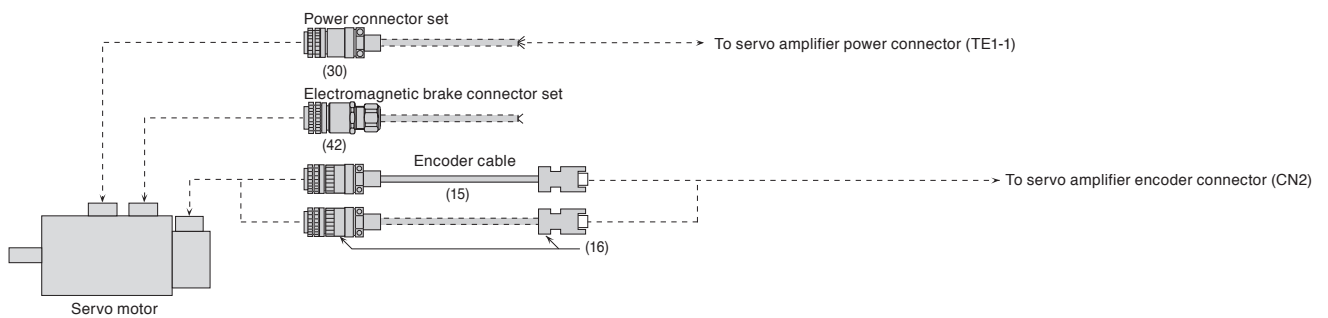
For HG-SR rotary servo motor series



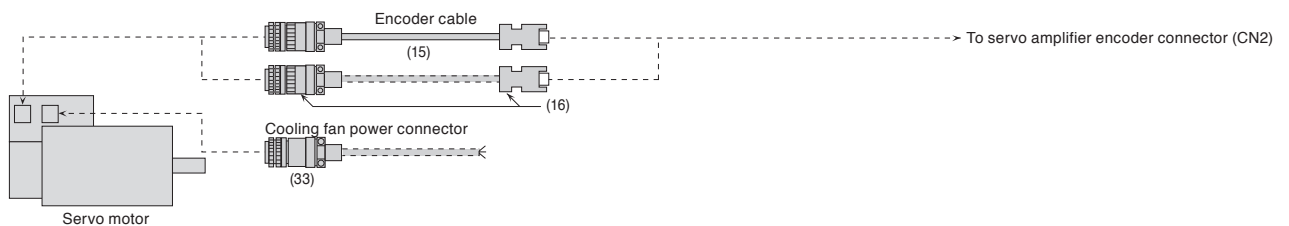
For HG-JR rotary servo motor 3000 r/min series



For HG-JR rotary servo motor 1000 r/min series (6 kW to 12 kW) and 1500 r/min series (7 kW to 15 kW)



For HG-JR rotary servo motor 1000 r/min series (15 kW to 37 kW) and 1500 r/min series (22 kW to 55 kW)



Notes: 1. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction Manual for fabricating the cables.

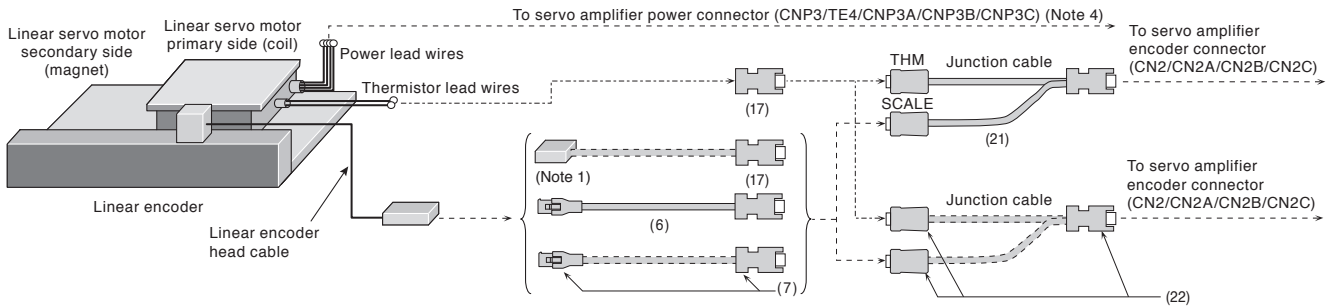
2. The connector for U, V, and W varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.

Configuration Example for Servo Motors (Note 3)

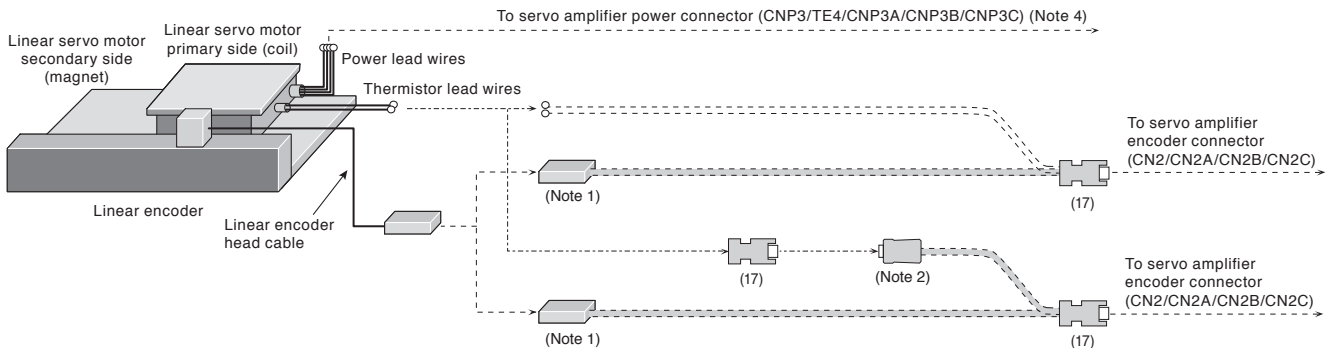
B WB A

For MR-J4-B/A or MR-J4W_-B, and LM-H3/LM-K2/LM-U2 linear servo motor

●When using a junction cable for linear servo motor

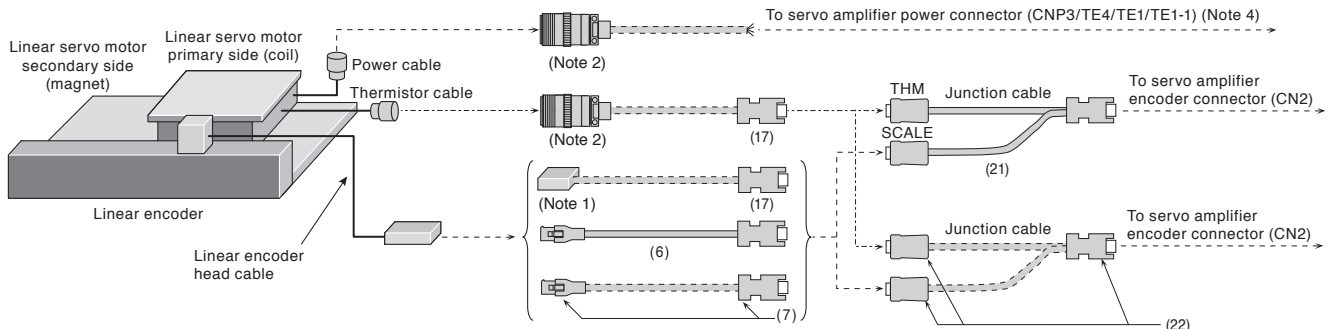


●When not using a junction cable for linear servo motor

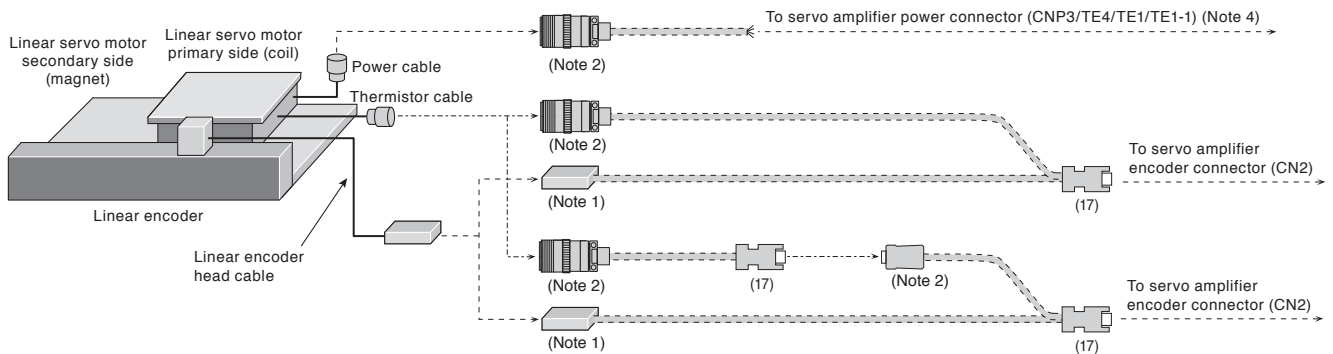


For MR-J4-B/A and LM-F linear servo motor

●When using a junction cable for linear servo motor



●When not using a junction cable for linear servo motor



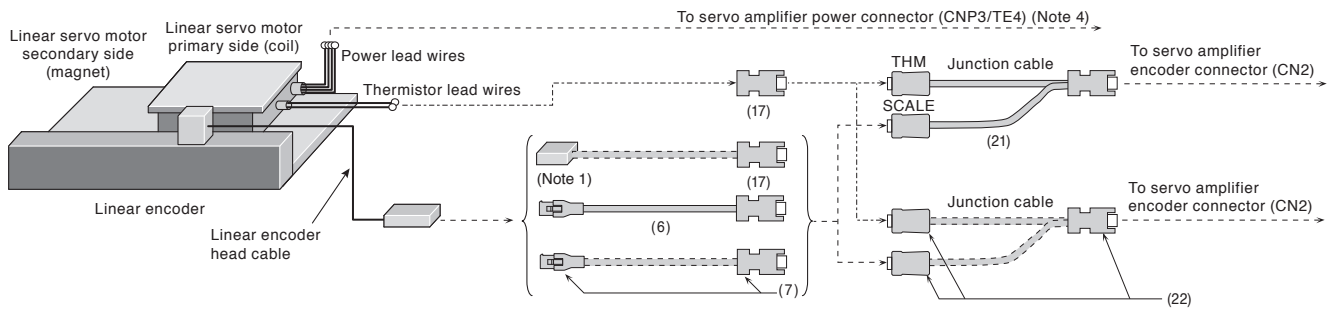
- Notes: 1. Contact the relevant linear encoder manufacturers for connectors to connect with the head cables.
 2. Refer to "Products on the Market for Servo Motors" in this catalog for these connectors.
 3. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction Manual for fabricating the cables.
 4. The connector for U, V, and W varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.

Configuration Example for Servo Motors (Note 3)

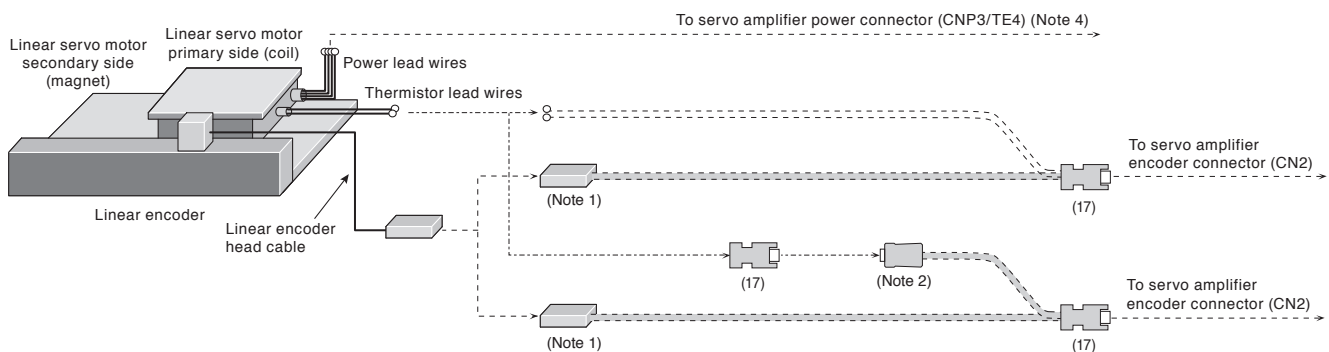
B-RJ A-RJ

For MR-J4-B-RJ/MR-J4-A-RJ and LM-H3/LM-K2/LM-U2 linear servo motor with a serial linear encoder

● When using a junction cable for linear servo motor

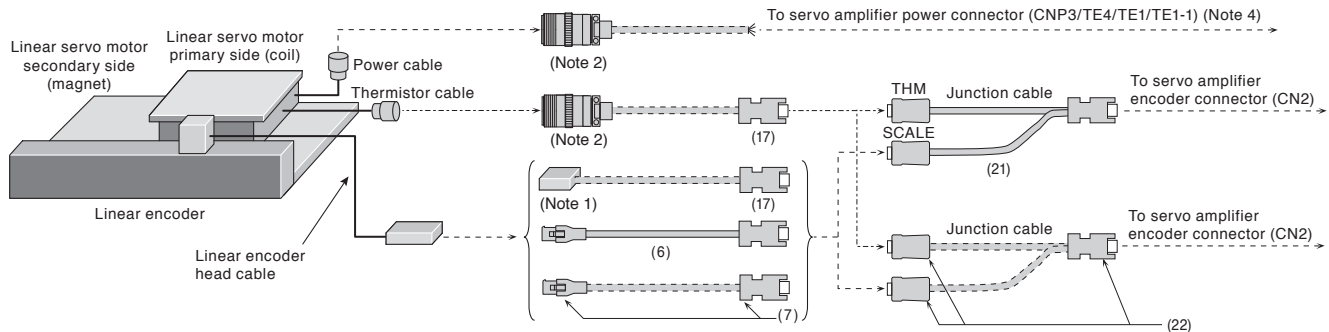


● When not using a junction cable for linear servo motor

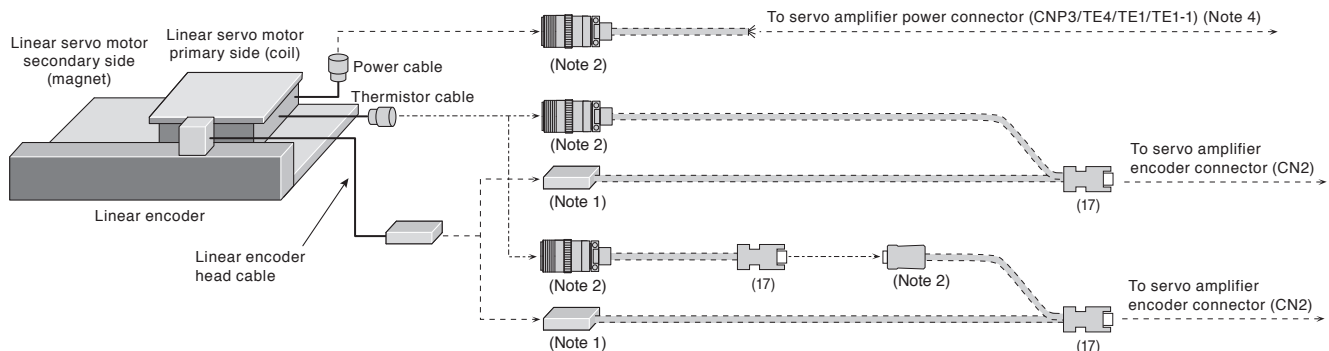


For MR-J4-B-RJ/MR-J4-A-RJ and LM-F linear servo motor with a serial linear encoder

● When using a junction cable for linear servo motor



● When not using a junction cable for linear servo motor



Notes: 1. Contact the relevant linear encoder manufacturers for connectors to connect with the head cables.

2. Refer to "Products on the Market for Servo Motors" in this catalog for these connectors.

3. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction Manual for fabricating the cables.

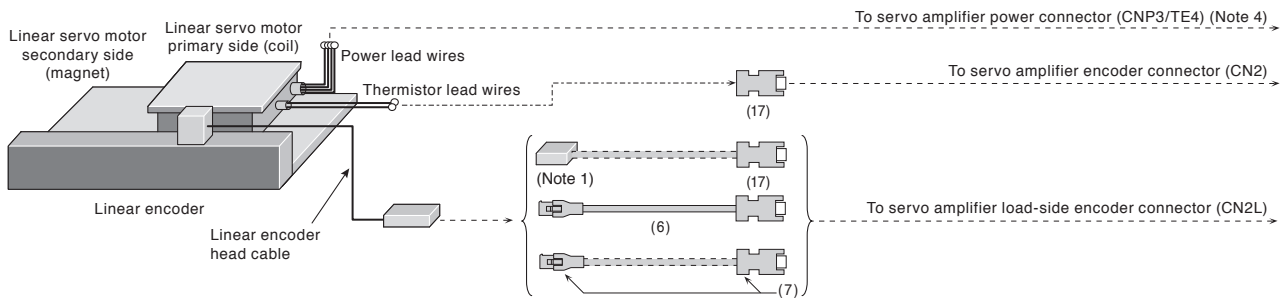
4. The connector for U, V, and W varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.



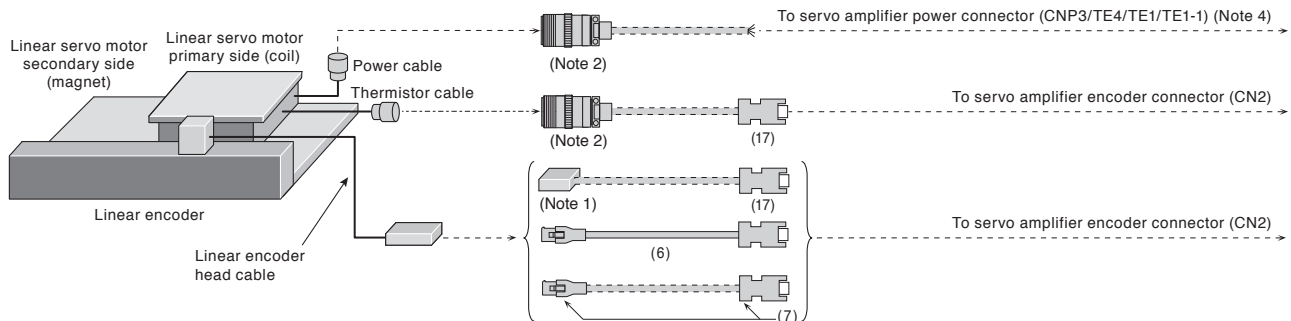
Configuration Example for Servo Motors (Note 3)

B-RJ **A-RJ**

For MR-J4-B-RJ/A-RJ and LM-H3/LM-K2/LM-U2 linear servo motor with an A/B/Z-phase differential output type linear encoder



For MR-J4-B-RJ/A-RJ and LM-F linear servo motor with an A/B/Z-phase differential output type linear encoder

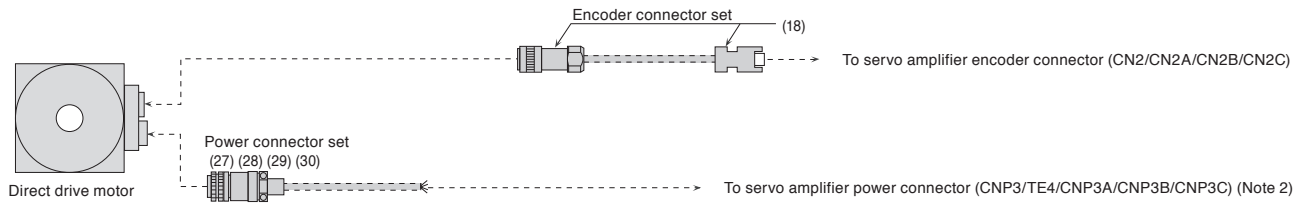


- Notes: 1. Contact the relevant linear encoder manufacturers for connectors to connect with the head cables.
 2. Refer to "Products on the Market for Servo Motors" in this catalog for these connectors.
 3. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction Manual for fabricating the cables.
 4. The connector for U, V, and W varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.

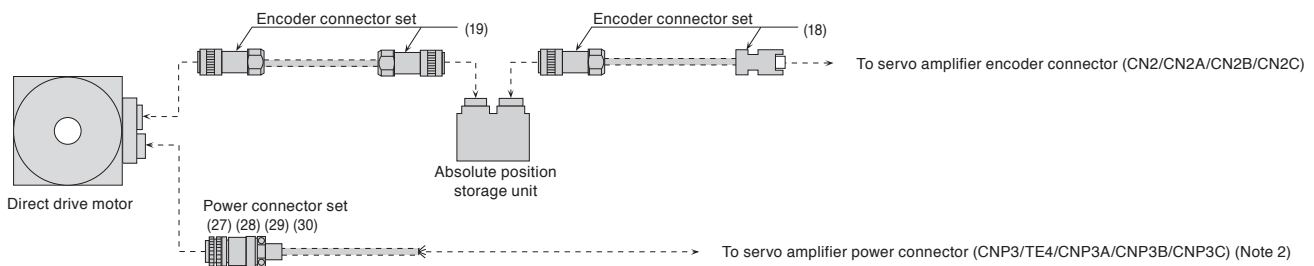
Configuration Example for Servo Motors (Note 1)**B****B-RJ****WB****A****A-RJ**

For TM-RFM direct drive motor series

● For incremental system



● For absolute position detection system












Notes: 1. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction Manual for fabricating the cables.

2. The connector for U, V, and W varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.

Cables and Connectors for Servo Motor Encoder

Refer to "Details of Optional Cables and Connectors for Servo Motors" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(1)	Encoder cable (Note 2) (load-side lead)	MR-J3ENCBL2M-A1-H ^{*1}	2 m	IP65	For HG-KR/HG-MR (direct connection type)	
		MR-J3ENCBL5M-A1-H ^{*1}	5 m			
		MR-J3ENCBL10M-A1-H ^{*1}	10 m			
		MR-J3ENCBL2M-A1-L ^{*1}	2 m			
		MR-J3ENCBL5M-A1-L ^{*1}	5 m			
		MR-J3ENCBL10M-A1-L ^{*1}	10 m			
(2)	Encoder cable (Note 2) (opposite to load-side lead)	MR-J3ENCBL2M-A2-H ^{*1}	2 m	IP65	For HG-KR/HG-MR (direct connection type)	
		MR-J3ENCBL5M-A2-H ^{*1}	5 m			
		MR-J3ENCBL10M-A2-H ^{*1}	10 m			
		MR-J3ENCBL2M-A2-L ^{*1}	2 m			
		MR-J3ENCBL5M-A2-L ^{*1}	5 m			
		MR-J3ENCBL10M-A2-L ^{*1}	10 m			
(3)	Encoder cable (Note 2) (load-side lead)	MR-J3JCB03M-A1-L ^{*1}	0.3 m	IP20	For HG-KR/HG-MR (junction type)	
(4)	Encoder cable (Note 2) (opposite to load-side lead)	MR-J3JCB03M-A2-L ^{*1}	0.3 m	IP20	For HG-KR/HG-MR (junction type)	 <p>Use this in combination with (5) or (7).</p>
(5)	Encoder cable (Note 2)	MR-EKCBL20M-H ^{*1}	20 m	IP20	For HG-KR/HG-MR (junction type)	 <p>Use this in combination with (3) or (4).</p>
		MR-EKCBL30M-H (Note 3) ^{*1}	30 m			
		MR-EKCBL40M-H (Note 3) ^{*1}	40 m			
		MR-EKCBL50M-H (Note 3) ^{*1}	50 m			
		MR-EKCBL20M-L ^{*1}	20 m			
		MR-EKCBL30M-L (Note 3) ^{*1}	30 m			
(6)	Encoder cable (Note 2, 5)	MR-EKCBL2M-H ^{*1}	2 m	IP20	For connecting load-side encoder, or linear encoder	
		MR-EKCBL5M-H ^{*1}	5 m			
(7)	Encoder connector set (Note 5)	MR-ECNM	-	IP20	For HG-KR/HG-MR (junction type) For connecting load-side encoder, or linear encoder	 <p>Use this in combination with (3) or (4) for HG-KR/HG-MR series.</p> <p>Applicable cable Wire size: 0.3 mm² (AWG 22) Cable OD: 8.2 mm Crimping tool (91529-1) is required.</p>
(8)	Encoder cable (Note 2) (load-side lead)	MR-J3JSCBL03M-A1-L ^{*1}	0.3 m	IP65 (Note 4)	For HG-KR/HG-MR (junction type)	
(9)	Encoder cable (Note 2) (opposite to load-side lead)	MR-J3JSCBL03M-A2-L ^{*1}	0.3 m	IP65 (Note 4)	For HG-KR/HG-MR (junction type)	 <p>Use this in combination with (10) or (11).</p>

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

2. -H and -L indicate a bending life. -H indicates a long bending life, and -L indicates a standard bending life.

3. This encoder cable is available in four-wire type. Parameter setting is required to use the four-wire type encoder cable. Refer to relevant Servo Amplifier Instruction Manual for details.

4. The encoder cable is rated IP65 while the junction connector itself is rated IP67.





5. Use MR-EKCBL_M-H and MR-ECNM to connect to an output cable for AT343A, AT543A-SC or AT545A-SC scales manufactured by Mitutoyo Corporation.

For unlisted lengths

*1. For unlisted lengths of the cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS BUSINESS PROMOTION DIVISION (Email: osb.webmaster@melsc.jp)

Cables and Connectors for Servo Motor Encoder

Refer to "Details of Optional Cables and Connectors for Servo Motors" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(10)	Encoder cable (Note 2)	MR-J3ENSCBL2M-H ^{*1} MR-J3ENSCBL5M-H ^{*1} MR-J3ENSCBL10M-H ^{*1} MR-J3ENSCBL20M-H ^{*1} MR-J3ENSCBL30M-H ^{*1} MR-J3ENSCBL40M-H ^{*1} MR-J3ENSCBL50M-H ^{*1} MR-J3ENSCBL2M-L ^{*1} MR-J3ENSCBL5M-L ^{*1} MR-J3ENSCBL10M-L ^{*1} MR-J3ENSCBL20M-L ^{*1} MR-J3ENSCBL30M-L ^{*1}	2 m 5 m 10 m 20 m 30 m 40 m 50 m 2 m 5 m 10 m 20 m 30 m	IP67	For HG-KR/HG-MR (junction type) For HG-SR/ HG-JR53, 73, 103, 153, 203, 353, 503, 703, 903, 534, 734, 1034, 1534, 2034, 3534, 5034, 7034, 9034/ HG-RR/HG-UR (direct connection type)	Junction connector or encoder connector Servo amplifier connector  Use this in combination with (8) or (9) for HG-KR/HG-MR series.
(11)	Encoder connector set (one-touch connection type) (Note 5)	MR-J3SCNS	-	IP67	For HG-KR/HG-MR (junction type) For HG-SR/ HG-JR53, 73, 103, 153, 203, 353, 503, 703, 903, 534, 734, 1034, 1534, 2034, 3534, 5034, 7034, 9034/ HG-RR/HG-UR (direct connection type) (straight type)	Junction connector or encoder connector Servo amplifier connector  Use this in combination with (8) or (9) for HG-KR/HG-MR series. Applicable cable Wire size: 0.5 mm ² (AWG 20) or smaller Cable OD: 5.5 mm to 9.0 mm (Note 4)
(12)	Encoder connector set (screw type) (Note 3, 5)	MR-ENCNS2 ^{*2}	-	IP67	For HG-SR/ HG-JR53, 73, 103, 153, 203, 353, 503, 703, 903, 534, 734, 1034, 1534, 2034, 3534, 5034, 7034, 9034/ HG-RR/HG-UR (straight type)	Encoder connector Servo amplifier connector  Applicable cable Wire size: 0.5 mm ² (AWG 20) or smaller Cable OD: 5.5 mm to 9.0 mm (Note 4)
(13)	Encoder connector set (one-touch connection type) (Note 5)	MR-J3SCNSA ^{*2}	-	IP67	For HG-SR/ HG-JR53, 73, 103, 153, 203, 353, 503, 703, 903, 534, 734, 1034, 1534, 2034, 3534, 5034, 7034, 9034/ HG-RR/HG-UR (angle type)	Encoder connector Servo amplifier connector  Applicable cable Wire size: 0.5 mm ² (AWG 20) or smaller Cable OD: 5.5 mm to 9.0 mm (Note 4)
(14)	Encoder connector set (screw type) (Note 3, 5)	MR-ENCNS2A ^{*2}	-	IP67		

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

2. -H and -L indicate a bending life. -H indicates a long bending life, and -L indicates a standard bending life.

3. A screw thread is cut on the encoder connector of HG-SR/HG-JR/HG-RR/HG-UR series, and the screw type connector can be used.

4. Cable clamps and bushings for cable OD of 5.5 mm to 7.5 mm and of 7.0 mm to 9.0 mm are included in the set.

5. The connector contains a plug and contacts. Using contractors for other plugs may damage the connector. Be sure to use the enclosed contacts.






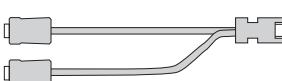
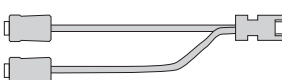

For unlisted lengths and fabricating cables

*1. For unlisted lengths of the cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS BUSINESS PROMOTION DIVISION (Email: osb.webmaster@melsc.jp)

*2. For fabricating encoder cables with these connectors, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS BUSINESS PROMOTION DIVISION (Email: osb.webmaster@melsc.jp)

Cables and Connectors for Servo Motor Encoder

Refer to "Details of Optional Cables and Connectors for Servo Motors" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(15)	Encoder cable (Note 2)	MR-ENECBL2M-H-MTH	2 m	IP67	For HG-JR601, 801, 12K1, 15K1, 20K1, 25K1, 30K1, 37K1, 701M, 11K1M, 15K1M, 22K1M, 30K1M, 37K1M, 6014, 8014, 12K14, 15K14, 20K14, 25K14, 30K14, 37K14, 701M4, 11K1M4, 15K1M4, 22K1M4, 30K1M4, 37K1M4, 45K1M4, 55K1M4	
		MR-ENECBL5M-H-MTH	5 m			
		MR-ENECBL10M-H-MTH	10 m			
		MR-ENECBL20M-H-MTH	20 m			
		MR-ENECBL30M-H-MTH	30 m			
		MR-ENECBL40M-H-MTH	40 m			
		MR-ENECBL50M-H-MTH	50 m			
(16)	Encoder connector set	MR-ENECNS	-	IP67	For HG-JR601, 801, 12K1, 15K1, 20K1, 25K1, 30K1, 37K1, 701M, 11K1M, 15K1M, 22K1M, 30K1M, 37K1M, 6014, 8014, 12K14, 15K14, 20K14, 25K14, 30K14, 37K14, 701M4, 11K1M4, 15K1M4, 22K1M4, 30K1M4, 37K1M4, 45K1M4, 55K1M4	 <p>Applicable cable Wire size: 0.3 mm² to 1.25 mm² (AWG 22 to 16) Cable OD: 6.8 mm to 10 mm</p>
(17)	Encoder connector set	MR-J3CN2	-	-	For connecting load-side encoder, linear encoder, or thermistor	
(18)	Encoder connector set	MR-J3DDCNS	-	IP67	For TM-RFM (connecting direct drive motor and servo amplifier, or absolute position storage unit and servo amplifier)	 <p>Applicable cable Wire size: 0.25 mm² to 0.5 mm² (AWG 23 to 20) Cable OD: 7.8 mm to 8.2 mm</p>
(19)	Encoder connector set	MR-J3DDSPS	-	IP67	For TM-RFM (connecting direct drive motor and absolute position storage unit)	 <p>Applicable cable Wire size: 0.25 mm² to 0.5 mm² (AWG 23 to 20) Cable OD: 7.8 mm to 8.2 mm</p>
(20)	Junction cable for fully closed loop control (Note 3)	MR-J4FCCBL03M	0.3 m	-	For branching load-side encoder	
(21)	Junction cable for linear servo motor (Note 3)	MR-J4THCBL03M	0.3 m	-	For branching thermistor	
(22)	Connector set	MR-J3THMCN2	-	-	For fully closed loop control or branching thermistor	

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor/absolute position storage unit.







If the IP rating of the servo amplifier/servo motor/absolute position storage unit differs from that of these connectors, overall IP rating depends on the lowest of all.

2. -H and -L indicate a bending life. -H indicates a long bending life, and -L indicates a standard bending life.

3. Servo system will not operate correctly when the junction cables for fully closed loop control and for linear servo motor are used mistakenly or interchangeably. Make sure of the model before placing an order.

Cables and Connectors for Servo Motor Power

Refer to "Details of Optional Cables and Connectors for Servo Motors" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(23)	Power cable (Note 2) (load-side lead)	MR-PWS1CBL2M-A1-H ^{*1} MR-PWS1CBL5M-A1-H ^{*1} MR-PWS1CBL10M-A1-H ^{*1} MR-PWS1CBL2M-A1-L ^{*1 (Note 3)} MR-PWS1CBL5M-A1-L ^{*1 (Note 3)} MR-PWS1CBL10M-A1-L ^{*1 (Note 3)}	2 m 5 m 10 m 2 m 5 m 10 m	IP65	For HG-KR/HG-MR (direct connection type)	Power connector  Lead-out
(24)	Power cable (Note 2) (opposite to load-side lead)	MR-PWS1CBL2M-A2-H ^{*1} MR-PWS1CBL5M-A2-H ^{*1} MR-PWS1CBL10M-A2-H ^{*1} MR-PWS1CBL2M-A2-L ^{*1 (Note 3)} MR-PWS1CBL5M-A2-L ^{*1 (Note 3)} MR-PWS1CBL10M-A2-L ^{*1 (Note 3)}	2 m 5 m 10 m 2 m 5 m 10 m	IP65	For HG-KR/HG-MR (direct connection type)	* The cable is not shielded.
(25)	Power cable (Note 2) (load-side lead)	MR-PWS2CBL03M-A1-L	0.3 m	IP55	For HG-KR/HG-MR (junction type)	Power connector  Lead-out
(26)	Power cable (Note 2) (opposite to load-side lead)	MR-PWS2CBL03M-A2-L	0.3 m	IP55	For HG-KR/HG-MR (junction type)	* The cable is not shielded.
(27)	Power connector set	MR-PWCNF ^{*2}	-	IP67	For TM-RFM_C20/ TM-RFM_E20	Power connector  Applicable cable Wire size: 0.3 mm ² to 1.25 mm ² (AWG 22 to 16) Cable OD: 8.3 mm to 11.3 mm
(28)	Power connector set	MR-PWCNS4 ^{*2}	-	IP67	For HG-SR51, 81, 52, 102, 152, 524, 1024, 1524/ HG-JR53, 73, 103, 153, 203, 534, 734, 1034, 1534, 2034, 3534, 5034/ TM-RFM_G20	Power connector  Applicable cable Wire size: 2 mm ² to 3.5 mm ² (AWG 14 to 12) Cable OD: 10.5 mm to 14.1 mm
(29)	Power connector set	MR-PWCNS5 ^{*2}	-	IP67	For HG-SR121, 201, 301, 202, 352, 502, 2024, 3524, 5024/ HG-JR353, 503/ TM-RFM040J10, TM-RFM120J10	Power connector  Applicable cable Wire size: 5.5 mm ² to 8 mm ² (AWG 10 to 8) Cable OD: 12.5 mm to 16 mm
(30)	Power connector set	MR-PWCNS3 ^{*2}	-	IP67	For HG-SR421, 702, 7024/ HG-JR703, 903, 601, 801, 12K1, 701M, 11K1M, 15K1M, 7034, 9034, 6014, 8014, 12K14, 701M4, 11K1M4, 15K1M4/ TM-RFM240J10	Power connector  Applicable cable Wire size: 14 mm ² to 22 mm ² (AWG 6 to 4) Cable OD: 22 mm to 23.8 mm

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

2. -H and -L indicate a bending life. -H indicates a long bending life, and -L indicates a standard bending life.

3. Shielded power cable MR-PWS3CBL_M-A_-L is also available. Contact your local sales office.

For unlisted lengths and fabricating cables



*1. For unlisted lengths of the cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS BUSINESS PROMOTION DIVISION (Email: osb.webmaster@melsc.jp)

*2. For fabricating servo motor power cables or electromagnetic brake cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS BUSINESS PROMOTION DIVISION (Email: osb.webmaster@melsc.jp)



Cables and Connectors for Servo Motor Power


Refer to "Details of Optional Cables and Connectors for Servo Motors" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(31)	Power connector set	MR-PWCNS1 ^{*1}	-	IP67	For HG-RR103, 153, 203/ HG-UR72, 152	Power connector  Applicable cable Wire size: 2 mm ² to 3.5 mm ² (AWG 14 to 12) Cable OD: 9.5 mm to 13 mm
(32)	Power connector set	MR-PWCNS2 ^{*1}	-	IP67	For HG-RR353, 503/ HG-UR202, 352, 502	Power connector  Applicable cable Wire size: 5.5 mm ² to 8 mm ² (AWG 10 to 8) Cable OD: 13 mm to 15.5 mm

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

Cables and Connectors for Servo Motor Cooling Fan Power

Refer to "Details of Optional Cables and Connectors for Servo Motors" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(33)	Cooling fan power connector set	MR-PWCNF ^{*1}	-	IP67	For HG-JR15K1, 20K1, 25K1, 30K1, 37K1, 22K1M, 30K1M, 37K1M, 15K14, 20K14, 25K14, 30K14, 37K14, 22K1M4, 30K1M4, 37K1M4, 45K1M4, 55K1M4	Power connector  Applicable cable Wire size: 0.3 mm ² to 1.25 mm ² (AWG 22 to 16) Cable OD: 8.3 mm to 11.3 mm

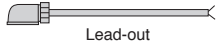




Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

For fabricating cables

^{*1}. For fabricating servo motor power cables or electromagnetic brake cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS BUSINESS PROMOTION DIVISION (Email: osb.webmaster@melsc.jp)

Cables and Connectors for Servo Motor Electromagnetic Brake

Refer to "Details of Optional Cables and Connectors for Servo Motors" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(34)	Electromagnetic brake cable (Note 2) (load-side lead)	MR-BKS1CBL2M-A1-H ^{*1}	2 m	IP65	For HG-KR/HG-MR (direct connection type)	 <p>Electromagnetic brake connector</p> <p>Lead-out</p>
		MR-BKS1CBL5M-A1-H ^{*1}	5 m			
		MR-BKS1CBL10M-A1-H ^{*1}	10 m			
		MR-BKS1CBL2M-A1-L ^{*1}	2 m			
		MR-BKS1CBL5M-A1-L ^{*1}	5 m			
		MR-BKS1CBL10M-A1-L ^{*1}	10 m			
(35)	Electromagnetic brake cable (Note 2) (opposite to load-side lead)	MR-BKS1CBL2M-A2-H ^{*1}	2 m	IP65	For HG-KR/HG-MR (direct connection type)	<p>* The cable is not shielded.</p>
		MR-BKS1CBL5M-A2-H ^{*1}	5 m			
		MR-BKS1CBL10M-A2-H ^{*1}	10 m			
		MR-BKS1CBL2M-A2-L ^{*1}	2 m			
		MR-BKS1CBL5M-A2-L ^{*1}	5 m			
		MR-BKS1CBL10M-A2-L ^{*1}	10 m			
(36)	Electromagnetic brake cable (Note 2) (load-side lead)	MR-BKS2CBL03M-A1-L	0.3 m	IP55	For HG-KR/HG-MR (junction type)	 <p>Electromagnetic brake connector</p> <p>Lead-out</p>
(37)	Electromagnetic brake cable (Note 2) (opposite to load-side lead)	MR-BKS2CBL03M-A2-L	0.3 m	IP55	For HG-KR/HG-MR (junction type)	<p>* The cable is not shielded.</p>
(38)	Electromagnetic brake connector set (Note 4) (one-touch connection type)	MR-BKCNS1 ^{*2}	-	IP67	For HG-SR/ HG-JR53B, 73B, 103B, 153B, 203B, 353B, 503B, 703B, 903B, 534B, 734B, 1034B, 1534B, 2034B, 3534B, 5034B, 7034B, 9034B (straight type)	<p>Electromagnetic brake connector</p> 
(39)	Electromagnetic brake connector set (Note 3, 4) (screw type)	MR-BKCNS2 ^{*2}	-	IP67	For HG-SR/ HG-JR53B, 73B, 103B, 153B, 203B, 353B, 503B, 703B, 903B, 534B, 734B, 1034B, 1534B, 2034B, 3534B, 5034B, 7034B, 9034B (angle type)	<p>Applicable cable</p> <p>Wire size: 1.25 mm² (AWG 16) or smaller</p> <p>Cable OD: 9.0 mm to 11.6 mm</p>
(40)	Electromagnetic brake connector set (Note 4) (one-touch connection type)	MR-BKCNS1A ^{*2}	-	IP67	For HG-SR/ HG-JR53B, 73B, 103B, 153B, 203B, 353B, 503B, 703B, 903B, 534B, 734B, 1034B, 1534B, 2034B, 3534B, 5034B, 7034B, 9034B (angle type)	<p>Electromagnetic brake connector</p> 
(41)	Electromagnetic brake connector set (Note 3, 4) (screw type)	MR-BKCNS2A ^{*2}	-	IP67	For HG-SR/ HG-JR53B, 73B, 103B, 153B, 203B, 353B, 503B, 703B, 903B, 534B, 734B, 1034B, 1534B, 2034B, 3534B, 5034B, 7034B, 9034B (angle type)	<p>Applicable cable</p> <p>Wire size: 1.25 mm² (AWG 16) or smaller</p> <p>Cable OD: 9.0 mm to 11.6 mm</p>
(42)	Electromagnetic brake connector set	MR-BKCN	-	IP67	For HG-JR601B, 801B, 12K1B, 701MB, 11K1MB, 15K1MB, 6014B, 8014B, 12K14B, 701M4B, 11K1M4B, 15K1M4B/ HG-UR202B, 352B, 502B (straight type)	<p>Electromagnetic brake connector</p>  <p>Applicable cable</p> <p>Wire size: 0.3 mm² to 1.25 mm² (AWG 22 to 16)</p> <p>Cable OD: 5.0 mm to 8.3 mm</p>

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

2. -H and -L indicate a bending life. -H indicates a long bending life, and -L indicates a standard bending life.

3. A screw thread is cut on the electromagnetic brake connector of HG-SR/HG-JR series, and the screw type connector can be used.

4. The connector contains a plug and contacts. Using contractors for other plugs may damage the connector. Be sure to use the enclosed contacts.

For unlisted lengths and fabricating cables

*1. For unlisted lengths of the cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS BUSINESS PROMOTION DIVISION (Email: osb.webmaster@melsc.jp)

*2. For fabricating servo motor power cables or electromagnetic brake cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS BUSINESS PROMOTION DIVISION (Email: osb.webmaster@melsc.jp)

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors



Options/Peripheral EquipmentLVIS/Wires



Product List



Cautions



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
Details of Optional Cables and Connectors for Servo Motors



Model	Encoder connector	Servo amplifier connector
MR-ENCNS2 (Note 3)	 Straight plug: CMV1S-SP10S-M2 (Note 1) Socket contact: CMV1-#22ASC-S1-100 (DDK Ltd.)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex)

Model	Encoder connector	Servo amplifier connector
MR-J3SCNSA (Note 2, 3)	 Angle plug: CMV1-AP10S-M2 (Note 1) Socket contact: CMV1-#22ASC-S1-100 (DDK Ltd.)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex)

Model	Encoder connector	Servo amplifier connector
MR-ENCNS2A (Note 3)	 Angle plug: CMV1S-AP10S-M2 (Note 1) Socket contact: CMV1-#22ASC-S1-100 (DDK Ltd.)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex)

Model	Encoder connector	Servo amplifier connector
MR-ENECBL_M-H-MTH MR-ENECNS	 Plug: D/MS3106A20-29S(D190) Backshell: CE02-20BS-S-D (straight) Cable clamp: CE3057-12A-3-D	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex)

Model	Servo amplifier connector	
MR-J3CN2	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M)	or Connector set: 54599-1019 (Molex)

Model	Encoder connector/absolute position storage unit connector	Servo amplifier connector
MR-J3DDCNS	 Plug: RM15WTPZK-12S Cord clamp: JR13WCCA-8(72) (Hirose Electric Co., Ltd.)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex)

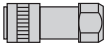
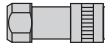






Notes: 1. Cable clamps and bushings for cable OD of 5.5 mm to 7.5 mm and of 7.0 mm to 9.0 mm are included in the set.

2. The cable or the connector set may contain different connectors but still usable.

3. The connector contains a plug and contacts. Using contractors for other plugs may damage the connector. Be sure to use the enclosed contacts.

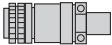
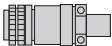











Details of Optional Cables and Connectors for Servo Motors

Model	Encoder connector	Absolute position storage unit connector
MR-J3DDSPS	 Plug: RM15WTPZK-12S Cord clamp: JR13WCCA-8(72) (Hirose Electric Co., Ltd.)	 Plug: RM15WTPZ-12P(72) Cord clamp: JR13WCCA-8(72) (Hirose Electric Co., Ltd.)
Model	Junction connector	Servo amplifier connector
MR-J4FCCBL03M MR-J4THCBL03M MR-J3THMCN2	 Plug: 36110-3000FD Shell kit: 36310-F200-008 (3M)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M)
Model	Power connector	
MR-PWS1CBL_M-A1-H (Note 1) MR-PWS1CBL_M-A1-L (Note 1) MR-PWS1CBL_M-A2-H (Note 1) MR-PWS1CBL_M-A2-L (Note 1)		Plug: KN4FT04SJ1-R Socket contact: ST-TMH-S-C1B-100-(A534G) (Japan Aviation Electronics Industry, Limited)
Model	Power connector	
MR-PWS2CBL03M-A1-L (Note 1) MR-PWS2CBL03M-A2-L (Note 1)		Plug: KN4FT04SJ2-R Socket contact: ST-TMH-S-C1B-100-(A534G) (Japan Aviation Electronics Industry, Limited)
Model	Power connector/cooling fan power connector	
MR-PWCNF		Plug: CE05-6A14S-2SD-D (straight) (DDK Ltd.) Cable clamp: YSO14-9 to 11 (Daiwa Dengyo Co., Ltd.)
Model	Power connector	
MR-PWCNS4		Plug: CE05-6A18-10SD-D-BSS (straight) Cable clamp: CE3057-10A-1-D (DDK Ltd.)

Notes: 1. The cable or the connector set may contain different connectors but still usable.

Details of Optional Cables and Connectors for Servo Motors

Model	Power connector	
MR-PWCNS5		Plug: CE05-6A22-22SD-D-BSS (straight) Cable clamp: CE3057-12A-1-D (DDK Ltd.)
Model	Power connector	
MR-PWCNS3		Plug: CE05-6A32-17SD-D-BSS (straight) Cable clamp: CE3057-20A-1-D (DDK Ltd.)
Model	Power connector	
MR-PWCNS1		Plug: CE05-6A22-23SD-D-BSS (straight) Cable clamp: CE3057-12A-2-D (DDK Ltd.)
Model	Power connector	
MR-PWCNS2		Plug: CE05-6A24-10SD-D-BSS (straight) Cable clamp: CE3057-16A-2-D (DDK Ltd.)
Model	Electromagnetic brake connector	
MR-BKS1CBL_M-A1-H MR-BKS1CBL_M-A1-L MR-BKS1CBL_M-A2-H MR-BKS1CBL_M-A2-L		Plug: JN4FT02SJ1-R Socket contact: ST-TMH-S-C1B-100-(A534G) (Japan Aviation Electronics Industry, Limited)
Model	Electromagnetic brake connector	
MR-BKS2CBL03M-A1-L MR-BKS2CBL03M-A2-L		Plug: JN4FT02SJ2-R Socket contact: ST-TMH-S-C1B-100-(A534G) (Japan Aviation Electronics Industry, Limited)
Model	Electromagnetic brake connector	
MR-BKCNS1 (Note 1, 2)		Straight plug: CMV1-SP2S-L Socket contact: CMV1-#22BSC-S2-100 (DDK Ltd.)
Model	Electromagnetic brake connector	
MR-BKCNS2 (Note 2)		Straight plug: CMV1S-SP2S-L Socket contact: CMV1-#22BSC-S2-100 (DDK Ltd.)
Model	Electromagnetic brake connector	
MR-BKCNS1A (Note 1, 2)		Angle plug: CMV1-AP2S-L Socket contact: CMV1-#22BSC-S2-100 (DDK Ltd.)
Model	Electromagnetic brake connector	
MR-BKCNS2A (Note 2)		Angle plug: CMV1S-AP2S-L Socket contact: CMV1-#22BSC-S2-100 (DDK Ltd.)
Model	Electromagnetic brake connector	
MR-BKCN		Plug: D/MS3106A10SL-4S(D190) (DDK Ltd.) Cable clamp: YSO10-5 to 8 (straight) (Daiwa Dengyo Co., Ltd.)

Notes: 1. The cable or the connector set may contain different connectors but still usable.

2. The connector contains a plug and contacts. Using contractors for other plugs may damage the connector. Be sure to use the enclosed contacts.

Products on the Market for Servo Motors

Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

Encoder connector (servo amplifier-side)



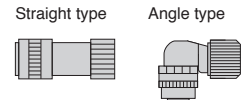
Application	Connector (3M)
Servo amplifier CN2 connector	Receptacle: 36210-0100PL Shell kit: 36310-3200-008
	Connector (Molex)
	54599-1019 (gray)
	54599-1016 (black)

Encoder connector for HG-KR/HG-MR series **Rotary**



Applicable servo motor	Feature (Note 1)	Connector (TE Connectivity Ltd. Company)	Crimping tools (TE Connectivity Ltd. Company)	Applicable cable example
HG-KR/ HG-MR	IP65	2174053-1	For ground clip: 1596970-1 For receptacle contact: 1596847-1	Wire size: 0.13 mm ² to 0.33 mm ² (AWG 26 to 22) Cable OD: 6.8 mm to 7.4 mm Wire example: Fluorine resin wire (Vinyl jacket cable TPE. SVP 70/0.08(AWG#22)-3P KB-2237-2 Bando Densen Co., Ltd. (Note 2) or an equivalent product)

Encoder connector for HG-SR/HG-JR 3000 r/min series/ HG-RR/HG-UR series **Rotary**



Applicable servo motor	Feature (Note 1)	Connector (DDK Ltd.)				Applicable cable example Cable OD [mm]
		Type	Type of connection	Plug	Socket contact	
HG-SR/ HG-JR53, 73, 103, 153, 203, 353, 503, 703, 903, 534, 734, 1034, 1534, 2034, 3534, 5034, 7034, 9034/ HG-RR/ HG-UR	IP67	Straight	One-touch connection type	CMV1-SP10S-M1	Select from solder or press bonding type. (Refer to the table below.)	5.5 to 7.5
				CMV1-SP10S-M2		7.0 to 9.0
			Screw type	CMV1S-SP10S-M1		5.5 to 7.5
				CMV1S-SP10S-M2		7.0 to 9.0
		Angle	One-touch connection type	CMV1-AP10S-M1		5.5 to 7.5
				CMV1-AP10S-M2		7.0 to 9.0
			Screw type	CMV1S-AP10S-M1		5.5 to 7.5
				CMV1S-AP10S-M2		7.0 to 9.0

Contact	Socket contact (DDK Ltd.)	Wire size (Note 3)
Solder type	CMV1-#22ASC-S1-100	0.5 mm ² (AWG 20) or smaller
Press bonding type	CMV1-#22ASC-C1-100	0.2 mm ² to 0.5 mm ² (AWG 24 to 20) Crimping tool (357J-53162T) is required.
	CMV1-#22ASC-C2-100	0.08 mm ² to 0.2 mm ² (AWG 28 to 24) Crimping tool (357J-53163T) is required.

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

2. Contact Toa Electric Industrial Co., Ltd.

3. The wire size shows wiring specification of the connector.

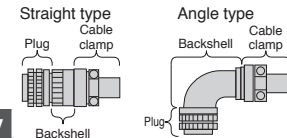
Rotary Rotary servo motor

Linear Linear servo motor

Direct Direct drive motor

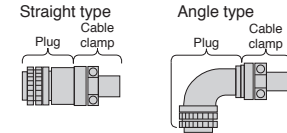
Products on the Market for Servo Motors

Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.



Encoder connector for HG-JR 1000 r/min series and 1500 r/min series (IP67 rated) **Rotary**

Applicable servo motor	Feature (Note 1)	Plug (DDK Ltd.)		Backshell (DDK Ltd.)		Cable clamp (DDK Ltd.)	Applicable cable example	
		Model	Type	Model	Model	Model	Wire size (Note 2)	Cable OD [mm]
HG-JR601, 801, 12K1, 15K1, 20K1, 25K1, 30K1, 37K1, 701M, 11K1M, 15K1M, 22K1M, 30K1M, 37K1M, 6014, 8014, 12K14, 15K14, 20K14, 25K14, 30K14, 37K14, 701M4, 11K1M4, 15K1M4, 22K1M4, 30K1M4, 37K1M4, 45K1M4, 55K1M4	IP67	D/MS3106A20-29S(D190)	Straight	CE02-20BS-S-D	CE3057-12A-3-D		0.3 mm ² to 1.25 mm ² (AWG 22 to 16)	6.8 to 10
			Angle	CE-20BA-S-D				



Encoder connector for HG-JR 1000 r/min series and 1500 r/min series (general environment) **Rotary**

Applicable servo motor	Feature (Note 1)	Plug (with backshell) (DDK Ltd.)		Cable clamp (DDK Ltd.)		Applicable cable example	
		Type	Model	Model	Model	Wire size (Note 2)	Cable OD [mm]
HG-JR601, 801, 12K1, 15K1, 20K1, 25K1, 30K1, 37K1, 701M, 11K1M, 15K1M, 22K1M, 30K1M, 37K1M, 6014, 8014, 12K14, 15K14, 20K14, 25K14, 30K14, 37K14, 701M4, 11K1M4, 15K1M4, 22K1M4, 30K1M4, 37K1M4, 45K1M4, 55K1M4	General environment	Straight	D/MS3106B20-29S	D/MS3057-12A		0.3 mm ² to 1.25 mm ² (AWG 22 to 16)	15.9 or smaller (bushing ID)
		Angle	D/MS3108B20-29S				

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

2. The wire size shows wiring specification of the connector.

Rotary Rotary servo motor

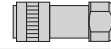
Linear Linear servo motor

Direct Direct drive motor

Products on the Market for Servo Motors

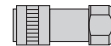
Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

Encoder connector for TM-RFM series and absolute position storage unit connector (servo amplifier side) **Direct**



Applicable servo motor	Application	Feature (Note 1)	Plug (Hirose Electric Co., Ltd.)			Applicable cable example
			Type	Plug	Cord clamp	
TM-RFM	For encoder or absolute position storage unit (servo amplifier side)	IP67	Straight	RM15WTPZK-12S	JR13WCCA-8(72)	Wire size: 0.5 mm ² (AWG 20) or smaller Cable OD: 7.8 mm to 8.2 mm Wire example: Vinyl jacket cable 20276 VSVPAWG#23 × 6P KB-0492 Bando Densen Co., Ltd. (Note 3)

Encoder connector for TM-RFM series and absolute position storage unit connector (encoder side) **Direct**



Applicable servo motor	Application	Feature (Note 1)	Plug (Hirose Electric Co., Ltd.)			Applicable cable example
			Type	Plug	Cord clamp	
TM-RFM	For absolute position storage unit (encoder side)	IP67	Straight	RM15WTPZ-12P(72)	JR13WCCA-8(72)	Wire size: 0.5 mm ² (AWG 20) or smaller Cable OD: 7.8 mm to 8.2 mm Wire example: Vinyl jacket cable 20276 VSVPAWG#23 × 6P KB-0492 Bando Densen Co., Ltd. (Note 3)

Thermistor junction connector for LM-H3/LM-K2/LM-U2/LM-F series **Linear**



Applicable servo motor	Feature (Note 1)	Connector (3M)		Applicable cable example
		Plug	Shell kit	
LM-H3/ LM-K2/ LM-U2/ LM-F	General environment	36110-3000FD	36310-F200-008	Wire size: 0.3 mm ² (AWG 22) or smaller Cable OD: 7 mm to 9 mm

Thermistor connector for LM-F series **Linear**



Applicable servo motor	Feature (Note 1)	Cable receptacle (DDK Ltd.)	Cable clamp (DDK Ltd.)	Applicable cable example
LM-F	General environment	D/MS3101A14S-9S	D/MS3057A-6A	Wire size: 0.3 mm ² to 1.25 mm ² (AWG 22 to 16) Cable OD: up to 7.9 mm

Power connector for HG-KR/HG-MR series **Rotary**



Applicable servo motor	Feature (Note 1)	Connector (Japan Aviation Electronics Industry, Limited)	Crimping tools (Japan Aviation Electronics Industry, Limited)	Applicable cable example
HG-KR/ HG-MR	IP65	Plug: KN4FT04SJ1-R Socket contact: ST-TMH-S-C1B-100-(A534G)	For contactor: CT160-3-TMH5B	Wire size: 0.3 mm ² to 0.75 mm ² (AWG 22 to 18) Cable OD: 5.3 mm to 6.5 mm Wire example: Fluorine resin wire (Vinyl jacket cable RMFES-A (CL3X) AWG 19, 4 cores Dyden Corporation (Note 2) or an equivalent product)

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor/absolute position storage unit.
If the IP rating of the servo amplifier/servo motor/absolute position storage unit differs from that of these connectors, overall IP rating depends on the lowest of all.
2. Contact Taisei Co., Ltd.
3. Contact Toa Electric Industrial Co., Ltd.

Rotary Rotary servo motor

Linear Linear servo motor

Direct Direct drive motor

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

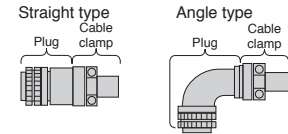
LVs/Wires

Product List

Cautions

Products on the Market for Servo Motors

Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.



Power connector for HG-SR/HG-JR/TM-RFM series **Rotary** **Direct**

Applicable servo motor	Feature (Note 1)	Plug (with backshell) (DDK Ltd.)		Cable clamp (DDK Ltd.)	Applicable cable example	
		Type	Model		Wire size (Note 3)	Cable OD [mm]
HG-SR51, 81, 52, 102, 152, 524, 1024, 1524/ HG-JR53, 73, 103, 153, 203, 534, 734, 1034, 1534, 2034, 3534, 5034/ TM-RFM012G20, 048G20, 072G20	IP67 EN compliant	Straight	CE05-6A18-10SD-D-BSS	CE3057-10A-2-D	2 mm ² to 3.5 mm ² (AWG 14 to 12)	8.5 to 11
				CE3057-10A-1-D		10.5 to 14.1
General environment (Note 2)			D/MS3106B18-10S	D/MS3057-10A	2 mm ² to 3.5 mm ² (AWG 14 to 12)	14.3 or smaller (bushing ID)
			CE05-6A22-22SD-D-BSS	CE3057-12A-2-D	5.5 mm ² to 8 mm ² (AWG 10 to 8)	9.5 to 13
IP67 EN compliant				CE3057-12A-1-D		12.5 to 16
General environment (Note 2)			D/MS3106B22-22S	D/MS3057-12A	5.5 mm ² to 8 mm ² (AWG 10 to 8)	15.9 or smaller (bushing ID)
HG-SR121, 201, 301, 202, 352, 502, 2024, 3524, 5024/ HG-JR353, 503/ TM-RFM040J10, 120J10	IP67 EN compliant		CE05-6A32-17SD-D-BSS	CE3057-20A-1-D	14 mm ² to 22 mm ² (AWG 6 to 4)	22 to 23.8
General environment (Note 2)			D/MS3106B32-17S	D/MS3057-20A	14 mm ² to 22 mm ² (AWG 6 to 4)	23.8 or smaller (bushing ID)
HG-SR421, 702, 7024/ HG-JR703, 903, 601, 801, 12K1, 701M, 11K1M, 15K1M, 7034, 9034, 6014, 8014, 12K14, 701M4, 11K1M4, 15K1M4/ TM-RFM240J10	IP67 EN compliant	Angle	CE05-8A18-10SD-D-BAS	CE3057-10A-2-D	2 mm ² to 3.5 mm ² (AWG 14 to 12)	8.5 to 11
				CE3057-10A-1-D		10.5 to 14.1
General environment (Note 2)			D/MS3108B18-10S	D/MS3057-10A	2 mm ² to 3.5 mm ² (AWG 14 to 12)	14.3 or smaller (bushing ID)
HG-SR121, 201, 301, 202, 352, 502, 2024, 3524, 5024/ HG-JR353, 503	IP67 EN compliant		CE05-8A22-22SD-D-BAS	CE3057-12A-2-D	5.5 mm ² to 8 mm ² (AWG 10 to 8)	9.5 to 13
				CE3057-12A-1-D		12.5 to 16
General environment (Note 2)			D/MS3108B22-22S	D/MS3057-12A	5.5 mm ² to 8 mm ² (AWG 10 to 8)	15.9 or smaller (bushing ID)
HG-SR421, 702, 7024/ HG-JR703, 903, 601, 801, 12K1, 701M, 11K1M, 15K1M, 7034, 9034, 6014, 8014, 12K14, 701M4, 11K1M4, 15K1M4	IP67 EN compliant		CE05-8A32-17SD-D-BAS	CE3057-20A-1-D	14 mm ² to 22 mm ² (AWG 6 to 4)	22 to 23.8
General environment (Note 2)			D/MS3108B32-17S	D/MS3057-20A	14 mm ² to 22 mm ² (AWG 6 to 4)	23.8 or smaller (bushing ID)

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

2. Not compliant with EN.

3. The wire size shows wiring specification of the connector. Refer to "Selection Example in HIV Wires for Servo Motors" in this catalog for examples of wire size selection.

Rotary Rotary servo motor

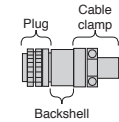
Linear Linear servo motor

Direct Direct drive motor

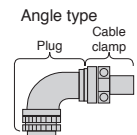
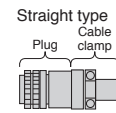
Products on the Market for Servo Motors

Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

Power connector for HG-JR 1000 r/min series (6 kW to 12 kW) and 1500 r/min series (7 kW to 15 kW) (Note 4) **Rotary**



Applicable servo motor	Feature (Note 1)	Plug (DDK Ltd.)	Backshell (DDK Ltd.)		Cable clamp (DDK Ltd.)	Applicable cable example	
		Model	Type	Model	Model	Wire size (Note 2)	Cable OD [mm]
HG-JR601, 801, 12K1, 701M, 11K1M, 15K1M, 6014, 8014, 12K14, 701M4, 11K1M4, 15K1M4	IP67	CE05-6A32-17SD-D	Straight	CE05-32BS-S-D-OB	CE3057-24A-1-D	22 mm ² (AWG 4)	30 to 32.5
					CE3057-24A-2-D		27.5 to 29.6



Power connector for HG-RR/HG-UR series **Rotary**

Applicable servo motor	Feature (Note 1)	Plug (with backshell) (DDK Ltd.)		Cable clamp (DDK Ltd.)	Applicable cable example	
		Type	Model	Model	Wire size (Note 2)	Cable OD [mm]
HG-RR103, 153, 203/ HG-UR72, 152	IP67 EN compliant	Straight	CE05-6A22-23SD-D-BSS	CE3057-12A-2-D	2 mm ² to 3.5 mm ² (AWG 14 to 12)	9.5 to 13
	General environment (Note 3)		D/MS3106B22-23S	D/MS3057-12A		12.5 to 16
HG-RR353, 503/ HG-UR202, 352, 502	IP67 EN compliant		CE05-6A24-10SD-D-BSS	CE3057-16A-2-D	5.5 mm ² to 8 mm ² (AWG 10 to 8)	13 to 15.5
	General environment (Note 3)		D/MS3106B24-10S	D/MS3057-16A		15 to 19.1
HG-RR103, 153, 203/ HG-UR72, 152	IP67 EN compliant	Angle	CE05-8A22-23SD-D-BAS	CE3057-12A-2-D	2 mm ² to 3.5 mm ² (AWG 14 to 12)	9.5 to 13
	General environment (Note 3)		D/MS3108B22-23S	D/MS3057-12A		12.5 to 16
HG-RR353, 503/ HG-UR202, 352, 502	IP67 EN compliant		CE05-8A24-10SD-D-BAS	CE3057-16A-2-D	5.5 mm ² to 8 mm ² (AWG 10 to 8)	13 to 15.5
	General environment (Note 3)		D/MS3108B24-10S	D/MS3057-16A		15 to 19.1

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

2. The wire size shows wiring specification of the connector. Refer to "Selection Example in HIV Wires for Servo Motors" in this catalog for examples of wire size selection.

3. Not compliant with EN.

4. This connector is usable only when the outer diameter of the cable used for HG-JR 1000 r/min series (6 kW to 12 kW) and 1500 r/min series (7 kW to 15 kW) is larger than 23.8 mm.

Rotary Rotary servo motor

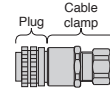
Linear Linear servo motor

Direct Direct drive motor

Products on the Market for Servo Motors

Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

Power connector for TM-RFM series **Direct**



Applicable servo motor	Feature ^(Note 1)	Plug (DDK Ltd.)	Cable clamp (with backshell)			Applicable cable example	
			Type	Model	Manufacturer	Wire size ^(Note 2)	Cable OD [mm]
TM-RFM002C20, 004C20, 006C20, 006E20, 012E20, 018E20	IP67 EN compliant	CE05-6A14S-2SD-D	Straight	ACS-08RL-MS14F	Nippon Flex Co., Ltd.	0.3 mm ² to 1.25 mm ² (AWG 22 to 16)	4 to 8
				ACS-12RL-MS14F			8 to 12
				YSO14-5 to 8	Daiwa Dengyo Co., Ltd.		5 to 8.3
				YSO14-9 to 11			8.3 to 11.3
	General environment ^(Note 3)	D/MS3106B14S-2S	Straight	D/MS3057-6A	DDK Ltd.	0.3 mm ² to 1.25 mm ² (AWG 22 to 16)	7.9 or smaller (bushing ID)

Power connector for LM-F series **Linear**



Applicable servo motor	Feature ^(Note 1)	Cable receptacle (DDK Ltd.)	Cable clamp (DDK Ltd.)	Applicable cable example	
				Wire size ^(Note 2)	Cable OD [mm]
LM-FP2B, 2D, 2F	General environment ^(Note 3)	D/MS3101A18-10S	D/MS3057-10A	2 mm ² to 3.5 mm ² (AWG 14 to 12)	14.3 or smaller (bushing ID)
LM-FP4B, 4D, 4F, 4H, 5H	General environment ^(Note 3)	D/MS3101A24-22S	D/MS3057-16A	5.5 mm ² to 8 mm ² (AWG 10 to 8)	19.1 or smaller (bushing ID)

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

2. The wire size shows wiring specification of the connector. Refer to "Selection Example in HIV Wires for Servo Motors" in this catalog for examples of wire size selection.

3. Not compliant with EN.

Products on the Market for Servo Motors

Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

Electromagnetic brake connector for HG-KR/HG-MR series **Rotary**

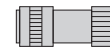


Applicable servo motor	Feature (Note 1)	Connector (Japan Aviation Electronics Industry, Limited)	Crimping tool (Japan Aviation Electronics Industry, Limited)	Applicable cable example
HG-KR/ HG-MR	IP65	Plug: JN4FT02SJ1-R Socket contact: ST-TMH-S-C1B-100-(A534G)	For contactor: CT160-3-TMH5B	Wire size: 0.3 mm ² to 0.5 mm ² (AWG 22 to 20) Cable OD: 3.6 mm to 4.8 mm Wire example: Fluorine resin wire (Vinyl jacket cable RMFES-A (CL3X) AWG 20, 2 cores Dyden Corporation (Note 3) or an equivalent product)

Electromagnetic brake connector for HG-SR/ HG-JR 3000 r/min series **Rotary**

Straight type

Angle type



Applicable servo motor	Feature (Note 1)	Connector (DDK Ltd.)				Applicable cable example
		Type	Type of connection	Plug	Socket contact	Cable OD [mm]
HG-SR/ HG-JR53B, 73B, 103B, 153B, 203B, 353B, 503B, 703B, 903B, 534B, 734B, 1034B, 1534B, 2034B, 3534B, 5034B, 7034B, 9034B	IP67	Straight	One-touch connection type	CMV1-SP2S-S	Select from solder or press bonding type. (Refer to the table below.)	4.0 to 6.0
				CMV1-SP2S-M1		5.5 to 7.5
				CMV1-SP2S-M2		7.0 to 9.0
				CMV1-SP2S-L		9.0 to 11.6
			Screw type	CMV1S-SP2S-S		4.0 to 6.0
				CMV1S-SP2S-M1		5.5 to 7.5
				CMV1S-SP2S-M2		7.0 to 9.0
				CMV1S-SP2S-L		9.0 to 11.6
		Angle	One-touch connection type	CMV1-AP2S-S		4.0 to 6.0
				CMV1-AP2S-M1		5.5 to 7.5
				CMV1-AP2S-M2		7.0 to 9.0
				CMV1-AP2S-L		9.0 to 11.6
			Screw type	CMV1S-AP2S-S		4.0 to 6.0
				CMV1S-AP2S-M1		5.5 to 7.5
				CMV1S-AP2S-M2		7.0 to 9.0
				CMV1S-AP2S-L		9.0 to 11.6

Contact	Socket contact (DDK Ltd.)	Wire size (Note 2)
Solder type	CMV1-#22BSC-S2-100	1.25 mm ² (AWG 16) or smaller
Press bonding type	CMV1-#22BSC-C3-100	0.5 mm ² to 1.25 mm ² (AWG 20 to 16) Crimping tool (357J-53164T) is required.

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

2. The wire size shows wiring specification of the connector. Refer to "Selection Example in HIV Wires for Servo Motors" in this catalog for examples of wire size selection.

3. Contact Taisei Co., Ltd.

Rotary Rotary servo motor

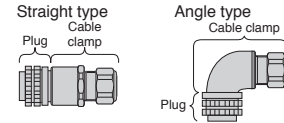
Linear Linear servo motor

Direct Direct drive motor

Products on the Market for Servo Motors

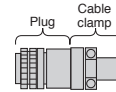
Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

Electromagnetic brake connector for HG-JR 1000 r/min series (6 kW to 12 kW) and 1500 r/min series (7 kW to 15 kW)/HG-UR (2 kW or larger) series (IP67 rated) **Rotary**



Applicable servo motor	Feature (Note 1)	Plug (DDK Ltd.)	Cable clamp (with backshell)			Applicable cable example	
		Model	Type	Model	Manufacturer	Wire size (Note 2)	Cable OD [mm]
HG-JR601B, 801B, 12K1B, 701MB, 11K1MB, 15K1MB, 6014B, 8014B, 12K14B, 701M4B, 11K1M4B, 15K1M4B/HG-UR202B, 352B, 502B	IP67	D/MS3106A10SL-4S(D190)	Straight	ACS-08RL-MS10F	Nippon Flex Co., Ltd.	0.3 mm ² to 1.25 mm ² (AWG 22 to 16)	4 to 8
				ACS-12RL-MS10F			8 to 12
				YSO10-5 to 8	Daiwa Dengyo Co., Ltd.		5 to 8.3
			Angle	ACA-08RL-MS10F	Nippon Flex Co., Ltd.		4 to 8
				ACA-12RL-MS10F			8 to 12
				YLO10-5 to 8	Daiwa Dengyo Co., Ltd.		5 to 8.3

Electromagnetic brake connector for HG-JR 1000 r/min series (6 kW to 12 kW) and 1500 r/min series (7 kW to 15 kW)/HG-UR (2 kW or larger) series (general environment) **Rotary**



Applicable servo motor	Feature (Note 1)	Plug (with backshell) (DDK Ltd.)		Cable clamp (DDK Ltd.)		Applicable cable example	
		Type	Model	Model		Wire size (Note 2)	Cable OD [mm]
HG-JR601B, 801B, 12K1B, 701MB, 11K1MB, 15K1MB, 6014B, 8014B, 12K14B, 701M4B, 11K1M4B, 15K1M4B/HG-UR202B, 352B, 502B	General environment	Straight	D/MS3106A10SL-4S	D/MS3057-4A		0.3 mm ² to 1.25 mm ² (AWG 22 to 16)	5.6 or smaller (bushing ID)

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

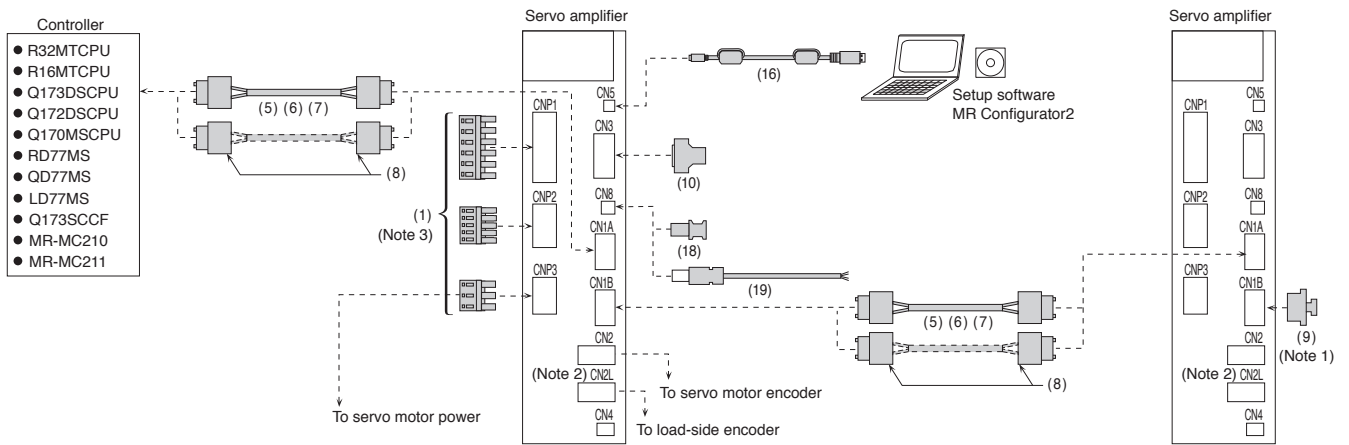
2. The wire size shows wiring specification of the connector. Refer to "Selection Example in HIV Wires for Servo Motors" in this catalog for examples of wire size selection.

Configuration Example for MR-J4-_B_(-RJ), MR-J4-DU_B_(-RJ)

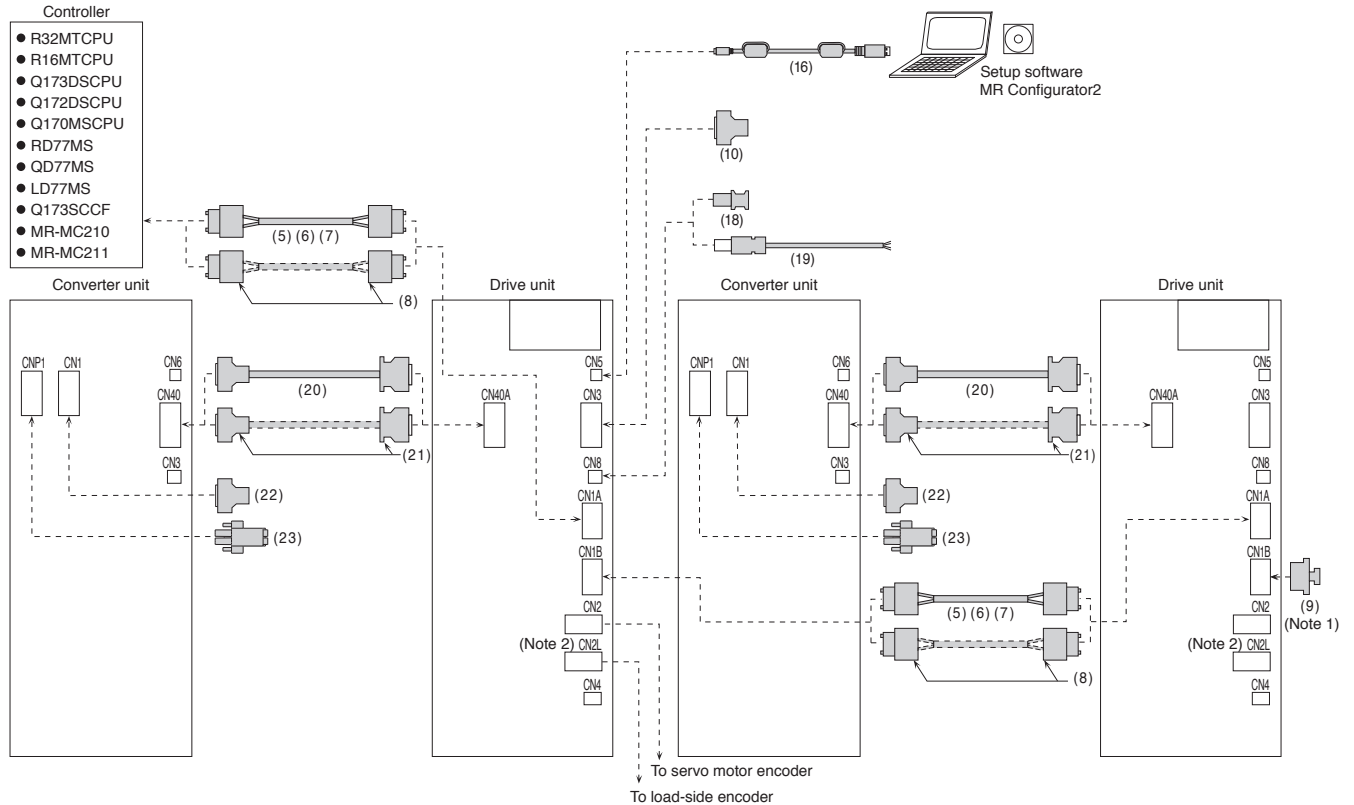
B

B-RJ

For 22 kW or smaller



For 30 kW or larger



- Notes: 1. Be sure to attach a cap to CN1B connector of the final axis.
 2. CN2L connector is available for MR-J4-_B_-RJ servo amplifiers and MR-J4-DU_B_-RJ drive units.
 3. The connectors are for 3.5 kW or smaller servo amplifiers. Terminal blocks are mounted for 5 kW or larger servo amplifiers.

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LV5/Wires

Product List

Cautions

Controller

- R32MTCPU
- R16MTCPU
- Q173DSCPU
- Q172DSCPU
- Q170MSCPU
- RD77MS
- QD77MS
- LD77MS
- Q173SCCF
- MR-MC210
- MR-MC211

Servo amplifier (Note 4)

Setup software MR Configurator2

Junction terminal block MR-TB26A (Note 3)

(Note 1)
Battery case: MR-BT6VCASE
Battery: MR-BAT6V1 × 5 pcs

(Note 2)

(Note 4)

(Note 5)

(Note 6)

(Note 7)

(Note 8)

(Note 9)

(Note 10)

(Note 11)

(Note 12)

(Note 13)

(Note 14)

(Note 15)

(Note 16)

(Note 17)

(Note 18)

(Note 19)

To A-axis servo motor power

To B-axis servo motor power

To C-axis servo motor power (Note 4)

To A-axis servo motor encoder

To B-axis servo motor encoder

To C-axis servo motor encoder (Note 4)

CNP1

CNP2

CNP3A

CNP3B

CNP3C

CN1A

CN1B

CN2A

CN2B

CN2C

CN3

CN4

CN5

CN8

CN1

CN2

CN3

CN4

CN5

CN8

CN1A

CN1B

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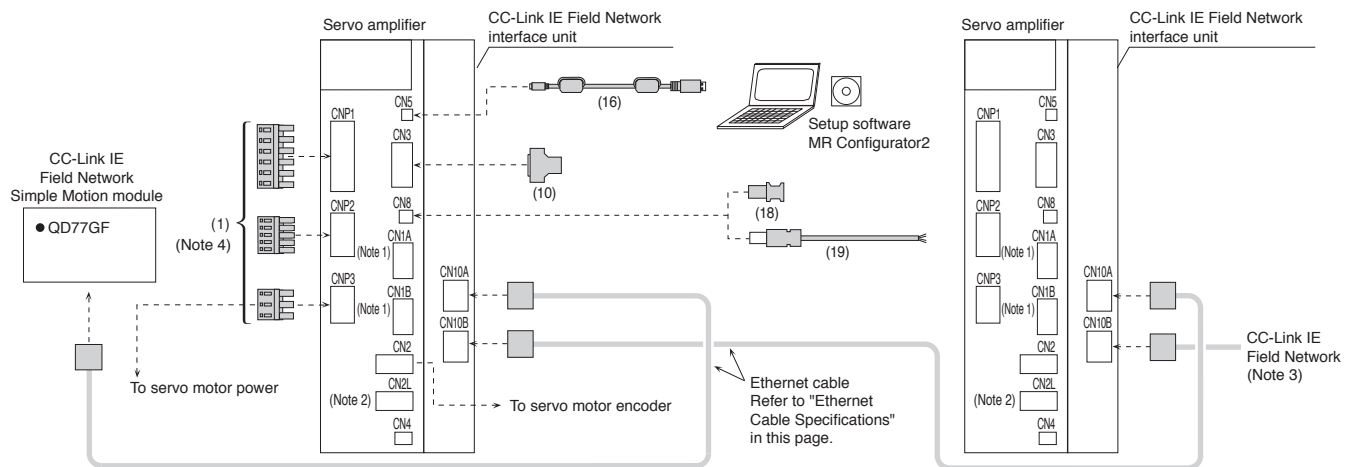
CN4

CN5

CN8</

5-31

Configuration Example for MR-J4-B-RJ010



- Notes: 1. This connector is not for use. Be sure to attach a cap supplied with the servo amplifier.
 2. This connector is not for use.
 3. When branching off CC-Link IE Field Network with a switching HUB, use DT135TX (Mitsubishi Electric System & Service Co., Ltd.).
 4. The connectors are for 3.5 kW or smaller servo amplifiers. Terminal blocks are mounted for 5 kW or larger servo amplifiers.

Ethernet Cable Specifications (Note 1, 2)

Item	Description	
Ethernet cable	Standard	Category 5e or higher, (double shielded/STP) straight cable
		The cable must meet either of the following standards: • IEEE802.3 1000BASE-T • ANSI/TIA/EIA-568-B (Category 5e)
	Connector	RJ-45 connector with shield

- Notes: 1. Use wiring parts recommended by CC-Link Partner Association for wiring the CC-Link IE Field Network.
 2. CC-Link IE Field Network cables are not compatible with CC-Link IE Controller Network.

[Products on the Market]

Ethernet Cable

Item	Model		Note
Ethernet cable for CC-Link IE Field Network	For indoor	SC-E5EW-S_M : cable length (100 m max., unit of 1 m)	Double shielded cable (Category 5e) for CC-Link IE Field Network
	For moving part, indoor	SC-E5EW-S_M-MV : cable length (45 m max., unit of 1 m)	
	For indoor/outdoor	SC-E5EW-S_M-L : cable length (100 m max., unit of 1 m)	

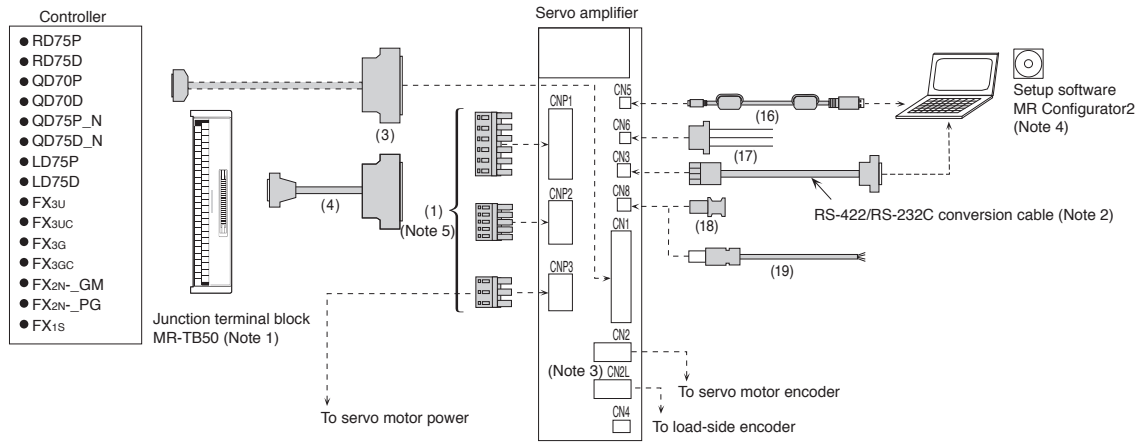
For details, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS BUSINESS PROMOTION DIVISION (Email: osb.webmaster@melsc.jp)

Configuration Example for MR-J4- A (-RJ), MR-J4-DU A (-RJ)

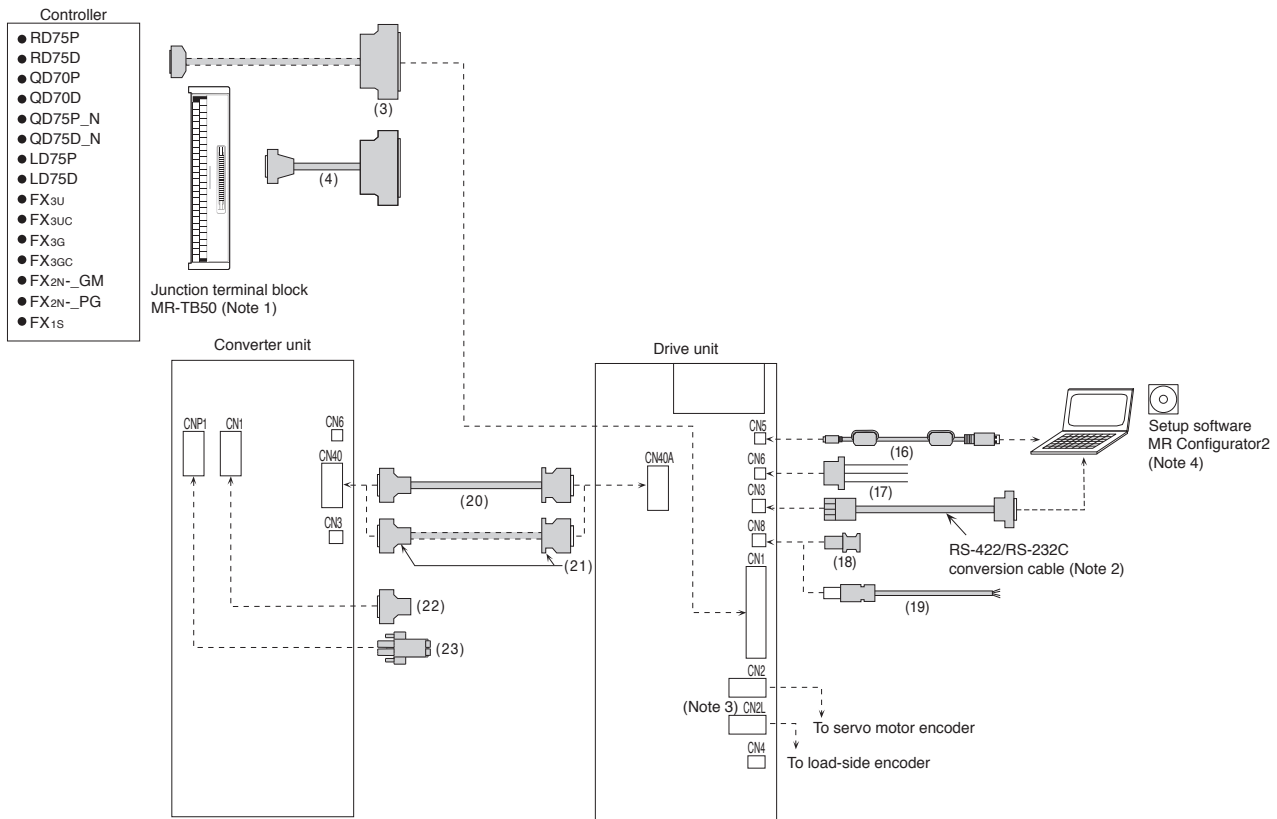
A

A-RJ

For 22 kW or smaller



For 30 kW or larger



Notes: 1. Refer to "Junction Terminal Block" in this catalog.

2. A conversion cable is required for using RS-422 serial communication function. Refer to "Products on the Market for Servo Amplifiers" in this catalog for the RS-422/RS-232C conversion cable.

3. CN2L connector is available for MR-J4- A_-RJ servo amplifiers and MR-J4-DU A_-RJ drive units.

















4. MR Configurator2 supports only USB communication.

5. The connectors are for 3.5 kW or smaller servo amplifiers. Terminal blocks are mounted for 5 kW or larger servo amplifiers.



Cables and Connectors for Servo Amplifiers











Refer to "Details of Optional Cables and Connectors for Servo Amplifiers" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating	Application	Description
For CNP1/CNP2/CNP3	(1) Servo amplifier power connector set ^(Note 1) (insertion type)	(Standard accessory)	-	-	For MR-J4-100B(-RJ) or smaller/ MR-J4-40B1(-RJ) or smaller/ MR-J4-100B-RJ010 or smaller/ MR-J4-100A(-RJ) or smaller/ MR-J4-40A1(-RJ) or smaller	CNP1 connector  CNP2 connector  CNP3 connector  Open tool  Applicable wire size ^(Note 2) : AWG 18 to 14 Insulator OD: up to 3.9 mm
					For MR-J4-200B(-RJ)/ MR-J4-200B-RJ010/ MR-J4-200A(-RJ)/ MR-J4-350B(-RJ)/ MR-J4-350B-RJ010/ MR-J4-350A(-RJ)	CNP1 connector  CNP2 connector  CNP3 connector  Open tool  CNP1/CNP3 connector Applicable wire size ^(Note 2) : AWG 16 to 10 Insulator OD: up to 4.7 mm CNP2 connector Applicable wire size ^(Note 2) : AWG 18 to 14 Insulator OD: up to 3.9 mm
					For MR-J4-350B4(-RJ) or smaller/ MR-J4-350A4(-RJ) or smaller	CNP1 connector  CNP2 connector  CNP3 connector  Open tool  Applicable wire size ^(Note 2) : AWG 16 to 14 Insulator OD: up to 3.9 mm
For CNP1/CNP2/CNP3_	(2) Servo amplifier power connector set ^(Note 3) (insertion type)	(Standard accessory)	-	-	For MR-J4W2-B/ MR-J4W3-B	CNP1 connector  Applicable wire size ^(Note 2) : AWG 16 to 14 Insulator OD: up to 4.2 mm CNP2 connector  Applicable wire size ^(Note 2) : AWG 16 to 14 Insulator OD: up to 3.8 mm CNP3A/CNP3B/CNP3C connector  Open tool  Applicable wire size ^(Note 2) : AWG 18 to 14 Insulator OD: up to 3.8 mm

Notes: 1. This connector set is not required for 5 kW or larger servo amplifiers since terminal blocks are mounted. Refer to servo amplifier dimensions in this catalog for details.
 2. The wire size shows wiring specification of the connector. Refer to "Selection Example in HIV Wires for Servo Motors" in this catalog for examples of wire size selection.
 3. Press bonding type is also available. Refer to "MR-J4W_ _B Servo Amplifier Instruction Manual" for details.

Cables and Connectors for Servo Amplifiers

Refer to "Details of Optional Cables and Connectors for Servo Amplifiers" in this catalog for the detailed models.

		Item	Model	Cable length	IP rating	Application	Description
For CN1	(3)	Connector set	MR-J3CN1	-	-	For MR-J4-_A_(-RJ)/ MR-J4-DU_A_(-RJ)	 Servo amplifier connector
	(4)	Junction terminal block cable	MR-J2M-CN1TBL05M MR-J2M-CN1TBL1M	0.5 m 1 m	-	For connecting MR-J4-_A_(-RJ)/ MR-J4-DU_A_(-RJ) and MR-TB50	 Servo amplifier connector
For controller/CN1A/CN1B	(5)	SSCNET III cable (Note 1) (standard cord inside cabinet) Compatible with SSCNET III(H)	MR-J3BUS015M	0.15 m	-	For MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	 SSCNET III(H) connector
			MR-J3BUS03M	0.3 m	-		
			MR-J3BUS05M	0.5 m	-		
			MR-J3BUS1M	1 m	-		
			MR-J3BUS3M	3 m	-		
	(6)	SSCNET III cable (Note 1) (standard cable outside cabinet) Compatible with SSCNET III(H)	MR-J3BUS5M-A*1	5 m	-	For MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	 SSCNET III(H) connector
			MR-J3BUS10M-A*1	10 m	-		
			MR-J3BUS20M-A*1	20 m	-		
	(7)	SSCNET III cable (Note 1, 3) (long distance cable, long bending life) Compatible with SSCNET III(H)	MR-J3BUS30M-B*1	30 m	-	For MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	 SSCNET III(H) connector
			MR-J3BUS40M-B*1	40 m	-		
			MR-J3BUS50M-B*1	50 m	-		
	(8)	SSCNET III connector set (Note 1, 2) Compatible with SSCNET III(H)	MR-J3BCN1	-	-	For MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	 SSCNET III(H) connector
For CN1B	(9)	SSCNET III connector cap Compatible with SSCNET III(H)	(Standard accessory)	-	-	For MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	
For CN3	(10)	Connector set	MR-CCN1	-	-	For MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_B_-RJ010	 Servo amplifier connector
	(11)	Connector set (Qty: 1 pc)	MR-J2CMP2	-	-	For MR-J4W2-_B/ MR-J4W3-_B	 Servo amplifier connector
	(12)	Connector set (Qty: 20 pcs)	MR-ECN1	-	-	For MR-J4W2-_B/ MR-J4W3-_B	
	(13)	Junction terminal block cable	MR-TBNATBL05M	0.5 m	-	For connecting MR-J4W2-_B/ MR-J4W3-_B and MR-TB26A	 Junction terminal block connector
			MR-TBNATBL1M	1 m			

Notes: 1. Read carefully through the precautions enclosed with the options before use.

2. Dedicated tools are required. Contact your local sales office for more details.


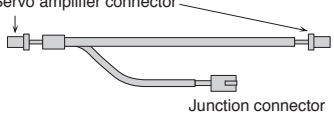








3. When SSCNET III/H is used, refer to "Products on the Market for Servo Amplifiers" in this catalog for cables over 50 m or with ultra-long bending life.

For unlisted lengths

*1. For unlisted lengths of the cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS BUSINESS PROMOTION DIVISION (Email: osb.webmaster@melsc.jp)

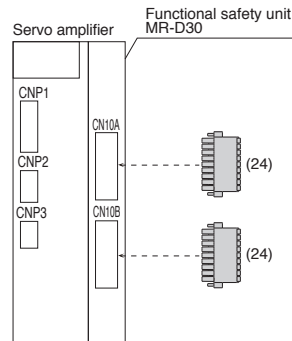
Cables and Connectors for Servo Amplifiers

Refer to "Details of Optional Cables and Connectors for Servo Amplifiers" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating	Application	Description
For CN4	(14) Battery cable	MR-BT6V1CBL03M	0.3 m	-	For connecting MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_B_-RJ010/ MR-J4-A_(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-B/ MR-J4W3-B and MR-BT6VCASE	
		MR-BT6V1CBL1M	1 m			
	(15) Junction battery cable	MR-BT6V2CBL03M	0.3 m	-	For MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_B_-RJ010/ MR-J4-A_(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-B/ MR-J4W3-B	
		MR-BT6V2CBL1M	1 m			
For CN5	(16) Personal computer communication cable (USB cable)	MR-J3USBCBL3M	3 m	-	For MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_B_-RJ010/ MR-J4-A_(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	 <p>* Do not use this cable for SSCNET III(H) compatible controller.</p>
For CN6	(17) Monitor cable	MR-J3CN6CBL1M	1 m	-	For MR-J4-A(-RJ)/ MR-J4-DU_A_(-RJ)	
For CN8	(18) Short-circuit connector	(Standard accessory)	-	-	For MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_B_-RJ010/ MR-J4-A_(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-B/ MR-J4W3-B	 <p>This connector is required when the STO function is not used.</p>
	(19) STO cable	MR-D05UDL3M-B	3 m	-	For connecting MR-J3-D05 or other safety control device with MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_B_-RJ010/ MR-J4-A_(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	
For CN40A on drive unit and CN40 on converter unit	(20) Protection coordination cable	MR-J3CDL05M	0.5 m	-	For MR-J4-DU_B_ / MR-J4-DU_A_ / MR-CR55K_	
	(21) Connector set	MR-J2CN1-A	-	-	For MR-J4-DU_B_ / MR-J4-DU_A_ / MR-CR55K_	
For CN1 on converter unit	(22) Digital I/O connector	(Standard accessory)	-	-	For MR-CR55K_	
For CNP1 on converter unit	(23) Magnetic contactor wiring connector	(Standard accessory)	-	-	For MR-CR55K_	


Configuration Example for MR-D30

B-RJ



Cables and Connectors for MR-D30

Refer to "Details of Optional Connector for MR-D30" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating	Application	Description
For CN10A/CN10B	(24) Connector (Qty: 2 pcs)	(Standard accessory of MR-D30)	-	-	For MR-J3-D05	 Functional safety connector

Configuration Example for MR-J3-D05

B

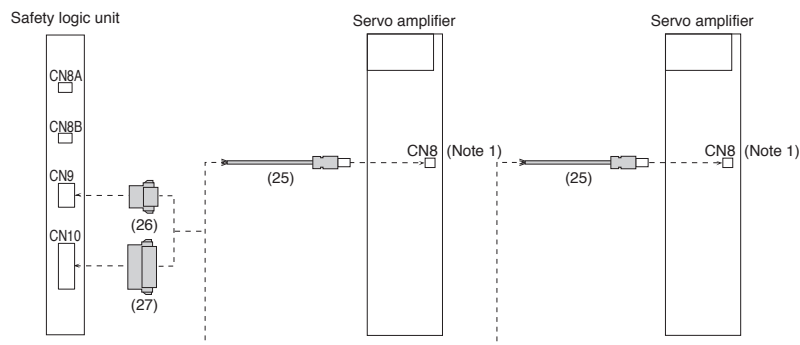
B-RJ

WB

B-RJ010

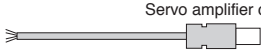


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Cables and Connectors for MR-J3-D05





Refer to "Details of Optional Cables and Connectors for MR-J3-D05" in this catalog for the detailed models.





	Item	Model	Cable length	IP rating	Application	Description
For CN8	(25) STO cable	MR-D05UDL3M-B	3 m	-	For connecting MR-J3-D05 or other safety control device with MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_B_-RJ010/ MR-J4-A_(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	 Servo amplifier connector
For CN9	(26) Connector	(Standard accessory of MR-J3-D05)	-	-	For MR-J3-D05	 Safety logic unit connector
For CN10	(27) Connector	(Standard accessory of MR-J3-D05)	-	-	For MR-J3-D05	 Safety logic unit connector





Notes: 1. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.








Details of Optional Cables and Connectors for Servo Amplifiers



Model	CNP1 connector	CNP2 connector	CNP3 connector	Open tool
Servo amplifier power connector set For MR-J4-100B(-RJ) or smaller/ MR-J4-40B1(-RJ) or smaller/ MR-J4-100B-RJ010 or smaller/ MR-J4-100A(-RJ) or smaller/ MR-J4-40A1(-RJ) or smaller (Standard accessory)	 06JFAT-SAXGDK-H7.5 (J.S.T. Mfg. Co., Ltd.)	 05JFAT-SAXGDK-H5.0 (J.S.T. Mfg. Co., Ltd.)	 03JFAT-SAXGDK-H7.5 (J.S.T. Mfg. Co., Ltd.)	 J-FAT-OT (J.S.T. Mfg. Co., Ltd.)



Model	CNP1 connector	CNP2 connector	CNP3 connector	Open tool
Servo amplifier power connector set For MR-J4-200B(-RJ)/ MR-J4-200B-RJ010/ MR-J4-200A(-RJ)/ MR-J4-350B(-RJ)/ MR-J4-350B-RJ010/ MR-J4-350A(-RJ) (Standard accessory)	 06JFAT-SAXGFK-XL (J.S.T. Mfg. Co., Ltd.)	 05JFAT-SAXGDK-H5.0 (J.S.T. Mfg. Co., Ltd.)	 03JFAT-SAXGFK-XL (J.S.T. Mfg. Co., Ltd.)	 J-FAT-OT-EXL (J.S.T. Mfg. Co., Ltd.)

Model	CNP1 connector	CNP2 connector	CNP3 connector	Open tool
Servo amplifier power connector set For MR-J4-350B4(-RJ)/ MR-J4-350A4(-RJ) (Standard accessory)	 06JFAT-SAXGDK-HT10.5 (J.S.T. Mfg. Co., Ltd.)	 05JFAT-SAXGDK-HT7.5 (J.S.T. Mfg. Co., Ltd.)	 03JFAT-SAXGDK-HT10.5 (J.S.T. Mfg. Co., Ltd.)	 J-FAT-OT-XL (J.S.T. Mfg. Co., Ltd.)

Model	CNP1 connector	CNP2 connector	CNP3A/B/C connector	Open tool
Servo amplifier power connector set For MR-J4W2-_B/MR-J4W3-_B (Standard accessory)	 03JFAT-SAXGFK-43 (J.S.T. Mfg. Co., Ltd.)	 06JFAT-SAXYGG-F-KK (J.S.T. Mfg. Co., Ltd.)	 04JFAT-SAGG-G-KK (J.S.T. Mfg. Co., Ltd.)	 J-FAT-OT-EXL (J.S.T. Mfg. Co., Ltd.)













Model	Servo amplifier connector			
MR-J3CN1	 <p>Connector: 10150-3000PE Shell kit: 10350-52F0-008 (3M) or an equivalent product</p>			

Model	Junction terminal block connector	Servo amplifier connector
MR-J2M-CN1TBL_M	 <p>Connector: D7950-B500FL (3M)</p>	 <p>Press bonding type ^(Note 1) Connector: 10150-6000EL Shell kit: 10350-3210-000 (3M)</p>

Model	SSCNET III(/H) connector	SSCNET III(/H) connector
MR-J3BUS_M MR-J3BUS_M-A MR-J3BCN1	 <p>Connector: PF-2D103 (Japan Aviation Electronics Industry, Limited)</p>	 <p>Connector: PF-2D103 (Japan Aviation Electronics Industry, Limited)</p>

Notes: 1. Solder type (connector: 10150-3000PE and shell kit: 10350-52F0-008) (3M) is also usable. Contact the manufacturer directly.

Details of Optional Cables and Connectors for Servo Amplifiers

Model	SSCNET III(H) connector	SSCNET III(H) connector
MR-J3BUS_M-B	 Connector: CF-2D103-S (Japan Aviation Electronics Industry, Limited)	 Connector: CF-2D103-S (Japan Aviation Electronics Industry, Limited)
Model	Servo amplifier connector	
MR-CCN1		Solder type ^(Note 1) Connector: 10120-3000PE Shell kit: 10320-52F0-008 (3M) or an equivalent product
Model	Servo amplifier connector	Junction terminal block connector
MR-J2HBUS_M	 Connector: 52316-2019 Shell kit: 52370-2070 (Molex) or an equivalent product or Press bonding type ^(Note 2) Connector: 10120-6000EL Shell kit: 10320-3210-000 (3M) or an equivalent product	 Connector: 52316-2019 Shell kit: 52370-2070 (Molex) or an equivalent product or Press bonding type ^(Note 2) Connector: 10120-6000EL Shell kit: 10320-3210-000 (3M) or an equivalent product
Model	Servo amplifier connector	
MR-J2CMP2 MR-ECN1		Connector: 10126-3000PE Shell kit: 10326-52F0-008 (3M) or an equivalent product
Model	Servo amplifier connector	Junction terminal block connector
MR-TBNATBL_M	 Connector: 10126-6000EL Shell kit: 10326-3210-000 (3M) or an equivalent product	 Connector: 10126-6000EL Shell kit: 10326-3210-000 (3M) or an equivalent product
Model	Servo amplifier connector	Battery case connector
MR-BT6V1CBL_M	 Contact: SPHD-001G-P0.5 Housing: PAP-02V-0 (J.S.T. Mfg. Co., Ltd.)	Solder type ^(Note 3) Connector: 10114-3000PE Shell kit: 10314-52F0-008 (3M) or an equivalent product
Model	Servo amplifier connector	Junction connector
MR-BT6V2CBL_M	 Contact: SPHD-001G-P0.5 Housing: PAP-02V-0 (J.S.T. Mfg. Co., Ltd.)	 Contact: SPAL-001GU-P0.5 Housing: PALR-02VF-O (J.S.T. Mfg. Co., Ltd.)
Model	Servo amplifier connector	
MR-J3CN6CBL1M		Housing: 51004-0300 Terminal: 50011-8100 (Molex)



Notes: 1. Press bonding type (connector: 10120-6000EL and shell kit: 10320-3210-000) (3M) is also usable. Contact the manufacturer directly.


2. Solder type (connector: 10120-3000PE and shell kit: 10320-52F0-008) (3M) is also usable. Contact the manufacturer directly.


3. Press bonding type (connector: 10140-6000EL and shell kit: 10314-3210-000) (3M) is also usable. Contact the manufacturer directly.




Details of Optional Connectors and Cables for Drive Unit/Converter Unit

Model	Converter unit connector	Drive unit connector
MR-J3CDL05M MR-J2CN1-A	 Connector: 10120-3000PE Shell kit: 10320-52F0-008 (3M) or equivalent product	 Connector: PCR-S20FS+ Case: PCR-LS20LA1 (Honda Tsushin Kogyo Co., Ltd.)


Model	Converter unit connector
Digital I/O connector (Standard accessory of converter unit)	 Connector: 17JE23090-02(D8A)K11-CG (DDK Ltd.)


Model	Converter unit connector
Magnetic contactor wiring connector (Standard accessory of converter unit)	 Socket: GFKC 2.5/ 2-STF-7,62 (Phoenix Contact)


Details of Optional Connectors for MR-D30

Model	Functional safety unit connector
Connector for CN10A/CN10B of functional safety unit (Standard accessory of MR-D30)	 Connector: DFMC 1,5/ 9-STF-3.5 (Phoenix Contact)

Details of Optional Cables and Connectors for MR-J3-D05

Model	Servo amplifier connector
MR-D05UDL3M-B	 Connector set: 2069250-1 (TE Connectivity Ltd. Company)

Model	Safety logic unit connector
Connector for CN9 of safety logic unit (Standard accessory of MR-J3-D05)	 Connector: 1-1871940-4 (TE Connectivity Ltd. Company)

Model	Safety logic unit connector
Connector for CN10 of safety logic unit (Standard accessory of MR-J3-D05)	 Connector: 1-1871940-8 (TE Connectivity Ltd. Company)


Products on the Market for Servo Amplifiers

Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

Personal computer communication cable

A


A-RJ

Application	Model	Description
RS-422/RS-232C conversion cable	DSV-CABV	 Servo amplifier connector Personal computer connector Diatrend Corp.

RS-422 connector

A


A-RJ

Application	Model	Description
RS-422 connector	TM10P-88P	 Hirose Electric Co., Ltd.

RS-422 branch connector (for multi-drop)

A

A-RJ


Application	Model	Description
Branch connector	BMJ-8	 Hachiko Electric Co., Ltd.

SSCNET III cable

B

B-RJ

WB

Application	Model	Description
Ultra-long bending life fiber-optic cable for SSCNET III(H)	SC-J3BUS_M-C _ = cable length (100 m max. (Note 1), unit of 1 m)	 Mitsubishi Electric System & Service Co., Ltd.

Notes: 1. The maximum wiring distance between stations is 100 m for SSCNET III(H) and 50 m for SSCNET III.

Products on the Market for MR-J4W2-_B/MR-J4W3-_B

WB

Contact Mitsubishi Electric System & Service Co., Ltd. for power cables with a press bonding type connector for MR-J4W2-_B/MR-J4W3-_B servo amplifiers and power cables for servo motors.

Application of connecting encoder junction cable

B

B-RJ

WB

B-RJ010

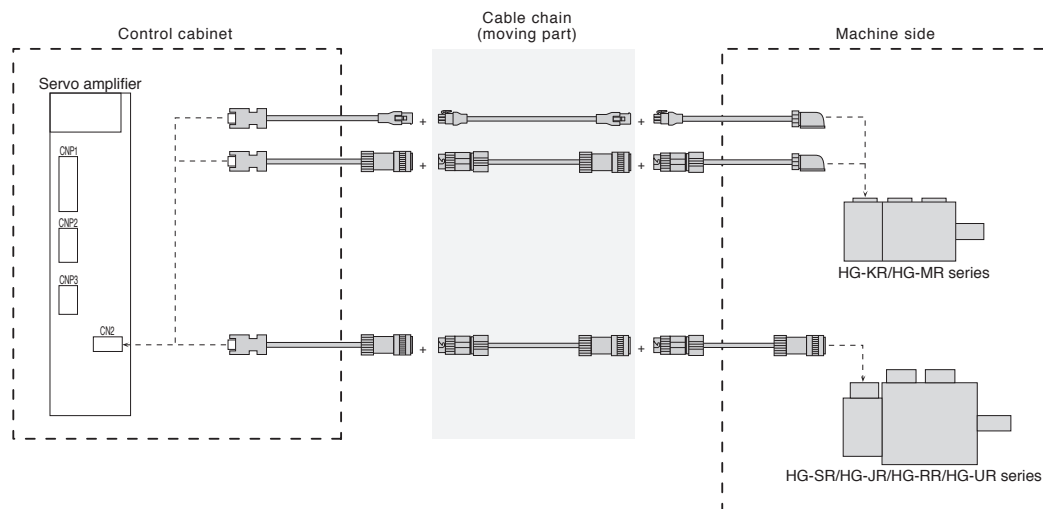
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Unlisted lengths of cables between servo amplifier and servo motor, EMC cables, and special cables for connecting servo amplifier and servo motor with multiple cables are available. Please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS BUSINESS PROMOTION DIVISION (Email: osb.webmaster@melsc.jp)

Example) Configuration using three encoder junction cables

- Replacing only the cable of the moving part in the cable chain is possible.
- Resetting after transporting a machine is easy because the servo amplifier side and the servo motor side can be separated.





Functional Safety Unit (MR-D30)

Specifications

A combination of MR-D30 functional safety unit and MR-J4-_B_-RJ servo amplifier expands the safety observation function. (Note 4)

	Model	MR-D30
Output	Rated voltage	24 V DC
	Rated current [A]	0.3
Interface power supply	Voltage	24 V DC ± 10%
	Power supply capacity [A]	0.8 (Note 1)
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d and Category 4 PL e IEC 61508 SIL 2 and SIL 3 EN 62061 SIL CL 2 and SIL CL 3 EN 61800-5-2 SIL 2 and SIL 3
	Mean time to dangerous failure	MTTFd ≥ 100 [year]
	Effectiveness of safety observation system or safety observation subsystem	DC = 90 [%]
	Probability of dangerous Failure per Hour	PFH = 6.57 × 10 ⁻⁹ [1/h]
	Mission time	TM = 20 [year]
	Response performance (Note 2)	Using input device: 15 ms or less
	Speed observation resolution	Depends on a command resolution (0.1 r/min or less at 22-bit position command)
	Input device	6 points × 2 systems
	Output device	3 points × 2 systems
	Safety function (IEC/EN 61800-5-2)	Safe torque off (STO)	SIL 2, Category 3 PL d/SIL 3, Category 4 PL e (Note 3)
Safe stop 1 (SS1)		SIL 2, Category 3 PL d/SIL 3, Category 4 PL e (Note 3)
Safely-limited speed (SLS)		SIL 2, Category 3 PL d
Safe speed monitor (SSM)		SIL 2, Category 3 PL d
Safe brake control (SBC)		SIL 2, Category 3 PL d/SIL 3, Category 4 PL e (Note 3)
Compliance to global standards	CE marking	EMC: EN 61800-3 MD: EN ISO 13849-1, EN 61800-5-2, EN 62061
Structure (IP rating)		Natural cooling, open (IP20 when mounted on servo amplifier and IP00 for MR-D30 alone)
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)
	Ambient humidity	Operation/storage: 5 %RH to 90 %RH (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/s² at 10 Hz to 57 Hz
Mass [kg]		0.15

Notes: 1. This is the value applicable when all I/O signals are used. The current capacity can be decreased by reducing the number of I/O points.

2. Time from STO input to energy shut off.

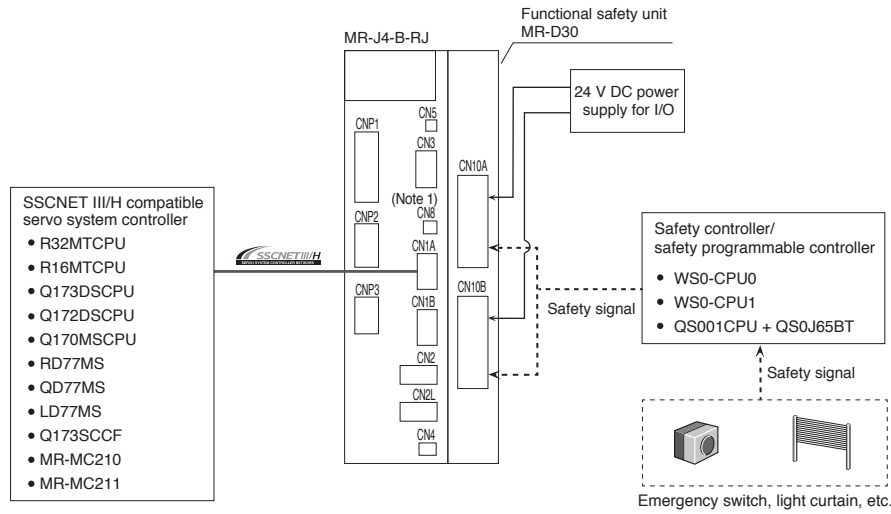
3. To meet SIL 3, Category 4 PL e, an input diagnosis using test pulse is required.

4. MR-D30 functional safety unit is not compatible with the drive unit.

Functional Safety Unit (MR-D30)

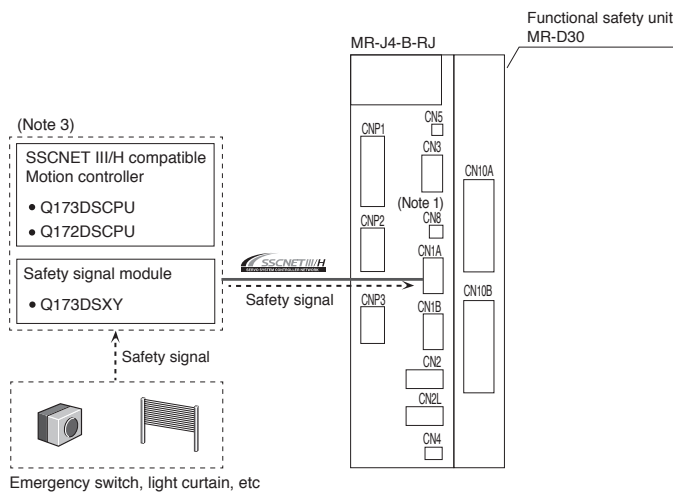
System configuration for using I/O device of functional safety unit (Note 2)

The following is a system configuration example to use the safety function by using input/output devices (CN10A and CN10B) of MR-D30 functional safety unit.



System configuration for using input signal of SSCNET III/H compatible Motion controller (Note 2)

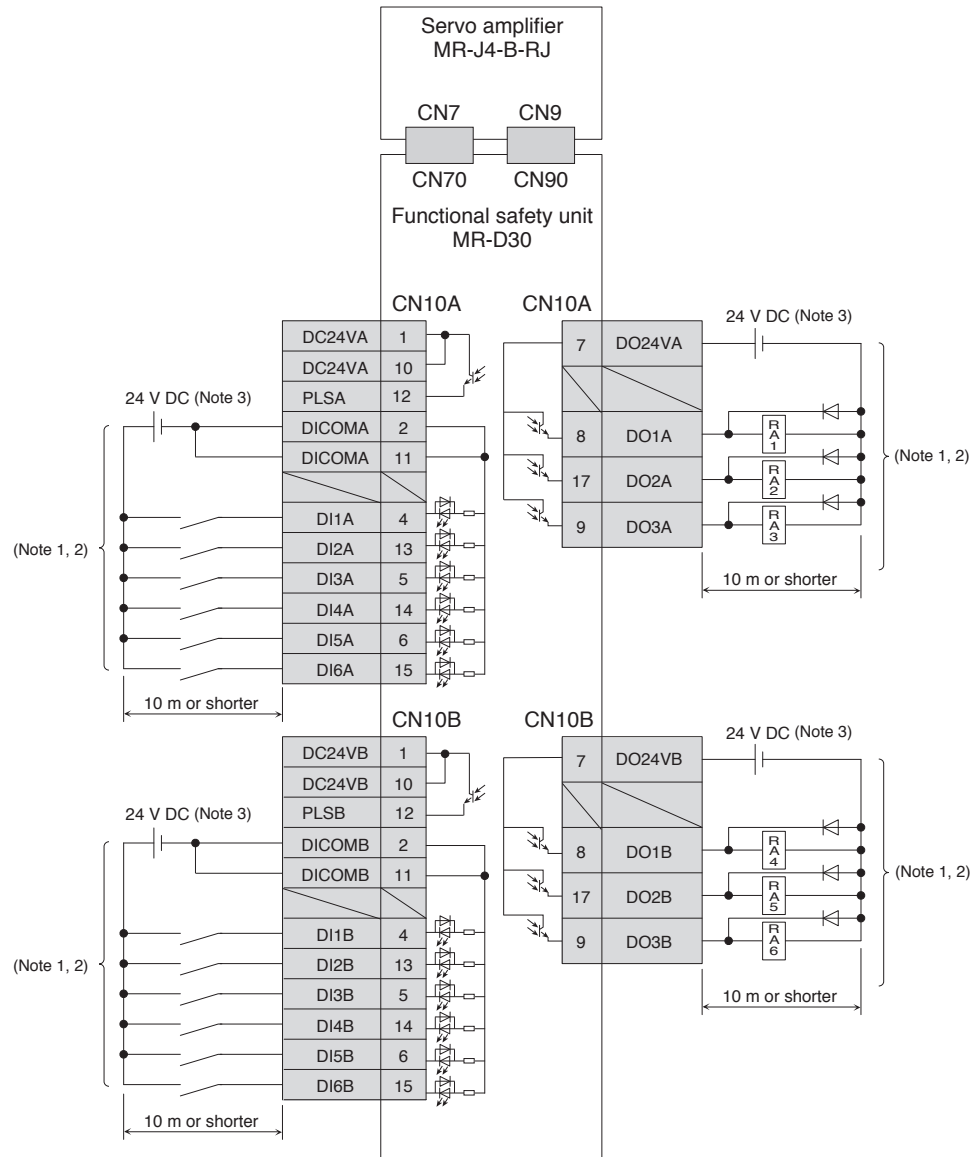
The following is a system configuration example to use the safety function from SSCNET III/H compatible Motion controller through SSCNET III/H.



- Notes: 1. Disconnect the short-circuit connector attached to CN8 connector of the servo amplifier, and do not connect anything when using MR-D30.
 2. The wirings are the same as MR-J4-B-RJ servo amplifier except for the mentioned wiring.
 3. The safety function has obtained the approval of Certification Body by the combination of Q17nDSCPU, Q173DSXY and QnUD(E)(H)CPU.

Functional Safety Unit (MR-D30)

Connection Example



Notes: 1. Separate all of the external wirings into two systems. Connect separately even for the input and output power supply (24 V DC and 0 V common) connection. Do not wire between CN10A and CN10B.

2. Assign each I/O device by the combination of connector pins shown in the table below. Refer to "MR-D30 Instruction Manual" for each device.

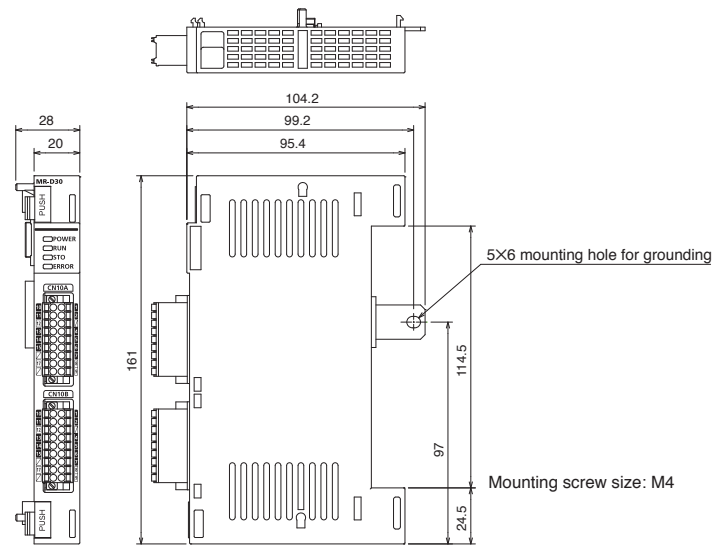
Combination for input connector pin	Combination for output connector pin
DI1A (CN10A-4)/DI1B (CN10B-4)	DO1A (CN10A-8)/DO1B (CN10B-8)
DI2A (CN10A-13)/DI2B (CN10B-13)	DO2A (CN10A-17)/DO2B (CN10B-17)
DI3A (CN10A-5)/DI3B (CN10B-5)	DO3A (CN10A-9)/DO3B (CN10B-9)
DI4A (CN10A-14)/DI4B (CN10B-14)	
DI5A (CN10A-6)/DI5B (CN10B-6)	
DI6A (CN10A-15)/DI6B (CN10B-15)	

3. Provide an external power supply of 24 V DC $\pm 10\%$ for the interface. When all input/output points are used, the total current capacity of 0.8 A is required. The current capacity can be decreased by reducing the number of I/O points. For convenience of illustration, the diagram shows separate 24 V DC power supplies for input and output signals. However, the input and output signals can share a common power supply.

Functional Safety Unit (MR-D30)

B-RJ

Dimensions



[Unit: mm]



Safety Logic Unit (MR-J3-D05)

B

B-RJ

WB

B-RJ010

A

A-RJ

The safety logic unit has SS1 and STO functions. Servo amplifier achieves Safe stop 1 (SS1) function by adding the MR-J3-D05.

Specifications

Safety logic unit model		MR-J3-D05
Control circuit power supply	Voltage	24 V DC
	Permissible voltage fluctuation	24 V DC ± 10%
	Required current capacity [A]	0.5 (Note 1, 2)
Compatible system		2 systems (A-axis, B-axis independent)
Shut-off input		4 points (2 points × 2 systems) SDI_ : source/sink compatible (Note 3)
Shut-off release input		2 points (1 point × 2 systems) SRES_ : source/sink compatible (Note 3)
Feedback input		2 points (1 point × 2 systems) TOF_ : source compatible (Note 3)
Input type		Photocoupler insulation, 24 V DC (external supply), internal limited resistance 5.4 kΩ
Shut-off output		8 points (4 points × 2 systems) STO_ : source compatible (Note 3) SDO_ : source/sink compatible (Note 3)
Output type		Photocoupler insulation, open-collector type Permissible current: 40 mA or less per output, Inrush current: 100 mA or less per output
Delay time setting		A-axis: select from 0 s, 1.4 s, 2.8 s, 5.6 s, 9.8 s or 30.8 s B-axis: select from 0 s, 1.4 s, 2.8 s, 9.8 s or 30.8 s Accuracy: ±2%
Functional safety		STO, SS1 (IEC/EN 61800-5-2) EMG STOP, EMG OFF (IEC/EN 60204-1)
Safety performance	Standards certified by CB	EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, EN 61800-5-2 SIL 2
	Response performance (when delay time is set to 0 s) (Note 4)	10 ms or less (STO input OFF → shut-off output OFF)
	Mean time to dangerous failure (MTTFd)	516 years
	Average diagnostic coverage (DC _{avg})	93.1%
	Probability of dangerous Failure per Hour (PFH)	4.75 × 10 ⁻⁹ [1/h]
Compliance to standards	CE marking	LVD: EN 61800-5-1 EMC: EN 61800-3 MD: EN ISO 13849-1, EN 61800-5-2, EN 62061
Structure (IP rating)		Natural cooling, open (IP00)
Environment	Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)
	Ambient humidity	Operation/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]		0.2 (including CN9 and CN10 connectors)

Notes: 1. Inrush current of approximately 1.5 A flows instantaneously when the power is switched on. Select an appropriate capacity of a power supply considering the inrush current.

2. Power-on duration of the safety logic unit is 100,000 times.

3. _ in signal name represents a symbol which indicates a number and axis name.

4. Contact your local sales office for test pulse input.

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LV5/Wires

Product List

Cautions

Safety Logic Unit (MR-J3-D05)

B

B-RJ

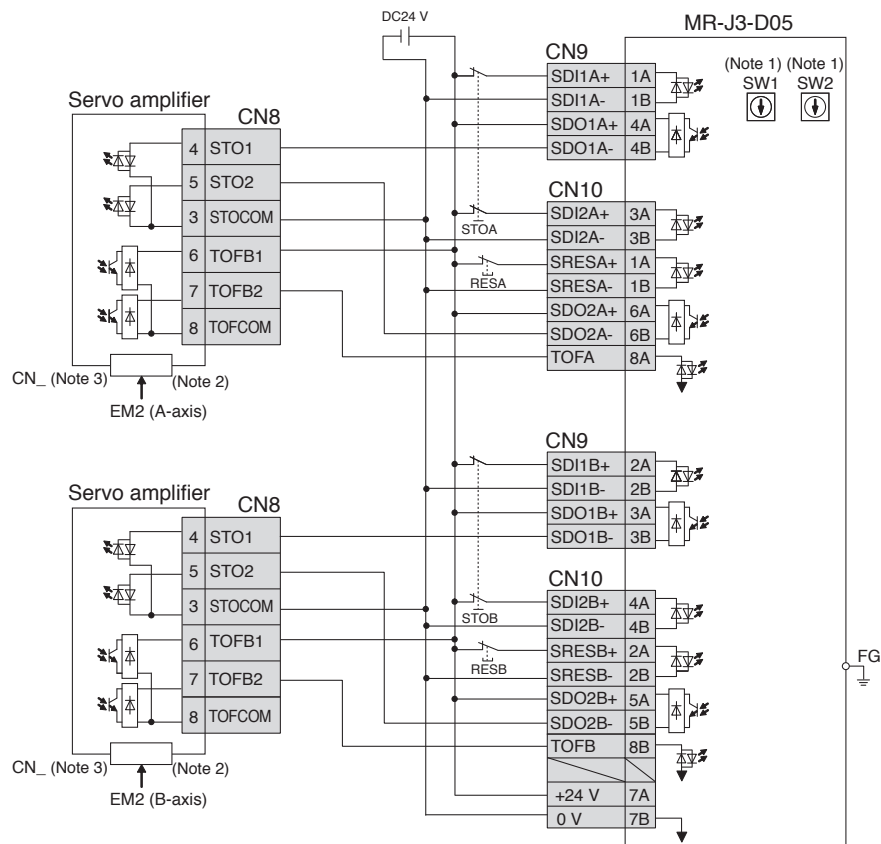
WB

B-RJ010

A

A-RJ

Connection example

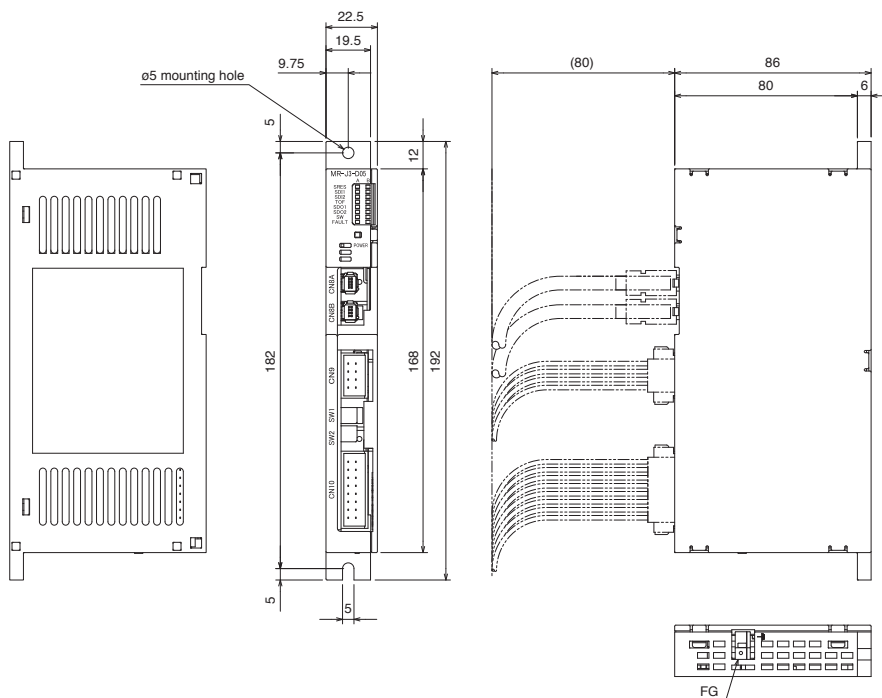


Notes: 1. Set delay time of STO output with SW1 and SW2.

2. This connection is for source interface.

3. This connector is CN3 for MR-J4-_B_, MR-J4-DU-_B_, and MR-J4W-_B; and CN1 for MR-J4-_A_ and MR-J4-DU-_A_.

Dimensions





Regenerative Option

B

B-RJ

WB

B-RJ010

A

A-RJ

200 V/100 V

Servo amplifier model	Tolerable regenerative power [W] (Note 3)																	
	Built-in regenerative resistor	External regenerative resistor (standard accessory) (Note 5)			Regenerative option													
		GRZG400-			MR-RB													
		0.8 Ω × 4 (Note 2)	0.6 Ω × 5 (Note 2)	0.5 Ω × 5 (Note 2)	032 40 Ω	12 40 Ω	30 13 Ω	3N 9 Ω	31 6.7 Ω	32 40 Ω	50 (Note 1) 13 Ω	5N (Note 1) 9 Ω	51 (Note 1) 6.7 Ω	5R (Note 2) 3.2 Ω	9F (Note 2) 3 Ω	9T (Note 2) 2.5 Ω	14 26 Ω	34 26 Ω
MR-J4-10B/A MR-J4-10B1/A1	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-
MR-J4-20B/A MR-J4-20B1/A1	10	-	-	-	30	100	-	-	-	-	-	-	-	-	-	-	-	-
MR-J4-40B/A MR-J4-40B1/A1	10	-	-	-	30	100	-	-	-	-	-	-	-	-	-	-	-	-
MR-J4-60B/A	10	-	-	-	30	100	-	-	-	-	-	-	-	-	-	-	-	-
MR-J4-70B/A	20	-	-	-	30	100	-	-	-	300	-	-	-	-	-	-	-	-
MR-J4-100B/A	20	-	-	-	30	100	-	-	-	300	-	-	-	-	-	-	-	-
MR-J4-200B/A	100	-	-	-	-	-	300	-	-	-	500	-	-	-	-	-	-	-
MR-J4-350B/A	100	-	-	-	-	-	-	300	-	-	-	500	-	-	-	-	-	-
MR-J4-500B/A	130	-	-	-	-	-	-	-	300	-	-	-	500	-	-	-	-	-
MR-J4-700B/A	170	-	-	-	-	-	-	-	300	-	-	-	500	-	-	-	-	-
MR-J4-11KB/A	-	500 (800)	-	-	-	-	-	-	-	-	-	-	-	500 (800)	-	-	-	-
MR-J4-15KB/A	-	-	850 (1300)	-	-	-	-	-	-	-	-	-	-	-	850 (1300)	-	-	-
MR-J4-22KB/A	-	-	-	850 (1300)	-	-	-	-	-	-	-	-	-	-	-	850 (1300)	-	-
MR-J4W2-22B	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-
MR-J4W2-44B	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-
MR-J4W2-77B	100	-	-	-	-	-	-	300	-	-	-	-	-	-	-	-	-	-
MR-J4W2-1010B	100	-	-	-	-	-	-	300	-	-	-	-	-	-	-	-	-	-
MR-J4W3-222B	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	300
MR-J4W3-444B	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	300

Converter unit model	Drive unit model	Tolerable regenerative power [W] of regenerative option (Note 3)	
		MR-RB139	MR-RB137
		1.3 Ω	1.3 Ω (Note 4)
MR-CR55K	MR-J4-DU30KB/A MR-J4-DU37KB/A	1300	3900

Notes: 1. Be sure to cool the unit forcibly with a cooling fan (92 mm × 92 mm, minimum air flow: 1.0 m³/min). The cooling fan must be prepared by user.

2. The value in brackets is applicable when cooling fans (2 units of 92 mm × 92 mm, minimum air flow: 1.0 m³/min) are installed, and then [Pr. PA02] is changed.

3. The power values in this table are resistor-generated powers, not rated powers.

4. This is the resultant resistance when three units of MR-RB137 are connected in parallel.

5. The regenerative resistor enclosed with the servo amplifiers 11 kW to 22 kW does not have a protective cover, and touching the resistor (including the wiring screws) may cause a burn or an electric shock. Provide safety measures such as a protective cover or use MR-RB_ regenerative option.

* Cautions when connecting the regenerative option

1. The regenerative option causes a temperature rise of 100 °C or higher relative to the ambient temperature. Fully examine heat dissipation, installation position, wires used before installing the unit. Use flame-retardant wires or apply flame retardant on wires, and keep the wires clear of the unit.
2. Use twisted wires for connecting the regenerative option to the servo amplifier, and keep the wire length to a maximum of 5 m.
3. Use twisted wires for connecting a thermal sensor, and make sure that the sensor does not fail to work properly due to inducted noise.

Regenerative Option

B

B-RJ

WB

B-RJ010

A

A-RJ

400 V

Servo amplifier model	Tolerable regenerative power [W] (Note 4)												
	Built-in regenerative resistor	External regenerative resistor (standard accessory) (Note 6)		Regenerative option									
		GRZG400-		MR-RB									
		2.5 Ω × 4 (Note 2)	2 Ω × 5 (Note 2)	1H-4	3M-4 (Note 1)	3G-4 (Note 1)	34-4 (Note 1)	3U-4 (Note 1)	5G-4 (Note 1)	54-4 (Note 1)	5U-4 (Note 1)	5K-4 (Note 2)	6K-4 (Note 2)
				82 Ω	120 Ω	47 Ω	26 Ω	22 Ω	47 Ω	26 Ω	22 Ω	10 Ω	10 Ω
MR-J4-60B4/A4	15	-	-	100	300	-	-	-	-	-	-	-	-
MR-J4-100B4/A4	15	-	-	100	300	-	-	-	-	-	-	-	-
MR-J4-200B4/A4	100	-	-	-	-	300	-	-	500	-	-	-	-
MR-J4-350B4/A4	100	-	-	-	-	300	-	-	500	-	-	-	-
MR-J4-500B4/A4	130 (Note 3)	-	-	-	-	-	300	-	-	500	-	-	-
MR-J4-700B4/A4	170 (Note 3)	-	-	-	-	-	-	300	-	-	500	-	-
MR-J4-11KB4/A4	-	500 (800)	-	-	-	-	-	-	-	-	-	500 (800)	-
MR-J4-15KB4/A4	-	-	850 (1300)	-	-	-	-	-	-	-	-	-	850 (1300)
MR-J4-22KB4/A4	-	-	850 (1300)	-	-	-	-	-	-	-	-	-	850 (1300)

Converter unit model	Drive unit model	Tolerable regenerative power [W] of regenerative option (Note 4)	
		MR-RB137-4	MR-RB13V-4
		4 Ω	4 Ω (Note 5)
MR-CR55K4	MR-J4-DU30KB4/A4 MR-J4-DU37KB4/A4 MR-J4-DU45KB4/A4 MR-J4-DU55KB4/A4	1300	3900

Notes: 1. Be sure to cool the unit forcibly with a cooling fan (92 mm × 92 mm, minimum air flow: 1.0 m³/min). The cooling fan must be prepared by user.

2. The value in brackets is applicable when cooling fans (2 units of 92 mm × 92 mm, minimum air flow: 1.0 m³/min) are installed, and then [Pr. PA02] is changed.

3. The servo amplifier built-in regenerative resistor is compatible with the maximum torque deceleration when the servo motor is used within the rated speed and the recommended load to motor inertia ratio. Contact your local sales office if the operating motor speed or the load to motor inertia ratio exceeds the rated speed or the recommended ratio.

4. The power values in this table are resistor-generated powers, not rated powers.

5. This is the resultant resistance when three units of MR-RB13V-4 are connected in parallel.

6. The regenerative resistor enclosed with the servo amplifiers 11 kW to 22 kW does not have a protective cover, and touching the resistor (including the wiring screws) may cause a burn or an electric shock. Provide safety measures such as a protective cover or use MR-RB_ regenerative option.

* Cautions when connecting the regenerative option

1. The regenerative option causes a temperature rise of 100 °C or higher relative to the ambient temperature. Fully examine heat dissipation, installation position, wires used before installing the unit. Use flame-retardant wires or apply flame retardant on wires, and keep the wires clear of the unit.
2. Use twisted wires for connecting the regenerative option to the servo amplifier, and keep the wire length to a maximum of 5 m.
3. Use twisted wires for connecting a thermal sensor, and make sure that the sensor does not fail to work properly due to inducted noise.



Regenerative Option

B

B-RJ

WB

B-RJ010

A

A-RJ

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

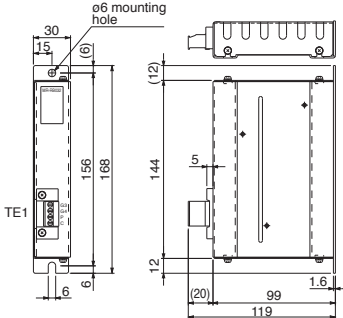
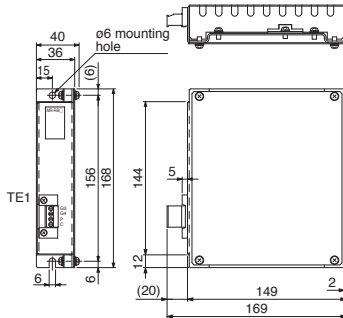
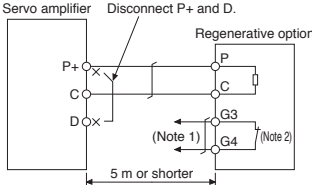
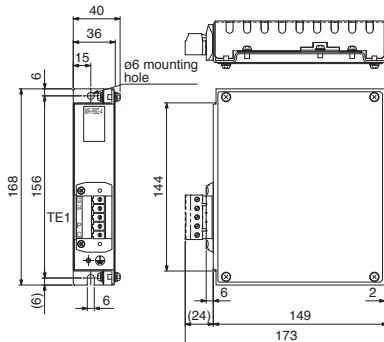
Direct Drive Motors

Options/Peripheral
Equipment

LVs/Wires

Product List

Cautions

Dimensions	[Unit: mm]	Connections										
MR-RB032 (for 200 V/100 V)												
	<div>Terminal arrangement</div> <table><tr><td>TE1</td></tr><tr><td>G3</td></tr><tr><td>G4</td></tr><tr><td>P</td></tr><tr><td>C</td></tr></table> <div>Applicable wire size (Note 3): 0.2 mm² to 2.5 mm² (AWG 24 to 12) Mounting screw size: M5</div> <table><tr><th>Model</th><th>Mass [kg]</th></tr><tr><td>MR-RB032</td><td>0.5</td></tr></table>	TE1	G3	G4	P	C	Model	Mass [kg]	MR-RB032	0.5		
TE1												
G3												
G4												
P												
C												
Model	Mass [kg]											
MR-RB032	0.5											
MR-RB12 (for 200 V/100 V), MR-RB14 (for 200 V)												
	<div>Terminal arrangement</div> <table><tr><td>TE1</td></tr><tr><td>G3</td></tr><tr><td>G4</td></tr><tr><td>P</td></tr><tr><td>C</td></tr></table> <div>Applicable wire size (Note 3): 0.2 mm² to 2.5 mm² (AWG 24 to 12) Mounting screw size: M5</div> <table><tr><th>Model</th><th>Mass [kg]</th></tr><tr><td>MR-RB12</td><td rowspan="2">1.1</td></tr><tr><td>MR-RB14</td></tr></table>	TE1	G3	G4	P	C	Model	Mass [kg]	MR-RB12	1.1	MR-RB14	
TE1												
G3												
G4												
P												
C												
Model	Mass [kg]											
MR-RB12	1.1											
MR-RB14												
MR-RB1H-4 (for 400 V)												
	<div>Terminal arrangement</div> <table><tr><td>TE1</td></tr><tr><td>G3</td></tr><tr><td>G4</td></tr><tr><td>P</td></tr><tr><td>C</td></tr></table> <div>Applicable wire size (Note 3): 0.2 mm² to 4.0 mm² (AWG 24 to 10) Mounting screw size: M5</div> <table><tr><th>Model</th><th>Mass [kg]</th></tr><tr><td>MR-RB1H-4</td><td>1.1</td></tr></table>	TE1	G3	G4	P	C	Model	Mass [kg]	MR-RB1H-4	1.1		
TE1												
G3												
G4												
P												
C												
Model	Mass [kg]											
MR-RB1H-4	1.1											

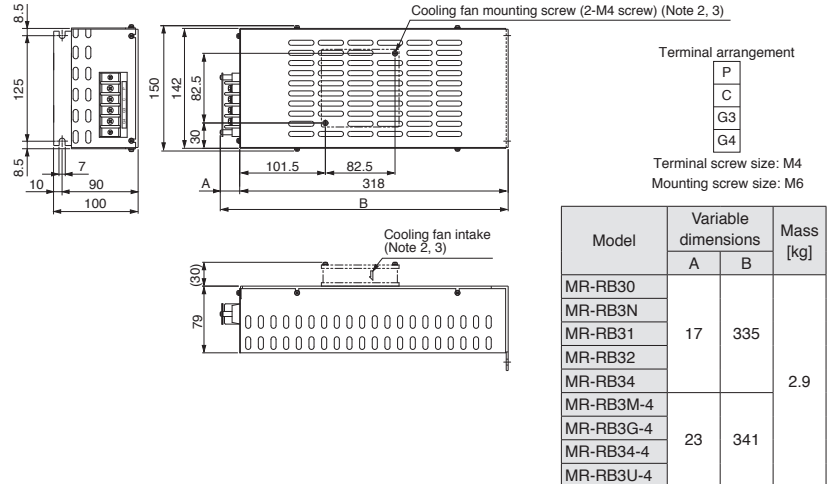
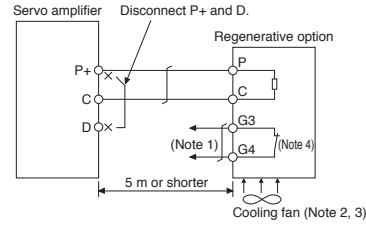
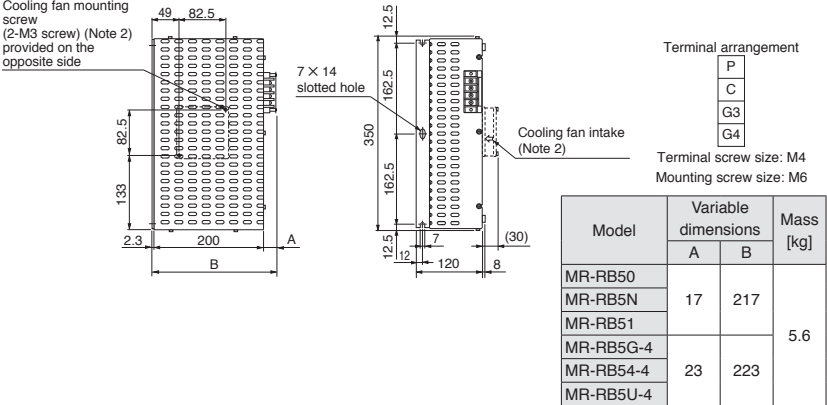
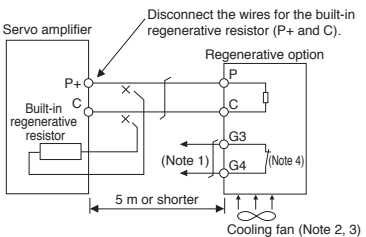
Notes: 1. Create a sequence circuit that turns off the magnetic contactor when abnormal overheating occurs.

2. G3 and G4 terminals are thermal sensor. G3-G4 opens when the regenerative option overheats abnormally.

3. The wire size shows wiring specification of the connector. Refer to "Wires, Molded-Case Circuit Breakers and Magnetic Contactors" in this catalog for examples of wire size selection.

Regenerative Option

B B-RJ WB B-RJ010 A A-RJ

Dimensions	[Unit: mm]	Connections																									
<div>MR-RB30, MR-RB3N, MR-RB31, MR-RB32, MR-RB34 (for 200 V) MR-RB3M-4, MR-RB3G-4, MR-RB34-4, MR-RB3U-4 (for 400 V)</div> <div></div> <div><table><tr><th rowspan="2">Model</th><th colspan="2">Variable dimensions</th><th rowspan="2">Mass [kg]</th></tr><tr><th>A</th><th>B</th></tr><tr><td>MR-RB30</td><td rowspan="4">17</td><td rowspan="4">335</td><td rowspan="4">2.9</td></tr><tr><td>MR-RB3N</td></tr><tr><td>MR-RB31</td></tr><tr><td>MR-RB32</td></tr><tr><td>MR-RB34</td><td rowspan="4">23</td><td rowspan="4">341</td><td rowspan="4"></td></tr><tr><td>MR-RB3M-4</td></tr><tr><td>MR-RB3G-4</td></tr><tr><td>MR-RB34-4</td></tr><tr><td>MR-RB3U-4</td><td></td><td></td><td></td></tr></table></div>			Model	Variable dimensions		Mass [kg]	A	B	MR-RB30	17	335	2.9	MR-RB3N	MR-RB31	MR-RB32	MR-RB34	23	341		MR-RB3M-4	MR-RB3G-4	MR-RB34-4	MR-RB3U-4				<div>For MR-J4-500B/A or smaller, MR-J4-350B4/A4 or smaller, and MR-J4W_-B</div> <div></div>
Model	Variable dimensions			Mass [kg]																							
	A	B																									
MR-RB30	17	335	2.9																								
MR-RB3N																											
MR-RB31																											
MR-RB32																											
MR-RB34	23	341																									
MR-RB3M-4																											
MR-RB3G-4																											
MR-RB34-4																											
MR-RB3U-4																											
<div>MR-RB50, MR-RB5N, MR-RB51 (for 200 V) MR-RB5G-4, MR-RB54-4, MR-RB5U-4 (for 400 V)</div> <div></div> <div><table><tr><th rowspan="2">Model</th><th colspan="2">Variable dimensions</th><th rowspan="2">Mass [kg]</th></tr><tr><th>A</th><th>B</th></tr><tr><td>MR-RB50</td><td rowspan="3">17</td><td rowspan="3">217</td><td rowspan="3">5.6</td></tr><tr><td>MR-RB5N</td></tr><tr><td>MR-RB51</td></tr><tr><td>MR-RB5G-4</td><td rowspan="3">23</td><td rowspan="3">223</td><td rowspan="3"></td></tr><tr><td>MR-RB54-4</td></tr><tr><td>MR-RB5U-4</td></tr></table></div>			Model	Variable dimensions		Mass [kg]	A	B	MR-RB50	17	217	5.6	MR-RB5N	MR-RB51	MR-RB5G-4	23	223		MR-RB54-4	MR-RB5U-4	<div>For MR-J4-500B4/A4 and MR-J4-700B(4)/A(4)</div> <div></div>						
Model	Variable dimensions			Mass [kg]																							
	A	B																									
MR-RB50	17	217	5.6																								
MR-RB5N																											
MR-RB51																											
MR-RB5G-4	23	223																									
MR-RB54-4																											
MR-RB5U-4																											

Notes: 1. Create a sequence circuit that turns off the magnetic contactor when abnormal overheating occurs.

2. When using MR-RB3M-4, MR-RB3G-4, MR-RB34-4, MR-RB3U-4, MR-RB50, MR-RB5N, MR-RB51, MR-RB5G-4, MR-RB54-4, or MR-RB5U-4, cool the unit forcibly with a cooling fan (92 mm × 92 mm, minimum air flow: 1.0 m³/min). The cooling fan must be prepared by user.

3. When using MR-RB30, MR-RB3N, MR-RB31, MR-RB32, or MR-RB34, it may be necessary to cool the unit forcibly with a cooling fan (92 mm × 92 mm, minimum air flow: 1.0 m³/min), depending on the operating environment. Refer to relevant Servo Amplifier Instruction Manual for details. The cooling fan must be prepared by user.

4. G3 and G4 terminals are thermal sensor. G3-G4 opens when the regenerative option overheats abnormally.

Regenerative Option

B B-RJ B-RJ010 A A-RJ

Dimensions

[Unit: mm]

Connections

Standard accessory (Note 1)

GRZG400-0.8Ω, GRZG400-0.6Ω, GRZG400-0.5Ω (for 200 V)

GRZG400-2.5Ω, GRZG400-2Ω (for 400 V)

Model	Qty.	Tolerable regenerative power [W]	With cooling fan [W]	Resistance value [Ω]	Variable dimensions			Mass/unit [kg]
					A	C	K	
GRZG400-0.8Ω	4	500	800	3.2 (0.8 Ω × 4)	10	5.5	39	0.8
GRZG400-0.6Ω	5	850	1300	3 (0.6 Ω × 5)	16	8.2	46	
GRZG400-0.5Ω	5	850	1300	2.5 (0.5 Ω × 5)				
GRZG400-2.5Ω	4	500	800	10 (2.5 Ω × 4)	10	5.5	39	
GRZG400-2Ω	5	850	1300	10 (2 Ω × 5)				

MR-RB5R, MR-RB9F, MR-RB9T (for 200 V) (Note 1)

MR-RB5K-4, MR-RB6K-4 (for 400 V) (Note 1)

Terminal arrangement

TE1

G4 G3 C P

Terminal screw size: M5

Mounting screw size: M8

Model	Tolerable regenerative power [W]	With cooling fan [W]	Description	Mass [kg]
MR-RB5R	500	800	GRZG400-0.8Ω × 4	10
MR-RB9F	850	1300	GRZG400-0.6Ω × 5	11
MR-RB9T	850	1300	GRZG400-0.5Ω × 5	11
MR-RB5K-4	500	800	GRZG400-2.5Ω × 4	10
MR-RB6K-4	850	1300	GRZG400-2Ω × 5	11

Notes: 1. To increase the regenerative braking frequency, install cooling fans (2 units of 92 mm × 92 mm, minimum air flow: 1.0 m³/min), and then change [Pr. PA02]. The cooling fans must be prepared by user.

2. By installing a thermal sensor, create a safety circuit that shuts off the main circuit power supply when abnormal overheating occurs.

3. G3 and G4 terminals are thermal sensor. G3-G4 opens when the regenerative option overheats abnormally.

Regenerative Option

B

B-RJ

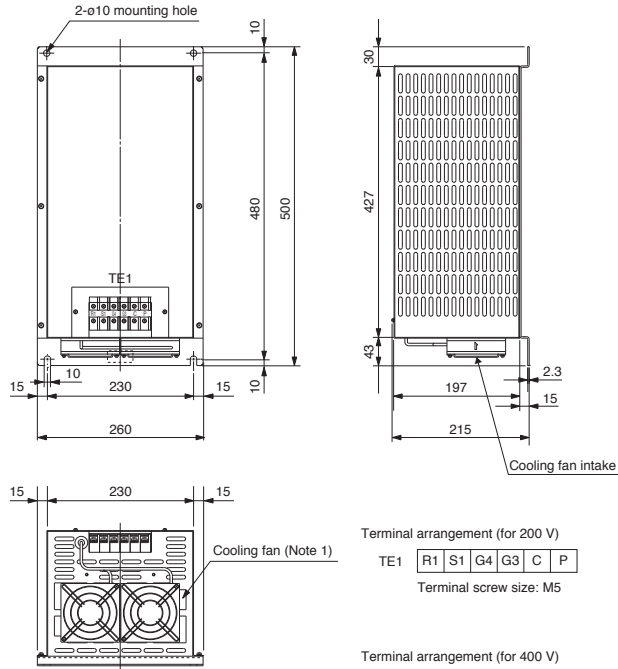
A

A-RJ

Dimensions

[Unit: mm]

MR-RB139, MR-RB137 (for 200 V)
MR-RB137-4, MR-RB13V-4 (for 400 V)



Terminal arrangement (for 200 V)

TE1 R1 S1 G4 G3 C P

Terminal screw size: M5

Terminal arrangement (for 400 V)

TE1 R400 S400 G4 G3 C P

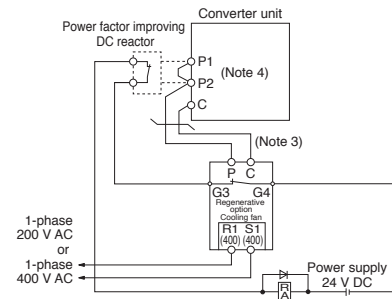
Terminal screw size: M5

Mounting screw size: M8

Model	Tolerable regenerative power [W]	Mass [kg]
MR-RB139	1300	10
MR-RB137	3900 (Three units are required.) (Note 2)	11
MR-RB137-4	1300	10
MR-RB13V-4	3900 (Three units are required.) (Note 2)	11

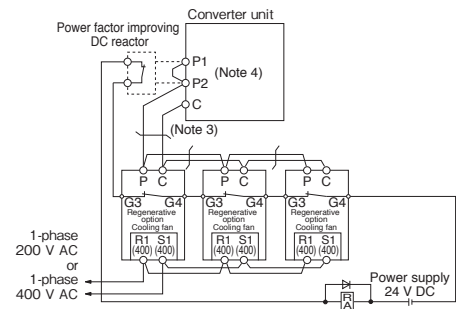
Connections

MR-RB139, MR-RB137-4



Create an external sequence circuit which opens the contact of the converter unit main circuit contactor when overheating causes the thermal sensor contact (normally closed) in the regenerative option open.

MR-RB137, MR-RB13V-4



Create an external sequence circuit which opens the contact of the converter unit main circuit contactor when overheating causes the thermal sensor contact (normally closed) in the regenerative option open.

- Notes: 1. One unit of cooling fan is attached for MR-RB137-4 and MR-RB13V-4.
2. Three units of MR-RB137 or MR-RB13V-4 are required per converter unit.
3. Connect the regenerative option to the converter unit, and keep the total length of the wiring within 5 m.
4. Disconnect a short-circuit bar between P1 and P2 when using the power factor improving DC reactor.



Power Regeneration Common Converter (FR-CV, FR-CV-H)

B B-RJ B-RJ010 A A-RJ

FR-CV power regeneration common converter is suitable for 200 V class servo amplifiers ranged from 100 W to 22 kW, and FR-CV-H for 400 V class servo amplifiers ranged from 11 kW to 22 kW.

200 V class

Power regeneration common converter			FR-CV-	7.5K	11K	15K	22K	30K	37K	55K
Capacity			[kW]	7.5	11	15	22	30	37	55
Maximum number of connectable servo amplifiers				6						
Total capacity of connectable servo amplifiers			[kW]	3.75	5.5	7.5	11	15	18.5	27.5
Maximum servo amplifier capacity			[kW]	3.5	5	7	11	15	15	22
Output	Total rated current of connectable servo motors		[A]	33	46	61	90	115	145	215
	Regenerative braking torque	Short-time rating	Total capacity of applicable servo motors, 300% torque, 60 s ^(Note 1)							
		Continuous rating									100% Torque
Power supply	Rated input AC voltage/frequency		3-phase 200 V AC to 220 V AC, 50 Hz, or 3-phase 200 V AC to 230 V AC, 60 Hz							
	Permissible AC voltage fluctuation		3-phase 170 V AC to 242 V AC, 50 Hz, or 3-phase 170 V AC to 253 V AC, 60 Hz							
	Permissible frequency fluctuation		±5%							
	Power supply capacity ^(Note 2)		[kVA]	17	20	28	41	52	66	100
IP rating (JEM 1030), cooling method				Open type (IP00), forced cooling						
Environment	Ambient temperature		-10 °C to 50 °C (non-freezing)							
	Ambient humidity		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							
Molded-case circuit breaker or earth-leakage current breaker				30AF 30A	50AF 50A	100AF 75A	100AF 100A	125AF 125A	125AF 125A	225AF 175A
Magnetic contactor				S-N20	S-N35	S-N50	S-N65	S-N80	S-N95	S-N125

400 V class

Power regeneration common converter			FR-CV-H	22K	30K	37K	55K
Capacity [kW]			22	30	37	55	
Maximum number of connectable servo amplifiers			1			2	
Total capacity of connectable servo amplifiers [kW]			11	15	18.5	27.5	
Maximum servo amplifier capacity [kW]			11	15	15	22	
Output	Total rated current of connectable servo motors [A]		43	57	71	110	
	Regenerative braking torque	Short-time rating	Total capacity of applicable servo motors, 300% torque, 60 s ^(Note 1)				
		Continuous rating	100% Torque				
Power supply	Rated input AC voltage/frequency		3-phase 380 V AC to 480 V AC, 50 Hz/60 Hz				
	Permissible AC voltage fluctuation		3-phase 323 V AC to 528 V AC, 50 Hz/60 Hz				
	Permissible frequency fluctuation		±5%				
	Power supply capacity ^(Note 2) [kVA]		41	52	66	100	
IP rating (JEM 1030), cooling method			Open type (IP00), forced cooling				
Environment	Ambient temperature		-10 °C to 50 °C (non-freezing)				
	Ambient humidity		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				
Molded-case circuit breaker or earth-leakage current breaker			50AF 50A	60AF 60A	100AF 75A	100AF 100A	
Magnetic contactor			S-N25	S-N35	S-N50	S-N65	

Notes: 1. This is a time for the protective function of FR-CV-(H) to activate. Refer to relevant Servo Amplifier Instruction Manual for the time for the protective function of the servo amplifier to activate.

2. The mentioned value is a power supply capacity for FR-CV-(H). The actually required capacity depends on the sum of the power supply capacities for the servo amplifiers connected.

* Cautions when selecting the power regeneration common converter

- Capacity of FR-CV-(H) [W] ≥ Total rated capacity of servo amplifiers connected to FR-CV-(H) [W] × 2
- Keep the total rated current of the servo motors to be used equal to or below the applicable current [A] of FR-CV-(H).
- The number of the servo amplifiers and the total capacities for the servo amplifiers to be connected must be equal to or lower than the mentioned values in the specifications.

Power Regeneration Common Converter (FR-CV, FR-CV-H)

B

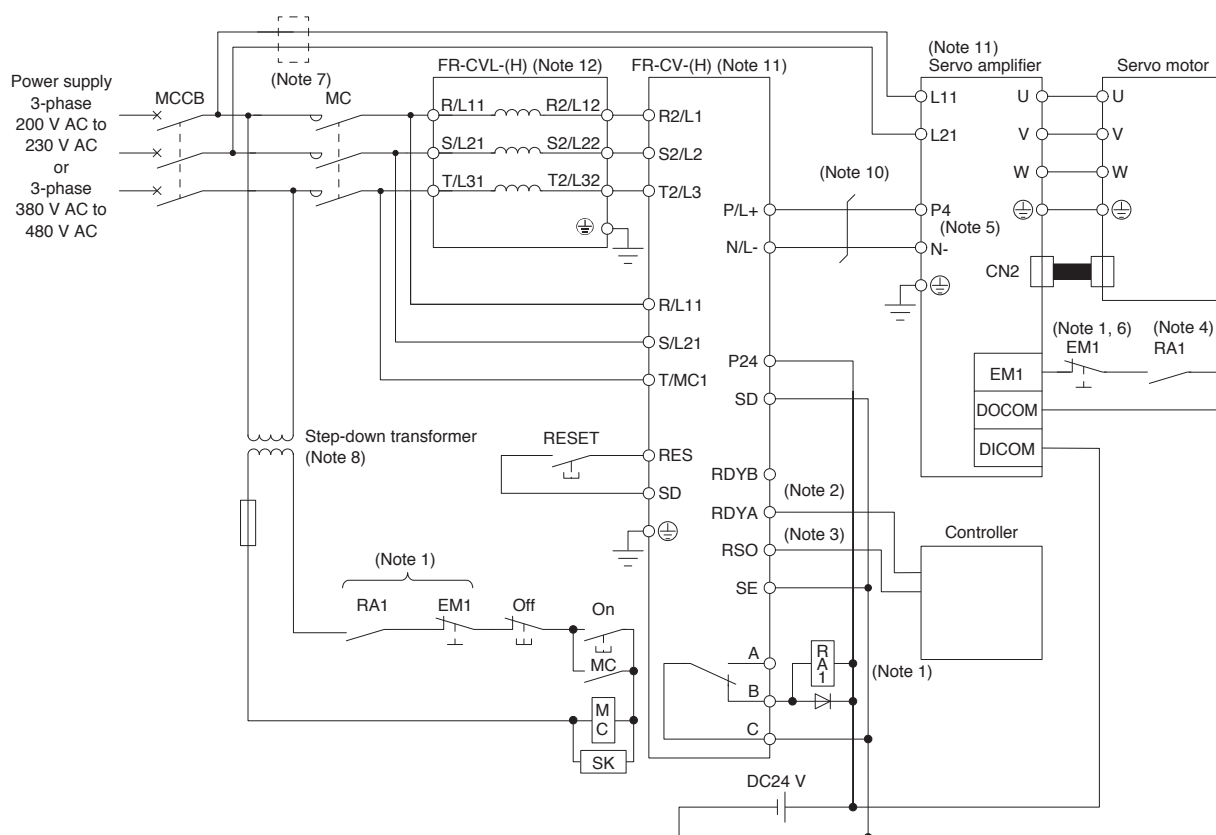
B-RJ

B-RJ010

A

A-RJ

Connection example (Note 9)



Notes: 1. Create a sequence that shuts off the main circuit power when either:

An alarm occurs on FR-CV(H) or the servo amplifier, or
EM1 (Forced stop 1) is validated.

2. For the servo amplifier, create a sequence that switches the servo-on after FR-CV(H) is ready.

3. RSO signal turns off when FR-CV(H) is ready to run after the reset signal is input to FR-CV(H). Create a sequence that makes the servo inoperative when the RSO signal is on.

4. Create a sequence that stops the servo motor with the emergency stop input to the servo system controller when an alarm occurs on FR-CV(H). When the emergency stop input is not available in the servo system controller, stop the servo motor with the forced stop input to the servo amplifier as shown in the diagram.

5. Disconnect the short-circuit bar between P3 and P4 when using FR-CV(H).

6. Set [Pr. PA04] to "0 0 _" to enable EM1 (Forced stop 1).

7. When wires used for L11 and L21 are thinner than those for L1, L2, and L3, use a molded-case circuit breaker.

8. When FR-CV-H is used, a step-down transformer is required if coil voltage of the magnetic contactor is in 200 V class.

9. Refer to relevant Servo Amplifier Instruction Manual for the examples of selecting wire sizes.

10. Use twisted wires for connecting the DC power supply between FR-CV(H) and the servo amplifiers, and keep the wire length to a maximum of 5 m.

11. Inputs/outputs (main circuit) of FR-CV(H) and the servo amplifier include high frequency components, and they may interfere with peripheral communication devices.

In this case, the interference can be reduced by installing radio noise filter (FR-BIF or FR-BIF-H) or line noise filter (FR-BSF01 or FR-BLF).

12. When using FR-CV(H), be sure to use a dedicated stand-alone reactor (FR-CVL or FR-CVL-H). Do not use a power factor improving AC reactor (FR-HAL or FR-HAL-H) or a power factor improving DC reactor (FR-HEL or FR-HEL-H) with FR-CV(H).

Power regeneration common converter	Dedicated stand-alone reactor
FR-CV-7.5K(-AT)	FR-CVL-7.5K
FR-CV-11K(-AT)	FR-CVL-11K
FR-CV-15K(-AT)	FR-CVL-15K
FR-CV-22K(-AT)	FR-CVL-22K
FR-CV-30K(-AT)	FR-CVL-30K
FR-CV-37K	FR-CVL-37K
FR-CV-55K	FR-CVL-55K

Power regeneration common converter	Dedicated stand-alone reactor
FR-CV-H22K(-AT)	FR-CVL-H22K
FR-CV-H30K(-AT)	FR-CVL-H30K
FR-CV-H37K	FR-CVL-H37K
FR-CV-H55K	FR-CVL-H55K

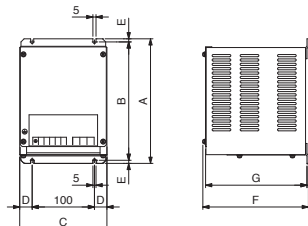
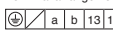
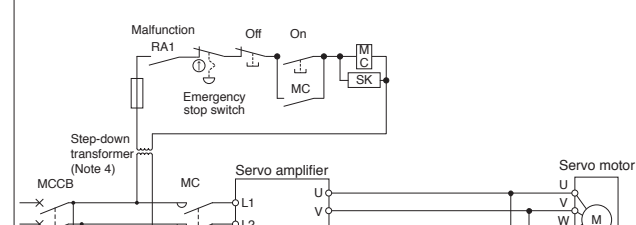
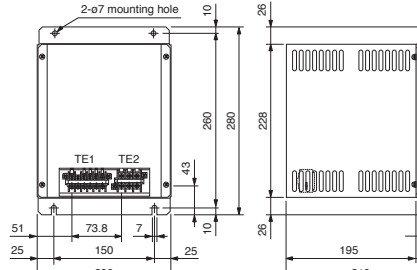
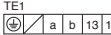
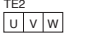
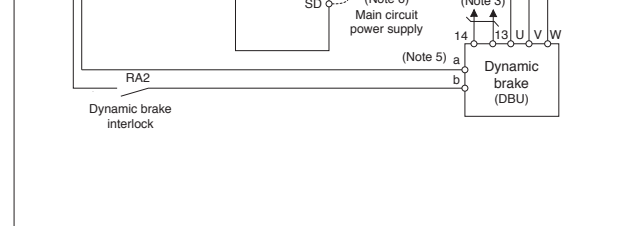
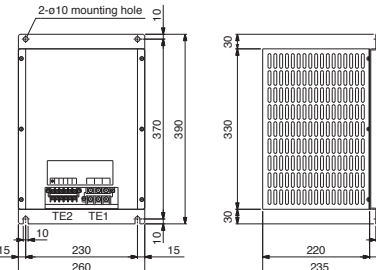
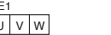
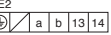
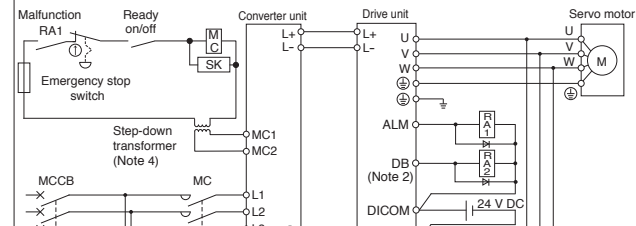
Dynamic Brake

Use the following optional external dynamic brake with the 11 kW or larger servo amplifiers.

Without the external dynamic brake, a servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system when not using the dynamic brake.

Servo amplifier model	Dynamic brake model	Fig.
MR-J4-11KB/A	DBU-11K	A
MR-J4-15KB/A	DBU-15K	
MR-J4-22KB/A	DBU-22K-R1	
MR-J4-11KB4/A4	DBU-11K-4	B
MR-J4-15KB4/A4	DBU-22K-4	
MR-J4-22KB4/A4		

Drive unit model	Dynamic brake model	Fig.
MR-J4-DU30KB/A	DBU-37K-R1	C
MR-J4-DU37KB/A		
MR-J4-DU30KB4/A4	DBU-55K-4-R5	
MR-J4-DU37KB4/A4		
MR-J4-DU45KB4/A4		
MR-J4-DU55KB4/A4		

Dimensions		[Unit: mm]	Connections																																												
A	 <p>Terminal arrangement  Screw size: M3.5 Screw size: M4 Mounting screw size: M4</p>																																														
	<table> <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]</th><th colspan="2">Wire size [mm²] (Note 1)</th></tr> <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</td><td>5.5</td><td>2</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</td><td>(AWG 10)</td><td>(AWG 14)</td></tr> <tr> <td>DBU-22K-R1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>		Model	A	B	C	D	E	F	G	Mass [kg]	Wire size [mm ²] (Note 1)		DBU-11K	200	190	140	20	5	170	163.5	2	5.5	2	DBU-15K	250	238	150	25	6	235	228	6	(AWG 10)	(AWG 14)	DBU-22K-R1											
Model	A	B	C	D	E	F	G	Mass [kg]	Wire size [mm ²] (Note 1)																																						
DBU-11K	200	190	140	20	5	170	163.5	2	5.5	2																																					
DBU-15K	250	238	150	25	6	235	228	6	(AWG 10)	(AWG 14)																																					
DBU-22K-R1																																															
B	 <p>TE1  Screw size: M3.5 TE2  Screw size: M4 Mounting screw size: M6</p>																																														
	<table> <tr> <th>Model</th><th>Mass [kg]</th><th colspan="2">Wire size [mm²] (Note 1)</th></tr> <tr> <td>DBU-11K-4</td><td rowspan="2">6.7</td><td rowspan="4">5.5 (AWG 10)</td><td rowspan="2">2 (AWG 14)</td></tr> <tr> <td>DBU-22K-4</td></tr> </table>		Model	Mass [kg]	Wire size [mm ²] (Note 1)		DBU-11K-4	6.7	5.5 (AWG 10)	2 (AWG 14)	DBU-22K-4																																				
Model	Mass [kg]	Wire size [mm ²] (Note 1)																																													
DBU-11K-4	6.7	5.5 (AWG 10)	2 (AWG 14)																																												
DBU-22K-4																																															
C	 <p>TE1  Screw size: M5 TE2  Screw size: M3.5 Mounting screw size: M8</p>																																														
	<table> <tr> <th>Model</th><th>Mass [kg]</th><th colspan="2">Wire size [mm²] (Note 1)</th></tr> <tr> <td>DBU-37K-R1</td><td>8</td><td>14</td><td>2</td></tr> <tr> <td>DBU-55K-4-R5</td><td>11</td><td>(AWG 6)</td><td>(AWG 14)</td></tr> </table>		Model	Mass [kg]	Wire size [mm ²] (Note 1)		DBU-37K-R1	8	14	2	DBU-55K-4-R5	11	(AWG 6)	(AWG 14)																																	
Model	Mass [kg]	Wire size [mm ²] (Note 1)																																													
DBU-37K-R1	8	14	2																																												
DBU-55K-4-R5	11	(AWG 6)	(AWG 14)																																												

Notes: 1. The wire size is applicable when 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wires) is used.

2. Validate DB (Dynamic brake interlock) by [Pr. PD07] to [Pr. PD09] for MR-J4-B/MR-J4-B4/MR-J4-DU_B/MR-J4-DU_B4.

3. The terminals 13 and 14 are normally opened outputs. If the dynamic brake is welded, the terminals 13 and 14 will be opened. Thus, create an external sequence circuit that SON (Servo-on) does not turn on when the terminals 13 and 14 are opened.

4. A step-down transformer is required if the servo amplifier is in 400 V class, and coil voltage of the magnetic contactor is in 200 V class.

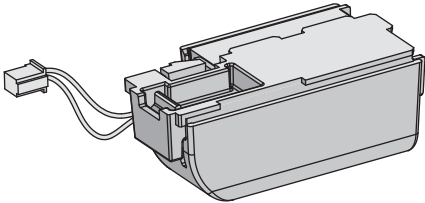
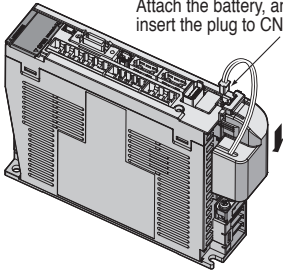
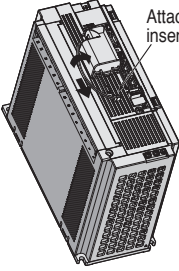
5. When using DBU-11K-4 or DBU-22K-4, the power supply voltage must be between 1-phase 380 V AC and 463 V AC, 50 Hz/60 Hz. Refer to relevant Servo Amplifier Instruction Manual for details.

6. Create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.

Battery (MR-BAT6V1SET) (Note 1)**B****B-RJ****B-RJ010****A****A-RJ**

The absolute position data can be retained by mounting the battery on the 1-axis servo amplifier. MR-BAT6V1SET is reusable by replacing the built-in MR-BAT6V1 batteries.

MR-BAT6V1SET is not required for the linear servo motor system or the incremental system.

Appearance	Mounting method	
 <p>Model: MR-BAT6V1SET Nominal voltage: 6 V Nominal capacity: 1650 mAh Lithium content: 1.2 g Primary battery: 2CR17335A Mass: 55 g</p>	For 200 V, 3.5 kW or smaller 100 V, 0.4 kW or smaller, and 400 V, 2 kW or smaller	For 200 V, 5 kW or larger, and 400 V, 3.5 kW or larger
	 <p>Attach the battery, and then insert the plug to CN4 connector.</p>	 <p>Attach the battery, and then insert the plug to CN4 connector.</p>

* MR-J3BAT battery cannot be used because of the difference in voltage.

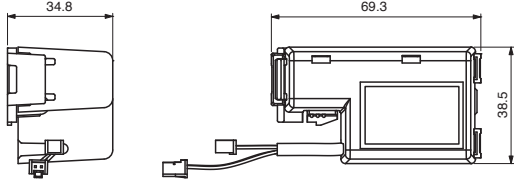
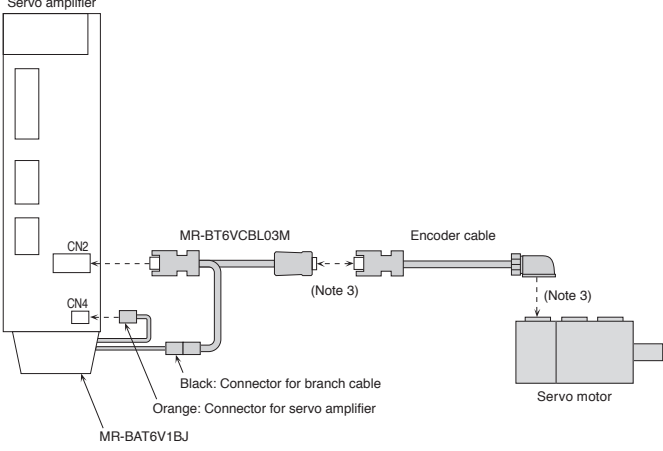
Notes: 1. MR-BAT6V1SET is an assembled battery composed of lithium metal batteries of CR17335A. This battery is not subject to the dangerous goods (Class 9) of the UN Recommendations. To transport lithium metal batteries and lithium metal batteries contained in equipment by means of transport subject to the UN Recommendations, take actions to comply with the following regulations: the United Nations Recommendations on the Transport of Dangerous Goods, the Technical Instruction (ICAO-TI) by the International Civil Aviation Organization (ICAO), and the International Maritime Dangerous Goods Code (IMDG Code) by the International Maritime Organization (IMO). To transport the batteries, check the latest standards or the laws of the destination country and take actions. Contact your local sales office for more details.

Battery for Junction Battery Cable (MR-BAT6V1BJ) (Note 1)**B****B-RJ****B-RJ010****A****A-RJ****Junction Battery Cable (MR-BT6VCBL03M)**

Use these battery and junction battery cable when the absolute position data needs to be retained while the servo amplifier and the servo motor are disconnected for shipping. The servo motor does not have a super capacitor (for holding an absolute position data for a short period) in the encoder. When MR-BAT6V1BJ and MR-BT6VCBL03M are used together, the absolute position data can be held even when the servo amplifier is disconnected from the servo motor. These battery and cable are compatible with the 1-axis servo amplifier used with HG servo motor series (Note 2).

When purchasing MR-BAT6V1BJ for the first time, please purchase MR-BT6VCBL03M together.

The batteries built in MR-BAT6V1BJ are not replaceable.

Dimensions	Connections (Note 4)
 <p>Model: MR-BAT6V1BJ System: Electronic battery backup type Nominal voltage: 6 V Nominal capacity: 1650 mAh Primary battery: 2CR17335A Mass: 66 g</p>	 <p>Servo amplifier</p> <p>CN2</p> <p>CN4</p> <p>MR-BT6VCBL03M</p> <p>Encoder cable</p> <p>(Note 3)</p> <p>Black: Connector for branch cable</p> <p>Orange: Connector for servo amplifier</p> <p>MR-BAT6V1BJ</p> <p>Servo motor</p> <p>(Note 3)</p>

Notes: 1. MR-BAT6V1BJ is an assembled battery composed of lithium metal batteries of CR17335A. This battery is not subject to the dangerous goods (Class 9) of the UN Recommendations. To transport lithium metal batteries and lithium metal batteries contained in equipment by means of transport subject to the UN Recommendations, take actions to comply with the following regulations: the United Nations Recommendations on the Transport of Dangerous Goods, the Technical Instruction (ICAO-TI) by the International Civil Aviation Organization (ICAO), and the International Maritime Dangerous Goods Code (IMDG Code) by the International Maritime Organization (IMO). To transport the batteries, check the latest standards or the laws of the destination country and take actions. Contact your local sales office for more details.

2. These battery and cable will be compatible with the direct drive motors in the future.

3. To hold the absolute position data, keep the connections from the battery to the encoder. Connections to CN2 and CN4 connectors can be disconnected.

4. Start up the absolute position detection system after MR-BAT6V1BJ and MR-BT6VCBL03M are connected.

Battery Case (MR-BT6VCASE), Battery (MR-BAT6V1) (Note 1)**B****B-RJ****WB****B-RJ010****A****A-RJ**

Absolute position data of up to eight axes of the servo motors can be retained by using the battery case and the batteries. When the direct drive motors are used, the total number of axes connected to the direct drive motors must be four or less. Refer to the following table for the connectable number of the each servo motor. The rotary servo motors and the direct drive servo motors used in incremental system, and the rotary servo motors and the synchronous encoders used for load side in the fully closed loop control system are also included in the number of the connectable axes. The linear servo motors are not included in the number of the connectable axes. This battery case is also usable in a system having MR-J4- _B_ (-RJ) and MR-J4W_ _B servo amplifiers in combination. The case stores five batteries by connecting to the connectors. The batteries are not included in the battery case. Please purchase the batteries separately.

Servo motor	Number of axes									
Rotary servo motor	0	1	2	3	4	5	6	7	8	
Direct drive motor	4	4	4	4	4	3	2	1	0	

Dimensions (assembled)	[Unit: mm]	MR-BAT6V1
<p>25 130 70 130 4.6 5 2-φ5 mounting hole 5 120 5</p> <p>MR-BT6V1CBL_M (optional)</p> <p>Mounting screw size: M4</p> <p>Mass: 0.18 kg</p>		<p>Model: MR-BAT6V1 Nominal voltage: 6 V Nominal capacity: 1650 mAh Lithium content: 1.2 g Primary battery: 2CR17335A Mass: 34 g</p>

Notes: 1. MR-BAT6V1 is an assembled battery composed of lithium metal batteries of CR17335A. This battery is not subject to the dangerous goods (Class 9) of the UN Recommendations. To transport lithium metal batteries and lithium metal batteries contained in equipment by means of transport subject to the UN Recommendations, take actions to comply with the following regulations: the United Nations Recommendations on the Transport of Dangerous Goods, the Technical Instruction (ICAO-TI) by the International Civil Aviation Organization (ICAO), and the International Maritime Dangerous Goods Code (IMDG Code) by the International Maritime Organization (IMO). To transport the batteries, check the latest standards or the laws of the destination country and take actions. Contact your local sales office for more details.

Connections	
<p>For connecting to one unit of servo amplifier</p> <p>Servo amplifier</p> <p>MR-BT6VCASE</p> <p>MR-BT6V1CBL_M (Note 1)</p>	<p>For connecting up to eight servo amplifier axes</p> <p>Servo amplifier</p> <p>Servo amplifier</p> <p>Servo amplifier</p> <p>MR-BT6VCASE</p> <p>MR-BT6V1CBL_M (Note 1)</p> <p>MR-BT6V2CBL_M (Note 1)</p> <p>MR-BT6V2CBL_M (Note 1)</p>

Notes: 1. This is an optional cable. Refer to "Cables and Connectors for Servo Amplifiers" in this catalog.

Absolute Position Storage Unit (MR-BTAS01)

B

B-RJ

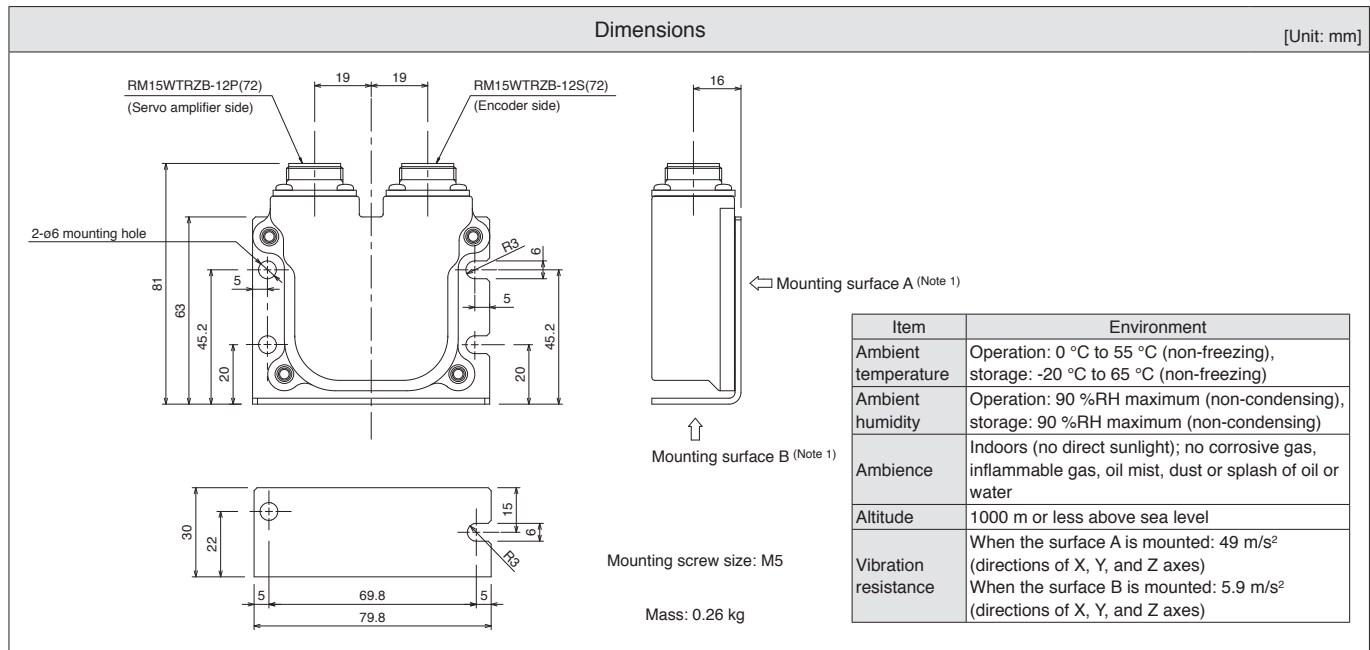
WB

A

A-RJ

This absolute position storage unit is required for configuring absolute position detection system using the direct drive motor.

This unit is not required when the servo system is used in incremental method.



Notes: 1. When mounting the absolute position storage unit outside a cabinet, be sure to mount the surface A with 4 screws. When mounting the unit inside a cabinet, mounting the surface B with 2 screws is also possible.

Heat Sink Outside Mounting Attachment (MR-J4ACN15K, MR-J3ACN)

B

B-RJ

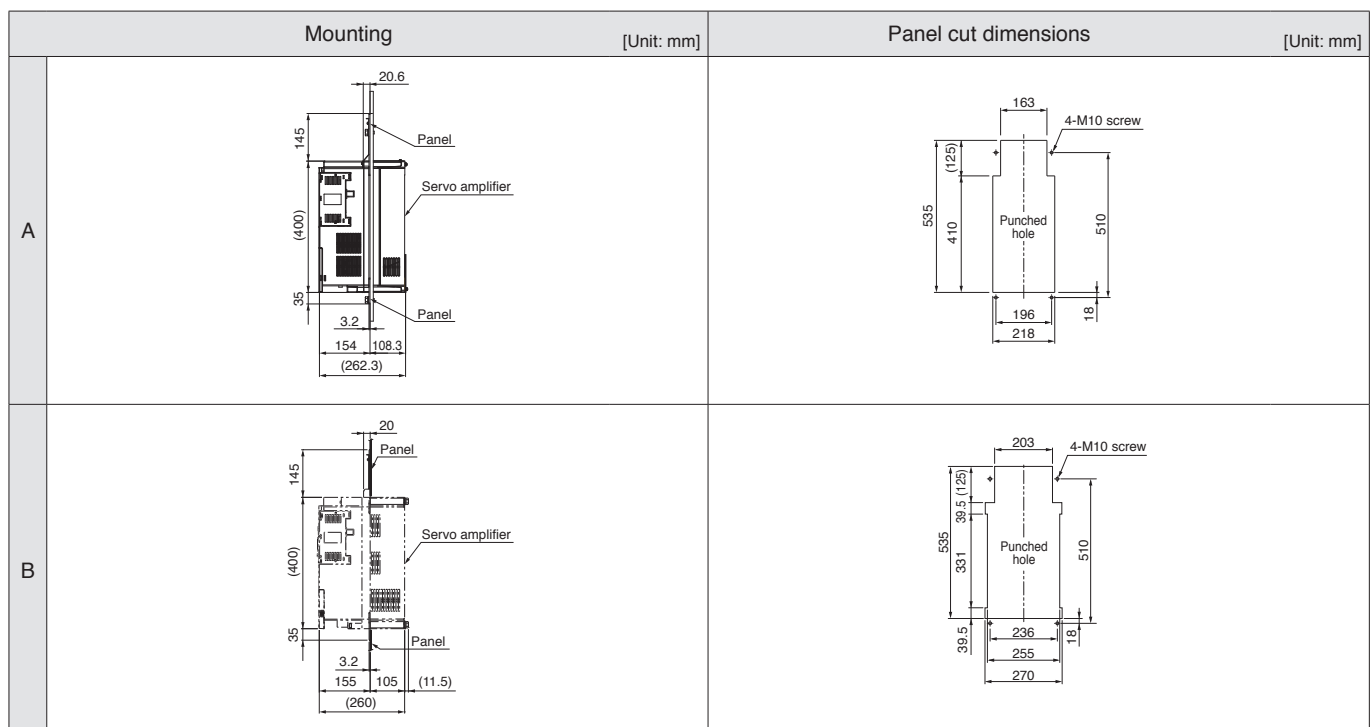
B-RJ010

A

A-RJ

By using the heat sink outside mounting attachment on the servo amplifier of 11 kW to 22 kW, the heat generating section can be mounted outside a cabinet, enabling to dissipate about 50% of the heat from the unit to outside the cabinet. This allows smaller cabinet size.

Servo amplifier model	Heat sink outside mounting attachment model	Fig.
MR-J4-11KB/A, /MR-J4-11KB4/A4 MR-J4-15KB/A, /MR-J4-15KB4/A4	MR-J4ACN15K	A
MR-J4-22KB/A, MR-J4-22KB4/A4	MR-J3ACN	B



Junction Terminal Block (MR-TB26A)

Connect all signals via the junction terminal block.

Dimensions (Note 1)		[Unit: mm]

Notes: 1. The lengths in brackets apply when the junction terminal block is mounted on a 35 mm wide DIN rail.

Junction Terminal Block (MR-TB50)

Connect all signals via the junction terminal block.

Dimensions		[Unit: mm]

Manual Pulse Generator (MR-HDP01)

Dimensions		[Unit: mm]	Mounting		[Unit: mm]

Parameter unit (MR-PRU03)

A

A-RJ

Parameter unit with a 16 characters × 4 lines display, is available as an option.

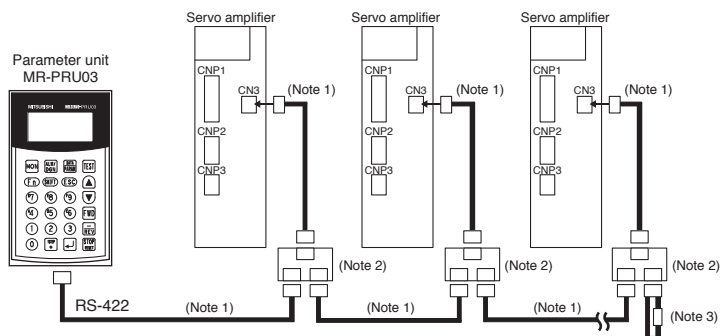
The parameter unit ^(Note 1) connected with servo amplifiers enables setting of point table data ^(Note 2) and parameters, and test operation without MR Configurator2.

Notes: 1. Use MR-PRU03 with software version B0 or later.
2. Programs cannot be edited with the parameter unit.

Wiring and communication method

- RS-422 communication method
- Connectable with one unit of the servo amplifier with the commercial LAN cable
- Connectable up to 32 axes with multi-drop system

Dimensions

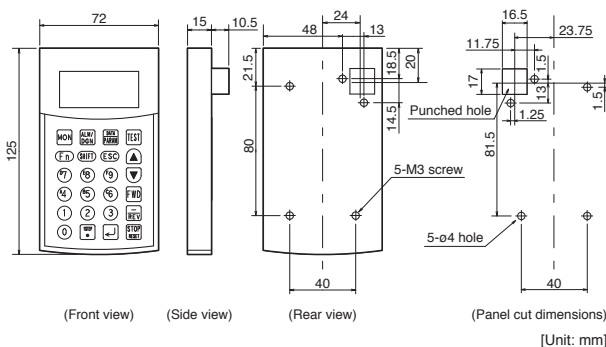


Notes: 1. Use 10BASE-T cable (EIA568 compliant), etc.

Keep the distance between the branch connector and servo amplifier as short as possible.

2. Branch connector, BMJ-8 (HACHIHO ELECTRIC CO., LTD) is recommended. Refer to "Ordering Information for Customers" in this catalog.

3. Connect a 150 Ω termination resistor.



Specifications

Item		Description
Model		MR-PRU03
Power supply		Receives power from the servo amplifier
Functions	Parameter mode	Basic setting parameters, gain/filter parameters, extension setting parameters, I/O setting parameters, extension setting 2 parameters, extension setting 3 parameters, option setting parameters, special setting parameters, linear/DD motor setting parameters, positioning control parameters
	Monitor mode	Cumulative feedback pulses, rotary servo motor/linear servo motor speed, droop pulses, cumulative command pulses, command pulse frequency, analog speed command voltage/analog speed limit voltage, analog torque limit voltage/analog torque command voltage, regenerative load ratio, effective load ratio, peak load ratio, instantaneous torque, position within one-revolution, ABS counter, load to motor inertia ratio, bus voltage, load-side encoder cumulative feedback pulses, load-side encoder droop pulses, load-side encoder information 1, load-side encoder information 2, servo motor thermistor temperature, cumulative feedback pulses (unit of motor side), electrical angle, motor-side/load-side position deviation, motor-side/load-side speed deviation, encoder inside temperature, settling time, oscillation detection frequency, the number of tough drive operations, unit power consumption, unit total power consumption, current position, command position, command remaining distance, point table No./program No./station position No., step No., override voltage, override level
	Diagnosis mode	External I/O (DIDO) display, software version, Automatic VC offset, servo motor information, cumulative power-on
	Alarm mode	Current alarm, alarm history
	Test operation mode	JOG operation, positioning operation, forced digital output (DO), single-step feed
	Point table mode	Position data, servo motor speed, acceleration/deceleration time constants, dwell, sub function, M code
Display		LCD system (16 characters × 4 lines)
Environment	Ambient temperature in operation	-10 °C to 55 °C (non-freezing)
	Ambient humidity in operation	90 %RH maximum (non-condensing)
	Storage temperature	-20 °C to 65 °C (non-freezing)
	Storage humidity	90 %RH maximum (non-condensing)
	Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust
Mass		[g] 130

Radio Noise Filter (FR-BIF, FR-BIF-H)

B B-RJ WB B-RJ010 A A-RJ

This filter effectively controls noise emitted from the power supply side of the servo amplifier and is especially effective for radio frequency bands 10 MHz or lower. The FR-BIF(-H) is designed for the input only.

Dimensions [Unit: mm]	Connections
<p>White Red Blue Green Approx. 300 29 58 42 Leakage current: 4 mA ø5 hole 29 44 7</p>	<p>The FR-BIF(-H) is designed to be connected with the input only. Wiring should be as short as possible. Grounding is required. Be sure to insulate the unused wire when using FR-BIF with 1-phase power.</p> <p>For 3.5 kW or smaller 1-axis servo amplifiers, and multi-axis servo amplifiers</p> <p>For 5 kW or larger 1-axis servo amplifiers</p> <p>200 V /100 V class: FR-BIF 400 V class: FR-BIF-H</p>

Line Noise Filter (FR-BSF01, FR-BLF)

B B-RJ WB B-RJ010 A A-RJ

This filter is effective in suppressing radio noise emitted from the power supply side and the output side of the servo amplifier, and also in suppressing high-frequency leakage current (zero-phase current), especially within 0.5 MHz to 5 MHz band.

Dimensions [Unit: mm]	Connections
<p>FR-BSF01 For wire size of 3.5 mm² (AWG 12) or smaller</p> <p>FR-BLF For wire size of 5.5 mm² (AWG 10) or larger</p>	<p>Attach a line noise filter on wires of the main circuit power supply (L1, L2, and L3) of the servo amplifier, and of the motor power (U, V, and W). Pass each of the wires through the line noise filter equal times in a same direction.</p> <p>For the main circuit power supply, the effect of the filter rises as the number of passes increases, but generally four passes would be appropriate. For the servo motor power, passes must be four times or less. Do not pass the grounding wire through the filter. Otherwise, the effect of the filter is reduced.</p> <p>Wind the wires to pass through the filter as the required number of passes as shown in Fig. 1. If the wires are too thick to wind, use two or more filters to have the required number of passes as shown in Fig. 2.</p> <p>Place the line noise filters as close to the servo amplifier as possible for their best performance.</p> <p>Fig. 1</p> <p>Fig. 2</p>

Data Line Filter

B B-RJ WB B-RJ010 A A-RJ

This filter is effective in preventing noise when attached to the pulse output cable of the pulse train output controller or the motor encoder cable.

Example) ESD-SR-250 (manufactured by NEC TOKIN Corporation)
ZCAT3035-1330 (manufactured by TDK)
GRFC-13 (manufactured by Kitagawa Industries Co., Ltd.)
E04SRM563218 (manufactured by Seiwa Electric Mfg. Co. Ltd.)

Surge Killer

B B-RJ WB B-RJ010 A A-RJ

Attach surge killers to AC relays and AC valves around the servo amplifier. Attach diodes to DC relays and DC valves.

Example) Surge killer: CR-50500 (manufactured by Okaya Electric Industries Co., Ltd.)
Diode: A diode with breakdown voltage four or more times greater than the relay drive voltage, and with current capacity two or more times greater than the relay drive current.

EMC Filter

B

B-RJ

WB

B-RJ010

A

A-RJ

The following filters are recommended as a filter compliant with the EMC directive for the power supply of the servo amplifier.

Servo amplifier model	EMC filter model (Note 1, 3)	Rated current [A]	Rated voltage [V AC]	Leakage current [mA]	Mass [kg]	Fig.
MR-J4-10B/A to MR-J4-100B/A MR-J4-10B1/A1 to MR-J4-40B1/A1 MR-J4W2-22B MR-J4W3-222B	HF3010A-UN (Note 2)	10	250	5	3.5	A
MR-J4W2-44B	HF3010A-UN2 (Note 2)	10	250	5	3.5	
MR-J4-200B/A, MR-J4-350B/A MR-J4W2-77B, MR-J4W2-1010B MR-J4W3-444B	HF3030A-UN (Note 2)	30	250	5	5.5	B
MR-J4-500B/A, MR-J4-700B/A	HF3040A-UN (Note 2)	40	250	6.5	6.0	
MR-J4-11KB/A to MR-J4-22KB/A	HF3100A-UN (Note 2)	100	250	6.5	12	C
MR-J4-60B4/A4, MR-J4-100B4/A4	TF3005C-TX	5	500	5.5	6.0	D
MR-J4-200B4/A4 to MR-J4-700B4/A4	TF3020C-TX	20	500	5.5	6.0	
MR-J4-11KB4/A4	TF3030C-TX	30	500	5.5	7.5	
MR-J4-15KB4/A4	TF3040C-TX	40	500	5.5	12.5	E
MR-J4-22KB4/A4	TF3060C-TX	60	500	5.5	12.5	

Converter unit	Drive unit	EMC filter model (Note 1, 3)	Rated current [A]	Rated voltage [V AC]	Leakage current [mA]	Mass [kg]	Fig.
MR-CR55K	MR-J4-DU30KB/A MR-J4-DU37KB/A	HF3200A-UN (Note 2)	200	250	9	18	F
MR-CR55K4	MR-J4-DU30KB4/A4	TF3150C-TX	150	500	5.5	31	G
	MR-J4-DU37KB4/A4						
	MR-J4-DU45KB4/A4						
	MR-J4-DU55KB4/A4						

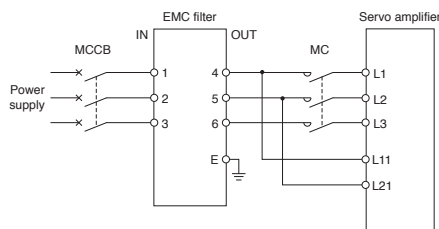
Notes: 1. Manufactured by Soshin Electric Co., Ltd.

2. A surge protector is separately required to use this EMC filter. Refer to "EMC Installation Guidelines."

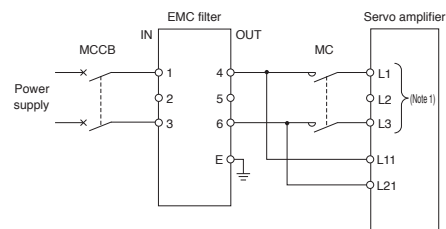
3. When using the EMC filter, install one EMC filter for each servo amplifier or converter unit.

Connections

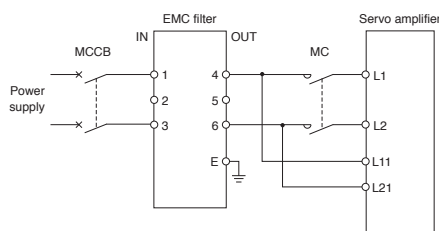
3-phase 200 V AC, 22 kW or smaller, or
3-phase 400 V AC, 22 kW or smaller



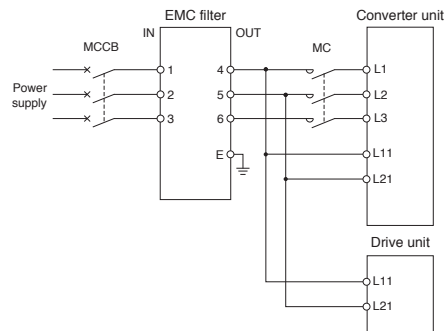
1-phase 200 V AC



1-phase 100 V AC



3-phase 200 V AC, 30 kW or larger, or
3-phase 400 V AC, 30 kW or larger



Notes: 1. Connect the power supply to L1 and L3 terminals. Do not connect anything to L2. The connections are different from MR-J3 series servo amplifiers. Be careful not to make a connection error when replacing MR-J3 with MR-J4.

EMC Filter

B

B-RJ

WB

B-RJ010

A

A-RJ

Dimensions

[Unit: mm]

<p>A</p> <p>HF3010A-UN, HF3010A-UN2</p> <p>IN (Input side) 3-M4 4-5.5×7 3-M4 OUT (Output side) 22±2 85±2 110±4 258±4 273±2 288±4 300±5 65±4 (41) M4</p>	<p>B</p> <p>HF3030A-UN, HF3040A-UN</p> <p>IN (Input side) 6-R3.25 length 8 3-M5 3-M5 OUT (Output side) 125±2 140±1 155±2 85±1 85±1 210±2 260±5 70±2 140±2 M4</p>
<p>C</p> <p>HF-3100A-UN</p> <p>IN (Input side) 2-ø6.5 × 8 3-M8 2-ø6.5 3-M8 OUT (Output side) 145±1 165±3 380±1 400±5 M6 160±3</p>	<p>D</p> <p>HF3005C-TX, HF-3020C-TX, HF3030C-TX</p> <p>IN (Input side) 6-R3.25 length 8 (For M6) 3-M4 3-M4 OUT (Output side) 3-M4 M4 16 16 (12.2) 100±1 100±1 290±2 308±5 332±5 125±2 140±1 155±2 (67.5)±3 150±2 (160) 170±5</p>
<p>E</p> <p>HF-3040C-TX, TF3060C-TX</p> <p>3-M6 IN (Input side) 8-R3.25 length 8 M4 OUT (Output side) 3-M6 22.22 (17) 100±1 100±1 100±1 390±2 412±5 438±5 145±2 160±1 175±2 (91.5) 180±2 (190) 200±5 M6</p>	<p>F</p> <p>HF3200A-UN</p> <p>IN (Input side) 3-ø6.5 length 8 3-M8 3-ø6.5 3-M10 OUT (Output side) 160±1 180±5 480±1 500±5 M8 200±5</p>
<p>G</p> <p>TF3150C-TX</p> <p>IN (Input side) 8-R 4.25 length 12 (For M8) 3-M8 3-M8 OUT (Output side) 27±1 27±1 150±1 150±1 150±1 452±5 500±3 23±1 200±2 225±1 245±3 258±3 110±2 210±2 (227) 260±3 M8 M4</p>	

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LVs/Wires

Product List

Cautions

Power Factor Improving DC Reactor (FR-HEL, FR-HEL-H, MR-DCL)

B

B-RJ

B-RJ010

A

A-RJ

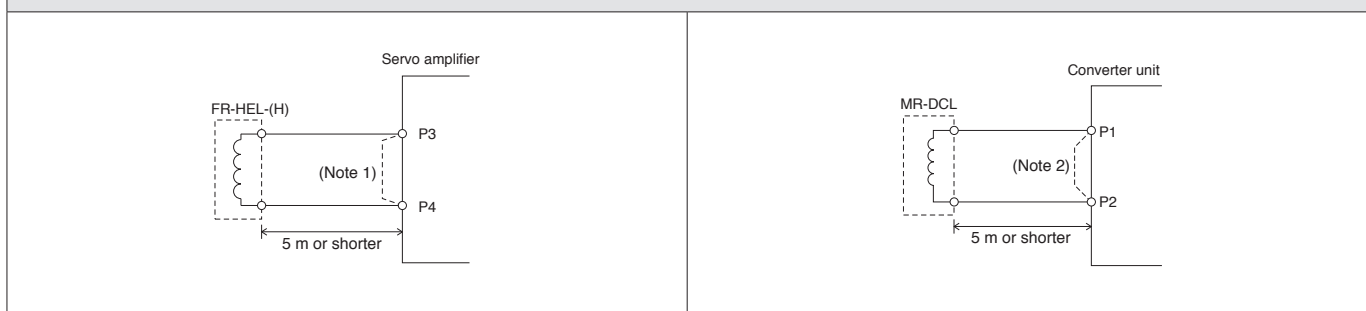
This boosts the power factor of servo amplifier and reduces the power supply capacity. Use either the DC reactor or the AC reactor. As compared to the AC reactor (FR-HAL or FR-HAL-H), the DC reactor (FR-HEL or FR-HEL-H) is more recommended since the DC reactor is more effective in power factor improvement, smaller and lighter, and its wiring is easier. (The DC reactor uses two wires, while the AC reactor uses six wires.)

Servo amplifier model	Power factor improving DC reactor model	Fig.
MR-J4-10B/A	FR-HEL-0.4K	A
MR-J4-20B/A		
MR-J4-40B/A	FR-HEL-0.75K	
MR-J4-60B/A		
MR-J4-70B/A	FR-HEL-1.5K	
MR-J4-100B/A	FR-HEL-2.2K	B
MR-J4-200B/A	FR-HEL-3.7K	
MR-J4-350B/A	FR-HEL-7.5K	
MR-J4-500B/A	FR-HEL-11K	
MR-J4-700B/A	FR-HEL-15K	
MR-J4-11KB/A	FR-HEL-22K	C
MR-J4-15KB/A	FR-HEL-30K	
MR-J4-22KB/A	FR-HEL-H1.5K	D
MR-J4-60B4/A4	FR-HEL-H2.2K	

Servo amplifier model	Power factor improving DC reactor model	Fig.
MR-J4-200B4/A4	FR-HEL-H3.7K	E
MR-J4-350B4/A4	FR-HEL-H7.5K	
MR-J4-500B4/A4	FR-HEL-H11K	
MR-J4-700B4/A4	FR-HEL-H15K	F
MR-J4-11KB4/A4	FR-HEL-H22K	
MR-J4-15KB4/A4	FR-HEL-H30K	

Converter unit model	Drive unit model	Power factor improving DC reactor model	Fig.
MR-CR55K	MR-J4-DU30KB/A	MR-DCL30K	G
	MR-J4-DU37KB/A	MR-DCL37K	
MR-CR55K4	MR-J4-DU30KB4/A4	MR-DCL30K-4	
	MR-J4-DU37KB4/A4	MR-DCL37K-4	
	MR-J4-DU45KB4/A4	MR-DCL45K-4	
	MR-J4-DU55KB4/A4	MR-DCL55K-4	

Connections



Notes: 1. Disconnect the short-circuit bar between P3 and P4 when using the DC reactor.
2. Disconnect the short-circuit bar between P1 and P2 when using the DC reactor.

Dimensions

[Unit: mm]

Model	Variable dimensions					Mass [kg]	Terminal screw size	Wire size (Note 3) [mm ²]
	W	W1	H	D	d			
FR-HEL-0.4K	70	60	71	61	M4	0.4	M4	2 (AWG 14)
FR-HEL-0.75K	85	74	81	61	M4	0.5	M4	2 (AWG 14)
FR-HEL-1.5K	85	74	81	70	M4	0.8	M4	2 (AWG 14)
FR-HEL-2.2K	85	74	81	70	M4	0.9	M4	2 (AWG 14)

Notes: 1. Use this mounting hole for grounding.
2. This indicates the maximum dimension. The dimension varies depending on the bending degree of the input/output lines.
3. The wire size is applicable when 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wires) is used.

Power Factor Improving DC Reactor (FR-HEL, FR-HEL-H)

B

B-RJ

B-RJ010

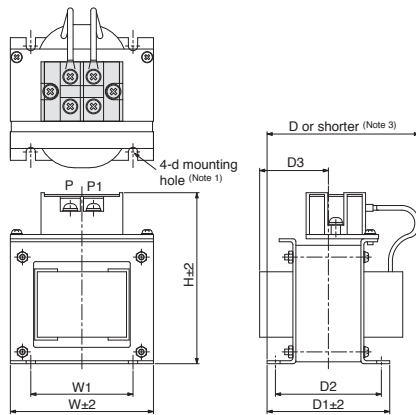
A

A-RJ

Dimensions

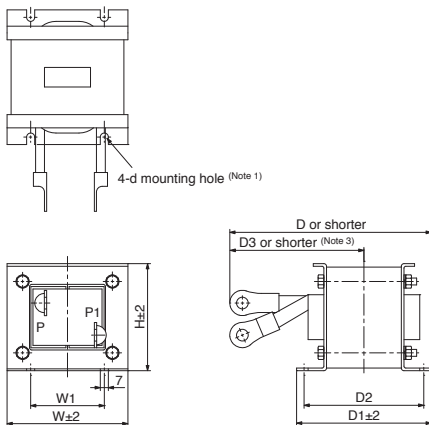
[Unit: mm]

B



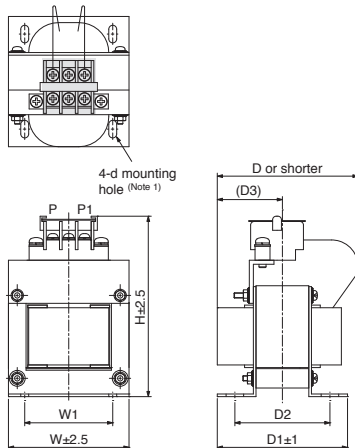
Model	Variable dimensions								Mass [kg]	Terminal screw size	Wire size (Note 4) [mm ²]
	W	W1	H	D	D1	D2	D3	d			
FR-HEL-3.7K	77	55	92	82	66	57	37	M4	1.5	M4	2 (AWG 14)
FR-HEL-7.5K	86	60	113	98	81	72	43	M4	2.5	M5	3.5 (AWG 12)
FR-HEL-11K	105	64	133	112	92	79	47	M6	3.3	M6	5.5 (AWG 10)
FR-HEL-15K	105	64	133	115	97	84	48.5	M6	4.1	M6	8 (AWG 8) 14 (AWG 6) (Note 2)

C



Model	Variable dimensions								Mass [kg]	Terminal screw size	Wire size (Note 4) [mm ²]
	W	W1	H	D	D1	D2	D3	d			
FR-HEL-22K	105	64	93	175	117	104	115	M6	5.6	M10	22 (AWG 4)
FR-HEL-30K	114	72	100	200	125	101	135	M6	7.8	M10	38 (AWG 2)

D



Model	Variable dimensions								Mass [kg]	Terminal screw size	Wire size (Note 4) [mm ²]
	W	W1	H	D	D1	D2	D3	d			
FR-HEL-H1.5K	66	50	100	80	74	54	37	M4	1.0	M3.5	2 (AWG 14)
FR-HEL-H2.2K	76	50	110	80	74	54	37	M4	1.3	M3.5	2 (AWG 14)

Notes: 1. Use this mounting hole for grounding.

2. When using FR-HEL-15K, select a wire of 8 mm² (AWG 8) for MR-J4-700B/A, and 14 mm² (AWG 6) for MR-J4-11KB/A.

3. This indicates the maximum dimension. The dimension varies depending on the bending degree of the input/output lines.

4. The wire size is applicable when 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wires) is used.

Power Factor Improving DC Reactor (FR-HEL, FR-HEL-H, MR-DCL)

B

B-RJ

B-RJ010

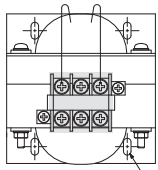
A

A-RJ

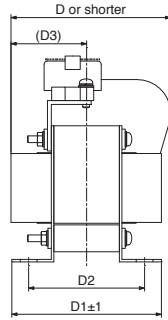
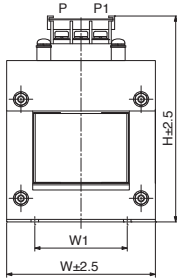
Dimensions

[Unit: mm]

E

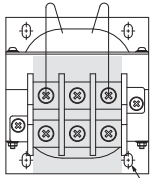


4-d mounting hole (Note 1)

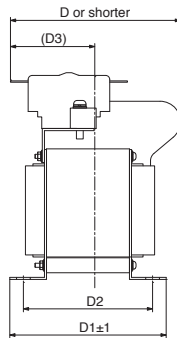
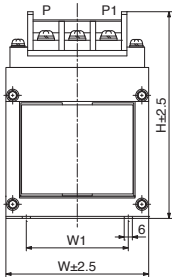


Model	Variable dimensions								Mass [kg]	Terminal screw size	Wire size (Note 3) [mm²]
	W	W1	H	D	D1	D2	D3	d			
FR-HEL-H3.7K	86	55	120	95	89	69	45	M4	2.3	M4	2 (AWG 14)
FR-HEL-H7.5K	96	60	128	105	100	80	50	M5	3.5	M4	2 (AWG 14)
FR-HEL-H11K	105	75	137	110	105	85	53	M5	4.5	M5	3.5 (AWG 12)

F

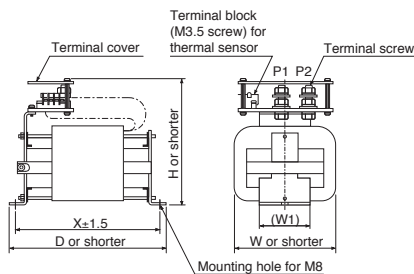


4-d mounting hole (Note 1)



Model	Variable dimensions								Mass [kg]	Terminal screw size	Wire size (Note 3) [mm²]
	W	W1	H	D	D1	D2	D3	d			
FR-HEL-H15K	105	75	152	125	115	95	62	M5	5.0	M6	5.5 (AWG 10) 8 (AWG 8) (Note 2)
FR-HEL-H22K	133	90	178	120	95	75	53	M5	6.0	M6	8 (AWG 8)
FR-HEL-H30K	133	90	178	120	100	80	56	M5	6.5	M6	14 (AWG 6)

G



Model	Variable dimensions					Mass [kg]	Terminal screw size	Wire size (Note 3) [mm²]
	W	D	H	W1	X			
MR-DCL30K	135	255	215	80	232	9.5	M12	60 (AWG 2/0)
MR-DCL37K	135	255	215	80	232	9.5	M12	60 (AWG 2/0)
MR-DCL30K-4	135	205	200	75	175	6.5	M8	22 (AWG 4)
MR-DCL37K-4	135	225	200	80	197	7	M8	22 (AWG 4)
MR-DCL45K-4	135	240	200	80	212	7.5	M8	38 (AWG 2)
MR-DCL55K-4	135	260	215	80	232	9.5	M8	38 (AWG 2)

Notes: 1. Use this mounting hole for grounding.

2. When using FR-HEL-H15K, select a wire of 5.5 mm² (AWG 10) for MR-J4-700B4/A4, and 8 mm² (AWG 8) for MR-J4-11KB4/A4.

3. The wire size is applicable when 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wires) is used.

Power Factor Improving AC Reactor (FR-HAL, FR-HAL-H)

B

B-RJ

WB

B-RJ010

A

A-RJ

This boosts the power factor of servo amplifier and reduces the power supply capacity.

For MR-J4-B/A

Servo amplifier model	Power factor improving AC reactor model <small>(Note 2)</small>	Fig.
MR-J4-10B(1)/A(1)	FR-HAL-0.4K	A
MR-J4-20B(1)/A(1)		
MR-J4-40B(1)/A(1)	FR-HAL-0.75K	
MR-J4-60B/A	FR-HAL-1.5K	
MR-J4-70B/A		
MR-J4-100B/A	FR-HAL-2.2K	B
MR-J4-200B/A	FR-HAL-3.7K	
MR-J4-350B/A	FR-HAL-7.5K	
MR-J4-500B/A	FR-HAL-11K	
MR-J4-700B/A	FR-HAL-15K	
MR-J4-11KB/A		
MR-J4-15KB/A	FR-HAL-22K	C
MR-J4-22KB/A	FR-HAL-30K	
MR-J4-60B4/A4	FR-HAL-H1.5K	D
MR-J4-100B4/A4	FR-HAL-H2.2K	
MR-J4-200B4/A4	FR-HAL-H3.7K	E
MR-J4-350B4/A4	FR-HAL-H7.5K	
MR-J4-500B4/A4	FR-HAL-H11K	
MR-J4-700B4/A4	FR-HAL-H15K	
MR-J4-11KB4/A4		
MR-J4-15KB4/A4	FR-HAL-H22K	F
MR-J4-22KB4/A4	FR-HAL-H30K	

For MR-J4W2-B (Note 1)

Total output of rotary servo motors	Total continuous thrust of linear servo motors	Total output of direct drive motors	Power factor improving AC reactor model (Note 2)	Fig.
450 W or less	150 N or less	100 W or less	FR-HAL-0.75K	A
Over 450 W to 600 W	Over 150 N to 240 N	Over 100 W to 377 W	FR-HAL-1.5K	
Over 600 W to 1 kW	Over 240 N to 300 N	Over 377 W to 545 W	FR-HAL-2.2K	
Over 1 kW to 2 kW	Over 300 N to 720 N	Over 545 W to 838 W	FR-HAL-3.7K	

For MR-J4W3-B (Note 1)

Total output of rotary servo motors	Total continuous thrust of linear servo motors	Total output of direct drive motors	Power factor improving AC reactor model (Note 2)	Fig.
450 W or less	150 N or less	-	FR-HAL-0.75K	A
Over 450 W to 600 W	Over 150 N to 240 N	378 W or less	FR-HAL-1.5K	
Over 600 W to 1 kW	Over 240 N to 300 N	-	FR-HAL-2.2K	
Over 1 kW to 2 kW	Over 300 N to 450 N	-	FR-HAL-3.7K	

Notes: 1. Refer to "MR-J4W_-B Servo Amplifier Instruction Manual" for selecting a power factor improving AC reactor when combining multiple servo motors among the rotary servo motor, the linear servo motor or the direct drive motor.

2. When using the power factor improving AC reactor, install one reactor for each servo amplifier.

Connections		
<p>3-phase 200 V AC or 3-phase 400 V AC</p>	<p>1-phase 200 V AC</p>	<p>1-phase 100 V AC</p>

Notes: 1. Connect the power supply to L1 and L3 terminals. Do not connect anything to L2. The connections are different from MR-J3 series servo amplifiers. Be careful not to make a connection error when replacing MR-J3 with MR-J4.

Power Factor Improving AC Reactor (FR-HAL, FR-HAL-H)

B

B-RJ

WB

B-RJ010

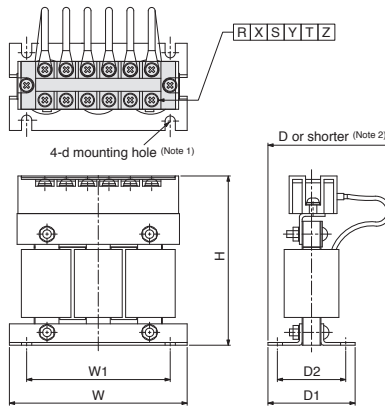
A

A-RJ

Dimensions

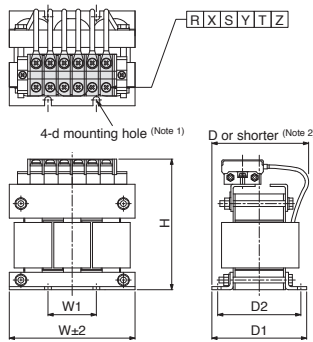
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A



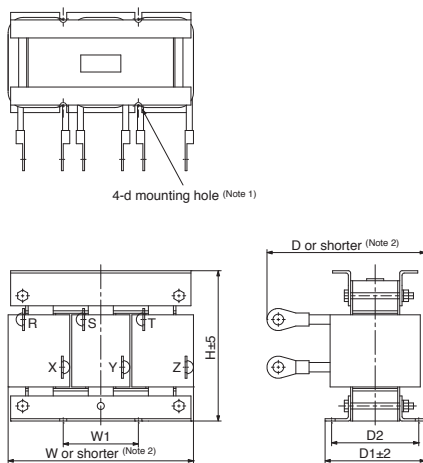
Model	Variable dimensions							Mass [kg]	Terminal screw size
	W	W1	H	D	D1	D2	d		
FR-HAL-0.4K	104±2	84	99	72	51	40	M5	0.6	M4
FR-HAL-0.75K	104±2	84	99	74	56	44	M5	0.8	M4
FR-HAL-1.5K	104±2	84	99	77	61	50	M5	1.1	M4
FR-HAL-2.2K	115 (Note 2)	40	115	77	71	57	M6	1.5	M4
FR-HAL-3.7K	115 (Note 2)	40	115	83	81	67	M6	2.2	M4

B



Model	Variable dimensions							Mass [kg]	Terminal screw size
	W	W1	H	D	D1	D2	d		
FR-HAL-7.5K	130	50	135	100	98	86	M6	4.2	M5
FR-HAL-11K	160	75	164	111	109	92	M6	5.2	M6
FR-HAL-15K	160	75	167	126	124	107	M6	7.0	M6

C



Model	Variable dimensions							Mass [kg]	Terminal screw size
	W	W1	H	D	D1	D2	d		
FR-HAL-22K	185	75	150	158	100	87	M6	9.0	M8
FR-HAL-30K	185	75	150	168	100	87	M6	9.7	M10

Notes: 1. Use this mounting hole for grounding.

2. This indicates the maximum dimension. The dimension varies depending on the bending degree of the input/output lines.



Power Factor Improving AC Reactor (FR-HAL, FR-HAL-H)

B

B-RJ

B-RJ010

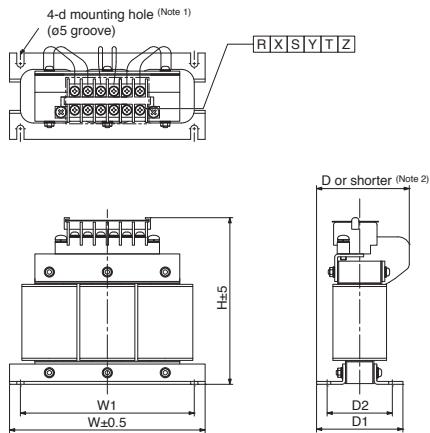
A

A-RJ

Dimensions

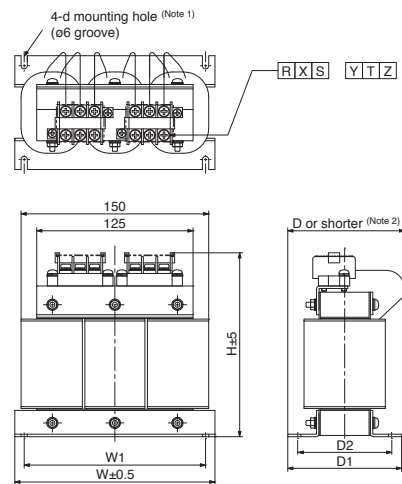
[Unit: mm]

D



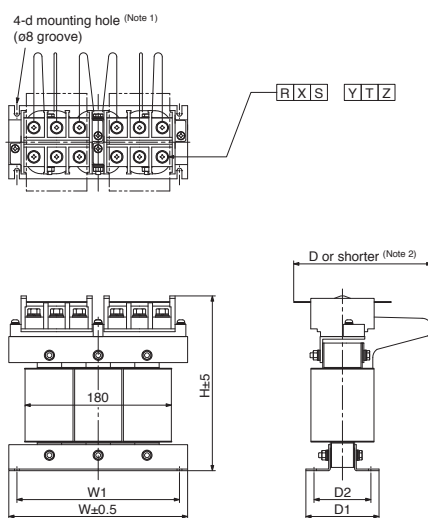
Model	Variable dimensions							Mass [kg]	Terminal screw size
	W	W1	H	D	D1	D2	d		
FR-HAL-H1.5K	135	120	115	59	59.6	45	M4	1.5	M3.5
FR-HAL-H2.2K	135	120	115	59	59.6	45	M4	1.5	M3.5
FR-HAL-H3.7K	135	120	115	69	70.6	57	M4	2.5	M3.5

E



Model	Variable dimensions							Mass [kg]	Terminal screw size
	W	W1	H	D	D1	D2	d		
FR-HAL-H7.5K	160	145	142	91	91	75	M4	5.0	M4
FR-HAL-H11K	160	145	146	91	91	75	M4	6.0	M5
FR-HAL-H15K	220	200	195	105	90	70	M5	9.0	M5

F



Model	Variable dimensions							Mass [kg]	Terminal screw size
	W	W1	H	D	D1	D2	d		
FR-HAL-H22K	220	200	215	170	90	70	M5	9.5	M8
FR-HAL-H30K	220	200	215	170	96	75	M5	11	M8

Notes: 1. Use this mounting hole for grounding.

2. This indicates the maximum dimension. The dimension varies depending on the bending degree of the input/output lines.

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LVs/Wires

Product List

Cautions

Servo Support Software

Capacity selection software (MRZJW3-MOTSZ111E)

B

B-RJ

WB

B-RJ010

A

A-RJ

Specifications

Item		Description
Types of machine component		Horizontal ball screws, vertical ball screws, rack and pinions, roll feeds, rotating tables, carts, elevators, conveyors, linear servo, other (direct inertia input) devices
Output of results	Item	Servo amplifier, servo motor, regenerative option, moment of inertia of load, load to motor inertia ratio, peak torque, peak torque ratio, effective torque, effective torque ratio, regenerative power ^(Note 4) , regenerative power ratio
	Printing	Prints entered specifications, operating pattern, calculation process, graph of selection process feed speed (or motor speed) and torque, and sizing results.
	Data saving	Entered specifications, operating patterns and sizing results are saved with a file name.
Moment of inertia calculation function		Cylinder, square block, variable speed, linear movement, hanging, conical, conical base

System requirements

IBM PC/AT compatible model running with the following requirements.

Components		Capacity selection software (MRZJW3-MOTSZ111E) ^(Note 1)
Personal computer ^(Note 2)	OS ^(Note 3)	Microsoft® Windows® 8.1 Enterprise Operating System Microsoft® Windows® 8.1 Pro Operating System Microsoft® Windows® 8.1 Operating System Microsoft® Windows® 8 Enterprise Operating System Microsoft® Windows® 8 Pro Operating System Microsoft® Windows® 8 Operating System Microsoft® Windows® 7 Enterprise Operating System Microsoft® Windows® 7 Ultimate Operating System Microsoft® Windows® 7 Professional Operating System Microsoft® Windows® 7 Home Premium Operating System Microsoft® Windows® 7 Starter Operating System Microsoft® Windows Vista® Enterprise Operating System Microsoft® Windows Vista® Ultimate Operating System Microsoft® Windows Vista® Business Operating System Microsoft® Windows Vista® Home Premium Operating System Microsoft® Windows Vista® Home Basic Operating System Microsoft® Windows® XP Professional Operating System Microsoft® Windows® XP Home Edition Operating System Microsoft® Windows® 2000 Professional Operating System Microsoft® Windows® Millennium Edition Operating System Microsoft® Windows® 98 Second Edition Operating System Microsoft® Windows® 98 Operating System
	CPU	Pentium® 133 MHz or more (Windows® 98, Windows® 2000) Pentium® 150 MHz or more (Windows® Millennium Edition) Pentium® 300 MHz or more (Windows® XP) 1 GHz or more 32-bit (X86) processor (Windows Vista®) 1 GHz or more 32-bit (X86) or 64-bit (X64) processor (Windows® 7, Windows® 8, Windows® 8.1)
	Memory	24 MB or more (Windows® 98) 32 MB or more (Windows® Millennium Edition, Windows® 2000) 128 MB or more (Windows® XP) 1 GB or more (Windows Vista®, Windows® 7, Windows® 8, Windows® 8.1)
	Free hard disk space	40 MB or more
	Browser	Windows® Internet Explorer® 4.0 or later
Monitor		Resolution 800 × 600 or more, 16-bit high color, Compatible with above personal computers.
Keyboard		Compatible with above personal computers.
Mouse		Compatible with above personal computers.
Printer		Compatible with above personal computers.
Communication cable		Not required

Notes: 1. Be sure to use the latest version of this software. Contact your local sales office for updating your software.

2. This software may not run correctly, depending on a personal computer being used.

3. For 64-bit operating system, this software is compatible with Windows® 7 or later.

4. MR-J4W_ outputs regenerative energy.



Servo Support Software

MR Configurator2 (SW1DNC-MRC2-E)

B

B-RJ

WB

B-RJ010

A

A-RJ



MR Configurator2 can be obtained by either of the following:

- Purchase MR Configurator2 alone.
- Purchase GX Works3 or MT Works2: MR Configurator2 is included in GX Works3 and MT Works2 with software version 1.34L or later.
- Download MR Configurator2: If you have GX Works2 or MT Works2 with software version earlier than 1.34L, you can download MR Configurator2 from website free of charge.

Specifications

Item	Description
Project	New/Open/Close/Save/Save As/Delete Project, Read Other Format, Write Other Format, System Setting, Print Preview, Print, Exit MR Configurator2
Parameter	Parameter Setting, Axis Name Setting ^(Note 3) , Parameter Converter ^(Note 4)
Monitor	Display All, I/O Monitor, Graph, ABS Data Display
Diagnosis	Alarm Display, Alarm Onset Data, Drive Recorder, No Motor Rotation, System Configuration, Life Diagnosis, Machine Diagnosis, Fully Closed Loop Diagnosis ^(Note 5) , Linear Diagnosis ^(Note 6)
Test mode	JOG Mode ^(Note 7) , Positioning Mode, Motor-Less Operation ^(Note 1) , DO Forced Output, Program Operation, Test Mode Information
Adjustment	One-touch Tuning, Tuning, Machine Analyzer
Others	Servo Assistant, Update Parameter Setting Range, Machine Unit Conversion Setting ^(Note 2) , Help

Notes: 1. Available only in the standard control mode. The motor-less operation is currently available only in the standard control mode and will be available in the fully closed loop control mode, the linear servo motor control mode, and the direct drive motor control mode in the future.

2. Available only with MR-J4-_B_, MR-J4-_B_-RJ, MR-J4-DU-_B_, MR-J4-DU-_B_-RJ, MR-J4W-_B_, and MR-J4-_B_-RJ010.

3. Available only with MR-J4-_A_, MR-J4-_A_-RJ, MR-J4-DU-_A_, and MR-J4-DU-_A_-RJ.

4. Available only in the standard control mode with MR-J4-_A_, MR-J4-_A_-RJ, MR-J4-DU-_A_, and MR-J4-DU-_A_-RJ.

5. Available only in the fully closed loop control mode.

6. Available only in the linear servo motor control mode.

7. Available only in the standard control mode, the fully closed loop control mode, and the direct drive motor control mode.

System requirements

IBM PC/AT compatible model running with the following requirements.

Components	MR Configurator2 ^(Note 3)
Personal computer ^(Note 1)	OS ^(Note 2)
	Microsoft® Windows® 8.1 Enterprise Operating System
	Microsoft® Windows® 8.1 Pro Operating System
	Microsoft® Windows® 8.1 Operating System
	Microsoft® Windows® 8 Enterprise Operating System
	Microsoft® Windows® 8 Pro Operating System
	Microsoft® Windows® 8 Operating System
	Microsoft® Windows® 7 Enterprise Operating System
	Microsoft® Windows® 7 Ultimate Operating System
	Microsoft® Windows® 7 Professional Operating System
	Microsoft® Windows® 7 Home Premium Operating System
	Microsoft® Windows® 7 Starter Operating System
	Microsoft® Windows Vista® Enterprise Operating System
	Microsoft® Windows Vista® Ultimate Operating System
	Microsoft® Windows Vista® Business Operating System
	Microsoft® Windows Vista® Home Premium Operating System
	Microsoft® Windows Vista® Home Basic Operating System
	Microsoft® Windows® XP Professional Operating System, Service Pack2 or later
	Microsoft® Windows® XP Home Edition Operating System, Service Pack2 or later
CPU (recommended)	Desktop PC: Intel® Celeron® processor 2.8 GHz or more Laptop PC: Intel® Pentium® M processor 1.7 GHz or more
Memory (recommended)	512 MB or more (32-bit OS), 1 GB or more (64-bit OS)
Free hard disk space	1 GB or more
Communication interface	Use USB port
Browser	Windows® Internet Explorer® 4.0 or later
Monitor	Resolution 1024 × 768 or more, 16-bit high color, Compatible with above personal computers.
Keyboard	Compatible with above personal computers.
Mouse	Compatible with above personal computers.
Printer	Compatible with above personal computers.
Communication cable	MR-J3USBCBL3M

Notes: 1. This software may not run correctly, depending on a personal computer being used.

2. For 64-bit operating system, this software is compatible with Windows® 7 or later.

3. Be sure to use the latest version of this software. Contact your local sales office for updating your software.

Unit Conversion Table

Quantity	SI (metric) unit	U.S. customary unit
Mass	1 [kg]	2.2046 [lb]
Length	1 [mm]	0.03937 [in]
Torque	1 [N•m]	141.6 [oz•in]
Moment of inertia	1 [$\times 10^{-4}$ kg•m ²]	5.4675 [oz•in ²]
Load (thrust load/axial load)	1 [N]	0.2248 [lbf]
Temperature	n [°C] $\times 9/5 + 32$	n [°F]

6

	Servo amplifier						●: Applicable
	B	B-RJ	WB	B-RJ010	A	A-RJ	
Features of Low-Voltage Switchgear	●	●	●	●	●	●	..... 6-1
Wires, Molded-Case Circuit Breakers and Magnetic Contactors	●	●	●	●	●	●	..... 6-4
Selection Example in HIV Wires for Servo Motors	●	●	●	●	●	●	..... 6-6
B MR-J4-B/MR-J4-DU_B B-RJ MR-J4-B-RJ/MR-J4-DU_B-RJ WB MR-J4W2-B/MR-J4W3-B B-RJ010 MR-J4-B-RJ010 A MR-J4-A/MR-J4-DU_A A-RJ MR-J4-A-RJ/MR-J4-DU_A-RJ							

* Only MR-J4-B and MR-J4-A servo amplifiers are mentioned in this section. Note that low-voltage switchgear and wires for MR-J4-B-RJ and MR-J4-B-RJ010 are the same as those for MR-J4-B, and MR-J4-A-RJ for MR-J4-A. For the low-voltage switchgear and wires for MR-J4-B-RJ, MR-J4-B-RJ010, and MR-J4-A-RJ, refer to those for MR-J4-B and MR-J4-A with the same rated capacity.

* Refer to p. 5-65 in this catalog for conversion of units.

Low-Voltage Switchgear/Wires

Mitsubishi Molded Case Circuit Breakers and Earth Leakage Circuit Breakers WS-V Series

"WS-V Series" is the new circuit breakers that have a lot of superior aspects such as higher breaking capacity, design for easy use, standardization of accessory parts, and compliance to the global standards.

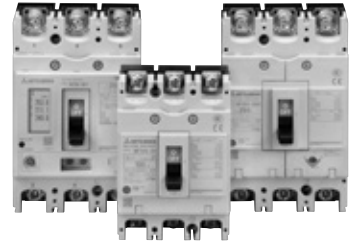
Features

Technologies based on long years of experience are brought together to achieve improved performance

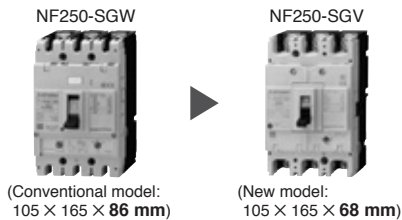
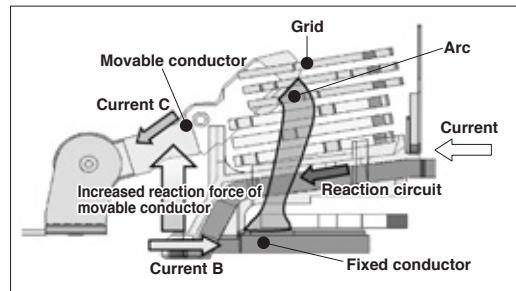
The new circuit breaking technology "Expanded ISTAC" has improved the current-limiting performance and upgraded the overall breaking capacity. Expansion of the conductor under the stator shortens the contact parting time of the mover as compared to the conventional ISTAC structure. The current-limiting performance has been improved remarkably. (The maximum peak current value has been reduced by approx. 10%.)

Compact design for ease of use

The thermal adjustable circuit breakers and electronic circuit breakers are smaller.



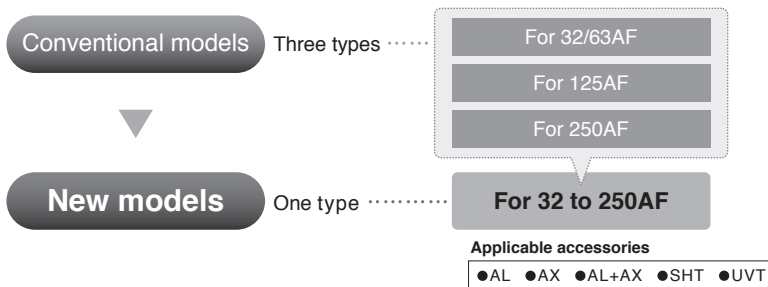
New circuit breaking technology (Expanded ISTAC)



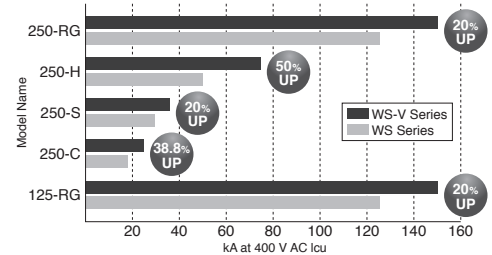
Volume ratio 79%
(Compared with our conventional models)

Types of internal accessories are reduced from 3 types to 1 type

Standardization of internal accessories contributes to a reduction of stock and delivery time.

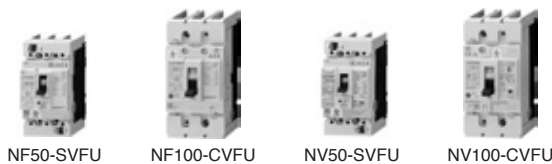


Breaking capacity comparison with a conventional model



Lineup of UL 489 listed circuit breakers with 54 mm width "Small Fit" (F) Style

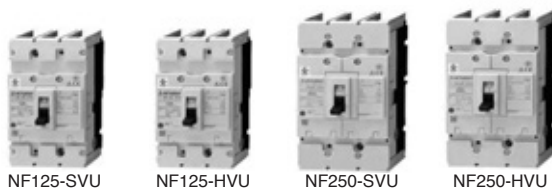
The compact breakers contribute to a size reduction of machines, and IEC 35 mm rail mounting is standard.



For security and standard compliance of machines, F-type and V-type operating handles are available for breakers with 54 mm width.

Lineup of UL 489 listed circuit breakers for 480 V AC "High Performance"

The breaking capacity has been improved to satisfy the request for SCCR upgrading.



Breaking capacity of UL 489 listed circuit breakers for 480 V AC (UL 489)

NF125-SVU/NV125-SVU: 30 kA
NF125-HVU/NV125-HVU: 50 kA
NF250-SVU/NV250-SVU: 35 kA
NF250-HVU/NV250-HVU: 50 kA

Mitsubishi Magnetic Motor Starters and Magnetic Contactors MS-T Series

MS-T series is newly released!

The MS-T series is smaller than ever, enabling more compact control panel. The MS-T series is suitable for MELSERVO-J4 series as well as other Mitsubishi FA equipment. In addition, the MS-T conforms to a variety of global standards, supporting the global use.

Features

Compact

Just 36 mm wide for 10 A-frame type!

General-purpose magnetic contactor with smallest width* in the industry.

The width of MS-T series is reduced by 32% as compared to the prior MS-N series, enabling a more compact panel.

*Based on Mitsubishi Electric research as of March 2014 in the general-purpose magnetic contactor industry for 10 A-frame class.



S-T10

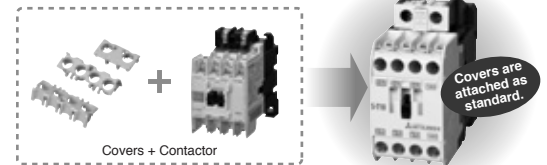
[Unit: mm]

Frame size		11 A	13 A		20 A	25 A
MS-N series	Front view					
		S-N10	S-N11 (Auxiliary 1-pole)	S-N12 (Auxiliary 2-pole)	S-N20	S-N25
New MS-T series	Front view					
		S-T10	S-T12 (Auxiliary 2-pole)	S-T20	S-T25	

Standardization

Covers provided as standard equipment

Terminal cover and auxiliary contact unit covers are provided as standard equipment. Not only ensuring your safety, but also saving you time and cost of selecting and purchasing the covers separately.



Wide-ranged operation coil rating

The prior series had 14 types of the operation coil rating. Owing to the wide-ranged operation coil rating, the number of the rating types for the MS-T series is reduced to half, making it easier to select as compared to the prior model.

Consolidating the number of the produced coils type allows not just the reduction of customer storage, but also shortening of delivery time.

Coil designation	Rated voltage [V]	
	50 Hz	60 Hz
AC12 V	12	12
AC24 V	24	24
AC48 V	48 to 50	48 to 50
AC100 V	100	100 to 110
AC120 V	110 to 120	115 to 120
AC127 V	125 to 127	127
AC200 V	200	200 to 220
AC220 V	208 to 220	220
AC230 V	220 to 240	230 to 240
AC260 V	240 to 260	260 to 280
AC380 V	346 to 380	380
AC400 V	380 to 415	400 to 440
AC440 V	415 to 440	460 to 480
AC500 V	500	500 to 550

Coil designation	Rated voltage [V]
	50 Hz/60 Hz
AC24 V	24
AC48 V	48 to 50
AC100 V	100 to 127
AC200 V	200 to 240
AC300 V	260 to 300
AC400 V	380 to 440
AC500 V	460 to 550

* 12 V type is an order-made product.

Global Standard

Conforms to various global standards

Not only major global standards such as IEC, JIS, UL, CE, and CCC but also ship standards and other country standards are planned to be certified.

◎: Compliant as standard

Model	Applicable Standard				Safety Standard		EC Directive	Certification Body	CCC
	IEC	JIS	DIN/VDE	BS/EN	UL	CSA	CE Marking	TÜV	GB
	International	Japan	Germany	England Europe	U.S.A	Canada	Europe	Germany	China
S-T10 to S-T32 MSO-T10 to MSO-T25 TH-T18(KP) to TH-T25(KP)	◎	◎	◎	◎	◎	◎	◎	◎ *1	◎

*1. The Motor Starters will be certified under each type name of the Magnetic contactors and the Thermal Overload Relays on the condition that the Magnetic contactors and the Thermal Overload Relays are used in combination.

Mitsubishi Magnetic Motor Starters and Magnetic Contactors MS-N Series

Environment-friendly Mitsubishi MS-N series ensures safety and conforms to various global standards. Its compact size contributes to space-saving in a machine. The MS-N series is suitable for MELSERVO-J4 series as well as other Mitsubishi FA equipment and can be used globally.

Features

Bifurcated contact adopted to achieve high contact reliability

Contact reliability is greatly improved by combining bifurcated moving contact and stationary contact. This series responds to the various needs such as the application to safety circuit.

* The MS-T series also has bifurcated contacts.

Mirror contact (auxiliary contact off at main contact welding)

The MS-N series meets requirements of "Control functions in the event of failure" described in EN 60204-1 "Electrical equipment of machines", being suitable as interlock circuit contact. The MS-N series is applicable for category 4 safety circuit. We ensure safety for our customers.

* The MS-T series also has mirror contacts.

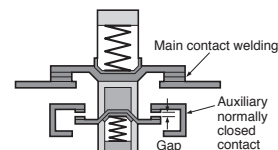
Various option units

Various options including surge absorbers and additional auxiliary contact blocks are available.

Conforms to various global standards



S-N35CX



◎ : Compliant as standard

Model	Applicable Standard				Safety Standard		EC Directive	Certification Body	CCC
	IEC	JIS	DIN/VDE	BS/EN	UL	CSA	CE Marking	TÜV	GB
	International	Japan	Germany	England Europe	U.S.A	Canada	Europe	Germany	China
S-N10 to S-N400 MSO-N10 to MSO-N400 TH-N12KP to TH-N400KP	◎	◎	◎	◎	◎	◎	◎	◎ *1	◎

*1. The Motor Starters are certified under each type name of the Magnetic contactors and the Thermal Overload Relays on the condition that the Magnetic contactors and the Thermal Overload Relays are used in combination.

Wires, Molded-Case Circuit Breakers and Magnetic Contactors

(Example of Selection for MR-J4-B/A)

The following are examples of wire sizes when 600 V grade heat-resistant polyvinyl chloride insulated wires (HIV wires) are used. The wire size for U, V, W, and Φ varies depending on the servo motor. Refer to "Selection Example in HIV Wires for Servo Motors" in this catalog for details on wires for each servo motor.

Servo amplifier model	Molded-case circuit breaker (Note 5, 7)	Magnetic contactor (Note 3, 7)	Wire size [mm ²] (Note 5)			
			L1, L2, L3, Φ	L11, L21	P+, C	U, V, W, Φ
MR-J4-10B(1)/A(1)	30 A frame 5 A (30 A frame 5 A)	S-N10, S-T10	2 (AWG 14)	1.25 to 2 (AWG 16 to 14)	2 (AWG 14) (Note 1)	AWG 18 to 14 (Note 4)
MR-J4-20B/A	30 A frame 5 A (30 A frame 5 A)	S-N10, S-T10				
MR-J4-20B1/A1	30 A frame 10 A (30 A frame 10 A)	S-N10, S-T10				
MR-J4-40B/A	30 A frame 10 A (30 A frame 5 A)	S-N10, S-T10				
MR-J4-40B1/A1	30 A frame 15 A (30 A frame 10 A)	S-N10, S-T10				
MR-J4-60B/A	30 A frame 15 A (30 A frame 10 A)	S-N10, S-T10				
MR-J4-70B/A	30 A frame 15 A (30 A frame 10 A)	S-N10, S-T10				
MR-J4-100B/A	30 A frame 15 A (30 A frame 10 A)	S-N10, S-T10				
MR-J4-200B/A	30 A frame 20 A (30 A frame 20 A)	S-N20 (Note 6), S-T21				
MR-J4-350B/A	30 A frame 30 A (30 A frame 30 A)	S-N20, S-T21	3.5 (AWG 12)	1.25 to 2 (AWG 16 to 14)	3.5 (AWG 12) (Note 1)	AWG 16 to 10 (Note 4)
MR-J4-500B/A (Note 2)	50 A frame 50 A (50 A frame 50 A)	S-N35	5.5 (AWG 10)			2 to 5.5 (AWG 14 to 10)
MR-J4-700B/A (Note 2)	100 A frame 75 A (60 A frame 60 A)	S-N50	8 (AWG 8)			2 to 8 (AWG 14 to 8)
MR-J4-11KB/A (Note 2)	100 A frame 100 A (100 A frame 100 A)	S-N50	14 (AWG 6)			5.5 (AWG 10), 8 (AWG 8), 14 (AWG 6)
MR-J4-15KB/A (Note 2)	125 A frame 125 A (125 A frame 125 A)	S-N65	22 (AWG 4)			8 (AWG 8), 22 (AWG 4)
MR-J4-22KB/A (Note 2)	225 A frame 175 A (225 A frame 175 A)	S-N95	38 (AWG 2)			38 (AWG 2)
MR-J4-60B4/A4	30 A frame 5 A (30 A frame 5 A)	S-N10, S-T10	2 (AWG 14)		2 (AWG 14) (Note 1)	AWG 16 to 14 (Note 4)
MR-J4-100B4/A4	30 A frame 10 A (30 A frame 5 A)	S-N10, S-T10	2 (AWG 14)			
MR-J4-200B4/A4	30 A frame 15 A (30 A frame 10 A)	S-N10, S-T10	2 (AWG 14)			
MR-J4-350B4/A4	30 A frame 20 A (30 A frame 15 A)	S-N20 (Note 6), S-T21	2 (AWG 14)			
MR-J4-500B4/A4 (Note 2)	30 A frame 20 A (30 A frame 20 A)	S-N20 (Note 6), S-T21	2 (AWG 14)			
MR-J4-700B4/A4 (Note 2)	30 A frame 30 A (30 A frame 30 A)	S-N20, S-T21	3.5 (AWG 12)			
MR-J4-11KB4/A4 (Note 2)	50 A frame 50 A (50 A frame 50 A)	S-N25	5.5 (AWG 10)			
MR-J4-15KB4/A4 (Note 2)	60 A frame 60 A (60 A frame 60 A)	S-N35	8 (AWG 8)			
MR-J4-22KB4/A4 (Note 2)	100 A frame 100 A (100 A frame 100 A)	S-N50	14 (AWG 6)			
					3.5 (AWG 12) (Note 1)	8 (AWG 8)
					3.5 (AWG 12) (Note 1)	5.5 (AWG 10), 8 (AWG 8), 14 (AWG 6)

Notes: 1. Keep the wire length to the regenerative option within 5 m.

2. When connecting the wires to the terminal blocks, be sure to use the screws attached to the terminal blocks.

3. Be sure to use a magnetic contactor with an operation delay time of 80 ms or less. The operation delay time is the time interval from current being applied to the coil until closure of contacts.

4. The wire size shows applicable size for the servo amplifier connector.

5. When complying with IEC/EN/UL/CSA standard, refer to "MELSERVO-J4 Instructions and Cautions for Safe Use of AC Servos" enclosed with the servo amplifier.

When using a power improving reactor, use a molded-case circuit breaker listed in the brackets.

6. S-N18 can be used when auxiliary contact is not required.

7. Install one molded-case circuit breaker and one magnetic contactor for each servo amplifier.

Wires, Molded-Case Circuit Breakers and Magnetic Contactors (Example of Selection for MR-J4-DU_B/MR-J4-DU_A)

B
B-RJ
A
A-RJ



The following are examples of wire sizes when 600 V grade heat-resistant polyvinyl chloride insulated wires (HIV wires) are used. The wire size for U, V, W, and ⊕ varies depending on the servo motor. Refer to "Selection Example in HIV Wires for Servo Motors" in this catalog for details on wires for each servo motor.

Converter unit	Drive unit	Molded-case circuit breaker (Note 8, 9)	Magnetic contactor (Note 1, 8)	Wire size [mm ²] (Note 9)			
				L1, L2, L3, ⊕	L11, L21	P2, C	U, V, W, ⊕
MR-CR55K (Note 7)	MR-J4-DU30KB/A	400A frame 250A (225A frame 225A)	S-N150	38 (AWG 2)	1.25 to 2 (AWG 16 to 14)	5.5 (AWG10) (Note 1)	60 (AWG 2/0)
	MR-J4-DU37KB/A	400A frame 300A (400A frame 300A)	S-N180	60 (AWG 2/0)			60 (AWG 2/0)
MR-CR55K4 (Note 7)	MR-J4-DU30KB4/A4	225A frame 125A (225A frame 125A)	S-N95	22 (AWG 4)			22 (AWG 4)
	MR-J4-DU37KB4/A4	225A frame 150A (225A frame 150A)	S-N125	22 (AWG 4)			38 (AWG 2)
	MR-J4-DU45KB4/A4	225A frame 175A (225A frame 175A)	S-N150	38 (AWG 2)			38 (AWG 2)
	MR-J4-DU55KB4/A4	400A frame 225A (225A frame 225A)	S-N180	38 (AWG 2)			38 (AWG 2)

Wires (Example of Selection for MR-J4W2-B and MR-J4W3-B)

WB

The following are examples of wire sizes when 600 V grade heat-resistant polyvinyl chloride insulated wires (HIV wires) are used. The wire size for U, V, W, and ⊕ varies depending on the servo motor. Refer to "Selection Example in HIV Wires for Servo Motors" in this catalog for details on wires for each servo motor.

Servo amplifier model	Molded-case circuit breaker	Magnetic contactor	Wire size [mm ²] <small>(Note 3)</small>			
			L1, L2, L3, 	L11, L21	P+, C <small>(Note 6)</small>	U, V, W, 
MR-J4W2-22B	Refer to the following tables.	Refer to the following tables.	2 (AWG 14)			AWG 18 to 14 <small>(Note 2)</small>
MR-J4W2-44B						
MR-J4W2-77B						
MR-J4W2-1010B						
MR-J4W3-222B						
MR-J4W3-444B						

Molded-Case Circuit Breakers and Magnetic Contactors (Example of Selection for MR-J4W2-B) (Note 4)

WB

Total output of rotary servo motors	Total continuous thrust of linear servo motors	Total output of direct drive motors	Molded-case circuit breaker (Note 3, 8)	Magnetic contactor (Note 1, 8)
300 W or less	-	-	30 A frame 5 A	S-N10
Over 300 W to 600 W	150 N or less	100 W or less	30 A frame 10 A	S-N10
Over 600 W to 1 kW	Over 150 N to 300 N	Over 100 W to 252 W	30 A frame 15 A	S-N10
Over 1 kW to 2 kW	Over 300 N to 720 N	Over 252 W to 838 W	30 A frame 20 A	S-N20 (Note 5)

Molded-Case Circuit Breakers and Magnetic Contactors (Example of Selection for MR-J4W3-B) (Note 4)

WB

Total output of rotary servo motors	Total continuous thrust of linear servo motors	Total output of direct drive motors	Molded-case circuit breaker (Note 3, 8)	Magnetic contactor (Note 1, 8)
450 W or less	150 N or less	-	30 A frame 10 A	S-N10
Over 450 W to 800 W	Over 150 N to 300 N	252 W or less	30 A frame 15 A	S-N10
Over 800 W to 1.5 kW	Over 300 N to 450 N	Over 252 W to 378 W	30 A frame 20 A	S-N20

- Notes: 1. Be sure to use a magnetic contactor with an operation delay time of 80 ms or less. The operation delay time is the time interval from current being applied to the coil until closure of contacts.
2. The wire size shows applicable size for the servo amplifier connector.
3. When complying with IEC/EN/UL/CSA standard, refer to "MELSERVO-J4 Instructions and Cautions for Safe Use of AC Servos" enclosed with the servo amplifier.
4. Refer to "MR-J4W_-B Servo Amplifier Instruction Manual" for selecting a molded-case circuit breaker when combining multiple servo motors among the rotary servo motor, the linear servo motor or the direct drive motor.
5. S-N18 can be used when auxiliary contact is not required.
6. Keep the wire length to the regenerative option within 5 m.
7. When connecting the wires to the terminal blocks, be sure to use the screws attached to the terminal blocks.
8. Install one molded-case circuit breaker and one magnetic contactor for each servo amplifier or drive unit.
9. When complying with IEC/EN/UL/CSA standard, refer to "MR-J4-DU/MR-CR Instructions and Cautions for Safe Use of AC Servos" enclosed with the converter unit and the drive unit. When using a power improving reactor, use a molded-case circuit breaker listed in the brackets.



Selection Example in HIV Wires for Servo Motors

B

B-RJ

WB

B-RJ010

A

A-RJ

The following are examples of wire sizes when 600 V grade heat-resistant polyvinyl chloride insulated wires (HIV wires) with a length of 30 m are used. Refer to "Servo Motor Instruction Manual (Vol. 3)" when using cab-tire cables for supplying power (U, V, and W) to HG-SR/HG-JR/HG-RR/HG-UR series.

Rotary servo motor	Wire size [mm²]		
	For power and grounding (U, V, W, ⊕) (general environment)	For electromagnetic brake (B1, B2)	For cooling fan (BU, BV, BW)
HG-KR053, 13, 23, 43, 73	0.75 (AWG 18) ^(Note 1, 2, 3)	0.5 (AWG 20) ^(Note 4, 7)	-
HG-MR053, 13, 23, 43, 73			
HG-SR51, 81	1.25 (AWG 16) ^(Note 5)		
HG-SR121, 201	2 (AWG 14)		
HG-SR301	3.5 (AWG 12)		
HG-SR421	5.5 (AWG 10)		
HG-SR52, 102	1.25 (AWG 16) ^(Note 5)		
HG-SR152, 202	2 (AWG 14)		
HG-SR352	3.5 (AWG 12)		
HG-SR502	5.5 (AWG 10)		
HG-SR702	8 (AWG 8)		
HG-SR524, 1024	1.25 (AWG 16) ^(Note 5)		
HG-SR1524, 2024, 3524	2 (AWG 14)		
HG-SR5024	3.5 (AWG 12)		
HG-SR7024	5.5 (AWG 10)		
HG-JR53, 73, 103	1.25 (AWG 16) ^(Note 5, 6)		
HG-JR153, 203	2 (AWG 14) ^(Note 6)		
HG-JR353	3.5 (AWG 12) ^(Note 6)		
HG-JR503	5.5 (AWG 10) ^(Note 6)		
HG-JR703, 601, 701M	8 (AWG 8)		
HG-JR903, 801, 12K1, 11K1M	14 (AWG 6)		
HG-JR15K1	22 (AWG 4)	-	1.25 (AWG 16)
HG-JR15K1M	22 (AWG 4)	1.25 (AWG 16)	-
HG-JR20K1, 25K1, 22K1M	38 (AWG 2)	-	1.25 (AWG 16)
HG-JR30K1, 37K1, 30K1M, 37K1M	60 (AWG 2/0)		
HG-JR534, 734, 1034	1.25 (AWG 16) ^(Note 5, 6)	1.25 (AWG 16)	-
HG-JR1534, 2034, 3534	2 (AWG 14) ^(Note 6)		
HG-JR5034	3.5 (AWG 12) ^(Note 6)		
HG-JR7034, 6014, 701M4, 8014	5.5 (AWG 10)		
HG-JR9034, 12K14, 11K1M4, 15K1M4	8 (AWG 8)		
HG-JR15K14	8 (AWG 8)	-	1.25 (AWG 16)
HG-JR20K14, 25K14, 30K14, 22K1M4	14 (AWG 6)		
HG-JR37K14, 30K1M4, 37K1M4	22 (AWG 4)		
HG-JR45K1M4, 55K1M4	38 (AWG 2)		
HG-RR103, 153	2 (AWG 14)	1.25 (AWG 16)	-
HG-RR203	3.5 (AWG 12)		
HG-RR353, 503	5.5 (AWG 10)		
HG-UR72	1.25 (AWG 16) ^(Note 5)		
HG-UR152	2 (AWG 14)		
HG-UR202	3.5 (AWG 12)		
HG-UR352, 502	5.5 (AWG 10)		

Notes: 1. Use a fluorine resin wire of 0.75 mm² (AWG 18) for wiring to the servo motor power connector.

2. This size is applicable for wiring length of 10 m or shorter. For over 10 m, use MR-PWS2CBL03M-A_-L and extend it with HIV wire of 1.25 mm² (AWG 16).

3. When complying with UL/CSA standard, extend the wire using MR-PWS2CBL03M-A_-L and HIV wire of 2 mm² (AWG 14).

4. Use a fluorine resin wire of 0.5 mm² (AWG 20) when connecting to servo motor electromagnetic brake connector.

5. When complying with UL/CSA standard, use 2 mm² (AWG 14). Refer to "Servo Motor Instruction Manual (Vol. 3)" for details.

6. The same wire size is applicable when the torque is maximally increased.

7. This size is applicable for wiring length of 10 m or shorter. For over 10 m, extend the wire with HIV wire of 1.25 mm² (AWG 16).

Servo Amplifiers

Rotary Servo Motors

Linear Servo Motors

Direct Drive Motors

Options/Peripheral Equipment

LVs/Wires

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Selection Example in HIV Wires for Servo Motors

B
B-RJ
WB
A
A-RJ

The following are examples of wire sizes when 600 V grade heat-resistant polyvinyl chloride insulated wires (HIV wires) with a length of 30 m are used.

Linear servo motor Primary side		Wire size [mm ²]	
		For power and grounding (U, V, W, E) (general environment)	For thermistor (G1, G2)
LM-H3P2A-07P-BSS0		1.25 (AWG 16) ^(Note 1)	0.2 (AWG 24)
LM-H3P3A-12P-CSS0		1.25 (AWG 16) ^(Note 1)	
LM-H3P3B-24P-CSS0		1.25 (AWG 16) ^(Note 1)	
LM-H3P3C-36P-CSS0		1.25 (AWG 16) ^(Note 1)	
LM-H3P3D-48P-CSS0		2 (AWG 14)	
LM-H3P7A-24P-ASS0		1.25 (AWG 16) ^(Note 1)	
LM-H3P7B-48P-ASS0		2 (AWG 14)	
LM-H3P7C-72P-ASS0		2 (AWG 14)	
LM-H3P7D-96P-ASS0		3.5 (AWG 12)	
LM-FP2B-06M-1SS0	Natural cooling	2 (AWG 14)	
	Liquid cooling		
LM-FP2D-12M-1SS0	Natural cooling	2 (AWG 14)	
	Liquid cooling	3.5 (AWG 12)	
LM-FP2F-18M-1SS0	Natural cooling	2 (AWG 14)	
	Liquid cooling	3.5 (AWG 12) ^(Note 2)	
LM-FP4B-12M-1SS0	Natural cooling	5.5 (AWG 10)	
	Liquid cooling		
LM-FP4D-24M-1SS0	Natural cooling	5.5 (AWG 10)	
	Liquid cooling		
LM-FP4F-36M-1SS0	Natural cooling	5.5 (AWG 10)	
	Liquid cooling	8 (AWG 8) ^(Note 2)	
LM-FP4H-48M-1SS0	Natural cooling	8 (AWG 8)	
	Liquid cooling	8 (AWG 8) ^(Note 3)	
LM-FP5H-60M-1SS0	Natural cooling	5.5 (AWG 10)	
	Liquid cooling	8 (AWG 8)	
LM-K2P1A-01M-2SS1		1.25 (AWG 16)	
LM-K2P1C-03M-2SS1		2 (AWG 14)	
LM-K2P2A-02M-1SS1		1.25 (AWG 16)	
LM-K2P2C-07M-1SS1		3.5 (AWG 12)	
LM-K2P2E-12M-1SS1		5.5 (AWG 10)	
LM-K2P3C-14M-1SS1		3.5 (AWG 12)	
LM-K2P3E-24M-1SS1		5.5 (AWG 10)	
LM-U2PAB-05M-0SS0, LM-U2PAD-10M-0SS0, LM-U2PAF-15M-0SS0, LM-U2PBB-07M-1SS0, LM-U2PBD-15M-1SS0, LM-U2PBF-22M-1SS0		1.25 (AWG 16)	
LM-U2P2B-40M-2SS0		2 (AWG 14)	
LM-U2P2C-60M-2SS0		3.5 (AWG 12)	
LM-U2P2D-80M-2SS0		5.5 (AWG 10)	

Direct drive motor	Wire size [mm ²]	
	For power and grounding (U, V, W, ⊕)	
TM-RFM002C20, TM-RFM004C20, TM-RFM006C20, TM-RFM006E20, TM-RFM012E20, TM-RFM018E20, TM-RFM012G20	1.25 (AWG 16)	
TM-RFM048G20, TM-RFM072G20	3.5 (AWG 12)	
TM-RFM040J10	1.25 (AWG 16)	
TM-RFM120J10	3.5 (AWG 12)	
TM-RFM240J10	5.5 (AWG 10)	

Notes: 1. When complying with UL/CSA standard, use 2 mm² (AWG 14). Refer to relevant Servo Amplifier Instruction Manual for details.

2. Use a wire which has a heat resistance temperature of 105 °C for wiring to the servo motor power connector.

3. Use a wire which has a heat resistance temperature of 150 °C for wiring to the servo motor power connector.

MEMO

Servo Amplifiers
Rotary Servo Motors
Linear Servo Motors
Direct Drive Motors
Options/Peripheral Equipment
LVS/Wires
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Servo amplifiers

Item		Model	Rated output	Main circuit power supply
Servo amplifier MR-J4-B	200 V class	MR-J4-10B	0.1 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-20B	0.2 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-40B	0.4 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-60B	0.6 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-70B	0.75 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-100B	1 kW	3-phase 200 V AC to 240 V AC
		MR-J4-200B	2 kW	3-phase 200 V AC to 240 V AC
		MR-J4-350B	3.5 kW	3-phase 200 V AC to 240 V AC
		MR-J4-500B	5 kW	3-phase 200 V AC to 240 V AC
		MR-J4-700B	7 kW	3-phase 200 V AC to 240 V AC
		MR-J4-11KB	11 kW	3-phase 200 V AC to 240 V AC
		MR-J4-15KB	15 kW	3-phase 200 V AC to 240 V AC
		MR-J4-22KB	22 kW	3-phase 200 V AC to 240 V AC
	100 V class	MR-J4-10B1	0.1 kW	1-phase 100 V AC to 120 V AC
		MR-J4-20B1	0.2 kW	1-phase 100 V AC to 120 V AC
		MR-J4-40B1	0.4 kW	1-phase 100 V AC to 120 V AC
	400 V class	MR-J4-60B4	0.6 kW	3-phase 380 V AC to 480 V AC
		MR-J4-100B4	1 kW	3-phase 380 V AC to 480 V AC
		MR-J4-200B4	2 kW	3-phase 380 V AC to 480 V AC
		MR-J4-350B4	3.5 kW	3-phase 380 V AC to 480 V AC
		MR-J4-500B4	5 kW	3-phase 380 V AC to 480 V AC
		MR-J4-700B4	7 kW	3-phase 380 V AC to 480 V AC
		MR-J4-11KB4	11 kW	3-phase 380 V AC to 480 V AC
		MR-J4-15KB4	15 kW	3-phase 380 V AC to 480 V AC
		MR-J4-22KB4	22 kW	3-phase 380 V AC to 480 V AC
Drive unit MR-J4-DUB (Note 1)	200 V class	MR-J4-DU30KB	30 kW	Main circuit power is supplied from the converter unit to the drive unit.
		MR-J4-DU37KB	37 kW	
	400 V class	MR-J4-DU30KB4	30 kW	
		MR-J4-DU37KB4	37 kW	
		MR-J4-DU45KB4	45 kW	
Servo amplifier MR-J4-B-RJ	200 V class	MR-J4-10B-RJ	0.1 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-20B-RJ	0.2 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-40B-RJ	0.4 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-60B-RJ	0.6 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-70B-RJ	0.75 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-100B-RJ	1 kW	3-phase 200 V AC to 240 V AC
		MR-J4-200B-RJ	2 kW	3-phase 200 V AC to 240 V AC
		MR-J4-350B-RJ	3.5 kW	3-phase 200 V AC to 240 V AC
		MR-J4-500B-RJ	5 kW	3-phase 200 V AC to 240 V AC
		MR-J4-700B-RJ	7 kW	3-phase 200 V AC to 240 V AC
		MR-J4-11KB-RJ	11 kW	3-phase 200 V AC to 240 V AC
		MR-J4-15KB-RJ	15 kW	3-phase 200 V AC to 240 V AC
		MR-J4-22KB-RJ	22 kW	3-phase 200 V AC to 240 V AC
	100 V class	MR-J4-10B1-RJ	0.1 kW	1-phase 100 V AC to 120 V AC
		MR-J4-20B1-RJ	0.2 kW	1-phase 100 V AC to 120 V AC
		MR-J4-40B1-RJ	0.4 kW	1-phase 100 V AC to 120 V AC
	400 V class	MR-J4-60B4-RJ	0.6 kW	3-phase 380 V AC to 480 V AC
		MR-J4-100B4-RJ	1 kW	3-phase 380 V AC to 480 V AC
		MR-J4-200B4-RJ	2 kW	3-phase 380 V AC to 480 V AC
		MR-J4-350B4-RJ	3.5 kW	3-phase 380 V AC to 480 V AC
		MR-J4-500B4-RJ	5 kW	3-phase 380 V AC to 480 V AC
		MR-J4-700B4-RJ	7 kW	3-phase 380 V AC to 480 V AC
		MR-J4-11KB4-RJ	11 kW	3-phase 380 V AC to 480 V AC
		MR-J4-15KB4-RJ	15 kW	3-phase 380 V AC to 480 V AC
		MR-J4-22KB4-RJ	22 kW	3-phase 380 V AC to 480 V AC

Notes:

- One unit of converter unit is required for each drive unit.



Servo amplifiers

Item		Model	Rated output	Main circuit power supply	
Drive unit MR-J4-DUB-RJ <small>(Note 1)</small>	200 V class	MR-J4-DU30KB-RJ	30 kW	Main circuit power is supplied from the converter unit to the drive unit.	
		MR-J4-DU37KB-RJ	37 kW		
	400 V class	MR-J4-DU30KB4-RJ	30 kW		
		MR-J4-DU37KB4-RJ	37 kW		
		MR-J4-DU45KB4-RJ	45 kW		
		MR-J4-DU55KB4-RJ	55 kW		
Servo amplifier MR-J4W2-B		MR-J4W2-22B	0.2 kW × 2 axes	3-phase or 1-phase 200 V AC to 240 V AC	
		MR-J4W2-44B	0.4 kW × 2 axes	3-phase or 1-phase 200 V AC to 240 V AC	
		MR-J4W2-77B	0.75 kW × 2 axes	3-phase or 1-phase 200 V AC to 240 V AC	
		MR-J4W2-1010B	1 kW × 2 axes	3-phase 200 V AC to 240 V AC	
Servo amplifier MR-J4W3-B		MR-J4W3-222B	0.2 kW × 3 axes	3-phase or 1-phase 200 V AC to 240 V AC	
		MR-J4W3-444B	0.4 kW × 3 axes	3-phase or 1-phase 200 V AC to 240 V AC	
Servo amplifier MR-J4-B-RJ010 <small>(Note 2)</small>		200 V class	MR-J4-10B-RJ010	0.1 kW	3-phase or 1-phase 200 V AC to 240 V AC
			MR-J4-20B-RJ010	0.2 kW	3-phase or 1-phase 200 V AC to 240 V AC
			MR-J4-40B-RJ010	0.4 kW	3-phase or 1-phase 200 V AC to 240 V AC
			MR-J4-60B-RJ010	0.6 kW	3-phase or 1-phase 200 V AC to 240 V AC
			MR-J4-70B-RJ010	0.75 kW	3-phase or 1-phase 200 V AC to 240 V AC
			MR-J4-100B-RJ010	1 kW	3-phase 200 V AC to 240 V AC
			MR-J4-200B-RJ010	2 kW	3-phase 200 V AC to 240 V AC
			MR-J4-350B-RJ010	3.5 kW	3-phase 200 V AC to 240 V AC
			MR-J4-500B-RJ010	5 kW	3-phase 200 V AC to 240 V AC
			MR-J4-700B-RJ010	7 kW	3-phase 200 V AC to 240 V AC
			MR-J4-11KB-RJ010	11 kW	3-phase 200 V AC to 240 V AC
			MR-J4-15KB-RJ010	15 kW	3-phase 200 V AC to 240 V AC
		MR-J4-22KB-RJ010	22 kW	3-phase 200 V AC to 240 V AC	
		400 V class	MR-J4-60B4-RJ010	0.6 kW	3-phase 380 V AC to 480 V AC
			MR-J4-100B4-RJ010	1 kW	3-phase 380 V AC to 480 V AC
			MR-J4-200B4-RJ010	2 kW	3-phase 380 V AC to 480 V AC
			MR-J4-350B4-RJ010	3.5 kW	3-phase 380 V AC to 480 V AC
			MR-J4-500B4-RJ010	5 kW	3-phase 380 V AC to 480 V AC
			MR-J4-700B4-RJ010	7 kW	3-phase 380 V AC to 480 V AC
			MR-J4-11KB4-RJ010	11 kW	3-phase 380 V AC to 480 V AC
			MR-J4-15KB4-RJ010	15 kW	3-phase 380 V AC to 480 V AC
			MR-J4-22KB4-RJ010	22 kW	3-phase 380 V AC to 480 V AC
Servo amplifier MR-J4-A			200 V class	MR-J4-10A	0.1 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-20A		0.2 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-40A		0.4 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-60A		0.6 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-70A		0.75 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-100A		1 kW	3-phase 200 V AC to 240 V AC
		MR-J4-200A		2 kW	3-phase 200 V AC to 240 V AC
		MR-J4-350A		3.5 kW	3-phase 200 V AC to 240 V AC
		MR-J4-500A		5 kW	3-phase 200 V AC to 240 V AC
		MR-J4-700A		7 kW	3-phase 200 V AC to 240 V AC
		MR-J4-11KA		11 kW	3-phase 200 V AC to 240 V AC
		MR-J4-15KA		15 kW	3-phase 200 V AC to 240 V AC
		MR-J4-22KA	22 kW	3-phase 200 V AC to 240 V AC	
		100 V class	MR-J4-10A1	0.1 kW	1-phase 100 V AC to 120 V AC
			MR-J4-20A1	0.2 kW	1-phase 100 V AC to 120 V AC
			MR-J4-40A1	0.4 kW	1-phase 100 V AC to 120 V AC
		400 V class	MR-J4-60A4	0.6 kW	3-phase 380 V AC to 480 V AC
			MR-J4-100A4	1 kW	3-phase 380 V AC to 480 V AC
			MR-J4-200A4	2 kW	3-phase 380 V AC to 480 V AC
			MR-J4-350A4	3.5 kW	3-phase 380 V AC to 480 V AC
			MR-J4-500A4	5 kW	3-phase 380 V AC to 480 V AC
			MR-J4-700A4	7 kW	3-phase 380 V AC to 480 V AC
MR-J4-11KA4	11 kW		3-phase 380 V AC to 480 V AC		
MR-J4-15KA4	15 kW		3-phase 380 V AC to 480 V AC		
MR-J4-22KA4	22 kW		3-phase 380 V AC to 480 V AC		

Notes:

- One unit of converter unit is required for each drive unit.
- Optional CC-Link IE Field Network interface unit (MR-J3-T10) is required.

Servo amplifiers

Item		Model	Rated output	Main circuit power supply
Drive unit MR-J4-DUA ^(Note 1)	200 V class	MR-J4-DU30KA	30 kW	Main circuit power is supplied from the converter unit to the drive unit.
		MR-J4-DU37KA	37 kW	
	400 V class	MR-J4-DU30KA4	30 kW	
		MR-J4-DU37KA4	37 kW	
		MR-J4-DU45KA4	45 kW	
		MR-J4-DU55KA4	55 kW	
Servo amplifier MR-J4-A-RJ	200 V class	MR-J4-10A-RJ	0.1 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-20A-RJ	0.2 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-40A-RJ	0.4 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-60A-RJ	0.6 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-70A-RJ	0.75 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-100A-RJ	1 kW	3-phase 200 V AC to 240 V AC
		MR-J4-200A-RJ	2 kW	3-phase 200 V AC to 240 V AC
		MR-J4-350A-RJ	3.5 kW	3-phase 200 V AC to 240 V AC
		MR-J4-500A-RJ	5 kW	3-phase 200 V AC to 240 V AC
		MR-J4-700A-RJ	7 kW	3-phase 200 V AC to 240 V AC
		MR-J4-11KA-RJ	11 kW	3-phase 200 V AC to 240 V AC
		MR-J4-15KA-RJ	15 kW	3-phase 200 V AC to 240 V AC
		MR-J4-22KA-RJ	22 kW	3-phase 200 V AC to 240 V AC
	100 V class	MR-J4-10A1-RJ	0.1 kW	1-phase 100 V AC to 120 V AC
		MR-J4-20A1-RJ	0.2 kW	1-phase 100 V AC to 120 V AC
		MR-J4-40A1-RJ	0.4 kW	1-phase 100 V AC to 120 V AC
	400 V class	MR-J4-60A4-RJ	0.6 kW	3-phase 380 V AC to 480 V AC
		MR-J4-100A4-RJ	1 kW	3-phase 380 V AC to 480 V AC
		MR-J4-200A4-RJ	2 kW	3-phase 380 V AC to 480 V AC
		MR-J4-350A4-RJ	3.5 kW	3-phase 380 V AC to 480 V AC
		MR-J4-500A4-RJ	5 kW	3-phase 380 V AC to 480 V AC
		MR-J4-700A4-RJ	7 kW	3-phase 380 V AC to 480 V AC
		MR-J4-11KA4-RJ	11 kW	3-phase 380 V AC to 480 V AC
		MR-J4-15KA4-RJ	15 kW	3-phase 380 V AC to 480 V AC
		MR-J4-22KA4-RJ	22 kW	3-phase 380 V AC to 480 V AC
Drive unit MR-J4-DUA-RJ ^(Note 1)	200 V class	MR-J4-DU30KA-RJ	30 kW	Main circuit power is supplied from the converter unit to the drive unit.
		MR-J4-DU37KA-RJ	37 kW	
	400 V class	MR-J4-DU30KA4-RJ	30 kW	
		MR-J4-DU37KA4-RJ	37 kW	
		MR-J4-DU45KA4-RJ	45 kW	
		MR-J4-DU55KA4-RJ	55 kW	
Converter unit MR-CR	200 V class	MR-CR55K	55 kW	3-phase 200 V AC to 240 V AC
	400 V class	MR-CR55K4	55 kW	3-phase 380 V AC to 480 V AC

Notes:

1. One unit of converter unit is required for each drive unit.



Rotary servo motors

Item	Model	Rated output	Rated speed	Reduction ratio
HG-KR series B: With electromagnetic brake	HG-KR053(B)	50 W	3000 r/min	-
	HG-KR13(B)	100 W	3000 r/min	-
	HG-KR23(B)	200 W	3000 r/min	-
	HG-KR43(B)	400 W	3000 r/min	-
	HG-KR73(B)	750 W	3000 r/min	-
HG-KR series With reducer for general industrial machines B: With electromagnetic brake	HG-KR053(B)G1 1/5	50 W	3000 r/min	1/5
	HG-KR053(B)G1 1/12	50 W	3000 r/min	1/12
	HG-KR053(B)G1 1/20	50 W	3000 r/min	1/20
	HG-KR13(B)G1 1/5	100 W	3000 r/min	1/5
	HG-KR13(B)G1 1/12	100 W	3000 r/min	1/12
	HG-KR13(B)G1 1/20	100 W	3000 r/min	1/20
	HG-KR23(B)G1 1/5	200 W	3000 r/min	1/5
	HG-KR23(B)G1 1/12	200 W	3000 r/min	1/12
	HG-KR23(B)G1 1/20	200 W	3000 r/min	1/20
	HG-KR43(B)G1 1/5	400 W	3000 r/min	1/5
	HG-KR43(B)G1 1/12	400 W	3000 r/min	1/12
	HG-KR43(B)G1 1/20	400 W	3000 r/min	1/20
	HG-KR73(B)G1 1/5	750 W	3000 r/min	1/5
	HG-KR73(B)G1 1/12	750 W	3000 r/min	1/12
	HG-KR73(B)G1 1/20	750 W	3000 r/min	1/20
HG-KR series With flange-output type reducer for high precision applications, flange mounting B: With electromagnetic brake	HG-KR053(B)G5 1/5 (40 × 40)	50 W	3000 r/min	1/5 (flange dimensions: 40 mm × 40 mm)
	HG-KR053(B)G5 1/5 (60 × 60)	50 W	3000 r/min	1/5 (flange dimensions: 60 mm × 60 mm)
	HG-KR053(B)G5 1/9	50 W	3000 r/min	1/9
	HG-KR053(B)G5 1/11	50 W	3000 r/min	1/11
	HG-KR053(B)G5 1/21	50 W	3000 r/min	1/21
	HG-KR053(B)G5 1/33	50 W	3000 r/min	1/33
	HG-KR053(B)G5 1/45	50 W	3000 r/min	1/45
	HG-KR13(B)G5 1/5 (40 × 40)	100 W	3000 r/min	1/5 (flange dimensions: 40 mm × 40 mm)
	HG-KR13(B)G5 1/5 (60 × 60)	100 W	3000 r/min	1/5 (flange dimensions: 60 mm × 60 mm)
	HG-KR13(B)G5 1/11	100 W	3000 r/min	1/11
	HG-KR13(B)G5 1/21	100 W	3000 r/min	1/21
	HG-KR13(B)G5 1/33	100 W	3000 r/min	1/33
	HG-KR13(B)G5 1/45	100 W	3000 r/min	1/45
	HG-KR23(B)G5 1/5	200 W	3000 r/min	1/5
	HG-KR23(B)G5 1/11	200 W	3000 r/min	1/11
	HG-KR23(B)G5 1/21	200 W	3000 r/min	1/21
	HG-KR23(B)G5 1/33	200 W	3000 r/min	1/33
	HG-KR23(B)G5 1/45	200 W	3000 r/min	1/45
	HG-KR43(B)G5 1/5	400 W	3000 r/min	1/5
	HG-KR43(B)G5 1/11	400 W	3000 r/min	1/11
	HG-KR43(B)G5 1/21	400 W	3000 r/min	1/21
	HG-KR43(B)G5 1/33	400 W	3000 r/min	1/33
	HG-KR43(B)G5 1/45	400 W	3000 r/min	1/45
	HG-KR73(B)G5 1/5	750 W	3000 r/min	1/5
	HG-KR73(B)G5 1/11	750 W	3000 r/min	1/11
	HG-KR73(B)G5 1/21	750 W	3000 r/min	1/21
	HG-KR73(B)G5 1/33	750 W	3000 r/min	1/33
	HG-KR73(B)G5 1/45	750 W	3000 r/min	1/45
HG-KR series With shaft-output type reducer for high precision applications, flange mounting B: With electromagnetic brake	HG-KR053(B)G7 1/5 (40 × 40)	50 W	3000 r/min	1/5 (flange dimensions: 40 mm × 40 mm)
	HG-KR053(B)G7 1/5 (60 × 60)	50 W	3000 r/min	1/5 (flange dimensions: 60 mm × 60 mm)
	HG-KR053(B)G7 1/9	50 W	3000 r/min	1/9
	HG-KR053(B)G7 1/11	50 W	3000 r/min	1/11
	HG-KR053(B)G7 1/21	50 W	3000 r/min	1/21

Rotary servo motors

Item		Model	Rated output	Rated speed	Reduction ratio
HG-KR series With shaft-output type reducer for high precision applications, flange mounting B: With electromagnetic brake		HG-KR053(B)G7 1/33	50 W	3000 r/min	1/33
		HG-KR053(B)G7 1/45	50 W	3000 r/min	1/45
		HG-KR13(B)G7 1/5 (40 × 40)	100 W	3000 r/min	1/5 (flange dimensions: 40 mm × 40 mm)
		HG-KR13(B)G7 1/5 (60 × 60)	100 W	3000 r/min	1/5 (flange dimensions: 60 mm × 60 mm)
		HG-KR13(B)G7 1/11	100 W	3000 r/min	1/11
		HG-KR13(B)G7 1/21	100 W	3000 r/min	1/21
		HG-KR13(B)G7 1/33	100 W	3000 r/min	1/33
		HG-KR13(B)G7 1/45	100 W	3000 r/min	1/45
		HG-KR23(B)G7 1/5	200 W	3000 r/min	1/5
		HG-KR23(B)G7 1/11	200 W	3000 r/min	1/11
		HG-KR23(B)G7 1/21	200 W	3000 r/min	1/21
		HG-KR23(B)G7 1/33	200 W	3000 r/min	1/33
		HG-KR23(B)G7 1/45	200 W	3000 r/min	1/45
		HG-KR43(B)G7 1/5	400 W	3000 r/min	1/5
		HG-KR43(B)G7 1/11	400 W	3000 r/min	1/11
		HG-KR43(B)G7 1/21	400 W	3000 r/min	1/21
		HG-KR43(B)G7 1/33	400 W	3000 r/min	1/33
		HG-KR43(B)G7 1/45	400 W	3000 r/min	1/45
		HG-KR73(B)G7 1/5	750 W	3000 r/min	1/5
		HG-KR73(B)G7 1/11	750 W	3000 r/min	1/11
		HG-KR73(B)G7 1/21	750 W	3000 r/min	1/21
		HG-KR73(B)G7 1/33	750 W	3000 r/min	1/33
		HG-KR73(B)G7 1/45	750 W	3000 r/min	1/45
HG-MR series B: With electromagnetic brake		HG-MR053(B)	50 W	3000 r/min	-
		HG-MR13(B)	100 W	3000 r/min	-
		HG-MR23(B)	200 W	3000 r/min	-
		HG-MR43(B)	400 W	3000 r/min	-
		HG-MR73(B)	750 W	3000 r/min	-
HG-SR 1000 r/min series B: With electromagnetic brake		HG-SR51(B)	0.5 kW	1000 r/min	-
		HG-SR81(B)	0.85 kW	1000 r/min	-
		HG-SR121(B)	1.2 kW	1000 r/min	-
		HG-SR201(B)	2.0 kW	1000 r/min	-
		HG-SR301(B)	3.0 kW	1000 r/min	-
		HG-SR421(B)	4.2 kW	1000 r/min	-
HG-SR 2000 r/min series B: With electromagnetic brake	200 V class	HG-SR52(B)	0.5 kW	2000 r/min	-
		HG-SR102(B)	1.0 kW	2000 r/min	-
		HG-SR152(B)	1.5 kW	2000 r/min	-
		HG-SR202(B)	2.0 kW	2000 r/min	-
		HG-SR352(B)	3.5 kW	2000 r/min	-
		HG-SR502(B)	5.0 kW	2000 r/min	-
		HG-SR702(B)	7.0 kW	2000 r/min	-
	400 V class	HG-SR524(B)	0.5 kW	2000 r/min	-
		HG-SR1024(B)	1.0 kW	2000 r/min	-
		HG-SR1524(B)	1.5 kW	2000 r/min	-
		HG-SR2024(B)	2.0 kW	2000 r/min	-
		HG-SR3524(B)	3.5 kW	2000 r/min	-
		HG-SR5024(B)	5.0 kW	2000 r/min	-
		HG-SR7024(B)	7.0 kW	2000 r/min	-



Rotary servo motors

Item		Model	Rated output	Rated speed	Reduction ratio
HG-SR 2000 r/min series With reducer for general industrial machines B: With electromagnetic brake G1: Flange mounting G1H: Foot mounting	200 V class	HG-SR52(B)G1(H) 1/6	0.5 kW	2000 r/min	1/6
		HG-SR52(B)G1(H) 1/11	0.5 kW	2000 r/min	1/11
		HG-SR52(B)G1(H) 1/17	0.5 kW	2000 r/min	1/17
		HG-SR52(B)G1(H) 1/29	0.5 kW	2000 r/min	1/29
		HG-SR52(B)G1(H) 1/35	0.5 kW	2000 r/min	1/35
		HG-SR52(B)G1(H) 1/43	0.5 kW	2000 r/min	1/43
		HG-SR52(B)G1(H) 1/59	0.5 kW	2000 r/min	1/59
		HG-SR102(B)G1(H) 1/6	1.0 kW	2000 r/min	1/6
		HG-SR102(B)G1(H) 1/11	1.0 kW	2000 r/min	1/11
		HG-SR102(B)G1(H) 1/17	1.0 kW	2000 r/min	1/17
		HG-SR102(B)G1(H) 1/29	1.0 kW	2000 r/min	1/29
		HG-SR102(B)G1(H) 1/35	1.0 kW	2000 r/min	1/35
		HG-SR102(B)G1(H) 1/43	1.0 kW	2000 r/min	1/43
		HG-SR102(B)G1(H) 1/59	1.0 kW	2000 r/min	1/59
		HG-SR152(B)G1(H) 1/6	1.5 kW	2000 r/min	1/6
		HG-SR152(B)G1(H) 1/11	1.5 kW	2000 r/min	1/11
		HG-SR152(B)G1(H) 1/17	1.5 kW	2000 r/min	1/17
		HG-SR152(B)G1(H) 1/29	1.5 kW	2000 r/min	1/29
		HG-SR152(B)G1(H) 1/35	1.5 kW	2000 r/min	1/35
		HG-SR152(B)G1(H) 1/43	1.5 kW	2000 r/min	1/43
		HG-SR152(B)G1(H) 1/59	1.5 kW	2000 r/min	1/59
		HG-SR202(B)G1(H) 1/6	2.0 kW	2000 r/min	1/6
		HG-SR202(B)G1(H) 1/11	2.0 kW	2000 r/min	1/11
		HG-SR202(B)G1(H) 1/17	2.0 kW	2000 r/min	1/17
		HG-SR202(B)G1(H) 1/29	2.0 kW	2000 r/min	1/29
		HG-SR202(B)G1(H) 1/35	2.0 kW	2000 r/min	1/35
		HG-SR202(B)G1(H) 1/43	2.0 kW	2000 r/min	1/43
		HG-SR202(B)G1(H) 1/59	2.0 kW	2000 r/min	1/59
		HG-SR352(B)G1(H) 1/6	3.5 kW	2000 r/min	1/6
		HG-SR352(B)G1(H) 1/11	3.5 kW	2000 r/min	1/11
		HG-SR352(B)G1(H) 1/17	3.5 kW	2000 r/min	1/17
		HG-SR352(B)G1(H) 1/29	3.5 kW	2000 r/min	1/29
		HG-SR352(B)G1(H) 1/35	3.5 kW	2000 r/min	1/35
		HG-SR352(B)G1(H) 1/43	3.5 kW	2000 r/min	1/43
		HG-SR352(B)G1(H) 1/59	3.5 kW	2000 r/min	1/59
		HG-SR502(B)G1(H) 1/6	5.0 kW	2000 r/min	1/6
		HG-SR502(B)G1(H) 1/11	5.0 kW	2000 r/min	1/11
		HG-SR502(B)G1(H) 1/17	5.0 kW	2000 r/min	1/17
		HG-SR502(B)G1(H) 1/29	5.0 kW	2000 r/min	1/29
		HG-SR502(B)G1(H) 1/35	5.0 kW	2000 r/min	1/35
		HG-SR502(B)G1(H) 1/43	5.0 kW	2000 r/min	1/43
		HG-SR502(B)G1(H) 1/59	5.0 kW	2000 r/min	1/59
		HG-SR702(B)G1(H) 1/6	7.0 kW	2000 r/min	1/6
		HG-SR702(B)G1(H) 1/11	7.0 kW	2000 r/min	1/11
		HG-SR702(B)G1(H) 1/17	7.0 kW	2000 r/min	1/17
		HG-SR702(B)G1(H) 1/29	7.0 kW	2000 r/min	1/29
		HG-SR702(B)G1(H) 1/35	7.0 kW	2000 r/min	1/35
		HG-SR702(B)G1(H) 1/43	7.0 kW	2000 r/min	1/43
		HG-SR702(B)G1(H) 1/59	7.0 kW	2000 r/min	1/59

Rotary servo motors

Item		Model	Rated output	Rated speed	Reduction ratio
HG-SR 2000 r/min series With reducer for general industrial machines B: With electromagnetic brake G1: Flange mounting G1H: Foot mounting	400 V class	HG-SR524(B)G1(H) 1/6	0.5 kW	2000 r/min	1/6
		HG-SR524(B)G1(H) 1/11	0.5 kW	2000 r/min	1/11
		HG-SR524(B)G1(H) 1/17	0.5 kW	2000 r/min	1/17
		HG-SR524(B)G1(H) 1/29	0.5 kW	2000 r/min	1/29
		HG-SR524(B)G1(H) 1/35	0.5 kW	2000 r/min	1/35
		HG-SR524(B)G1(H) 1/43	0.5 kW	2000 r/min	1/43
		HG-SR524(B)G1(H) 1/59	0.5 kW	2000 r/min	1/59
		HG-SR1024(B)G1(H) 1/6	1.0 kW	2000 r/min	1/6
		HG-SR1024(B)G1(H) 1/11	1.0 kW	2000 r/min	1/11
		HG-SR1024(B)G1(H) 1/17	1.0 kW	2000 r/min	1/17
		HG-SR1024(B)G1(H) 1/29	1.0 kW	2000 r/min	1/29
		HG-SR1024(B)G1(H) 1/35	1.0 kW	2000 r/min	1/35
		HG-SR1024(B)G1(H) 1/43	1.0 kW	2000 r/min	1/43
		HG-SR1024(B)G1(H) 1/59	1.0 kW	2000 r/min	1/59
		HG-SR1524(B)G1(H) 1/6	1.5 kW	2000 r/min	1/6
		HG-SR1524(B)G1(H) 1/11	1.5 kW	2000 r/min	1/11
		HG-SR1524(B)G1(H) 1/17	1.5 kW	2000 r/min	1/17
		HG-SR1524(B)G1(H) 1/29	1.5 kW	2000 r/min	1/29
		HG-SR1524(B)G1(H) 1/35	1.5 kW	2000 r/min	1/35
		HG-SR1524(B)G1(H) 1/43	1.5 kW	2000 r/min	1/43
		HG-SR1524(B)G1(H) 1/59	1.5 kW	2000 r/min	1/59
		HG-SR2024(B)G1(H) 1/6	2.0 kW	2000 r/min	1/6
		HG-SR2024(B)G1(H) 1/11	2.0 kW	2000 r/min	1/11
		HG-SR2024(B)G1(H) 1/17	2.0 kW	2000 r/min	1/17
		HG-SR2024(B)G1(H) 1/29	2.0 kW	2000 r/min	1/29
		HG-SR2024(B)G1(H) 1/35	2.0 kW	2000 r/min	1/35
		HG-SR2024(B)G1(H) 1/43	2.0 kW	2000 r/min	1/43
		HG-SR2024(B)G1(H) 1/59	2.0 kW	2000 r/min	1/59
		HG-SR3524(B)G1(H) 1/6	3.5 kW	2000 r/min	1/6
		HG-SR3524(B)G1(H) 1/11	3.5 kW	2000 r/min	1/11
		HG-SR3524(B)G1(H) 1/17	3.5 kW	2000 r/min	1/17
		HG-SR3524(B)G1(H) 1/29	3.5 kW	2000 r/min	1/29
		HG-SR3524(B)G1(H) 1/35	3.5 kW	2000 r/min	1/35
		HG-SR3524(B)G1(H) 1/43	3.5 kW	2000 r/min	1/43
		HG-SR3524(B)G1(H) 1/59	3.5 kW	2000 r/min	1/59
		HG-SR5024(B)G1(H) 1/6	5.0 kW	2000 r/min	1/6
		HG-SR5024(B)G1(H) 1/11	5.0 kW	2000 r/min	1/11
		HG-SR5024(B)G1(H) 1/17	5.0 kW	2000 r/min	1/17
		HG-SR5024(B)G1(H) 1/29	5.0 kW	2000 r/min	1/29
		HG-SR5024(B)G1(H) 1/35	5.0 kW	2000 r/min	1/35
		HG-SR5024(B)G1(H) 1/43	5.0 kW	2000 r/min	1/43
		HG-SR5024(B)G1(H) 1/59	5.0 kW	2000 r/min	1/59
		HG-SR7024(B)G1(H) 1/6	7.0 kW	2000 r/min	1/6
		HG-SR7024(B)G1(H) 1/11	7.0 kW	2000 r/min	1/11
		HG-SR7024(B)G1(H) 1/17	7.0 kW	2000 r/min	1/17
		HG-SR7024(B)G1(H) 1/29	7.0 kW	2000 r/min	1/29
		HG-SR7024(B)G1(H) 1/35	7.0 kW	2000 r/min	1/35
		HG-SR7024(B)G1(H) 1/43	7.0 kW	2000 r/min	1/43
		HG-SR7024(B)G1(H) 1/59	7.0 kW	2000 r/min	1/59



Rotary servo motors

Item		Model	Rated output	Rated speed	Reduction ratio
HG-SR 2000 r/min series With flange-output type reducer for high precision applications, flange mounting B: With electromagnetic brake	200 V class	HG-SR52(B)G5 1/5	0.5 kW	2000 r/min	1/5
		HG-SR52(B)G5 1/11	0.5 kW	2000 r/min	1/11
		HG-SR52(B)G5 1/21	0.5 kW	2000 r/min	1/21
		HG-SR52(B)G5 1/33	0.5 kW	2000 r/min	1/33
		HG-SR52(B)G5 1/45	0.5 kW	2000 r/min	1/45
		HG-SR102(B)G5 1/5	1.0 kW	2000 r/min	1/5
		HG-SR102(B)G5 1/11	1.0 kW	2000 r/min	1/11
		HG-SR102(B)G5 1/21	1.0 kW	2000 r/min	1/21
		HG-SR102(B)G5 1/33	1.0 kW	2000 r/min	1/33
		HG-SR102(B)G5 1/45	1.0 kW	2000 r/min	1/45
		HG-SR152(B)G5 1/5	1.5 kW	2000 r/min	1/5
		HG-SR152(B)G5 1/11	1.5 kW	2000 r/min	1/11
		HG-SR152(B)G5 1/21	1.5 kW	2000 r/min	1/21
		HG-SR152(B)G5 1/33	1.5 kW	2000 r/min	1/33
		HG-SR152(B)G5 1/45	1.5 kW	2000 r/min	1/45
		HG-SR202(B)G5 1/5	2.0 kW	2000 r/min	1/5
		HG-SR202(B)G5 1/11	2.0 kW	2000 r/min	1/11
		HG-SR202(B)G5 1/21	2.0 kW	2000 r/min	1/21
		HG-SR202(B)G5 1/33	2.0 kW	2000 r/min	1/33
		HG-SR202(B)G5 1/45	2.0 kW	2000 r/min	1/45
	400 V class	HG-SR352(B)G5 1/5	3.5 kW	2000 r/min	1/5
		HG-SR352(B)G5 1/11	3.5 kW	2000 r/min	1/11
		HG-SR352(B)G5 1/21	3.5 kW	2000 r/min	1/21
		HG-SR502(B)G5 1/5	5.0 kW	2000 r/min	1/5
		HG-SR502(B)G5 1/11	5.0 kW	2000 r/min	1/11
		HG-SR702(B)G5 1/5	7.0 kW	2000 r/min	1/5
		HG-SR524(B)G5 1/5	0.5 kW	2000 r/min	1/5
		HG-SR524(B)G5 1/11	0.5 kW	2000 r/min	1/11
		HG-SR524(B)G5 1/21	0.5 kW	2000 r/min	1/21
		HG-SR524(B)G5 1/33	0.5 kW	2000 r/min	1/33
		HG-SR524(B)G5 1/45	0.5 kW	2000 r/min	1/45
		HG-SR1024(B)G5 1/5	1.0 kW	2000 r/min	1/5
		HG-SR1024(B)G5 1/11	1.0 kW	2000 r/min	1/11
		HG-SR1024(B)G5 1/21	1.0 kW	2000 r/min	1/21
		HG-SR1024(B)G5 1/33	1.0 kW	2000 r/min	1/33
		HG-SR1024(B)G5 1/45	1.0 kW	2000 r/min	1/45
		HG-SR1524(B)G5 1/5	1.5 kW	2000 r/min	1/5
		HG-SR1524(B)G5 1/11	1.5 kW	2000 r/min	1/11
		HG-SR1524(B)G5 1/21	1.5 kW	2000 r/min	1/21
		HG-SR1524(B)G5 1/33	1.5 kW	2000 r/min	1/33
		HG-SR1524(B)G5 1/45	1.5 kW	2000 r/min	1/45
		HG-SR2024(B)G5 1/5	2.0 kW	2000 r/min	1/5
		HG-SR2024(B)G5 1/11	2.0 kW	2000 r/min	1/11
		HG-SR2024(B)G5 1/21	2.0 kW	2000 r/min	1/21
		HG-SR2024(B)G5 1/33	2.0 kW	2000 r/min	1/33
		HG-SR2024(B)G5 1/45	2.0 kW	2000 r/min	1/45
		HG-SR3524(B)G5 1/5	3.5 kW	2000 r/min	1/5
		HG-SR3524(B)G5 1/11	3.5 kW	2000 r/min	1/11
		HG-SR3524(B)G5 1/21	3.5 kW	2000 r/min	1/21
		HG-SR5024(B)G5 1/5	5.0 kW	2000 r/min	1/5
		HG-SR5024(B)G5 1/11	5.0 kW	2000 r/min	1/11
		HG-SR7024(B)G5 1/5	7.0 kW	2000 r/min	1/5

Rotary servo motors

Item		Model	Rated output	Rated speed	Reduction ratio
HG-SR 2000 r/min series With shaft-output type reducer for high precision applications, flange mounting B: With electromagnetic brake	200 V class	HG-SR52(B)G7 1/5	0.5 kW	2000 r/min	1/5
		HG-SR52(B)G7 1/11	0.5 kW	2000 r/min	1/11
		HG-SR52(B)G7 1/21	0.5 kW	2000 r/min	1/21
		HG-SR52(B)G7 1/33	0.5 kW	2000 r/min	1/33
		HG-SR52(B)G7 1/45	0.5 kW	2000 r/min	1/45
		HG-SR102(B)G7 1/5	1.0 kW	2000 r/min	1/5
		HG-SR102(B)G7 1/11	1.0 kW	2000 r/min	1/11
		HG-SR102(B)G7 1/21	1.0 kW	2000 r/min	1/21
		HG-SR102(B)G7 1/33	1.0 kW	2000 r/min	1/33
		HG-SR102(B)G7 1/45	1.0 kW	2000 r/min	1/45
		HG-SR152(B)G7 1/5	1.5 kW	2000 r/min	1/5
		HG-SR152(B)G7 1/11	1.5 kW	2000 r/min	1/11
		HG-SR152(B)G7 1/21	1.5 kW	2000 r/min	1/21
		HG-SR152(B)G7 1/33	1.5 kW	2000 r/min	1/33
		HG-SR152(B)G7 1/45	1.5 kW	2000 r/min	1/45
		HG-SR202(B)G7 1/5	2.0 kW	2000 r/min	1/5
		HG-SR202(B)G7 1/11	2.0 kW	2000 r/min	1/11
		HG-SR202(B)G7 1/21	2.0 kW	2000 r/min	1/21
		HG-SR202(B)G7 1/33	2.0 kW	2000 r/min	1/33
		HG-SR202(B)G7 1/45	2.0 kW	2000 r/min	1/45
	400 V class	HG-SR352(B)G7 1/5	3.5 kW	2000 r/min	1/5
		HG-SR352(B)G7 1/11	3.5 kW	2000 r/min	1/11
		HG-SR352(B)G7 1/21	3.5 kW	2000 r/min	1/21
		HG-SR502(B)G7 1/5	5.0 kW	2000 r/min	1/5
		HG-SR502(B)G7 1/11	5.0 kW	2000 r/min	1/11
		HG-SR702(B)G7 1/5	7.0 kW	2000 r/min	1/5
		HG-SR524(B)G7 1/5	0.5 kW	2000 r/min	1/5
		HG-SR524(B)G7 1/11	0.5 kW	2000 r/min	1/11
		HG-SR524(B)G7 1/21	0.5 kW	2000 r/min	1/21
		HG-SR524(B)G7 1/33	0.5 kW	2000 r/min	1/33
		HG-SR524(B)G7 1/45	0.5 kW	2000 r/min	1/45
		HG-SR1024(B)G7 1/5	1.0 kW	2000 r/min	1/5
		HG-SR1024(B)G7 1/11	1.0 kW	2000 r/min	1/11
		HG-SR1024(B)G7 1/21	1.0 kW	2000 r/min	1/21
		HG-SR1024(B)G7 1/33	1.0 kW	2000 r/min	1/33
		HG-SR1024(B)G7 1/45	1.0 kW	2000 r/min	1/45
		HG-SR1524(B)G7 1/5	1.5 kW	2000 r/min	1/5
		HG-SR1524(B)G7 1/11	1.5 kW	2000 r/min	1/11
		HG-SR1524(B)G7 1/21	1.5 kW	2000 r/min	1/21
		HG-SR1524(B)G7 1/33	1.5 kW	2000 r/min	1/33
		HG-SR1524(B)G7 1/45	1.5 kW	2000 r/min	1/45
		HG-SR2024(B)G7 1/5	2.0 kW	2000 r/min	1/5
		HG-SR2024(B)G7 1/11	2.0 kW	2000 r/min	1/11
		HG-SR2024(B)G7 1/21	2.0 kW	2000 r/min	1/21
		HG-SR2024(B)G7 1/33	2.0 kW	2000 r/min	1/33
		HG-SR2024(B)G7 1/45	2.0 kW	2000 r/min	1/45
		HG-SR3524(B)G7 1/5	3.5 kW	2000 r/min	1/5
		HG-SR3524(B)G7 1/11	3.5 kW	2000 r/min	1/11
		HG-SR3524(B)G7 1/21	3.5 kW	2000 r/min	1/21
		HG-SR5024(B)G7 1/5	5.0 kW	2000 r/min	1/5
		HG-SR5024(B)G7 1/11	5.0 kW	2000 r/min	1/11
		HG-SR7024(B)G7 1/5	7.0 kW	2000 r/min	1/5



Rotary servo motors

Item		Model	Rated output	Rated speed	Reduction ratio
HG-JR 1000 r/min series B: With electromagnetic brake	200 V class	HG-JR601(B)	6.0 kW	1000 r/min	-
		HG-JR801(B)	8.0 kW	1000 r/min	-
		HG-JR12K1(B)	12 kW	1000 r/min	-
		HG-JR15K1	15 kW	1000 r/min	-
		HG-JR20K1	20 kW	1000 r/min	-
		HG-JR25K1	25 kW	1000 r/min	-
		HG-JR30K1	30 kW	1000 r/min	-
		HG-JR37K1	37 kW	1000 r/min	-
	400 V class	HG-JR6014(B)	6.0 kW	1000 r/min	-
		HG-JR8014(B)	8.0 kW	1000 r/min	-
		HG-JR12K14(B)	12 kW	1000 r/min	-
		HG-JR15K14	15 kW	1000 r/min	-
		HG-JR20K14	20 kW	1000 r/min	-
		HG-JR25K14	25 kW	1000 r/min	-
		HG-JR30K14	30 kW	1000 r/min	-
		HG-JR37K14	37 kW	1000 r/min	-
HG-JR 1500 r/min series B: With electromagnetic brake	200 V class	HG-JR701M(B)	7.0 kW	1500 r/min	-
		HG-JR11K1M(B)	11 kW	1500 r/min	-
		HG-JR15K1M(B)	15 kW	1500 r/min	-
		HG-JR22K1M	22 kW	1500 r/min	-
		HG-JR30K1M	30 kW	1500 r/min	-
		HG-JR37K1M	37 kW	1500 r/min	-
	400 V class	HG-JR701M4(B)	7.0 kW	1500 r/min	-
		HG-JR11K1M4(B)	11 kW	1500 r/min	-
		HG-JR15K1M4(B)	15 kW	1500 r/min	-
		HG-JR22K1M4	22 kW	1500 r/min	-
		HG-JR30K1M4	30 kW	1500 r/min	-
		HG-JR37K1M4	37 kW	1500 r/min	-
		HG-JR45K1M4	45 kW	1500 r/min	-
		HG-JR55K1M4	55 kW	1500 r/min	-
HG-JR 3000 r/min series B: With electromagnetic brake	200 V class	HG-JR53(B)	0.5 kW	3000 r/min	-
		HG-JR73(B)	0.75 kW	3000 r/min	-
		HG-JR103(B)	1.0 kW	3000 r/min	-
		HG-JR153(B)	1.5 kW	3000 r/min	-
		HG-JR203(B)	2.0 kW	3000 r/min	-
		HG-JR353(B)	3.3 kW (3.5 kW)	3000 r/min	-
		HG-JR503(B)	5.0 kW	3000 r/min	-
		HG-JR703(B)	7.0 kW	3000 r/min	-
		HG-JR903(B)	9.0 kW	3000 r/min	-
	400 V class	HG-JR534(B)	0.5 kW	3000 r/min	-
		HG-JR734(B)	0.75 kW	3000 r/min	-
		HG-JR1034(B)	1.0 kW	3000 r/min	-
		HG-JR1534(B)	1.5 kW	3000 r/min	-
		HG-JR2034(B)	2.0 kW	3000 r/min	-
		HG-JR3534(B)	3.3 kW (3.5 kW)	3000 r/min	-
		HG-JR5034(B)	5.0 kW	3000 r/min	-
		HG-JR7034(B)	7.0 kW	3000 r/min	-
		HG-JR9034(B)	9.0 kW	3000 r/min	-
HG-RR series B: With electromagnetic brake		HG-RR103(B)	1.0 kW	3000 r/min	-
		HG-RR153(B)	1.5 kW	3000 r/min	-
		HG-RR203(B)	2.0 kW	3000 r/min	-
		HG-RR353(B)	3.5 kW	3000 r/min	-
		HG-RR503(B)	5.0 kW	3000 r/min	-
HG-UR series B: With electromagnetic brake		HG-UR72(B)	0.75 kW	2000 r/min	-
		HG-UR152(B)	1.5 kW	2000 r/min	-
		HG-UR202(B)	2.0 kW	2000 r/min	-
		HG-UR352(B)	3.5 kW	2000 r/min	-
		HG-UR502(B)	5.0 kW	2000 r/min	-

Linear servo motors

Item		Model	Continuous thrust	Maximum thrust	Maximum speed	Length
LM-H3 series Primary side (coil)		LM-H3P2A-07P-BSS0	70 N	175 N	3.0 m/s	-
		LM-H3P3A-12P-CSS0	120 N	300 N	3.0 m/s	-
		LM-H3P3B-24P-CSS0	240 N	600 N	3.0 m/s	-
		LM-H3P3C-36P-CSS0	360 N	900 N	3.0 m/s	-
		LM-H3P3D-48P-CSS0	480 N	1200 N	3.0 m/s	-
		LM-H3P7A-24P-ASS0	240 N	600 N	3.0 m/s	-
		LM-H3P7B-48P-ASS0	480 N	1200 N	3.0 m/s	-
		LM-H3P7C-72P-ASS0	720 N	1800 N	3.0 m/s	-
LM-H3 series Secondary side (magnet)		LM-H3S20-288-BSS0	-	-	-	288 mm
		LM-H3S20-384-BSS0	-	-	-	384 mm
		LM-H3S20-480-BSS0	-	-	-	480 mm
		LM-H3S20-768-BSS0	-	-	-	768 mm
		LM-H3S30-288-CSS0	-	-	-	288 mm
		LM-H3S30-384-CSS0	-	-	-	384 mm
		LM-H3S30-480-CSS0	-	-	-	480 mm
		LM-H3S30-768-CSS0	-	-	-	768 mm
		LM-H3S70-288-ASS0	-	-	-	288 mm
		LM-H3S70-384-ASS0	-	-	-	384 mm
		LM-H3S70-480-ASS0	-	-	-	480 mm
		LM-H3S70-768-ASS0	-	-	-	768 mm
LM-F series Primary side (coil)	200 V class	LM-FP2B-06M-1SS0	300 N (natural cooling) /600 N (liquid cooling)	1800 N	2.0 m/s	-
		LM-FP2D-12M-1SS0	600 N (natural cooling) /1200 N (liquid cooling)	3600 N	2.0 m/s	-
		LM-FP2F-18M-1SS0	900 N (natural cooling) /1800 N (liquid cooling)	5400 N	2.0 m/s	-
		LM-FP4B-12M-1SS0	600 N (natural cooling) /1200 N (liquid cooling)	3600 N	2.0 m/s	-
		LM-FP4D-24M-1SS0	1200 N (natural cooling) /2400 N (liquid cooling)	7200 N	2.0 m/s	-
		LM-FP4F-36M-1SS0	1800 N (natural cooling) /3600 N (liquid cooling)	10800 N	2.0 m/s	-
		LM-FP4H-48M-1SS0	2400 N (natural cooling) /4800 N (liquid cooling)	14400 N	2.0 m/s	-
	400 V class	LM-FP5H-60M-1SS0	3000 N (natural cooling) /6000 N (liquid cooling)	18000 N	2.0 m/s	-
LM-F series Secondary side (magnet)	200 V class	LM-FS20-480-1SS0	-	-	-	480 mm
		LM-FS20-576-1SS0	-	-	-	576 mm
		LM-FS40-480-1SS0	-	-	-	480 mm
		LM-FS40-576-1SS0	-	-	-	576 mm
	400 V class	LM-FS50-480-1SS0	-	-	-	480 mm
		LM-FS50-576-1SS0	-	-	-	576 mm
LM-K2 series Primary side (coil)		LM-K2P1A-01M-2SS1	120 N	300 N	2.0 m/s	-
		LM-K2P1C-03M-2SS1	360 N	900 N	2.0 m/s	-
		LM-K2P2A-02M-1SS1	240 N	600 N	2.0 m/s	-
		LM-K2P2C-07M-1SS1	720 N	1800 N	2.0 m/s	-
		LM-K2P2E-12M-1SS1	1200 N	3000 N	2.0 m/s	-
		LM-K2P3C-14M-1SS1	1440 N	3600 N	2.0 m/s	-
		LM-K2P3E-24M-1SS1	2400 N	6000 N	2.0 m/s	-
LM-K2 series Secondary side (magnet)		LM-K2S10-288-2SS1	-	-	-	288 mm
		LM-K2S10-384-2SS1	-	-	-	384 mm
		LM-K2S10-480-2SS1	-	-	-	480 mm
		LM-K2S10-768-2SS1	-	-	-	768 mm
		LM-K2S20-288-1SS1	-	-	-	288 mm
		LM-K2S20-384-1SS1	-	-	-	384 mm
		LM-K2S20-480-1SS1	-	-	-	480 mm
		LM-K2S20-768-1SS1	-	-	-	768 mm
		LM-K2S30-288-1SS1	-	-	-	288 mm
		LM-K2S30-384-1SS1	-	-	-	384 mm
		LM-K2S30-480-1SS1	-	-	-	480 mm
		LM-K2S30-768-1SS1	-	-	-	768 mm



Linear servo motors

Item	Model	Continuous thrust	Maximum thrust	Maximum speed	Length
LM-U2 series Primary side (coil)	LM-U2PAB-05M-0SS0	50 N	150 N	2.0 m/s	-
	LM-U2PAD-10M-0SS0	100 N	300 N	2.0 m/s	-
	LM-U2PAF-15M-0SS0	150 N	450 N	2.0 m/s	-
	LM-U2PBB-07M-1SS0	75 N	225 N	2.0 m/s	-
	LM-U2PBD-15M-1SS0	150 N	450 N	2.0 m/s	-
	LM-U2PBF-22M-1SS0	225 N	675 N	2.0 m/s	-
	LM-U2P2B-40M-2SS0	400 N	1600 N	2.0 m/s	-
	LM-U2P2C-60M-2SS0	600 N	2400 N	2.0 m/s	-
	LM-U2P2D-80M-2SS0	800 N	3200 N	2.0 m/s	-
LM-U2 series Secondary side (magnet)	LM-U2SA0-240-0SS0	-	-	-	240 mm
	LM-U2SA0-300-0SS0	-	-	-	300 mm
	LM-U2SA0-420-0SS0	-	-	-	420 mm
	LM-U2SB0-240-1SS0	-	-	-	240 mm
	LM-U2SB0-300-1SS0	-	-	-	300 mm
	LM-U2SB0-420-1SS0	-	-	-	420 mm
	LM-U2S20-300-2SS0	-	-	-	300 mm
	LM-U2S20-480-2SS0	-	-	-	480 mm

Direct drive motors

Item	Model	Rated torque	Maximum torque	Rated speed
TM-RFM series	TM-RFM002C20	2 N•m	6 N•m	200 r/min
	TM-RFM004C20	4 N•m	12 N•m	200 r/min
	TM-RFM006C20	6 N•m	18 N•m	200 r/min
	TM-RFM006E20	6 N•m	18 N•m	200 r/min
	TM-RFM012E20	12 N•m	36 N•m	200 r/min
	TM-RFM018E20	18 N•m	54 N•m	200 r/min
	TM-RFM012G20	12 N•m	36 N•m	200 r/min
	TM-RFM048G20	48 N•m	144 N•m	200 r/min
	TM-RFM072G20	72 N•m	216 N•m	200 r/min
	TM-RFM040J10	40 N•m	120 N•m	100 r/min
	TM-RFM120J10	120 N•m	360 N•m	100 r/min
	TM-RFM240J10	240 N•m	720 N•m	100 r/min

Encoder cables/Junction cables

Item	Model	Length	Bending life	IP rating	Application
Encoder cable (load-side lead)	MR-J3ENCBL2M-A1-H	2 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-J3ENCBL5M-A1-H	5 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-J3ENCBL10M-A1-H	10 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-J3ENCBL2M-A1-L	2 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
	MR-J3ENCBL5M-A1-L	5 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
Encoder cable (opposite to load-side lead)	MR-J3ENCBL2M-A2-H	2 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-J3ENCBL5M-A2-H	5 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-J3ENCBL10M-A2-H	10 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-J3ENCBL2M-A2-L	2 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
	MR-J3ENCBL5M-A2-L	5 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
Encoder cable (load-side lead)	MR-J3JCB03M-A1-L	0.3 m	Standard	IP20	For HG-KR/HG-MR (junction type) ^(Note 1)
Encoder cable (opposite to load-side lead)	MR-J3JCB03M-A2-L	0.3 m	Standard	IP20	For HG-KR/HG-MR (junction type) ^(Note 1)
Encoder cable	MR-EKCB20M-H	20 m	Long bending life	IP20	For HG-KR/HG-MR (junction type) ^(Note 2)
	MR-EKCB30M-H	30 m	Long bending life	IP20	For HG-KR/HG-MR (junction type) ^(Note 2)
	MR-EKCB40M-H	40 m	Long bending life	IP20	For HG-KR/HG-MR (junction type) ^(Note 2)
	MR-EKCB50M-H	50 m	Long bending life	IP20	For HG-KR/HG-MR (junction type) ^(Note 2)
	MR-EKCB20M-L	20 m	Standard	IP20	For HG-KR/HG-MR (junction type) ^(Note 2)
	MR-EKCB30M-L	30 m	Standard	IP20	For HG-KR/HG-MR (junction type) ^(Note 2)
	MR-EKCB2M-H	2 m	Long bending life	IP20	For connecting load-side encoder or linear encoder
	MR-EKCB5M-H	5 m	Long bending life	IP20	For connecting load-side encoder or linear encoder
Encoder cable (load-side lead)	MR-J3JSCBL03M-A1-L	0.3 m	Standard	IP65	For HG-KR/HG-MR (junction type) ^(Note 3)
Encoder cable (opposite to load-side lead)	MR-J3JSCBL03M-A2-L	0.3 m	Standard	IP65	For HG-KR/HG-MR (junction type) ^(Note 3)
Encoder cable	MR-J3ENSCBL2M-H	2 m	Long bending life	IP67	For HG-KR/HG-MR (junction type) ^(Note 4) , For HG-SR/HG-JR53(4), 73(4), 103(4), 153(4), 203(4), 353(4), 503(4), 703(4), 903(4)/ HG-RR/HG-UR (direct connection type)
	MR-J3ENSCBL5M-H	5 m	Long bending life	IP67	
	MR-J3ENSCBL10M-H	10 m	Long bending life	IP67	
	MR-J3ENSCBL20M-H	20 m	Long bending life	IP67	
	MR-J3ENSCBL30M-H	30 m	Long bending life	IP67	
	MR-J3ENSCBL40M-H	40 m	Long bending life	IP67	
	MR-J3ENSCBL50M-H	50 m	Long bending life	IP67	
	MR-J3ENSCBL2M-L	2 m	Standard	IP67	For HG-KR/HG-MR (junction type) ^(Note 4) , For HG-SR/HG-JR53(4), 73(4), 103(4), 153(4), 203(4), 353(4), 503(4), 703(4), 903(4)/ HG-RR/HG-UR (direct connection type)
	MR-J3ENSCBL5M-L	5 m	Standard	IP67	
	MR-J3ENSCBL10M-L	10 m	Standard	IP67	
	MR-J3ENSCBL20M-L	20 m	Standard	IP67	
	MR-J3ENSCBL30M-L	30 m	Standard	IP67	
	MR-ENECBL2M-H-MTH	2 m	Long bending life	IP67	For HG-JR601(4), 801(4), 12K1(4), 15K1(4), 20K1(4), 25K1(4), 30K1(4), 37K1(4), 701M(4), 11K1M(4), 15K1M(4), 22K1M(4), 30K1M(4), 37K1M(4), 45K1M4, 55K1M4
	MR-ENECBL5M-H-MTH	5 m	Long bending life	IP67	
	MR-ENECBL10M-H-MTH	10 m	Long bending life	IP67	
	MR-ENECBL20M-H-MTH	20 m	Long bending life	IP67	
	MR-ENECBL30M-H-MTH	30 m	Long bending life	IP67	
	MR-ENECBL40M-H-MTH	40 m	Long bending life	IP67	
	MR-ENECBL50M-H-MTH	50 m	Long bending life	IP67	
Junction cable for fully closed loop control	MR-J4FCCBL03M	0.3 m	-	-	For branching load-side encoder
Junction cable for linear servo motor	MR-J4THCBL03M	0.3 m	-	-	For branching thermistor

Notes:

1. Use this in combination with MR-EKCB_L-H (20 m to 50 m), MR-EKCB_L-M (20 m or 30 m), or MR-ECNM.
2. Use this in combination with MR-J3JCB03M-A1-L or MR-J3JCB03M-A2-L.
3. Use this in combination with MR-J3ENSCBL_M-H, MR-J3ENSCBL_M-L, or MR-J3SCNS.
4. Use this in combination with MR-J3JSCBL03M-A1-L or MR-J3JSCBL03M-A2-L when using for HG-KR or HG-MR series.



Encoder connector sets/Junction connector sets

Item	Model	Description	IP rating	Application
Encoder connector set (one-touch connection type)	MR-J3SCNS	Straight type Junction connector or encoder connector × 1, Servo amplifier connector × 1	IP67	For HG-KR/HG-MR (junction type) ^(Note 2) , For HG-SR/HG-JR53(4), 73(4), 103(4), 153(4), 203(4), 353(4), 503(4), 703(4), 903(4)/ HG-RR/HG-UR (direct connection type)
Encoder connector set (screw type)	MR-ENCNS2	Straight type Encoder connector × 1, Servo amplifier connector × 1	IP67	For HG-SR/HG-JR53(4), 73(4), 103(4), 153(4), 203(4), 353(4), 503(4), 703(4), 903(4)/ HG-RR/HG-UR
Encoder connector set (one-touch connection type)	MR-J3SCNSA	Angle type Encoder connector × 1, Servo amplifier connector × 1	IP67	For HG-SR/HG-JR53(4), 73(4), 103(4), 153(4), 203(4), 353(4), 503(4), 703(4), 903(4)/ HG-RR/HG-UR
Encoder connector set (screw type)	MR-ENCNS2A	Angle type Encoder connector × 1, Servo amplifier connector × 1	IP67	For HG-SR/HG-JR53(4), 73(4), 103(4), 153(4), 203(4), 353(4), 503(4), 703(4), 903(4)/ HG-RR/HG-UR
Encoder connector set	MR-ECNM	Junction connector × 1, Servo amplifier connector × 1	IP20	For HG-KR/HG-MR (junction type) ^(Note 1) , For connecting load-side encoder or linear encoder
	MR-ENECNS	Straight type Encoder connector × 1, Servo amplifier connector × 1	IP67	For HG-JR601(4), 801(4), 12K1(4), 15K1(4), 20K1(4), 25K1(4), 30K1(4), 37K1(4), 701M(4), 11K1M(4), 15K1M(4), 22K1M(4), 30K1M(4), 37K1M(4), 45K1M4, 55K1M4
	MR-J3CN2	Servo amplifier connector × 1	-	For connecting load-side encoder, linear encoder, or thermistor
	MR-J3DDCNS	Encoder connector or absolute position storage unit connector × 1, Servo amplifier connector × 1	IP67	For TM-RFM (connecting direct drive motor and servo amplifier, or absolute position storage unit and servo amplifier)
	MR-J3DDSPS	Encoder connector × 1, Absolute position storage unit connector × 1	IP67	For TM-RFM (connecting direct drive motor and absolute position storage unit)
Connector set	MR-J3THMCN2	Junction connector × 2, Servo amplifier connector × 1	-	For fully closed loop control or branching thermistor

Notes:

1. Use this in combination with MR-J3JCB03M-A1-L or MR-J3JCB03M-A2-L.
2. Use this in combination with MR-J3JSCBL03M-A1-L or MR-J3JSCBL03M-A2-L when using for HG-KR or HG-MR series.

Servo motor power cables

Item	Model	Length	Bending life	IP rating	Application
Servo motor power cable (load-side lead, lead-out)	MR-PWS1CBL2M-A1-H	2 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-PWS1CBL5M-A1-H	5 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-PWS1CBL10M-A1-H	10 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-PWS1CBL2M-A1-L	2 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
	MR-PWS1CBL5M-A1-L	5 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
Servo motor power cable (opposite to load-side lead, lead-out)	MR-PWS1CBL10M-A1-L	10 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
	MR-PWS1CBL2M-A2-H	2 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-PWS1CBL5M-A2-H	5 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-PWS1CBL10M-A2-H	10 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-PWS1CBL2M-A2-L	2 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
Servo motor power cable (load-side lead, lead-out)	MR-PWS1CBL5M-A2-L	5 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
	MR-PWS1CBL10M-A2-L	10 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
Servo motor power cable (load-side lead, lead-out)	MR-PWS2CBL03M-A1-L	0.3 m	Standard	IP55	For HG-KR/HG-MR (junction type)
Servo motor power cable (opposite to load-side lead, lead-out)	MR-PWS2CBL03M-A2-L	0.3 m	Standard	IP55	For HG-KR/HG-MR (junction type)

Servo motor power connector sets

Item	Model	Description	IP rating	Application
Servo motor power connector set EN compliant	MR-PWCNF	Straight type Power connector × 1	IP67	For TM-RFM_C20, _E20
	MR-PWCNS4	Straight type Power connector × 1	IP67	For HG-SR51, 81, 52(4), 102(4), 152(4)/ HG-JR53(4), 73(4), 103(4), 153(4), 203(4), 3534, 5034/ TM-RFM_G20
	MR-PWCNS5	Straight type Power connector × 1	IP67	For HG-SR121, 201, 301, 202(4), 352(4), 502(4)/HG-JR353, 503/ TM-RFM040J10, 120J10
	MR-PWCNS3	Straight type Power connector × 1	IP67	For HG-SR421, 702(4)/HG-JR703(4), 903(4), 601(4), 801(4), 12K1(4), 701M(4), 11K1M(4), 15K1M(4)/ TM-RFM240J10
	MR-PWCNS1	Straight type Power connector × 1	IP67	For HG-RR103, 153, 203/ HG-UR72, 152
	MR-PWCNS2	Straight type Power connector × 1	IP67	For HG-RR353, 503/ HG-UR202, 352, 502

Cooling fan power connector set

Item	Model	Description	IP rating	Application
Cooling fan power connector set	MR-PWCNF	Straight type Power connector × 1	IP67	For HG-JR15K1(4), 20K1(4), 25K1(4), 30K1(4), 37K1(4), 22K1M(4), 30K1M(4), 37K1M(4), 45K1M4, 55K1M4

Electromagnetic brake cables

Item	Model	Length	Bending life	IP rating	Application
Electromagnetic brake cable (load-side lead, lead-out)	MR-BKS1CBL2M-A1-H	2 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-BKS1CBL5M-A1-H	5 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-BKS1CBL10M-A1-H	10 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-BKS1CBL2M-A1-L	2 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
	MR-BKS1CBL5M-A1-L	5 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
	MR-BKS1CBL10M-A1-L	10 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
Electromagnetic brake cable (opposite to load-side lead, lead-out)	MR-BKS1CBL2M-A2-H	2 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-BKS1CBL5M-A2-H	5 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-BKS1CBL10M-A2-H	10 m	Long bending life	IP65	For HG-KR/HG-MR (direct connection type)
	MR-BKS1CBL2M-A2-L	2 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
	MR-BKS1CBL5M-A2-L	5 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
	MR-BKS1CBL10M-A2-L	10 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
Electromagnetic brake cable (load-side lead, lead-out)	MR-BKS2CBL03M-A1-L	0.3 m	Standard	IP55	For HG-KR/HG-MR (junction type)
Electromagnetic brake cable (opposite to load-side lead, lead-out)	MR-BKS2CBL03M-A2-L	0.3 m	Standard	IP55	For HG-KR/HG-MR (junction type)



Electromagnetic brake connector sets

Item	Model	Description	IP rating	Application
Electromagnetic brake connector set (one-touch connection type)	MR-BKCNS1	Straight type, Electromagnetic brake connector × 1	IP67	For HG-SR/HG-JR53(4)B, 73(4)B, 103(4)B, 153(4)B, 203(4)B, 353(4)B, 503(4)B, 703(4)B, 903(4)B
Electromagnetic brake connector set (screw type)	MR-BKCNS2	Straight type, Electromagnetic brake connector × 1	IP67	For HG-SR/HG-JR53(4)B, 73(4)B, 103(4)B, 153(4)B, 203(4)B, 353(4)B, 503(4)B, 703(4)B, 903(4)B
Electromagnetic brake connector set (one-touch connection type)	MR-BKCNS1A	Angle type, Electromagnetic brake connector × 1	IP67	For HG-SR/HG-JR53(4)B, 73(4)B, 103(4)B, 153(4)B, 203(4)B, 353(4)B, 503(4)B, 703(4)B, 903(4)B
Electromagnetic brake connector set (screw type)	MR-BKCNS2A	Angle type, Electromagnetic brake connector × 1	IP67	For HG-SR/HG-JR53(4)B, 73(4)B, 103(4)B, 153(4)B, 203(4)B, 353(4)B, 503(4)B, 703(4)B, 903(4)B
Electromagnetic brake connector set	MR-BKCN	Straight type, Electromagnetic brake connector × 1	IP67	For HG-JR601(4)B, 801(4)B, 12K1(4)B, 701M(4)B, 11K1M(4)B, 15K1M(4)B/HG-UR202B, 352B, 502B

SSCNET III cables/SSCNET III connector set

Item	Model	Length	Bending life	IP rating	Application
SSCNET III cable (standard cord inside cabinet) compatible with SSCNET III(/H)	MR-J3BUS015M	0.15 m	Standard	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B
	MR-J3BUS03M	0.3 m	Standard	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B
	MR-J3BUS05M	0.5 m	Standard	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B
	MR-J3BUS1M	1 m	Standard	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B
	MR-J3BUS3M	3 m	Standard	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B
SSCNET III cable (standard cable outside cabinet) compatible with SSCNET III(/H)	MR-J3BUS5M-A	5 m	Standard	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B
	MR-J3BUS10M-A	10 m	Standard	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B
	MR-J3BUS20M-A	20 m	Standard	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B
SSCNET III cable (long distance cable) compatible with SSCNET III(/H)	MR-J3BUS30M-B	30 m	Long bending life	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B
	MR-J3BUS40M-B	40 m	Long bending life	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B
	MR-J3BUS50M-B	50 m	Long bending life	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B
SSCNET III connector set compatible with SSCNET III(/H)	MR-J3BCN1	-	-	-	For MR-J4-B / B_-RJ, MR-J4-DUB / DUB_-RJ, and MR-J4W_-B

Junction terminal blocks/Junction terminal block cables

Item	Model	Length	Application
Junction terminal block (26 pins)	MR-TB26A	-	For MR-J4W_-B
Junction terminal block cable (for MR-TB26A)	MR-TBNATBL05M	0.5 m	For connecting MR-J4W_-B and MR-TB26A
	MR-TBNATBL1M	1 m	For connecting MR-J4W_-B and MR-TB26A
Junction terminal block (50 pins)	MR-TB50	-	For MR-J4-A / A_-RJ, and MR-J4-DUA / DUA_-RJ
Junction terminal block cable (for MR-TB50)	MR-J2M-CN1TBL05M	0.5 m	For connecting MR-J4-A / A_-RJ, MR-J4-DUA / DUA_-RJ and MR-TB50
	MR-J2M-CN1TBL1M	1 m	For connecting MR-J4-A / A_-RJ, MR-J4-DUA / DUA_-RJ and MR-TB50

Batteries/Battery case/Battery cables

Item	Model	Length	Application
Battery	MR-BAT6V1SET	-	For MR-J4-B / B_-RJ/ B_-RJ010, MR-J4-A / A_-RJ, MR-J4-DUB_ / DUB_-RJ, and MR-J4-DUA_ / DUA_-RJ
	MR-BAT6V1	-	For MR-BAT6V1SET, MR-BT6VCASE
Battery for junction battery cable	MR-BAT6V1BJ	-	For MR-BT6VCBL03M
Junction battery cable	MR-BT6VCBL03M	0.3 m	For MR-J4-B / B_-RJ/ B_-RJ010, MR-J4-A / A_-RJ, MR-J4-DUB_ / DUB_-RJ, and MR-J4-DUA_ / DUA_-RJ
Battery case	MR-BT6VCASE	-	For MR-J4-B / B_-RJ/ B_-RJ010, MR-J4-A / A_-RJ, MR-J4-DUB_ / DUB_-RJ, MR-J4-DUA_ / DUA_-RJ, and MR-J4W_-B
Battery cable	MR-BT6V1CBL03M	0.3 m	For MR-BT6VCASE
	MR-BT6V1CBL1M	1 m	For MR-BT6VCASE
Junction battery cable	MR-BT6V2CBL03M	0.3 m	For MR-BT6VCASE
	MR-BT6V2CBL1M	1 m	For MR-BT6VCASE

Regenerative options

Item	Model	Tolerable regenerative power	Resistance value	Application
Regenerative option (200 V AC/100 V AC)	MR-RB032	30 W	40 Ω	For MR-J4-10B(1)/ B(1)-RJ/ B-RJ010 to 100B/ B-RJ/ B-RJ010, and MR-J4-10A(1)/ A(1)-RJ to 100A/ A-RJ
	MR-RB12	100 W	40 Ω	For MR-J4-20B(1)/ B(1)-RJ/ B-RJ010 to 100B/ B-RJ/ B-RJ010, and MR-J4-20A(1)/ A(1)-RJ to 100A/ A-RJ
	MR-RB30	300 W	13 Ω	For MR-J4-200B/ B-RJ/ B-RJ010, and MR-J4-200A/ A-RJ
	MR-RB3N	300 W	9 Ω	For MR-J4-350B/ B-RJ/ B-RJ010, MR-J4-350A/ A-RJ, and MR-J4W2-77B, 1010B
	MR-RB31	300 W	6.7 Ω	For MR-J4-500B/ B-RJ/ B-RJ010, 700B/ B-RJ/ B-RJ010, and MR-J4-500A/ A-RJ, 700A/ A-RJ
	MR-RB32	300 W	40 Ω	For MR-J4-70B/ B-RJ/ B-RJ010, 100B/ B-RJ/ B-RJ010, and MR-J4-70A/ A-RJ, 100A/ A-RJ
	MR-RB50	500 W	13 Ω	For MR-J4-200B/ B-RJ/ B-RJ010, and MR-J4-200A/ A-RJ
	MR-RB5N	500 W	9 Ω	For MR-J4-350B/ B-RJ/ B-RJ010, and MR-J4-350A/ A-RJ
	MR-RB51	500 W	6.7 Ω	For MR-J4-500B/ B-RJ/ B-RJ010, 700B/ B-RJ/ B-RJ010, and MR-J4-500A/ A-RJ, 700A/ A-RJ
	MR-RB5R	500 (800) W	3.2 Ω	For MR-J4-11KB/ B-RJ/ B-RJ010, and MR-J4-11KA/ A-RJ
	MR-RB9F	850 (1300) W	3 Ω	For MR-J4-15KB/ B-RJ/ B-RJ010, and MR-J4-15KA/ A-RJ
	MR-RB9T	850 (1300) W	2.5 Ω	For MR-J4-22KB/ B-RJ/ B-RJ010, and MR-J4-22KA/ A-RJ
	MR-RB14	100 W	26 Ω	For MR-J4W2-22B, 44B, and MR-J4W3-222B, 444B
	MR-RB34	300 W	26 Ω	For MR-J4W3-222B, 444B
	MR-RB139	1300 W	1.3 Ω	For MR-CR55K
	MR-RB137 ^(Note 1)	3900 W	1.3 Ω	For MR-CR55K

Notes:

1. Please purchase three units of MR-RB137 for each converter unit.



Regenerative options

Item	Model	Tolerable regenerative power	Resistance value	Application
Regenerative option (400 V AC)	MR-RB1H-4	100 W	82 Ω	For MR-J4-60B4/ B4-RJ/ B4-RJ010, 100B4/ B4-RJ/ B4-RJ010, and MR-J4-60A4/ A4-RJ, 100A4/ A4-RJ
	MR-RB3M-4	300 W	120 Ω	For MR-J4-60B4/ B4-RJ/ B4-RJ010, 100B4/ B4-RJ/ B4-RJ010, and MR-J4-60A4/ A4-RJ, 100A4/ A4-RJ
	MR-RB3G-4	300 W	47 Ω	For MR-J4-200B4/ B4-RJ/ B4-RJ010, 350B4/ B4-RJ/ B4-RJ010, and MR-J4-200A4/ A4-RJ, 350A4/ A4-RJ
	MR-RB34-4	300 W	26 Ω	For MR-J4-500B4/ B4-RJ/ B4-RJ010, and MR-J4-500A4/ A4-RJ
	MR-RB3U-4	300 W	22 Ω	For MR-J4-700B4/ B4-RJ/ B4-RJ010, and MR-J4-700A4/ A4-RJ
	MR-RB5G-4	500 W	47 Ω	For MR-J4-200B4/ B4-RJ/ B4-RJ010, 350B4/ B4-RJ/ B4-RJ010, and MR-J4-200A4/ A4-RJ, 350A4/ A4-RJ
	MR-RB54-4	500 W	26 Ω	For MR-J4-500B4/ B4-RJ/ B4-RJ010, and MR-J4-500A4/ A4-RJ
	MR-RB5U-4	500 W	22 Ω	For MR-J4-700B4/ B4-RJ/ B4-RJ010, and MR-J4-700A4/ A4-RJ
	MR-RB5K-4	500 (800) W	10 Ω	For MR-J4-11KB4/ B4-RJ/ B4-RJ010, and MR-J4-11KA4/ A4-RJ
	MR-RB6K-4	850 (1300) W	10 Ω	For MR-J4-15KB4/ B4-RJ/ B4-RJ010, 22KB4/ B4-RJ/ B4-RJ010, and MR-J4-15KA4/ A4-RJ, 22KA4/ A4-RJ
	MR-RB137-4	1300 W	4 Ω	For MR-CR55K4
	MR-RB13V-4 ^(Note 1)	3900 W	4 Ω	For MR-CR55K4

Notes:

- Please purchase three units of MR-RB13V-4 for each converter unit.

Peripheral units

Item	Model	Application
CC-Link IE Field Network interface unit	MR-J3-T10	For MR-J4-B_-RJ010
Functional safety unit	MR-D30	For MR-J4-B_-RJ, and MR-J4-DUB_-RJ
Safety logic unit	MR-J3-D05	For MR-J4-B / B_-RJ/ B_-RJ010, MR-J4-A / A_-RJ, MR-J4-DUB / DUB_-RJ, MR-J4-DUA / DUA_-RJ, and MR-J4W_-B
Absolute position storage unit	MR-BTAS01	For MR-J4-B / B_-RJ, MR-J4-A / A_-RJ, and MR-J4W_-B
Parameter unit	MR-PRU03	For MR-J4-A / A_-RJ, and MR-J4-DUA / DUA_-RJ
Manual pulse generator	MR-HDP01	For MR-J4-A_-RJ, and MR-J4-DUA_-RJ
Dynamic brake (200 V AC)	DBU-11K	For MR-J4-11KB/ B-RJ/ B-RJ010, and MR-J4-11KA/ A-RJ
	DBU-15K	For MR-J4-15KB/ B-RJ/ B-RJ010, and MR-J4-15KA/ A-RJ
	DBU-22K-R1	For MR-J4-22KB/ B-RJ/ B-RJ010, and MR-J4-22KA/ A-RJ
	DBU-37K-R1	For MR-J4-DUB/ DUB-RJ, and MR-J4-DUA/ DUA-RJ
Dynamic brake (400 V AC)	DBU-11K-4	For MR-J4-11KB4/ B4-RJ/ B4-RJ010, and MR-J4-11KA4/ A4-RJ
	DBU-22K-4	For MR-J4-15KB4/ B4-RJ/ B4-RJ010, 22KB4/ B4-RJ/ B4-RJ010, and MR-J4-15KA4/ A4-RJ, 22KA4/ A4-RJ
	DBU-55K-4-R5	For MR-J4-DUB4/ DUB4-RJ, and MR-J4-DUA4/ DUA4-RJ
Power factor improving DC reactor (200 V)	MR-DCL30K	For MR-CR55K + MR-J4-DU30KB(-RJ)/ MR-J4-DU30KA(-RJ)
	MR-DCL37K	For MR-CR55K + MR-J4-DU37KB(-RJ)/ MR-J4-DU37KA(-RJ)
Power factor improving DC reactor (400 V)	MR-DCL30K-4	For MR-CR55K4 + MR-J4-DU30KB4(-RJ)/ MR-J4-DU30KA4(-RJ)
	MR-DCL37K-4	For MR-CR55K4 + MR-J4-DU37KB4(-RJ)/ MR-J4-DU37KA4(-RJ)
	MR-DCL45K-4	For MR-CR55K4 + MR-J4-DU45KB4(-RJ)/ MR-J4-DU45KA4(-RJ)
	MR-DCL55K-4	For MR-CR55K4 + MR-J4-DU55KB4(-RJ)/ MR-J4-DU55KA4(-RJ)
Heat sink outside mounting attachment	MR-J4ACN15K	For MR-J4-11KB(4)/ B(4)-RJ/ B(4)-RJ010, 15KB(4)/ B(4)-RJ/ B(4)-RJ010, and MR-J4-11KA(4)/ A(4)-RJ, 15KA(4)/ A(4)-RJ
	MR-J3ACN	For MR-J4-22KB(4)/ B(4)-RJ/ B(4)-RJ010, and MR-J4-22KA(4)/ A(4)-RJ

Peripheral cables/Connector sets

Item	Model	Length	Application
STO cable	MR-D05UDL3M-B	3 m	For connecting MR-J4-B / B_-RJ/ B_-RJ010, MR-J4-A / A_-RJ, MR-J4-DUB / DUB_-RJ, MR-J4-DUA / DUA_-RJ, or MR-J4W_-B with MR-J3-D05 and other safety control devices
Monitor cable	MR-J3CN6CBL1M	1 m	For analog monitor output of MR-J4-A / A_-RJ, and MR-J4-DUA / DUA_-RJ
Personal computer communication cable (USB cable)	MR-J3USBCBL3M	3 m	For MR-J4-B / B_-RJ/ B_-RJ010, MR-J4-A / A_-RJ, MR-J4-DUB / DUB_-RJ, MR-J4-DUA / DUA_-RJ, and MR-J4W_-B
Protection coordination cable	MR-J3CDL05M	0.5 m	For connecting converter unit and drive unit
Connector set	MR-J3CN1	-	For I/O signals of MR-J4-A / A_-RJ, and MR-J4-DUA / DUA_-RJ
	MR-CCN1	-	For I/O signals of MR-J4-B / B_-RJ/ B_-RJ010, and MR-J4-DUB / DUB_-RJ
	MR-J2CMP2	-	For MR-J4W_-B (Qty: 1 pc)
	MR-ECN1	-	For MR-J4W_-B (Qty: 20 pcs)
	MR-J2CN1-A	-	Converter unit connector × 1, drive unit connector × 1

Servo support software

Item	Model	Application
MR Configurator2 ^(Note 1)	SW1DNC-MRC2-E	Servo setup software for AC servo

Notes:

1. MR Configurator2 is included in MT Works2 with software version 1.34L or later.

If you have MT Works2 with software version earlier than 1.34L or GX works2, you can download MR Configurator2 from website.

MEMO

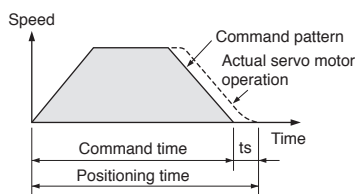
Servo Amplifiers
Rotary Servo Motors
Linear Servo Motors
Direct Drive Motors
Options/Peripheral Equipment
LVS/Wires
Product List
Cautions

To ensure safe use

- To use the products given in this catalog properly, always read the "Installation Guide" and "Instruction Manual" before starting to use them.

Cautions for model selection

- Select a rotary servo motor or a direct drive motor which has the rated torque equal to or higher than the continuous effective torque.
- Select a linear servo motor which has the continuous thrust equal to or higher than the continuous effective load thrust.
- When the linear servo motor is used for vertical axis, it is necessary to have anti-drop mechanism such as spring and counter balance in the machine side.
- When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70% of the servo motor rated torque.
- Create the operating pattern by considering the settling time (t_s).
- Load to motor inertia ratio or load to mass ratio must be below the recommended ratio. If the ratio is too large, the expected performance may not be achieved, and the dynamic brake may be damaged.



General safety precautions

1. Transportation/Installation

- Combinations of the servo motor and the servo amplifier are predetermined. Confirm the models of the servo motor and the servo amplifier to be used before installation.
- Do not drop or apply strong impact on the servo amplifier and the servo motor as they are precision devices. They may be damaged from such stress or shock.
- When fumigants that contain halogen materials such as fluorine, chlorine, bromine, and iodine are used for disinfecting and protecting wooden packaging from insects, they cause malfunction when entering our products. Please take necessary precautions to ensure that remaining materials from fumigant do not enter our products, or treat packaging with methods other than fumigation (heat method). Additionally, disinfect and protect wood from insects before packing products.
- Do not get on or place heavy objects on the servo amplifier or the servo motor. Doing so may result in injury or damage.
- The system must withstand high speeds and high acceleration/deceleration.
- To enable high-accuracy positioning, ensure the machine rigidity, and keep the machine resonance point at a high level.
- Mount the servo amplifier and the servo motor on nonflammable material. Mounting them directly on or near flammable material may result in fires.
- The regenerative option becomes hot (the temperature rise of 100 °C or higher) with frequent use. Do not install within flammable objects or objects subject to thermal deformation. Make sure that wires do not come into contact with the unit.
- Securely fix the servo motor onto the machine. Insufficient fixing may cause the servo motor to dislocate during operation.
- Install electrical and mechanical stoppers at the stroke end.
- Mount the servo amplifier vertically on a wall.
- Do not block intake and exhaust areas of the servo amplifier. Doing so may cause the servo amplifier to malfunction.

- When installing multiple servo amplifiers in a row in a sealed cabinet, leave space around the servo amplifiers as described in Servo Amplifier Instruction Manual. To ensure the life and reliability of the servo amplifiers, prevent heat accumulation by keeping space as open as possible toward the top plate.

2. Environment

- Use the servo amplifier and the servo motor in the designated environment.
- Avoid installing the servo amplifier and the servo motor in areas with oil mist or dust. When installing in such areas, be sure to enclose the servo amplifier in a sealed cabinet, and protect the servo motor by furnishing a cover or by taking similar measures.
- Do not use in areas where the servo motor may be constantly subject to cutting fluid or lubricant oil, or where dew could condense because of oil mist, overcooling or excessive humidity. Doing so may deteriorate the insulation of the servo motor.

3. Grounding

- Securely ground to prevent electric shocks and to stabilize the potential in the control circuit.
- Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for the servo motor grounding.
- Faults such as a position mismatch may occur if the grounding is insufficient.

4. Wiring

- Do not supply power to the output terminals (U, V, and W) of the servo amplifier or the input terminals (U, V, and W) of the servo motor. Doing so damages the servo amplifier and the servo motor.
- Connect the servo motor to the output terminals (U, V, and W) of the servo amplifier.
- Match the phase of the input terminals (U, V, and W) of the servo motor to the output terminals (U, V, and W) of the servo amplifier when connecting them. If they do not match, the servo motor does not operate properly.
- Check the wiring and sequence program thoroughly before switching the power on.
- Carefully select the cable clamping method, and make sure that bending stress and the stress of the cable's own weight are not applied on the cable connection section.
- In an application where the servo motor moves, determine the cable bending radius according to the cable bending life and wire type.

5. Initial settings

- For MR-J4-A(-RJ), select a control mode from position, speed or torque by [Pr. PA01]. Position control mode is set as default. Change the parameter setting value when using the other control modes. For MR-J4-B(-RJ) or MR-J4W_-B, the control mode is set by the controller.
- When using the regenerative option, change [Pr. PA02]. The regenerative option is disabled as default.

6. Operation

- Do not use a product which is damaged or has missing parts. In that case, replace the product.
- Turn on FLS and RLS (Upper/Lower stroke limit), or LSP and LSN (Forward/Reverse rotation stroke end) in position or speed control mode. The servo motor will not start if the signals are off.
- When a magnetic contactor is installed on the primary side of the servo amplifier, do not perform frequent starts and stops with the magnetic contactor. Doing so may damage the servo amplifier.
- When an error occurs, the servo amplifier stops outputting the power with activation of the protective function, and the servo motor stops immediately with the dynamic brake. Servo amplifiers without dynamic brake are also available for free-running the servo motor. Contact your local sales office for more details.

- The dynamic brake is a function for emergency stop. Do not use it to stop the servo motor in normal operations.
- As a rough guide, the dynamic brake withstands 1000 times of use when a machine which has load to motor inertia ratio equals to or lower than the recommended ratio stops from the rated speed every 10 minutes.
- If the protective functions of the servo amplifier activate, turn the power off immediately. Remove the cause before turning the power on again. If operation is continued without removing the cause of the error, the servo motor may malfunction, resulting in injury or damage.
- The servo amplifier, the regenerative resistor, and the servo motor can be very hot during or after operation. Take safety measures such as covering them to prevent your hand and/or parts including cables from coming in contact with them.
- Do not touch the servo amplifier, the regenerative resistor, or the servo motor while the power is on or for a while after the power is turned off. Otherwise, an electric shock may occur. Be sure that the charge lamp is off, and check the voltage between P+ and N- (L+ and L- for the drive unit) with a voltage tester before wiring or inspection.

7. Others

- Do not touch the servo amplifier or the servo motor with wet hands.
- Do not modify the servo amplifier or the servo motor.

Cautions for SSCNET III cables

- Do not apply excessive tension on the SSCNET III cable when cabling.
- The minimum bending radius of the SSCNET III cable is 25 mm for MR-J3BUS_M and 50 mm for MR-J3BUS_M-AV-B. If using these cables under the minimum bending radius, performance cannot be guaranteed.
- If the ends of the SSCNET III cable are dirty, the light will be obstructed, causing malfunctions. Keep the ends clean.
- Do not tighten the SSCNET III cable with cable ties, etc.
- Do not look at the light directly when the SSCNET III cable is not connected.

Cautions for rotary servo motors and direct drive motors

- Do not hammer the shaft of the rotary servo motor and the rotor of the direct drive motor when installing a pulley or a coupling. Doing so may damage the encoder. When installing the pulley or the coupling to the key shaft servo motor, use the screw hole on the shaft end. Use a pulley extractor when removing the pulley.
- Do not apply a load exceeding the tolerable load onto the rotary servo motor shaft or the direct drive motor rotor. The shaft or the rotor may break.
- When the rotary servo motor is mounted with the shaft vertical (shaft up), take measures on the machine side so that oil from the gear box does not get into the servo motor.
- Mount the geared servo motor in a direction described in "Servo Motor Instruction Manual (Vol. 3)."
- When the direct drive motor is used in a machine such as vertical axis which generates unbalanced torque, be sure to use it in absolute position detection system.
- Do not use the 24 V DC interface power supply for the electromagnetic brake. Provide a dedicated power supply to the electromagnetic brake.
- Do not apply the electromagnetic brake when the servo is on. Doing so may cause the servo amplifier overload or shorten the brake life. Apply the electromagnetic brake when the servo is off.
- Torque may drop due to temperature increase of the rotary servo motor or the direct drive motor. Be sure to use the motor within the specified ambient temperature.

Cautions for linear encoders

- If the linear encoder is improperly mounted, an alarm or a positioning deviation may occur. Refer to the following general inspections of linear encoder to verify the mounting state. Contact the relevant linear encoder manufacturers for more details.
- General inspections of linear encoder
 - (a) Verify that the gap between the linear encoder head and the linear encoder is appropriate.
 - (b) Check for any rolling or yawing (looseness) on the linear encoder head.
 - (c) Check for contaminations and scratches on the linear encoder head and scale surface.
 - (d) Verify that vibration and temperature are within the specified range.
 - (e) Verify that the speed is within the tolerable range even when overshooting.

Cautions for linear servo motors

- The linear servo system uses powerful magnets on the secondary side. Magnetic force is inversely proportional to the square of the distance from the magnetic material. Therefore, the magnetic force will be significantly stronger as closer to the magnetic material. Persons installing the linear servo motor as well as operating the machine must be fully cautious. Persons with pacemakers or other medical devices must keep away from the machine.
- Keep cell phones, watches, calculators and other products which may malfunction or fail due to the magnetic force away from the machine. Avoid wearing metals including earrings and necklaces when handling the machine.
- Give a marking such as "CAUTION! POWERFUL MAGNET" to give warning against the machine.
- Use non-magnetic tools, when installing or working near the linear servo motor.
e.g., explosion-proof beryllium copper alloy safety tools (BEALON manufactured by NGK Insulators, Ltd.)
- The permanent magnets on the secondary side generate attraction force, and there is a risk that your hand may be caught. Handle the linear servo motor carefully to avoid serious injury especially when installing the primary side after installing the secondary side.
- If the linear servo motor is used in such an environment where there is magnetic powder, the powder may adhere to the permanent magnets of the secondary side and cause a damage. In that case, take measures to prevent the magnetic powder or pieces from being attracted to the permanent magnets of the secondary side or from going into the gap between primary side and secondary side.
- The linear servo motor is rated IP00. Provide protection measures to prevent dust and oil, etc., as necessary.
- Install the moving part in such manner that the center of gravity of the moving part comes directly above the center of the primary side.
- Lead wires or cables led from the primary side do not have a long bending life. Fix the lead wires or cables to a moving part to prevent the lead wires or cables from repetitive bending.
- Thrust may drop due to temperature increase of the linear servo motor. Be sure to use the motor within the specified ambient temperature.

Disposal of linear servo motors

- Dispose the primary side as industrial waste.
- Demagnetize the secondary side with a heat of 300 °C or higher, and dispose as industrial waste. If not possible to demagnetize, return the secondary side to us in an appropriate package.
- Do not leave the product unattended.

For safety standard certification

Even though the MR-J4 series servo amplifier, MR-D30 functional safety unit, and MR-J3-D05 safety logic unit are certified to various safety standards, this does not guarantee that the systems in which they are installed will also be certified. The entire system shall observe the following:

- (1) For safety circuits, use parts and/or devices whose safety are confirmed or which satisfy safety standards.
- (2) For details regarding the use of the servo amplifiers and other cautionary information, refer to relevant Servo Amplifier Instruction Manual.
- (3) Perform risk assessment on the entire machine/system. It is recommended to use a Certification Body for final safety certification.



Warranty

1. Warranty period and coverage

We will repair any failure or defect hereinafter referred to as “failure” in our FA equipment hereinafter referred to as the “Product” arisen during warranty period at no charge due to causes for which we are responsible through the distributor from which you purchased the Product or our service provider. However, we will charge the actual cost of dispatching our engineer for an on-site repair work on request by customer in Japan or overseas countries. We are not responsible for any on-site readjustment and/or trial run that may be required after a defective unit is repaired or replaced.

[Term]

The term of warranty for Product is twelve (12) months after your purchase or delivery of the Product to a place designated by you or eighteen (18) months from the date of manufacture whichever comes first (“Warranty Period”). Warranty period for repaired Product cannot exceed beyond the original warranty period before any repair work.

[Limitations]

- (1) You are requested to conduct an initial failure diagnosis by yourself, as a general rule. It can also be carried out by us or our service company upon your request and the actual cost will be charged. However, it will not be charged if we are responsible for the cause of the failure.
- (2) This limited warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are set forth in the instruction manual and user manual for the Product and the caution label affixed to the Product.
- (3) Even during the term of warranty, the repair cost will be charged on you in the following cases;
 - (i) a failure caused by your improper storing or handling, carelessness or negligence, etc., and a failure caused by your hardware or software problem
 - (ii) a failure caused by any alteration, etc. to the Product made on your side without our approval
 - (iii) a failure which may be regarded as avoidable, if your equipment in which the Product is incorporated is equipped with a safety device required by applicable laws and has any function or structure considered to be indispensable according to a common sense in the industry
 - (iv) a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and replaced
 - (v) any replacement of consumable parts (battery, fan, smoothing capacitor, etc.)
 - (vi) a failure caused by external factors such as inevitable accidents, including without limitation fire and abnormal fluctuation of voltage, and acts of God, including without limitation earthquake, lightning and natural disasters
 - (vii) a failure generated by an unforeseeable cause with a scientific technology that was not available at the time of the shipment of the Product from our company
 - (viii) any other failures which we are not responsible for or which you acknowledge we are not responsible for

2. Term of warranty after the stop of production

- (1) We may accept the repair at charge for another seven (7) years after the production of the product is discontinued. The announcement of the stop of production for each model can be seen in our Sales and Service, etc.
- (2) Please note that the Product (including its spare parts) cannot be ordered after its stop of production.

3. Service in overseas countries

Our regional FA Center in overseas countries will accept the repair work of the Product. However, the terms and conditions of the repair work may differ depending on each FA Center. Please ask your local FA Center for details.

4. Exclusion of responsibility for compensation against loss of opportunity, secondary loss, etc.

Whether under or after the term of warranty, we assume no responsibility for any damages arisen from causes for which we are not responsible, any losses of opportunity and/or profit incurred by you due to a failure of the Product, any damages, secondary damages or compensation for accidents arisen under a specific circumstance that are foreseen or unforeseen by our company, any damages to products other than the Product, and also compensation for any replacement work, readjustment, start-up test run of local machines and the Product and any other operations conducted by you.

5. Change of Product specifications

Specifications listed in our catalogs, manuals or technical documents may be changed without notice.

6. Application and use of the Product

- (1) For the use of our General-Purpose AC Servo, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in General-Purpose AC Servo, and a backup or fail-safe function should operate on an external system to General-Purpose AC Servo when any failure or malfunction occurs.
 - (2) Our General-Purpose AC Servo is designed and manufactured as a general purpose product for use at general industries. Therefore, applications substantially influential on the public interest for such as atomic power plants and other power plants of electric power companies, and also which require a special quality assurance system, including applications for railway companies and government or public offices are not recommended, and we assume no responsibility for any failure caused by these applications when used.
- In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatments, railway service, incineration and fuel systems, man-operated material handling equipment, entertainment machines, safety machines, etc. are not recommended, and we assume no responsibility for any failure caused by these applications when used.

We will review the acceptability of the abovementioned applications, if you agree not to require a specific quality for a specific application. Please contact us for consultation.

FA Products

PLC

MELSEC iQ-R Series



Revolutionary, next generation controllers building a new era in automation

- ◎High-speed, high-accuracy multiple CPU control system based on the iQ Platform
- ◎New high-speed system bus and inter-module sync realizes improved productivity and reduced TCO*
- ◎Reducing development costs through intuitive engineering (GX Works3)
- ◎Robust security features (such as security key authentication, IP filter)

Product Specifications

Program capacity	40K steps to 1200K steps
LD instruction speed	0.98 ns
Available modules	I/O, analog, high-speed counter, positioning, simple motion, network module
Control system architecture	Rack-mounted modular based system
Supported networks	Ethernet, CC-Link IE Control Network, CC-Link IE Field Network, CC-Link, RS-232, RS-422/485

*Total Cost of Ownership

PLC

MELSEC-L Series



“Light & Flexible” condensing various functions easily and flexibly.

- ◎CPU equipped as a standard with various functions including counter, positioning and CC-Link.
- ◎The base-less structure with high degree of freedom saves space in the control panel.
- ◎Easily confirm the system status and change the settings with the display unit.
- ◎Ten models are available in program capacities from 20 k steps to 260 k steps.

Product specifications

Program capacity	20 k steps/60 k steps/260 k steps
Number of input/output points [X/Y]	1024 points/4096 points
Number of input/output device points [X/Y]	8192 points
Basic instruction processing speed (LD instruction)	60 ns/ 40 ns/ 9.5 ns
External connection interface	USB, Ethernet, RS-232, SD memory card, CC-Link (L26CPU-BT/PBT)
Function modules	I/O, analog, high-speed counter, positioning, simple motion, temperature control, network module
Unit expansion style	Base-less structure
Network	Ethernet, CC-Link IE Field network, CC-Link, CC-Link/LT, SSCNETIII(H), RS-232, RS-422

PLC

MELSEC-F Series



All-in-One Micro Programmable Controller equipped with all necessary functions in a compact body

- ◎Supporting small-scale control from 10 points to 384 points (using CC-Link) with an outstanding cost performance.
- ◎Wide range of options available for additional functions required by your system.
- ◎Easy to use and highly reliable. More than 12 million units have shipped worldwide. (April 2013)
- ◎Small-scale control is available in various networks such as CC-Link, Ethernet, and MODBUS.

Product specifications

Program capacity	16k steps (FX _{3S}) to 64 k steps (FX _{3U} /FX _{3UC})
Number of input/output points	10 points (FX _{3S}) to 384 points (FX _{3U} /FX _{3UC} with CC-Link)
Basic instruction processing speed	0.21 μs (FX _{3S}) to 65 ns (FX _{3U} /FX _{3UC})
External connection interface	RS-422, USB (FX _{3S} /FX _{3U} /FX _{3UC} /FX _{3GE} only), Ethernet (FX _{3GE} only), CC-Link/LT (FX _{3UC} -32MT-LT(-2) only)
Built-in functions	I/O, high-speed counter input, positioning pulse output, analog (FX _{3GE} only)
Extended functions	I/O, analog, temperature control, high-speed counter, positioning, network
Unit expansion style	Backplane-less design
Network	Ethernet, CC-Link, CC-Link/LT, SSCNETIII, CANopen, J1939, RS-232C, RS-422, RS-485, MODBUS



HMI

Graphic Operation Terminal GOT2000 Series GT27 Model



To the top of HMIs with further user-friendly, satisfactory standard features.

- ◎Comfortable screen operation even if high-load processing (e.g. logging, device data transfer) is running. (Monitoring performance is twice faster than GT16)
- ◎Actual usable space without using a SD card is expanded to 128MB for more flexible screen design.
- ◎Multi-touch features, two-point press, and scroll operations for more user-friendliness.
- ◎Outline font and PNG images for clear, beautiful screen display.

Product Specifications

Screen size	15", 12.1", 10.4", 8.4"
Resolution	XGA, SVGA, VGA
Intensity adjustment	32-step adjustment
Touch panel type	Analog resistive film
Built-in interface	RS-232, RS-422/485, Ethernet, USB, SD card
Applicable software	GT Works3
Input power supply voltage	100 to 240VAC (+10%, -15%), 24VDC (+25%, -20%)

AC Servo

Mitsubishi General-Purpose AC Servo MELSERVO-JE Series



High performance and easy to use servo system for all machines

- ◎Easy To Use: The advanced one-touch tuning function enables servo adjustment with one-touch ease without a personal computer.
- ◎High Performance: Class top-level basic performance including speed frequency response of 2.0kHz.
- ◎Global Standard: Digital input/output is compatible with both sink and source type connections as a standard.

Product specifications

Power supply specifications	1-phase/3-phase 200V AC
Command interface	Pulse train, analog
Control mode	Position/speed/torque
Speed frequency response	2.0kHz
Tuning function	Advanced one-touch tuning, advanced vibration control II, robust filter, etc.
Compatible servo motor	Rotary servo motor (rated output: 0.1 to 3kW)

Inverter

FR-A800 Series



High-functionality, high-performance inverter

- ◎Realize even higher responsiveness during real sensor-less vector control or vector control, and achieve faster operating frequencies.
- ◎The latest automatic tuning function supports various induction motors and also sensor-less PM motors.
- ◎The standard model is compatible with EU Safety Standards STO (PLd, SIL2). Add options to support higher level safety standards.
- ◎Control and monitor inverters via CC-Link/CC-Link IE Field Network (option interface).

Product Specifications

Inverter capacity	200V class: 0.4kW to 90kW, 400V class: 0.4kW to 500kW
Control method	High-carrier frequency PWM control (Select from V/F, advanced magnetic flux vector, real sensorless vector or PM sensorless vector control), vector control (when using options)
Output frequency range	0.2 to 590Hz (when using V/F control or advanced magnetic flux vector control)
Regenerative braking torque (Maximum allowable duty)	200V class: 0.4K to 1.5K (150% at 3%ED) 2.2K/3.7K (100% at 3%ED) 5.5K/7.5K (100% at 2%ED) 11K to 55K (20% continuous) 75K or more (10% continuous), 400V class: 0.4K to 7.5K (100% at 2%ED) 11K to 55K (20% continuous) 75K or more (10% continuous)
Starting torque	200% 0.3Hz (3.7K or less), 150% 0.3Hz (5.5K or more) (when using real sensorless vector, vector control)

FA Products

Three-Phase Motor | High Performance Energy-Saving Motor Super Line Premium Series SF-PR



Premium Efficiency & Compatible. New Launch of Super Line Premium Series SF-PR Model

- ◎ Compared to general-purpose motor SF-JR model, generated loss is reduced by 37% on average, and it is compatible with highly efficient premium IE3.
- ◎ Easy replacement is achieved as mounting dimension (frame number) is compatible with general-purpose motor SF-JR model.
- ◎ One motor can accommodate different power sources of Japan and the U.S. Three ratings in Japan meet the Top Runner standards, while it corresponds to EISA in the U.S.
- ◎ Can be driven by inverters as standard. Advanced magnetic-flux vector control by our FR-A800/700 achieves steady torque drive up to 0.5Hz.

Product Specifications

Number of poles	2-poles, 4-poles, 6-poles
Voltage-Frequency	200/200/220/230V 50/60/60/60Hz EISA 230V 60Hz or 400/400/440/460V 50/60/60/60Hz EISA 460V 60Hz
Exterior	Totally enclosed fan cooled type (inside, outside installation)
Protection system	IP44
Electrically-driven power system	Motor with 2-poles over 11kW is dedicated for a direct connection. Motors with 4-poles and 6-poles are for both direct and crossed belt connections.
Rotation direction	Counter-clock-wise (CCW) direction viewed from the edge of axis.
Compatible standard	JEC-2137-2000 (Efficiency is compatible with IEC 60034-30.)

Robot | MELFA F Series



High speed, high precision and high reliability industrial robot

- ◎ Compact body and slim arm design, allowing operating area to be expanded and load capacity increased.
- ◎ The fastest in its class using high performance motors and unique driver control technology.
- ◎ Improved flexibility for robot layout design considerations.
- ◎ Optimal motor control tuning set automatically based on operating position, posture, and load conditions.

Product Specifications

Degrees of freedom	Vertical:6 Horizontal:4
Installation	Vertical:Floor-mount, ceiling mount, wall mount (Range of motion for J1 is limited) Horizontal:Floor-mount
Maximum load capacity	Vertical:2-20kg Horizontal:3-20kg
Maximum reach radius	Vertical:504-1503mm Horizontal:350-1,000mm

CNC | MITSUBISHI CNC M70V Series



A global standard model that offers both high speed and accuracy.

- ◎ Permits commands in 0.1μm increments and internal interpolation control in 1nm increments for smooth, high-accuracy machining.
- ◎ Intuitive operation and display of hierarchical screens, with an Ethernet I/F (standard feature) for easy program management.
- ◎ Offers a more compact control panel by integrating the display and control.
- ◎ A lineup that includes Type A for compound lathes, and Type B for tapping centers.

Product specifications

Maximum number of control axes (NC axes + spindles + PLC axes)	Type A: 11 axes Type B: 9 axes
Maximum number of part systems	Type A: 2 systems Type B: 1 system
Least command increment	0.1μm
Least control increment	1nm
Maximum program capacity	Type A: 2,000 KB (5,120 m) Type B: 500 KB (1,280 m)
Maximum PLC program capacity	Type A: 32,000 steps Type B: 20,000 steps
Main functions (for machining center)	DMR-DD control (high-speed synchronous tapping), High-speed & high-accuracy control, Tool center point control, Inclined surface machining, etc.
Main functions (for lathes)	Milling interpolation, 2-system simultaneous thread cutting, Control axis synchronization across part systems, Control axis superimposition, Mixed control, etc.



Low Voltage Circuit Breakers | Mitsubishi WS-V Series Molded Case Circuit Breakers, Earth Leakage Circuit Breakers



Technologies based on long year experience realize more improved performance.

- ◎The new electronic circuit breakers can display various measurement items.
- ◎Improvement of breaking performance with new breaking technology “Expanded ISTAC”.
- ◎Compliance with global standard for panel and machine export.
- ◎Commoditization of internal accessories for shorter delivery time and stock reduction.

Product Specifications.

Frame	32-250A Frame
Applicable standard	Applicable to IEC, GB, UL, CSA, JIS and etc.
Expansion of UL listed product line-up	New line-up of 480VAC type with high breaking performance for SCCR requirement
Commoditization of internal accessories	Reduction of internal accessory types from 3 to 1
Commoditization for AC and DC circuit use	Common use of 32/63A frame in both AC and DC circuit
Compact size for easy to use	Thermal adjustable and electronic circuit breakers are same size as 250AF fixed type
Measuring Display Unit (MDU) breakers	MDU breakers measure, display and transmit energy data to realize energy management.

Magnetic Starter | MS-T Series



Exceed your expectations.

- ◎10A frame model is over 16% smaller with a width of just 36mm!!
- ◎New integrated terminal covers.
- ◎Reduce your coil inventory by up to 50%.
- ◎Be certified to the highest international levels while work is ongoing to gain other country.

Product specifications

Frame	10 A to 32 A
Applicable standards	Certification to various standards including IEC, JIS, CE, UL, TÜV, CCC.
Terminal cover	Standard terminal cover improves safety, simplifies ordering, and reduces inventory, etc.
Improved wiring	Wiring and operability are improved with streamlining wiring terminal BC specifications.
Operation coil rating	Wide range of operation coil ratings reduces number of coil types from 14 (N Series) to 7 types and simplifies selection.
Option units	Diverse lineup includes Auxiliary Contact Block, Operation Coil Surge Absorber Unit, Mechanical Interlock Unit.

Low-voltage switch | Mitsubishi Motor Circuit Breaker MMP-T Series



Introducing a Motor Circuit Breaker from Mitsubishi Electric!

- ◎Design smaller panels by using the Motor Circuit Breaker, various options and MS-T Series Magnetic Contactor.
- ◎Prevent secondary damage with Motor Circuit Breaker and Magnetic Contactor combination.
- ◎Streamlined wiring terminal BC specifications (option) contribute to improving your productivity.
- ◎Supports your overseas business with compliance to various International Standards as well as the UL Type E/F combination.

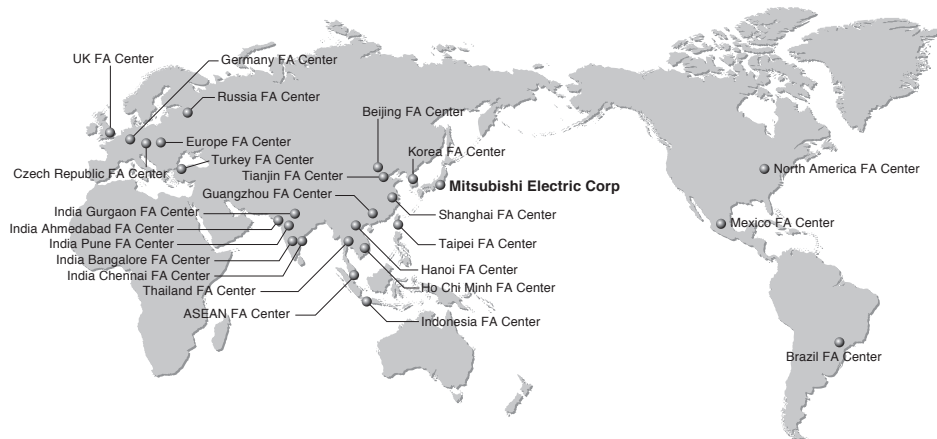
Product specifications

Rated current	0.16 A to 32 A (15 types)
Applicable (compliant) standards	Standard product compliant with various International Standards including IEC, JIS, CCC, TÜV and UL (certified)
Wiring types	Bare wire, rod terminal, Y crimp and round crimp supported
Improvement of wiring	Wiring and operability are improved with connection conductor unit and streamlined wiring terminal BC specifications (option)
Optional units	Auxiliary/Alarm Contact Unit, Short-Circuit Indicator Unit, Line Side Terminal Adapter, Connection Conductor Unit, etc., available
DIN rail mounting	Standard product mountable on rail
Finger protection support	Standard product compliant with IP20 from front side of terminals
Application in North America	Type E/F combination certification acquired. Compatible up to maximum SCCR value 50 kA

MEMO



Global FA Centers



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List of Instruction Manuals

Instruction Manuals for MELSERVO-J4 series are listed below:

Servo Amplifier

Manual name	Manual No.
MR-J4-_A(-RJ)/MR-J4-_A4(-RJ)/MR-J4-_A1(-RJ) SERVO AMPLIFIER INSTRUCTION MANUAL	SH-030107
MR-J4-_A-RJ/MR-J4-_A4-RJ/MR-J4-_A1-RJ SERVO AMPLIFIER INSTRUCTION MANUAL (POSITIONING MODE)	SH-030143
MR-J4-_B(-RJ)/MR-J4-_B4(-RJ)/MR-J4-_B1(-RJ) SERVO AMPLIFIER INSTRUCTION MANUAL	SH-030106
MR-J4W2-_B/MR-J4W3-_B SERVO AMPLIFIER INSTRUCTION MANUAL	SH-030105
MELSERVO-J4 Servo amplifier INSTRUCTION MANUAL TROUBLE SHOOTING	SH-030109
MR-J4-_B-RJ010/MR-J4-_B4-RJ010/MR-J3-T10 SERVO AMPLIFIER INSTRUCTION MANUAL	SH-030117
MR-J4-DU_(-RJ)/MR-CR55K_ INSTRUCTION MANUAL	SH-030153

Servo Motor

Manual name	Manual No.
HG-KR/HG-MR/HG-SR/HG-JR/HG-RR/HG-UR SERVO MOTOR INSTRUCTION MANUAL (Vol. 3)	SH-030113
LM-H3/LM-U2/LM-F/LM-K2 LINEAR SERVO MOTOR INSTRUCTION MANUAL	SH-030110
TM-RFM DIRECT DRIVE MOTOR INSTRUCTION MANUAL	SH-030112

Option

Manual name	Manual No.
Functional safety unit MR-D30 INSTRUCTION MANUAL	SH-030132

Others

Manual name	Manual No.
EMC Installation Guidelines	IB-67310
LINEAR ENCODER INSTRUCTION MANUAL	SH-030111



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Safety Warning

To ensure proper use of the products listed in this catalog,
please be sure to read the instruction manual prior to use.

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Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001(standards for quality assurance management systems)



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