for a greener tomorrow

MITSUBISHI ELECTRIC
Changes for the Better

FACTORY AUTOMATION

SERVO AMPLIFIERS & MOTORS
MELSERVO-J4

Man, machine and environment in perfect harmony

GLOBAL IMPACT OF MITSUBISHI ELECTRIC

Through Mitsubishi Electric's vision, "Changes for the Better" are possible for a brighter future.

Changes for the Better

We bring together the best minds to create the best technologies. At Mitsubishi Electric, we understand that technology is the driving force of change in our lives. By bringing greater comfort to daily life, maximizing the efficiency of businesses and keeping things running across society, we integrate technology and innovation to bring changes for the better.

Mitsubishi Electric is involved in many areas including the following

Energy and Electric Systems
A wide range of power and electrical products from generators to large-scale displays.

Electronic Devices
A wide portfolio of cutting-edge semiconductor devices for systems and products.

Home Appliance
Dependable consumer products like air conditioners and home entertainment systems.

Information and Communication Systems
Commercial and consumer-centric equipment, products and systems.

Industrial Automation Systems
Maximizing productivity and efficiency with cutting-edge automation technology.

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A complete system lineup to meet your production and manufacturing needs

CONTROLLER

Programmable controller

MELSEC iQ-R series

MELSEC-Q series

MELSEC-QS/WS series

MELSEC-L series

Simple Motion module

CC-Link IE Field Network

RJ71GF11-T2
QJ71GF11-T2

RD77GF
QD77GF

SSCNET III/H

RD77MS
QD77MS

LD77MS

FX5-_SSC-S

C Controller Interface Module

SSCNET III/H

Q173SCCF

INTERFACE

CC-Link IE Field Network

CC-Link IE Field
CC-Link IE Field Basic

SSCNET III/H

SSCNET III/H

SERVO AMPLIFIER SENSING MODULE

CC-Link IE Field Network compatible servo amplifier

MR-J4-GF(-RJ)

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

* Refer to the Instruction Manual about CC-Link IE Field Network Basic.

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

Capacity expanded

Medium/large/ ultra-large capacity, low inertia
HG-JR series
Capacity: 0.5 to 220 kW

Ultra-compact size, ultra-small capacity
HG-AK series
Capacity: 10 to 30 W

Medium/large capacity, ultra-low inertia
HG-RR series
Capacity: 1 to 22 kW

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

Available in the future

Large capacity, ultra-low inertia
HG-RR series
Capacity: 11 to 22 kW

* For the combinations of the servo amplifier and the servo motor, refer to pp. 1-4 to 1-8 in this catalog.

SOLUTION

e-F@ctory

e-F@ctory is the Mitsubishi Electric solution for improving the performance of any manufacturing enterprise by enhancing productivity, and reducing the maintenance and operation costs together with seamless information flow throughout the plant.

To respond to an expanding range of applications including semiconductor and FPD manufacturing, robots, and food processing machines, MELSERVO-J4 combines with other Mitsubishi Electric product lines such as Motion controllers, networks, graphic operation terminals, programmable controllers and more. This gives you the freedom and flexibility to create a more advanced servo system.

Programmable controller

MELSEC iQ-F/F series

Graphic Operation Terminal

GOT2000

Personal computer

SOFTWARE

- MELSOFT GX Works3
- MELSOFT MT Works2
- MELSOFT MR Configurator2
- Drive System Sizing Software Motorizer

LOW-VOLTAGE SWITCHGEAR

Molded-case circuit breaker

WS-V

Magnetic contactor

MS-T

Motion controller

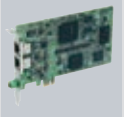
SSCNET III/H

RnMTCPU Q17nDSCPU Q170MSCPU

Personal computer embedded type

SSCNET III/H

CC-Link IE



MR-MC2_ _
MR-MC341

MR-EM340GF

Positioning module

RD75P
RD75D

QD75P
QD75D

LD75P
LD75D

FX_{2N}-10PG

SSCNET III/H

Power regeneration converter unit + SSCNET III/H compatible drive unit

MR-CV+MR-J4-DU_B(-RJ)

SSCNET III/H compatible sensing module

MR-MT2000 series

Pulse train/Analog voltage/RS-422/RS-485/MODBUS® RTU*

* RS-485 is supported only by MR-J4-A(-RJ). (Not supported by MR-J4-03A6-RJ)
* MODBUS® RTU is supported only by MR-J4-A-RJ. (Not supported by MR-J4-03A6-RJ)

General-purpose interface servo amplifier

MR-J4-A(-RJ)

Linear servo motor

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

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

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

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

Direct drive motor

Low-profile flange type
TM-RG2M series
Rating: 2.2 to 9 N•m

Low-profile table type
TM-RU2M series
Rating: 2.2 to 9 N•m

High rigidity
TM-RFM series
Rating: 2 to 240 N•m

PLATFORM

iQ Platform

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

MELSERVO-J4 Product Lines

■Servo amplifier

●: Supported –: Not supported

	Servo amplifier (*6)	Number of control axes	Power supply specifications	Rated output [kW] (*1, 4)	Command interface: CC-Link IE Field	SSCNET III/H	Pulse train	Analog voltage	RS-422/MODBUS® RTU	Control mode: Position	Speed	Torque	Positioning function	Fully closed loop control (*2)	Compatible servo motor series: HG-KR	HG-MR	HG-SR	HG-JR	HG-AK	HG-RR	HG-UR	LM-H3	LM-F	LM-K2	LM-U2	TM-RG2M	TM-RU2M	TM-RFM
																						(*5)						
CC-Link IE Field Network	MR-J4-GF(-RJ)	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	●	–	–	–	–	●	●	●	●	●	●	●	●	●	●	–	●	●	●	●	●	●	●	●	●
			3-phase 400 V AC	0.6, 1, 2, 3.5, 5, 7, 11, 15, 22	●	–	–	–	–	●	●	●	●	●	–	–	●	●	–	–	–	–	●	–	–	–	–	–
SSCNET III/H	MR-J4-B(-RJ)	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, 9, 11, 15, 22, 30, 37	–	●	–	–	–	●	●	●	–	●	●	●	●	●	–	●	●	●	●	●	●	●	●	●
			3-phase 400 V AC	0.6, 1, 2, 3.5, 5, 7, 9, 11, 15, 22, 30, 37, 45, 55	–	●	–	–	–	●	●	●	–	●	–	–	●	●	–	–	–	–	●	–	–	–	–	–
	MR-J4W2-B	2 axes	3-phase 200 V AC	0.2, 0.4, 0.75, 1	–	●	–	–	–	●	●	●	–	●	●	●	●	●	–	–	●	●	–	●	●	●	●	●
			48 V DC 24 V DC	0.03	–	●	–	–	–	●	●	●	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–
	MR-J4W3-B	3 axes	3-phase 200 V AC	0.2, 0.4	–	●	–	–	–	●	●	●	–	–	●	●	–	–	–	–	–	●	–	●	●	●	●	●
General-purpose interface	MR-J4-A(-RJ)	1 axis	1-phase 100 V AC	0.1, 0.2, 0.4	–	–	●	●	● (*3)	●	●	●	● (*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	–	–	●	●	● (*3)	●	●	●	● (*3)	●	●	●	●	●	–	●	●	●	●	●	●	●	●	●
			3-phase 400 V AC	0.6, 1, 2, 3.5, 5, 7, 11, 15, 22, 30, 37, 45, 55	–	–	●	●	● (*3)	●	●	●	● (*3)	●	–	–	●	●	–	–	–	–	●	–	–	–	–	–
			48 V DC 24 V DC	0.03	–	–	●	●	● (*3)	●	●	●	● (*3)	–	–	–	–	–	●	–	–	–	–	–	–	–	–	–	–

*1. The values listed are the rated output of the servo amplifier. For the compatible servo motor capacities, refer to pp. 1-4 to 1-8 in this catalog.
*2. MR-J4-GF/B/A servo amplifier is compatible with a two-wire type serial linear encoder. For four-wire type serial linear encoders and pulse train interface (A/B/Z-phase differential output type) linear encoders, use MR-J4-GF-RJ/B-RJ/A-RJ servo amplifier.
*3. The positioning function and MODBUS® RTU are supported by MR-J4-A-RJ. Note that MR-J4-03A6-RJ does not support MODBUS® RTU.
*4. A converter unit is necessary for the drive unit.
*5. MR-J4-GF/B/A servo amplifier is compatible with two-wire type and four-wire type serial linear encoders. For a pulse train interface (A/B/Z-phase differential output type) linear encoder, use MR-J4-GF-RJ/B-RJ/A-RJ servo amplifier.
*6. The functions listed are supported by the servo amplifiers with the latest software version. (As of September 2020) Refer to relevant servo amplifier instruction manuals for the supporting software versions.

■Linear servo motor

	Linear servo motor series	Maximum speed [m/s]	Continuous thrust [N] (*1)	Maximum thrust [N] (*1)	Cooling method	Features	Application examples
Core type	LM-H3 series	3.0	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.	•Mounters •Wafer cleaning systems •FPD assembly machines •Material handlings
	LM-F series	2.0	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	600, 1200, 1800, 2400, 3600, 4800, 6000	1800, 3600, 5400, 7200, 10800, 14400, 18000	Liquid cooling		
	LM-K2 series	2.0	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.	•Mounters •Wafer cleaning systems •FPD assembly machines
Coreless type	LM-U2 series	2.0	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

*1. 3000 : For 400 V.

■Rotary servo motor

●: Available –: Not available

	Rotary servo motor series	Rated speed (maximum speed) [r/min]	Rated output [kW] (*1)	Servo motor type (*2) With electro-magnetic brake (B)	Servo motor type (*2) With gear reducer (G1)	Servo motor type (*2) With gear reducer (G5, G7)	IP rating (*3)	Replaceable series	Features	Application examples
Small capacity	**HG-KR series**	3000 (6000)	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 •X-Y tables •Semiconductor manufacturing equipment
	HG-MR series	3000 (6000)	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)	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)	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/ultra-large capacity	**HG-JR series**	3000 (6000: 0.5 to 5 kW 5000: 7, 9 kW)	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	Low inertia Well suited for high-throughput and high-acceleration/ deceleration operations.	•Food packaging machines •Printing machines
		1500 (3000: 7 to 15 kW 2500: 22 to 55 kW)	7.0, 11, 15, 22, 30, 37 [7.0, 11, 15, 22, 30, 37, 45, 55]	● (*5)	–	–	IP67/ IP44 (*4)	HF-JP HA-LP series		•Injection molding machines •Press machines
		1000 (2000: 6 to 12 kW 1500: 15 to 37 kW)	6.0, 8.0, 12, 15, 20, 25, 30, 37 [6.0, 8.0, 12, 15, 20, 25, 30, 37]	● (*5)	–	–	IP67/ IP44 (*4)	HA-LP series		
		2000 (3000)	[110, 150, 180, 200, 220]	–	–	–	IP44	HF-JP series		
Ultra-small capacity	**HG-AK series**	3000 (6000)	0.01, 0.02, 0.03	●	–	–	IP55	HC-AQ series	Ultra-compact size Suitable for small machines.	•Mounters •Semiconductor manufacturing equipment •Compact robot •Electric component manufacturing machines
Medium capacity	**HG-RR series**	3000 (4500)	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)	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

*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. 2-41 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 (*1)	Features	Application examples
Low-profile	**TM-RG2M/TM-RU2M series**	ø130	ø20	300	600	2.2	8.8	IP40	•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
		ø180	ø47	300	600	4.5	13.5	IP40		
		ø230	ø62	300	600	9	27	IP40		
High-rigidity	**TM-RFM series**	ø130	ø20	200	500	2, 4, 6	6, 12, 18	IP42		
		ø180	ø47	200	500	6, 12, 18	18, 36, 54	IP42		
		ø230	ø62	200	500	12, 48, 72	36, 144, 216	IP42		
		ø330	ø104	100	200	40, 120, 240	120, 360, 720	IP42		

*1. Connectors and a gap along the rotor (output shaft) 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 Electric 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 networks linked in symphonic productivity

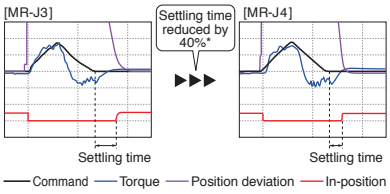
MELSERVO-J4 | Industry-Leading Basic Performance

Industry-Leading Level of Servo Amplifier Basic Performance

Industry-leading levels

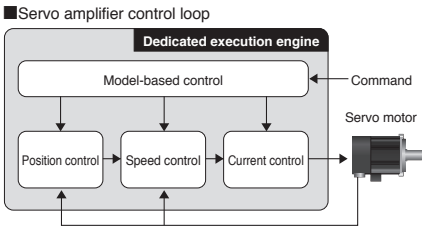
A speed frequency response of 2.5 kHz is achieved by applying our original high-speed servo control architecture evolved from the conventional two-degrees-of-freedom model adaptive control to the dedicated execution engine. Together with a high-resolution absolute position encoder of 4,194,304 pulses/rev, fast and accurate operation is enabled. The performance of the high-end machines is utilized to the fullest.

[Settling time comparison with the prior model]



* The result is based on our evaluation condition.

[Dedicated execution engine]

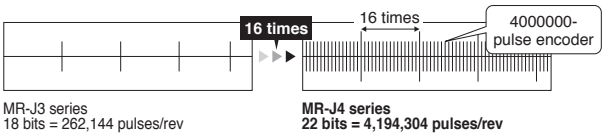


Improving Machine Performance with High-Performance Servo Motors

Industry-leading levels

With improved processing speed, the rotary servo motors equipped with a high-resolution encoder enables high-accuracy positioning and smooth rotation.

[Resolution comparison with the prior model]

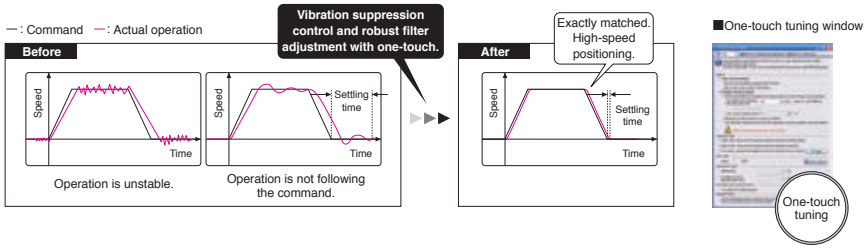


MELSERVO-J4 | Advanced Servo Gain Adjustment Function

One-Touch Tuning

Enhanced functions

Just turn on the one-touch tuning function to complete servo gain adjustment automatically, including machine resonance suppression filter, advanced vibration suppression control II*1, and robust filter for maximizing your machine performance. This function also sets responsivity automatically, while the real-time auto tuning requires manual setting. Moreover, a new method*2 allows to create an optimum tuning command inside the servo amplifier.

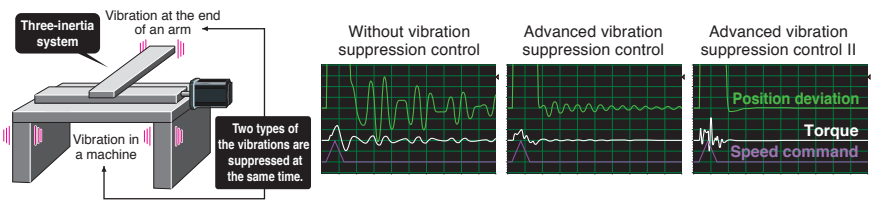


*1.The advanced vibration suppression control II automatically adjusts one frequency.
*2.This new method is supported by MR-J4-B/MR-J4W_-B/MR-J4-A.

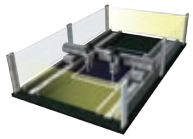
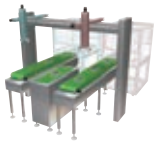
Advanced Vibration Suppression Control II

Patented 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.



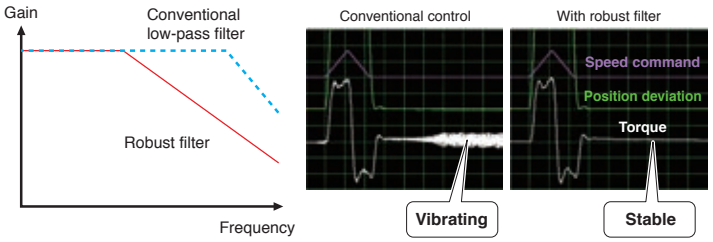
Application examples

[Pick and place robots]	[Automatic assembly equipment]	[Material handling systems]
		

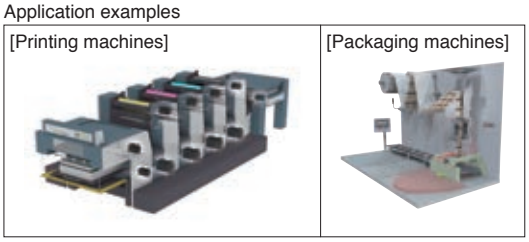
Robust Filter

Patented

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.



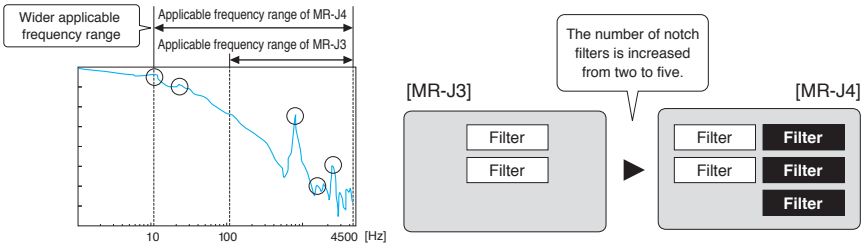
Application examples



Expanded Machine Resonance Suppression Filter

Enhanced functions

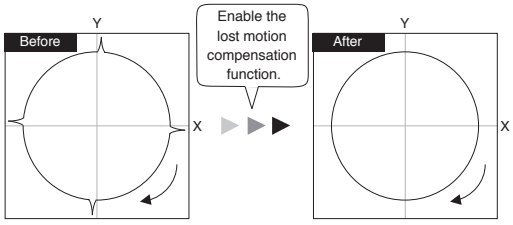
With advanced filter structure, applicable frequency range is expanded from between 100 Hz and 4500 Hz to between 10 Hz and 4500 Hz. Additionally, the number of simultaneously applicable filters is increased from two to five, improving vibration suppression performance of a machine.



Lost Motion Compensation Function

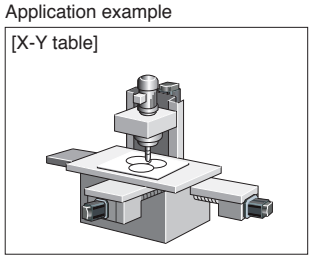
This function suppresses quadrant protrusion caused by friction and torsion generated when the servo motor rotates in a reverse direction. Therefore, the accuracy of circular path will be improved in trajectory control used in XY table, etc.

* This function is not supported by MR-J4W2-B and MR-J4W3-B.



Suppression of quadrant protrusion of circular trajectory

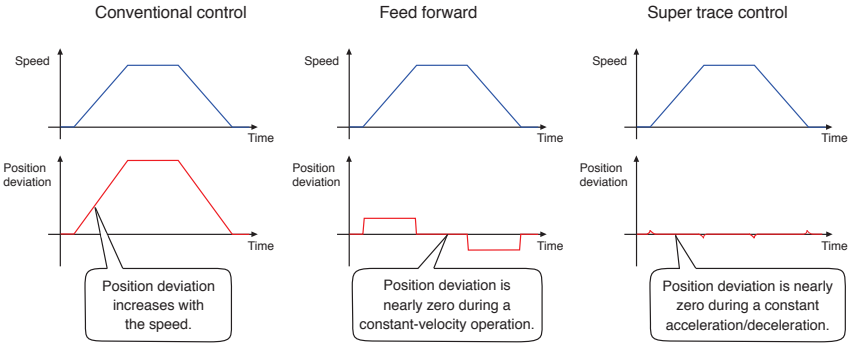
Application example



Super Trace Control

This function reduces a position deviation to nearly zero not only during constant-velocity operation, but also during constant acceleration/deceleration. The trajectory accuracy will be improved in high-rigidity machines.

* This function is not supported by MR-J4W2-B and MR-J4W3-B.



MELSERVO-J4 | A Variety of Functions for Various Applications

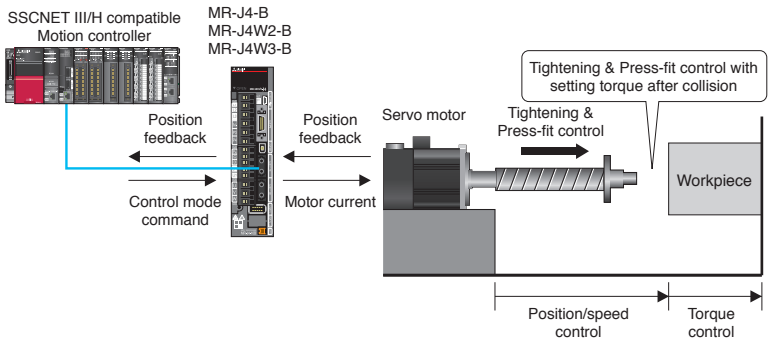
* Use a compatible controller.

Tightening & Press-Fit Control

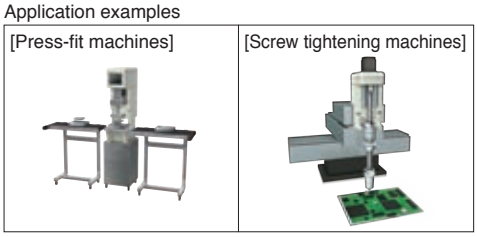
RnMTCPU | Q17nDSCPU | Q170MSCPU
FX5SSC | RD77MS | QD77MS | LD77MS
Patented

This function switches position/speed control mode to torque control mode smoothly without a stop or a sudden change in speed and torque, and thus reduces load to a machine. This function is best suit 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.

* This function is supported by MR-J4-B/MR-J4W2-B/MR-J4W3-B.



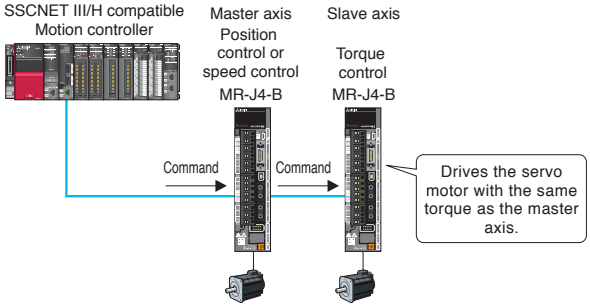
Application examples



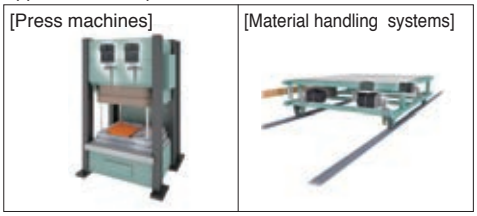
Master-Slave Operation Function

RnMTCPU | Q17nDSCPU | Q170MSCPU
FX5SSC | RD77MS | QD77MS | LD77MS

The master-slave operation function enables the torque of the master axis to be transmitted to the slave axes via SSCNET III/H and to control the slave axes with the same torque as the master axis.
No special wiring is necessary.



Application examples

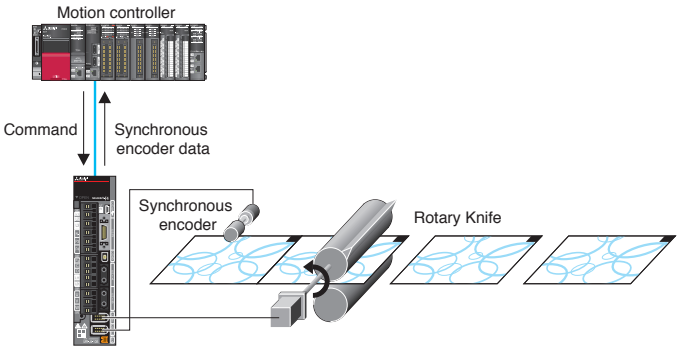


Scale Measurement Function

RnMTCPU | Q17nDSCPU | Q170MSCPU
RD77GF | QD77GF | FX5SSC | RD77MS | QD77MS | LD77MS

The scale measurement function of MR-J4-GF/MR-J4-B/MR-J4W2-B*1 servo amplifiers*2 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, resulting in less wiring.

*1. This function is not supported by MR-J4W2-0303B6.
*2. Use corresponding servo amplifier (MR-J4-GF/MR-J4-GF-RJ/ MR-J4-B/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.

MELSERVO-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. 39 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

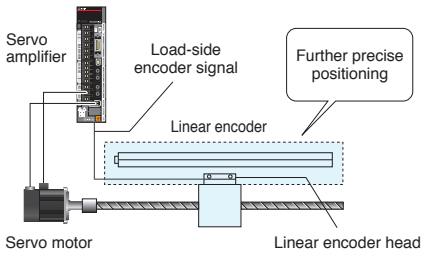
MR-J4W2-B

MR-J4W3-B

Supporting Fully Closed Loop Control

Supporting a fully closed loop control system*1 as standard, MR-J4-GF/MR-J4-B/MR-J4-A servo amplifiers enable further precise positioning*2.

*1. MR-J4-GF/MR-J4-B/MR-J4-A servo amplifier is compatible with two-wire type serial linear encoders. For four-wire type serial and pulse train interface (A/B/Z-phase differential output type) linear encoders, use MR-J4-GF-RJ/ MR-J4-B-RJ/MR-J4-A-RJ.
*2. Some models do not support a fully closed loop control system. Refer to "Product lines" on p. 39 in this catalog.



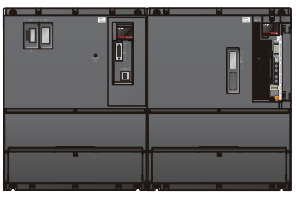
Wide Range of Power Supplies and Capacities

Each servo amplifier supports the following main circuit power supplies:
MR-J4-B/MR-J4-A: 3-phase 200 V AC/400 V AC,
1-phase 100 V AC, and 48 V DC/24 V DC
They also support a wide range of capacities from 30 W* to 55 kW.
MR-J4-GF: 3-phase 200 V AC/400 V AC, 1-phase 100 V AC
MR-J4-GF-RJ/MR-J4-B-RJ/MR-J4-A-RJ also supports DC power input.

* Servo amplifier of 30 W supports a power supply of 48 V DC/24 V DC.

MR-J4-10B1

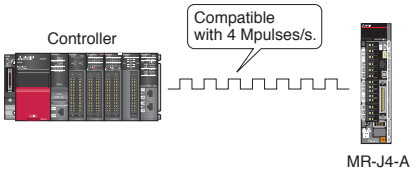
MR-J4-22KB



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 (when differential receiver is used).
When open collector is used, both sink and source inputs are enabled.

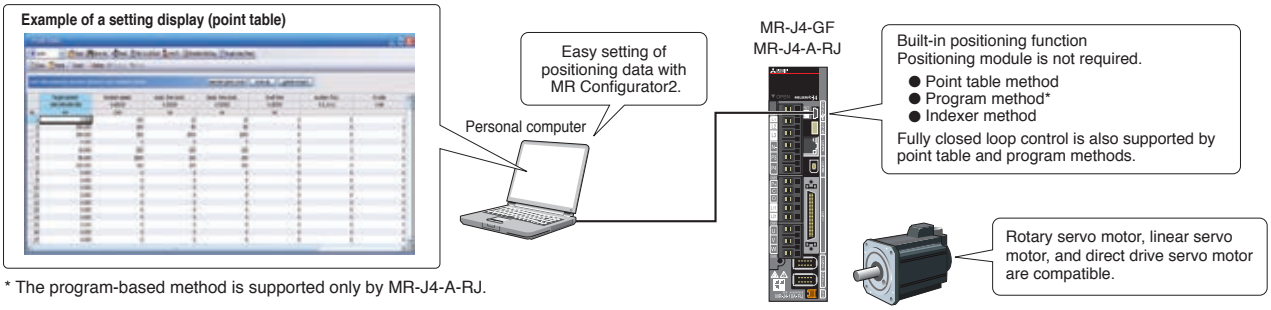


Positioning System without a Positioning Module

MELSERVO-J4 | Built-in Positioning Function for Simple System

MR-J4-GF(-RJ) and MR-J4-A-RJ with Built-in Positioning Function

MR-J4-GF(-RJ) and MR-J4-A-RJ have a built-in positioning function, enabling positioning operation with point table, program-based*, and indexer methods. With these servo amplifiers, a positioning system is configured without a Positioning module (command pulse). Positioning command is executed by CC-Link IE Field network, input/output signals, or RS-422/RS-485 communication (up to 32 axes). MR Configurator2 allows easy setting of the positioning data.



* The program-based method is supported only by MR-J4-A-RJ.

Point table method

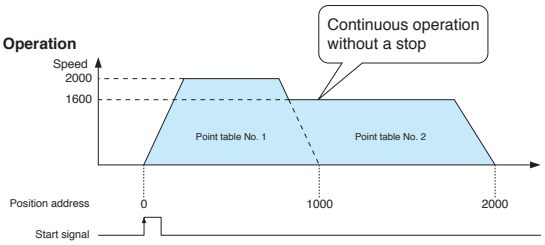
GF GF-RJ A-RJ

Set position data (target position), servo motor speed, and acceleration/deceleration time constants in point table. Setting the point table data (settable up to 255 points) is as easy as setting parameters. Perform positioning operation with a start signal after selecting the point table Nos.

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

* For MR-J4-A-RJ, point table can be set with push buttons on the servo amplifier or with MR-PRU03 parameter unit.

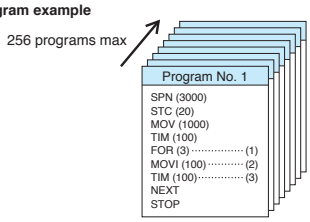


Program method*

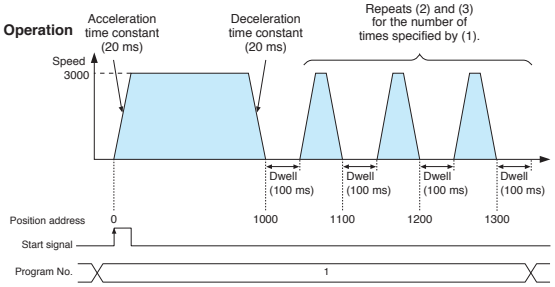
A-RJ

Create positioning programs with dedicated commands, and perform positioning operation with a start signal after selecting the program Nos. The program-based method enables more complex positioning operation than the point table method. Maximum of 256 programs are settable. (The total number of steps of all programs: 640)

Program example



* MR Configurator2 is required to create programs.



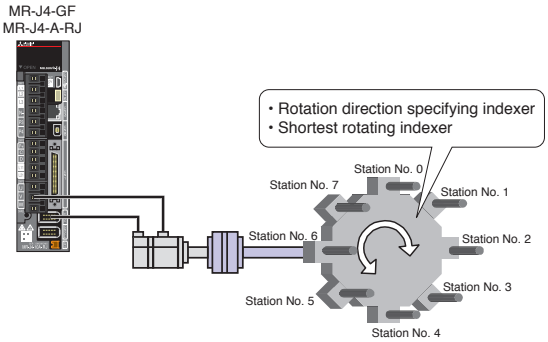
Indexer method*

GF GF-RJ A-RJ

Perform positioning operation by specifying equally divided stations (up to 255 stations) and the number of gear teeth on machine and motor sides. The travel distance will be calculated automatically based on the number of equally divided stations set in the parameter. The positioning operation is performed with a start signal after the station position Nos. are selected.

Rotation direction specifying indexer or shortest rotating indexer can be set.

* Fully closed loop control mode and linear servo motor control mode are not supported by the indexer method.



MELSERVO-J4

New Useful Functions with Positioning Function

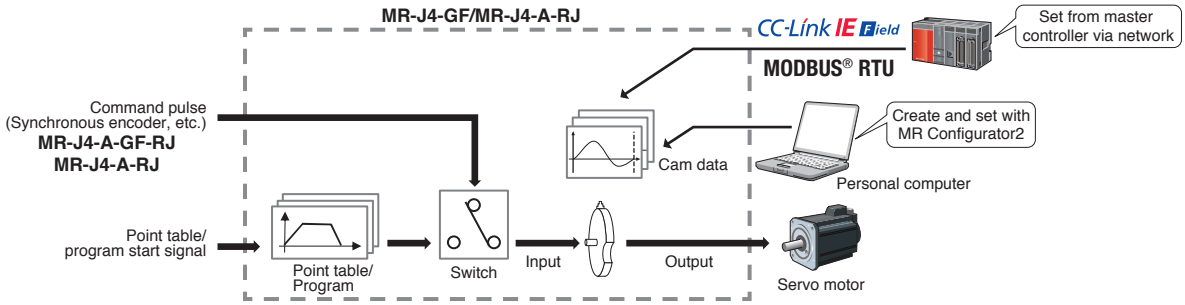
* Not supported by MR-J4-03A6-RJ.

New useful functions are added to the positioning function: simple cam function, encoder following function, pulse input through function, simple cam position compensation function, and communication functions (MODBUS® RTU, Point to Point positioning, and current position latch function). Apply these useful functions to a wide variety of applications to configure positioning system easily.

Simple cam function

GF GF-RJ A-RJ

Various patterns of cam data are created easily with MR Configurator2. Command pulse or point table/program start signal is used as input to the simple cam. The input command will be outputted to the servo motor according to the cam data.

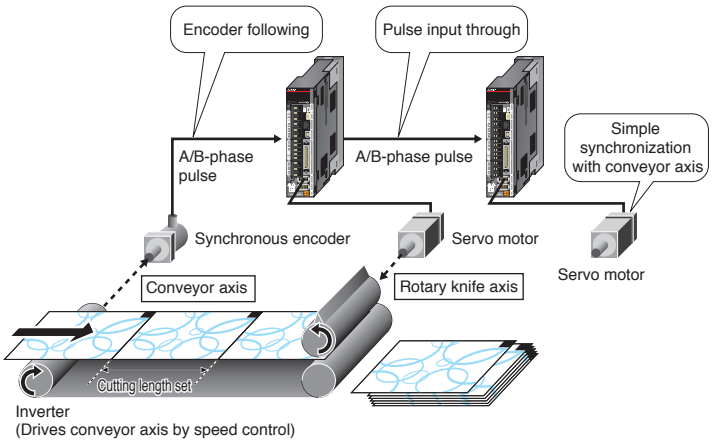


* The program-based method is supported only by MR-J4-A-RJ.

Encoder following function/Pulse input through function*

GF-RJ A-RJ

With the encoder following function, the servo amplifier receives A/B-phase output signal from the synchronous encoder as command pulse, and the input command will be outputted to the servo motor according to the cam data. Setting cam data that matches with the sheet length, a circumference of the rotary knife axis, and the synchronous section of the sheet enables a system in which the conveyor axis and the rotary knife axis are synchronized. Up to 4 Mpulses/s of input from a synchronous encoder is compatible with the servo amplifier.
The pulse input through function allows the first axis to output A/B-phase pulses which are received from the synchronous encoder to the next axis, enabling a system in which the subsequent axes are synchronized with the synchronous encoder.



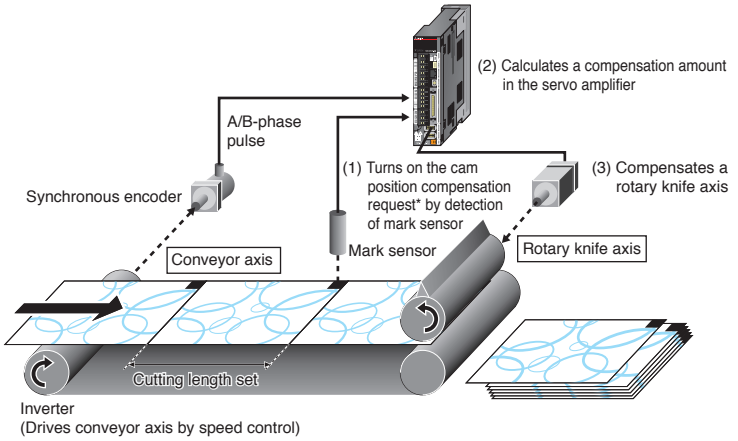
* The pulse input through function is available as A/B-phase pulse input through function for MR-J4-GF-RJ and as command pulse input through function for MR-J4-A-RJ.

Simple cam position compensation function*

GF-RJ A-RJ

The actual position of the servo motor is obtained based on the inputs from the sensor that detects the registration marks printed on the high-speed moving film. The servo amplifier calculates compensation amounts and corrects position errors of the rotary knife axis based on those inputs from the sensor so that the film is cut at the set position.

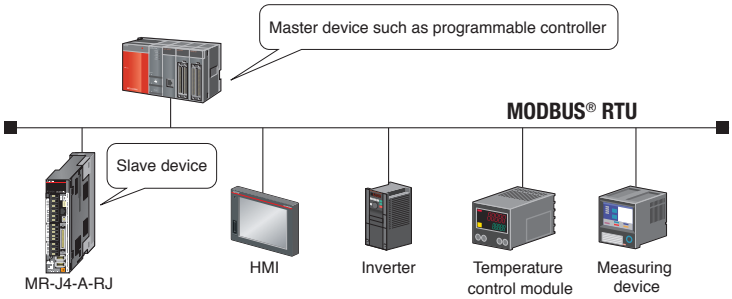
* "Cam position compensation request" is turned on with touch probe input for MR-J4-GF-RJ and mark sensor input for MR-J4-A-RJ.



Communication function (MODBUS® RTU)

A-RJ

In addition to RS-422/RS-485 communication (Mitsubishi Electric general-purpose AC servo protocol), RS-485 communication (MODBUS® RTU protocol) is supported. MODBUS® RTU protocol is compatible with function code 03h (Read holding registers), etc. Controlling and monitoring of the servo amplifier is possible by external devices.

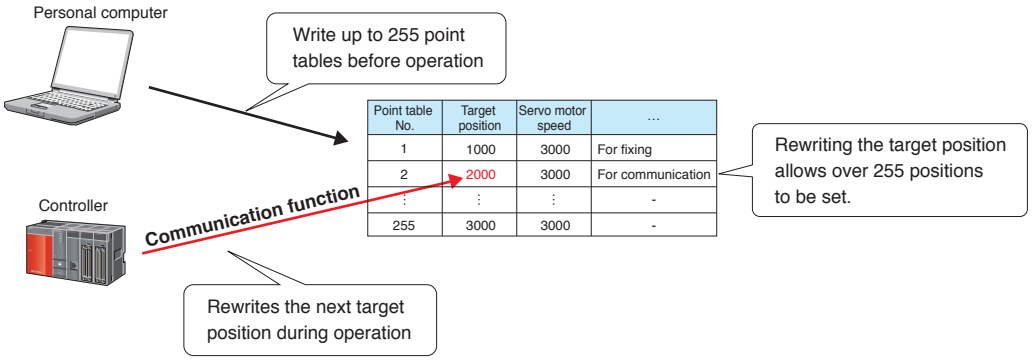


* RJ-45 junction connector terminal block and RJ-45 compatible cable designed for MR-J4-A-RJ are required.

Communication function (Point to Point positioning)

GF GF-RJ A-RJ

Up to 255 points of Point to Point positioning are enabled when the target position is set in the point table in advance. Rewriting the next target position during an operation is also possible by the communication function.



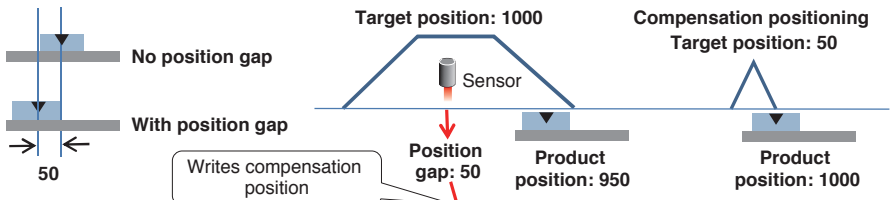
Communication function (current position latch)

A-RJ

Based on the data latched by the mark detection function (current position latch*), a target position is compensated by being written in the point table.

* When the mark detection signal turns on, a current position will be latched, and the latched data will be read with the communication function.

Example: Executing positioning compensation when a product is mispositioned by 50 on a handling pallet.
Start an operation by specifying point table No. 1 (target position: 1000).
Communication function (current position latch) measures a position gap with the mark detection function and writes the position gap of 50 to the target position in point table No. 2 for compensation during the operation.
After the operation of point table No. 1 is completed with a position gap of 50, start the operation by specifying point table No. 2.
The product will be set to the right position.



Point table No.	Target position	Servo motor speed	...
1	1000	3000	-
2	0	3000	For compensation

Point table No.	Target position	Servo motor speed	...
1	1000	3000	-
2	50	3000	For compensation

CC-Link IE Field

Ethernet-based integrated network

MELSERVO-J4 | All-Rounder Network with CC-Link IE Field

All-in-One Network

The network is designed to simultaneously handle distributed control, I/O control, and motion control. CC-Link IE Field Network lets you connect field devices such as programmable controllers, I/O modules, high-speed counter modules, servo amplifiers, inverters, and displays, providing optimal network which best fits the needs of the application.
Choose from star, line, or ring* topology suitable for layout of lines and machines.

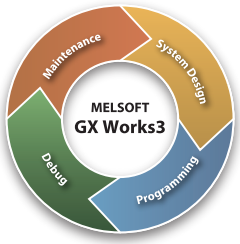
Communication speed 1Gbps	Maximum link registers 16Kwords	Maximum link relays 32,768bits	Star topology	Line topology	Ring topology*
Easy to configure parameters	Network diagnosis at-a-glance	Seamless connectivity	Twisted pair cable	Ethernet-based	Motion control Synchronized communication

* The Simple Motion modules do not support a ring topology.

A major innovation in industrial networks providing
reliable, flexible, and seamless communication

All-in-One Engineering Software

This all-in-one MELSOFT GX Works3 covers all aspects of the product development cycle from system design to maintenance - including programming, setting of CC-Link IE Field Network and Simple Motion modules, and adjustment of servo amplifiers.



Easy system design

- MELSOFT GX Works3 includes everything needed from system configuration to servo parameter settings.
- Parameters for CC-Link IE Field Network are easy to be set.

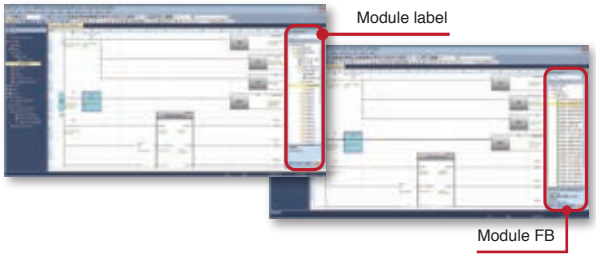
[Servo parameter]

[CC-Link IE Field network configuration]

Easy programming

- A sequence program is created effortlessly via drag & drop of module labels/FBs.

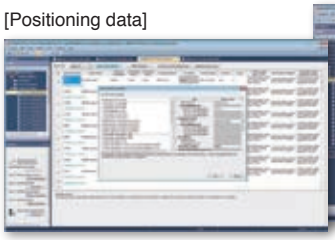
[Sequence program]



System Design | Programming | Debug | Maintenance

Easy motion control

[Positioning data]



[Synchronous control parameter]

- An array of sub functions helps you create positioning data.
- Synchronous control is performed easily just by parameter settings.
- Creation of a rough cam waveform on a graph via drag & drop, or direct numerical value input to the graph enables easy creation of cam data.

Easy startup

[One-touch tuning]

[Network diagnostics]

- Servo adjustment is automatically completed using the One-touch tuning function.
- Network diagnostics displays the network errors.
- Debugging of a program without an actual machine is possible by simulation.

CC-Link IE Field Network-Compatible Servo Amplifier MR-J4-GF

MELSERVO-J4 | All-Rounder Driving System with CC-Link IE Field

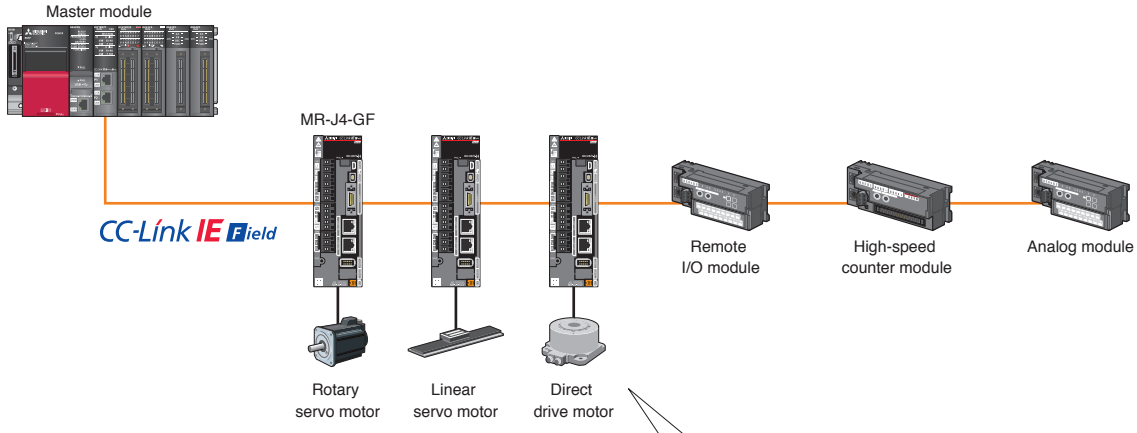
Compatible with CC-Link IE Field Network

MR-J4-GF(-RJ) is compatible with CC-Link IE Field Network as standard.
The servo amplifier is connectable with Ethernet-based CC-Link IE Field Network, enabling high-speed, seamless communication.

MR-J4-GF

Easy Positioning with CC-Link IE Field Network

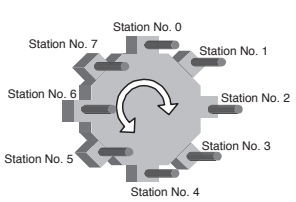
A combination of a master module and MR-J4-GF(-RJ) allows positioning operation with point table method or indexer method, not requiring a Positioning module. With the point table method, just set the point table No. and turn on the start signal, and then the positioning operation will be started. A continuous operation of the next point table is also possible without stopping.
In the indexer method, the travel amount is automatically calculated based on the number of stations set in the parameter.
For more details of the positioning function, refer to pp. 12 to 14 in this catalog.



Point table method

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

Indexer method

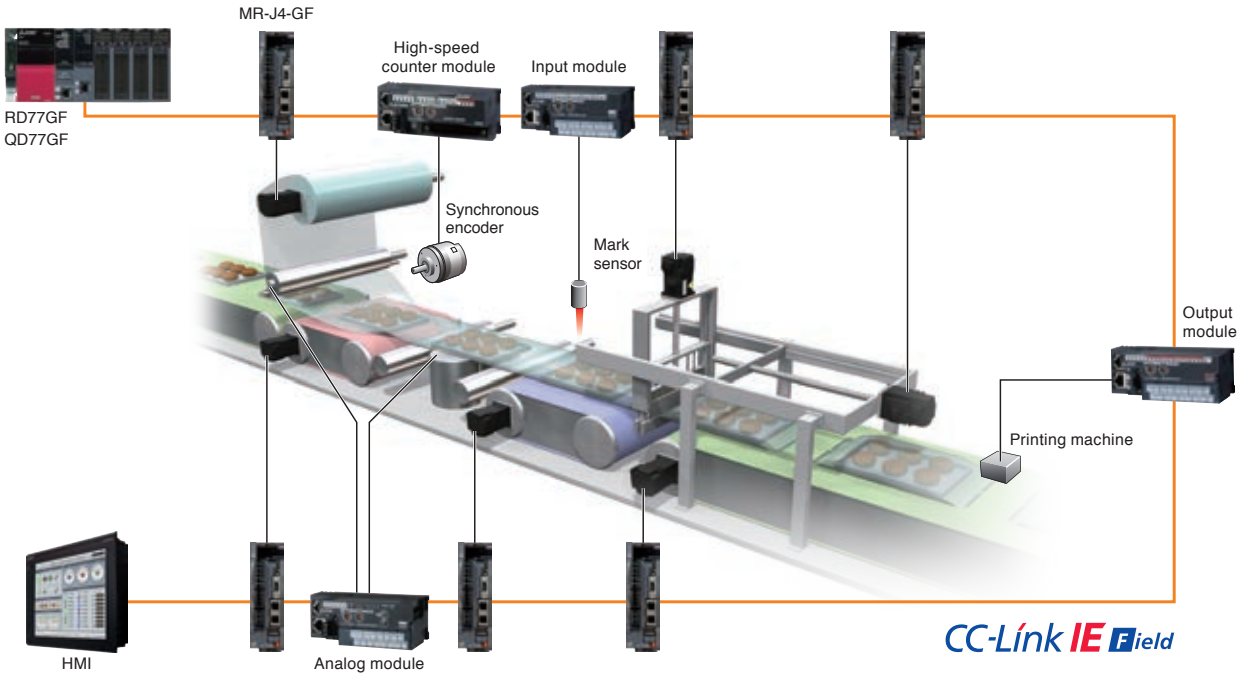


CC-Link IE Field Network Motion Control

A combination of a Simple Motion module and MR-J4-GF(-RJ) enables high-performance synchronous control and interpolation control with simple parameter setting and a start from a sequence program. Speed control and torque control are also possible, suitable for converting machines. In addition, using remote inputs/outputs which are compatible with the synchronized communication function enables a system synchronized with the command cycle of the servo amplifier.

An example of inputs/outputs synchronized with the command cycle of the servo amplifier

A synchronous encoder, unwinder, printing machine can be synchronized with the servo command communication cycle.

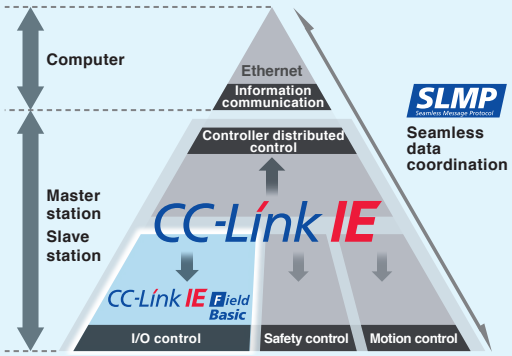


Supporting CC-Link IE Field Network Basic*3

CC-Link IE Field Basic

With recent trends of IoT*1, network connection of devices and equipment for small-scale systems are becoming more mainstream. CC-Link IE Field Network Basic realizes easier network integration of Ethernet devices, as its cyclic communications stack is software-based, without requiring a dedicated ASIC helping to reduce implementation costs for device partners.
Transparent communications are achieved by utilizing SLMP*2 that enables seamless connectivity within all levels of manufacturing.

*1. Internet of Things
*2. Seamless Message Protocol
*3. CC-Link IE Field Network is supported by MR-J4-GF with software version A4 or later. Refer to the Instruction Manual for CC-Link IE Field Network Basic.



Position of CC-Link IE Field Network Basic

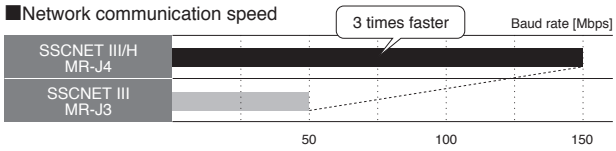
MELSERVO-J4 | High-Response Servo System Achieved with SSCNET III/H

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.

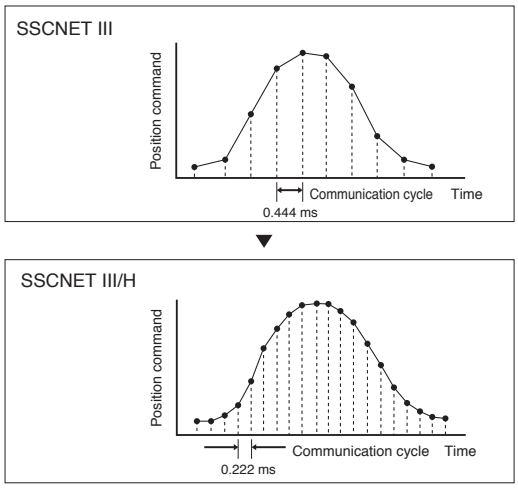
■Network communication speed



Cycle Time as Fast as 0.222 ms

Industry-leading levels

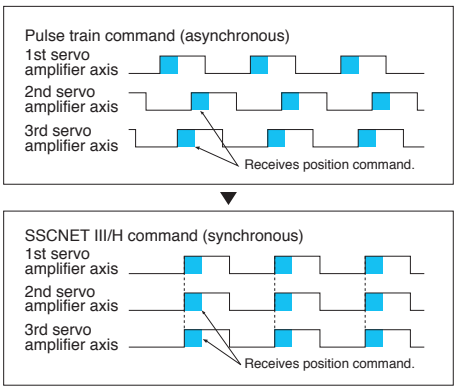
Smooth control of a machine is possible using high-speed serial communication with a cycle time of 0.222 ms.



Synchronous Communication

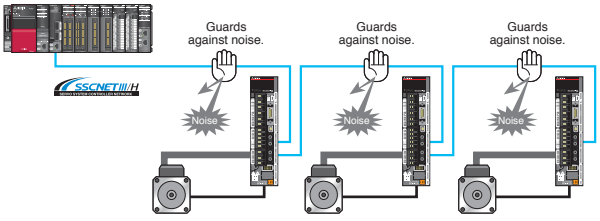
Synchronous communication is achieved with SSCNET III/H, offering technical advantages for machines in printing and food processing industry that require deterministic control.

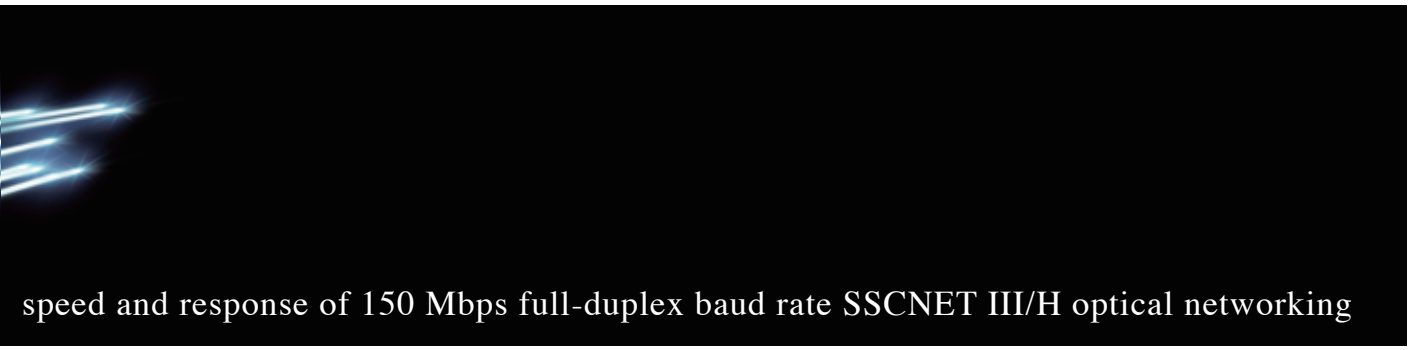
■Timing of servo amplifier processing



Improved Noise Tolerance by Optical Communication

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.



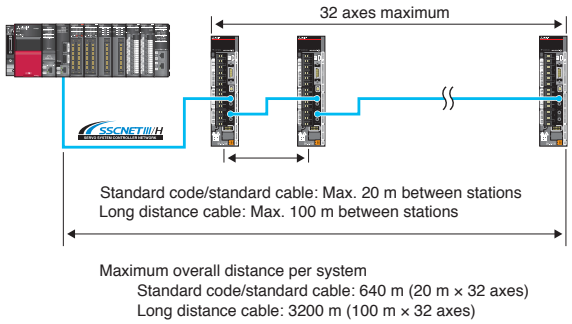


Long Distance Wiring up to 3200 m

Enhanced performance

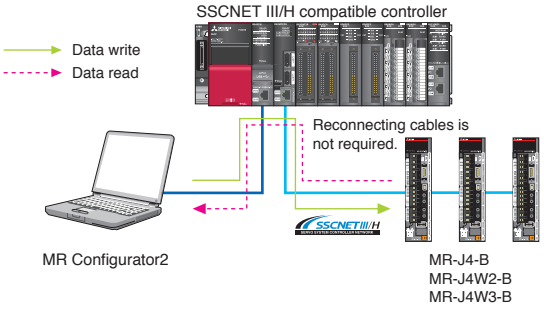
Long distance wiring is possible up to 3200 m per system (maximum of 100 m between stations × 32 axes), suitable for large-scale systems.

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



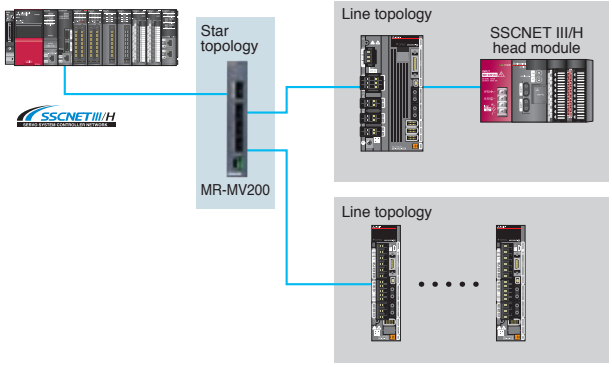
Central Control with Network

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.



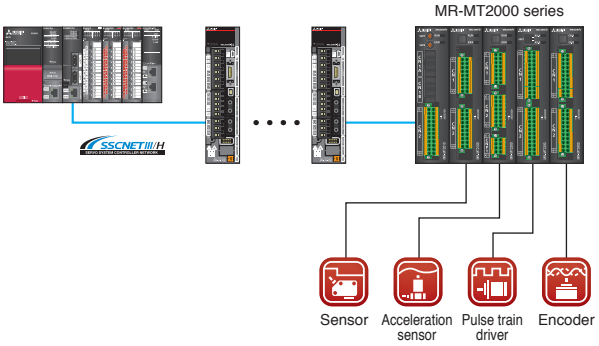
Network Topology

Star and line topologies are available with MR-MV200 optical hub unit* through SSCNET III/H for a network configuration. Maintenance can be executed without stopping the whole system, and thus the operation rate will be increased.



I/O Signals Synchronized with Motion Control

MR-MT2000 series sensing modules including the I/O module, analog I/O module, pulse I/O module, and encoder I/F module are connected to SSCNET III/H.
These various modules enable a faster, more accurate machine operation by synchronizing the I/Os of a general-purpose pulse train driver, sensor, and SSI encoder with the motion control.



* For MR-MV200 optical hub unit and MR-MT2000 sensing module, refer to "Servo System Controllers MELSEC iQ-R series/MELSEC iQ-F series catalog (L(NA)03100)".

Man

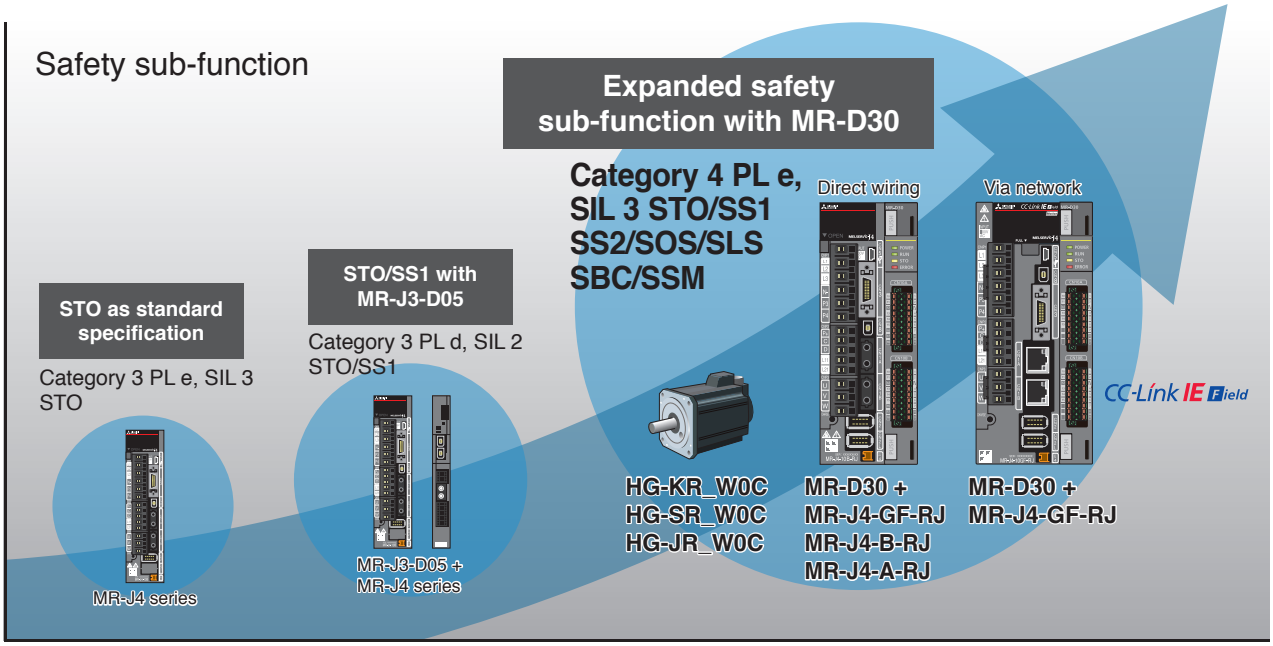
The leading edge in safety and convenience, designed to harmonize with the way you work.

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

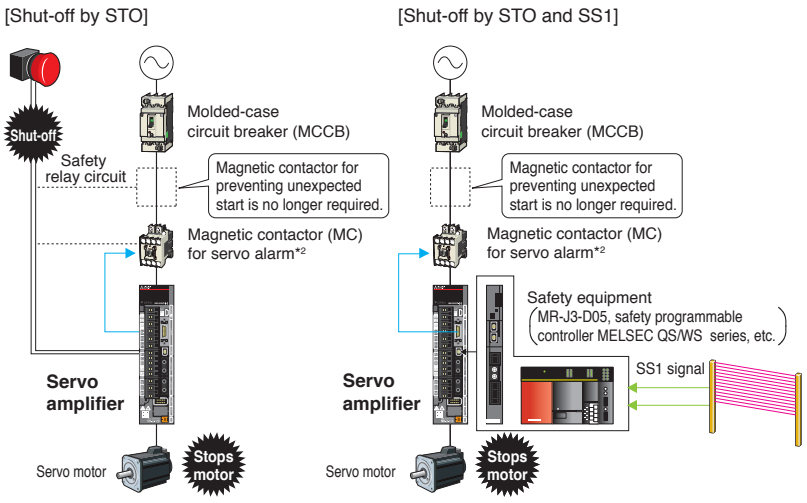


MELSERVO-J4 | Equipped with the Safety Sub-Function

Functions Compliant with 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 a machine.

- By using STO, it is not necessary to turn off the control power of the servo amplifier, resulting in a shorter restart time and eliminating the necessity of home position return.
- A magnetic contactor for preventing unexpected motor start is not needed.*2
- The safety level of STO is increased to SIL 3 from SIL 2. *3, 4



IEC/EN 61800-5-2:2007 function	Safety level
STO (Safe torque off)	Category 3 PL e, SIL 3 *3, 4
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 illustration has a magnetic contactor installed to prevent servo alarms and electric shock.
*3. Servo amplifiers manufactured in Japan in June 2015 or later, or in China in December 2015 or later are required, and a parameter needs to be set.
*4. For Category 3 PL e, SIL 3, use compatible safety equipment and set the parameters. When MR-J3-D05 is used, safety level is Category 3 PL d, SIL 2.

Increasing Safety Level with MR-D30 Functional Safety Unit

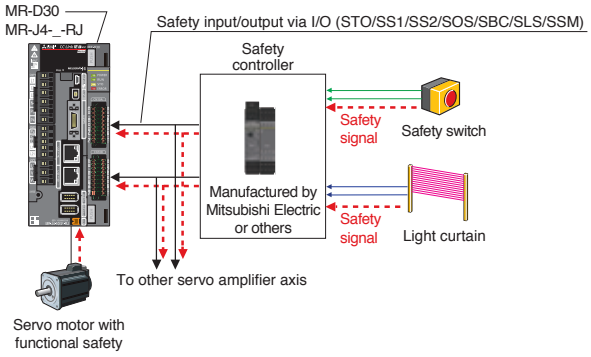
Achieving Category 4 PL e, SIL 3

● By wiring to MR-D30 functional safety unit

Safety level is Category 4 PL e, SIL 3 when the safety signals are inputted directly to MR-D30 functional safety unit. The safety sub-function is operated on the MR-D30 by parameter setting, and therefore expansion of the safety sub-function is possible independent of controllers.

IEC/EN 61800-5-2:2007 function	Safety level
STO (Safe torque off)	Category 4 PL e, SIL 3
SS1 (Safe stop 1)	
SS2 (Safe stop 2)*1	
SOS (Safe operating stop)*1	
SLS (Safely-limited speed)*2	
SBC (Safe brake control)	
SSM (Safe speed monitor)*2	

*1. Requires the use of a servo motor with functional safety.
*2. Safety level is Category 3 PL d, SIL 2 when the servo motor with functional safety is not used.

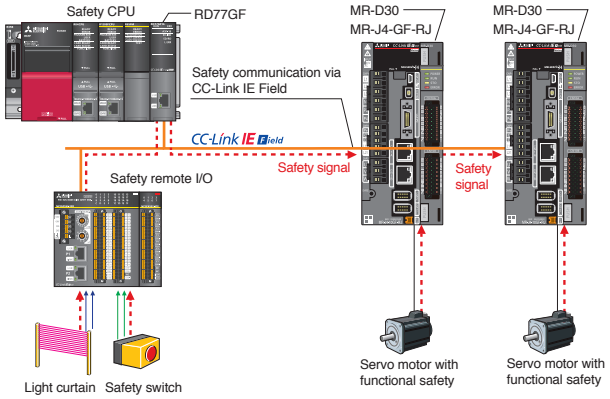


● By CC-Link IE Field Network

When MR-J4-GF-RJ is combined with R_SFCPU-SET safety CPU and RD77GF Simple Motion module, MR-J4-GF-RJ receives the safety signal data though CC-Link IE Field Network connected to RD77GF, and thus wiring the safety signals to the I/O of MR-D30 is not necessary.

IEC/EN 61800-5-2:2007 function	Safety level
STO (Safe torque off)	Category 4 PL e, SIL 3
SS1 (Safe stop 1)	
SS2 (Safe stop 2)*1	
SOS (Safe operating stop)*1	
SLS (Safely-limited speed)*2	
SBC (Safe brake control)	
SSM (Safe speed monitor)*2	

*1. Requires the use of a servo motor with functional safety.
*2. Safety level is Category 3 PL d, SIL 2 when the servo motor with functional safety is not used.



Related Catalogs

Refer to "Safety Programmable Controller/Safety Controller catalog (L(NA)08192E)" for details.

Achieving IEC/EN 61800-5-2 Functions

(1) Functions achievable with MR-J4-GF(-RJ)/MR-J4-B(-RJ)/MR-J4W_-B/MR-J4-A(-RJ)
(2) Functions achievable with MR-J3-D05 and MR-J4-GF(-RJ)/MR-J4-B(-RJ)/MR-J4W_-B/MR-J4-A(-RJ)
(3) Functions achievable with MR-D30 + MR-J4-GF-RJ/MR-J4-B-RJ/MR-J4-A-RJ

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

IEC/EN 61800-5-2:2007 function	(1)	(2)	(3)
Safe torque off (STO) 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.	◎ *1	○	◎
Safe stop 1 (SS1) 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.	—	○	◎
Safe stop 2 (SS2) 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.	—	—	◎ *2
Safe operating stop (SOS) 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.	—	—	◎ *2

IEC/EN 61800-5-2:2007 function	(1)	(2)	(3)
Safely-limited speed (SLS) 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.	—	—	◎ *3
Safe brake control (SBC) The SBC signals are outputted for external brake control.	—	—	◎
Safe speed monitor (SSM) The SSM signals are outputted when the motor speed is below the specified speed limit.	—	—	◎ *3

V: Speed
Vmax: User specified speed limit value
S1, S2: Specified stop position
Function activation area

*1. SIL 3 when a necessary parameter is set.
*2. Requires the use of a servo motor with functional safety.
*3. SIL 2 without the use of a servo motor with functional safety.

Enhanced operating ease and drive stability

MELSERVO-J4 | Maintenance Function to Achieve TCO* Reduction

* TCO : Total Cost of Ownership

Compliance with SEMI-F47

MELSERVO-J4 series servo amplifier complies with SEMI-F47 standard* corresponding to semiconductors and FPD manufacturing systems. (SEMI-F47 is not applicable to 1-phase 100 V AC, 1-phase 200 V AC, and DC input. To comply with SEMI-F47 with 9 kW or larger servo amplifiers, the dynamic brake is not usable.)

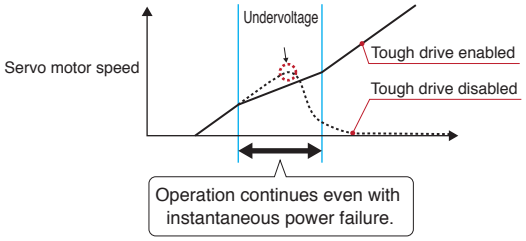
* The control power supply of the servo amplifier complies with SEMI-F47. Note that the backup capacitor may be required depending on the power impedance and operating situation for the instantaneous power failure of the main circuit power supply. Be sure to perform a test on your machine to meet the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

Tough Drive Function

Enhanced functions

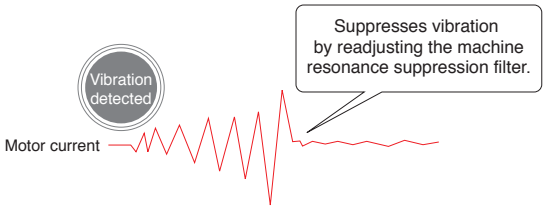
Instantaneous power failure tough drive

When an instantaneous power failure is detected, this function allows the servo amplifier to use the electric energy charged in the main circuit capacitor in the servo amplifier to avoid an alarm occurrence, increasing the machine availability even with an unstable power supply.



Vibration tough drive

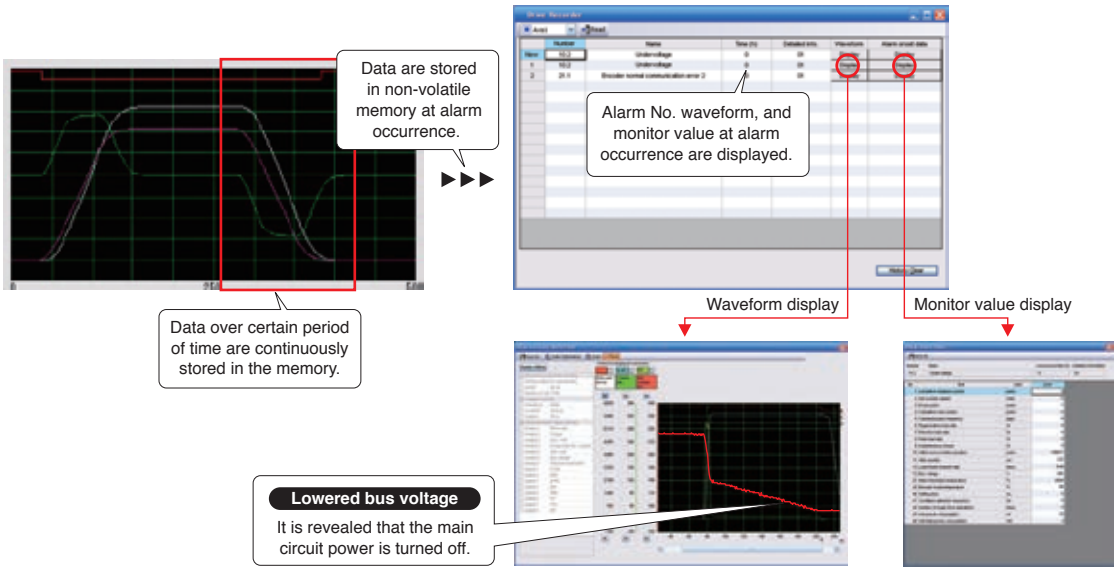
Machine resonance suppression filter is automatically readjusted when a change in machine resonance frequency is detected by the servo amplifier, reducing unplanned machine downtime caused by age-related degradation.



Large Capacity Drive Recorder

Patented 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 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 the past 16-time alarms in the alarm history.

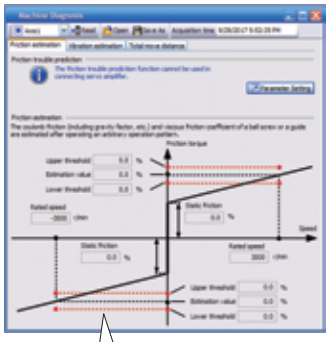


Machine Diagnosis Function

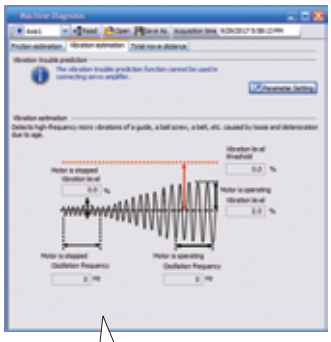
Patented

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

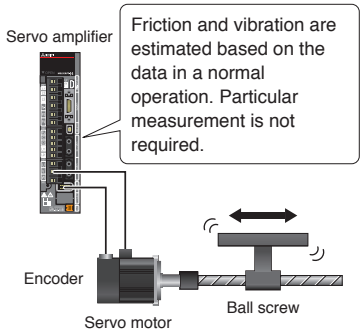
[Machine diagnosis function window on MR Configurator2]



Estimated friction value is displayed.



Estimated vibration value is displayed.



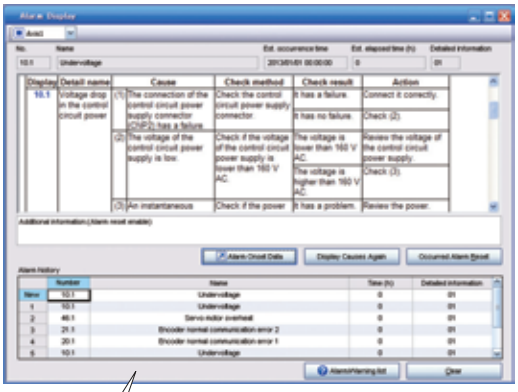
Three-Digit Alarm

MR-J4 series displays the alarm No. in three digits to show the servo alarm in more details, making troubleshooting easy.

[Three-digit alarm display]

This display is of MR-J4-A.

[Example of an alarm window on MR Configurator2]

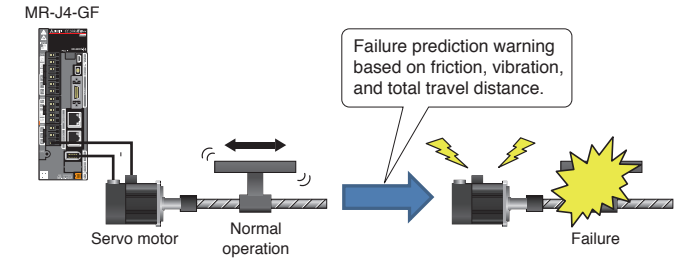


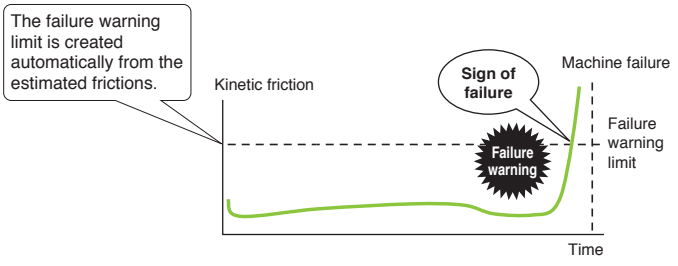
For the undervoltage alarm, whether the alarm occurred in the main or the control circuit is identified by the alarm No.

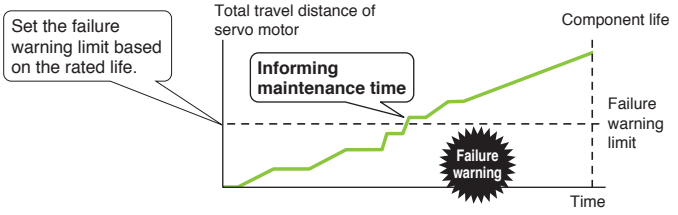
Predictive Maintenance

GF GF-RJ Patented

MR-J4-GF detects aging-related changes in a machine performance based on the frictions and vibrations monitored by the machine diagnosis function, and informs the maintenance time with a warning. MR-J4-GF also stores the total travel distance of the servo motor and informs the maintenance time with a warning when the total travel distance exceeds the warning limit set by you. When the limit is set to the rated life of a ball screw or bearing, preventive maintenance can be executed according to the actual machine operation.







User-friendly software for easy setup, tuning and operation

Servo setup software

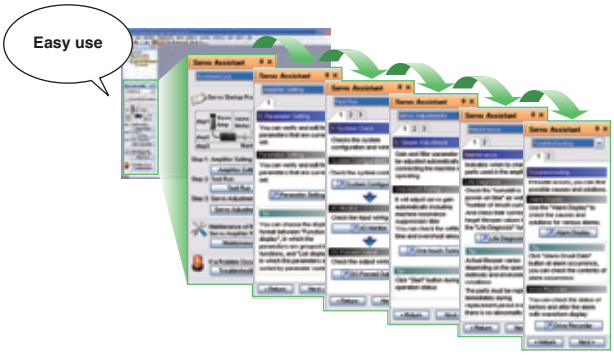
MR Configurator2 (SW1DNC-MRC2-E)

Tuning, monitor display, diagnosis, reading/writing parameters, and test operations are easily performed on a personal computer.
This powerful software tool supports a stable machine system and optimum control, and moreover, shortens setup time.

MELSERVO-J4 | Preparation

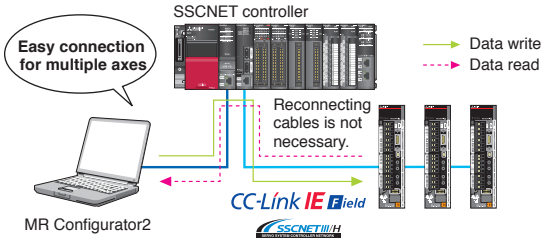
Servo Assistant Function

Complete setting up the servo amplifier just by following guidance displays. Related functions are called up from the shortcut buttons, making it so easy to set parameters and display alarms.



Using MR Configurator2 via Controller

Information such as parameter setting and monitoring for the multiple servo amplifiers are consolidated easily just by connecting a personal computer to the PLC CPU or the Motion CPU.



MELSERVO-J4 | Setting and Startup

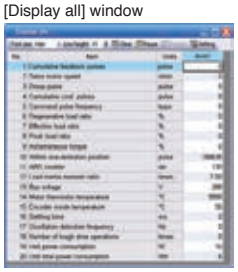
Parameter Setting Function

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.

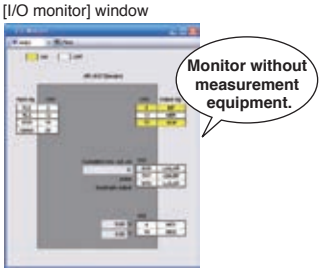
Monitor Function

Monitor the operation information on the [Display all] window. The power consumption can also be monitored without additional measurement equipment. Assign input/output signals and monitor on/off status of the signals on the "I/O monitor" window.

[Display all] window



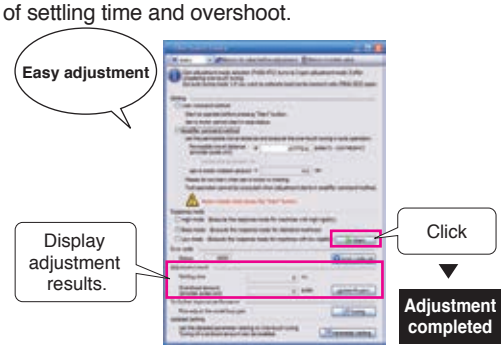
[I/O monitor] window



MELSERVO-J4 | Servo Adjustment

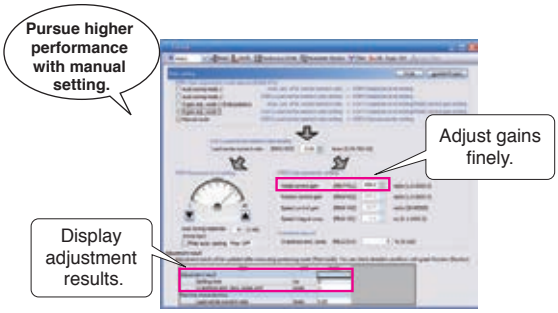
One-Touch Tuning Function

With the ease of clicking the start button, adjustments including estimating load to motor inertia ratio, adjusting gain, and suppressing machine resonance are automatically performed for the maximum servo performance. 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.



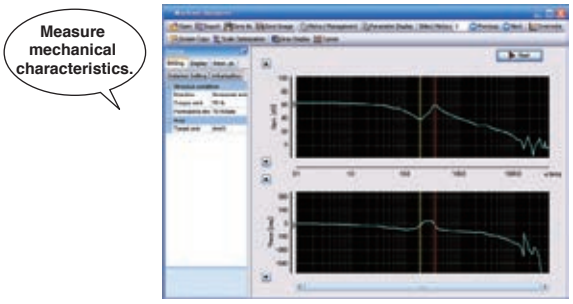
Graph Function

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 is simultaneously executed on the connected axes via Motion controller communication.

Machine Analyzer Function

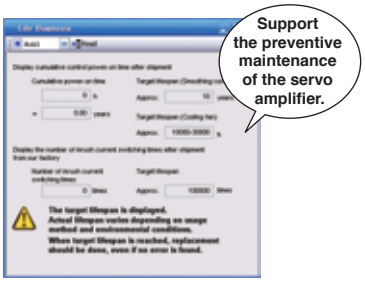
Input random torque to the servo motor automatically and analyze frequency characteristics (0.1 Hz to 4.5 kHz) of a machine system just by clicking the [Start] button. This function supports setting of machine resonance suppression filter, etc.



MELSERVO-J4 | Maintenance

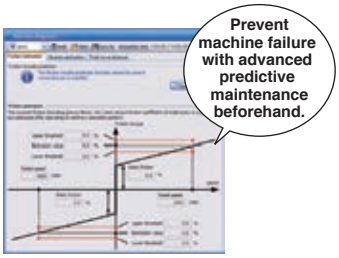
Servo Amplifier Life Diagnosis Function

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

This function estimates machine friction and vibration in normal operation without special measurements.
Comparing the data of the first and after years of operations helps to find out the age-related degradation of a machine, supporting predictive 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.

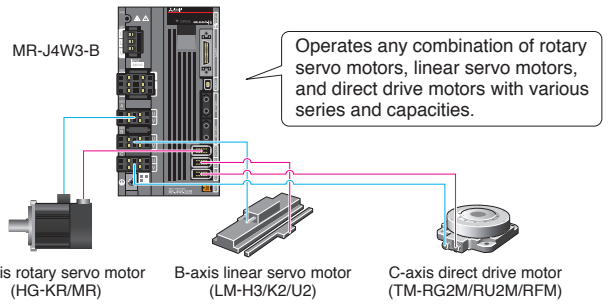
Designed to cut waste and save on space, wiring, and energy use

MELSERVO-J4 | Multi-Axis Servo Amplifier in Harmony with Eco-Friendly Society

2-axis/3-axis Types for Energy-Saving, 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-saving, 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*.

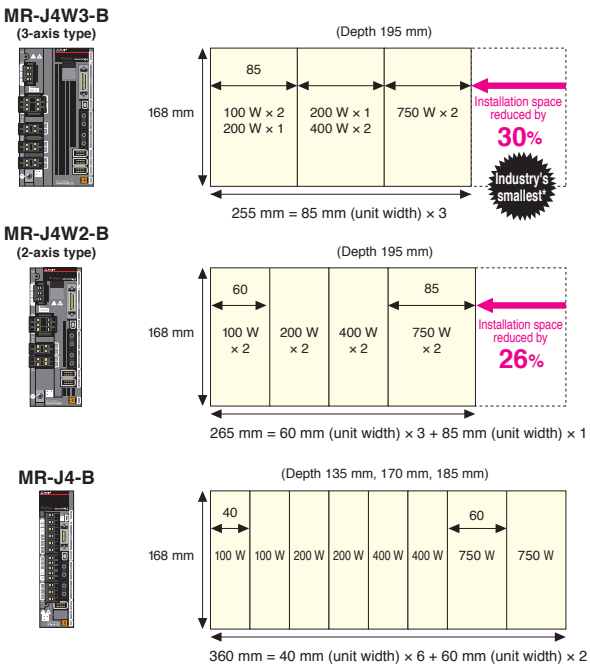
* For the combination, refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-8 in this catalog.



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.

[Example of installation space for two units of each 100 W, 200 W, 400 W, and 750 W]

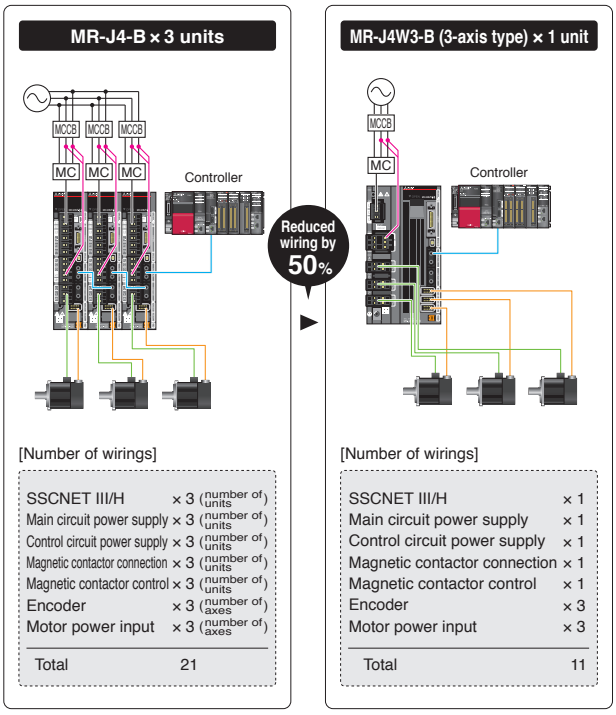


* Based on Mitsubishi Electric research as of February, 2019

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

The three axes of 3-axis servo amplifier MR-J4W3-B 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]



[Number of wirings]

SSCNET III/H	× 3 (number of units)
Main circuit power supply	× 3 (number of units)
Control circuit power supply	× 3 (number of units)
Magnetic contactor connection	× 3 (number of units)
Magnetic contactor control	× 3 (number of units)
Encoder	× 3 (number of axes)
Motor power input	× 3 (number of axes)
Total	21

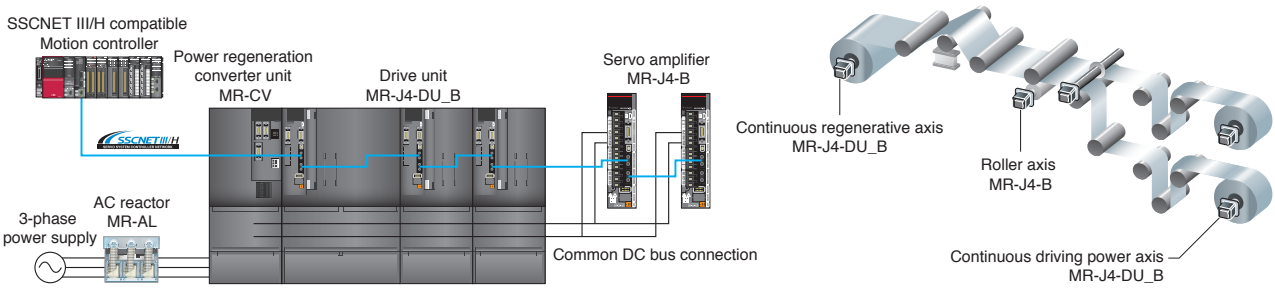
[Number of wirings]

SSCNET III/H	× 1
Main circuit power supply	× 1
Control circuit power supply	× 1
Magnetic contactor connection	× 1
Magnetic contactor control	× 1
Encoder	× 3
Motor power input	× 3
Total	11

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

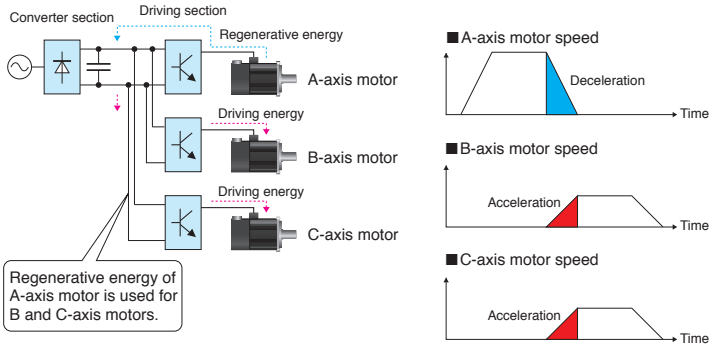
MELSERVO-J4 | Optimal Energy-Saving System for Your System

System Configuration Examples



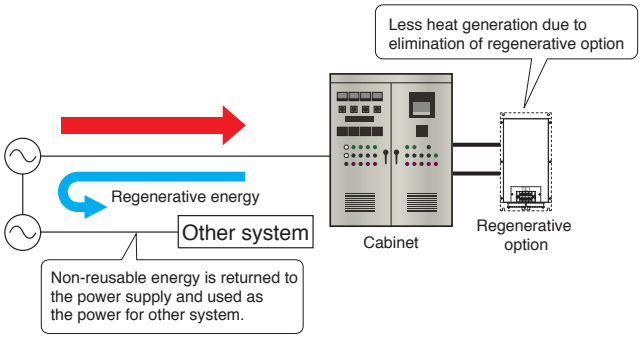
Energy-Conservation with Common DC Bus Connection

When multiple servo amplifiers and drive units are connected to the MR-CV power regeneration converter unit by a common DC bus connection, the regenerative energy of one axis is used for driving other axes, contributing to energy-conservation.
The multi-axis servo amplifier has the same effect.



Further Energy-Conservation with Power Regeneration System

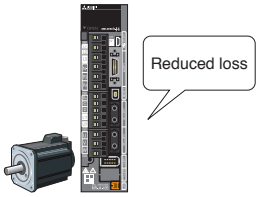
The MR-CV power regeneration converter unit has a power regeneration system which returns the regenerative energy back to the power supply, enabling the regenerative power to be used for other systems for further energy-conservation.
In addition, when the MR-CV power regeneration converter unit is used, a regenerative option is not required, and thus, the total heat generation in a system will be decreased.



Advanced Function and Performance for More Energy-Conservation

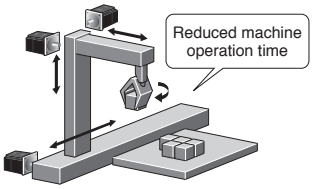
Reduced energy loss of servo amplifier and servo motor

[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.



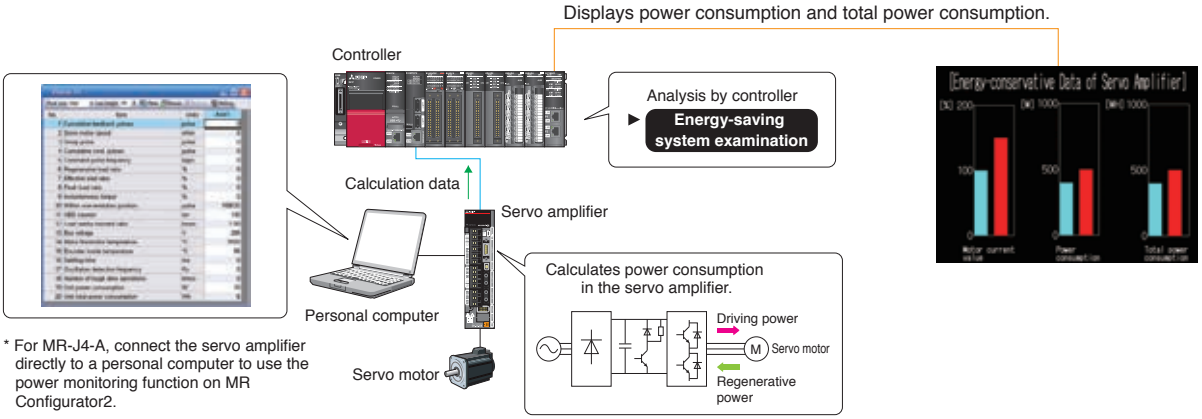
Energy-conservation due to the improved machine performance

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



Power Monitoring Function

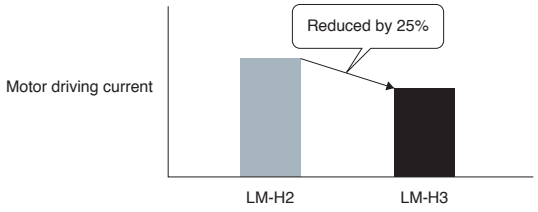
Driving power and regenerative power are calculated from the data in the servo amplifier such as speed and current, and the power consumption is monitored with MR Configurator2. In a system of CC-Link IE Field Network or SSCNET III/H, the data are transmitted to a controller, and the power consumption is analyzed and displayed.



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

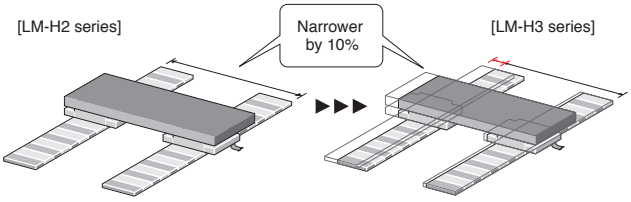
Reduced motor driving power

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 by approximately 12%* 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).



MELSERVO-J4 | Environment

Expanded Environmental Conditions

Capable of operating at an altitude of up to 2000 m.

Compatible with power supply voltage of 240 V AC for global use.

Complies with RoHS directive.

Servo amplifiers with special coating-specification are now available. This servo amplifier has an improved corrosion resistance in environments with corrosive gas concentrations, conforming to IEC 60721-3-3, Class 3C2. For details, contact your local office.

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

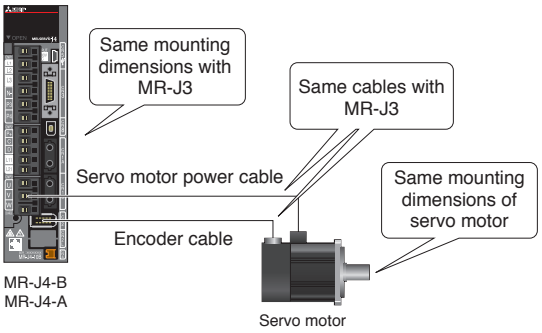
MELSERVO-J4 | Seamless Integration with Existing System

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 option cables for the power, the encoder*3, and the electromagnetic brake as HF series or HC-RP/HC-UP series.

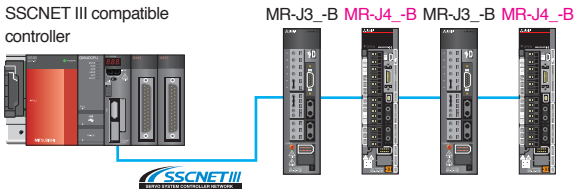
*1. Mounting dimensions are smaller for servo amplifiers rated 200 V 5 kW, 400 V 3.5 kW, 200 V/400 V 11 kW, and 200 V/400 V 15 kW.
*2. For replacing HA-LP series to HG-JR series, contact your local sales office for more detail.
*3. HG-JR series of 11 kW to 55 kW uses a different encoder cable from HF-JP series.



When not changing the controller to SSCNET III/H controller

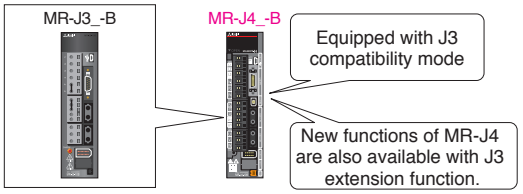
MR-J4-B/MR-J4W2-B/MR-J4W3-B servo amplifier has J3 compatibility mode. By operating in J3 compatibility mode, MR-J4 series servo amplifier and MR-J3 series servo amplifier can be used together in a same system without changing the existing controller.

* 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 supported by 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.

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

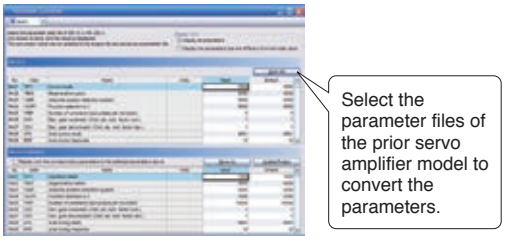


Parameter conversion

Parameters are automatically converted by changing MR-J3-B to MR-J4-B with MELSOFT MT Works2*1. MR-J3-A and MR-J3-T parameters can also be converted to MR-J4-A parameters using the parameter converter function of MR Configurator2*1.

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

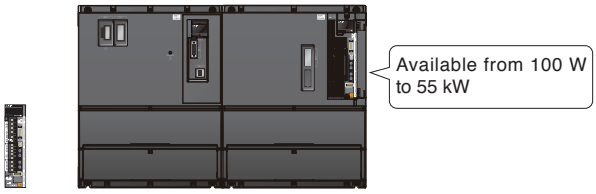
[Parameter converter window]



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

Supporting Replacement of MR-J2-Super Series

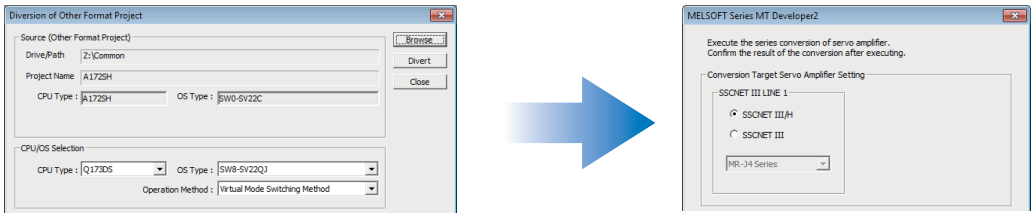
MELSERVO-J4 series product lines include general-purpose interface, positioning function, and SSCNET III/H interface. MELSERVO-J4 series is compatible with a wide variety of command interface and also replaceable from MELSERVO-J2S series.

For renewing the units to MR-J4 series

Parameters are automatically converted with MELSOFT MT Works2*1 when the servo amplifier is changed from MR-J2S-B to MR-J4-B.
With the parameter converter function of MR Configurator2*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.

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

[MT Works2 window]



Diversion of other format project window

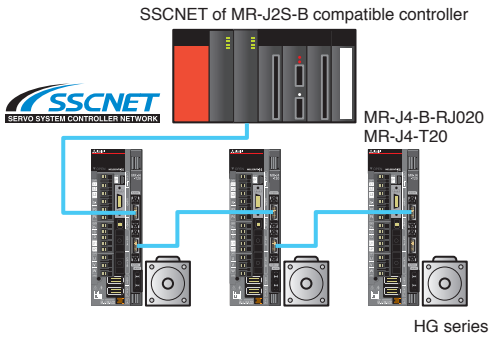
Servo amplifier conversion window

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.

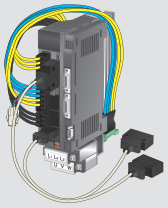
* The function and performance are equivalent to those of MR-J2S-B. (J2S compatibility mode)
* Refer to "New Product Release of Conversion Unit for SSCNET of MR-J2S-B" and "MR-J4-_B_-RJ020 MR-J4-T20 Servo Amplifier Instruction Manual" for details.

The set of MR-J4-B-RJ020 and MR-J4-T20 is compatible with the following servo system controllers:
A171SHCPU(N), A172SHCPU(N), A173UHCPU, A273UHCPU, A1SD75M, QD75M, Q172CPU(N), and Q173CPU(N)

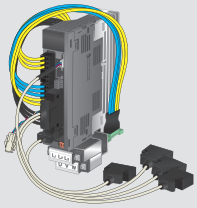


When using the existing wiring

MR-J2S-B renewal tool manufactured by Mitsubishi Electric System & Service Co., Ltd. is available for using the existing HC/HA series servo motors or for replacing MR-J2S 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 renewal tool, contact your local sales office.



Renewal tool for MR-J2S-_B



Renewal tool for MR-J2S-_A/CP

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 wiring.

Transition from MELSERVO-J3/J3W Series to J4 Series Handbook
L(NA)03127

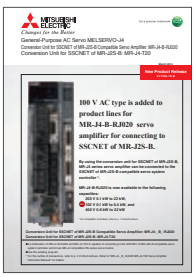
This handbook explains how to replace your MR-J3/J3W with MR-J4 series.

MELSERVO-J2-Super Transition Guide catalog
L(NA)03091

This catalog introduces how to upgrade your MR-J2S to MR-J4 series.

Transition from MELSERVO-J2-Super/J2M Series to J4 Series Handbook
L(NA)03093

This handbook explains how to replace your MR-J2S/J2M with MR-J4 series.



New Product Release of Conversion Unit for SSCNET of MR-J2S-B
SV1306-1

This brochure announces a 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.

MR-J2S Renewal Tool Catalog
X901307-312

This guide introduces a renewal tool for replacing MR-J2S with 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 with 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.

MR-J2S series has been discontinued since August 2015, and MR-J3/J3W series has been discontinued since May 2019.

Introducing basic functions from the conventional to the latest

MELSERVO-J4

Offering Various Basic Functions

Position/Speed/Torque control

Position, speed, and torque controls are available. The position control performs positioning by following position commands 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 necessary to consider the resonance frequency of a mechanical system.
This function is effective for the relatively 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.

Feed forward

With this function, a position deviation is reduced to 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.

* Supported only by 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 an 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 regeneration converter

Regenerative energy is returned to the power supply and used for other systems, contributing to energy-saving.
MR-CV_ power regeneration converter unit is compatible with MR-J4-DU_B_(-RJ) drive unit and MR-J4-_B_(-RJ) servo amplifier. FR-XC multifunction regeneration converter unit is compatible with the servo amplifiers of 100 W to 22 kW in 200 V class and 0.6 kW to 22 kW in 400 V class.

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 9 kW or larger servo amplifiers.

Close mounting

Close mounting is possible for 200 V 3.5 kW or smaller, 100 V, and 48 V DC/24 V DC servo amplifiers. Mounting space efficiency is significantly improved.

* When the servo amplifiers are closely mounted, the operation environment condition is different.
* Close mounting is not possible when the servo amplifiers of 1 kW and 2 kW in 200 V class are used with 1-phase power supply.

Input signal selection (device settings)

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

* Available with MR-J4-GF and 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-J4W2-B outputs A/B-phase pulse. MR-J4W3-B is not compatible with this function.

A/B-phase pulse through output

With this function, when an A/B/Z-phase differential output type linear encoder is used, A/B/Z-phase signals from the linear encoder are outputted as encoder output pulses. The signals from the linear encoder are used by a controller without being branched.

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

Monitoring (Status display)

Servo status such as regenerative load ratio, effective load ratio, instantaneous torque, or servo motor speed 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 and servo motor speed is outputted in terms of voltage in real time.

* Not available with MR-J4W2-B/MR-J4-W3-B.

Alarm history

The past 16 alarms are recorded in the servo amplifier. The alarms can be checked in a list with 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.

Multi-axis adjustment function

This function simultaneously adjusts parallel drive axes which make the same motion and also executes test operation and gain adjustment for up to four axes at the same time. The target axes can be selected with a simple operation on engineering software.

* This function is available when the servo amplifier is used with RnMTCPU or RD77MS.

Pressure control function

Pressure sensor signals are directly inputted to the servo amplifier, enabling high-response feedback control and pressure control.

* Pressure control-compatible servo amplifier (MR-J4-B-LL) is necessary.

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-GF(-RJ)

The CC-Link IE Field Network compatible servo amplifier enables a system synchronized with remote I/O with Ethernet-based open network.

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.

■Product lines

Servo amplifiers with CC-Link IE Field Network, SSCNET III/H, and general-purpose interface are available.

●: Supported –: Not supported

Model	Power supply	Command interface	Fully closed loop control*2	Compatible servo motor		
				Rotary	Linear*3	Direct drive
MR-J4-GF(-RJ)*1	1-phase 100 V AC	CC-Link IE Field Network	●	●	●	●
	3-phase 200 V AC		●	●	●	●
	3-phase 400 V AC		●	●	●	–
MR-J4-B(-RJ)*1	1-phase 100 V AC	SSCNET III/H	●	●	●	●
	3-phase 200 V AC		●	●	●	●
	3-phase 400 V AC		●	●	●	–
MR-J4W2-B	3-phase 200 V AC 2-axis		●	●	●	●
	48 V DC/24 V DC 2-axis		–	●	–	–
MR-J4W3-B	3-phase 200 V AC 3-axis		–	●	●	●
MR-J4-A(-RJ)*1	1-phase 100 V AC	Pulse train/ Analog voltage/ RS-422/RS-485 *5 MODBUS® RTU *4	●	●	●	●
	3-phase 200 V AC		●	●	●	●
	3-phase 400 V AC		●	●	●	–
	48 V DC/24 V DC		–	●	–	–

*1. MR-J4-GF-RJ/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. (MR-J4-03A6-RJ is not compatible with the linear encoders.)
*2. MR-J4-GF/B/A servo amplifier is compatible only 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-GF-RJ/B-RJ/A-RJ.
*3. MR-J4-GF/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-GF-RJ/B-RJ/A-RJ.

MR-J4W2-B

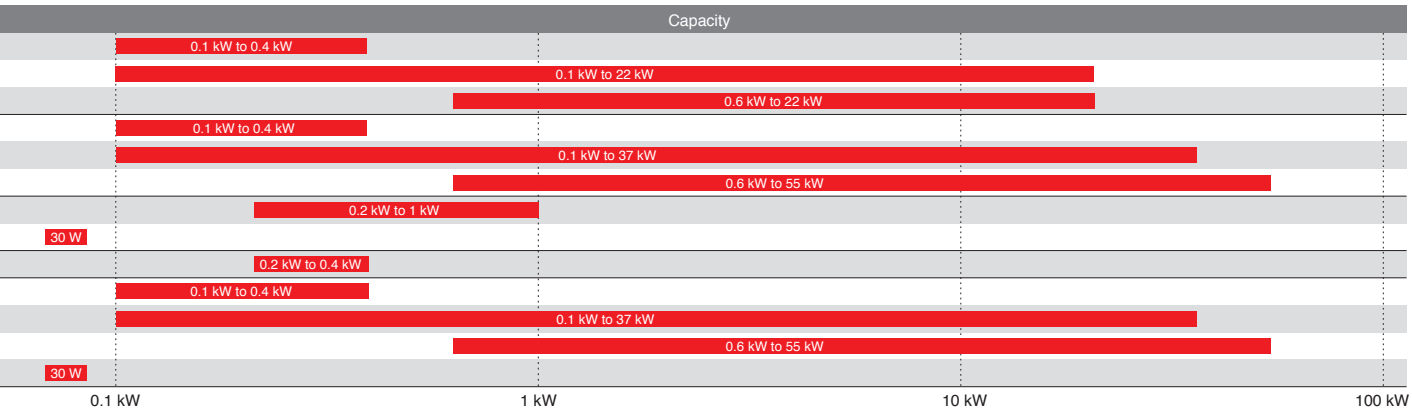
The SSCNET III/H compatible 2-axis servo amplifier drives two servo motors, enabling energy-saving, less-wiring, compact machine at lower cost.

MR-J4W3-B

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

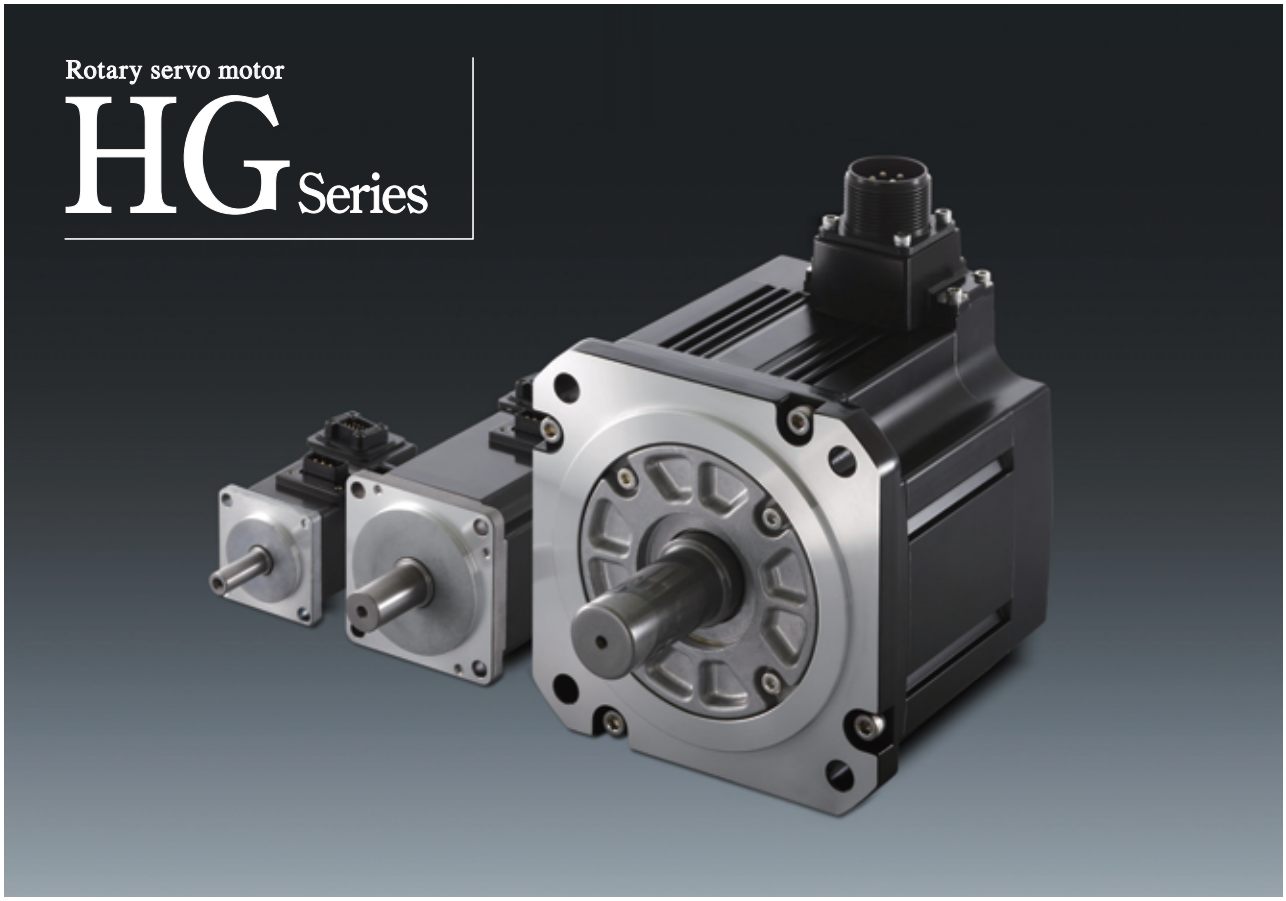
MR-J4-A(-RJ)

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.



*4. MODBUS® RTU is supported only by MR-J4-A-RJ. (Not supported by MR-J4-03A6-RJ).
*5. RS-485 is supported only by MR-J4-A(-RJ). (Not supported by MR-J4-03A6-RJ).

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



HG-KR Series
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. * Supported only by HG-KR.

HG-SR Series

This medium capacity, medium inertia servo motor enables stable operation. The motor has achieved the industry's shortest class in length by the structural design being optimized.

HG-JR Series

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

HG-AK Series

The ultra-compact servo motor with the flange size of 25 mm × 25 mm is suitable for small machines and machine heads.

HG-RR Series

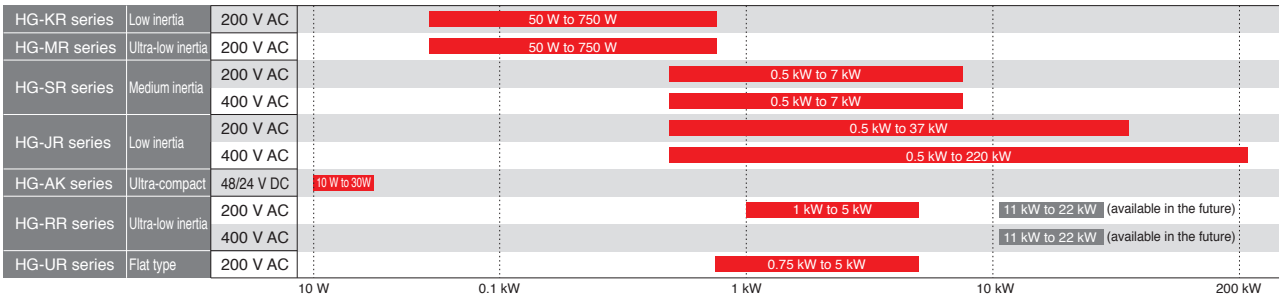
This medium capacity, ultra-low inertia servo motor is perfect for high-throughput operations.

HG-UR Series

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

Product Lines

A wide range of series and capacities is available.

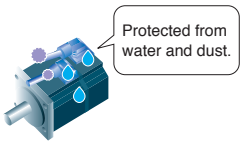


Equipped with High-Resolution Absolute Position Encoder

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.
* 262,144 pulses/rev (18-bit) for HG-AK series.

Improved Environmental Resistance

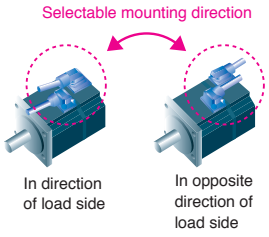
Ingress protection*2 of servo motors:
HG-KR/HG-MR/HG-RR/HG-UR: IP65
HG-SR/HG-JR: IP67*1
HG-AK: IP55



*1. HG-JR 1000 r/min series 15 kW or larger, HG-JR 1500 r/min series 22 kW or larger, and HG-JR 2000 r/min series are rated IP44.
*2. The shaft-through portion is excluded.

Cable Leading Direction

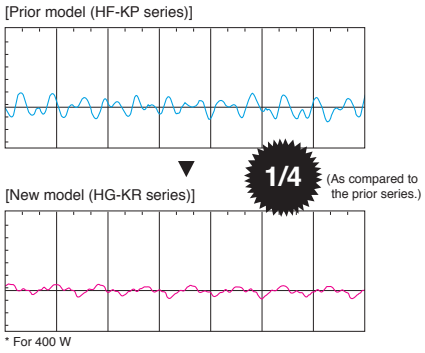
Cables for power, encoder, and electromagnetic brake are capable of being connected either in direction or in opposite direction of the load side, depending on the cable selection. (HG-KR and HG-MR series)



Reduced Torque Ripple during Conduction

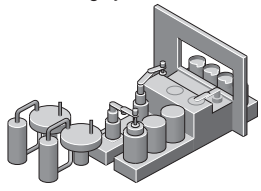
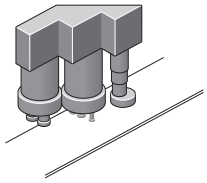
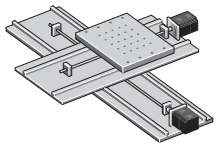
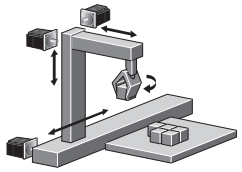
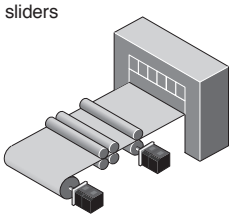
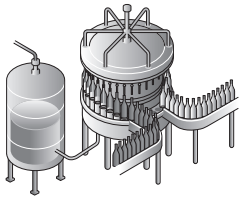
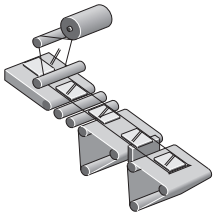
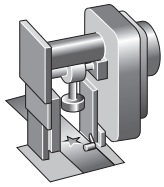
The torque ripple is reduced owing to the optimized combination of the numbers of the motor poles and the slots. Thereby, smooth rotation is achieved even during a low-speed operation which is more likely affected by the torque ripple, improving the operation stability.

■Torque ripple



Application Examples

For various applications of every kinds of machine.

Semiconductor/FPD/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

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 the increased winding density and the optimized core and magnet geometries as a result of 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 1 nm and up.
  * A/B/Z-phase differential output type linear encoder is compatible with MR-J4-GF-RJ/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 with CC-Link IE Field Network or SSCNET III/H compatible 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.

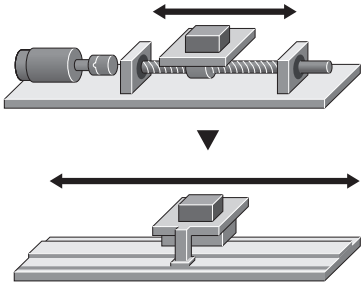
For easier use

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

For flexible machine configurations

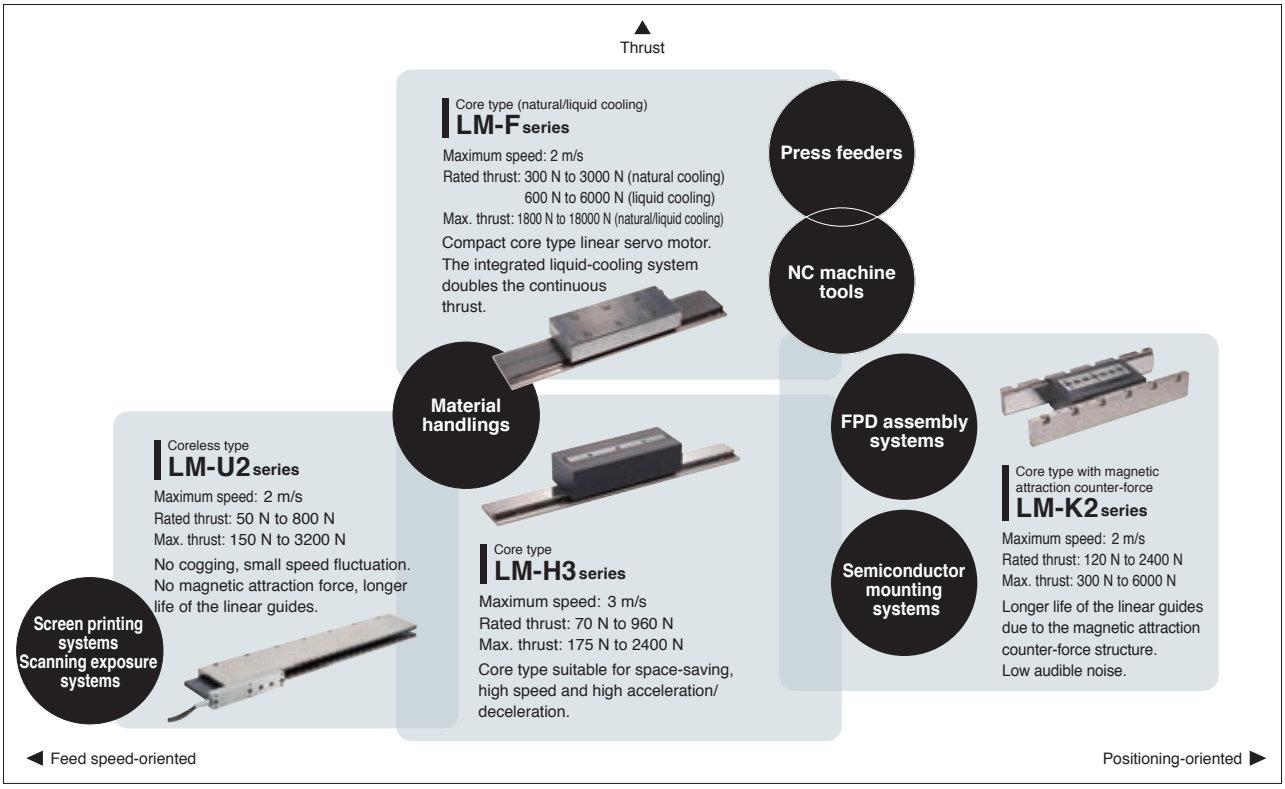
- Multi-head and tandem systems are easily configured.
- The linear servo motor is suitable for long-stroke applications.

[Offers more advantage than conventional ball screw driving systems]



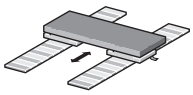
Product Lines

Four series are available depending on applications.



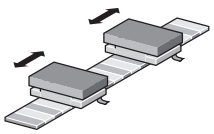
Application Examples

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



Tandem configuration

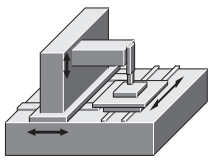
The linear servo motors configured in tandem are suitable for large systems that require highly accurate synchronous operation between two axes.



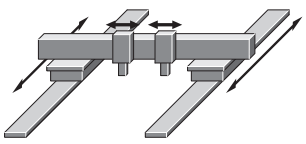
Multi-head configuration

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

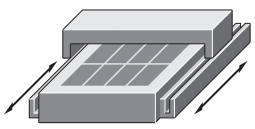
Machine tools XYZ stage



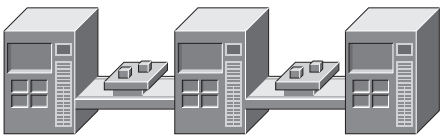
Semiconductor/FPD manufacturing systems
Electrical parts assembling/manufacturing systems



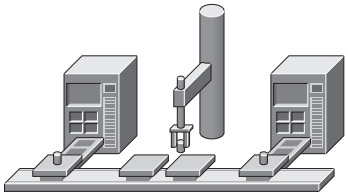
Screen printing systems and large FPD coaters



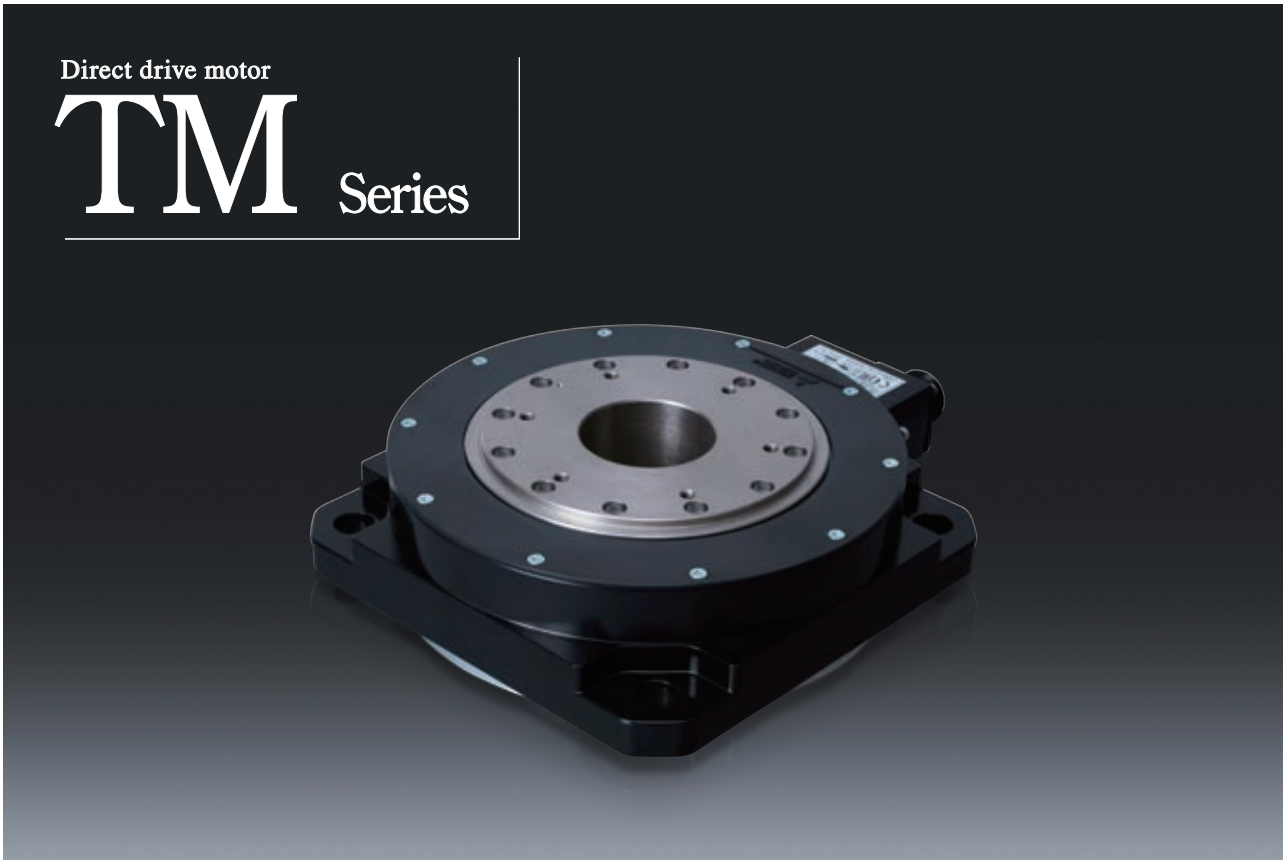
Material handling systems



Multi-head material handling between machines



Compact and robust direct drive motors for high-accuracy applications



Sophisticated Performance

High performance with the latest technologies

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

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.

High-resolution absolute position encoder

The direct drive motor is equipped with a high-resolution absolute position encoder (1,000,000 to 4,000,000 pulses/rev) as standard. High-accuracy machine is achieved.

Hollow shaft diameter range: ø20 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 coupled to a load.

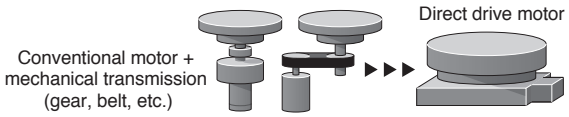
For easier use

- Since mechanical transmission 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

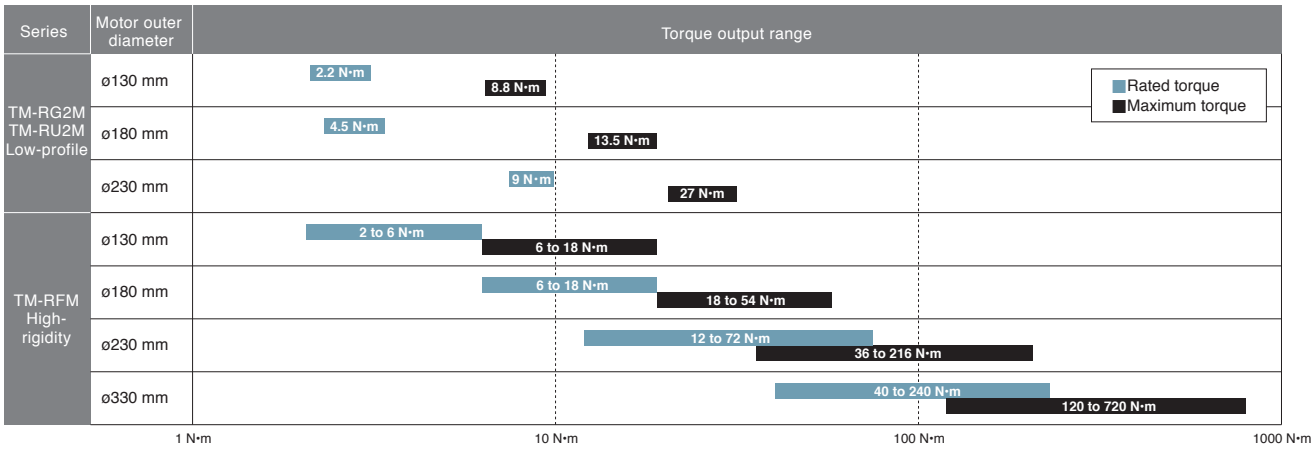
- Simple, compact, and high-rigid machine is achieved.
- Machine stability is enhanced due to the low-profile design and a low center of gravity.
- The motor has an inner rotor with hollow shaft that allows cables and pipes to pass through.

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



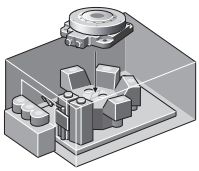
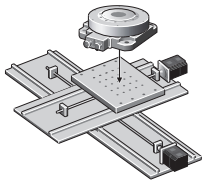
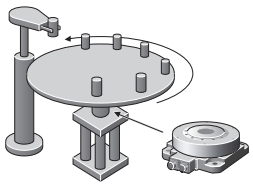
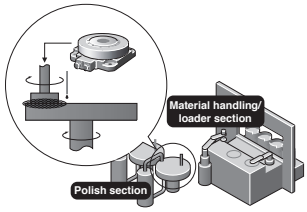
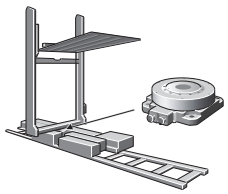
Product Lines

18 models with 4 different diameters are available.



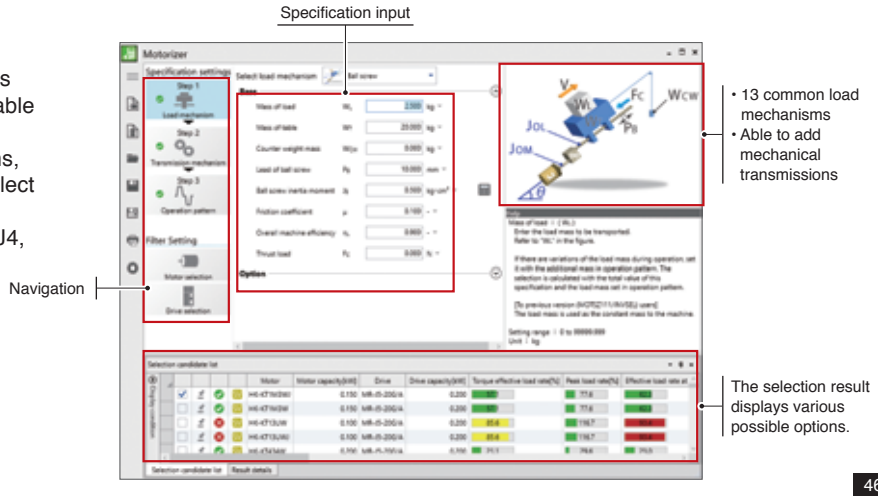
Application Examples

Suitable for low speed and high torque applications.

Coating and vapor deposition systems 	Spin-type cleaning systems for FPD/semiconductor	FPD/semiconductor testing systems (XYθ tables) 
Index table for machine tools 	Rotary axis for polishing systems 	Rotary axis for material handling robots 

MELSERVO-J4 | Drive System Sizing Software "Motorizer"

Select the most suitable servo motors, servo amplifiers, and regenerative options for your machine just by setting machine specifications and operation patterns. You can select a suitable combination from various results.
This software also supports multi-axis systems, enabling you to set operation patterns and select options for multiple axes.
This software supports MR-J5, MR-JET, MR-J4, MR-JE, and MR-JN series.



Simple Motion Module

CC-Link IE Field

CC-Link IE Field Network compatible Simple Motion module

RD77GF
QD77GF

SSCNET III/H

SSCNET III/H compatible Simple Motion module

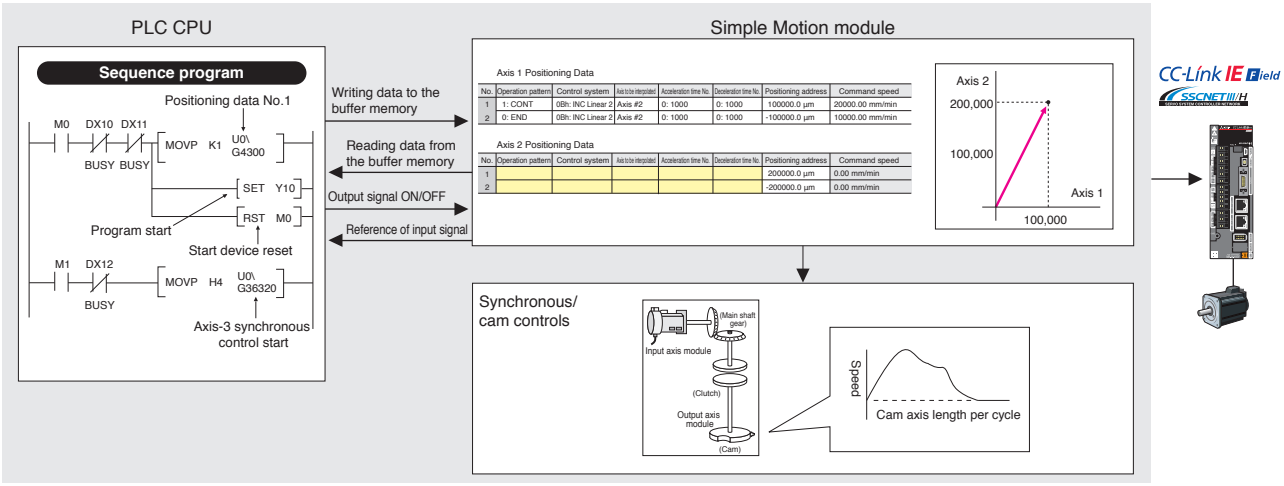
RD77MS
QD77MS
LD77MS
FX5-_SSC-S

Select from two types of network: Ethernet-based open network (CC-Link IE Field Network) or optical network (SSCNET III/H).

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 from sequence programs to the buffer memory.
- Positioning/synchronous/cam controls are performed with simple parameter setting and a start from a sequence program.



	RD77GFn	QD77GFn	RD77MSn	QD77MSn	LD77MSn	FX5-_SSC-S
Max. number of control axes	n = 4/8/16/32 axes	n = 4/8/16 axes	n = 2/4/8/16 axes	n = 2/4/16 axes		4/8
Operation cycle	0.5 ms or longer	1.0 ms or longer	0.444 ms or longer		0.888 ms or longer	1.777 ms
Programming language	—					
Control mode	Position control	Speed control	Torque control	Tightening & press-fit control*1	Advanced synchronous control	Cam control
Positioning control	Linear interpolation	Circular interpolation	Continuous trajectory control	Helical interpolation*2		Speed/position switching control (ABS)
		Speed/position switching control (INC)	Position/speed switching control			
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			

*1. Not supported by RD77GF/QD77GF.
*2. Not supported by QD77GF/QD77MS/LD77MS.

Motion Controller

SSCNET III/H compatible
Motion controller

R16MTCPU
R32MTCPU
R64MTCPU
Q172DSCPU
Q173DSCPU

- Multiple CPU system with PLC CPU

SSCNET III/H compatible
Stand-Alone Motion controller

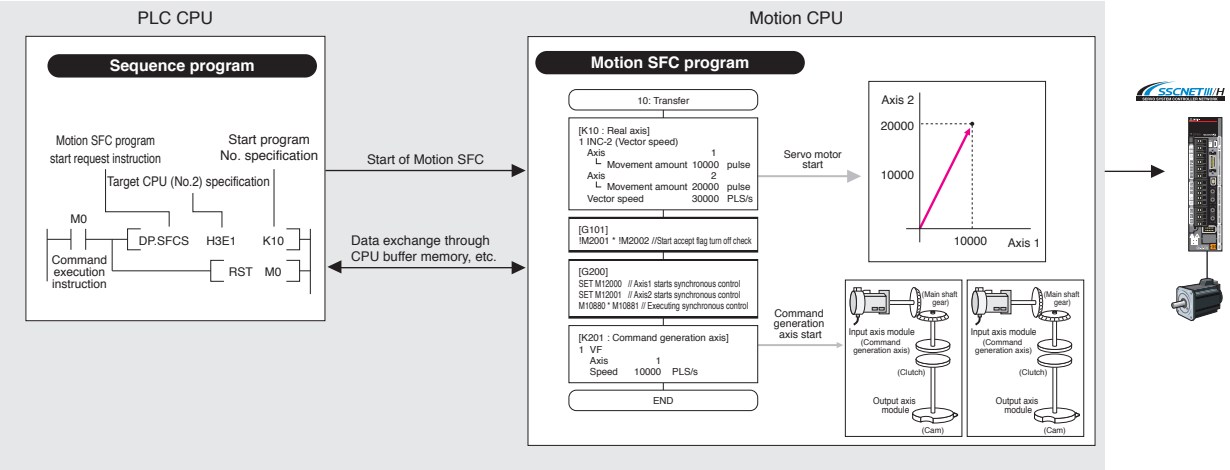
Q170MSCPU
Q170MSCPU-S1

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

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 tightening & press-fit, advanced synchronous, and cam controls can be performed in addition to basic controls including positioning, speed and torque controls.
- COGNEX vision system can be directly connected to the controller via Ethernet.



	R64MTCPU	R32MTCPU/Q173DSCPU	R16MTCPU/Q172DSCPU	Q170MSCPU-S1	Q170MSCPU
Max. number of control axes	64 axes	32 axes	16 axes		
Operation cycle	0.222 ms or longer			0.222 ms or longer / Equivalent to Q06UDH	0.222 ms or longer / Equivalent to Q03UD
Programming language	Motion SFC				
Control mode	Position control, Speed control, Torque control, Tightening & press-fit control, Advanced synchronous control, Cam control, Pressure control*1				
Positioning control	Linear interpolation, Circular interpolation, Continuous trajectory control, Helical interpolation, Position follow-up control, Speed control with fixed position stop, High-speed oscillation control, Speed/position switching control				
Sub function	Forced stop, Hardware stroke limit, Software stroke limit, Absolute position system, Amplifier-less operation, Unlimited length feed, Optional data monitor, Mark detection, ROM operation, M-code output, Error history, Digital oscilloscope, Vision system connection, Software security key, Cam auto-generation, High-speed reading, Limit switch output				

*1. Not supported by Q170MSCPU(-S1)

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

RD75P2, RD75D2
RD75P4, RD75D4

- Maximum number of control axes:
  2 axes (RD75P2/RD75D2) and 4 axes (RD75P4/RD75D4)
- 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

QD75P1N, QD75D1N
QD75P2N, QD75D2N
QD75P4N, QD75D4N

- Maximum number of control axes:
  1 axis (QD75P1N/QD75D1N), 2 axes (QD75P2N/QD75D2N), and 4 axes (QD75P4N/QD75D4N)
- 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

LD75P1, LD75D1
LD75P2, LD75D2
LD75P4, LD75D4

- Maximum number of control axes:
  1 axis (LD75P1/LD75D1), 2 axes (LD75P2/LD75D2), and 4 axes (LD75P4/LD75D4)
- 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

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

- Maximum number of control axes: 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 iQ-F series

FX_{5U} CPU module
FX_{5UC} CPU module

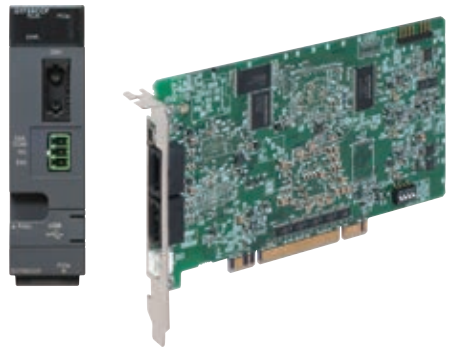
- Maximum number of control axes: 4 axes
- Equipped with positioning function with pulse output (200 kHz)

Pulse train compatible
MELSEC-F series

FX_{2N}-10PG

- Maximum number of control axes: 1 axis
- Pulse output block outputs high-speed pulses of 1 MHz maximum, enabling high-speed and high-accuracy positioning. (Differential line driver type)

C Controller/Personal Computer Embedded Type Servo System Controller



C Controller Interface Module

Q173SCCF

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

- ●High-speed access by PCI Express® and detection of interrupts.
- ●Event-driven programs, which use interrupts, can be created.

SSCNET III/H compatible Position Board

MR-MC210/211
MR-MC220U3/220U6
MR-MC240/241/341

CC-Link IE Field compatible Simple Motion Board

MR-EM340GF

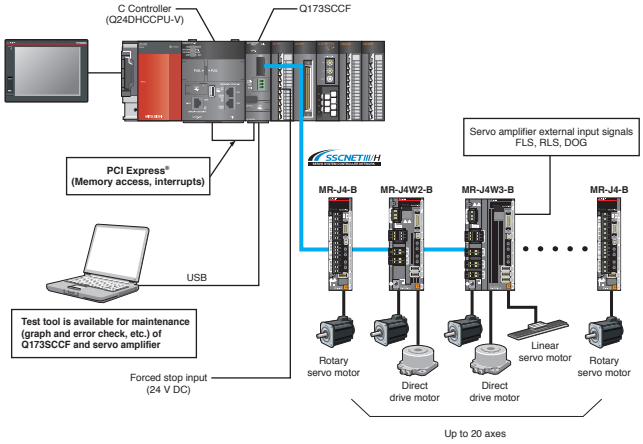
Connected to a personal computer, this board type controller is used for controlling MR-J4-B/MR-J4-GF.

- ●Event-driven programs, which use interrupts, can be created.
- ●Supporting the real-time OS.

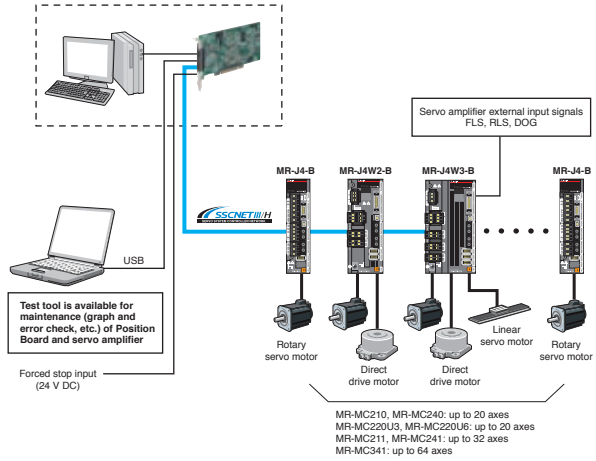
Features of C Controller/Personal Computer Embedded Type Servo System Controller

- ●Select a C Controller or a personal computer for the system.
- ●Programmable controllers are not required in the system
- ●Equipped with Point to Point positioning functionality as standard (set with Point table)
- ●High-speed processing (For SSCNET III/H: 1 cycle startup, 0.222 ms/8 axes)
- ●Various API functions and a test tool help users 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 Electric Servo System Controllers
MELSEC iQ-R series/
MELSEC iQ-F series catalog
L(NA)03100

Mitsubishi Electric Servo System Controllers catalog
L(NA)03062

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

MELSEC iQ-F Series
iQ Platform-compatible PLC catalog
L(NA)08428ENG

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

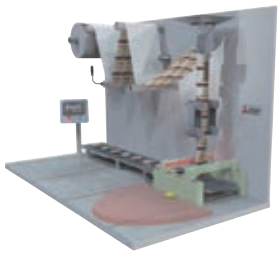
C Controller/Personal Computer Embedded Type Servo System Controller catalog
L(NA)03097

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

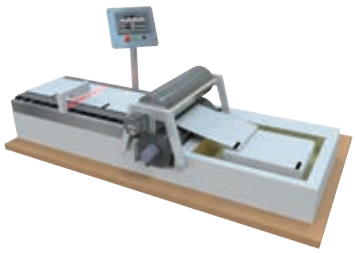


Solution 01 Stabilizing the packing quality
→ Synchronous Control

Solution 02 Shorter cycle time without increasing shock to a machine
→ Cam Control

Solution 03 Creating a safety system
→ Safety Sub-Function

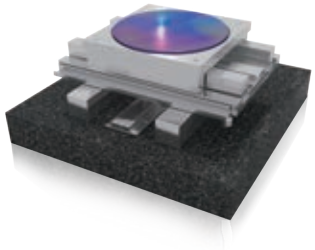
Rotary Knife For steel & paper cutting, stamping and labeling



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

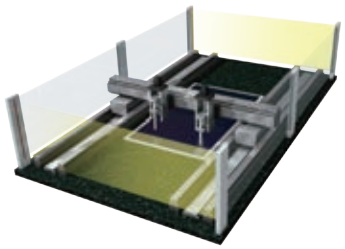


Solution 01 More accurate positioning
→ COGNEX Vision System

Solution 02 More precise drive operation
→ Direct Drive Motor

Solution 03 Shorter cycle time
→ Target Position Change Function

Gantry Application For material handling, automatic assembly and scanning

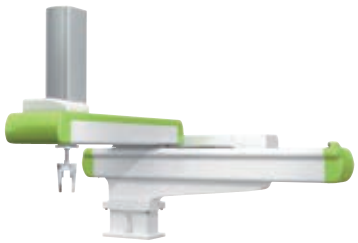


Solution 01 Suppression of the machine vibration
→ Vibration Suppression Functions

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



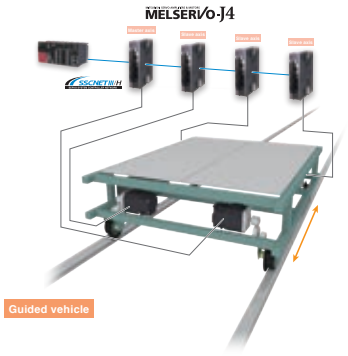
Solution 01 Suppression of the machine vibration
→ Advanced Vibration Suppression Control II

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

MELSERVO-J4 and our servo products come with a wide selection of functions to solve the challenges in production. Our newest functions are easier to use, and safer than ever before.

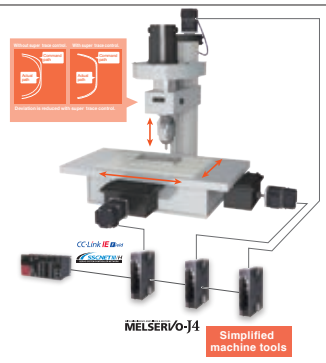
Master-Slave Operation Torque-coordination of multiple axes



1 Easy configuration of torque-assist system
2 Space utilization with distributed arrangement of slave axes

While the master axis is operated in position or speed control mode, the slave axes are operated in torque control mode with the same torque as the master axis.
Since multiple smaller-capacity servo motors are used for sharing load instead of a large-capacity servo motor, minimal space can be effectively used. The torque command is transmitted from the master axis to the slave axes via SSCNET III/H with a parameter setting, and no additional wiring is required for this function. Each SSCNET III/H line can have up to eight master axes.

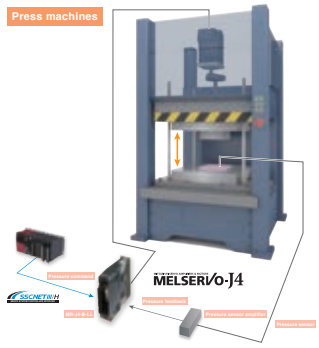
Super Trace Control Increasing path accuracy



1 Actual path exactly as commanded
2 Reduction of deviation errors on arc motion

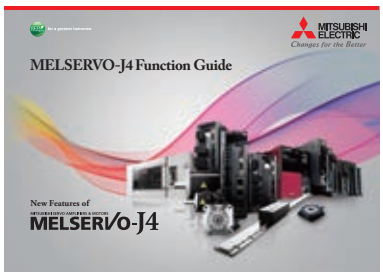
In normal control, a position deviation occurs in response to the position command from the controller, causing a deviation error between the machine axis' target path and the actual path. The super trace control function reduces this deviation error close to zero, enabling actual movement almost exactly as commanded, resulting in improved processing.

Pressure Control High-response pressure control



1 High-response pressure control
2 Smooth switching between pressure and position control
3 Easy adjustment

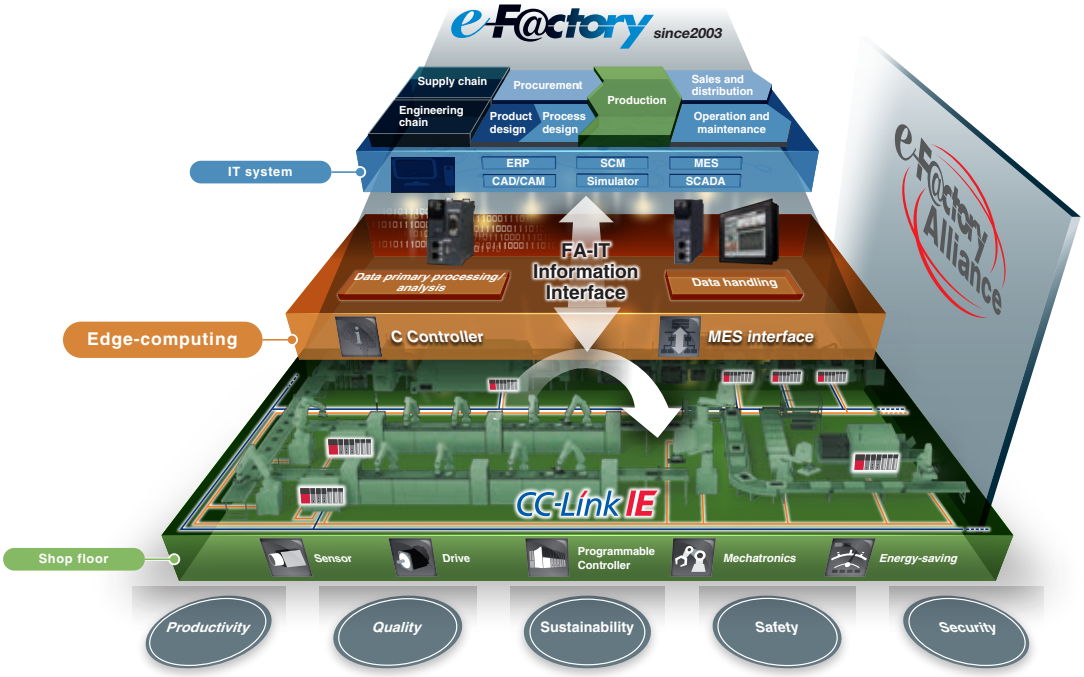
- Pressure sensor signals are inputted directly to the servo amplifier, enabling high-response feedback control.
- Pressure commands (applying/holding/releasing pressure) can be created easily on the profile setting window of the engineering software.



Refer to "MELSERVO-J4 Function Guide (L(NA)03152ENG)" for details.

e-F@ctory Solution

e-F@ctory is Mitsubishi Electric's integrated concept to build reliable and flexible manufacturing systems that enable users to achieve many of their high speed, information driven manufacturing aspirations. Through its partner solution activity, the e-F@ctory Alliance, and its work with open network associations such as The CC-Link Partners Association (CLPA), users can build comprehensive solutions based on a wide ranging "best in class" principle.



iQ Platform Solution

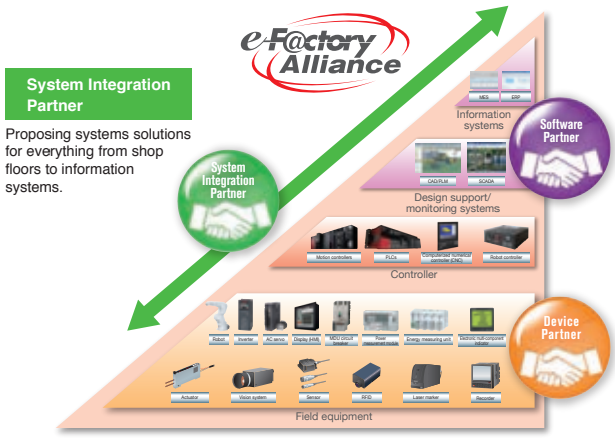
iQ platform minimizes TCO* by providing innovative solutions for:

- Building a stable production system with enhanced productivity
- Reducing the time from system development to startup for shorter product cycles
- Efficiently managing and servicing the system to reduce down time and maintain productivity
- Ensuring product quality by swiftly processing large volumes of control data and production data and establishing traceability

* TCO: Total Cost of Ownership

e-F@ctory Alliance

The e-F@ctory Alliance is a FA manufacturer partnering program that strongly links the connection compatibility of Mitsubishi Electric FA equipment utilizing excellent software and machinery offered by partners, thereby enabling systems to be built by systems integration partners and the proposal of optimal solutions to customers.



System Integration Partner

Proposing systems solutions for everything from shop floors to information systems.

Software Partner

Developing and proposing excellent application software and drivers that ensure the connection compatibility of Mitsubishi Electric FA equipment.

Device Partner

Proposing peripheral equipment that is easy to connect with Mitsubishi Electric FA equipment and is easier to use.

Mitsubishi Electric Servo System Partners

Servo system includes controllers, servo drivers, actuators, sensors, etc. The servo system takes a step further to accelerate the equipment revolution by collaborating with our partner companies. Now that a wide variety of partner products are available such as pressure-resistance, explosion-proof type motors, custom-made servo motors, magnetic type linear encoders, your system will be configured flexibly.
The Mitsubishi Electric Servo System Partner Association is a subcommittee of e-F@ctory Alliance.

Compliance with Global Standards and Regulations

MELSERVO-J4 series complies with global standards. For corresponding standards and models, contact your local sales office.

Servo amplifier

Europe	Low voltage directive	EN 61800-5-1 EN 60950-1 (MR-J4-03A6 and MR-J4W2-0303B6 also comply with this standard.)
	EMC directive	EN 61800-3 Category C3
	Machinery directive	EN ISO 13849-1:2015 Category 3 PL e / EN 62061 SIL CL 3 / EN 61800-5-2
	RoHS directive	EN IEC 63000
North America	UL standard	UL 508C
	CSA standard	CSA C22.2 No. 274
China	National Standard of the People's Republic of China (GB standards)	GB 12668.501, GB 12668.3
	Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products (China RoHS)	Compliant (Article 13 (Names and the content of hazardous substances are described in instruction Manuals.)) Compliant (Article 14 (Marking for the Restricted Use of Hazardous Substances is labeled.))
	China Compulsory Certification (CCC)	N/A
Korea	Korea Radio Wave Law (KC)	KN 61800-3
Russia, Belarus, Kazakhstan, Armenia, Kyrgyz	Certification system of the Eurasian Economic Union (EAC)	TR CU 004, TR CU 020

Rotary servo motor

Europe	Low voltage directive	EN 60034-1
	EMC directive	EN 61800-3 Category C3
	Machinery directive	-
	RoHS directive	EN IEC 63000
North America	UL standard	UL 1004-1 / UL 1004-6
	CSA standard	CSA C22.2 No.100
China	National Standard of the People's Republic of China (GB standards)	GB/T 755
	Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products (China RoHS)	Compliant (Article 13 (Names and the content of hazardous substances are described in instruction Manuals.)) Compliant (Article 14 (Marking for the Restricted Use of Hazardous Substances is labeled.))
	China Compulsory Certification (CCC)	N/A
Korea	Korea Radio Wave Law (KC)	N/A
Russia, Belarus, Kazakhstan, Armenia, Kyrgyz	Certification system of the Eurasian Economic Union (EAC)	TR CU 004, TR CU 020

Linear servo motor

European EC directive	Low voltage directive	DIN VDE 0580
	EMC directive	-
	Machinery directive	-
	RoHS directive	EN IEC 63000
North America	UL standard	UL 1004-6
	CSA standard	CSA C22.2 No.100
China	National Standard of the People's Republic of China (GB standards)	-
	Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products (China RoHS)	Compliant (Article 13 (Names and the content of hazardous substances are described in instruction Manuals.)) Compliant (Article 14 (Marking for the Restricted Use of Hazardous Substances is labeled.))
	China Compulsory Certification (CCC)	N/A
Korea	Korea Radio Wave Law (KC)	N/A
Russia, Belarus, Kazakhstan, Armenia, Kyrgyz	Certification system of the Eurasian Economic Union (EAC)	TR CU 004, TR CU 020

Direct drive motor

Europe	Low voltage directive	EN 60034-1
	EMC directive	EMC directive EN 61800-3 Category C3
	Machinery directive	-
	RoHS directive	EN IEC 63000
North America	UL standard	UL 1004-1 / UL 1004-6
	CSA standard	CSA C22.2 No.100
China	National Standard of the People's Republic of China (GB standards)	GB/T 755
	Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products (China RoHS)	Compliant (Article 13 (Names and the content of hazardous substances are described in instruction Manuals.)) Compliant (Article 14 (Marking for the Restricted Use of Hazardous Substances is labeled.))
	China Compulsory Certification (CCC)	N/A
Korea	Korea Radio Wave Law (KC)	N/A
Russia, Belarus, Kazakhstan, Armenia, Kyrgyz	Certification system of the Eurasian Economic Union (EAC)	TR CU 004, TR CU 020

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WB MR-J4W2-B/MR-J4W3-B **A** MR-J4-A/MR-J4-DU_A **A-RJ** MR-J4-A-RJ/MR-J4-DU_A-RJ

* Refer to p. 5-97 in this catalog for conversion of units.
* In this section, a term of servo amplifier includes a combination of the drive unit and the power regeneration converter unit or the resistance regeneration converter unit.

Model Designation for 1-Axis Servo Amplifier (Note 14)

GF | GF-RJ | B | B-RJ | A | A-RJ

M R - J 4 - 1 0 G F _ - _

Mitsubishi Electric general-purpose AC servo amplifier MELSERVO-J4 Series

Symbol	Interface
GF	CC-Link IE Field

Symbol	Power supply
None	3-phase 200 V AC or 1-phase 200 V AC (Note 2)
1	1-phase 100 V AC (Note 5)
4	3-phase 400 V AC (Note 3)

Symbol	Rated output [kW]	Symbol	Rated output [kW]
10	0.1	350	3.5
20	0.2	500	5
40	0.4	700	7
60	0.6	11K	11
70	0.75	15K	15
100	1	22K	22
200	2		

Symbol	Special specification (Note 8, 12)
None	Standard
RJ	Fully closed loop control four-wire type/ load-side encoder A/B/Z-phase input compatible/ Functional safety unit compatible (Note 13)/ DC power input type (Note 11)
ED	MR-J4-_GF_ without a dynamic brake (Note 1)
RU	MR-J4-_GF_-RJ without a dynamic brake (Note 1)
PX	MR-J4-_GF_ without an enclosed regenerative resistor (Note 4)
RZ	MR-J4-_GF_-RJ without an enclosed regenerative resistor (Note 4)
EB	MR-J4-_GF_ with a special coating specification (3C2) (Note 7)
KS	MR-J4-_GF_-RJ with a special coating specification (3C2) (Note 7)

M R - J 4 - 1 0 B _ - _

Mitsubishi Electric general-purpose AC servo amplifier MELSERVO-J4 Series

Symbol	Interface
B	SSCNET III/H
A	General-purpose

Symbol	Power supply
None	3-phase 200 V AC or 1-phase 200 V AC (Note 2)
1	1-phase 100 V AC (Note 5)
4	3-phase 400 V AC (Note 3)
6	48 V DC/24 V DC (Note 9)

Symbol	Rated output [kW]	Symbol	Rated output [kW]
03 (Note 9)	0.03	200	2
10	0.1	350	3.5
20	0.2	500	5
40	0.4	700	7
60	0.6	11K	11
70	0.75	15K	15
100	1	22K	22

Symbol	Special specification (Note 12)
None	Standard
RJ (Note 10)	Fully closed loop control four-wire type/ load-side encoder A/B/Z-phase input compatible/ Functional safety unit compatible/ Positioning mode compatible (Note 8)/ DC power input type (Note 11)
ED	MR-J4-_ without a dynamic brake (Note 1)
RU	MR-J4-_-RJ without a dynamic brake (Note 1)
PX	MR-J4-_ without an enclosed regenerative resistor (Note 4)
RZ	MR-J4-_-RJ without an enclosed regenerative resistor (Note 4)
EG	DC power input type
LL	Pressure control type (Note 6)
RN	MR-J4-_B_-LL without an enclosed regenerative resistor (Note 4)
EB	MR-J4-_ with a special coating specification (3C2) (Note 7)
KS	MR-J4-_-RJ with a special coating specification (3C2) (Note 7)

Notes: 1. Dynamic brake which is built in 7 kW or smaller servo amplifiers is removed. When the servo amplifiers without the dynamic brake are used, the servo motors coast to a stop and do not stop immediately at alarm occurrence or power failure. Take measures to ensure safety on the entire system. Refer to relevant Servo Amplifier Instruction Manual for details.
2. A power supply of 1-phase 200 V AC is supported by 0.1 kW to 2 kW servo amplifiers.
3. A power supply of 3-phase 400 V AC is supported by 0.6 kW and 1 kW or larger servo amplifiers.
4. Available in 11 kW to 22 kW servo amplifiers. A regenerative resistor (standard accessory) is not enclosed. Refer to relevant Servo Amplifier Instruction Manual for details.
5. A power supply of 1-phase 100 V AC is supported by 0.1 kW to 0.4 kW servo amplifiers.
6. MR-J4-_B_-LL is available. Refer to "MR-J4-_B_-LL MR-J4-DU_B_-LL Servo Amplifier Instruction Manual" for the pressure control compatible servo amplifiers.
7. The special coating (JIS C60721-3-3/IEC 60721-3-3 classification 3C2) is applied to the circuit board of the servo amplifier. Refer to relevant Servo Amplifier Instruction Manual for details.
8. Positioning mode is supported by MR-J4-GF(-RJ)/MR-J4-A-RJ servo amplifiers.
9. Supported by MR-J4-03A6(-RJ) servo amplifier.
10. Only positioning mode is supported by MR-J4-03A6-RJ. The fully closed loop control, load-side encoder A/B/Z-phase input, and the functional safety unit are not supported.
11. Only 200 V is available.
12. For the servo amplifier software version which supports each function, refer to the specification page of each unit.
13. When the servo amplifier is connected to CC-Link IE Field Network Basic, an MR-D30 functional safety unit is not supported.
14. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.

Model Designation for Multi-Axis Servo Amplifier (Note 14)

WB

MR-J4W2-22B__-__

Mitsubishi Electric general-purpose AC servo amplifier MELSERVO-J4 Series

Symbol	Number of axes
W2	2 axes
W3	3 axes (Note 11)

Symbol	Rated output [kW]		
	A-axis (Note 2)	B-axis (Note 2)	C-axis (Note 2)
0303 (Note 3)	0.03	0.03	-
22	0.2	0.2	-
44	0.4	0.4	-
77	0.75	0.75	-
1010	1	1	-
222	0.2	0.2	0.2
444	0.4	0.4	0.4

Symbol	Interface
B	SSCNET III/H

Symbol	Main circuit power supply
None	3-phase 200 V AC or 1-phase 200 V AC (Note 9)
6	48 V DC/24 V DC (Note 3)

Symbol	Special specification (Note 10)
None	Standard
ED	Without a dynamic brake (Note 1)
EG	DC power input type (Note 15)
EB	Special coating specification (3C2) (Note 4)

Model Designation for Drive Unit

B B-RJ B-RJ100 A A-RJ

MR-J4-DU900B__-__

Mitsubishi Electric general-purpose AC servo amplifier MELSERVO-J4 Series

Symbol	Rated output [kW]
900	9 (Note 6)
11K	11 (Note 6)
15K	15 (Note 6)
22K	22 (Note 6)
30K	30
37K	37
45K	45
55K	55

Symbol	Interface
B	SSCNET III/H
A	General-purpose

Symbol	Power supply
None	3-phase 200 V AC (Note 5)
4	3-phase 400 V AC

Symbol	Special specification (Note 10)
None	Standard
RJ	Fully closed loop control four-wire type/ load-side encoder A/B/Z-phase input compatible/ Positioning mode compatible (Note 7)/ Functional safety unit compatible
LL	Pressure control type (Note 8)
EB	MR-J4-DU_ with a special coating specification (3C2) (Note 4)
KS	MR-J4-DU_-RJ with a special coating specification (3C2) (Note 4)
RJ100	Parallel drive compatible (Note 12, 13)

A converter unit (MR-CV or MR-CR) is required for a drive unit.

Notes: 1. Dynamic brake which is built in servo amplifiers is removed. When the servo amplifiers without the dynamic brake are used, the servo motors coast to a stop and do not stop immediately at alarm occurrence or power failure. Take measures to ensure safety on the entire system. Refer to relevant Servo Amplifier Instruction Manual for details.
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. Supported by MR-J4W2-0303B6 servo amplifier.
4. The special coating (JIS C60721-3-3/IEC 60721-3-3 classification 3C2) is applied to the circuit board of the servo amplifier and the drive unit of 30 kW or larger. Refer to relevant Servo Amplifier Instruction Manual for details.
5. A power supply of 3-phase 200 V AC is supported by 37 kW or smaller drive units.
6. Available only with MR-J4-DU_B_(-RJ).
7. Positioning mode is supported by MR-J4-DU_A_-RJ drive unit.
8. MR-J4-DU_B_-LL is available in 30 kW or larger drive units. Refer to "MR-J4-_B_-LL MR-J4-DU_B_-LL Servo Amplifier Instruction Manual" for the pressure control compatible servo amplifiers.
9. A power supply of 1-phase 200 V AC is supported by 0.2 kW to 0.75 kW servo amplifiers.
10. For the servo amplifier/drive unit software version which supports each function, refer to the specification page of each unit.
11. Available only with 0.2 kW and 0.4 kW.
12. Available only with the drive unit of 3-phase 400 V AC and 45 kW or higher.
13. Refer to "Compatible Controllers" on p. 1-50 in this catalog for compatible controllers.
14. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.
15. Contact your local sales office for more details.

Model Designation for Power Regeneration Converter Unit (Note 1, 6)

B B-RJ B-RJ100

M R - C V 1 1 K _ _

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

Symbol	Capacity [kW]
11K	11
18K	18
30K	30
37K	37
45K	45
55K	55
75K	75 (Note 2)

Model Designation for Resistance Regeneration Converter Unit (Note 3, 5)

B B-RJ A A-RJ

M R - C R 5 5 K _ _ - _ _ _

Symbol	Special specification
None	Standard
EB	Special coating specification (3C2) (Note 4)

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

Symbol	Rated output [kW]
55K	55

Notes: 1. The power regeneration converter unit is supported by MR-J4-DU_B(4)(-RJ) and MR-J4-DU_B4-RJ100 drive units. It is not supported by MR-J4-DU_A(4)(-RJ) drive unit. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the combination with MR-J4-_B(4)(-RJ) servo amplifiers.
2. Available only with the power regeneration converter unit of 400 V.
3. One unit of resistance regeneration converter unit is required for each drive unit.
4. The special coating (JIS C60721-3-3/IEC 60721-3-3 classification 3C2) is applied to the circuit board of the resistance regeneration converter unit. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for details.
5. Use the resistance regeneration converter unit with MR-J4-DU_B(4)(-RJ) or MR-J4-DU_A(4)(-RJ) unit. The resistance regeneration converter unit is not compatible with MR-J4-DU_B4-RJ100 and 22 kW or smaller MR-J4-DU_B(4)(-RJ).
6. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.

Combinations of 1-Axis Servo Amplifier and Servo Motor

GF | GF-RJ | B | B-RJ | A | A-RJ

MR-J4-GF/MR-J4-GF-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) (Note 1)	Direct drive motor
MR-J4-10GF(-RJ) MR-J4-10B(-RJ) MR-J4-10A(-RJ)	HG-KR053(B), 13(B) HG-MR053(B), 13(B)	-	-
MR-J4-20GF(-RJ) MR-J4-20B(-RJ) MR-J4-20A(-RJ)	HG-KR23(B) HG-MR23(B)	LM-U2PAB-05M-0SS0 LM-U2PBB-07M-1SS0	TM-RG2M002C30 (Note 5) TM-RU2M002C30 (Note 5) TM-RG2M004E30 (Note 5) TM-RU2M004E30 (Note 5) TM-RFM002C20
MR-J4-40GF(-RJ) MR-J4-40B(-RJ) MR-J4-40A(-RJ)	HG-KR43(B) HG-MR43(B)	LM-H3P2A-07P-BSS0 LM-H3P3A-12P-CSS0 LM-K2P1A-01M-2SS1 LM-U2PAD-10M-0SS0 LM-U2PAF-15M-0SS0	TM-RG2M004E30 (Note 4, 5) TM-RU2M004E30 (Note 4, 5) TM-RG2M009G30 (Note 5) TM-RU2M009G30 (Note 5) TM-RFM004C20
MR-J4-60GF(-RJ) MR-J4-60B(-RJ) MR-J4-60A(-RJ)	HG-SR51(B), 52(B) HG-JR53(B)	LM-U2PBD-15M-1SS0	TM-RFM006C20 TM-RFM006E20
MR-J4-70GF(-RJ) MR-J4-70B(-RJ) MR-J4-70A(-RJ)	HG-KR73(B) HG-MR73(B) HG-JR73(B) HG-UR72(B)	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-J4-100GF(-RJ) MR-J4-100B(-RJ) MR-J4-100A(-RJ)	HG-SR81(B), 102(B) HG-JR53(B) (Note 2, 3), 103(B)	-	TM-RFM018E20
MR-J4-200GF(-RJ) MR-J4-200B(-RJ) MR-J4-200A(-RJ)	HG-SR121(B), 201(B), 152(B), 202(B) HG-JR73(B) (Note 2, 3), 103(B) (Note 2, 3), 153(B), 203(B) HG-RR103(B), 153(B) HG-UR152(B)	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-J4-350GF(-RJ) MR-J4-350B(-RJ) MR-J4-350A(-RJ)	HG-SR301(B), 352(B) HG-JR153(B) (Note 2), 203(B) (Note 2), 353(B) HG-RR203(B) HG-UR202(B)	LM-H3P7D-96P-ASS0 LM-K2P2C-07M-1SS1 LM-K2P3C-14M-1SS1 LM-U2P2C-60M-2SS0	TM-RFM048G20 TM-RFM072G20 TM-RFM120J10
MR-J4-500GF(-RJ) MR-J4-500B(-RJ) MR-J4-500A(-RJ)	HG-SR421(B), 502(B) HG-JR353(B) (Note 2), 503(B) HG-RR353(B), 503(B) HG-UR352(B), 502(B)	LM-FP2D-12M-1SS0 LM-FP4B-12M-1SS0 LM-K2P2E-12M-1SS1 LM-K2P3E-24M-1SS1 LM-U2P2D-80M-2SS0	TM-RFM240J10
MR-J4-700GF(-RJ) MR-J4-700B(-RJ) MR-J4-700A(-RJ)	HG-SR702(B) HG-JR503(B) (Note 2), 703(B), 601(B), 701M(B)	LM-FP2F-18M-1SS0 LM-FP4D-24M-1SS0	-
MR-J4-11KGF(-RJ) MR-J4-11KB(-RJ) MR-J4-11KA(-RJ)	HG-JR903(B), 801(B), 12K1(B), 11K1M(B)	LM-FP4F-36M-1SS0	-
MR-J4-15KGF(-RJ) MR-J4-15KB(-RJ) MR-J4-15KA(-RJ)	HG-JR15K1, 15K1M(B)	LM-FP4H-48M-1SS0	-
MR-J4-22KGF(-RJ) 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. This combination increases the maximum torque from 300% to 400% of the rated torque.
3. When a 1-phase 200 V AC input is used, increasing the maximum torque to 400% is not possible with HG-JR servo motor series.
4. This combination increases the rated and maximum torque.
5. TM-RG2M/TM-RU2M series is supported by the servo amplifiers with software version C8 or later.

Combinations of 1-Axis Servo Amplifier and Servo Motor

GF | GF-RJ | B | B-RJ | A | A-RJ

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) (Note 1)	Direct drive motor
MR-J4-DU900B(-RJ)	HG-SR702(B) (Note 3) HG-JR503(B) (Note 2), 703(B) (Note 3), 903(B), 601(B), 801(B), 701M(B) (Note 3)	LM-FP2F-18M-1SS0 LM-FP4D-24M-1SS0	-
MR-J4-DU11KB(-RJ)	HG-JR12K1(B), 11K1M(B)	LM-FP4F-36M-1SS0	-
MR-J4-DU15KB(-RJ)	HG-JR15K1, 15K1M(B)	LM-FP4H-48M-1SS0	-
MR-J4-DU22KB(-RJ)	HG-JR20K1, 25K1, 22K1M	-	-
MR-J4-DU30KB(-RJ) MR-J4-DU30KA(-RJ)	HG-JR30K1 HG-JR30K1M	-	-
MR-J4-DU37KB(-RJ) MR-J4-DU37KA(-RJ)	HG-JR37K1 HG-JR37K1M	-	-

MR-J4-GF1/MR-J4-GF1-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-J4-10GF1(-RJ) MR-J4-10B1(-RJ) MR-J4-10A1(-RJ)	HG-KR053(B), 13(B) HG-MR053(B), 13(B)	-	-
MR-J4-20GF1(-RJ) MR-J4-20B1(-RJ) MR-J4-20A1(-RJ)	HG-KR23(B) HG-MR23(B)	LM-U2PAB-05M-0SS0 LM-U2PBB-07M-1SS0	TM-RG2M002C30 (Note 5) TM-RU2M002C30 (Note 5) TM-RG2M004E30 (Note 5) TM-RU2M004E30 (Note 5) TM-RFM002C20
MR-J4-40GF1(-RJ) MR-J4-40B1(-RJ) MR-J4-40A1(-RJ)	HG-KR43(B) HG-MR43(B)	LM-H3P2A-07P-BSS0 LM-H3P3A-12P-CSS0 LM-K2P1A-01M-2SS1 LM-U2PAD-10M-0SS0 LM-U2PAF-15M-0SS0	TM-RG2M004E30 (Note 4, 5) TM-RU2M004E30 (Note 4, 5) TM-RG2M009G30 (Note 5) TM-RU2M009G30 (Note 5) TM-RFM004C20

MR-J4-GF4/MR-J4-GF4-RJ/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-J4-60GF4(-RJ) MR-J4-60B4(-RJ) MR-J4-60A4(-RJ)	HG-SR524(B) HG-JR534(B)	-	-
MR-J4-100GF4(-RJ) MR-J4-100B4(-RJ) MR-J4-100A4(-RJ)	HG-SR1024(B) HG-JR534(B) (Note 2), 734(B), 1034(B)	-	-
MR-J4-200GF4(-RJ) MR-J4-200B4(-RJ) MR-J4-200A4(-RJ)	HG-SR1524(B), 2024(B) HG-JR734(B) (Note 2), 1034(B) (Note 2), 1534(B), 2034(B)	-	-
MR-J4-350GF4(-RJ) MR-J4-350B4(-RJ) MR-J4-350A4(-RJ)	HG-SR3524(B) HG-JR1534(B) (Note 2), 2034(B) (Note 2), 3534(B)	-	-
MR-J4-500GF4(-RJ) MR-J4-500B4(-RJ) MR-J4-500A4(-RJ)	HG-SR5024(B) HG-JR3534(B) (Note 2), 5034(B)	-	-
MR-J4-700GF4(-RJ) MR-J4-700B4(-RJ) MR-J4-700A4(-RJ)	HG-SR7024(B) HG-JR5034(B) (Note 2), 7034(B), 6014(B), 701M4(B)	-	-
MR-J4-11KGF4(-RJ) MR-J4-11KB4(-RJ) MR-J4-11KA4(-RJ)	HG-JR9034(B), 8014(B), 12K14(B), 11K1M4(B)	-	-
MR-J4-15KGF4(-RJ) MR-J4-15KB4(-RJ) MR-J4-15KA4(-RJ)	HG-JR15K14, 15K1M4(B)	-	-
MR-J4-22KGF4(-RJ) MR-J4-22KB4(-RJ) MR-J4-22KA4(-RJ)	HG-JR20K14, 25K14, 22K1M4	LM-FP5H-60M-1SS0	-

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. This combination increases the maximum torque from 300% to 400% of the rated torque.
3. The maxim torque will be increased when the "Selection of maximally increasing torque function with drive unit" is enabled with a parameter.
4. This combination increases the rated and maximum torque.
5. TM-RG2M/TM-RU2M series is supported by the servo amplifiers with software version C8 or later.

Combinations of 1-Axis Servo Amplifier and Servo Motor

B B-RJ A A-RJ

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) (Note 1)	Direct drive motor
MR-J4-DU900B4(-RJ)	HG-SR7024(B) (Note 3) HG-JR5034(B) (Note 2), 7034(B) (Note 3), 9034(B), 6014(B), 8014(B), 701M4(B) (Note 3)	-	-
MR-J4-DU11KB4(-RJ)	HG-JR12K14(B), 11K1M4(B)	-	-
MR-J4-DU15KB4(-RJ)	HG-JR15K14, 15K1M4(B)	-	-
MR-J4-DU22KB4(-RJ)	HG-JR20K14, 25K14, 22K1M4	LM-FP5H-60M-1SS0	-
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	-	-

MR-J4-03A6 (48 V DC/24 V DC)

Servo amplifier	Rotary servo motor	Linear servo motor (primary side) (Note 1)	Direct drive motor
MR-J4-03A6(-RJ)	HG-AK0136(B), 0236(B), 0336(B)	-	-

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. This combination increases the maximum torque from 300% to 400% of the rated torque.
3. The maxim torque will be increased when the "Selection of maximally increasing torque function with drive unit" is enabled with a parameter.

Combinations of 1-Axis Servo Amplifier and Servo Motor with Functional Safety GF-RJ B-RJ B-RJ100 A-RJ

The safety sub-function can be expanded when the servo motor with functional safety, MR-J4-GF-RJ/MR-J4-B-RJ/MR-J4-A-RJ servo amplifiers, and MR-D30 functional safety unit are combined.

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

Servo amplifier	Servo motor with functional safety
MR-J4-10GF-RJ MR-J4-10B-RJ MR-J4-10A-RJ	HG-KR053(B)W0C, 13(B)W0C
MR-J4-20GF-RJ MR-J4-20B-RJ MR-J4-20A-RJ	HG-KR23(B)W0C
MR-J4-40GF-RJ MR-J4-40B-RJ MR-J4-40A-RJ	HG-KR43(B)W0C
MR-J4-60GF-RJ MR-J4-60B-RJ MR-J4-60A-RJ	HG-SR51(B)W0C, 52(B)W0C HG-JR53(B)W0C
MR-J4-70GF-RJ MR-J4-70B-RJ MR-J4-70A-RJ	HG-KR73(B)W0C HG-JR73(B)W0C
MR-J4-100GF-RJ MR-J4-100B-RJ MR-J4-100A-RJ	HG-SR81(B)W0C, 102(B)W0C HG-JR53(B)W0C (Note 1, 3), 103(B)W0C
MR-J4-200GF-RJ MR-J4-200B-RJ MR-J4-200A-RJ	HG-SR121(B)W0C, 201(B)W0C, 152(B)W0C, 202(B)W0C HG-JR73(B)W0C (Note 1, 3), 103(B)W0C (Note 1, 3), 153(B)W0C, 203(B)W0C
MR-J4-350GF-RJ MR-J4-350B-RJ MR-J4-350A-RJ	HG-SR301(B)W0C, 352(B)W0C HG-JR153(B)W0C (Note 1), 203(B)W0C (Note 1), 353(B)W0C
MR-J4-500GF-RJ MR-J4-500B-RJ MR-J4-500A-RJ	HG-SR421(B)W0C, 502(B)W0C HG-JR353(B)W0C (Note 1), 503(B)W0C
MR-J4-700GF-RJ MR-J4-700B-RJ MR-J4-700A-RJ	HG-SR702(B)W0C HG-JR503(B)W0C (Note 1), 703(B)W0C, 701M(B)W0C
MR-J4-11KGF-RJ MR-J4-11KB-RJ MR-J4-11KA-RJ	HG-JR903(B)W0C, 11K1M(B)W0C
MR-J4-15KGF-RJ MR-J4-15KB-RJ MR-J4-15KA-RJ	HG-JR15K1M(B)W0C
MR-J4-22KGF-RJ MR-J4-22KB-RJ MR-J4-22KA-RJ	HG-JR22K1MW0C

MR-J4-GF1-RJ/MR-J4-B1-RJ/MR-J4-A1-RJ (100 V)

Servo amplifier	Servo motor with functional safety
MR-J4-10GF1-RJ MR-J4-10B1-RJ MR-J4-10A1-RJ	HG-KR053(B)W0C, 13(B)W0C
MR-J4-20GF1-RJ MR-J4-20B1-RJ MR-J4-20A1-RJ	HG-KR23(B)W0C
MR-J4-40GF1-RJ MR-J4-40B1-RJ MR-J4-40A1-RJ	HG-KR43(B)W0C

MR-J4-GF4-RJ/MR-J4-B4-RJ/MR-J4-A4-RJ (400 V)

Servo amplifier	Servo motor with functional safety
MR-J4-60GF4-RJ MR-J4-60B4-RJ MR-J4-60A4-RJ	HG-SR524(B)W0C HG-JR534(B)W0C
MR-J4-100GF4-RJ MR-J4-100B4-RJ MR-J4-100A4-RJ	HG-SR1024(B)W0C HG-JR534(B)W0C (Note 1), 734(B)W0C, 1034(B)W0C
MR-J4-200GF4-RJ MR-J4-200B4-RJ MR-J4-200A4-RJ	HG-SR1524(B)W0C, 2024(B)W0C HG-JR734(B)W0C (Note 1), 1034(B)W0C (Note 1), 1534(B)W0C, 2034(B)W0C
MR-J4-350GF4-RJ MR-J4-350B4-RJ MR-J4-350A4-RJ	HG-SR3524(B)W0C HG-JR1534(B)W0C (Note 1), 2034(B)W0C (Note 1), 3534(B)W0C
MR-J4-500GF4-RJ MR-J4-500B4-RJ MR-J4-500A4-RJ	HG-SR5024(B)W0C HG-JR3534(B)W0C (Note 1), 5034(B)W0C
MR-J4-700GF4-RJ MR-J4-700B4-RJ MR-J4-700A4-RJ	HG-SR7024(B)W0C HG-JR5034(B)W0C (Note 1), 7034(B)W0C, 701M4(B)W0C
MR-J4-11KGF4-RJ MR-J4-11KB4-RJ MR-J4-11KA4-RJ	HG-JR9034(B)W0C, 11K1M4(B)W0C
MR-J4-15KGF4-RJ MR-J4-15KB4-RJ MR-J4-15KA4-RJ	HG-JR15K1M4(B)W0C
MR-J4-22KGF4-RJ MR-J4-22KB4-RJ MR-J4-22KA4-RJ	HG-JR22K1M4W0C

MR-J4-DU_B-RJ (200 V)

Drive unit	Servo motor with functional safety
MR-J4-DU900B-RJ	HG-SR702(B)W0C (Note 2) HG-JR503(B)W0C (Note 1), 703(B)W0C (Note 2), 903(B)W0C, 701M(B)W0C (Note 2)
MR-J4-DU11KB-RJ	HG-JR11K1M(B)W0C
MR-J4-DU15KB-RJ	HG-JR15K1M(B)W0C
MR-J4-DU22KB-RJ	HG-JR22K1MW0C

MR-J4-DU_B4-RJ (400 V)

Drive unit	Servo motor with functional safety
MR-J4-DU900B4-RJ	HG-SR7024(B)W0C (Note 2) HG-JR5034(B)W0C (Note 1), 7034(B)W0C (Note 2), 9034(B)W0C, 701M4(B)W0C (Note 2)
MR-J4-DU11KB4-RJ	HG-JR11K1M4(B)W0C
MR-J4-DU15KB4-RJ	HG-JR15K1M4(B)W0C
MR-J4-DU22KB4-RJ	HG-JR22K1M4W0C
MR-J4-DU55KB4-RJ100 x 2 (Note 4, 5)	HG-JR110K24W0C
MR-J4-DU45KB4-RJ100 x 4 (Note 4, 5)	HG-JR150K24W0C
MR-J4-DU45KB4-RJ100 x 4 (Note 4, 5)	HG-JR180K24W0C
MR-J4-DU55KB4-RJ100 x 4 (Note 4, 5)	HG-JR200K24W0C
MR-J4-DU55KB4-RJ100 x 4 (Note 4, 5)	HG-JR220K24W0C

Notes: 1. This combination increases the maximum torque from 300% to 400% of the rated torque.
2. The maxim torque will be increased when the "Selection of maximally increasing torque function with drive unit" is enabled with a parameter.
3. When a 1-phase 200 V AC input is used, increasing the maximum torque to 400% is not possible with HG-JR servo motor series.
4. The same number of power regeneration converter units as the drive units are required.
5. Refer to "Compatible Controllers" on p. 1-50 in this catalog for compatible controllers.

Combinations of Multi-Axis Servo Amplifier and Servo Motors

WB

MR-J4W2-B

Any combination of the rotary servo motors, the linear servo motors, and the direct drive 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(B), 13(B), 23(B) HG-MR053(B), 13(B), 23(B)	LM-U2PAB-05M-0SS0 LM-U2PBB-07M-1SS0	TM-RG2M002C30 (Note 4) TM-RU2M002C30 (Note 4) TM-RG2M004E30 (Note 4) TM-RU2M004E30 (Note 4) TM-RFM002C20
MR-J4W2-44B	HG-KR053(B), 13(B), 23(B), 43(B) HG-MR053(B), 13(B), 23(B), 43(B)	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-RG2M002C30 (Note 4) TM-RU2M002C30 (Note 4) TM-RG2M004E30 (Note 3, 4) TM-RU2M004E30 (Note 3, 4) TM-RG2M009G30 (Note 4) TM-RU2M009G30 (Note 4) TM-RFM002C20 TM-RFM004C20
MR-J4W2-77B	HG-KR43(B), 73(B) HG-MR43(B), 73(B) HG-SR51(B), 52(B) HG-JR53(B), 73(B) HG-UR72(B)	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(B), 73(B) HG-MR43(B), 73(B) HG-SR51(B), 81(B), 52(B), 102(B) HG-JR53(B) (Note 2), 73(B), 103(B) HG-UR72(B)	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-RFM018E20 TM-RFM040J10
MR-J4W2-0303B6	HG-AK0136(B), 0236(B), 0336(B)	-	-

MR-J4W3-B

Any combination of the rotary servo motors, the linear servo motors, and the direct drive 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(B), 13(B), 23(B) HG-MR053(B), 13(B), 23(B)	LM-U2PAB-05M-0SS0 LM-U2PBB-07M-1SS0	TM-RG2M002C30 (Note 4) TM-RU2M002C30 (Note 4) TM-RG2M004E30 (Note 4) TM-RU2M004E30 (Note 4) TM-RFM002C20
MR-J4W3-444B	HG-KR053(B), 13(B), 23(B), 43(B) HG-MR053(B), 13(B), 23(B), 43(B)	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-RG2M002C30 (Note 4) TM-RU2M002C30 (Note 4) TM-RG2M004E30 (Note 3, 4) TM-RU2M004E30 (Note 3, 4) TM-RG2M009G30 (Note 4) TM-RU2M009G30 (Note 4) 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. This combination increases the maximum torque from 300% to 400% of the rated torque.
4. This combination increases the rated and maximum torque.
5. TM-RG2M/TM-RU2M series is supported by the servo amplifiers with software version C8 or later.

Selection of Power Regeneration Converter Unit, MR-J4-DU_B_(-RJ) Drive Unit, and Servo Amplifier

B B-RJ

Select a power regeneration converter unit which meets the following conditions. When all the conditions are satisfied, multiple MR-J4-DU_B_(-RJ) drive units can be connected to one power regeneration converter unit. When connecting the multiple MR-J4-DU_B_(-RJ) drive units, install the drive units in descending order of capacity from the right side of the power regeneration converter unit. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for details of the selection.

(1) Maximum capacity [kW] of MR-J4-DU_B_(-RJ) connected to MR-CV_ ≤ Maximum capacity [kW] of MR-J4-DU_B_(-RJ) drivable with MR-CV_
(2) Effective value of total output power of servo motors ≤ Continuous rating [kW] of MR-CV_
(3) Maximum value [kW] of total output power of servo motors × 1.2 ≤ Instantaneous maximum rating [kW] of MR-CV_
(4) Total widths of MR-J4-DU_B_(-RJ) ≤ 800 mm

		MR-CV_ (200 V)						MR-CV_ (400 V)						
		11K	18K	30K	37K	45K	55K	11K4	18K4	30K4	37K4	45K4	55K4	75K4
Maximum capacity of MR-J4-DU_B_(-RJ) drivable with MR-CV_	[kW]	11	15	30	37	37	37	11	15	30	37	45	55	55
Continuous rating	[kW]	7.5	11	20	22	22	37	7.5	11	20	25	25	55	55
Instantaneous maximum rating	[kW]	39	60	92	101	125	175	39	60	92	101	125	175	180
Total widths of MR-J4-DU_B_(-RJ)		800 mm or shorter												

	MR-J4-DU_ (200 V)						MR-J4-DU_ (400 V)							
	900B	11KB	15KB	22KB	30KB	37KB	900B4	11KB4	15KB4	22KB4	30KB4	37KB4	45KB4	55KB4
Unit width [mm]	150		240		300		150		240				300	

When one unit of MR-J4-DU_B_(-RJ) is connected to one power regeneration converter unit, the drive unit is driven at the rated output with the following combinations.

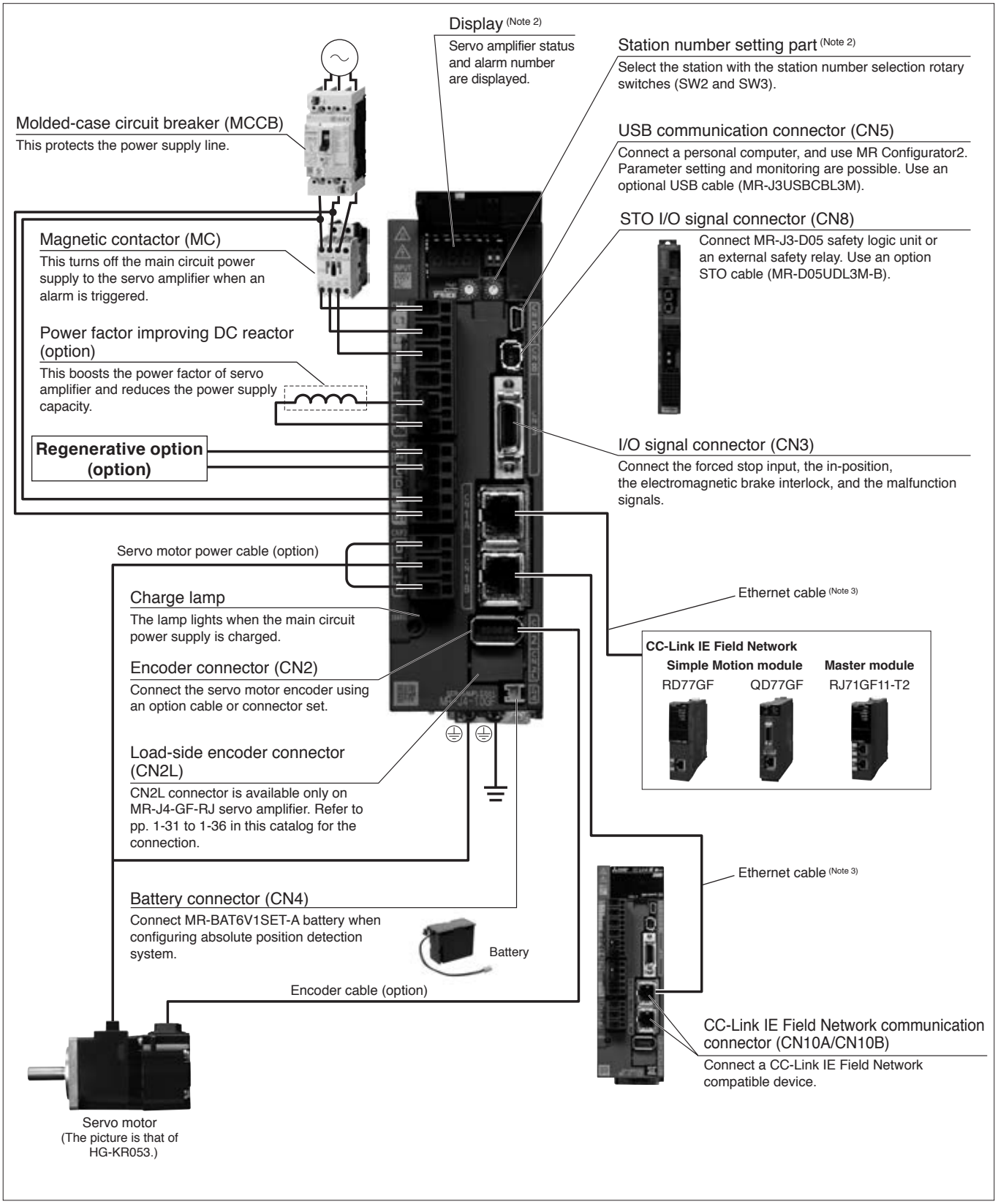
Power regeneration converter unit	Drive unit
MR-CV18K	MR-J4-DU900B(-RJ), MR-J4-DU11KB(-RJ)
MR-CV30K	MR-J4-DU15KB(-RJ)
MR-CV37K	MR-J4-DU22KB(-RJ)
MR-CV55K	MR-J4-DU30KB(-RJ), MR-J4-DU37KB(-RJ)
MR-CV18K4	MR-J4-DU900B4(-RJ), MR-J4-DU11KB4(-RJ)
MR-CV30K4	MR-J4-DU15KB4(-RJ)
MR-CV37K4	MR-J4-DU22KB4(-RJ)
MR-CV55K4	MR-J4-DU30KB4(-RJ), MR-J4-DU37KB4(-RJ), MR-J4-DU45KB4(-RJ), MR-J4-DU55KB4(-RJ)

Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the combinations of the power regeneration converter unit and MR-J4-_B_(-RJ) servo amplifier.

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

GF GF-RJ

Peripheral equipment is connected to MR-J4-GF/MR-J4-GF-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-J4-350GF/MR-J4-350GF-RJ or smaller servo amplifiers. Refer to "MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (Motion Mode)" for the actual connections.
2. This picture shows when the display cover is open.
3. For specifications of the Ethernet cable, refer to "Ethernet Cable Specifications" on p. 5-31 in this catalog.

MR-J4-GF(1)/MR-J4-GF(1)-RJ

GF GF-RJ

(CC-Link IE Field Network Interface (Note 20)) Specifications (200 V/100 V)

Servo amplifier model MR-J4-_(-RJ)			10GF	20GF	40GF	60GF	70GF	100GF	200GF	350GF	500GF	700GF	11KGF	15KGF	22KGF	10GF1	20GF1	40GF1
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)	AC input	3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz					3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz (Note 10)		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		
		DC input (Note 12)	283 V DC to 340 V DC													-		
	Rated current (Note 9)	[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	AC input	3-phase or 1-phase 170 V AC to 264 V AC					3-phase or 1-phase 170 V AC to 264 V AC (Note 10)		3-phase 170 V AC to 264 V AC						1-phase 85 V AC to 132 V AC		
		DC input (Note 12)	241 V DC to 374 V DC													-		
	Permissible frequency fluctuation		±5% maximum															
Control circuit power supply input	Voltage/frequency	AC input	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		
		DC input (Note 12)	283 V DC to 340 V DC													-		
	Rated current	[A]	0.2								0.3					0.4		
	Permissible voltage fluctuation	AC input	1-phase 170 V AC to 264 V AC													1-phase 85 V AC to 132 V AC		
		DC input (Note 12)	241 V DC to 374 V DC													-		
	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															
Permissible 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, 15, 16)	[W]	-	-	-	-	-	-	-	-	-	-	500 (800)	850 (1300)	850 (1300)	-	-	-
Dynamic brake (Note 4)			Built-in										External option (Note 17)			Built-in		
CC-Link IE Field communication cycle (Note 14)			0.5 ms, 1.0 ms, 2.0 ms, 4.0 ms															
Communication function	USB		Connect a personal computer (MR Configurator2 compatible)															
Encoder output pulse			Compatible (A/B/Z-phase pulse)															
Analog monitor			2 channels															
Positioning mode (Note 18)			Point table method, indexer method															
Fully closed loop control	MR-J4-GF(1)		Two-wire type communication method															
	MR-J4-GF(1)-RJ		Two-wire/four-wire type communication method															
Load-side encoder interface	MR-J4-GF(1)		Mitsubishi Electric high-speed serial communication															
	MR-J4-GF(1)-RJ		Mitsubishi Electric high-speed serial communication, A/B/Z-phase differential input signal															
Servo functions			Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, machine diagnosis function (including failure prediction (Note 19)), power monitoring function, scale measurement function, super trace control, lost motion compensation function															
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-GF(1)/MR-J4-GF(1)-RJ

GF GF-RJ

(CC-Link IE Field Network Interface (Note 20)) Specifications (200 V/100 V)

Servo amplifier model MR-J4-_(-RJ)		10GF	20GF	40GF	60GF	70GF	100GF	200GF	350GF	500GF	700GF	11KGF	15KGF	22KGF	10GF1	20GF1	40GF1
Functional safety		STO (IEC/EN 61800-5-2)															
Safety performance	Standards certified by CB (Note 13)	EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2															
	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)	MTTFd ≥ 100 [years] (314a)															
	Diagnostic coverage (DC)	DC = Medium, 97.6 [%]															
	Probability of dangerous Failure per Hour (PFH)	PFH = 6.4 × 10^{-9} [1/h]															
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 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	3-phase power input	Possible (Note 6)								Not possible					-		
	1-phase power input	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: 5 %RH to 90 %RH (non-condensing)															
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust															
	Altitude	2000 m or less above sea level (Note 11)															
	Vibration resistance	5.9 m/s² at 10 Hz to 55 Hz (directions of X, Y, and Z axes)															
Mass [kg]		1.0	1.0	1.0	1.0	1.4	1.4	2.1	2.3	4.0	6.2	13.4	13.4	18.2	1.0	1.0	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 is operated within the specified power supply voltage and frequency.
2. Select the most suitable regenerative option for your system with our drive system sizing software Motorizer.
3. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a regenerative option is used.
4. When using the dynamic brake, refer to "MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (Motion Mode)" 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 the servo amplifiers at 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. This value is applicable when a 3-phase power supply is used.
10. When a 1-phase 200 V AC to 240 V AC power supply is used, use the servo amplifiers at 75% or less of the effective load ratio.
11. Refer to "MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (Motion Mode)" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
12. DC power input is supported by MR-J4-_GF-RJ. For a connection example of power supply circuit with DC input, refer to "MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (Motion Mode)".
13. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (Motion Mode)" for details.
14. The command communication cycle depends on the controller specifications and the number of axes connected.
15. The value in brackets is applicable when cooling fans (two units of 92 mm × 92 mm, minimum air flow: 1.0 m^3/min) are installed, and then [Pr. PA02] is changed.
16. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "Model Designation for 1-Axis Servo Amplifier" in this catalog for details.
17. Use an external dynamic brake (option) 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.
18. Positioning mode is supported by MR-J4-_GF(-RJ) servo amplifiers with software version B3 or later.
19. The failure prediction function is supported by MR-J4-_GF(-RJ) servo amplifiers with software version A3 or later.
20. These models also support CC-Link IE Field Network Basic. To use this network, switch the network setting with the slide switches. Refer to "MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (CC-Link IE Field Network Basic)" for CC-Link IE Field Network Basic.

MR-J4-GF4/MR-J4-GF4-RJ

GF GF-RJ

(CC-Link IE Field Network Interface) Specifications (400 V)

Servo amplifier model MR-J4-_(-RJ)			60GF4	100GF4	200GF4	350GF4	500GF4	700GF4	11KGF4	15KGF4	22KGF4
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								
Permissible regenerative power	Built-in regenerative resistor (Note 2, 3)	[W]	15	15	100	100	130 (Note 7)	170 (Note 7)	-	-	-
	External regenerative resistor (standard accessory) (Note 2, 3, 12, 13)	[W]	-	-	-	-	-	-	500 (800)	850 (1300)	850 (1300)
Dynamic brake (Note 4)			Built-in						External option (Note 11)		
CC-Link IE Field communication cycle (Note 10)			0.5 ms, 1.0 ms, 2.0 ms, 4.0 ms								
Communication function	USB		Connect a personal computer (MR Configurator2 compatible)								
Encoder output pulse			Compatible (A/B/Z-phase pulse)								
Analog monitor			2 channels								
Positioning mode			Point table method, indexer method								
Fully closed loop control	MR-J4-GF4		Two-wire type communication method								
	MR-J4-GF4-RJ		Two-wire/four-wire type communication method								
Load-side encoder interface	MR-J4-GF4		Mitsubishi Electric high-speed serial communication								
	MR-J4-GF4-RJ		Mitsubishi Electric high-speed serial communication, A/B/Z-phase differential input signal								
Servo functions			Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, machine diagnosis function (including failure prediction (Note 15)), power monitoring function, scale measurement function, super trace control, lost motion compensation function								
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 (Note 9)		EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2								
	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)		MTTFd ≥ 100 [years] (314a)								
	Diagnostic coverage (DC)		DC = Medium, 97.6 [%]								
	Probability of dangerous Failure per Hour (PFH)		PFH = 6.4 × 10^{-9} [1/h]								
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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: 5 %RH to 90 %RH (non-condensing)								
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust								
	Altitude		2000 m or less above sea level (Note 8)								
	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-GF4/MR-J4-GF4-RJ

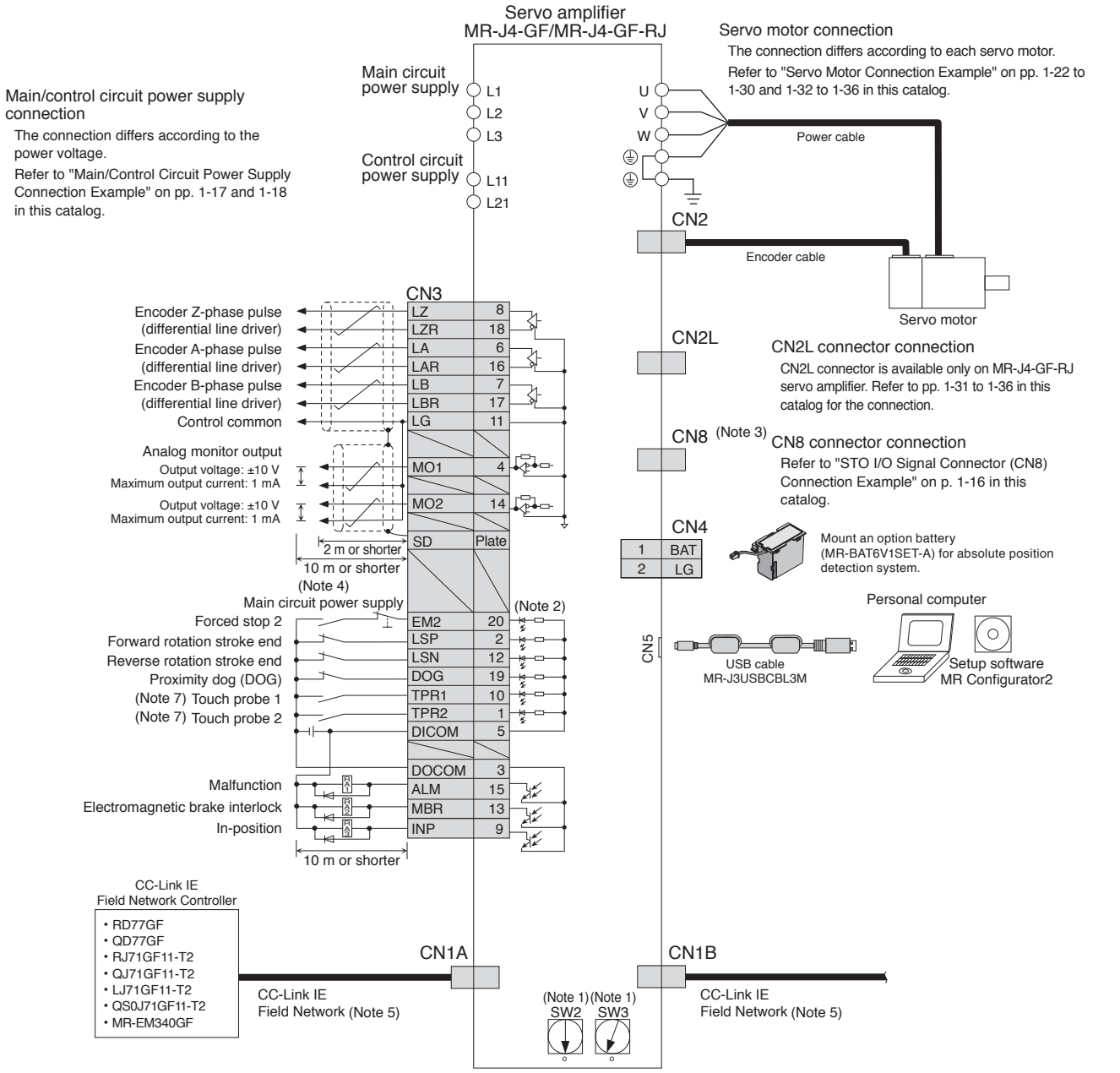
GF GF-RJ

(CC-Link IE Field Network Interface) Specifications (400 V)

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 is operated within the specified power supply voltage and frequency.
2. Select the most suitable regenerative option for your system with our drive system sizing software Motorizer.
3. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a regenerative option is used.
4. When using the dynamic brake, refer to "MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (Motion Mode)" 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 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.
8. Refer to "MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (Motion Mode)" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
9. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (Motion Mode)" for details.
10. The command communication cycle depends on the controller specifications and the number of axes connected.
11. Use an external dynamic brake (option) 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 in brackets is applicable when cooling fans (two units of 92 mm × 92 mm, minimum air flow: 1.0 m^3/min) are installed, and then [Pr. PA02] is changed.
13. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "Model Designation for 1-Axis Servo Amplifier" in this catalog for details.
14. Positioning mode is supported by MR-J4-_GF4(-RJ) servo amplifiers with software version B3 or later.
15. The failure prediction function is supported by MR-J4-_GF4(-RJ) servo amplifiers with software version A3 or later.

MR-J4-GF/MR-J4-GF-RJ Standard Wiring Diagram Example (Note 6)

GF GF-RJ



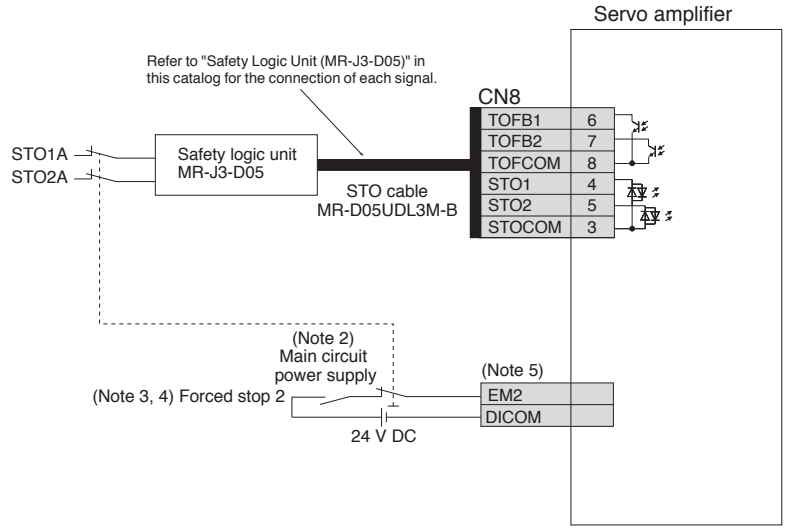
Notes: 1. Up to 120 stations are set with a combination of the station number selection rotary switches (SW2 and SW3). Note that the number of the connectable stations depends on the controller specifications.
2. This is for sink wiring. Source wiring is also possible.
3. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
4. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
5. When branching off CC-Link IE Field Network (synchronous communication function) with a switching hub, use NZ2MHG-T8F2 (Mitsubishi Electric Corporation) or DT135TX (Mitsubishi Electric System & Service Co., Ltd.).
6. This standard wiring diagram is common for 200 V AC and 400 V AC type servo amplifiers. The connection is the same for positioning mode.
7. TPR1 (touch probe 1) and TPR2 (touch probe 2) are available only with MR-J4-GF-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.

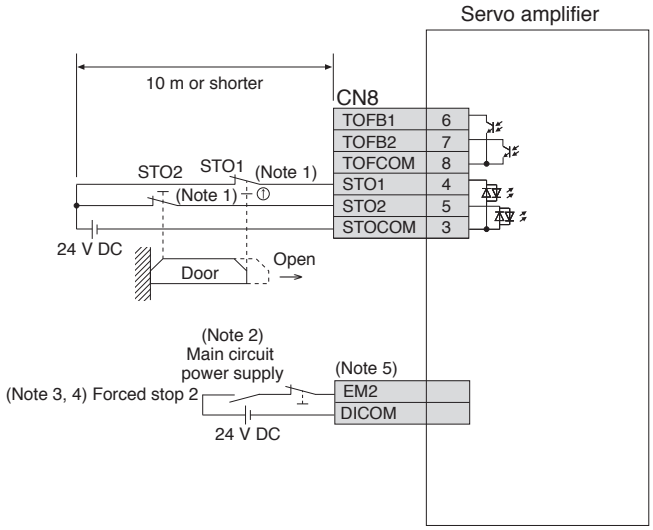
STO I/O Signal Connector (CN8) Connection Example

GF | GF-RJ | B | B-RJ | WB | A | A-RJ

●When used with MR-J3-D05



●When using a safety door



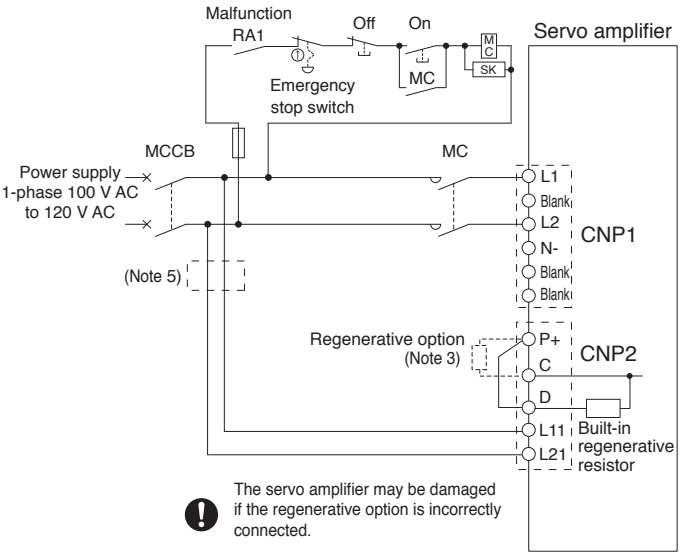
Notes: 1. When using the STO function, turn off STO1 and STO2 at the same time. Be sure to turn off STO1 and STO2 after the servo motor stops in servo-off state or after the servo motor is forcibly stopped with deceleration by turning off EM2 (Forced stop 2).
2. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
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.

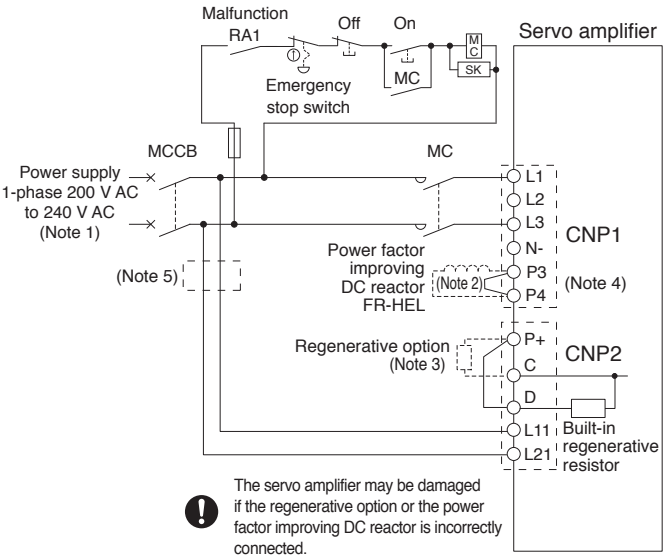
Main/Control Circuit Power Supply Connection Example (Note 7)

GF | GF-RJ | B | B-RJ | A | A-RJ

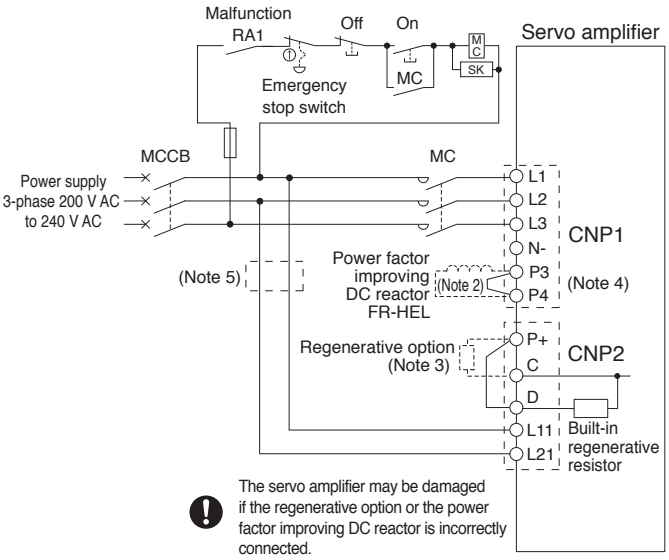
●For 1-phase 100 V AC



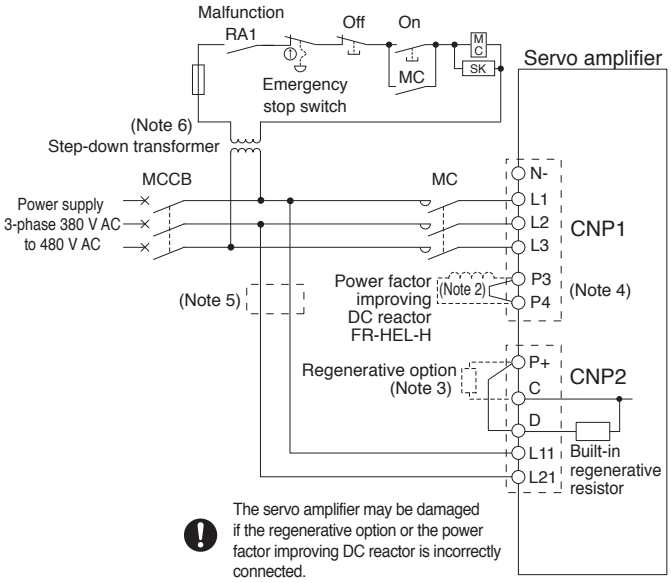
●For 1-phase 200 V AC



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



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



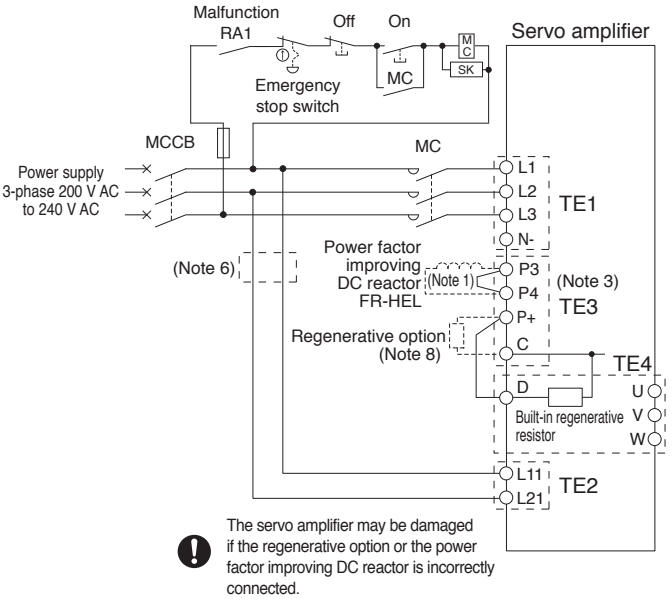
Notes: 1. For 1-phase 200 V AC to 240 V AC, connect the power supply to L1 and L3 terminals. Do not connect anything to L2. The connections are different from MR-J3 series servo amplifiers. Be careful not to make a connection error when replacing MR-J3 with MR-J4.
2. Disconnect a short-circuit bar between 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 or a fuse. Refer to relevant Servo Amplifier Instruction Manual for details.
6. A step-down transformer is required if coil voltage of the magnetic contactor is in 200 V class.
7. To turn on/off the main circuit power supply by a DC power supply, refer to relevant Servo Amplifier Instruction Manual for a connection example of the power supply circuit.

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)

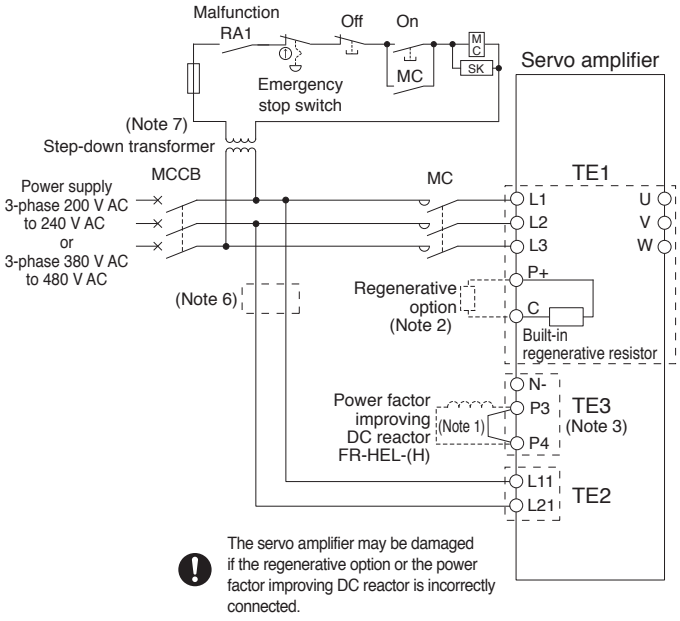
GF GF-RJ B B-RJ A A-RJ

●For 3-phase 200 V AC, 5 kW

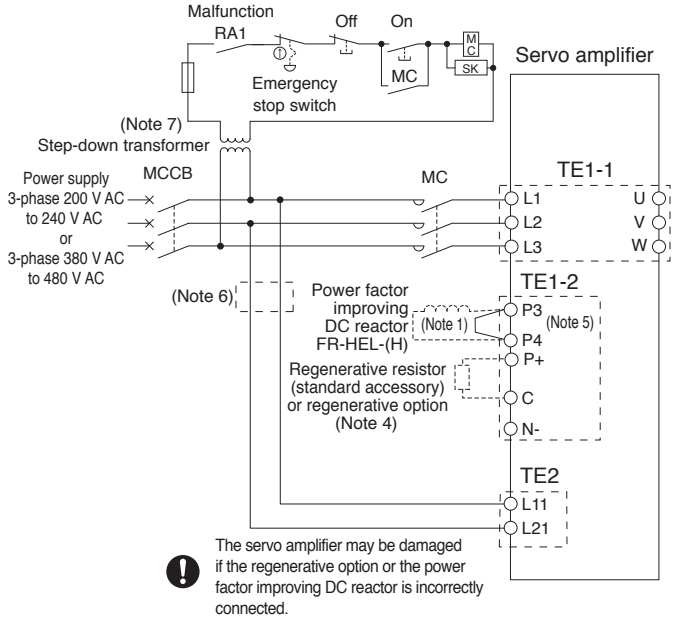


●For 3-phase 400 V AC, 5 kW

●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



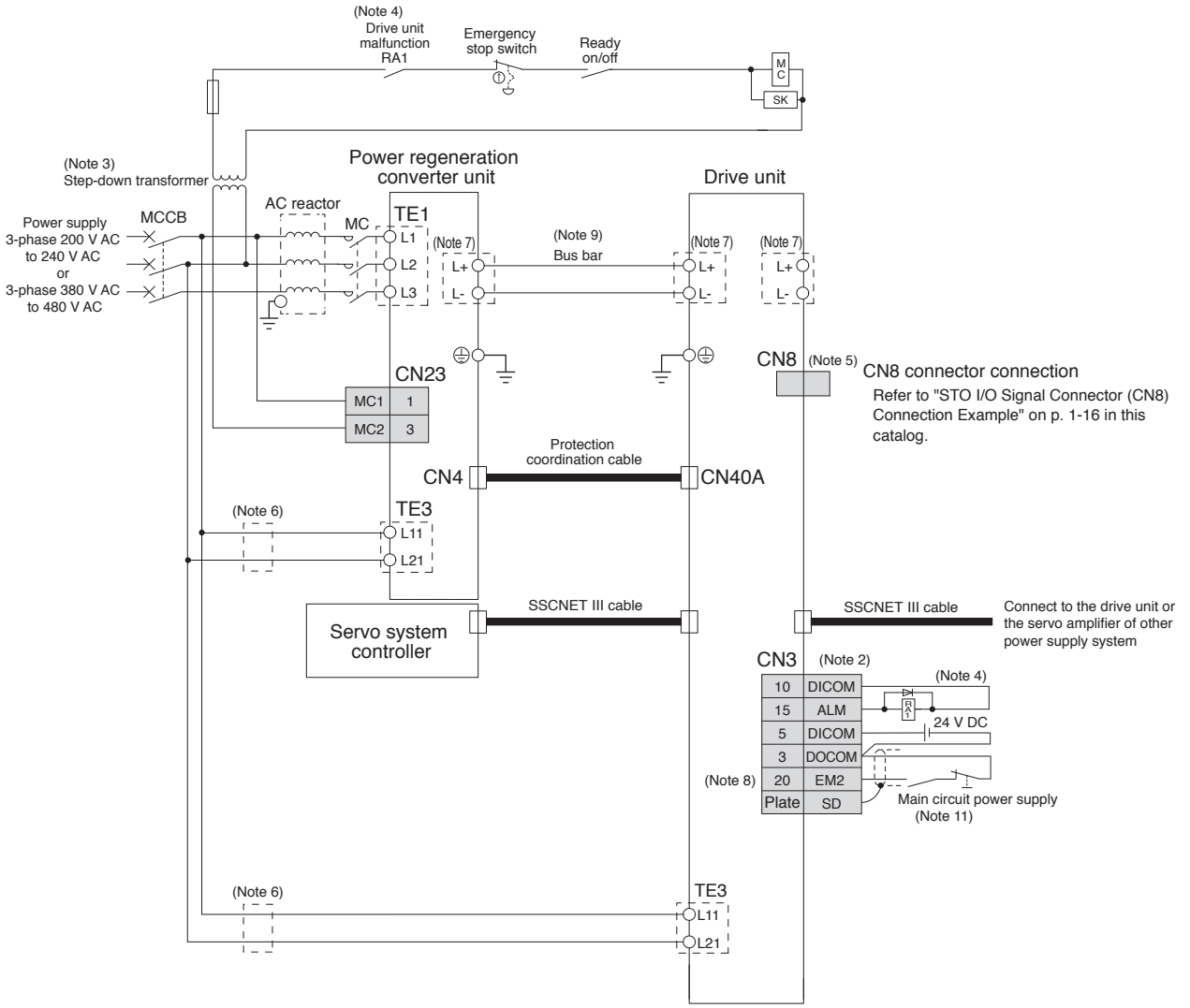
Notes: 1. Disconnect a short-circuit bar between P3 and P4 when using the power factor improving DC reactor.
2. Disconnect the wires for the built-in regenerative resistor (P+ and C) when connecting the regenerative option externally.
3. MR-J4 series servo amplifiers have P3 and P4 in the upstream of 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. MR-J4-11KGF_/B_/A_ 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 or a fuse. Refer to relevant Servo Amplifier Instruction Manual for details.
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 turn on/off the main circuit power supply by a DC power supply, refer to relevant Servo Amplifier Instruction Manual for a connection example of the power supply circuit.

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

B B-RJ

●For connecting MR-CV_ and MR-J4-DU_B(-RJ) (one-axis connection)



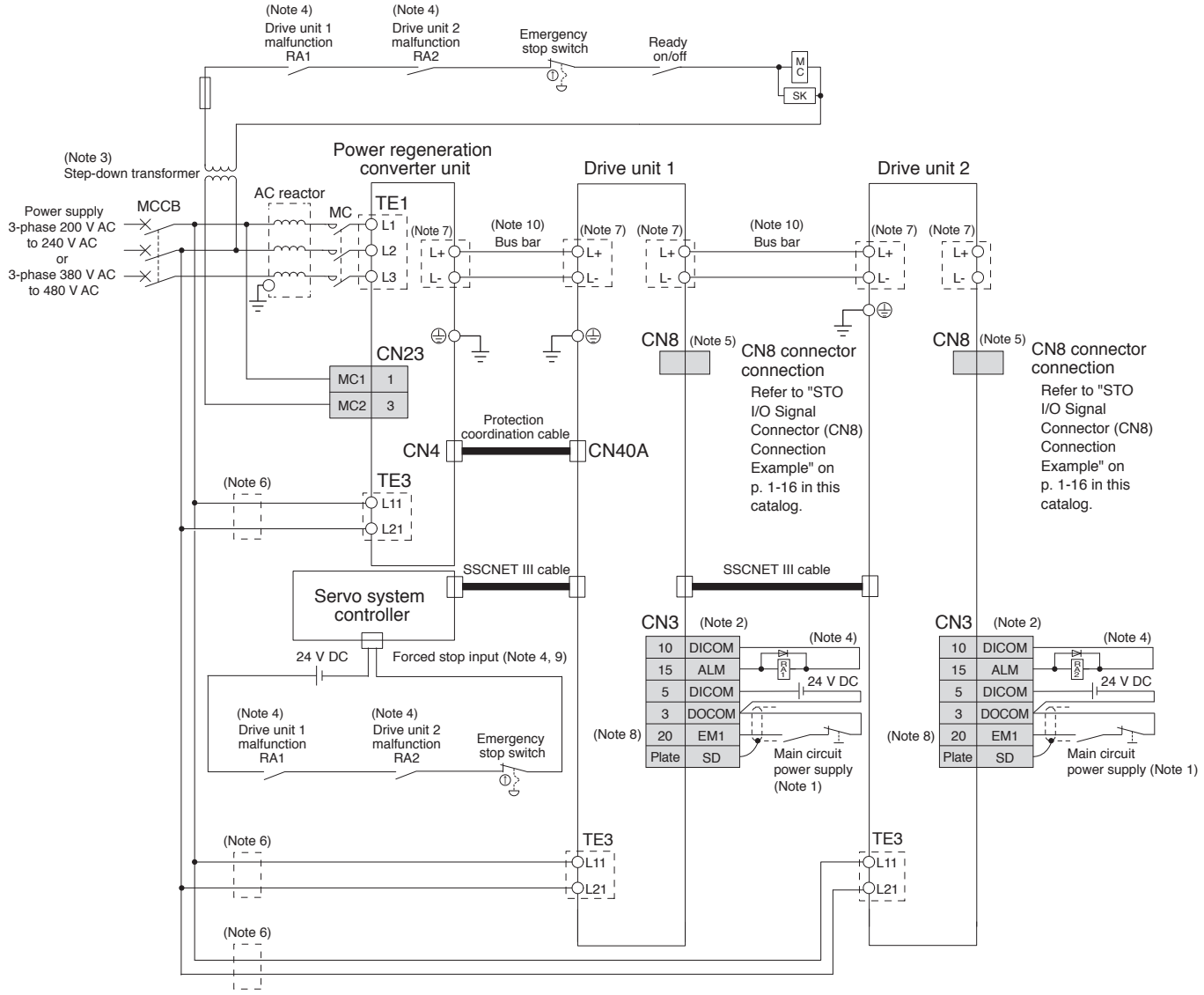
Notes: 1. To prevent an unexpected restart of the drive unit, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
2. This is for sink wiring. Source wiring is also possible.
3. A step-down transformer is required if the power regeneration converter unit is in 400 V class, and coil voltage of the magnetic contactor is in 200 V class.
4. Create a sequence that shuts off the main circuit power when an alarm occurs.
5. Be sure to attach a short-circuit connector supplied with the drive unit when the STO function is not used.
6. Install an overcurrent protection device (molded-case circuit breaker, fuse, etc.) to protect the branch circuit.
7. Terminal varies depending on the capacity of the power regeneration converter unit and the drive unit. Refer to "MR-CV_ Power Regeneration Converter Unit Dimensions" and "MR-J4-DU_B/MR-J4-DU_B-RJ Dimensions" in this catalog.
8. To stop the servo motor by forcibly decelerating with EM2, parameter setting is required. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for details.
9. The bus bar varies depending on the combination of the power regeneration converter unit and the drive unit. Refer to "Bus Bar" 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

B B-RJ

●For connecting MR-CV_ and MR-J4-DU_B(-RJ) (multi-axis connection)



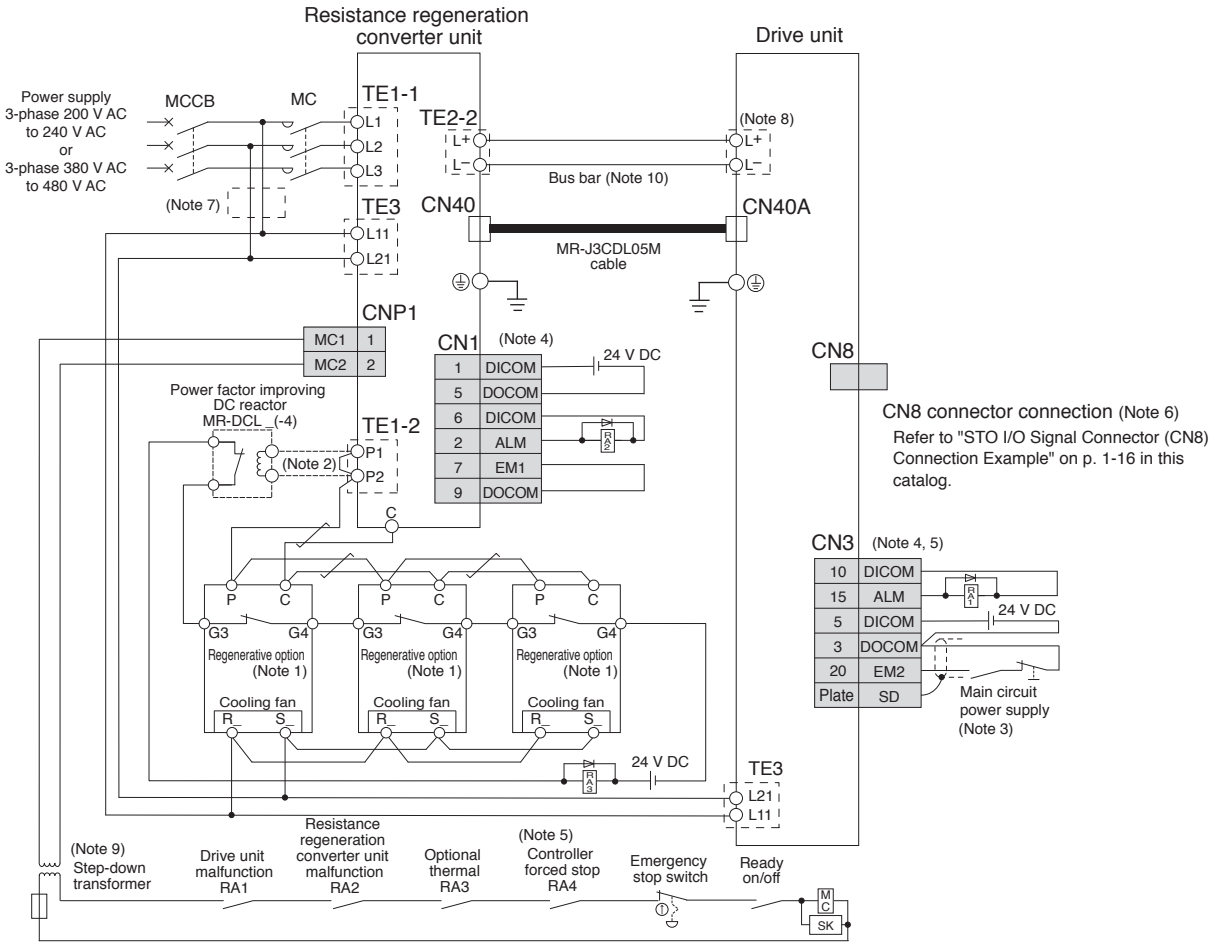
Notes: 1. To prevent an unexpected restart of the drive unit, create a circuit to turn off EM1 (Forced stop 1) when the main circuit power is turned off.
2. This is for sink wiring. Source wiring is also possible.
3. A step-down transformer is required if the power regeneration converter unit is in 400 V class, and coil voltage of the magnetic contactor is in 200 V class.
4. When connecting multiple drive units, create a sequence in which the servo system controller stops all axes and a sequence that shuts off the main circuit power if an alarm occurs on one axis.
5. Be sure to attach a short-circuit connector supplied with the drive unit when the STO function is not used.
6. Install an overcurrent protection device (molded-case circuit breaker, fuse, etc.) to protect the branch circuit.
7. Terminal varies depending on the capacity of the power regeneration converter unit and the drive unit. Refer to "MR-CV_ Power Regeneration Converter Unit Dimensions" and "MR-J4-DU_B/MR-J4-DU_B-RJ Dimensions" in this catalog.
8. To stop the servo motors of all axes forcibly with EM1, parameter setting is required. Refer to "MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for details.
9. Refer to the controller instruction manuals for the forced stop input of the servo system controller.
10. The bus bar varies depending on the combination of the power regeneration converter unit and the drive unit. Refer to "Bus Bar" 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 8)

B | B-RJ | A | A-RJ

●For connecting MR-CR_ and MR-J4-DU_B(-RJ)/MR-J4-DU_A(-RJ) (3-phase 200 V AC/400 V AC, 30 kW or larger)



Notes: 1. This connection is applicable when MR-RB137 (for 200 V) or MR-RB13V-4 (for 400 V) is used. Note that three units of MR-RB137 or MR-RB13V-4 are required for each resistance regeneration converter unit. (Permissible regenerative power: 3900 W)
2. Disconnect a short-circuit bar between P1 and P2 when using the power factor improving DC reactor.
3. To prevent an unexpected restart of the drive unit, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
4. This is for sink wiring. Source wiring is also possible.
5. This connection is applicable for MR-J4-DU_B(-RJ)/MR-J4-DU_B4(-RJ). For MR-J4-DU_A(-RJ)/MR-J4-DU_A4(-RJ), refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual."
6. Be sure to attach a short-circuit connector supplied with the drive unit when the STO function is not used.
7. Install an overcurrent protection device (molded-case circuit breaker, fuse, etc.) to protect the branch circuit.
8. Terminal varies depending on the drive unit capacities. Refer to the dimensions of the relevant drive unit in this catalog for details.
9. A step-down transformer is required if the resistance regeneration converter unit is in 400 V class, and coil voltage of the magnetic contactor is in 200 V class.
10. A bus bar is attached to 30 kW or larger drive units.

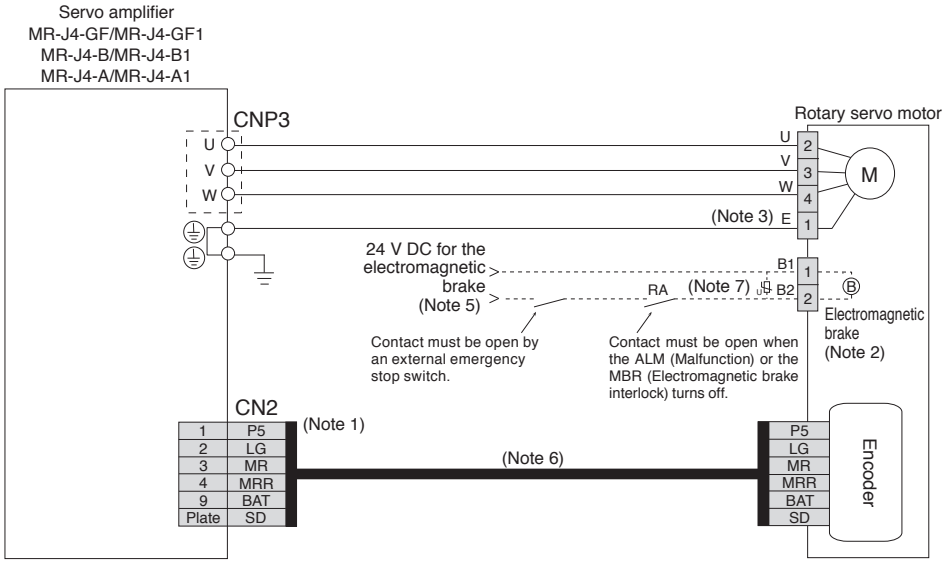
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

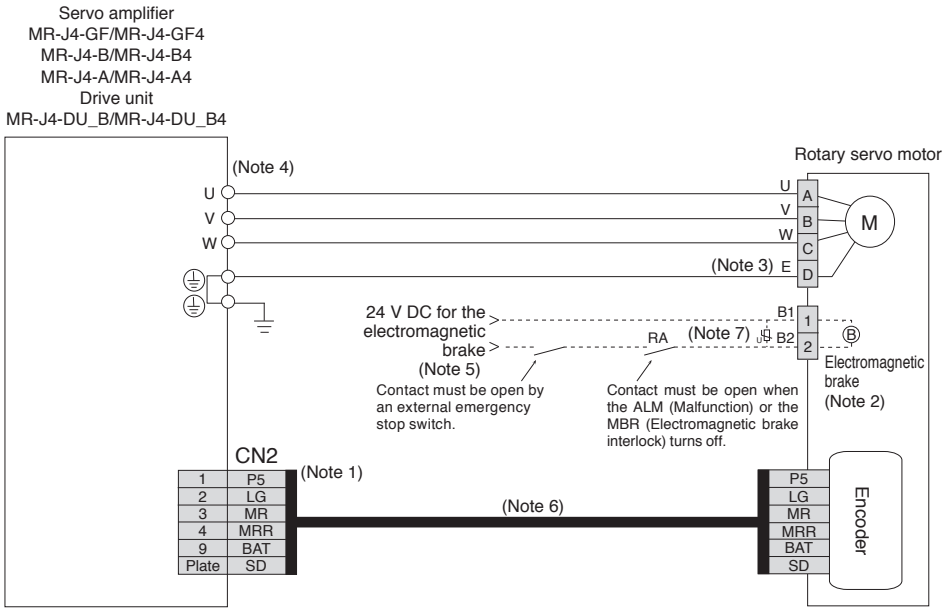
GF B A

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

●For HG-KR/HG-MR series



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



Notes: 1. The signals shown are 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 for grounding the servo motor.
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.
7. Be sure to install a surge absorber between B1 and B2.

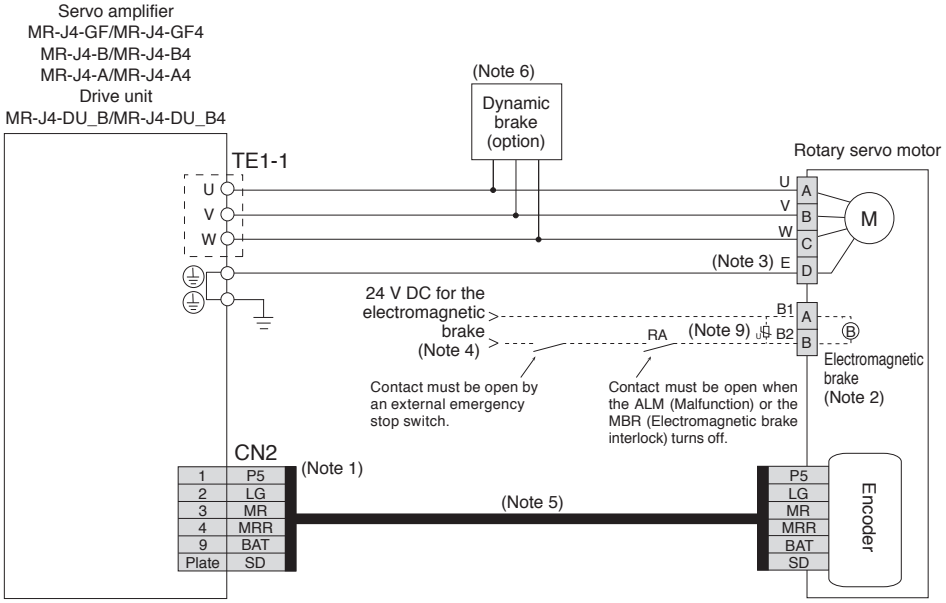
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

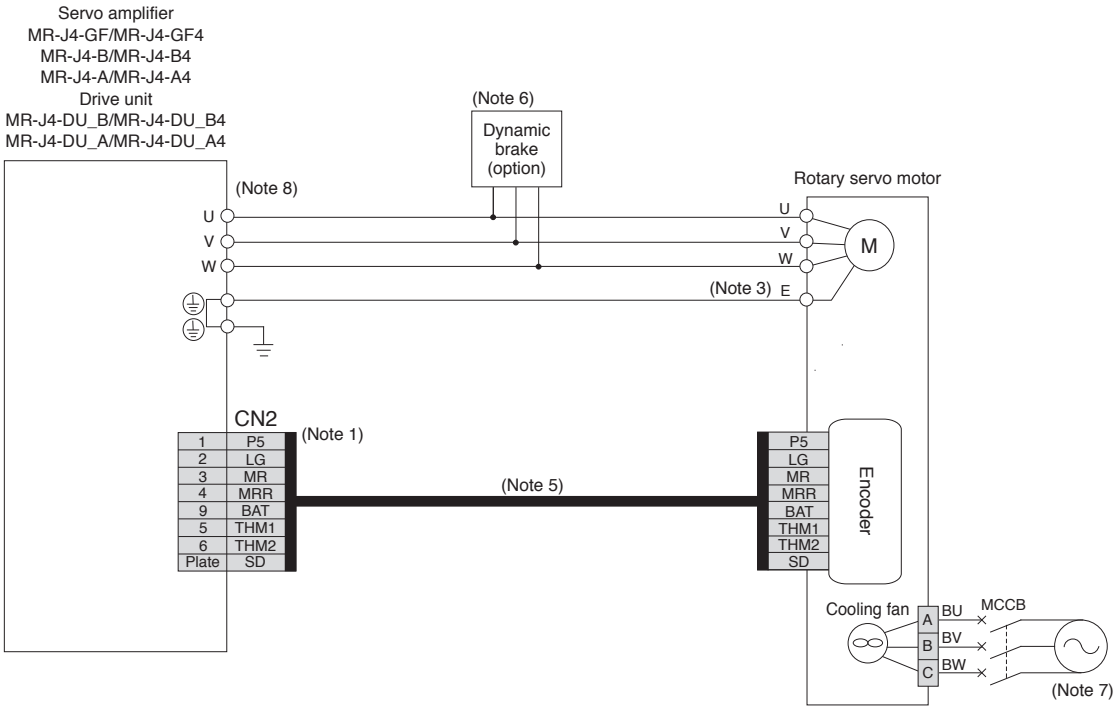
GF | B | A

Semi Closed Loop Control System with MR-J4-GF/MR-J4-B/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 1500 r/min series (22 kW or larger)



Notes: 1. The signals shown are 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 for grounding the servo motor.
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 external dynamic brake (option) 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.
9. Be sure to install a surge absorber between B1 and B2.

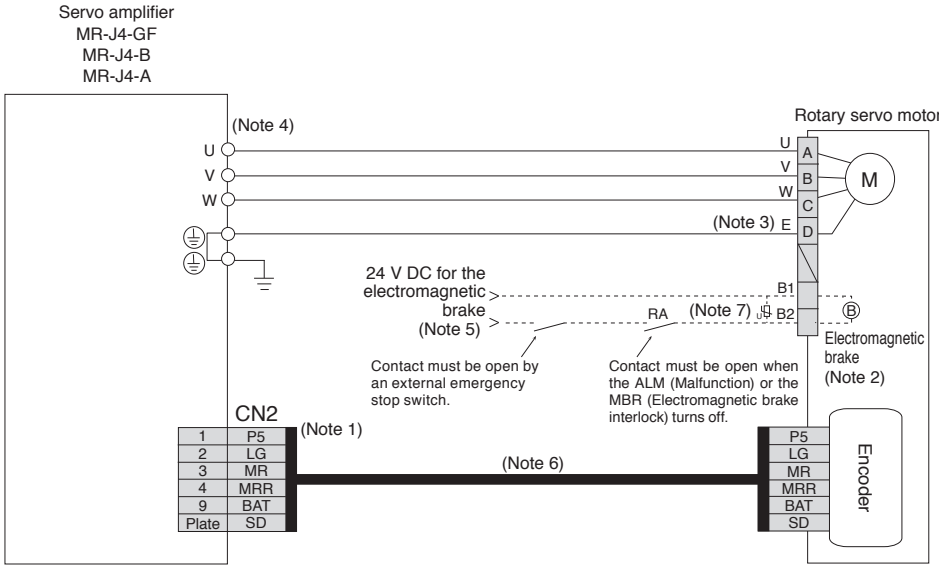
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

GF B A

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

●For HG-RR/HG-UR series



Notes: 1. The signals shown are 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. A separate connector from the motor power connector is provided 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 for grounding the servo motor.
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.
7. Be sure to install a surge absorber between B1 and B2.

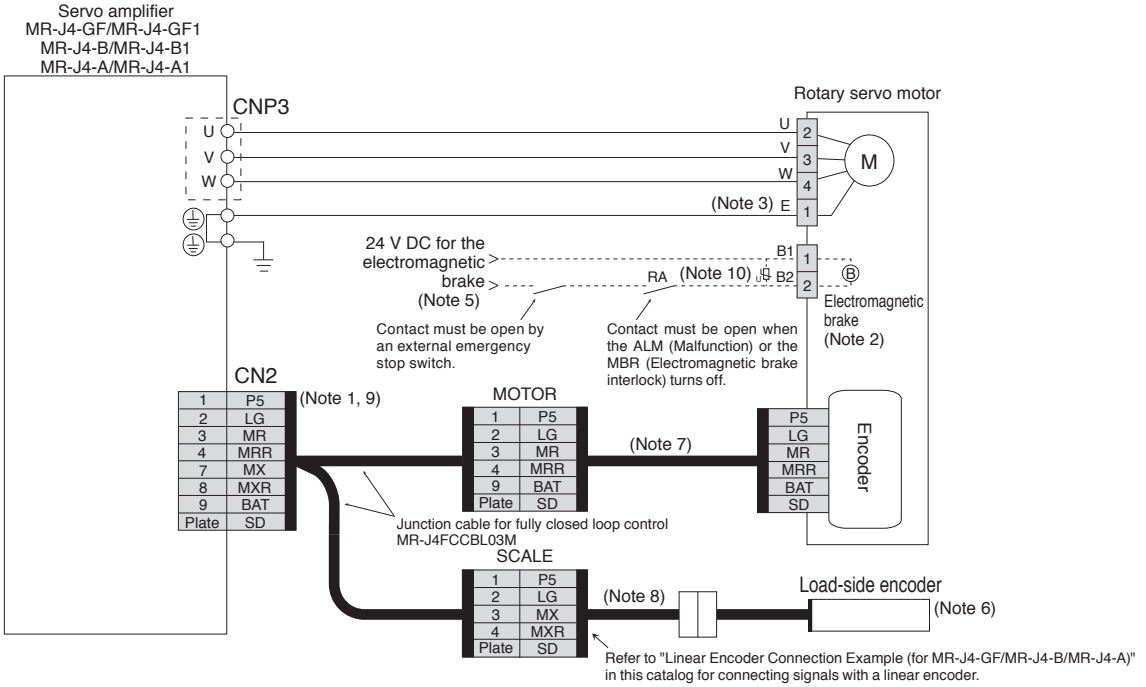
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

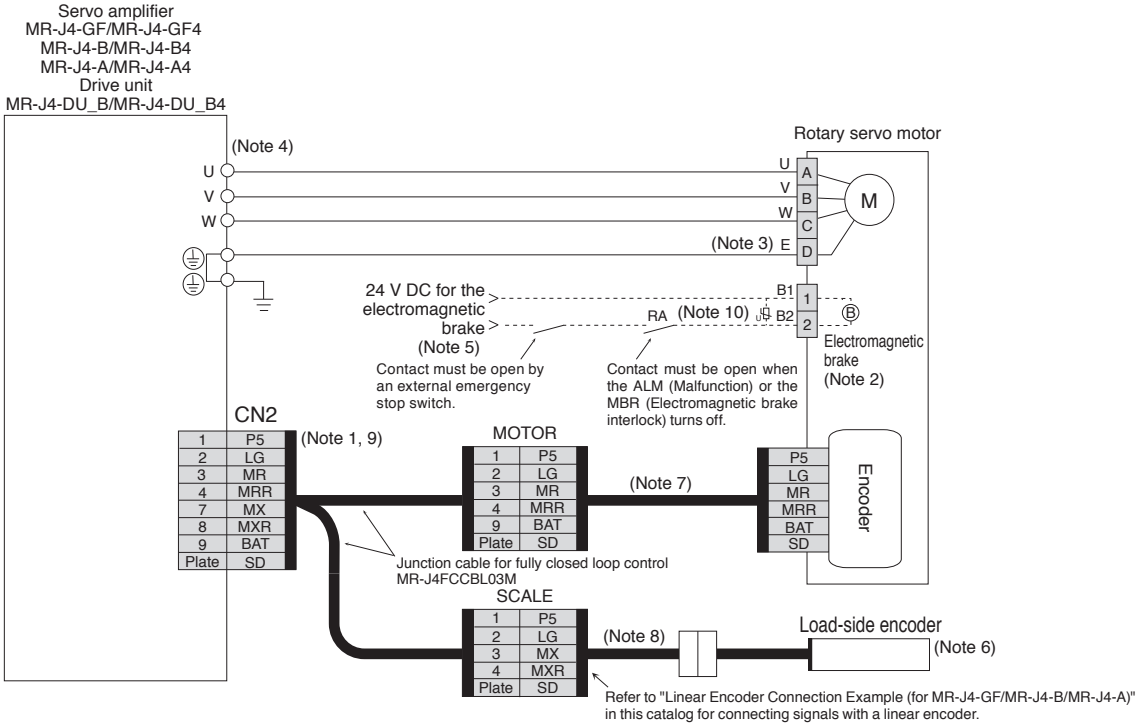
GF B A

Fully Closed Loop Control System with MR-J4-GF/MR-J4-B/MR-J4-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 for grounding the servo motor.
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-GF_/MR-J4-B_/MR-J4-DU_B_/MR-J4-A_, be sure to connect MR-J4FCCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set to CN2 connector.
10. Be sure to install a surge absorber between B1 and B2.

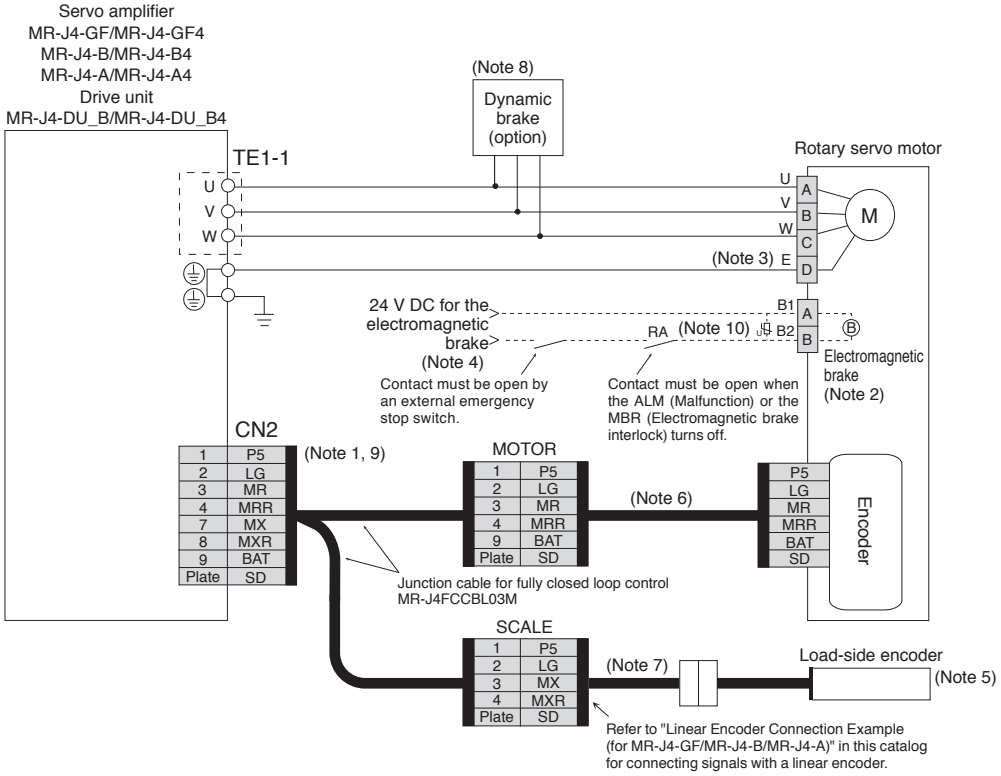
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

GF B A

Fully Closed Loop Control System with MR-J4-GF/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 for grounding the servo motor.
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 external dynamic brake (option) 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-GF_/MR-J4-B_/MR-J4-DU_B_/MR-J4-A_, be sure to connect MR-J4FCCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set to CN2 connector.
10. Be sure to install a surge absorber between B1 and B2.

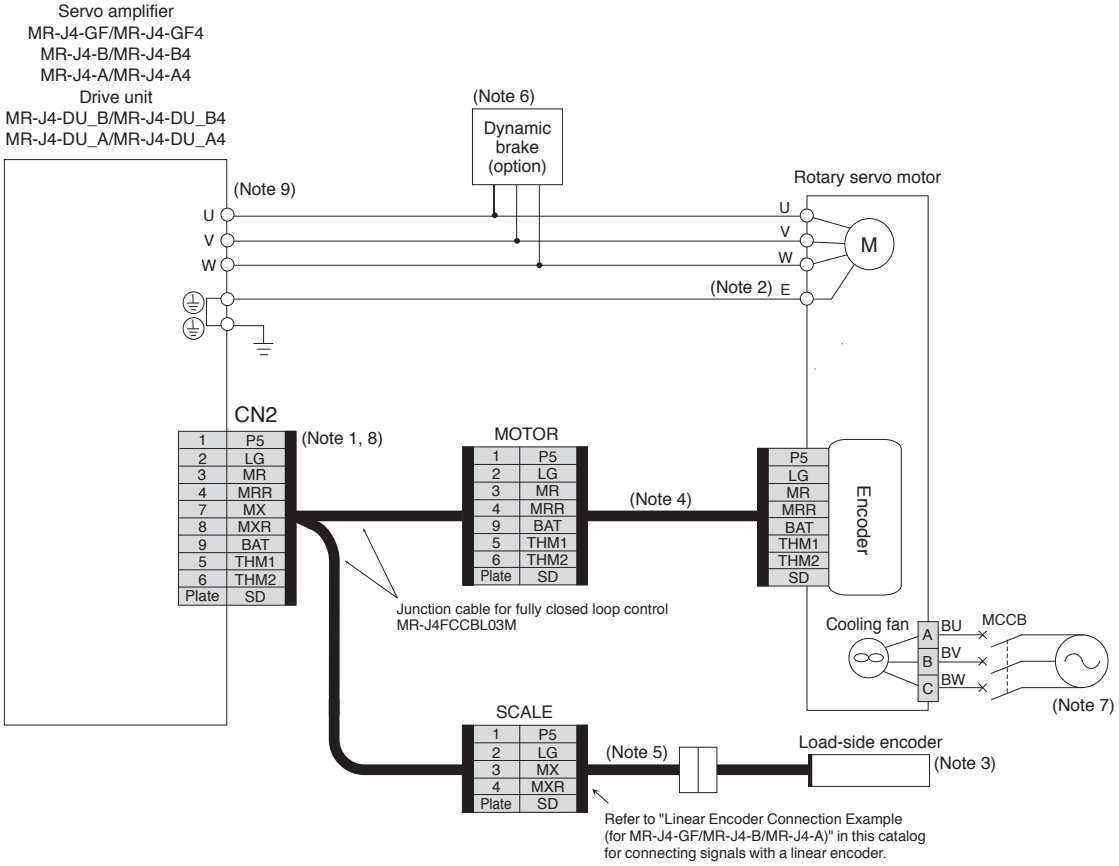
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

GF B A

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

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



CN2	
1	P5
2	LG
3	MR
4	MRR
7	MX
8	MXR
9	BAT
5	THM1
6	THM2
Plate	SD

MOTOR	
1	P5
2	LG
3	MR
4	MRR
9	BAT
5	THM1
6	THM2
Plate	SD

Encoder	
P5	
LG	
MR	
MRR	
BAT	
THM1	
THM2	
SD	

SCALE	
1	P5
2	LG
3	MX
4	MXR
Plate	SD

Cooling fan	
A	BU
B	BV
C	BW

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 for grounding the servo motor.
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 external dynamic brake (option) 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-GF_/MR-J4-B_/MR-J4-DU_B_/MR-J4-A_, 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.

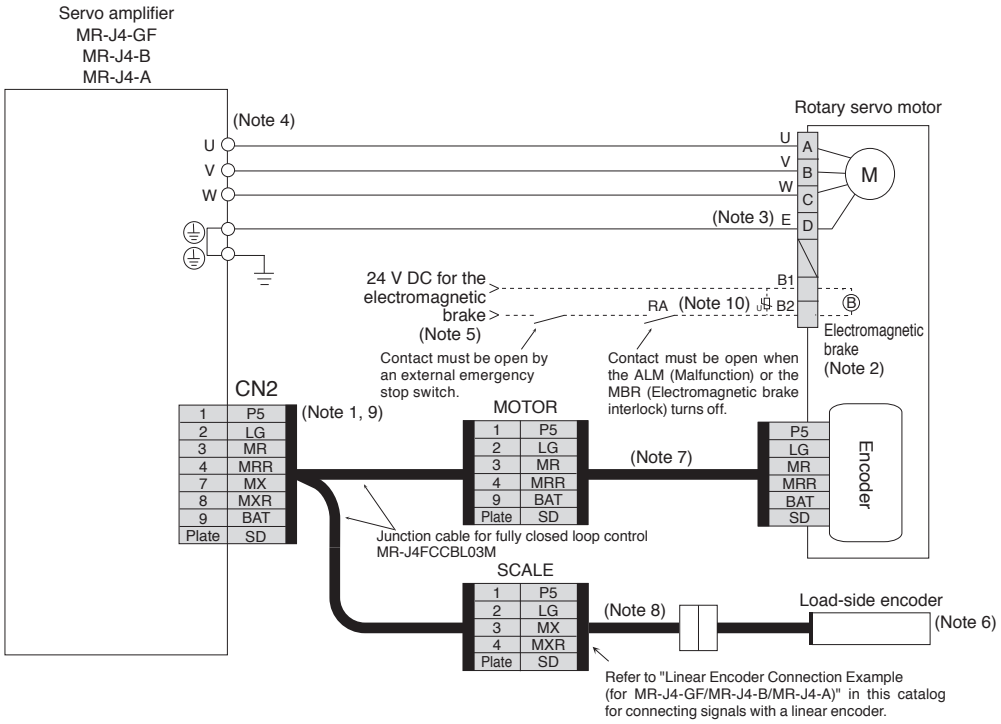
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

GF B A

Fully Closed Loop Control System with MR-J4-GF/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 provided 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 for grounding the servo motor.
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-GF/MR-J4-B/MR-J4-A, be sure to connect MR-J4FCCBL03M junction cable or a junction cable fabricated using MR-J3THMCN2 connector set to CN2 connector.
10. Be sure to install a surge absorber between B1 and B2.

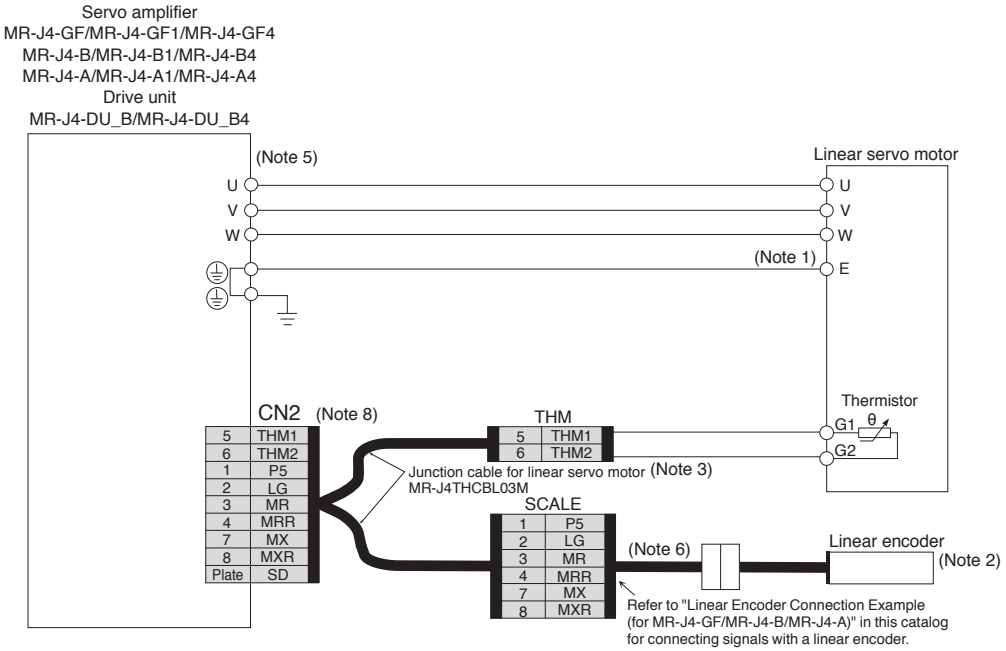
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Linear Servo Motor)

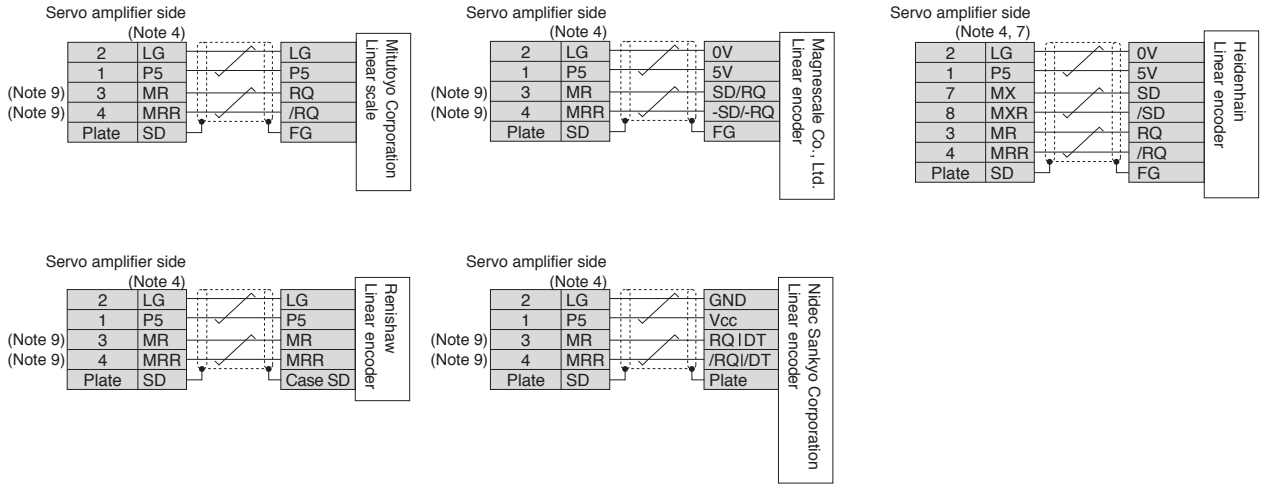
GF B A

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

●For LM-H3/LM-F/LM-K2/LM-U2 series



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



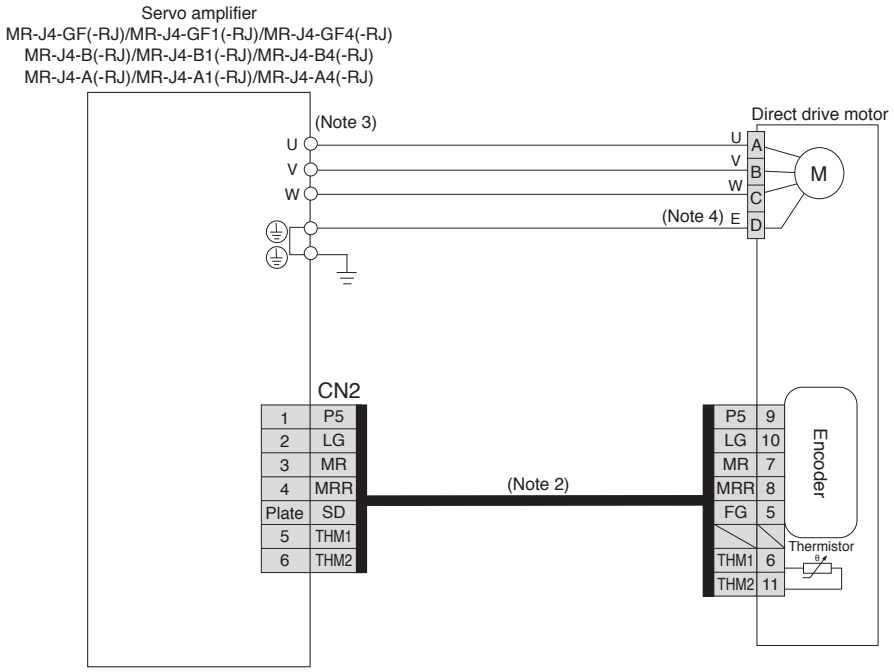
Notes: 1. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier for grounding the servo motor.
2. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog.
3. MR-J4THCBL03M junction cable for linear servo motor 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-GF_/MR-J4-B_/MR-J4-DU_B_/MR-J4-A_, 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.

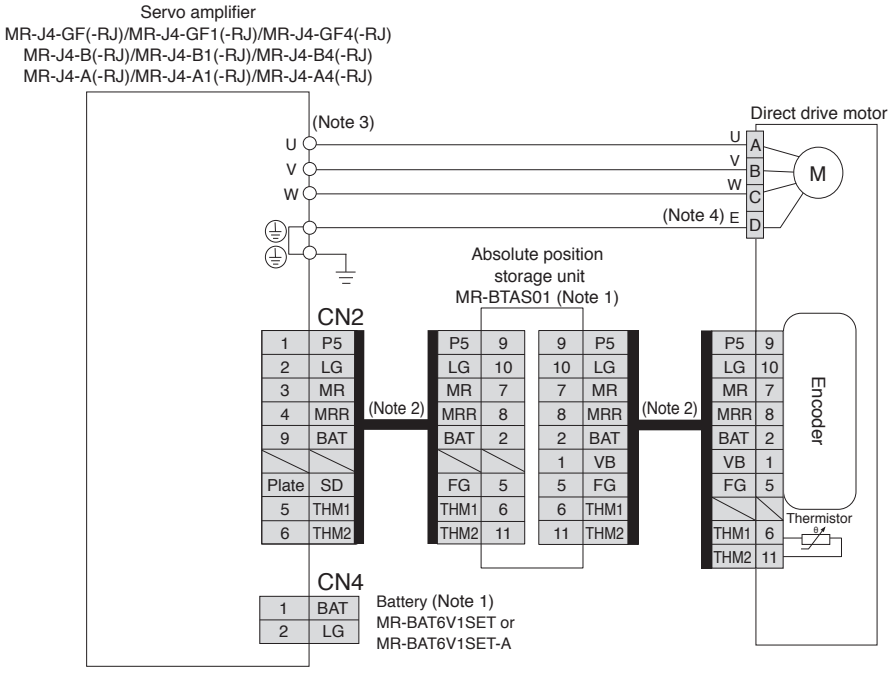
Servo Motor Connection Example (Direct Drive Motor)

GF | GF-RJ | B | B-RJ | A | A-RJ

●For TM-RG2M/TM-RU2M/TM-RFM series (incremental system)



●For TM-RG2M/TM-RU2M/TM-RFM series (absolute position detection system)



Notes: 1. An MR-BTAS01 absolute position storage unit and MR-BAT6V1SET or MR-BAT6V1SET-A battery (sold as options) are required for absolute position detection system. Required battery varies depending on the servo amplifiers. Refer to configuration example for each servo amplifier in this catalog. Refer to relevant Servo Amplifier Instruction Manual and "TM-RFM TM-RG2M TM-RU2M Direct Drive Motor Instruction Manual" for details of absolute position detection system.
2. Fabricate this encoder cable. Refer to "TM-RFM TM-RG2M TM-RU2M 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 for grounding the servo motor.

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

GF GF-RJ B B-RJ WB A A-RJ

When configuring a linear servo 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 table 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-GF_	MR-J4-GF_-RJ	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 system (Note 9)	Two-wire type	CN2 (Note 1)	CN2	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)		CN2L (Note 8)		
Fully closed loop control system	Two-wire type	CN2	CN2L	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	CN2L	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								

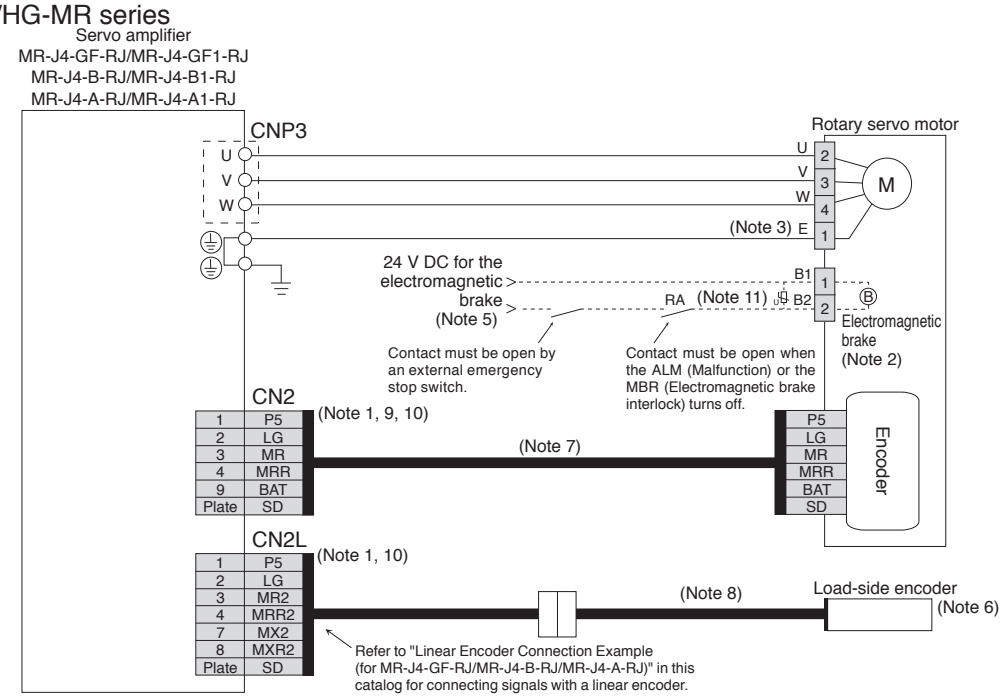
Notes: 1. MR-J4THCBL03M junction cable is required.
2. MR-J4FCCBL03M junction cable is required.
3. MR-J4-GF_/MR-J4-B_/MR-DU_B_/MR-J4-A_/MR-J4-DU_A_ is not compatible with a servo motor encoder with four-wire type communication method. Use MR-J4-GF_-RJ/MR-J4-B_-RJ/MR-DU_B_-RJ/MR-J4-A_-RJ/MR-J4-DU_A_-RJ.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

Servo Motor Connection Example (Rotary Servo Motor)

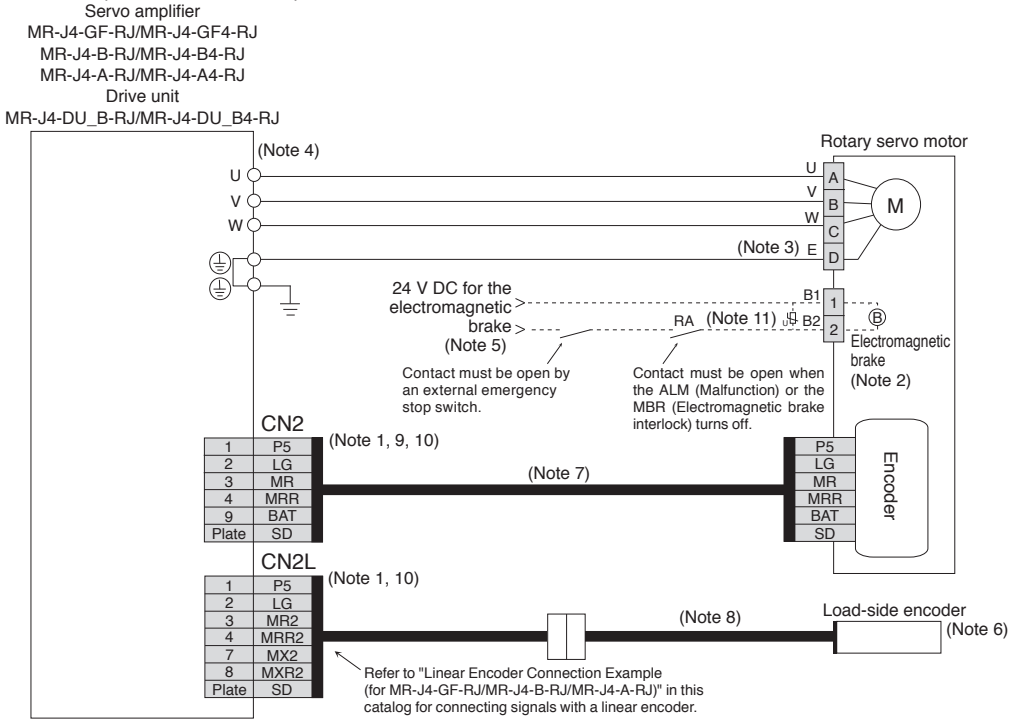
GF-RJ B-RJ A-RJ

Fully Closed Loop Control System with MR-J4-GF-RJ/MR-J4-B-RJ/MR-J4-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 for grounding the servo motor.
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-GF_-RJ/MR-J4-B_-RJ/MR-J4-DU_B_-RJ/MR-J4-A_-RJ, 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.
11. Be sure to install a surge absorber between B1 and B2.

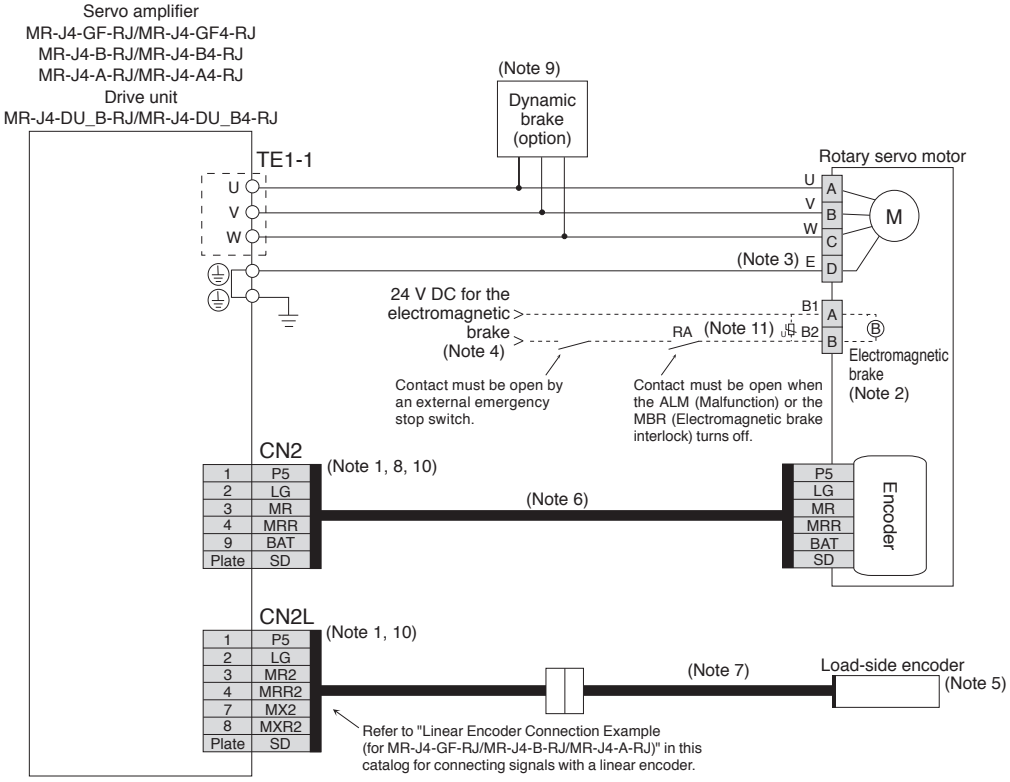
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

GF-RJ B-RJ A-RJ

Fully Closed Loop Control System with MR-J4-GF-RJ/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 for grounding the servo motor.
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 external dynamic brake (option) 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-GF_-RJ/MR-J4-B_-RJ/MR-J4-DU_B_-RJ/MR-J4-A_-RJ, 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.
11. Be sure to install a surge absorber between B1 and B2.

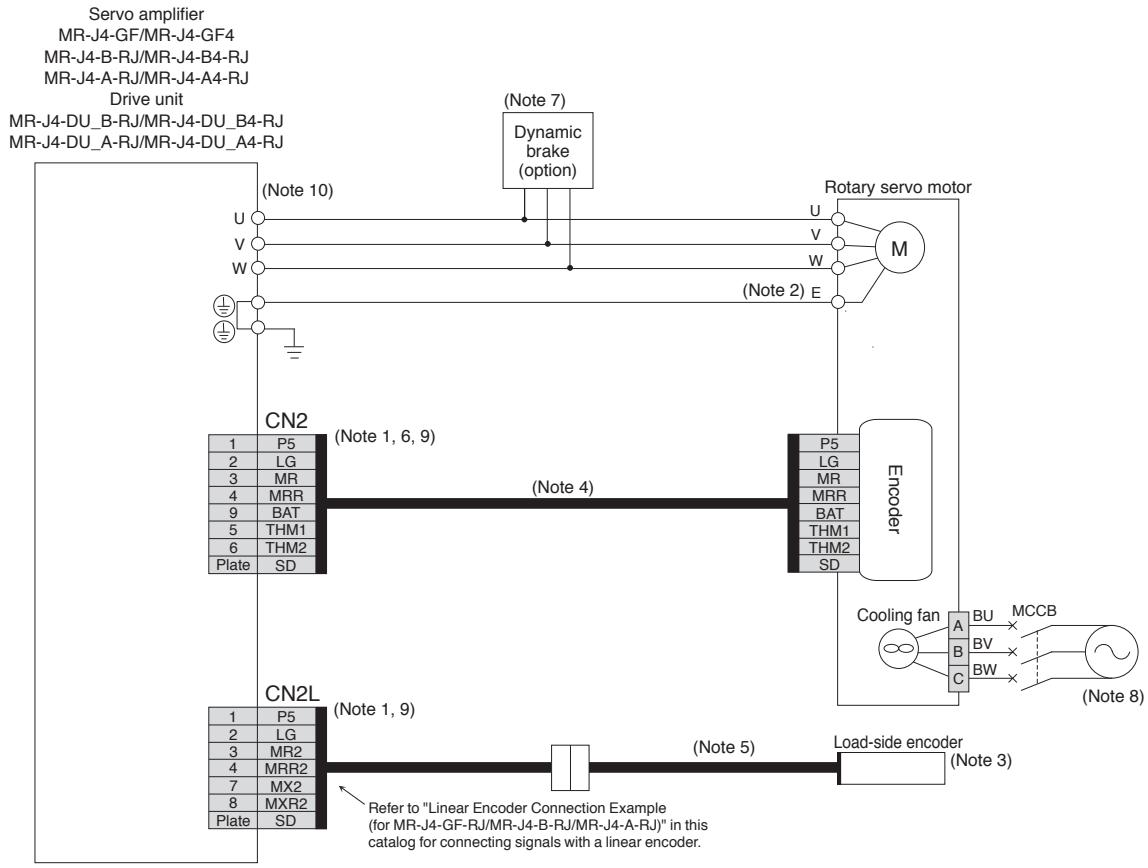
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

GF-RJ B-RJ A-RJ

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

●For HG-JR 1000 r/min series (15 kW or larger) and HG-JR 1500 r/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 for grounding the servo motor.
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 external dynamic brake (option) 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-GF_-RJ/MR-J4-B_-RJ/MR-J4-DU_B_-RJ/MR-J4-A_-RJ, 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.

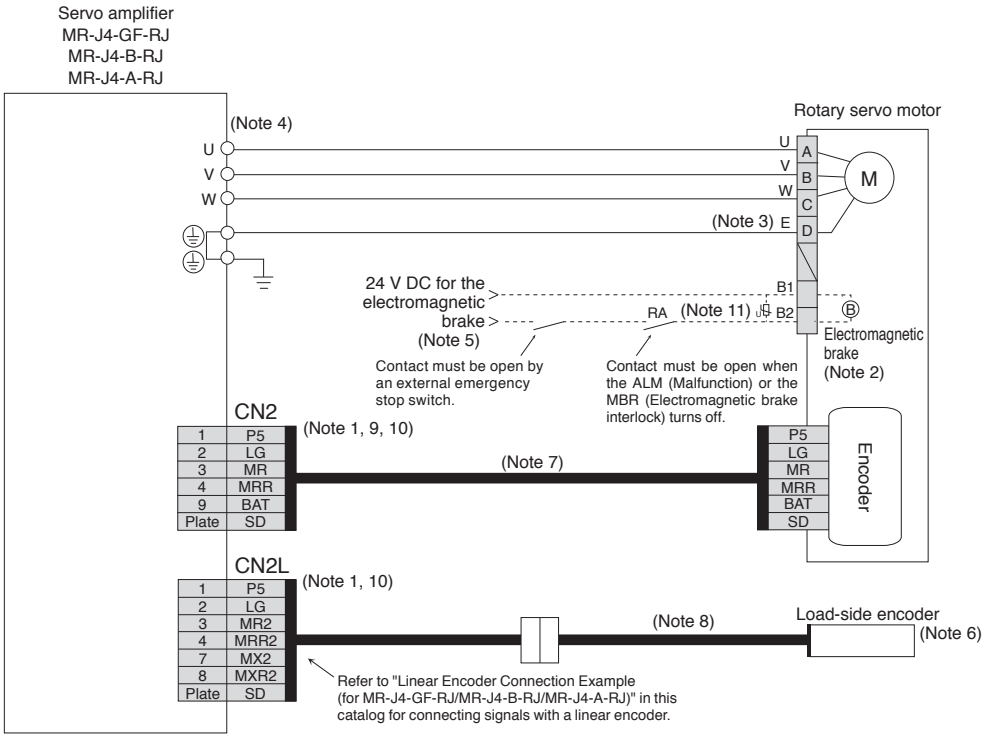
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

GF-RJ B-RJ A-RJ

Fully Closed Loop Control System with MR-J4-GF-RJ/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 provided 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 for grounding the servo motor.
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-GF-RJ/MR-J4-B-RJ/MR-J4-A-RJ, 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.
11. Be sure to install a surge absorber between B1 and B2.

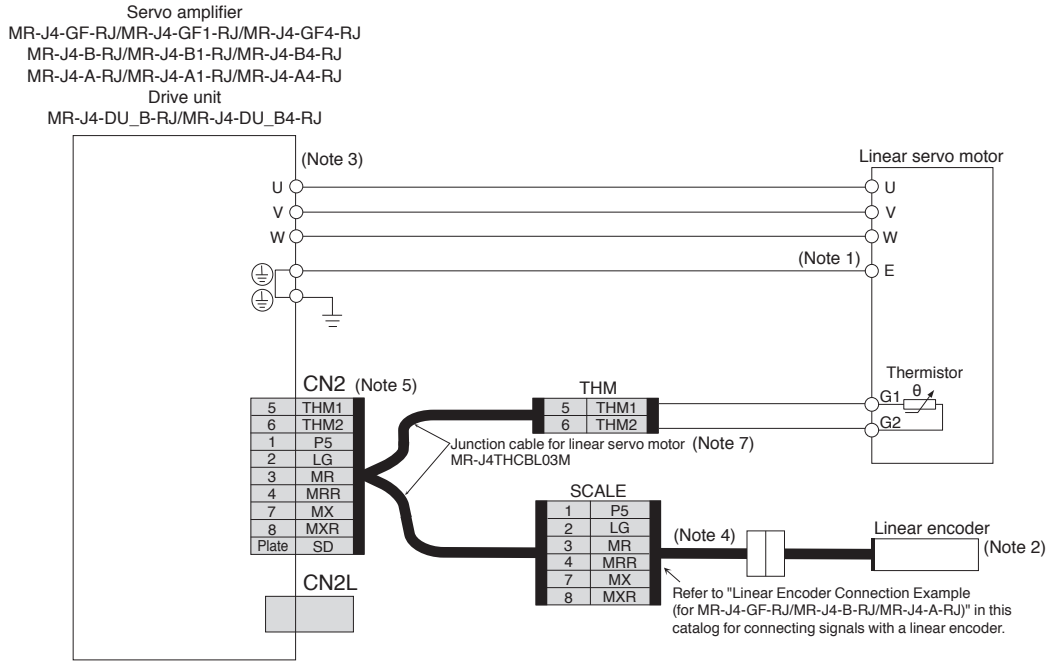
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Linear Servo Motor)

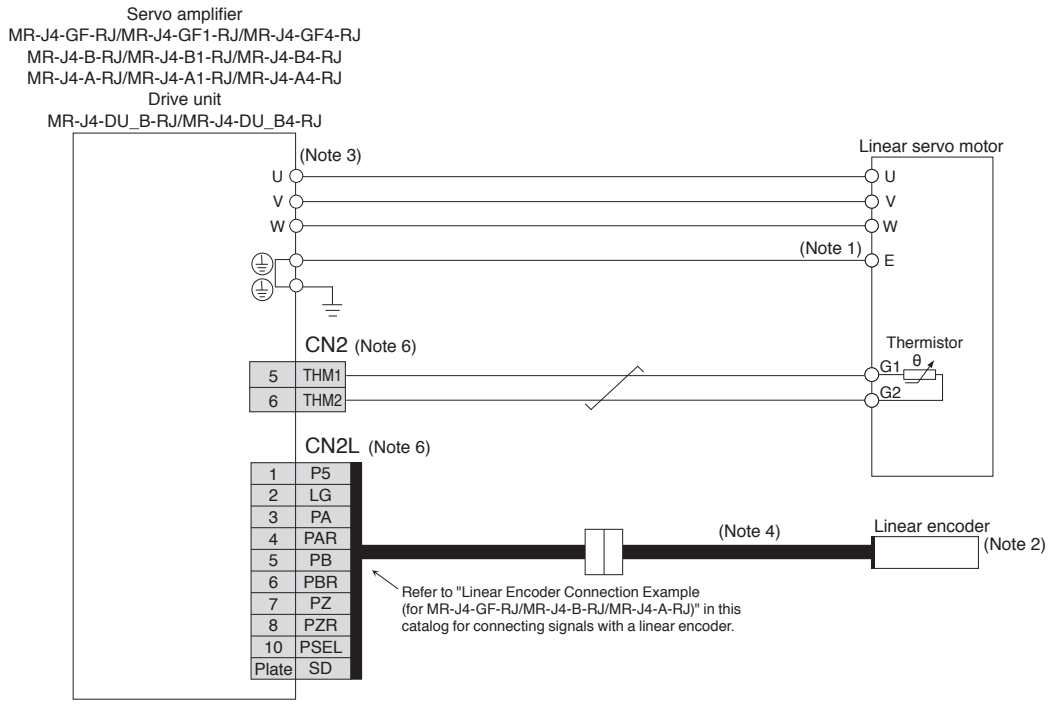
GF-RJ B-RJ A-RJ

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

●Connecting a serial linear encoder



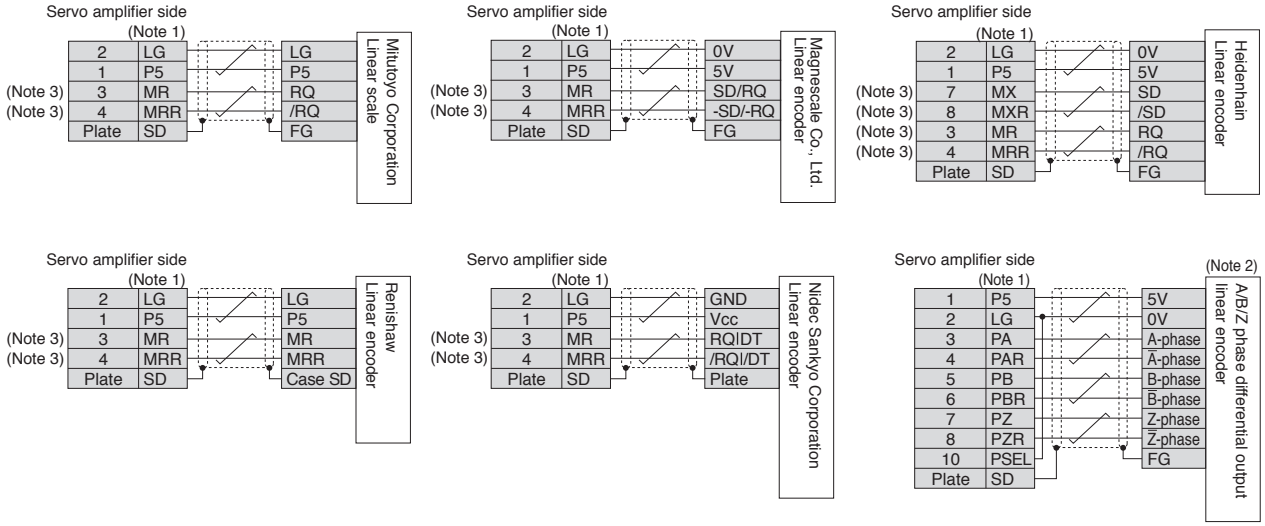
●Connecting an A/B/Z-phase differential output linear encoder



Notes: 1. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier for grounding the servo motor.
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 relevant Instruction Manual.
5. When configuring a linear servo system with MR-J4-GF_-RJ/MR-J4-B_-RJ/MR-J4-DU_B_-RJ/MR-J4-A_-RJ 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-GF_-RJ/MR-J4-B_-RJ/MR-J4-DU_B_-RJ/MR-J4-A_-RJ 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 both 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-GF-RJ/MR-J4-B-RJ/MR-J4-A-RJ) GF-RJ B-RJ A-RJ



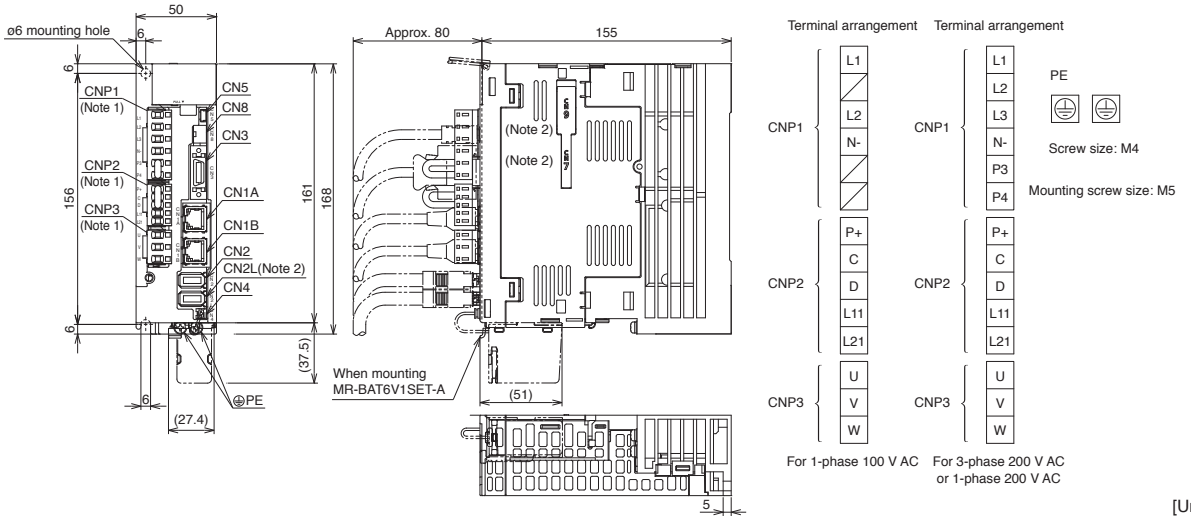
Notes: 1. For the number of the wire pairs for LG and P5, refer to "Linear Encoder Instruction Manual."
2. If the encoder's current consumption exceeds 350 mA, supply power from an external source.
3. For CN2L connector, the signals of 3-pin, 4-pin, 7-pin, and 8-pin are as follows:
3-pin: MR2
4-pin: 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-GF/MR-J4-GF-RJ Dimensions

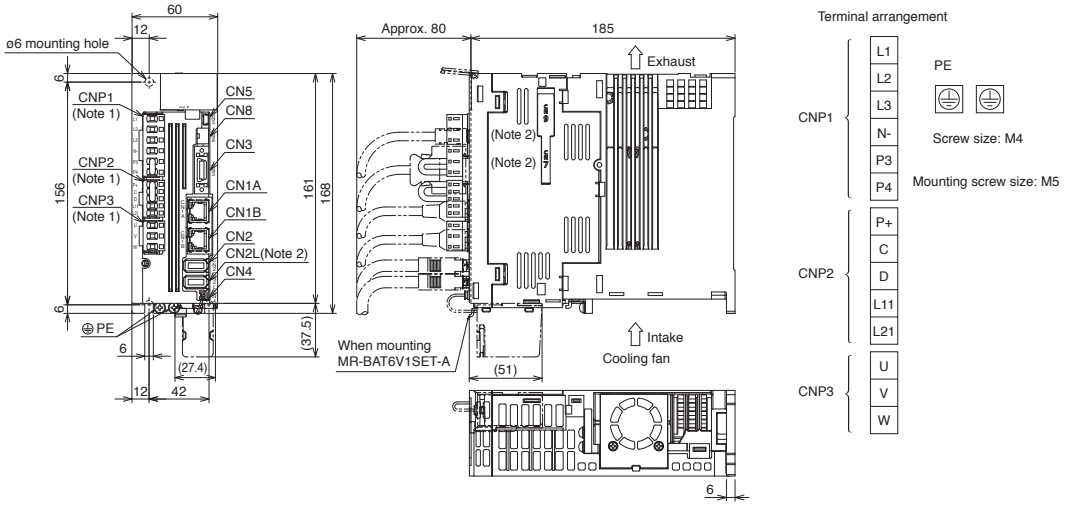
GF GF-RJ

●MR-J4-10GF, MR-J4-10GF-RJ, MR-J4-10GF1, MR-J4-10GF1-RJ
●MR-J4-20GF, MR-J4-20GF-RJ, MR-J4-20GF1, MR-J4-20GF1-RJ
●MR-J4-40GF, MR-J4-40GF-RJ, MR-J4-40GF1, MR-J4-40GF1-RJ
●MR-J4-60GF, MR-J4-60GF-RJ



[Unit: mm]

●MR-J4-70GF, MR-J4-70GF-RJ
●MR-J4-100GF, MR-J4-100GF-RJ



[Unit: mm]

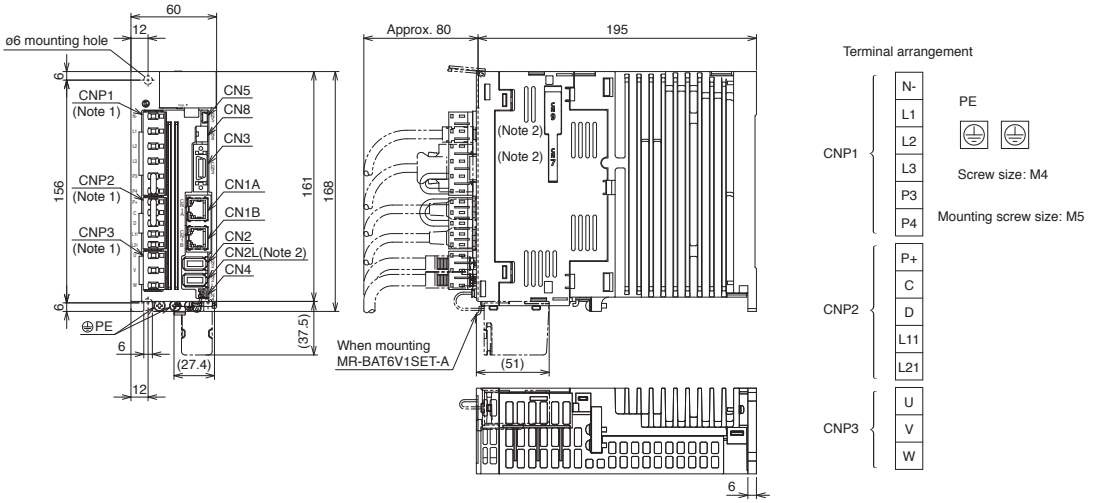
Notes: 1. CNP1, CNP2 and CNP3 connectors are supplied with the servo amplifier.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-GF servo amplifier.

MR-J4-GF/MR-J4-GF-RJ Dimensions

GF GF-RJ

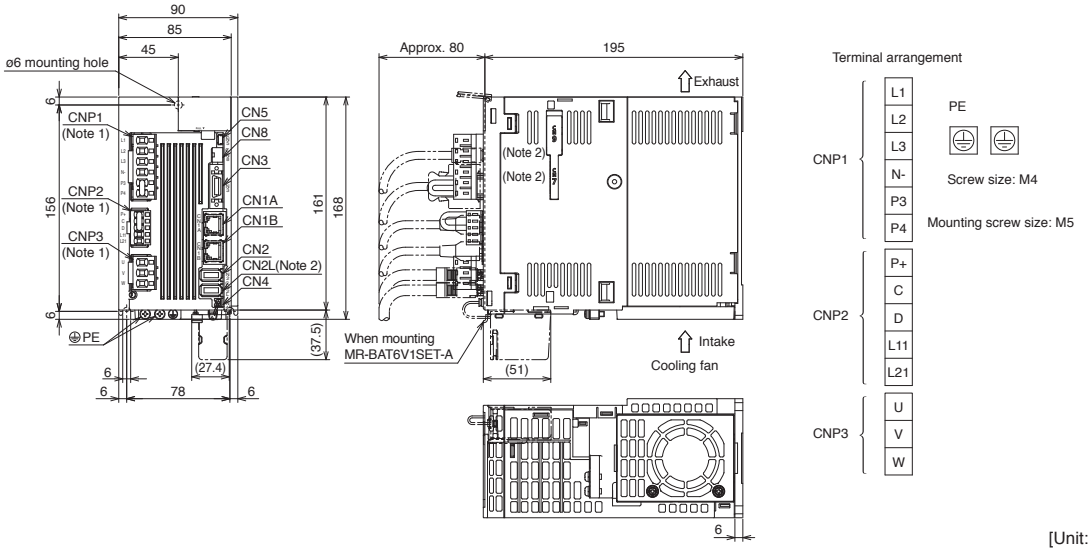
●MR-J4-60GF4, MR-J4-60GF4-RJ

●MR-J4-100GF4, MR-J4-100GF4-RJ



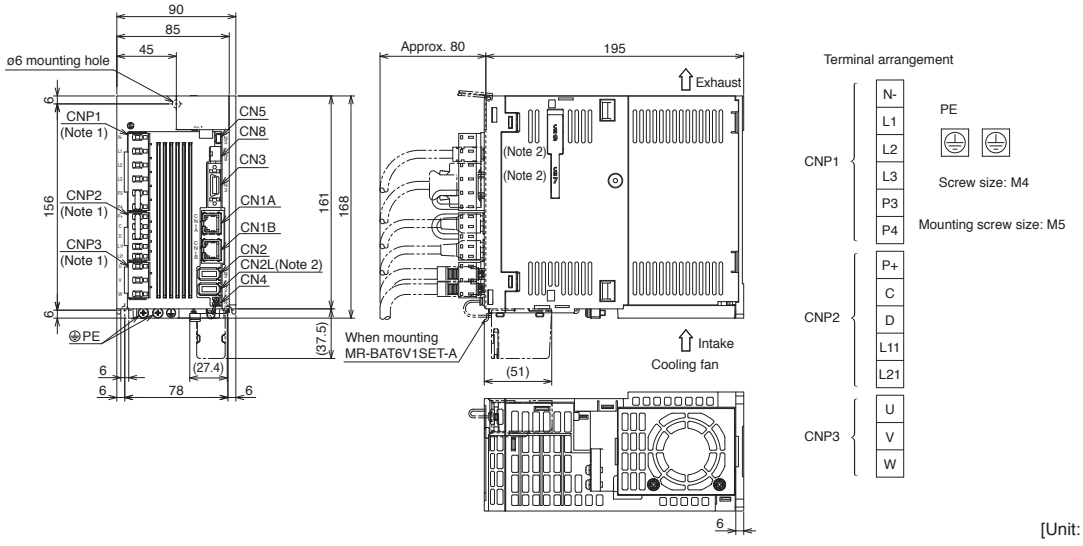
[Unit: mm]

●MR-J4-200GF, MR-J4-200GF-RJ



[Unit: mm]

●MR-J4-200GF4, MR-J4-200GF4-RJ



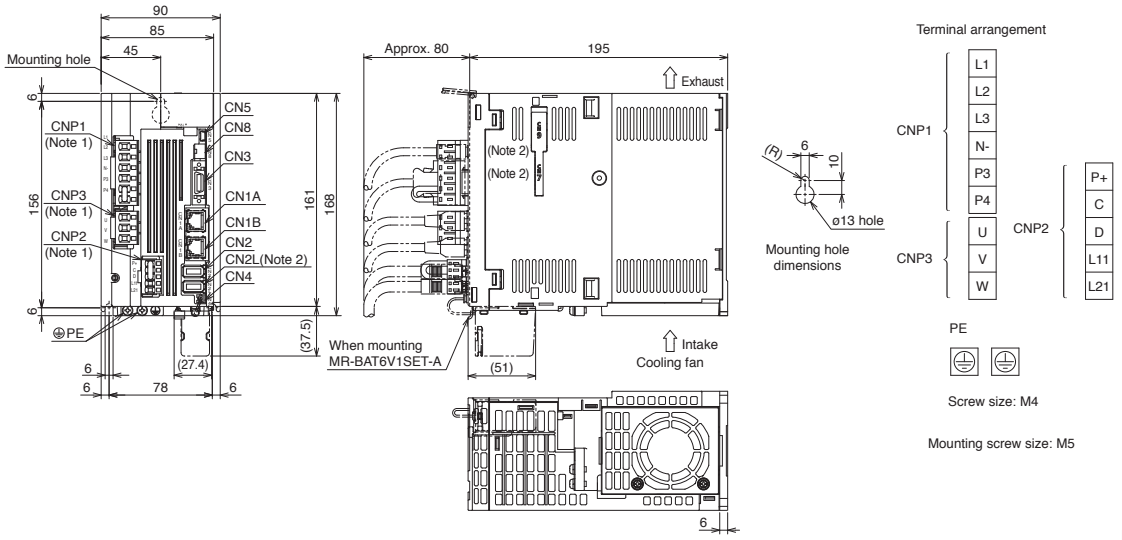
[Unit: mm]

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

MR-J4-GF/MR-J4-GF-RJ Dimensions

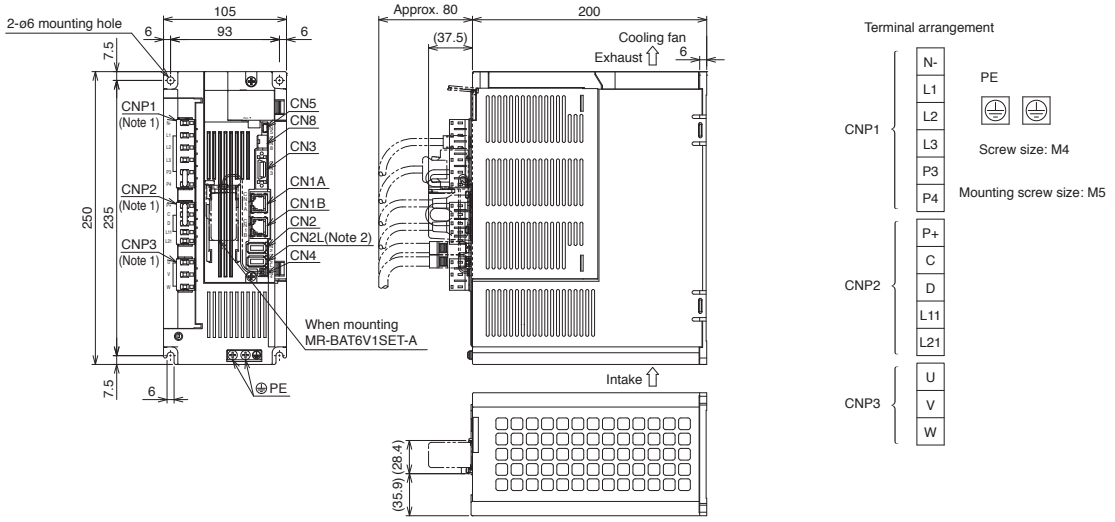
GF GF-RJ

●MR-J4-350GF, MR-J4-350GF-RJ



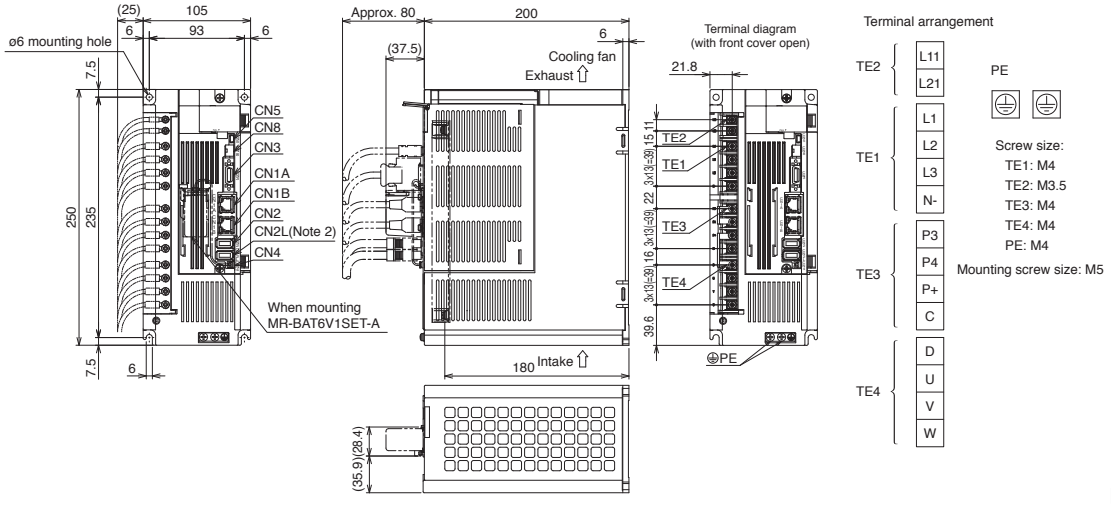
[Unit: mm]

●MR-J4-350GF4, MR-J4-350GF4-RJ



[Unit: mm]

●MR-J4-500GF, MR-J4-500GF-RJ



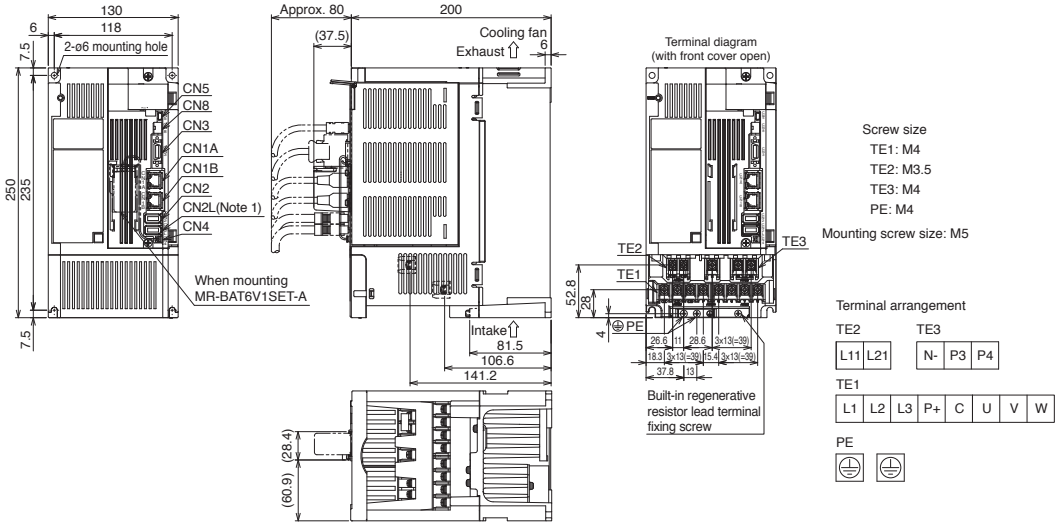
[Unit: mm]

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

MR-J4-GF/MR-J4-GF-RJ Dimensions

GF GF-RJ

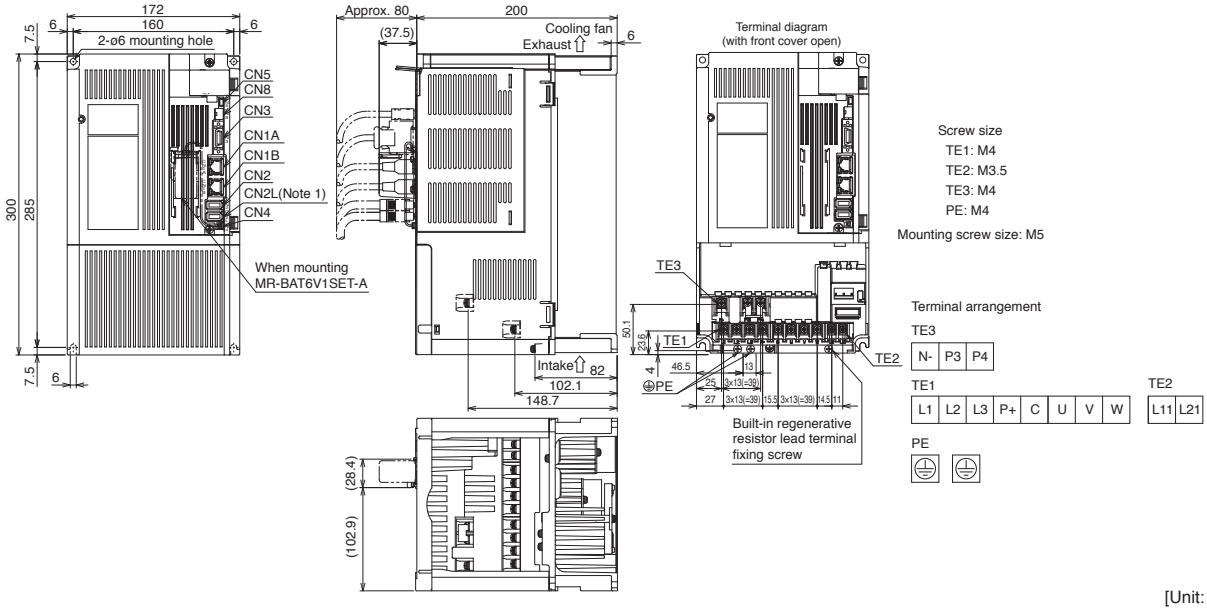
●MR-J4-500GF4, MR-J4-500GF4-RJ



[Unit: mm]

●MR-J4-700GF, MR-J4-700GF-RJ

●MR-J4-700GF4, MR-J4-700GF4-RJ



[Unit: mm]

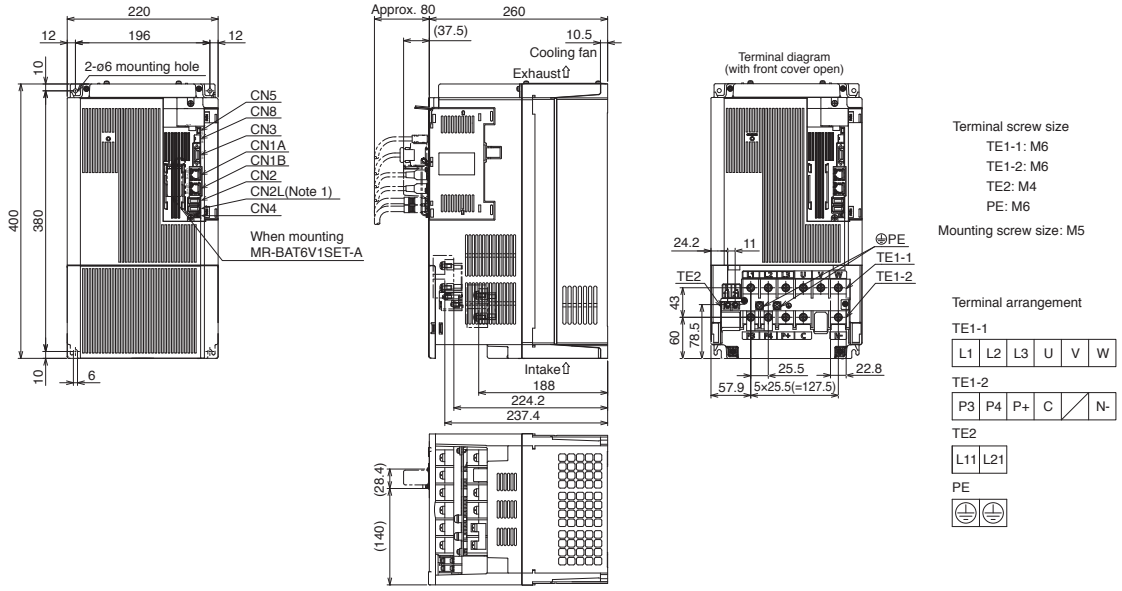
Notes: 1. CN2L, CN7, and CN9 connectors are not available for MR-J4-GF servo amplifier.

MR-J4-GF/MR-J4-GF-RJ Dimensions

GF GF-RJ

●MR-J4-11KGF, MR-J4-11KGF-RJ, MR-J4-11KGF4, MR-J4-11KGF4-RJ

●MR-J4-15KGF, MR-J4-15KGF-RJ, MR-J4-15KGF4, MR-J4-15KGF4-RJ



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

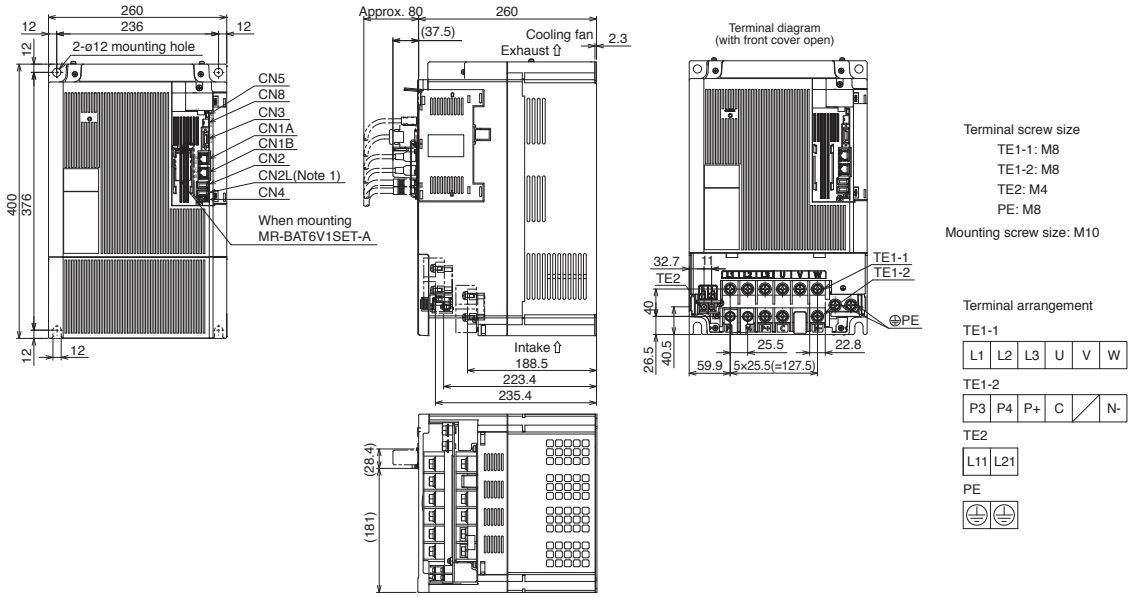
L11	L21

PE

⏚ ⏚

[Unit: mm]

●MR-J4-22KGF, MR-J4-22KGF-RJ, MR-J4-22KGF4, MR-J4-22KGF4-RJ



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

⏚ ⏚

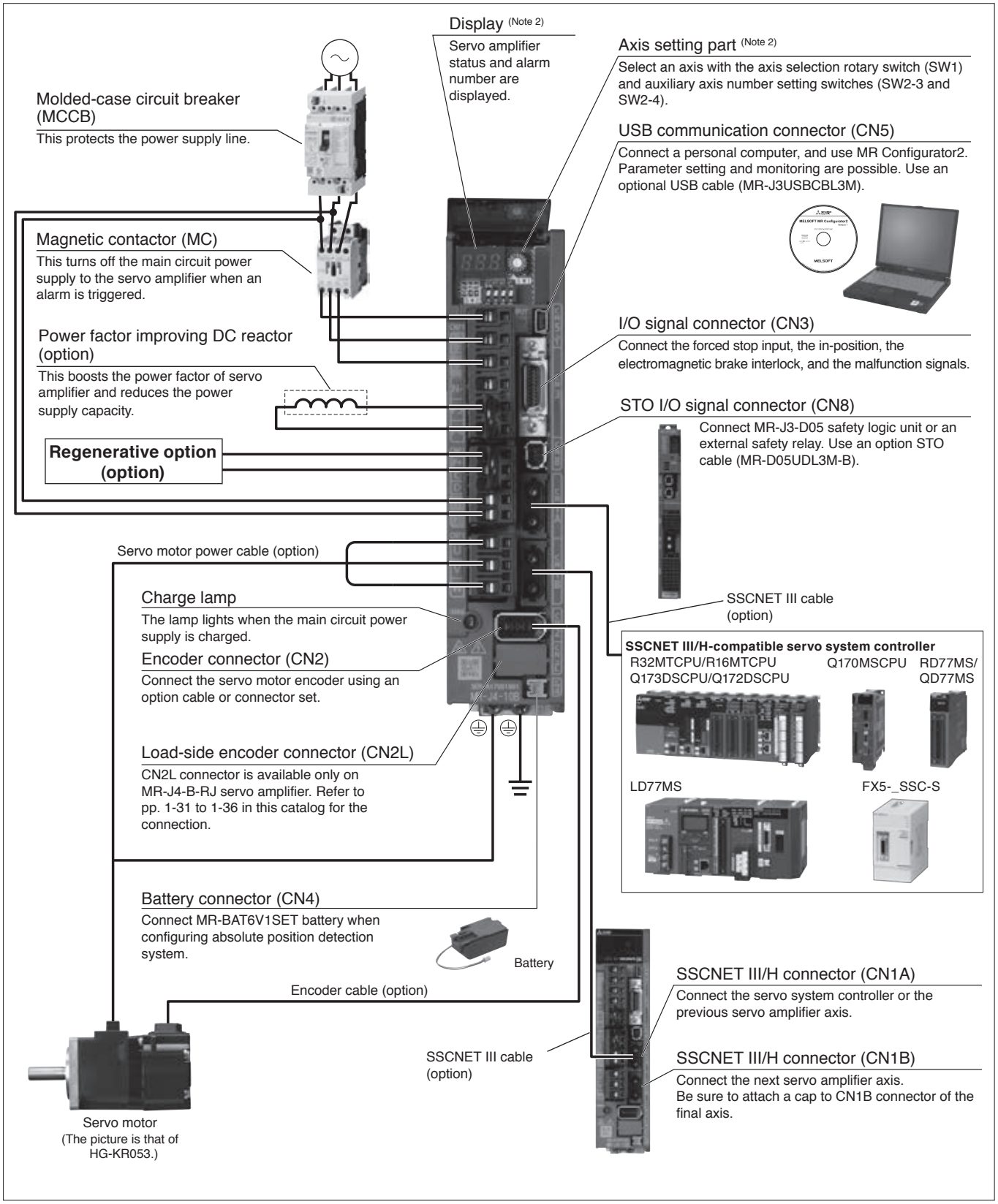
[Unit: mm]

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

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 (Note 1)	AC input	3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz					3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz (Note 17)		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		
		DC input (Note 19)	283 V DC to 340 V DC													-		
	Rated current (Note 15)	[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	AC input	3-phase or 1-phase 170 V AC to 264 V AC					3-phase or 1-phase 170 V AC to 264 V AC (Note 17)		3-phase 170 V AC to 264 V AC						1-phase 85 V AC to 132 V AC		
		DC input (Note 19)	241 V DC to 374 V DC													-		
	Permissible frequency fluctuation		±5% maximum															
Control circuit power supply input	Voltage/ frequency	AC input	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		
		DC input (Note 19)	283 V DC to 340 V DC													-		
	Rated current	[A]	0.2								0.3					0.4		
	Permissible voltage fluctuation	AC input	1-phase 170 V AC to 264 V AC													1-phase 85 V AC to 132 V AC		
		DC input (Note 19)	241 V DC to 374 V DC													-		
	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															
Permissible 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 (Note 4)			Built-in										External option (Note 13)			Built-in		
SSCNET III/H command communication cycle (Note 10)			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) (Note 9)		Two-wire type communication method															
	MR-J4-B(1)-RJ		Two-wire/four-wire type communication method															
Load-side encoder interface	MR-J4-B(1)		Mitsubishi Electric high-speed serial communication															
	MR-J4-B(1)-RJ		Mitsubishi Electric high-speed serial communication, A/B/Z-phase differential input signal															
Servo functions			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 14), scale measurement function (Note 14), J3 compatibility mode, super trace control (Note 16), lost motion compensation function (Note 16)															
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-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
Functional safety		STO (IEC/EN 61800-5-2)															
Safety performance	Standards certified by CB (Note 20)	EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2															
	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)	MTTFd ≥ 100 [years] (314a)															
	Diagnostic coverage (DC)	DC = Medium, 97.6 [%]															
	Probability of dangerous Failure per Hour (PFH)	PFH = 6.4 × 10^{-9} [1/h]															
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 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	3-phase power input	Possible (Note 6)								Not possible					-		
	1-phase power input	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: 5 %RH to 90 %RH (non-condensing)															
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust															
	Altitude	2000 m or less above sea level (Note 18)															
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y, and Z axes)															
Mass [kg]		0.8	0.8	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 is operated within the specified power supply voltage and frequency.
2. Select the most suitable regenerative option for your system with our drive system sizing software Motorizer.
3. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a regenerative option is used.
4. When using the 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 the servo amplifiers at 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 supported by the servo amplifiers with software version A3 or later.
10. The command communication cycle depends on the servo system controller specifications and the number of axes connected.
11. The value in brackets is applicable when cooling fans (two units of 92 mm × 92 mm, minimum air flow: 1.0 m^3/min) are installed, and then [Pr. PA02] is changed.
12. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "Model Designation for 1-Axis Servo Amplifier" in this catalog for details.
13. Use an external dynamic brake (option) 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 supported by the servo amplifiers with software version A8 or later.
15. This value is applicable when a 3-phase power supply is used.
16. This function is supported by the servo amplifiers with software version B4 or later.
17. When a 1-phase 200 V AC to 240 V AC power supply is used, use the servo amplifiers at 75% or less of the effective load ratio.
18. Refer to "MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
19. DC power input is supported by MR-J4-_B-RJ with software version C2 or later and MR-J4-_B-EG. For a connection example of power supply circuit with DC input, refer to "MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual".
20. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for details.

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)			DU900B	DU11KB	DU15KB	DU22KB	DU30KB	DU37KB
Compatible converter unit model			MR-CV_				MR-CV_/MR-CR55K	
Output	Rated voltage		3-phase 170 V AC					
	Rated current	[A]	54	68	87	126	174	204
Main circuit power supply input			Main circuit power is supplied from the power regeneration converter unit/ resistance regeneration converter unit to the drive unit.					
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 (Note 7)			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					
Load-side encoder interface	MR-J4-DU_B		Mitsubishi Electric high-speed serial communication					
	MR-J4-DU_B-RJ		Mitsubishi Electric high-speed serial communication, A/B/Z-phase differential input signal					
Servo functions			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 function					
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, magnetic pole detection protection, linear servo control fault protection					
Functional safety			STO (IEC/EN 61800-5-2)					
Safety performance	Standards certified by CB (Note 6)		EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2					
	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)		MTTFd ≥ 100 [years] (314a)					
	Diagnostic coverage (DC)		DC = Medium, 97.6 [%]					
	Probability of dangerous Failure per Hour (PFH)		PFH = 6.4 × 10^{-9} [1/h]					
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.					
Structure (IP rating)			Force cooling, open (IP20) (Note 1)					
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		2000 m or less above sea level (Note 5)					
	Vibration resistance		5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y, and Z axes)					
Mass		[kg]	9.9	9.9	15.2	15.2	21	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 servo system controller specifications and the number of axes connected.
4. Use an external dynamic brake (option) with the drive unit. 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. Refer to relevant "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
6. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for details.
7. When using the dynamic brake, refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the permissible load to motor inertia ratio and the permissible load to mass ratio.

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								
Permissible 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 (Note 4)			Built-in						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								
Load-side encoder interface	MR-J4-B4		Mitsubishi Electric high-speed serial communication								
	MR-J4-B4-RJ		Mitsubishi Electric high-speed serial communication, A/B/Z-phase differential input signal								
Servo functions			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 function (Note 13)								
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 (Note 15)		EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2								
	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)		MTTFd ≥ 100 [years] (314a)								
	Diagnostic coverage (DC)		DC = Medium, 97.6 [%]								
	Probability of dangerous Failure per Hour (PFH)		PFH = 6.4 × 10^{-9} [1/h]								
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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: 5 %RH to 90 %RH (non-condensing)								
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust								
	Altitude		2000 m or less above sea level (Note 14)								
	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 is operated within the specified power supply voltage and frequency.
2. Select the most suitable regenerative option for your system with our drive system sizing software Motorizer.
3. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a regenerative option is used.
4. When using the 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 servo system controller specifications and the number of axes connected.
8. The value in brackets is applicable when cooling fans (two units of 92 mm × 92 mm, minimum air flow: 1.0 m^3/min) are installed, and then [Pr. PA02] is changed.
9. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "Model Designation for 1-Axis Servo Amplifier" in this catalog for details.
10. Use an external dynamic brake (option) 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 supported by the servo amplifiers with software version A8 or later.
13. This function is supported by the servo amplifiers with software version B4 or later.
14. Refer to "MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
15. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for details.

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)			DU900B4	DU11KB4	DU15KB4	DU22KB4	DU30KB4	DU37KB4	DU45KB4	DU55KB4
Compatible converter unit model			MR-CV_4				MR-CV_4/MR-CR55K4			
Output	Rated voltage		3-phase 323 V AC							
	Rated current	[A]	25	32	41	63	87	102	131	143
Main circuit power supply input			Main circuit power is supplied from the power regeneration converter unit/ resistance regeneration converter unit to the drive unit.							
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 (Note 7)			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							
Load-side encoder interface	MR-J4-DU_B4		Mitsubishi Electric high-speed serial communication							
	MR-J4-DU_B4-RJ		Mitsubishi Electric high-speed serial communication, A/B/Z-phase differential input signal							
Servo functions			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 function							
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, magnetic pole detection protection, linear servo control fault protection							
Functional safety			STO (IEC/EN 61800-5-2)							
Safety performance	Standards certified by CB (Note 6)		EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2							
	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)		MTTFd ≥ 100 [years] (314a)							
	Diagnostic coverage (DC)		DC = Medium, 97.6 [%]							
	Probability of dangerous Failure per Hour (PFH)		PFH = 6.4 × 10^{-9} [1/h]							
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.							
Structure (IP rating)			Force cooling, open (IP20) (Note 1)							
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		2000 m or less above sea level (Note 5)							
	Vibration resistance		5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y, and Z axes)							
Mass		[kg]	9.9	9.9	15.2	15.2	16	16	21	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 servo system controller specifications and the number of axes connected.
4. Use an external dynamic brake (option) with the drive unit. 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. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
6. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for details.
7. When using the dynamic brake, refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the permissible load to motor inertia ratio and the permissible load to mass ratio.

MR-J4-DU_B4-RJ100 (SSCNET III/H Interface) Specifications (400 V)

B-RJ100

Drive unit model MR-J4-_			DU45KB4-RJ100	DU55KB4-RJ100
Compatible power regeneration converter unit model			MR-CV55K4 (Note 5)	
Output	Rated voltage		3-phase 323 V AC	
	Rated current	[A]	131	143
Main circuit power supply input			Main circuit power is supplied from the power regeneration converter unit to the drive unit.	
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 (Note 7)			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			Not compatible	
Servo functions			Robust filter, auto tuning, drive recorder function, tightening & press-fit control, machine diagnosis function, master-slave operation function, super trace control, lost motion compensation	
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 (Note 6)		EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2	
	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)		MTTFd ≥ 100 [years] (314a)	
	Diagnostic coverage (DC)		DC = Medium, 97.6 [%]	
	Probability of dangerous Failure per Hour (PFH)		PFH = 6.4 × 10^{-9} [1/h]	
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.	
Structure (IP rating)			Force cooling, open (IP20) (Note 1)	
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		2000 m or less above sea level (Note 8)	
	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. The command communication cycle depends on the servo system controller specifications and the number of axes connected.
4. Use one external dynamic brake (option) per drive unit. 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 power regeneration converter unit is required for each drive unit.
6. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for details.
7. When using the dynamic brake, refer to "MR-J4-DU_B4-RJ100 Drive Unit Instruction Manual" for the permissible load to motor inertia ratio
8. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.

Compatible Controllers

Motion controller model (Note 2)	Operation system	Note
Q172DSCPU	SW8DNC-SV22S87QL	Special OS (Note 1)
Q173DSCPU	SW8DNC-SV22S87QJ	Special OS (Note 1)
R16MTCPU	SW10DNC-RMTFW-S019	Special OS (Note 1)
R32MTCPU		

Notes: 1. Special motion operating system is required. Ultra-large capacity servo motors cannot be driven with standard motion operating system. Contact your local sales office for more details.
2. This servo amplifier is not compatible with R64MTCPU.

MR-CV Power Regeneration Converter Unit Specifications (200 V)

B B-RJ

Power regeneration converter unit model MR-CV_		11K	18K	30K	37K	45K	55K
Output	Rated voltage	270 V DC to 324 V DC					
	Rated current [A]	41	76	144	164	198	238
Main circuit power supply input	Voltage/frequency (Note 1)	3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz					
	Rated current [A]	35	65	107	121	148	200
	Permissible voltage fluctuation	3-phase 170 V AC to 264 V AC					
	Permissible frequency fluctuation	±3% maximum					
Control circuit power supply input	Voltage/frequency	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz					
	Rated current [A]	0.2					
	Permissible voltage fluctuation	1-phase 170 V AC to 264 V AC					
	Permissible frequency fluctuation	±3% maximum					
	Power consumption [W]	30					
Interface power supply		24 V DC ± 10% (required current capacity: 0.35 A)					
Capacity [kW]		11	18	30	37	45	55
Protective functions		Undervoltage protection, regenerative error protection, regenerative overvoltage shut-off, MC drive circuit error protection, open-phase detection, inrush current suppression circuit error protection, main circuit device overheat error protection, cooling fan error protection, overload shut-off (electronic thermal)					
Continuous rating [kW]		7.5	11	20	22	22	37
Instantaneous maximum rating [kW]		39	60	92	101	125	175
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 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: 5 %RH to 90 %RH (non-condensing)					
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust					
	Altitude	2000 m or less above sea level (Note 3)					
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y and Z axes)					
Mass [kg]		6.1	6.1	12.1	12.1	12.1	25.0

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 power regeneration converter unit is operated within the specified power supply voltage and frequency.
2. Terminal blocks are excluded.
3. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the restrictions when using the power regeneration converter units at altitude exceeding 1000 m and up to 2000 m above sea level.

MR-CV Power Regeneration Converter Unit Specifications (400 V)

B B-RJ B-RJ100

Power regeneration converter unit model MR-CV_		11K4	18K4	30K4	37K4	45K4	55K4	75K4
Output	Rated voltage	513 V DC to 648 V DC						
	Rated current [A]	21	38	72	82	99	119	150
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]	18	35	61	70	85	106	130
	Permissible voltage fluctuation	3-phase 323 V AC to 528 V AC						
	Permissible frequency fluctuation	±3% 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						
	Permissible voltage fluctuation	1-phase 323 V AC to 528 V AC						
	Permissible frequency fluctuation	±3% maximum						
	Power consumption [W]	30						
Interface power supply		24 V DC ± 10% (required current capacity: 0.35 A)						
Capacity [kW]		11	18	30	37	45	55	75
Protective functions		Undervoltage protection, regenerative error protection, regenerative overvoltage shut-off, MC drive circuit error protection, open-phase detection, inrush current suppression circuit error protection, main circuit device overheat error protection, cooling fan error protection, overload shut-off (electronic thermal)						
Continuous rating [kW]		7.5	11	20	25	25	55	55
Instantaneous maximum rating [kW]		39	60	92	101	125	175	180
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 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: 5 %RH to 90 %RH (non-condensing)						
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust						
	Altitude	2000 m or less above sea level (Note 3)						
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y and Z axes)						
Mass [kg]		6.1	6.1	12.1	12.1	12.1	25.0	25.0

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 power regeneration converter unit is operated within the specified power supply voltage and frequency.
2. Terminal blocks are excluded.
3. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the restrictions when using the power regeneration converter units at altitude exceeding 1000 m and up to 2000 m above sea level.

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

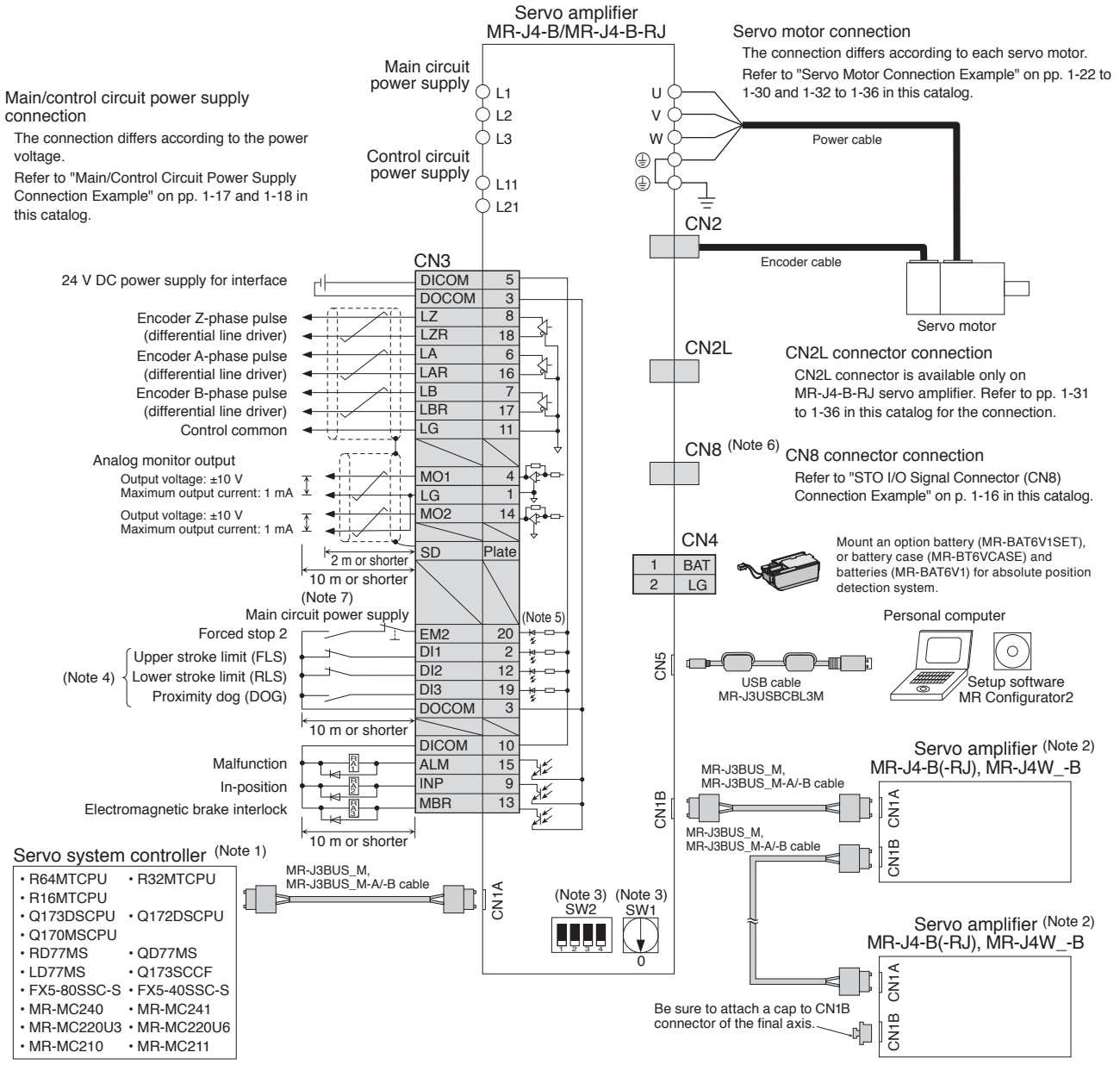
B B-RJ A A-RJ

Resistance regeneration converter unit model MR-CR_		55K	55K4
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)	
Capacity [kW]		55	
Regenerative power (when a 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	
Continuous rating [kW]		55	
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 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: 5 %RH to 90 %RH (non-condensing)	
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust	
	Altitude	2000 m or less above sea level (Note 3)	
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y, and Z axes)	
Mass [kg]		22	22

Notes: 1. Rated output and speed of a rotary servo motor are applicable when the resistance regeneration converter unit is operated within the specified power supply voltage and frequency.
2. Terminal blocks are excluded.
3. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the restrictions when using the resistance regeneration converter unit at altitude exceeding 1000 m and up to 2000 m above sea level.

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

B B-RJ



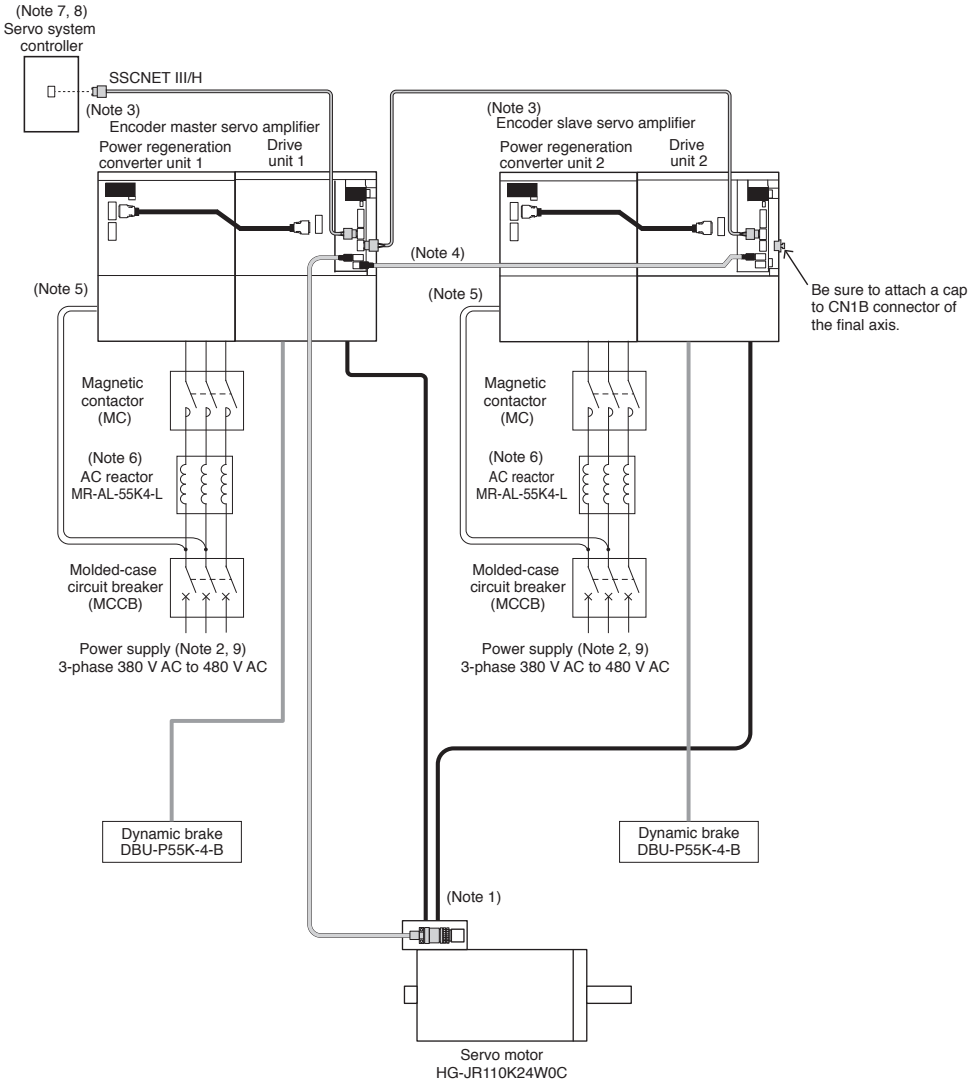
Notes: 1. For details such as setting the servo system controllers, refer to the programming or user's manual of each controller.
2. Connections for the second and following axes are omitted.
3. Up to 64 axes are set with a combination of an axis selection rotary switch (SW1) and auxiliary axis number setting switches (SW2-3 and SW2-4). Note that the number of the connectable axes depends on the servo system controller specifications.
4. Devices can be assigned for DI1, DI2 and DI3 with servo system 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. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
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.

MR-J4-DU_B4-RJ100 System Configurations

B-RJ100

●For HG-JR110K24W0C

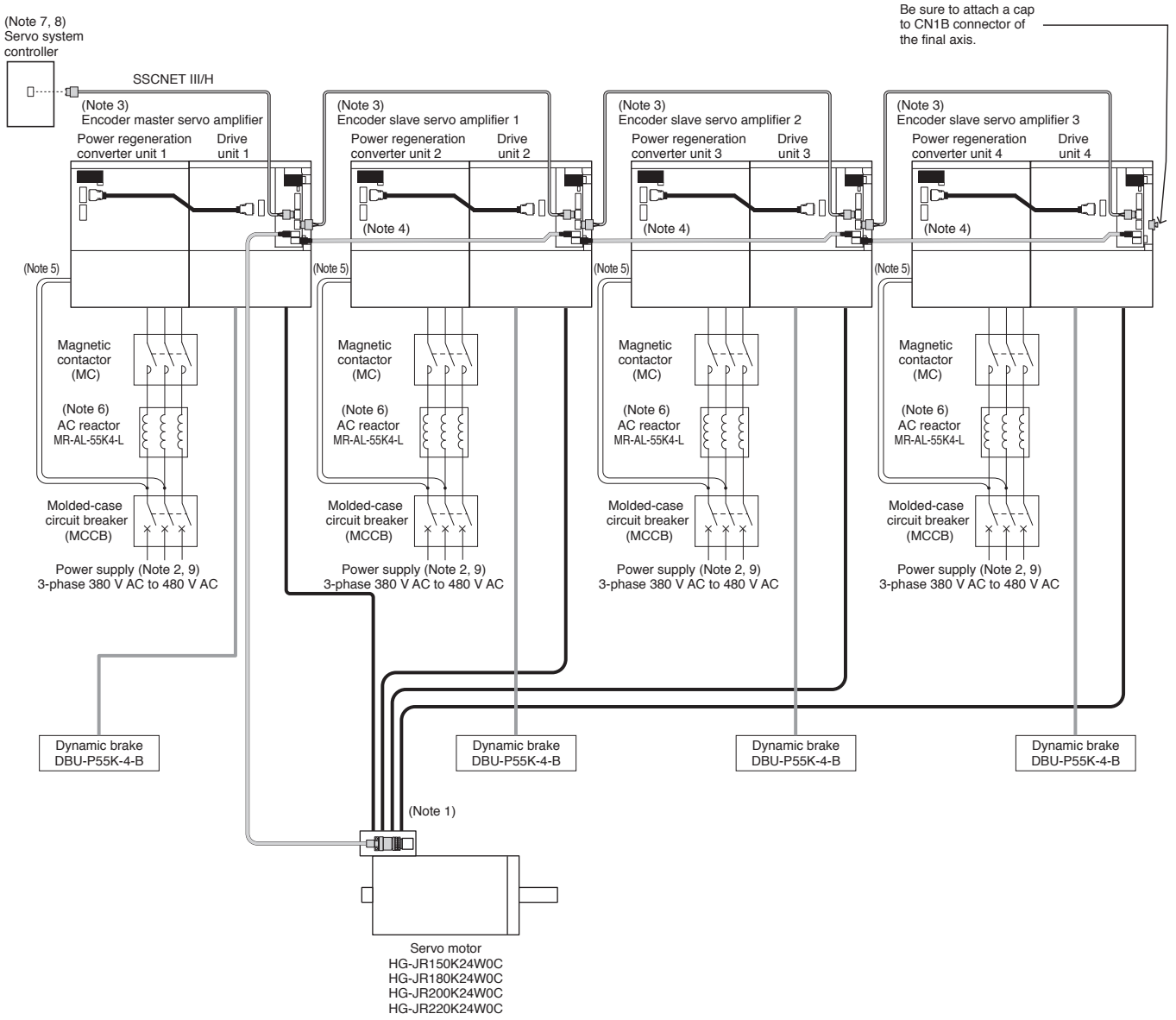


Notes: 1. Connect the grounding wire of the servo motor only to the first drive unit. If the grounding wire is connected to two drive units, circulating current may flow to the grounding wire, depending on the wiring situation. However, if the grounding wire has to be connected to the two drive units for safety reasons, be sure to twist the U, V and W wires of each drive unit.
2. For power supply, a molded-case circuit breaker, an AC reactor (MR-AL-55K4-L), and a magnetic contactor are required per power regeneration converter unit.
3. For SSCNET III/H connection, connect the encoder master servo amplifier closest to the Motion controller and then the encoder slave servo amplifier. Connect the encoder master servo amplifier and encoder slave servo amplifier in series on the same SSCNET III/H system.
4. Keep the encoder cable length between two drive units within 5 m.
5. Simultaneously turn on the control circuit power supplies of all the servo amplifiers (power regeneration converter units and drive units).
6. The AC reactor may be installed between the power regeneration converter unit and the magnetic contactor.
7. Refer to "Compatible Controllers" on p. 1-50 in this catalog for compatible controllers. Contact your local sales office for more details.
8. Create a sequence that stops the servo motor with the controller forced stop when an alarm occurs.
9. All the servo amplifiers (power regeneration converter units and drive units) must be powered from a single power source. If power is supplied from different power sources, the output may be different between the encoder master servo amplifier and the encoder slave servo amplifier, causing the servo motor to be driven improperly.

MR-J4-DU_B4-RJ100 System Configurations

B-RJ100

●For HG-JR150K24W0C/HG-JR180K24W0C/HG-JR200K24W0C/HG-JR220K24W0C

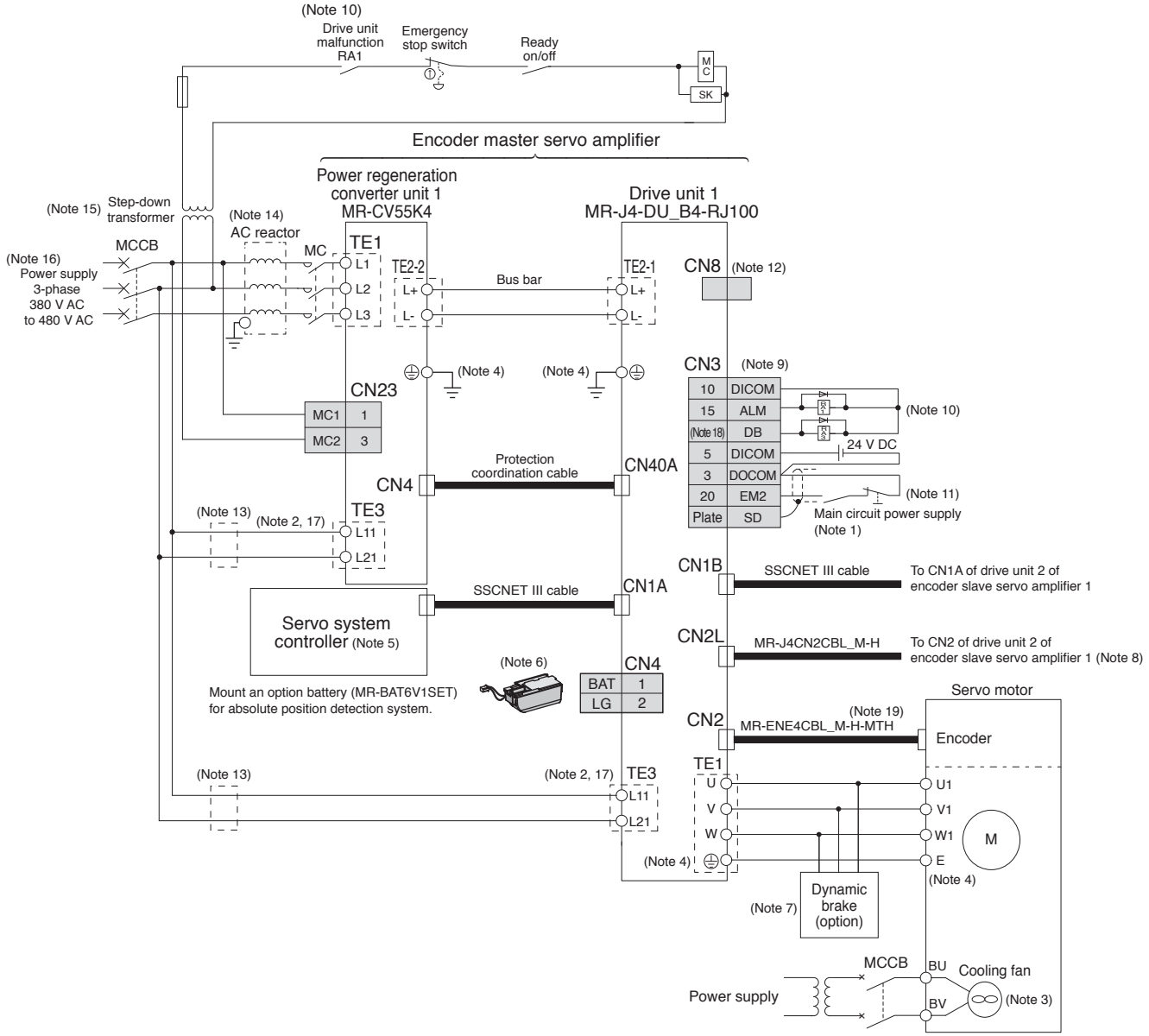


Notes: 1. Connect the grounding wire of the servo motor only to the first drive unit. If the grounding wire is connected to two or more drive units, circulating current may flow to the grounding wire, depending on the wiring situation. However, if the grounding wire has to be connected to the two or more drive units for safety reasons, be sure to twist the U, V and W wires of each drive unit.
2. For power supply, a molded-case circuit breaker, an AC reactor (MR-AL-55K4-L), and a magnetic contactor are required per power regeneration converter unit.
3. For SSCNET III/H connection, connect the encoder master servo amplifier closest to the Motion controller and then the encoder slave servo amplifiers. Connect the encoder master servo amplifier and encoder slave servo amplifiers in series on the same SSCNET III/H system.
4. Keep the encoder cable length between two drive units within 5 m.
5. Simultaneously turn on the control circuit power supplies of all the servo amplifiers (power regeneration converter units and drive units).
6. The AC reactor may be installed between the power regeneration converter unit and the magnetic contactor.
7. Refer to "Compatible Controllers" on p. 1-50 in this catalog for compatible controllers. Contact your local sales office for more details.
8. Create a sequence that stops the servo motor with the controller forced stop when an alarm occurs.
9. All the servo amplifiers (power regeneration converter units and drive units) must be powered from a single power source. If power is supplied from different power sources, the output may be different between the encoder master servo amplifier and the encoder slave servo amplifiers, causing the servo motor to be driven improperly.

MR-J4-DU_B4-RJ100 Standard Wiring Diagram Example

B-RJ100

●Connection example for encoder master servo amplifier

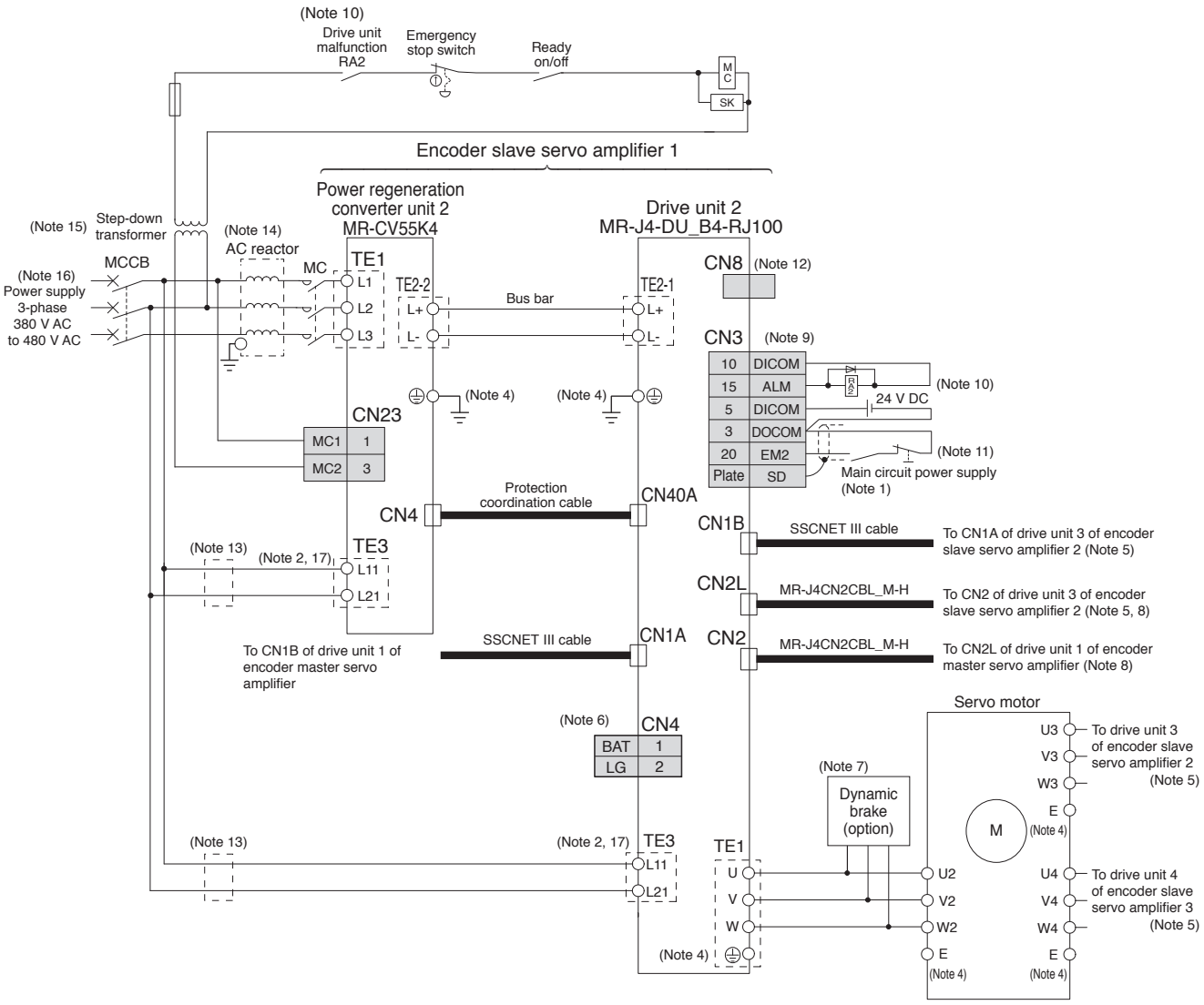


Notes: 1. To prevent an unexpected restart of the drive unit, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
2. The phases of the power supply connected to L11 and L21 on the power regeneration converter unit and the drive unit must always match the phases connected to L1 and L2. An incorrect connection may damage the drive unit and the power regeneration converter unit.
3. Be sure to supply power to the cooling fan terminals. For specifications of the cooling fan power supply and how to detect a failure, refer to "Servo Motor Instruction Manual (Vol. 3)".
4. Connect the grounding wire of the servo motor to the drive unit. Put the grounding wires of the drive unit and the power regeneration converter unit together into one on the cabinet protective earth (PE) terminal, and then connect to ground. Connect the grounding wire of the servo motor only to the drive unit of the encoder master servo amplifier. If the grounding wire is connected to two or more drive units, circulating current may flow to the grounding wire, depending on the wiring situation. However, if the grounding wire has to be connected to the two or more drive units for safety reasons, be sure to twist the U, V and W wires of each drive unit.
5. Refer to "Compatible Controllers" on p. 1-50 in this catalog for compatible controllers. Contact your local sales office for more details.
6. For absolute position detection system, connect an option battery only to the drive unit of the encoder master servo amplifier. Do not connect the battery to the drive units of the encoder slave servo amplifiers.
7. Use an external dynamic brake (option) with the drive unit. 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 "MR-J4-DU_B4-RJ100 Drive Unit Instruction Manual" when wiring the dynamic brake.
8. Encoder signals are distributed to all the drive units in the system via each drive unit.
9. This is for sink wiring. Source wiring is also possible.
10. Create a sequence that shuts off the main circuit power when an alarm occurs.
11. Create a circuit to turn on or off EM2 (Forced stop 2) of the drive units of the encoder master servo amplifier and encoder slave servo amplifiers simultaneously.
12. Be sure to attach a short-circuit connector supplied with the drive unit when the STO function is not used.
13. Install an overcurrent protection device (molded-case circuit breaker, fuse, etc.) to protect the branch circuit. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for details.
14. The AC reactor may be installed between the power regeneration converter unit and the magnetic contactor.
15. A step-down transformer is required if coil voltage of the magnetic contactor is in 200 V class.
16. All the servo amplifiers (power regeneration converter units and drive units) must be powered from a single power source. If power is supplied from different power sources, the output may be different between the encoder master servo amplifier and the encoder slave servo amplifiers, causing the servo motor to be driven improperly.
17. Simultaneously turn on the control circuit power supplies of all the servo amplifiers (power regeneration converter units and drive units).
18. The dynamic brake must be controlled by the drive unit of the encoder master servo amplifier. Assign DB (Dynamic brake interlock) with [Pr. PD07] to [Pr. PD09].
19. The encoder cable has thermistor signal wires. No additional wiring is required for the thermistor signal.

MR-J4-DU_B4-RJ100 Standard Wiring Diagram Example

B-RJ100

●Connection example for encoder slave servo amplifier (Note 3)



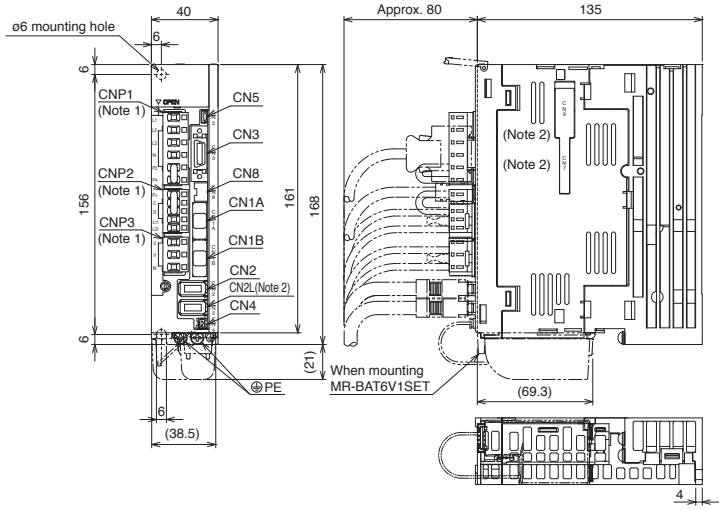
Notes: 1. To prevent an unexpected restart of the drive unit, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
2. The phases of the power supply connected to L11 and L21 on the power regeneration converter unit and the drive unit must always match the phases connected to L1 and L2. An incorrect connection may damage the drive unit and the power regeneration converter unit.
3. This connection is an example for the encoder slave servo amplifier 1.
4. Connect the grounding wire of the servo motor to the drive unit. Put the grounding wires of the drive unit and the power regeneration converter unit together into one on the cabinet protective earth (PE) terminal, and then connect to ground. Connect the grounding wire of the servo motor only to the drive unit of the encoder master servo amplifier. If the grounding wire is connected to two or more drive units, circulating current may flow to the grounding wire, depending on the wiring situation. However, if the grounding wire has to be connected to the two or more drive units for safety reasons, be sure to twist the U, V and W wires of each drive unit.
5. This diagram is applicable when HG-JR150K24W0C, HG-JR180K24W0C, HG-JR200K24W0C, or HG-JR220K24W0C servo motor is used. For HG-JR110K24W0C, connections to drive unit 3 and 4 are not required.
6. For absolute position detection system, connect an option battery only to the drive unit of the encoder master servo amplifier. Do not connect the battery to the drive units of the encoder slave servo amplifiers.
7. Use an external dynamic brake (option) with the drive unit. 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 "MR-J4-DU_B4-RJ100 Drive Unit Instruction Manual" when wiring the dynamic brake.
8. Encoder signals are distributed to all the drive units in the system via each drive unit.
9. This is for sink wiring. Source wiring is also possible.
10. Create a sequence that shuts off the main circuit power when an alarm occurs.
11. Create a circuit to turn on or off EM2 (Forced stop 2) of the drive units of the encoder master servo amplifier and encoder slave servo amplifiers simultaneously.
12. Be sure to attach a short-circuit connector supplied with the drive unit when the STO function is not used.
13. Install an overcurrent protection device (molded-case circuit breaker, fuse, etc.) to protect the branch circuit. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for details.
14. The AC reactor may be installed between the power regeneration converter unit and the magnetic contactor.
15. A step-down transformer is required if coil voltage of the magnetic contactor is in 200 V class.
16. All the servo amplifiers (power regeneration converter units and drive units) must be powered from a single power source. If power is supplied from different power sources, the output may be different between the encoder master servo amplifier and the encoder slave servo amplifiers, causing the servo motor to be driven improperly.
17. Simultaneously turn on the control circuit power supplies of all the servo amplifiers (power regeneration converter units and drive units).

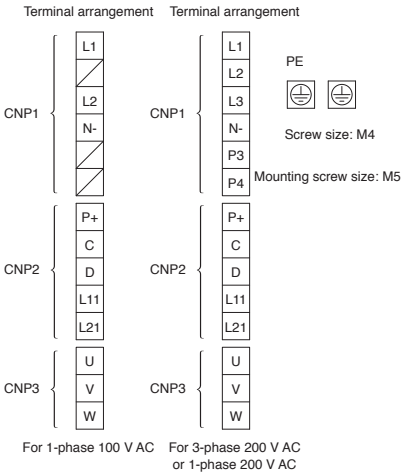
MR-J4-B/MR-J4-B-RJ Dimensions

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

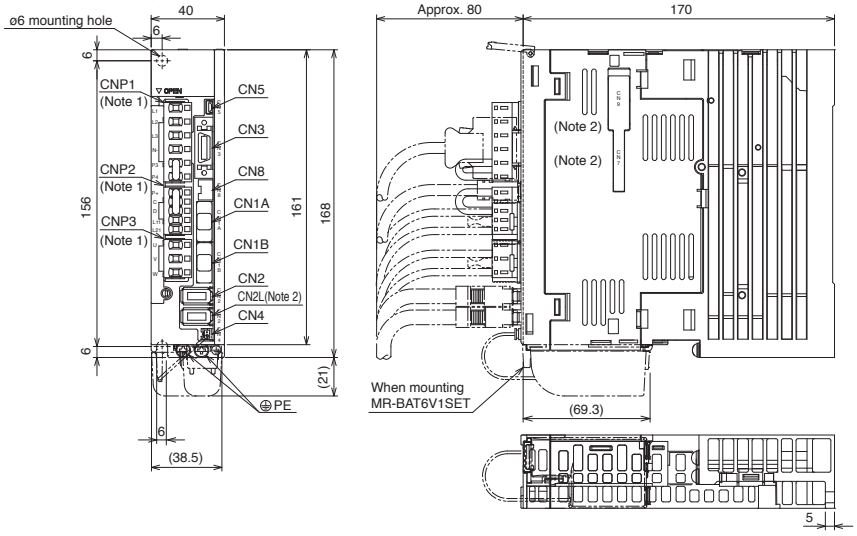


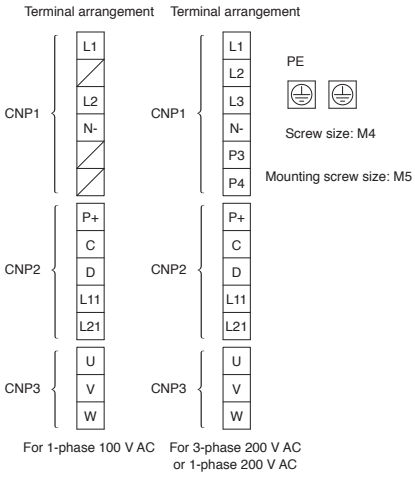


[Unit: mm]

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

●MR-J4-60B, MR-J4-60B-RJ

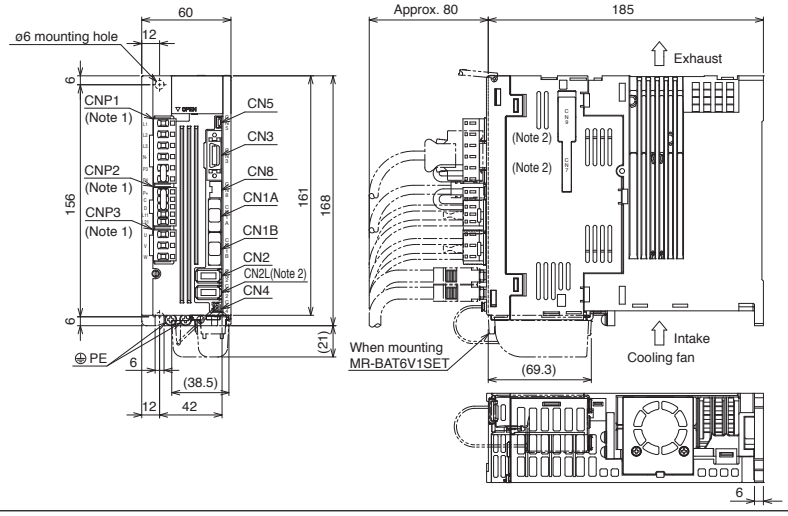


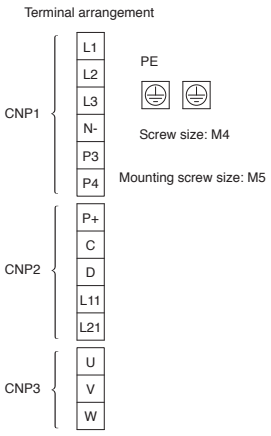


[Unit: mm]

●MR-J4-70B, MR-J4-70B-RJ

●MR-J4-100B, MR-J4-100B-RJ





[Unit: mm]

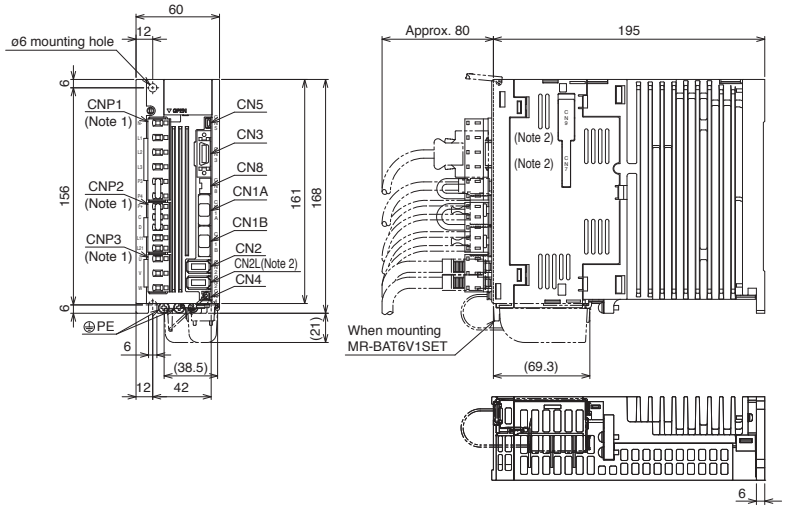
Notes: 1. CNP1, CNP2 and CNP3 connectors are supplied with the servo amplifier.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-B servo amplifier.

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

B B-RJ

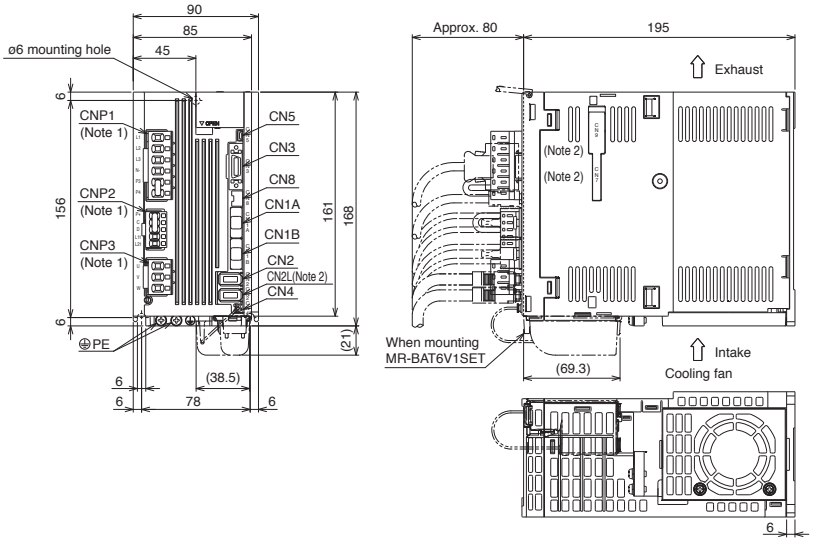
●MR-J4-60B4, MR-J4-60B4-RJ

●MR-J4-100B4, MR-J4-100B4-RJ



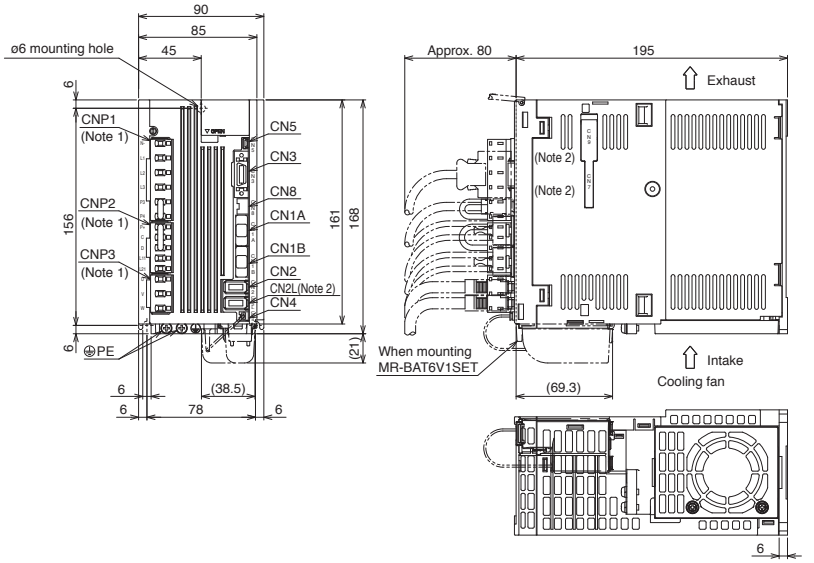
[Unit: mm]

●MR-J4-200B, MR-J4-200B-RJ



[Unit: mm]

●MR-J4-200B4, MR-J4-200B4-RJ



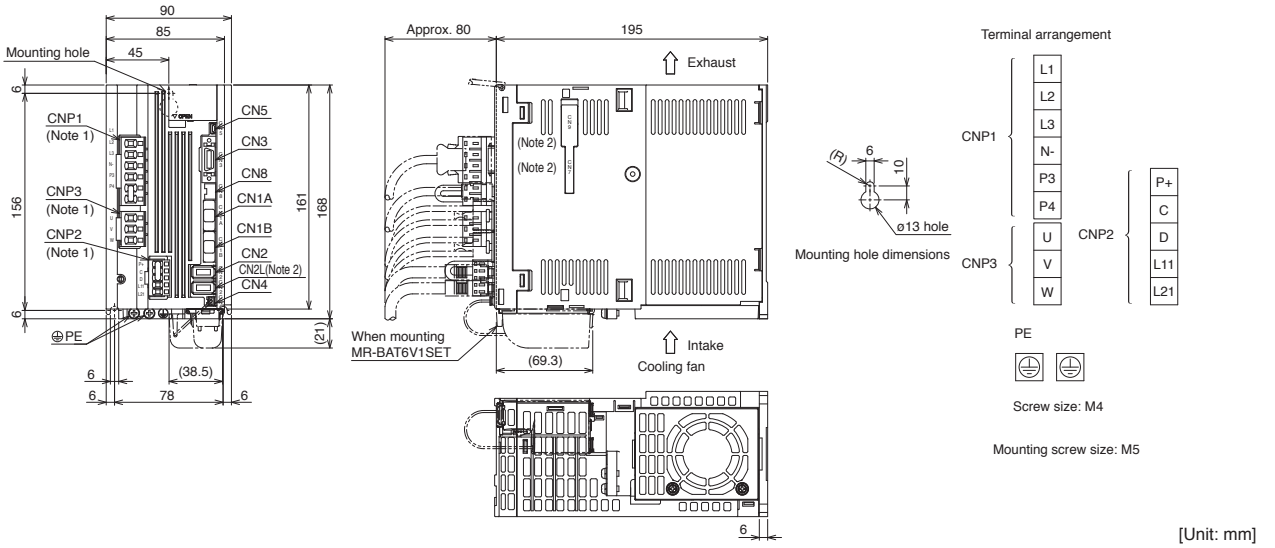
[Unit: mm]

Notes: 1. CNP1, CNP2 and CNP3 connectors 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

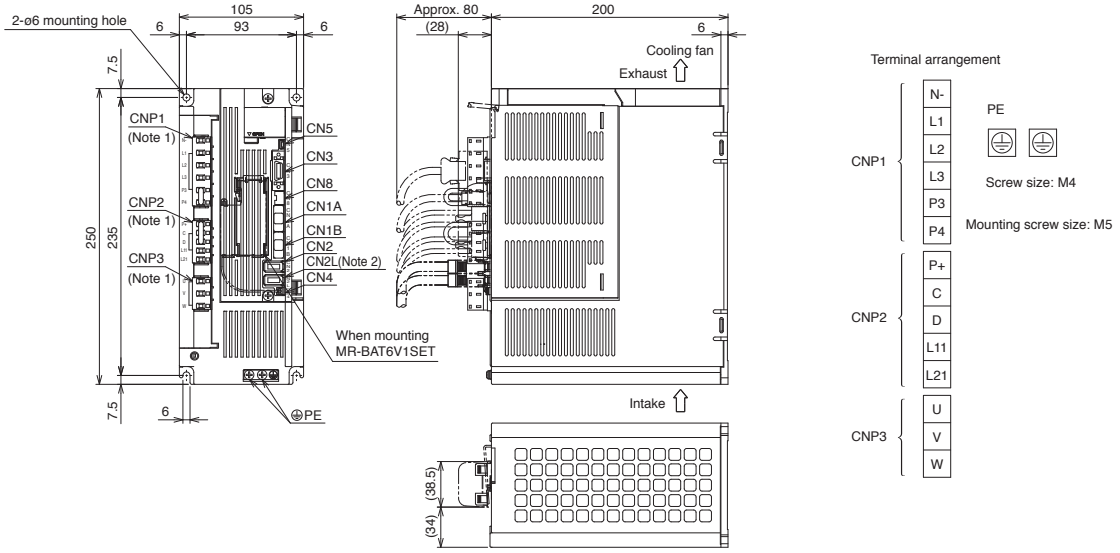
B B-RJ

●MR-J4-350B, MR-J4-350B-RJ



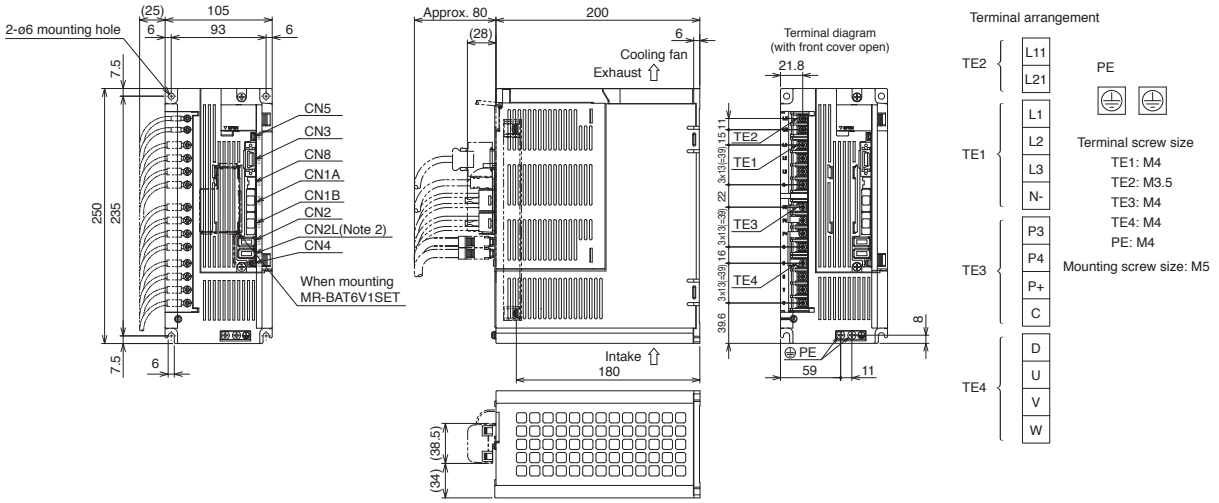
[Unit: mm]

●MR-J4-350B4, MR-J4-350B4-RJ



[Unit: mm]

●MR-J4-500B, MR-J4-500B-RJ



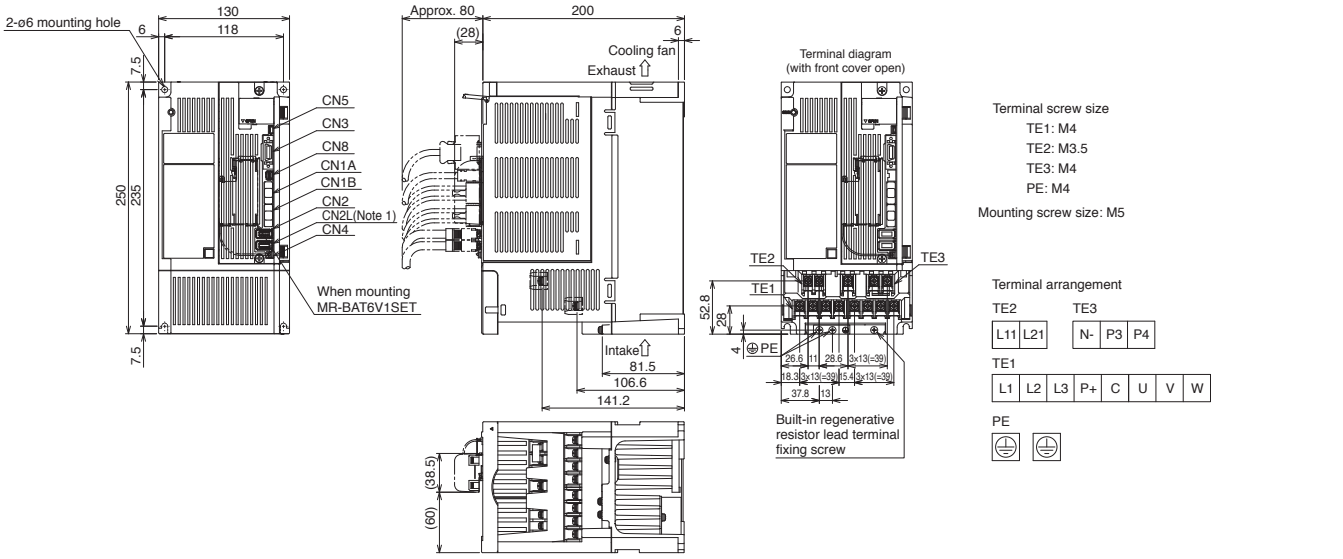
[Unit: mm]

Notes: 1. CNP1, CNP2 and CNP3 connectors 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



Terminal screw size
TE1: M4
TE2: M3.5
TE3: M4
PE: M4
Mounting screw size: M5

Terminal arrangement

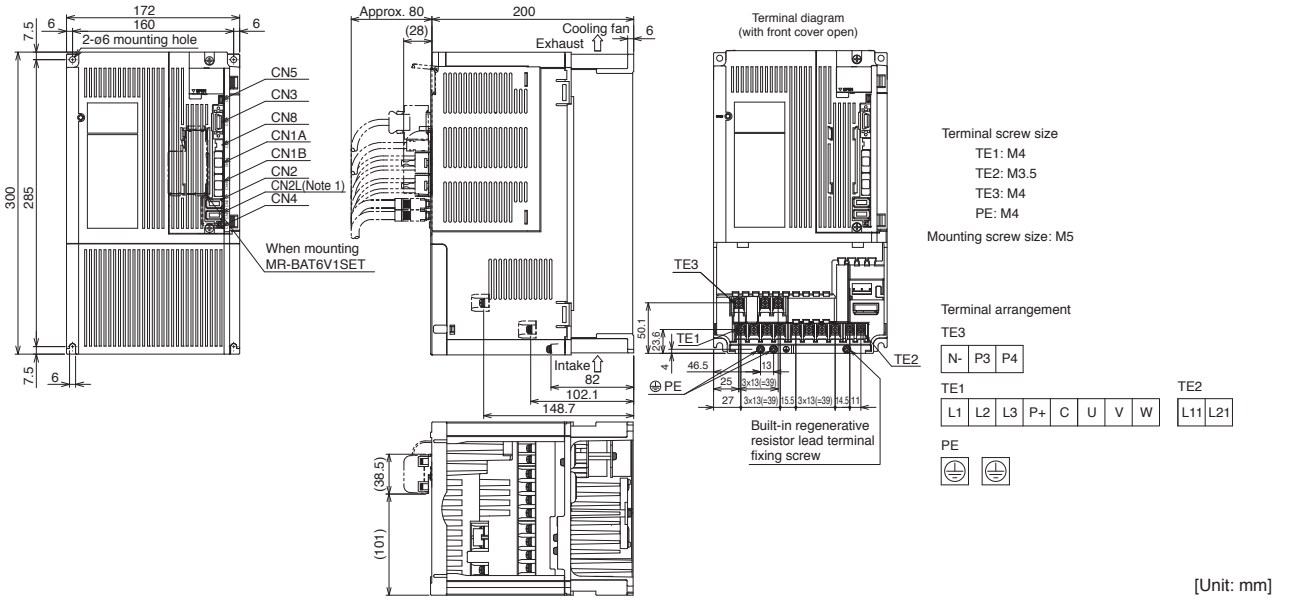
TE2		TE3		
L11	L21	N-	P3	P4

TE1								
L1	L2	L3	P+	C	U	V	W	

PE

[Unit: mm]

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



Terminal screw size
TE1: M4
TE2: M3.5
TE3: M4
PE: M4
Mounting screw size: M5

Terminal arrangement

TE3		
N-	P3	P4

TE1								
L1	L2	L3	P+	C	U	V	W	

TE2	
L11	L21

PE

[Unit: mm]

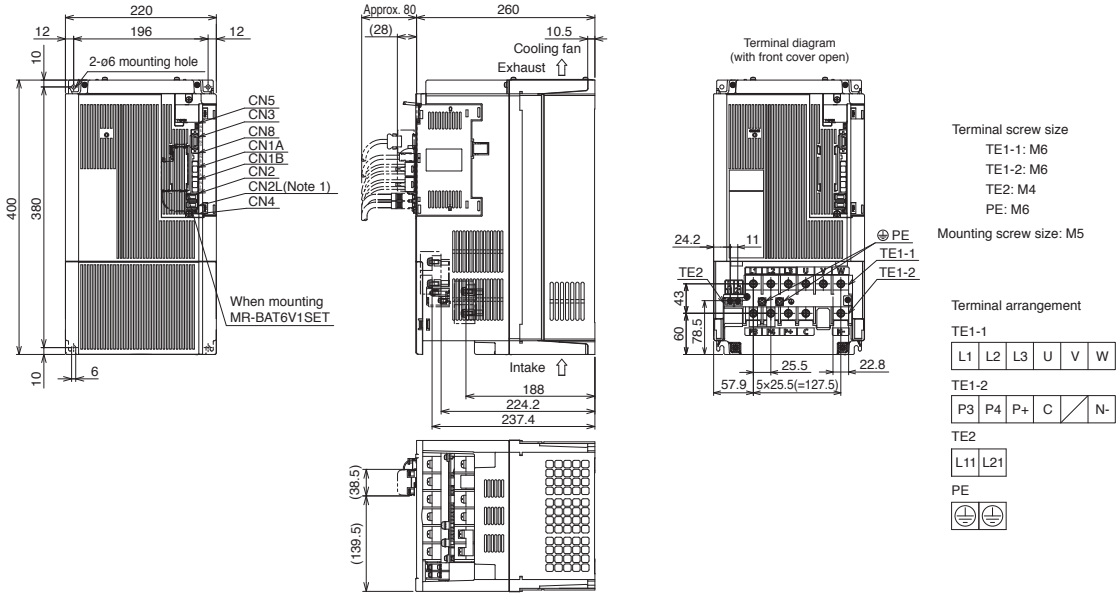
Notes: 1. CN2L, CN7, and CN9 connectors are not available for MR-J4-B servo amplifier.

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



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

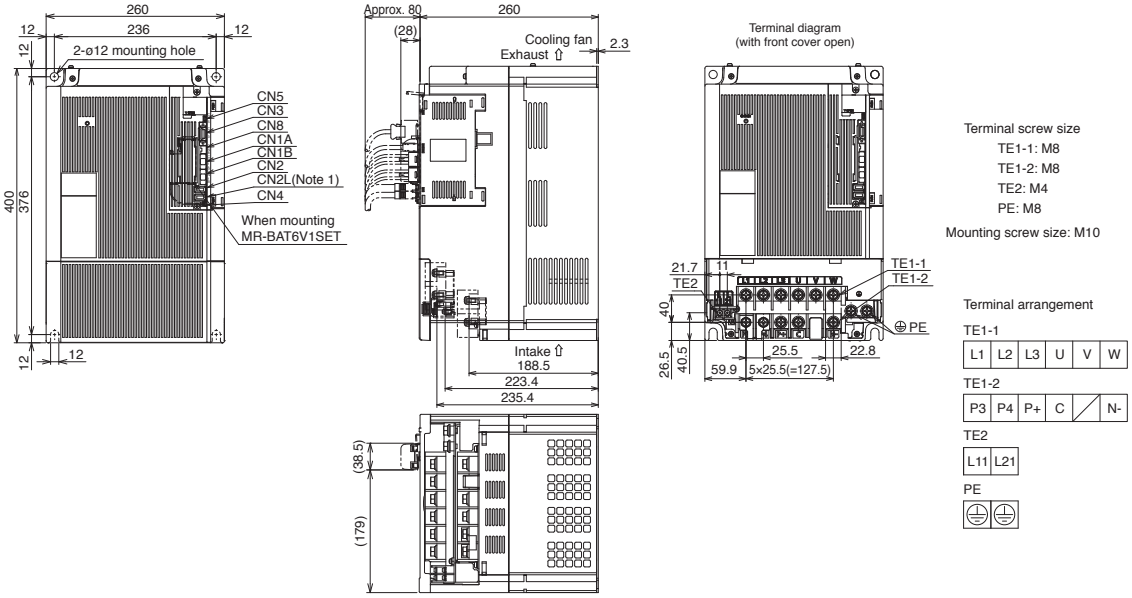
L11	L21

PE

⏚ ⏚

[Unit: mm]

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



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]

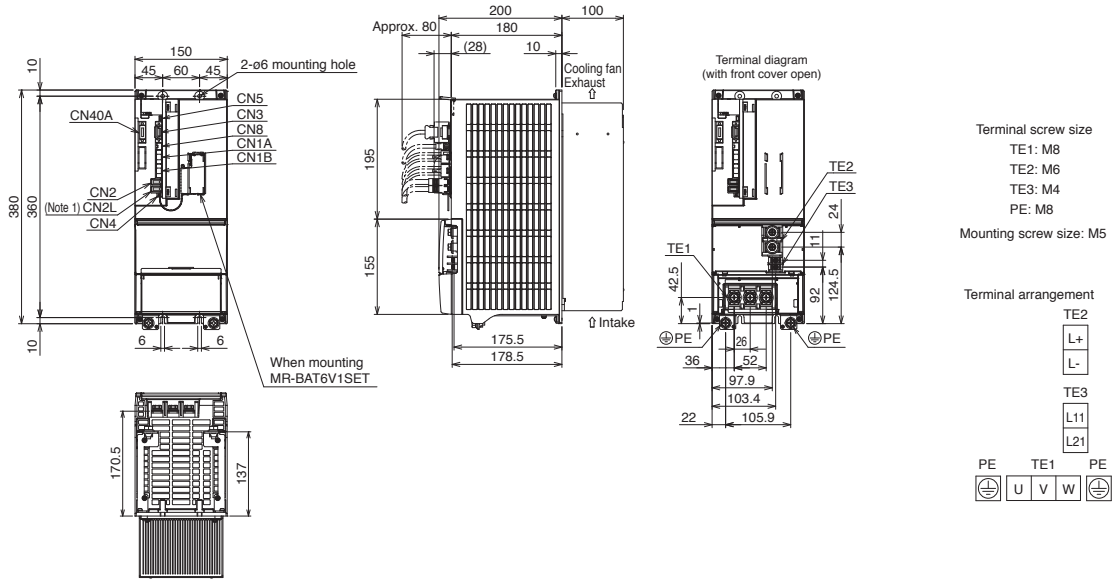
Notes: 1. CN2L, CN7, and CN9 connectors are not available for MR-J4-B servo amplifier.

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

B B-RJ

●MR-J4-DU900B, MR-J4-DU900B-RJ, MR-J4-DU900B4, MR-J4-DU900B4-RJ

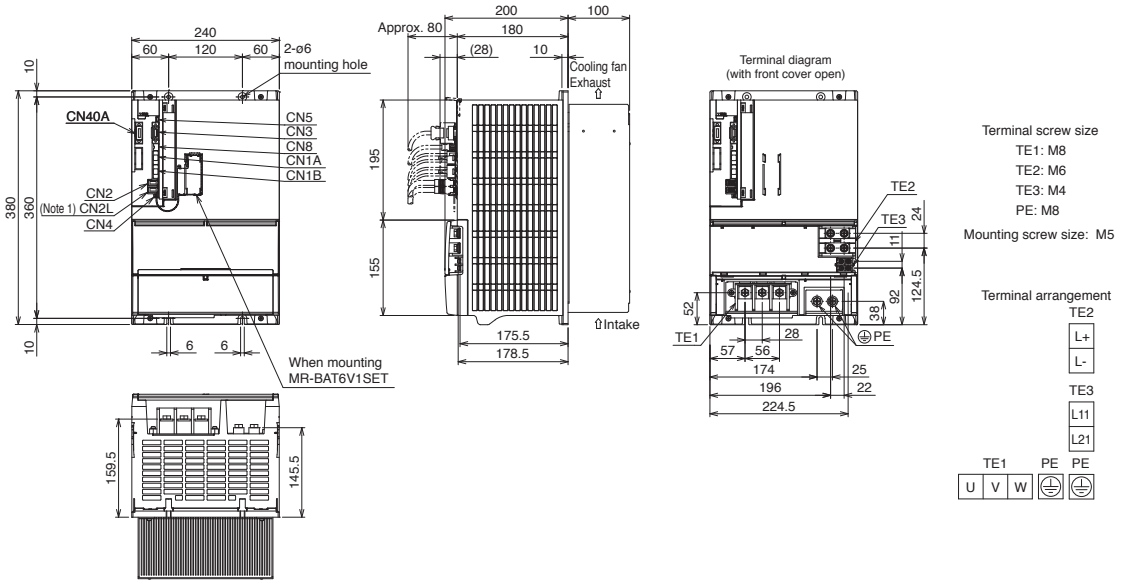
●MR-J4-DU11KB, MR-J4-DU11KB-RJ, MR-J4-DU11KB4, MR-J4-DU11KB4-RJ



[Unit: mm]

●MR-J4-DU15KB, MR-J4-DU15KB-RJ, MR-J4-DU15KB4, MR-J4-DU15KB4-RJ

●MR-J4-DU22KB, MR-J4-DU22KB-RJ, MR-J4-DU22KB4, MR-J4-DU22KB4-RJ



[Unit: mm]

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

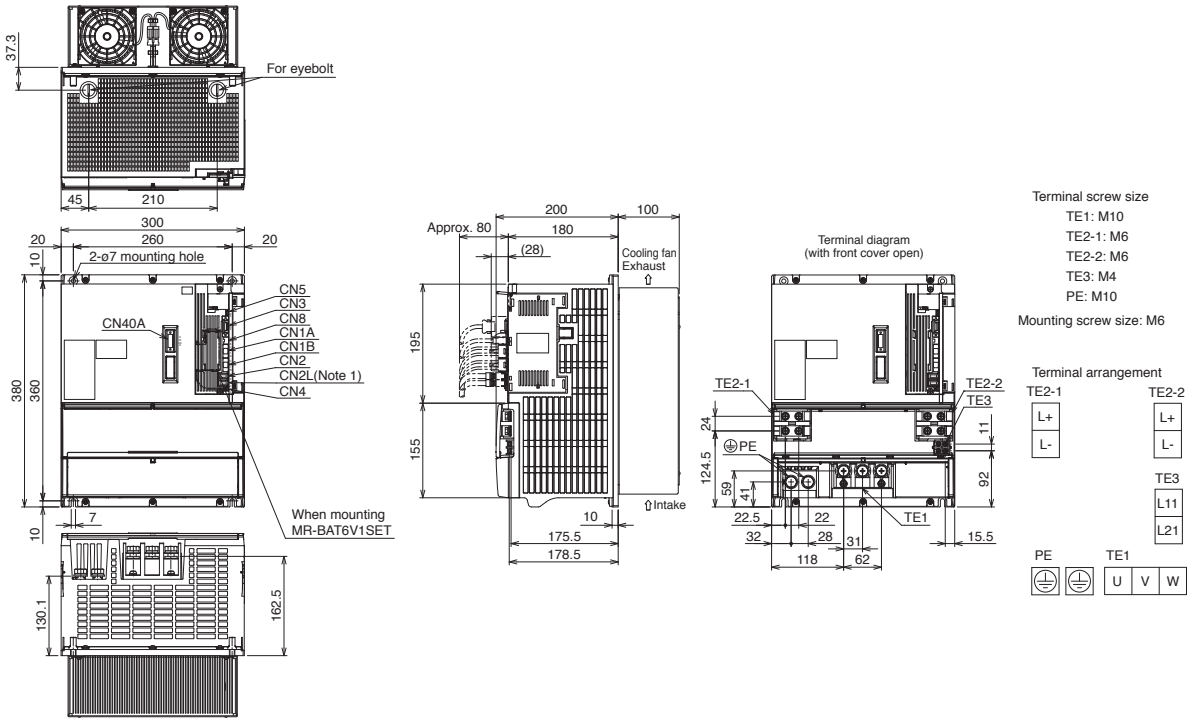
MR-J4-DU_B/MR-J4-DU_B-RJ/MR-J4-DU_B4-RJ100 Dimensions

B B-RJ B-RJ100

●MR-J4-DU30KB, MR-J4-DU30KB-RJ ●MR-J4-DU37KB, MR-J4-DU37KB-RJ

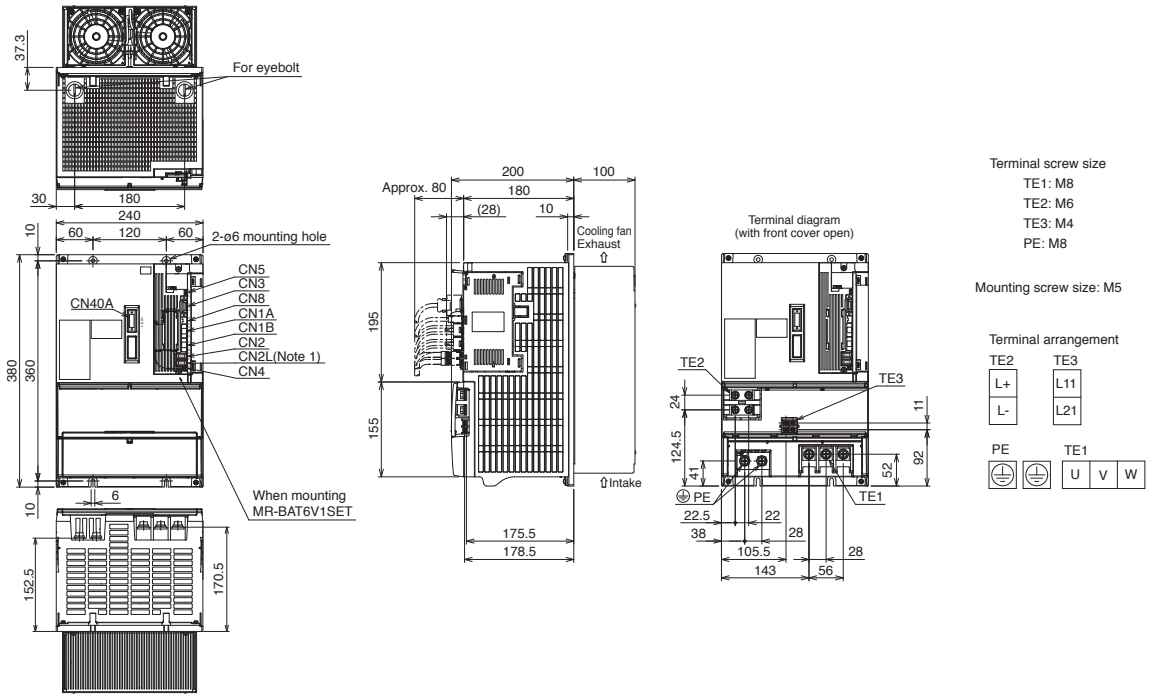
●MR-J4-DU45KB4, MR-J4-DU45KB4-RJ, MR-J4-DU45KB4-RJ100

●MR-J4-DU55KB4, MR-J4-DU55KB4-RJ, MR-J4-DU55KB4-RJ100



[Unit: mm]

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



[Unit: mm]

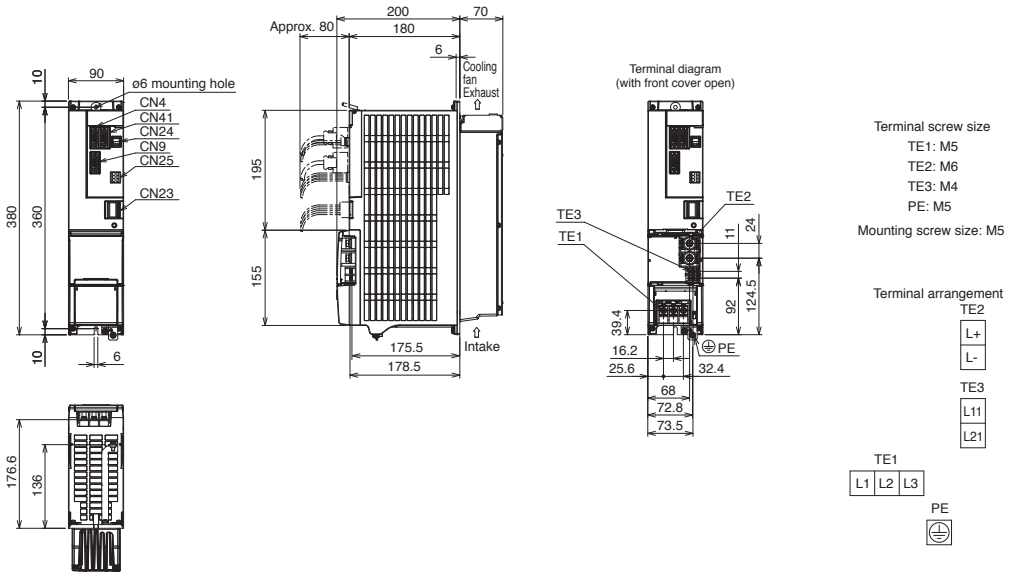
Notes: 1. CN2L, CN7, and CN9 connectors are not available for MR-J4-DU_B_ drive unit.

MR-CV_ Power Regeneration Converter Unit Dimensions

B B-RJ

●MR-CV11K, MR-CV11K4

●MR-CV18K, MR-CV18K4

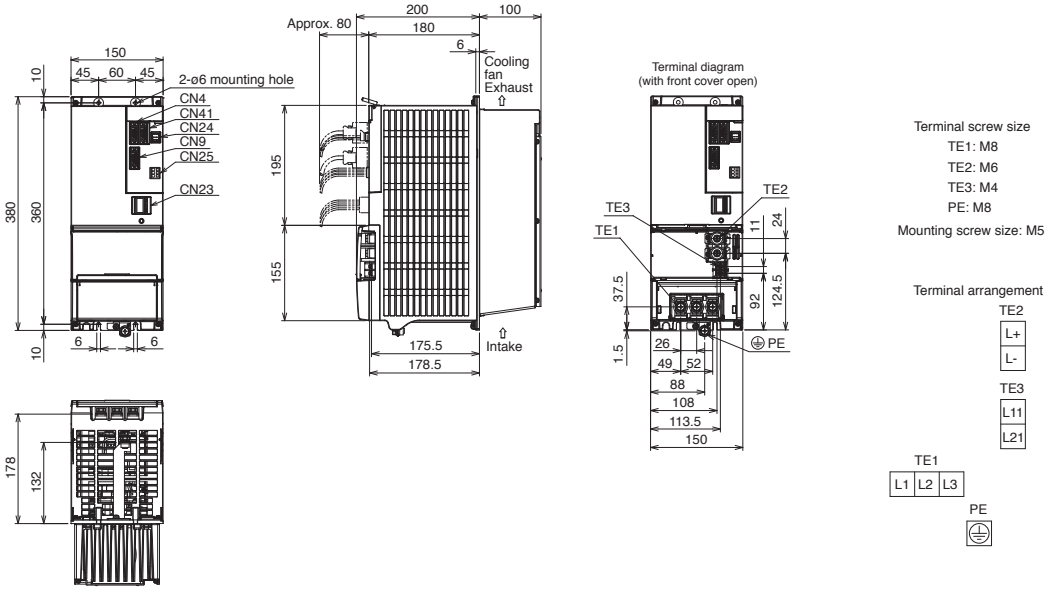


[Unit: mm]

●MR-CV30K, MR-CV30K4

●MR-CV37K, MR-CV37K4

●MR-CV45K, MR-CV45K4

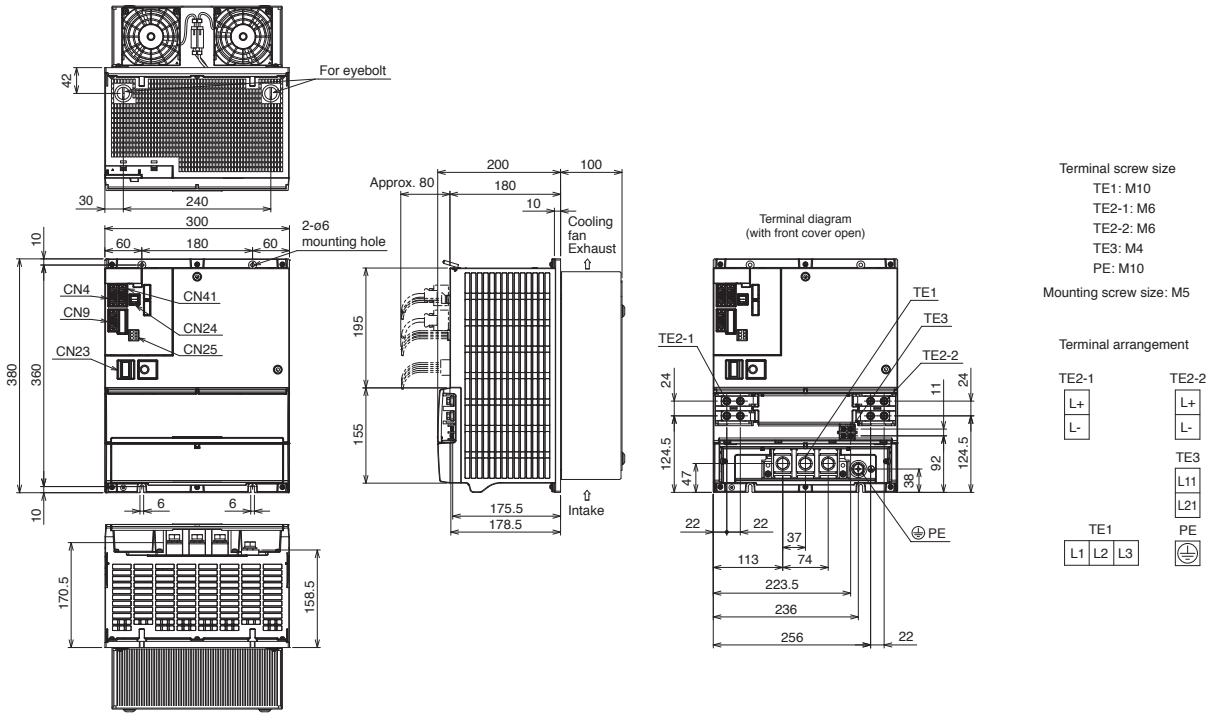


[Unit: mm]

MR-CV_ Power Regeneration Converter Unit Dimensions

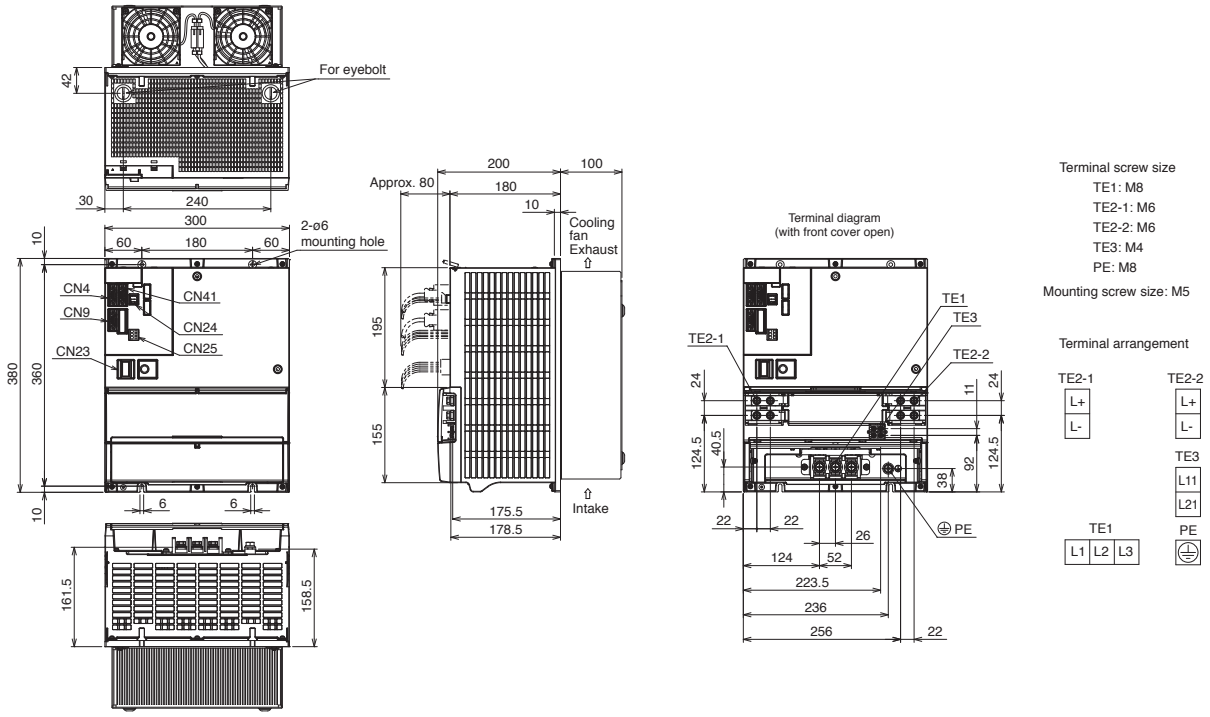
B B-RJ B-RJ100

●MR-CV55K



[Unit: mm]

●MR-CV55K4 ●MR-CV75K4

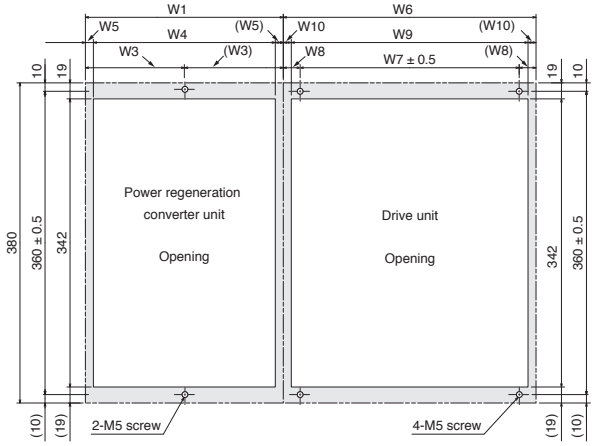


[Unit: mm]

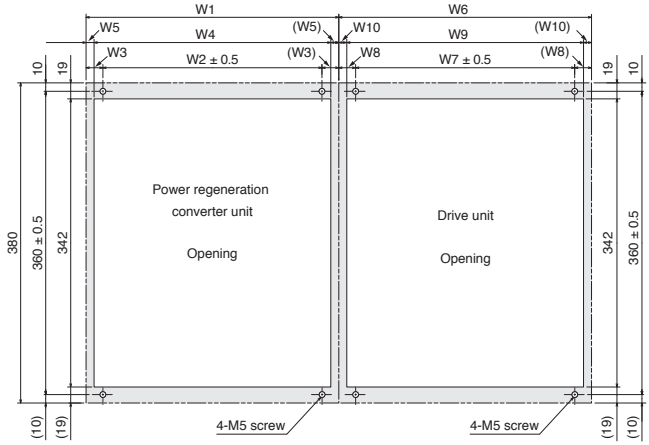
Panel Cut Dimensions for Power Regeneration Converter Unit and Drive unit

B B-RJ B-RJ100

For MR-CV11K(4) and MR-CV18K(4)



For MR-CV30K(4), MR-CV37K(4), MR-CV45K(4), MR-CV55K(4), and MR-CV75K4



Power regeneration converter unit	Variable dimensions				
	W1	W2	W3	W4	W5
MR-CV11K(4), MR-CV18K(4)	90	-	45	82	4
MR-CV30K(4), MR-CV37K(4), MR-CV45K(4)	150	60	45	142	4
MR-CV55K(4), MR-CV75K4	300	180	60	282	9

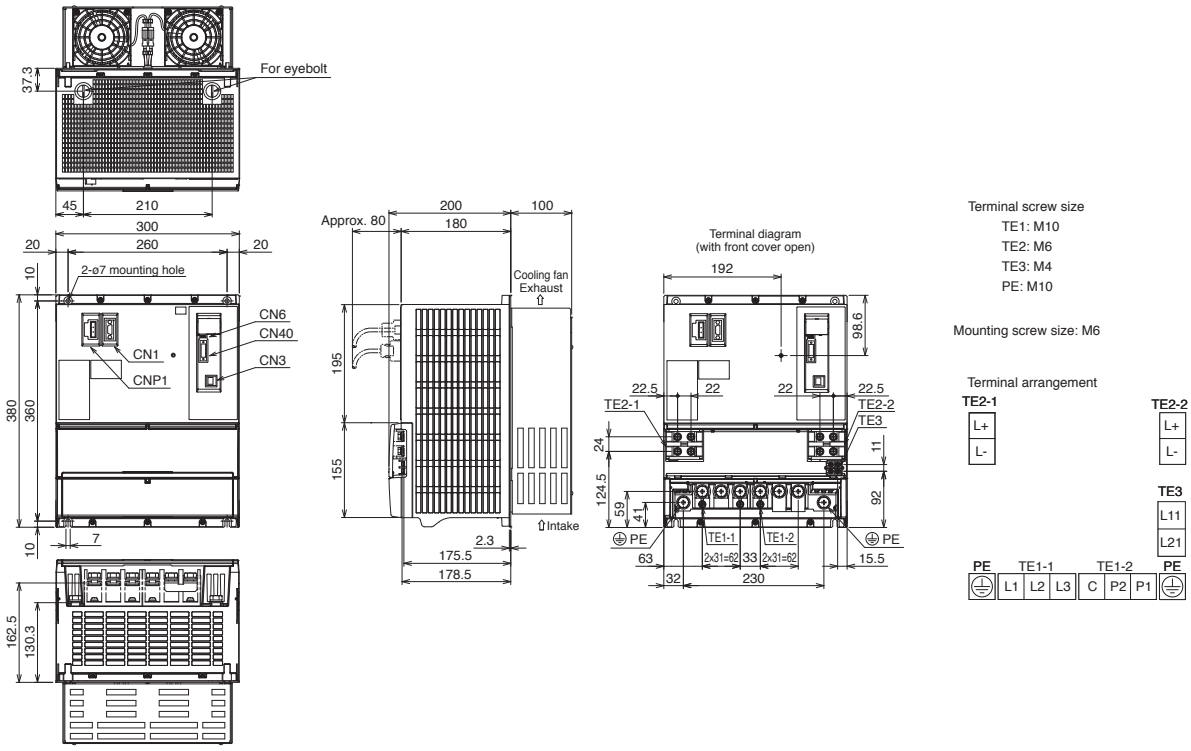
Drive unit	Variable dimensions				
	W6	W7	W8	W9	W10
MR-J4-DU900B(4)(-RJ), MR-J4-DU11KB(4)(-RJ)	150	60	45	142	4
MR-J4-DU15KB(4)(-RJ), MR-J4-DU22KB(4)(-RJ)	240	120	60	222	9
MR-J4-DU30KB(-RJ), MR-J4-DU37KB(-RJ) MR-J4-DU45KB4(-RJ), MR-J4-DU45KB4-RJ100 MR-J4-DU55KB4(-RJ), MR-J4-DU55KB4-RJ100	300	260	20	281	9.5

[Unit: mm]

MR-CR_ Resistance Regeneration Converter Unit Dimensions

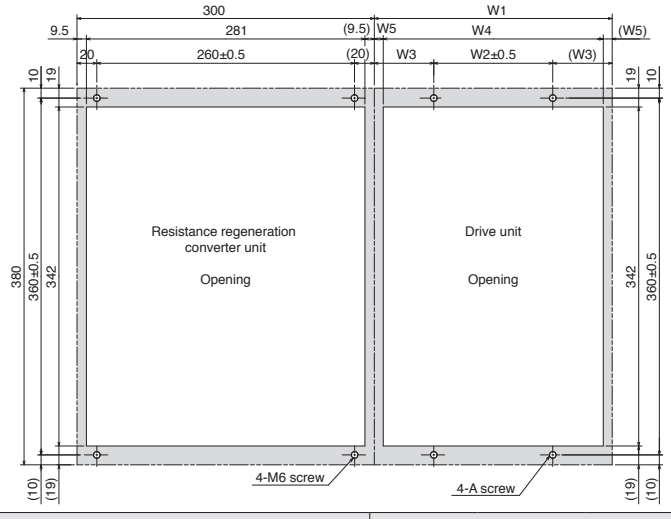
B | B-RJ | A | A-RJ

●MR-CR55K, MR-CR55K4



[Unit: mm]

Panel Cut Dimensions for Resistance Regeneration Converter Unit and Drive Unit (Note 1)



Drive unit model	Variable dimensions					Screw size
	W1	W2	W3	W4	W5	A
MR-J4-DU30KB, MR-J4-DU37KB, MR-J4-DU45KB4, MR-J4-DU55KB4 MR-J4-DU30KA, MR-J4-DU37KA, MR-J4-DU45KA4, MR-J4-DU55KA4	300	260	20	281	9.5	M6
MR-J4-DU30KB4, MR-J4-DU37KB4 MR-J4-DU30KA4, MR-J4-DU37KA4	240	120	60	222	9	M5

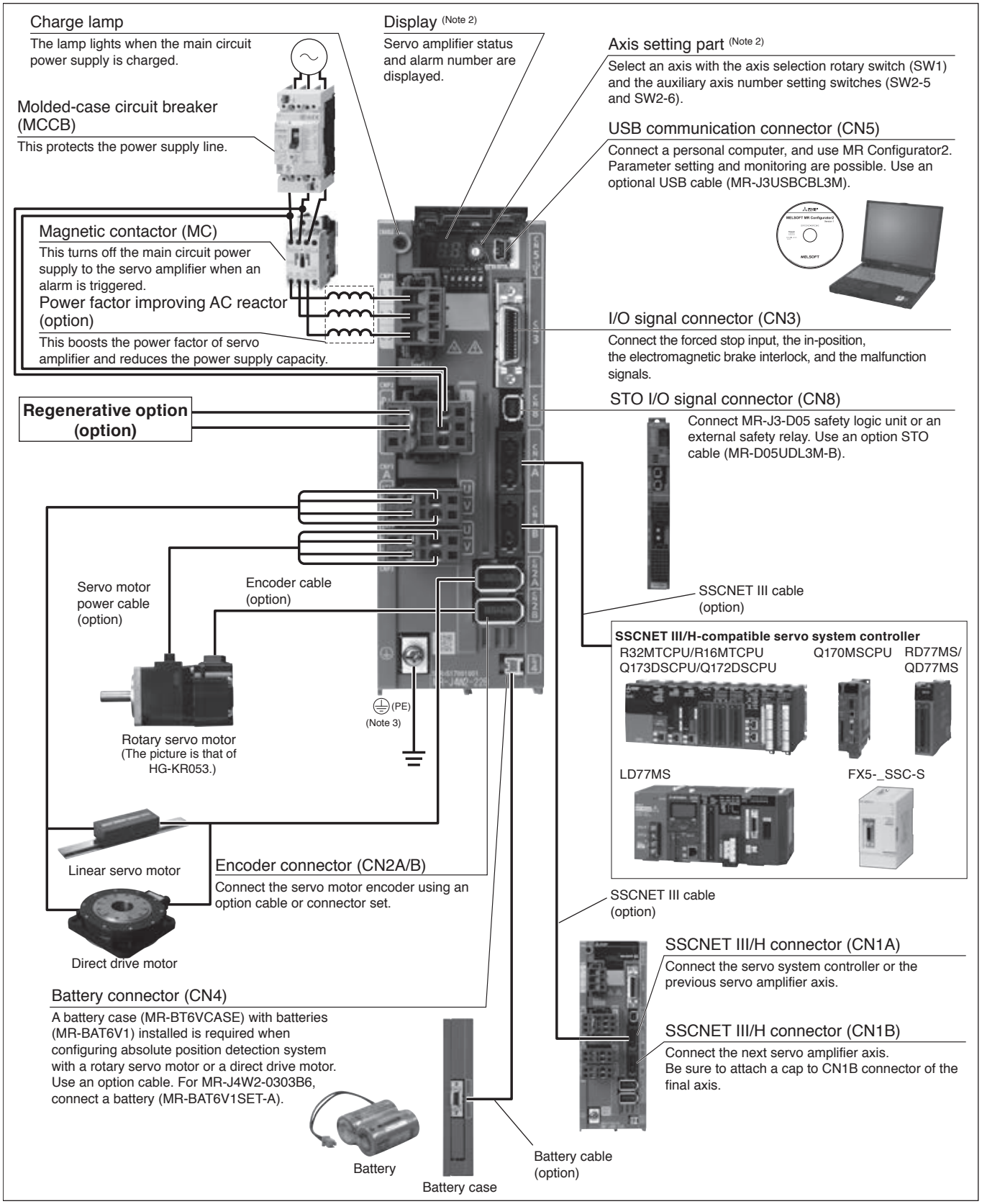
[Unit: mm]

Notes:1. The panel cut dimensions for resistance regeneration converter unit and drive unit are applicable for MR-J4-DU_B_/MR-J4-DU_B_-RJ/MR-J4-DU_A_/MR-J4-DU_A_-RJ.

MR-J4W2-B/MR-J4W3-B Connections with Peripheral Equipment (Note 1)

WB

Peripheral equipment is connected to MR-J4W2-B/MR-J4W3-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-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 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 wire to the cabinet protective earth (PE) terminal via the servo amplifier for grounding the servo motor.

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 (Note 1)		3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz			3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz
	Rated current (Note 15)	[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 (Note 5)	[J]	17	21	44	
	Moment of inertia (J) equivalent to permissible charging amount (Note 6)	[× 10^{-4} kg•m^2]	3.45	4.26	8.92	
	Mass equivalent to permissible charging amount (Note 7)	LM-H3 [kg]	3.8	4.7	9.8	
		LM-K2 LM-U2 [kg]	8.5	10.5	22.0	
Permissible regenerative power of the built-in regenerative resistor (Note 2, 3)		[W]	20		100	
Dynamic brake (Note 4)			Built-in			
SSCNET III/H command communication cycle (Note 13)			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 (Note 12)			Available (Note 11)			
Load-side encoder interface (Note 9)			Mitsubishi Electric high-speed serial communication			
Servo functions			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 (Note 14), 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			

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) (Note 10)			
Safety performance	Standards certified by CB (Note 17)	EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2			
	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)	MTTFd ≥ 100 [years] (314a)			
	Diagnostic coverage (DC)	DC = Medium, 97.6 [%]			
	Probability of dangerous Failure per Hour (PFH)	PFH = 6.4 × 10^{-9} [1/h]			
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 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: 5 %RH to 90 %RH (non-condensing)			
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust			
	Altitude	2000 m or less above sea level (Note 16)			
	Vibration resistance	5.9 m/s² 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 is operated within the specified power supply voltage and frequency.
2. Select the most suitable regenerative option for your system with our drive system sizing software Motorizer.
3. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a regenerative option is used.
4. When using the dynamic brake, refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 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 supported only in the two-wire type communication method.
12. Fully closed loop control is supported by the servo amplifiers with software version A3 or later.
13. The command communication cycle depends on the servo system controller specifications and the number of axes connected.
14. This function is supported by the servo amplifiers with software version A8 or later.
15. This value is applicable when a 3-phase power supply is used.
16. Refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
17. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual" for details.

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)	LM-H3 [kg]	4.7	6.7
		LM-K2 LM-U2 [kg]	10.5	15.0
Permissible regenerative power of the built-in regenerative resistor (Note 2, 3)		[W]	30	
Dynamic brake (Note 4)			Built-in	
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 available	
Servo functions			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	

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 (Note 14)	EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2	
	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)	MTTFd ≥ 100 [years] (314a)	
	Diagnostic coverage (DC)	DC = Medium, 97.6 [%]	
	Probability of dangerous Failure per Hour (PFH)	PFH = 6.4 × 10^{-9} [1/h]	
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 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: 5 %RH to 90 %RH (non-condensing)	
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust	
	Altitude	2000 m or less above sea level (Note 13)	
	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 is operated within the specified power supply voltage and frequency.
2. Select the most suitable regenerative option for your system with our drive system sizing software Motorizer.
3. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a regenerative option is used.
4. When using the dynamic brake, refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 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 servo system 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.
13. Refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
14. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual" for details.

MR-J4W2-0303B6 (2-axis, SSCNET III/H Interface) Specifications

WB

Servo amplifier model		MR-J4W2-0303B6
Output	Rated voltage	3-phase 13 V AC
	Rated current (each axis) [A]	2.4
Main circuit power supply input	Voltage (Note 1)	48 V DC/24 V DC (Note 4)
	Rated current [A]	For 48 V DC: 2.4 A For 24 V DC: 4.8 A
	Permissible voltage fluctuation	For 48 V DC: 40.8 V DC to 55.2 V DC For 24 V DC: 21.6 V DC to 26.4 V DC
Control circuit power supply input	Voltage	24 V DC
	Rated current [A]	0.5
	Permissible voltage fluctuation	21.6 V DC to 26.4 V DC
	Power consumption [W]	10
Interface power supply		24 V DC ± 10% (required current capacity: 0.25 A)
Control method		Sine-wave PWM control/current control method
Capacitor regeneration	Reusable regenerative energy [J] (Note 2)	0.9
	Moment of inertia (J) equivalent to permissible charging amount (Note 3) [× 10^{-4} kg•m^2]	0.18
Permissible regenerative power of the built-in regenerative resistor [W]		1.3
Dynamic brake (Note 6)		Built-in (Note 5)
SSCNET III/H command communication cycle (Note 8)		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		2 channels
Fully closed loop control		Not compatible
Servo functions		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, vibration 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
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.
Structure (IP rating)		Natural cooling, open (IP20)
Close mounting		Possible (Note 7)
DIN rail mounting (35 mm wide)		Possible
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/s^2 at 10 Hz to 55 Hz (directions of X, Y and Z axes)
Mass [kg]		0.3

Notes: 1. Rated output and speed of a rotary servo motor are applicable when the servo amplifier is operated within the specified power supply voltage.
2. Reusable regenerative energy is equivalent to 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.
3. 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.
4. Initial value is 48 V DC. For 24 V DC, set [Pr. PC05] to "_ 1 _ _." Servo motor characteristics vary depending on whether the voltage is 48 V DC or 24 V DC. Refer to "HG-AK Series (Ultra-Compact Size, Ultra-Small Capacity) Specifications" and "HG-AK Series Torque Characteristics" in this catalog.
5. The dynamic brake is electronic. The electronic dynamic brake does not operate when the control circuit power is off. It may not operate depending on alarms and warnings. Refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual" for details.
6. When using the dynamic brake, refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio.
7. When the servo amplifiers are closely mounted, keep the ambient temperature at 45 °C or lower, or keep the total load of the two axes at 45 W or lower.
8. The command communication cycle depends on the servo system controller specifications and the number of axes connected.

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

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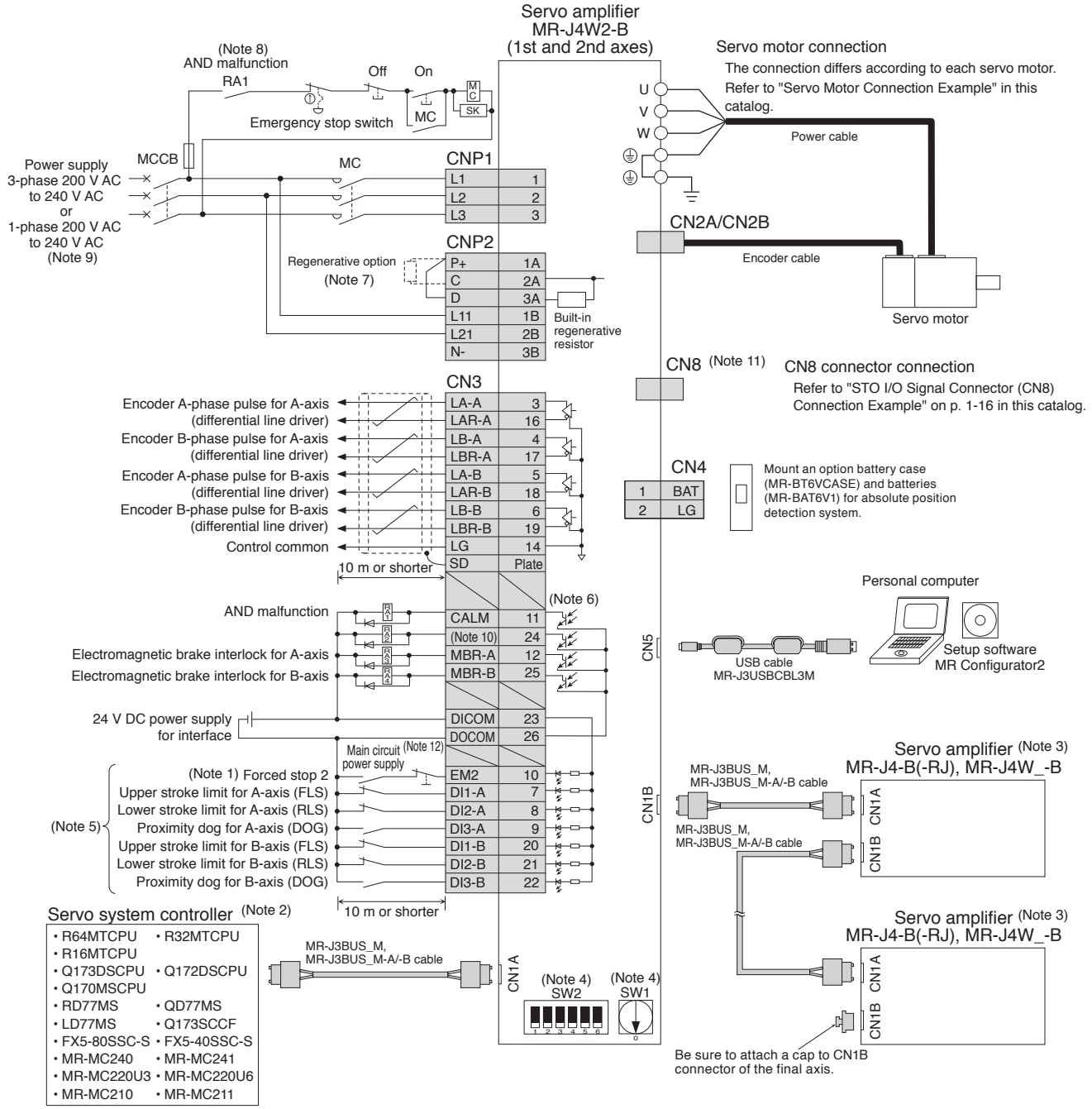

Notes: 1. The forced stop signal is issued for two axes of the servo amplifier. For overall system, apply the emergency stop on the servo system controller side.
2. For details such as setting the servo system controllers, refer to the programming or user's manual of each controller.
3. Connections for the third and following axes are omitted.
4. Up to 64 axes are set with 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 servo system controller specifications.
5. Devices can be assigned for DI1-A/B, DI2-A/B and DI3-A/B with the servo system 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 servo system 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 with [Pr. PD08].
11. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
12. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
13. To turn on/off the main circuit power supply by a DC power supply, refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual" for a connection example of the power supply circuit.

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)

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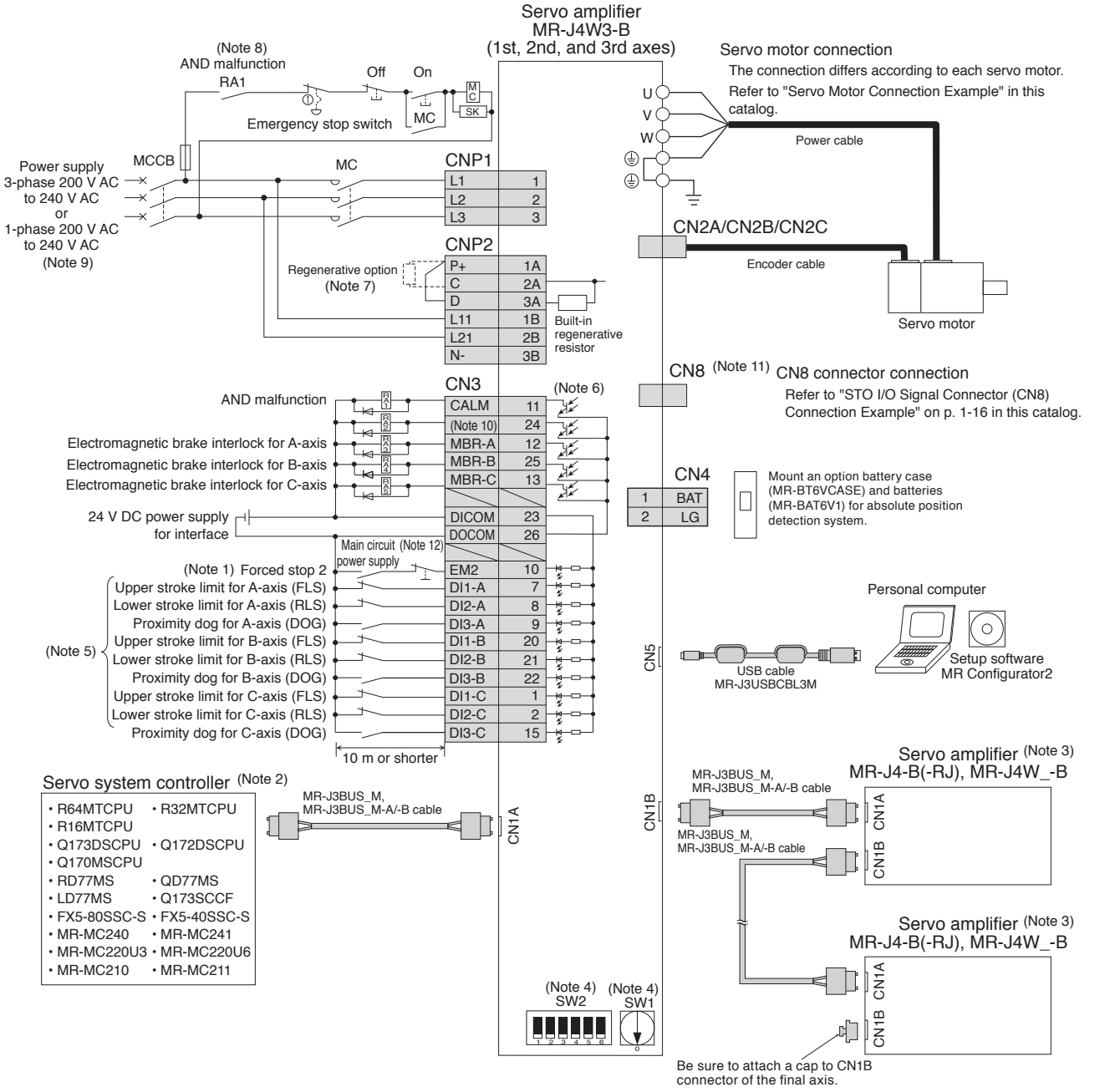


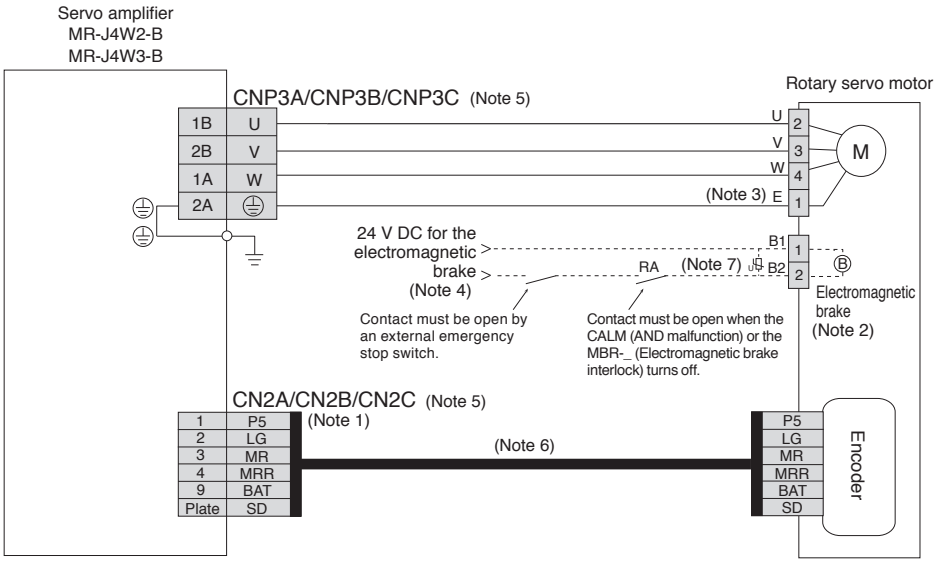
Notes: 1. The forced stop signal is issued for three axes of the servo amplifier. For overall system, apply the emergency stop on the servo system controller side.
2. For details such as setting the servo system controllers, refer to the programming or user's manual of each controller.
3. Connections for the fourth and following axes are omitted.
4. Up to 64 axes are set with 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 servo system controller specifications.
5. Devices can be assigned for DI1-A/B/C, DI2-A/B/C and DI3-A/B/C with the servo system 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 servo system 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. Refer to "MR-J4W3-B (3-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 with [Pr. PD08].
11. Be sure to attach a short-circuit connector supplied with the servo amplifier when the STO function is not used.
12. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
13. To turn on/off the main circuit power supply by a DC power supply, refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual" for a connection example of the power supply circuit.

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.

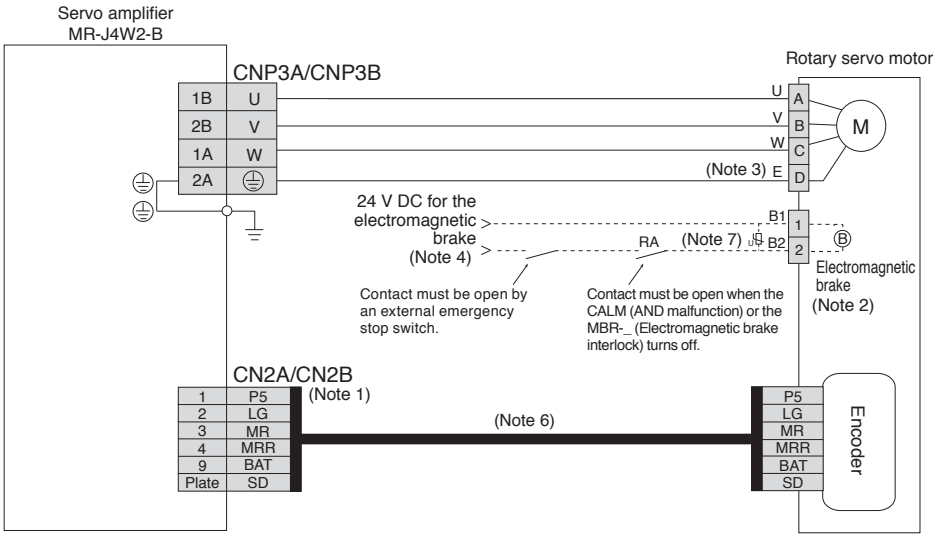
Servo Motor Connection Example (Rotary Servo Motor)

Semi-Closed Loop Control System with MR-J4W2-B/MR-J4W3-B

●For HG-KR/HG-MR series



●For HG-SR series



Notes: 1. The signals shown are 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 for grounding the servo motor.
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.
7. Be sure to install a surge absorber between B1 and B2.

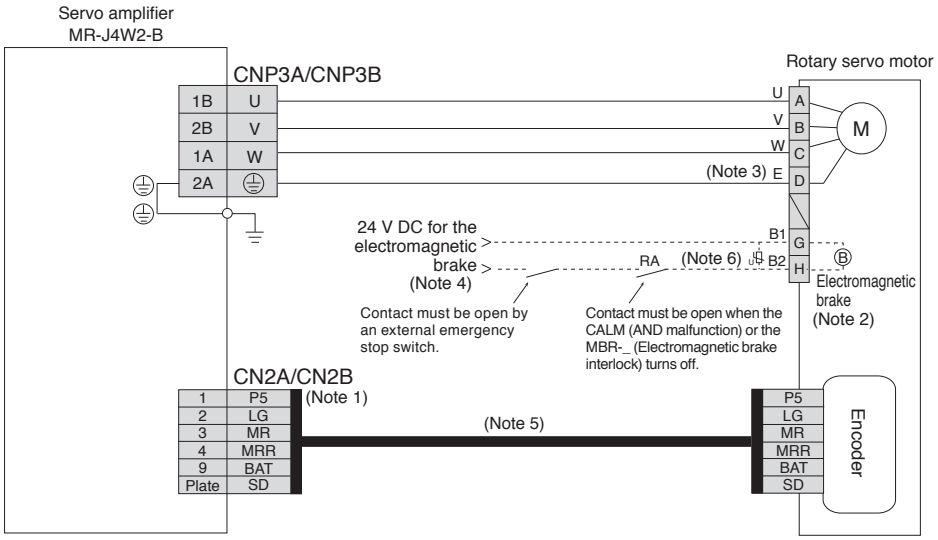
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

WB

Semi-Closed Loop Control System with MR-J4W2-B

●For HG-UR series



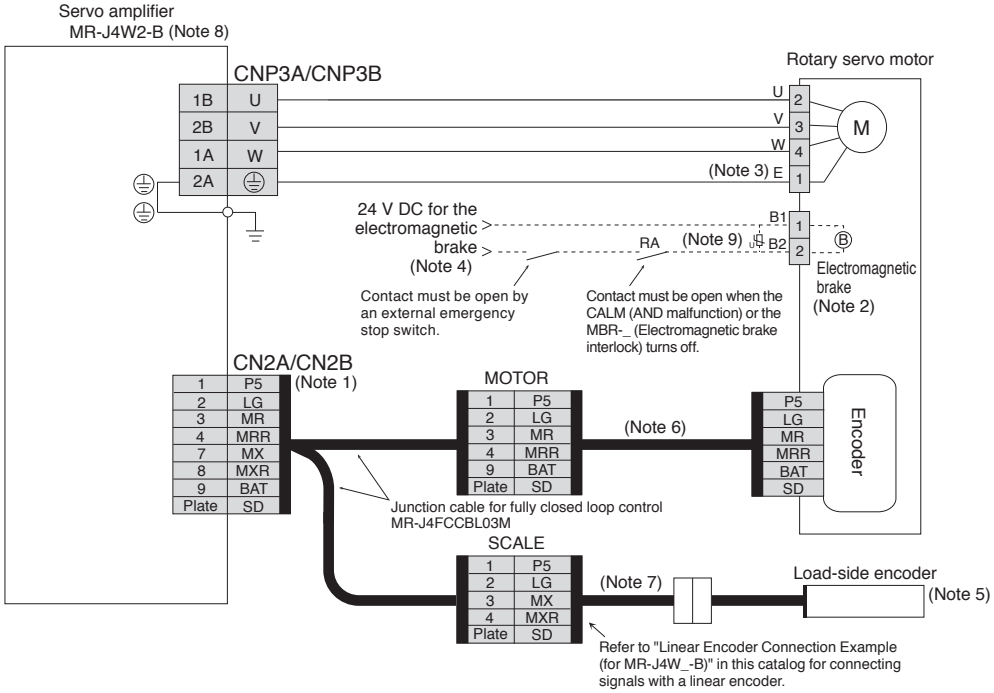
Notes: 1. The signals shown are applicable when using a two-wire type encoder cable. Four-wire type is also compatible.
2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier for grounding the servo motor.
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. Be sure to install a surge absorber between B1 and B2.

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.

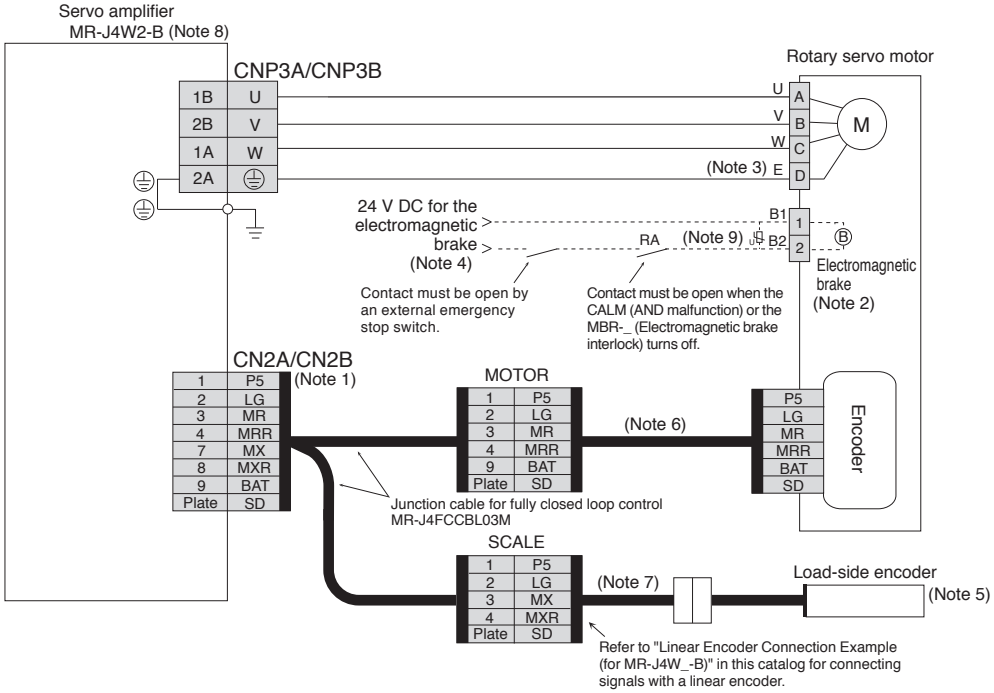
Servo Motor Connection Example (Rotary Servo Motor)

Fully Closed Loop Control System with MR-J4W2-B

●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 wire to the cabinet protective earth (PE) terminal via the servo amplifier for grounding the servo motor.
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-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 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 does not support fully closed loop control.
9. Be sure to install a surge absorber between B1 and B2.

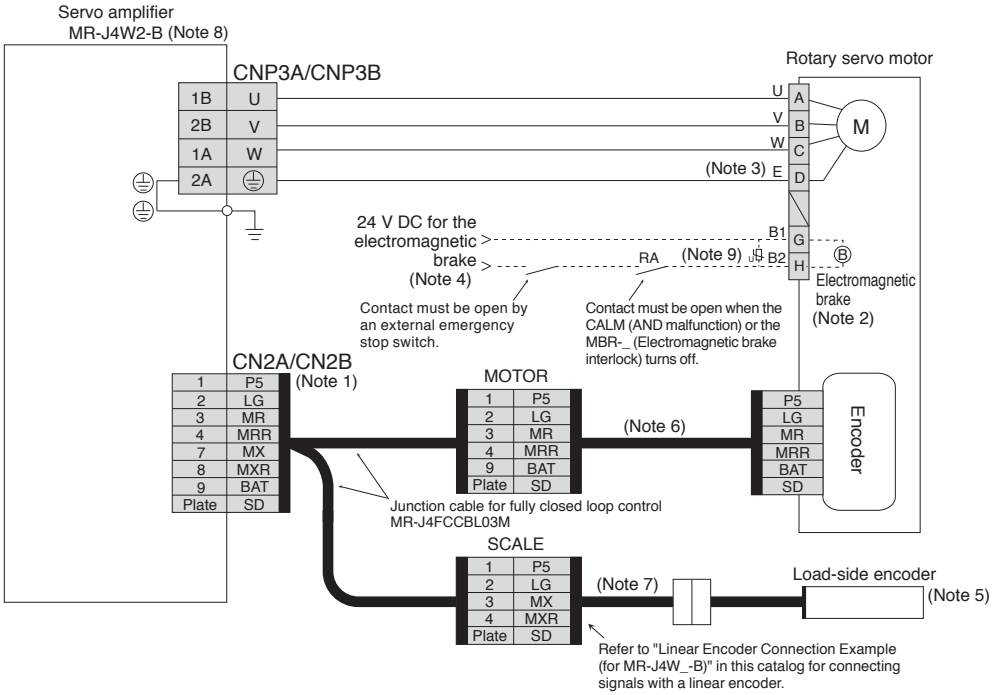
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Servo Motor Connection Example (Rotary Servo Motor)

WB

Fully Closed Loop Control System with MR-J4W2-B

●For HG-UR series



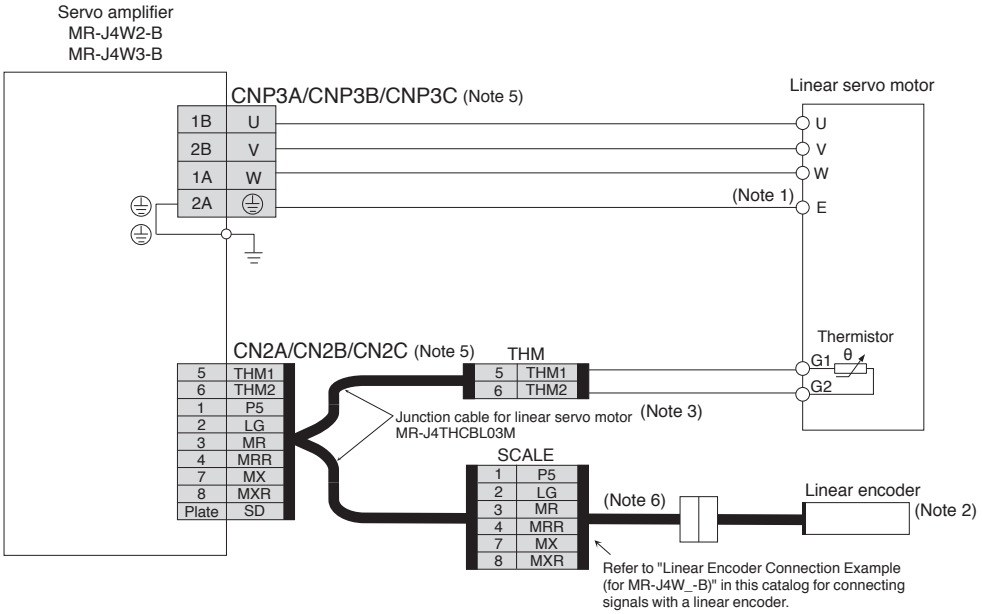
Notes: 1. For fully closed loop control, the load-side encoder and the servo motor encoder are compatible only with two-wire type communication method. Four-wire type cannot be used.
2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier for grounding the servo motor.
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-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 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 does not support fully closed loop control.
9. Be sure to install a surge absorber between B1 and B2.

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.

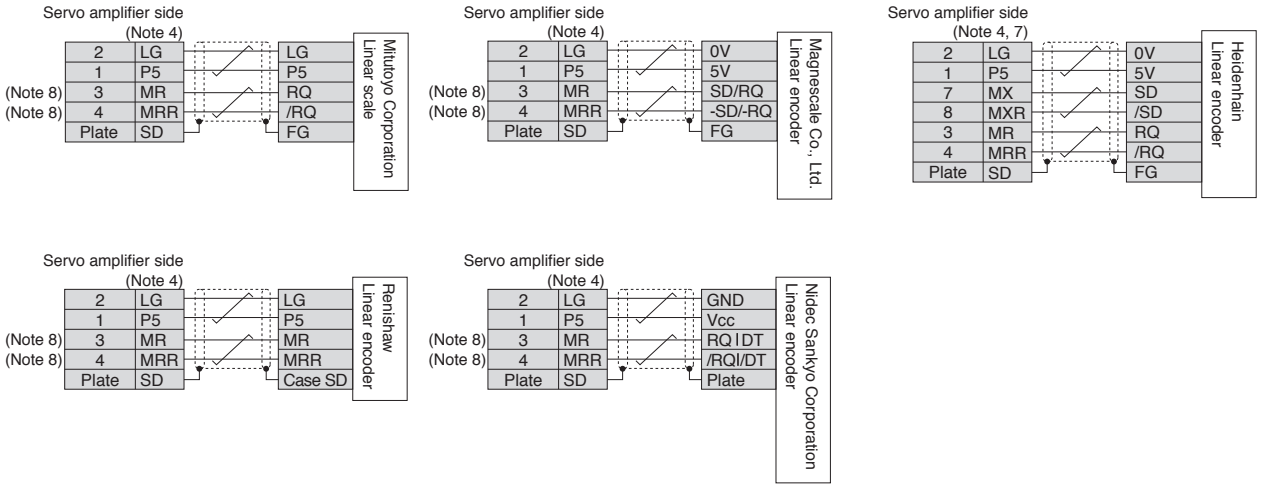
Servo Motor Connection Example (Linear Servo Motor)

Linear Servo System with MR-J4W2-B/MR-J4W3-B

●For LM-H3/LM-K2/LM-U2 series



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



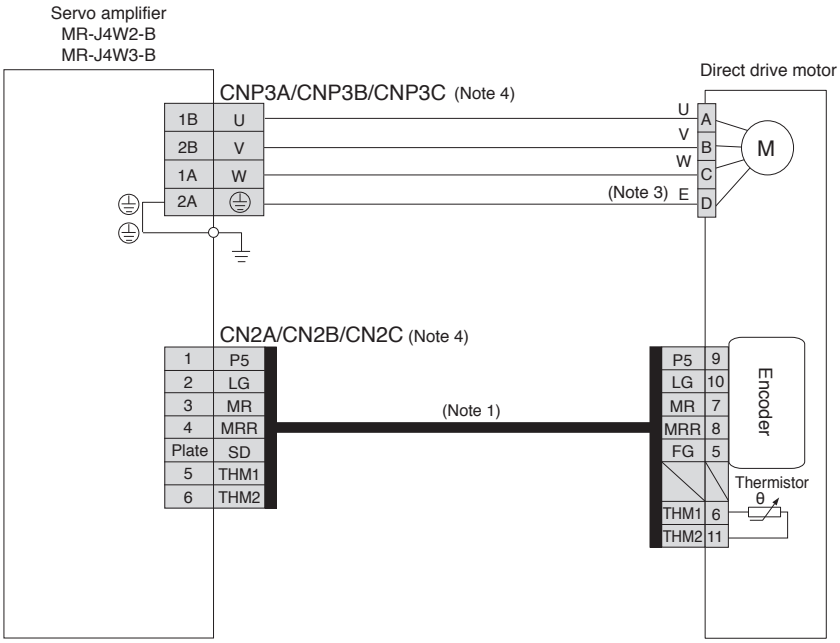
Notes: 1. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier for grounding the servo motor.
2. For linear encoders, refer to "List of Linear Encoders" under section 3 Linear Servo Motors in this catalog.
3. MR-J4THCBL03M junction cable for linear servo motor 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.

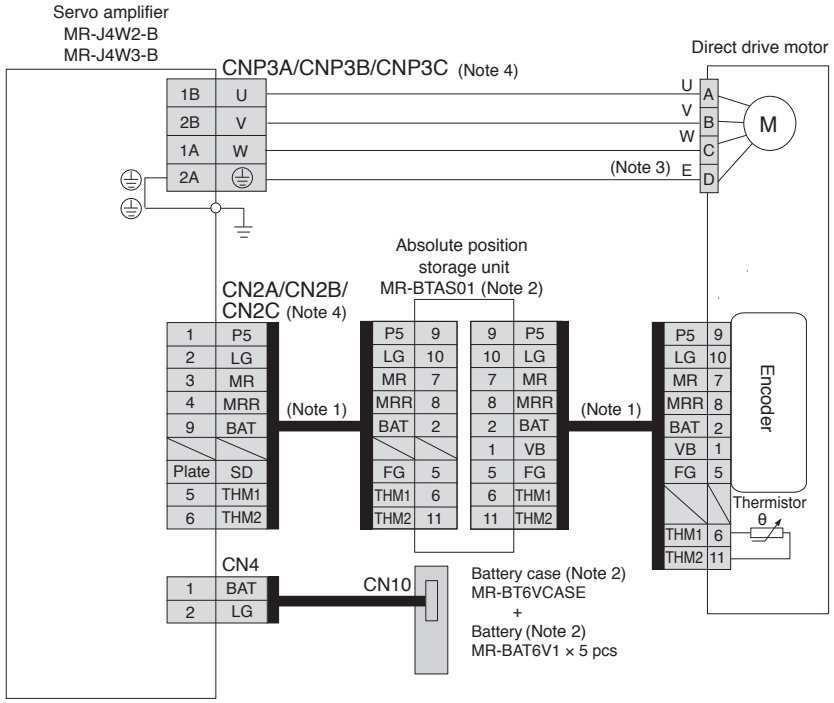
Servo Motor Connection Example (Direct Drive Motor)

WB

●For TM-RG2M/TM-RU2M/TM-RFM series (incremental system)



●For TM-RG2M/TM-RU2M/TM-RFM series (absolute position detection system)

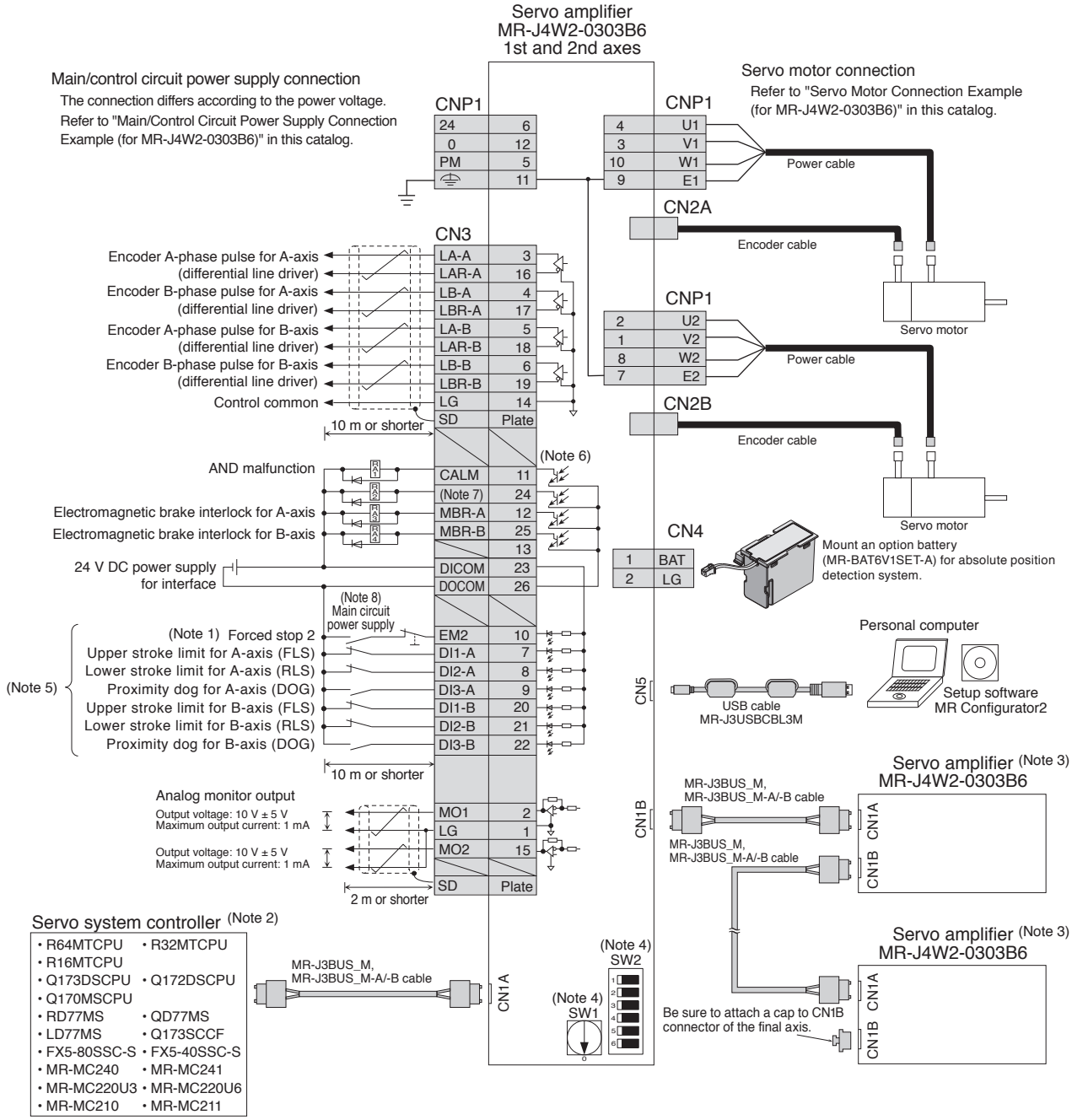


Notes: 1. Fabricate this encoder cable. Refer to "TM-RFM TM-RG2M TM-RU2M Direct Drive Motor Instruction Manual" for fabricating the encoder cable.
2. An MR-BTAS01 absolute position storage unit, MR-BT6VCASE battery case, and MR-BAT6V1 batteries (sold as options) are required for absolute position detection system. Refer to relevant Servo Amplifier Instruction Manual and "TM-RFM TM-RG2M TM-RU2M Direct Drive Motor Instruction Manual" for details.
3. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier for grounding the servo motor.
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-J4W2-0303B6 Standard Wiring Diagram Example

WB



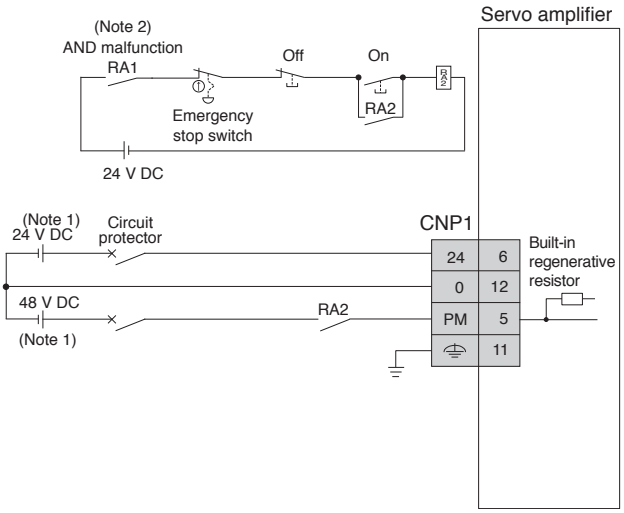
Notes: 1. The forced stop signal is issued for two axes of the servo amplifier. For overall system, apply the emergency stop on the servo system controller side.
2. For details such as setting the servo system controllers, refer to the programming or user's manual of each controller.
3. Connections for the third and following axes are omitted.
4. Up to 64 axes are set with 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 servo system controller specifications.
5. Devices can be assigned for DI1-A/B, DI2-A/B and DI3-A/B with the servo system controller setting. Refer to the controller instruction manuals for details on setting.
6. This is for sink wiring. Source wiring is also possible.
7. CINP (AND in-position) is assigned to this pin as default. Device for this pin can be changed with [Pr. PD08].
8. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.

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.

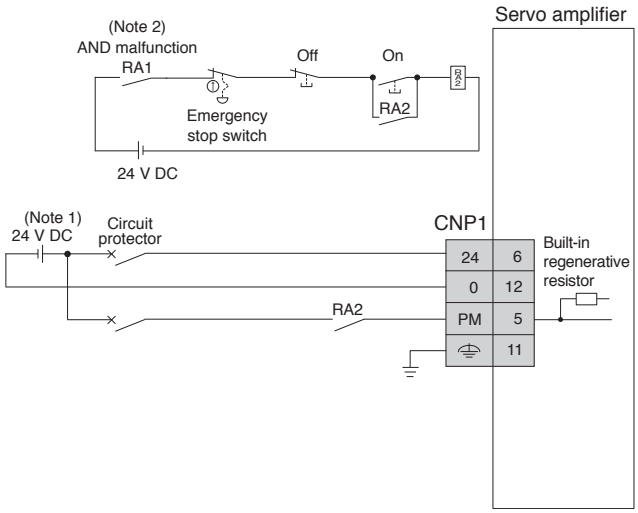
Main/Control Circuit Power Supply Connection Example (for MR-J4W2-0303B6)

WB

●For 48 V DC

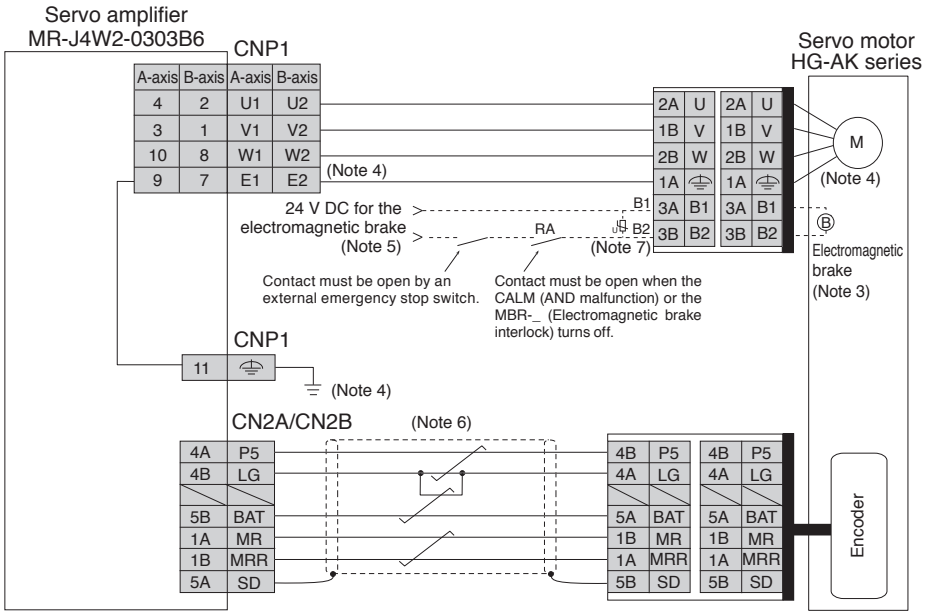


●For 24 V DC



Servo Motor Connection Example (for MR-J4W2-0303B6)

WB



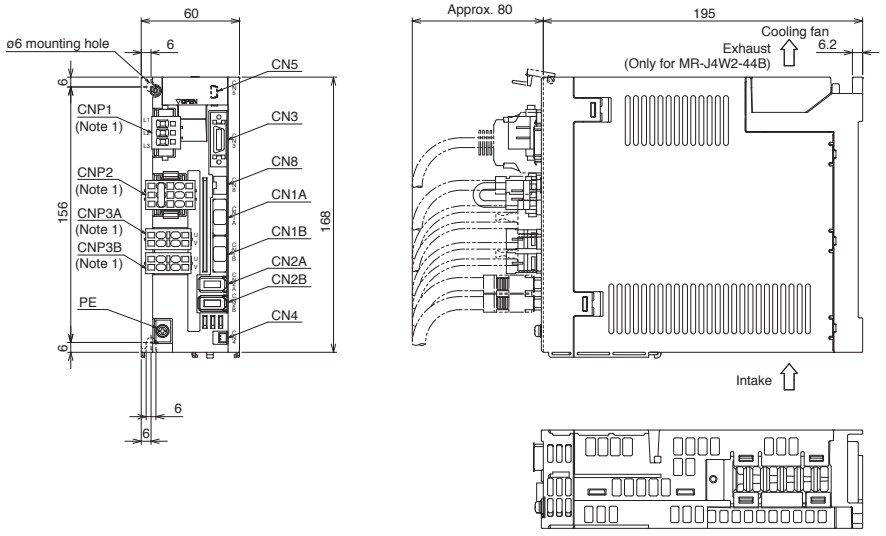
Notes: 1. Use 48 V DC and 24 V DC power supplies with reinforced insulation, and connect the negative side wiring (0 V) to the power supply terminal.
2. Select either of the following functions for CALM (AND malfunction) with the servo system controller.
1) The contact opens when an alarm occurs on one of the axes.
2) The contact opens when an alarm occurs on all axes.
3. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity.
4. Noiseless grounding ( ) terminals are connected to E1 and E2 terminals in the servo amplifier. Connect the noiseless ( ) terminals of CNP1 and the grounding terminal of the cabinet.
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.
7. Be sure to install a surge absorber between B1 and B2.

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.

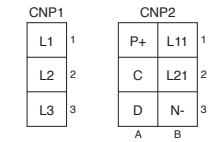
MR-J4W2-B Dimensions

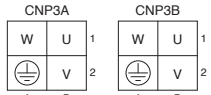
●MR-J4W2-22B

●MR-J4W2-44B



Terminal arrangement





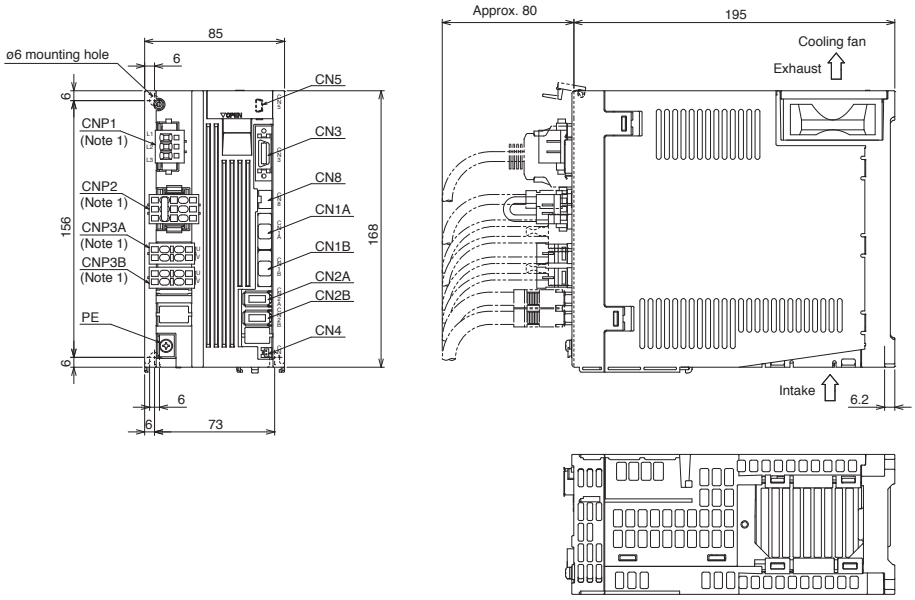
Screw size: M4

Mounting screw size: M5

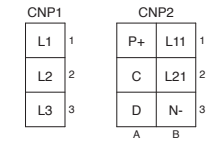
[Unit: mm]

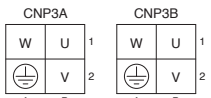
●MR-J4W2-77B

●MR-J4W2-1010B



Terminal arrangement





Screw size: M4

Mounting screw size: M5

[Unit: mm]

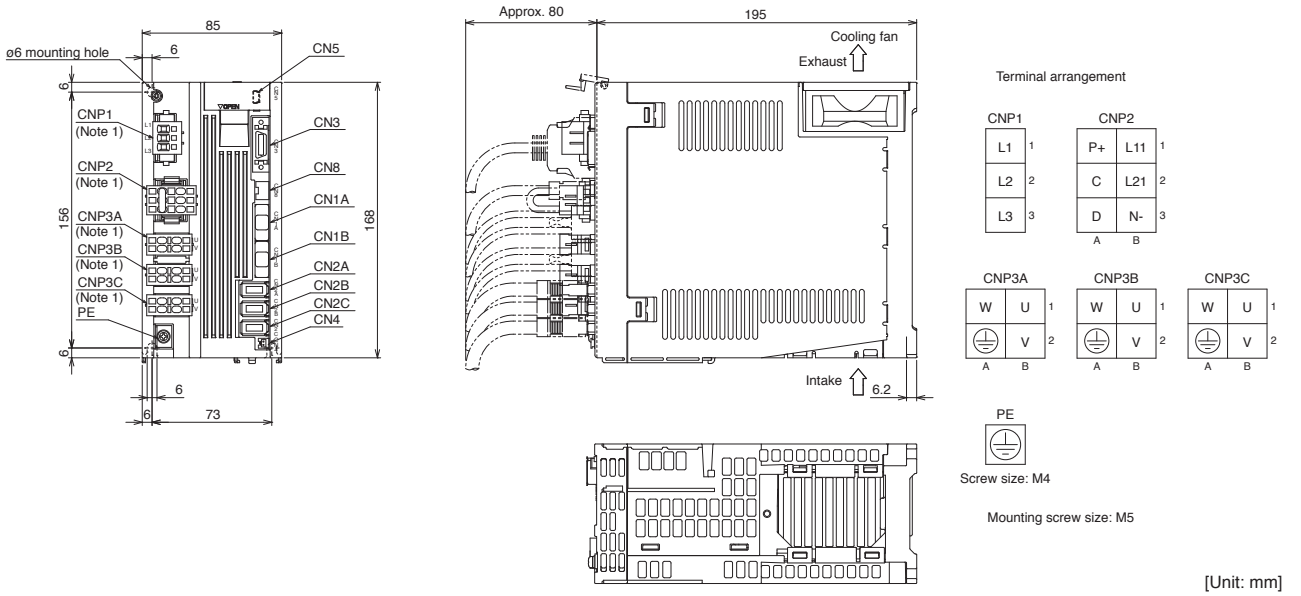
Notes: 1. CNP1, CNP2, CNP3A and CNP3B connectors are supplied with the servo amplifier.

MR-J4W3-B Dimensions

WB

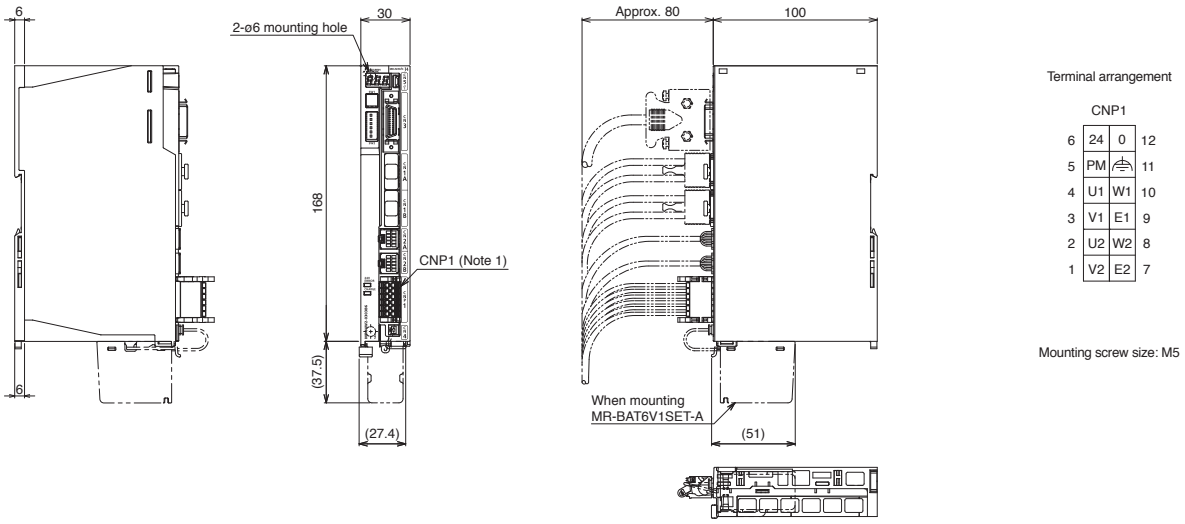
●MR-J4W3-222B

●MR-J4W3-444B



[Unit: mm]

MR-J4W2-0303B6 Dimensions



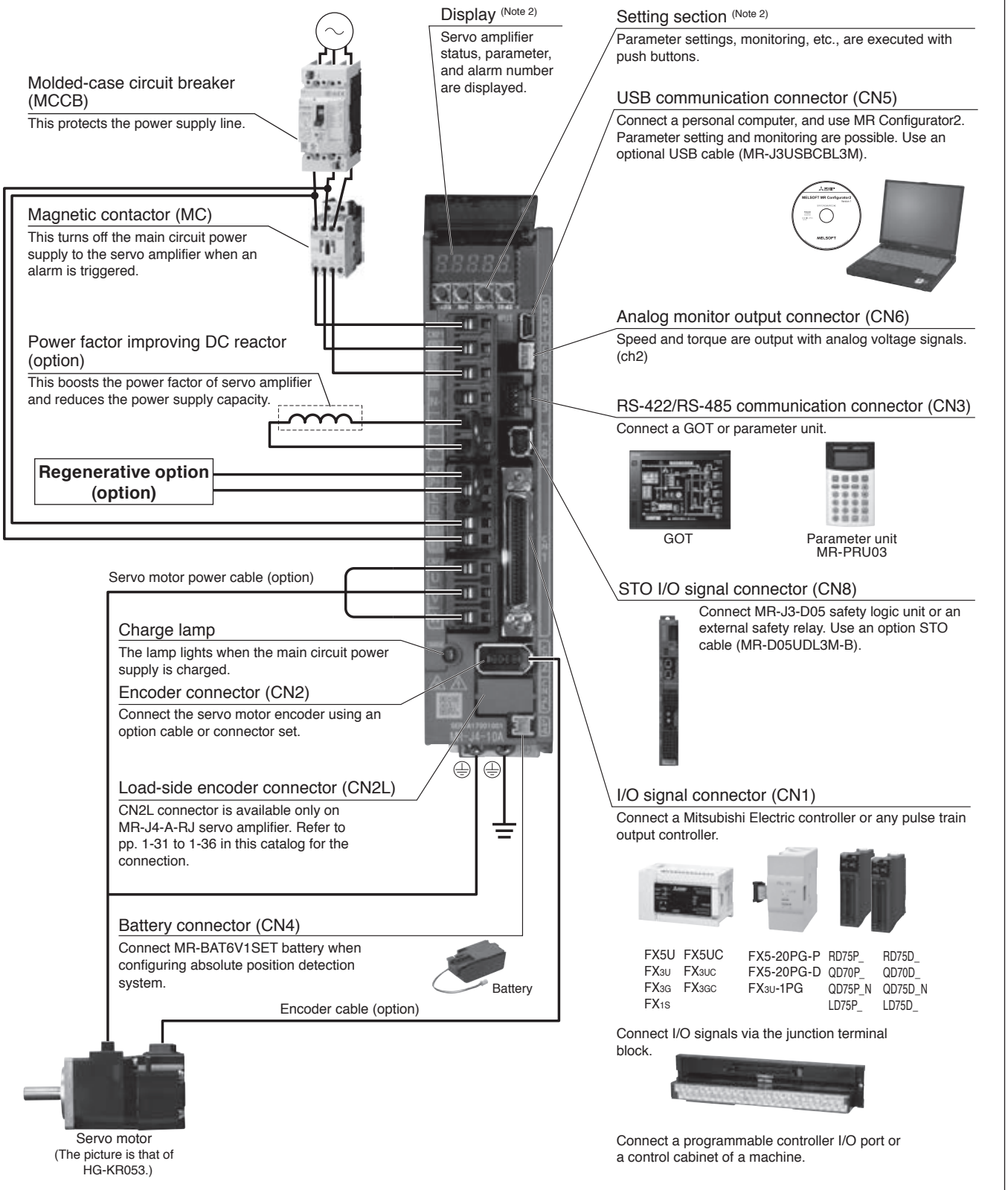
[Unit: mm]

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

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) MR-J4-03A6(-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)	AC input	3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz					3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz (Note 16)		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		
		DC input (Note 19)	283 V DC to 340 V DC													-		
	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	AC input	3-phase or 1-phase 170 V AC to 264 V AC					3-phase or 1-phase 170 V AC to 264 V AC (Note 16)		3-phase 170 V AC to 264 V AC						1-phase 85 V AC to 132 V AC		
		DC input (Note 19)	241 V DC to 374 V DC													-		
	Permissible frequency fluctuation		±5% maximum															
Control circuit power supply input	Voltage/ frequency	AC input	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		
		DC input (Note 19)	283 V DC to 340 V DC													-		
	Rated current	[A]	0.2							0.3						0.4		
	Permissible voltage fluctuation	AC input	1-phase 170 V AC to 264 V AC													1-phase 85 V AC to 132 V AC		
		DC input (Note 19)	241 V DC to 374 V DC													-		
	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															
Permissible 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 (Note 4)			Built-in										External option (Note 13)			Built-in		
Communication function	USB		Connect a personal computer (MR Configurator2 compatible)															
	RS-422/RS-485		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															
	In-position range 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 (Note 17)	MR-J4-A(1)		Not available															
	MR-J4-A(1)-RJ		Point table method, program method, indexer method															
Fully closed loop control	MR-J4-A(1) (Note 9)		Two-wire type communication method															
	MR-J4-A(1)-RJ		Two-wire/four-wire type communication method															
Load-side encoder interface	MR-J4-A(1)		Mitsubishi Electric high-speed serial communication															
	MR-J4-A(1)-RJ		Mitsubishi Electric high-speed serial communication, A/B/Z-phase differential input signal															
Servo functions			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 function (Note 15)															
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 (Note 20)	EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2															
	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)	MTTFd ≥ 100 [years] (314a)															
	Diagnostic coverage (DC)	DC = Medium, 97.6 [%]															
	Probability of dangerous Failure per Hour (PFH)	PFH = 6.4×10^{-9} [1/h]															
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 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	3-phase power input	Possible (Note 6)								Not possible					-		
	1-phase power input	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: 5 %RH to 90 %RH (non-condensing)															
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust															
	Altitude	2000 m or less above sea level (Note 18)															
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y, and Z axes)															
Mass [kg]		0.8	0.8	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 is operated within the specified power supply voltage and frequency.
2. Select the most suitable regenerative option for your system with our drive system sizing software Motorizer.
3. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a regenerative option is used.
4. When using the dynamic brake, refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-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 the servo amplifiers at 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 supported by the servo amplifiers with software version A5 or later.
10. RS-422/RS-485 communication function is supported by the servo amplifiers with software version A3 or later.
11. The value in brackets is applicable when cooling fans (two units of 92 mm × 92 mm, minimum air flow: 1.0 m^3/min) are installed, and then [Pr. PA02] is changed.
12. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "Model Designation for 1-Axis Servo Amplifier" in this catalog for details.
13. Use an external dynamic brake (option) 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 when a 3-phase power supply is used.
15. This function is supported by the servo amplifiers with software version B4 or later.
16. When a 1-phase 200 V AC to 240 V AC power supply is used, use the servo amplifiers at 75% or less of the effective load ratio.
17. Positioning mode is supported by MR-J4-A-RJ servo amplifier with software version B3 or later.
18. Refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) Servo Amplifier Instruction Manual" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
19. DC power input is supported by MR-J4-_A-RJ with software version C2 or later and MR-J4-_A-EG. For a connection example of power supply circuit with DC input, refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) Servo Amplifier Instruction Manual".
20. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) Servo Amplifier Instruction Manual" for details.

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 resistance regeneration 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 (Note 9)			External option (Note 3)	
Communication function	USB		Connect a personal computer (MR Configurator2 compatible)	
	RS-422/RS-485		1:n communication (up to 32 axes) (Note 5)	
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	
	In-position range 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 (Note 6)		MR-J4-DU_A	Not available	
		MR-J4-DU_A-RJ	Point table method, program method, indexer 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	
Load-side encoder interface		MR-J4-DU_A	Mitsubishi Electric high-speed serial communication	
		MR-J4-DU_A-RJ	Mitsubishi Electric high-speed serial communication, A/B/Z-phase differential input signal	
Servo functions			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 function	
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 (Note 8)	EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2	
	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)	MTTFd ≥ 100 [years] (314a)	
	Diagnostic coverage (DC)	DC = Medium, 97.6 [%]	
	Probability of dangerous Failure per Hour (PFH)	PFH = 6.4×10^{-9} [1/h]	
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.	
Structure (IP rating)		Force cooling, open (IP20) (Note 1)	
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	2000 m or less above sea level (Note 7)	
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y and Z axes)	
Mass [kg]		21	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 external dynamic brake (option) with the drive unit. 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. Refer to "MR-CR Resistance Regeneration Converter Unit Specifications (200 V/400 V)" on p. 1-53 in this catalog for the specifications of the resistance regeneration converter unit.
5. RS-485 communication function is supported by the drive units manufactured in January 2015 or later. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for checking procedure of manufacture data.
6. Positioning mode is supported by MR-J4-DU_A-RJ drive unit with software version B3 or later.
7. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
8. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) Servo Amplifier Instruction Manual" for details.
9. When using the dynamic brake, refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the permissible load to motor inertia ratio.

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								
Permissible 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 (Note 4)			Built-in						External option (Note 9)		
Communication function	USB		Connect a personal computer (MR Configurator2 compatible)								
	RS-422/RS-485		1:n communication (up to 32 axes) (Note 12)								
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								
	In-position range 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 (Note 13)	MR-J4-A4		Not available								
	MR-J4-A4-RJ		Point table method, program method, indexer method								
Fully closed loop control	MR-J4-A4		Two-wire type communication method								
	MR-J4-A4-RJ		Two-wire/four-wire type communication method								
Load-side encoder interface	MR-J4-A4		Mitsubishi Electric high-speed serial communication								
	MR-J4-A4-RJ		Mitsubishi Electric high-speed serial communication, A/B/Z-phase differential input signal								
Servo functions			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 function (Note 11)								
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 (Note 15)	EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2								
	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)	MTTFd ≥ 100 [years] (314a)								
	Diagnostic coverage (DC)	DC = Medium, 97.6 [%]								
	Probability of dangerous Failure per Hour (PFH)	PFH = 6.4 × 10^{-9} [1/h]								
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 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: 5 %RH to 90 %RH (non-condensing)								
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust								
	Altitude	2000 m or less above sea level (Note 14)								
	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 is operated within the specified power supply voltage and frequency.
2. Select the most suitable regenerative option for your system with our drive system sizing software Motorizer.
3. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a regenerative option is used.
4. When using the dynamic brake, refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-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 (two units of 92 mm × 92 mm, minimum air flow: 1.0 m^3/min) are installed, and then [Pr. PA02] is changed.
8. Servo amplifiers without an enclosed regenerative resistor are also available. Refer to "Model Designation for 1-Axis Servo Amplifier" in this catalog for details.
9. Use an external dynamic brake (option) 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 supported by the servo amplifiers with software version B4 or later.
12. RS-485 communication function is supported by the servo amplifiers manufactured in November 2014 or later. Refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) Servo Amplifier Instruction Manual" for checking procedure of manufacture data.
13. Positioning mode is supported by MR-J4-A4-RJ servo amplifier with software version B3 or later.
14. Refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) Servo Amplifier Instruction Manual" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
15. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) Servo Amplifier Instruction Manual" for details.

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 resistance regeneration 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 (Note 9)			External option (Note 3)			
Communication function	USB		Connect a personal computer (MR Configurator2 compatible)			
	RS-422/RS-485		1:n communication (up to 32 axes) (Note 5)			
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			
	In-position range 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 (Note 6)	MR-J4-DU_A4		Not available			
	MR-J4-DU_A4-RJ		Point table method, program method, indexer 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			
Load-side encoder interface	MR-J4-DU_A4		Mitsubishi Electric high-speed serial communication			
	MR-J4-DU_A4-RJ		Mitsubishi Electric high-speed serial communication, A/B/Z-phase differential input signal			
Servo functions			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 function			
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 (Note 8)	EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL 3, EN 61800-5-2			
	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)	MTTFd ≥ 100 [years] (314a)			
	Diagnostic coverage (DC)	DC = Medium, 97.6 [%]			
	Probability of dangerous Failure per Hour (PFH)	PFH = 6.4×10^{-9} [1/h]			
Compliance with global standards		Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.			
Structure (IP rating)		Force cooling, open (IP20) (Note 1)			
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	2000 m or less above sea level (Note 7)			
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y and Z axes)			
Mass [kg]		16	16	21	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 external dynamic brake (option) with the drive unit. 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. Refer to "MR-CR Resistance Regeneration Converter Unit Specifications (200 V/400 V)" on p. 1-53 in this catalog for the specifications of the resistance regeneration converter unit.
5. RS-485 communication function is supported by the drive units manufactured in January 2015 or later. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for checking procedure of manufacture data.
6. Positioning mode is supported by MR-J4-DU_A4-RJ drive unit with software version B3 or later.
7. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
8. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether or not STO input diagnosis is performed by TOFB output. Refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) Servo Amplifier Instruction Manual" for details.
9. When using the dynamic brake, refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for the permissible load to motor inertia ratio.

MR-J4-03A6/MR-J4-03A6-RJ (General-Purpose Interface) Specifications

A A-RJ

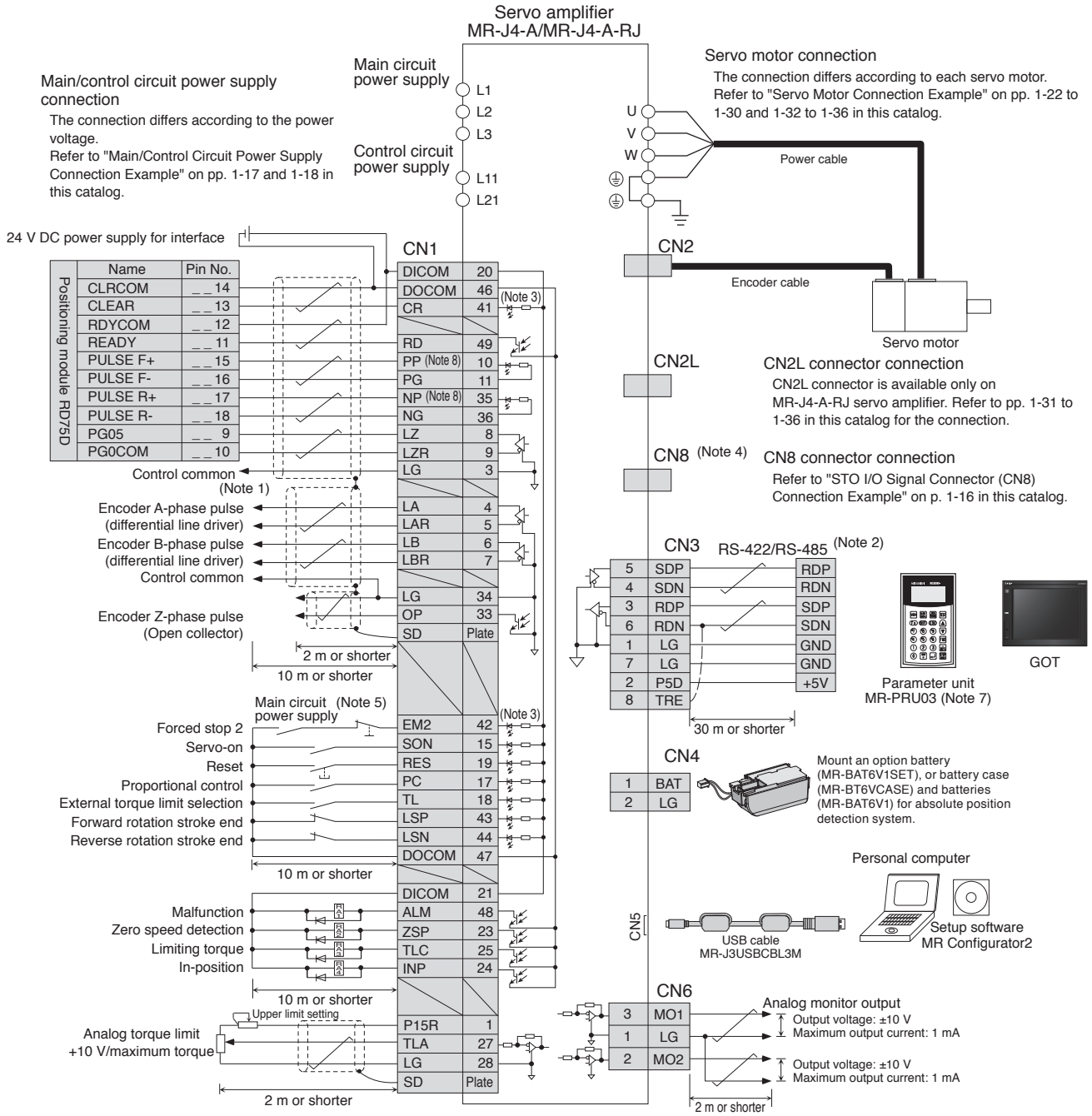
Servo amplifier model			MR-J4-03A6	MR-J4-03A6-RJ
Output	Rated voltage		3-phase 13 V AC	
	Rated current	[A]	2.4	
Main circuit power supply input	Voltage (Note 1)		48 V DC/24 V DC (Note 2)	
	Rated current	[A]	For 48 V DC: 1.2 A For 24 V DC: 2.4 A	
	Permissible voltage fluctuation		For 48 V DC: 40.8 V DC to 55.2 V DC For 24 V DC: 21.6 V DC to 26.4 V DC	
Control circuit power supply input	Voltage		24 V DC	
	Rated current	[A]	0.2	
	Permissible voltage fluctuation		21.6 V DC to 26.4 V DC	
	Power consumption	[W]	5.0	
Interface power supply			24 V DC ± 10% (required current capacity: 0.3 A)	
Control method			Sine-wave PWM control/current control method	
Permissible regenerative power of the built-in regenerative resistor		[W]	0.7	
Dynamic brake (Note 4)			Built-in (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: 18 bits	
	Command pulse multiplying factor		Electronic gear A/B multiple, A: 1 to 16777215, B: 1 to 16777215, 1/10 < A/B < 4000	
	In-position range 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			Not available	Point table method, program method, indexer method
Fully closed loop control			Not compatible	
Servo functions			Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, vibration tough drive function, drive recorder function, machine diagnosis function, power monitoring function	
Protective functions			Overcurrent shut-off, regenerative overvoltage shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, regenerative error protection, undervoltage protection, instantaneous power failure protection, overspeed protection, error excessive protection	
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.	
Structure (IP rating)			Natural cooling, open (IP20)	
Close mounting			Possible (Note 5)	
DIN rail mounting (35 mm wide)			Possible	
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/s^2 at 10 Hz to 55 Hz (directions of X, Y and Z axes)	
Mass		[kg]	0.2	

Notes: 1. Rated output and speed of a rotary servo motor are applicable when the servo amplifier is operated within the specified power supply voltage.
2. Initial value is 48 V DC. For 24 V DC, set [Pr. PC27] to "_ _1 _." Servo motor characteristics vary depending on whether the voltage is 48 V DC or 24 V DC. Refer to "HG-AK Series (Ultra-Compact Size, Ultra-Small Capacity) Specifications" and "HG-AK Series Torque Characteristics" in this catalog.
3. The dynamic brake is electronic. The electronic dynamic brake does not operate when the control circuit power is off. It may not operate depending on alarms and warnings. Refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) Servo Amplifier Instruction Manual" for details.
4. When using the dynamic brake, refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio.
5. When the servo amplifiers are closely mounted, keep the ambient temperature within 0 °C to 45 °C.

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

A A-RJ

Connecting to RD75D

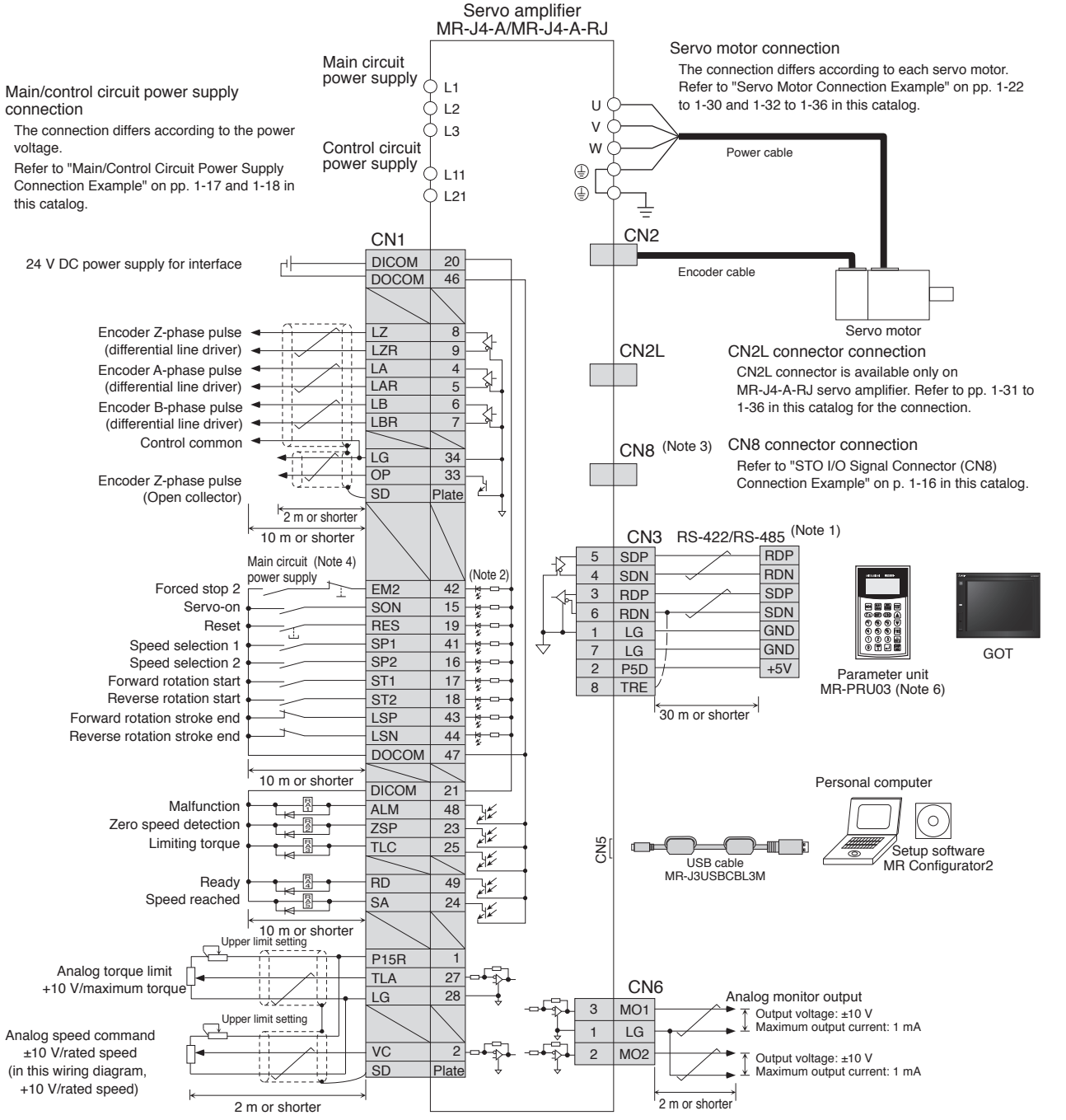


Notes: 1. This connection is not necessary for RD75D Positioning module. Note that the connection between LG and control common terminal is recommended for some Positioning modules to improve noise tolerance.
2. It is also possible to connect a personal computer to CN3 connector with an RS-422/RS-232C conversion cable. However, USB (CN5 connector) and RS-422/RS-485 (CN3 connector) communication functions 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. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
6. This standard wiring diagram is common for 200 V AC, 100 V AC and 400 V AC type servo amplifiers.
7. When using MR-PRU03 parameter unit, use a commercial LAN cable (EIA568 compliant), and keep the wire length to a maximum of 10 m.
8. Pulse train input is available with sink input and source input of open-collector type. When using the source input, use PP2 and NP2 terminals. Refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) 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-J4-A/MR-J4-A-RJ Standard Wiring Diagram Example: Speed Control Operation (Note 5)

A A-RJ

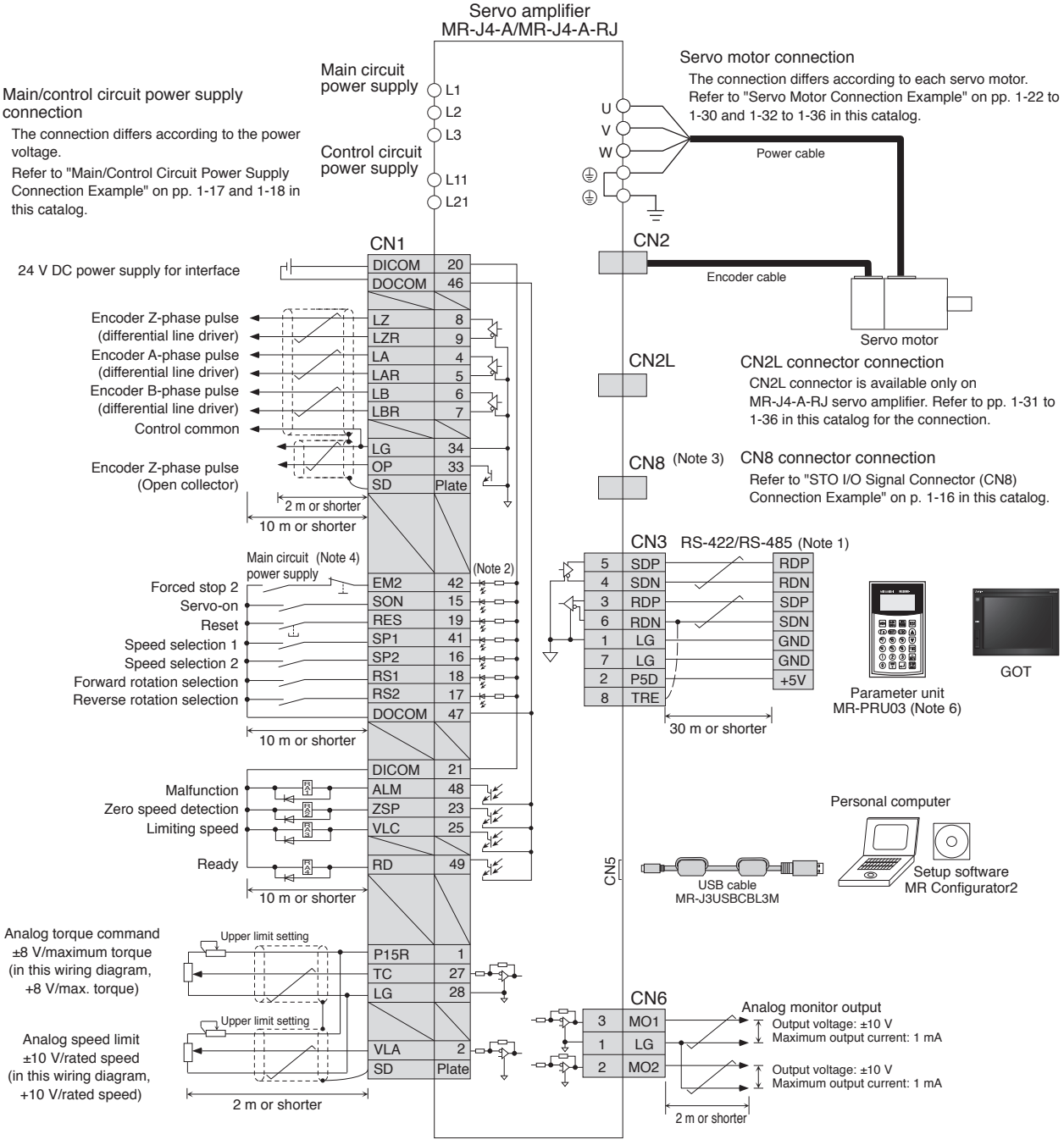


Notes: 1. It is also possible to connect a personal computer to CN3 connector with an RS-422/RS-232C conversion cable. However, USB (CN5 connector) and RS-422/RS-485 (CN3 connector) communication functions are mutually exclusive. Do not use them at the same time. Refer to "Products on the Market for 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. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
5. This standard wiring diagram is common for 200 V AC, 100 V AC and 400 V AC type servo amplifiers.
6. When using MR-PRU03 parameter unit, use a commercial LAN cable (EIA568 compliant), and keep the wire length to a maximum of 10 m.

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



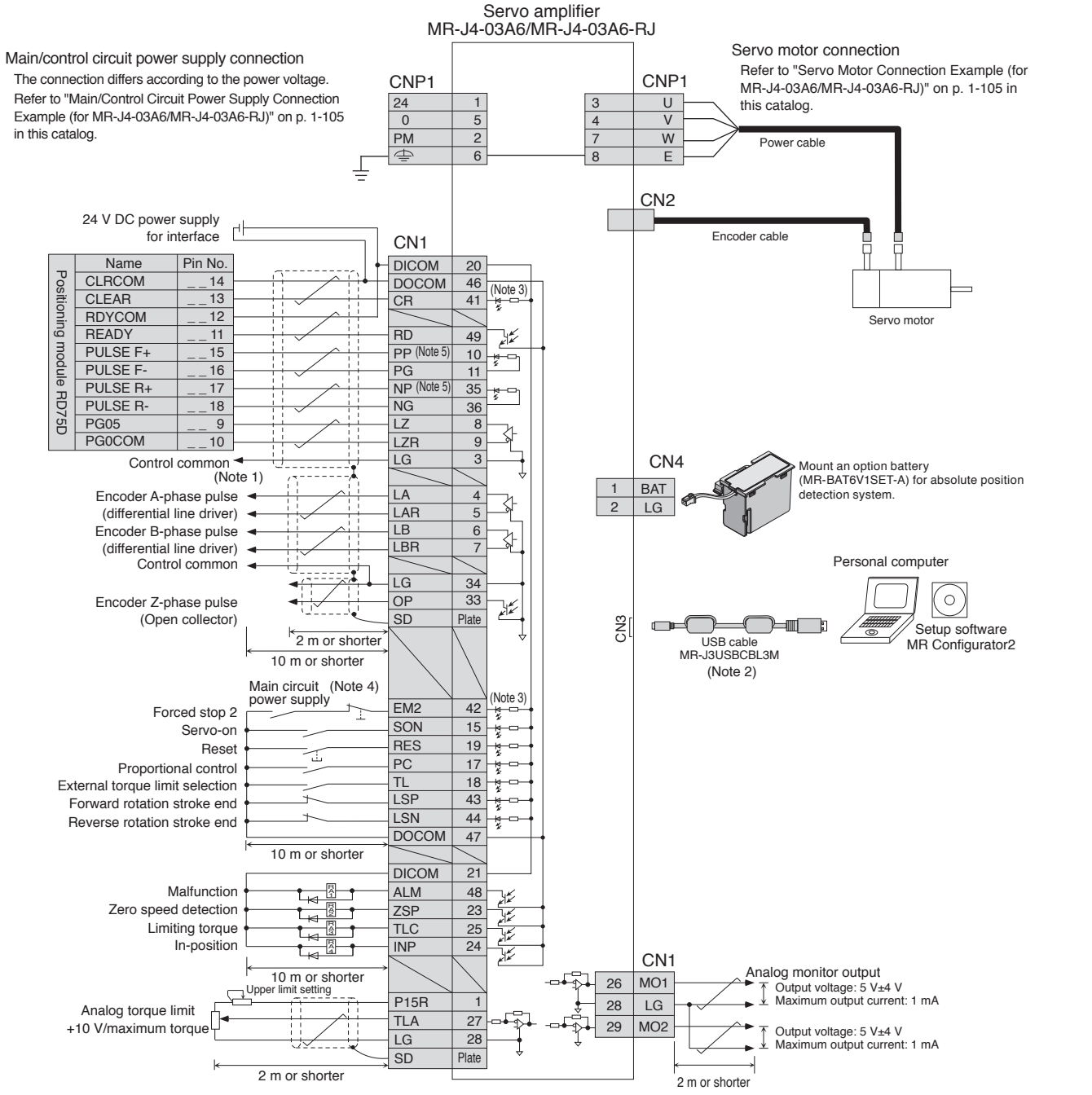
Notes: 1. It is also possible to connect a personal computer to CN3 connector with an RS-422/RS-232C conversion cable. However, USB (CN5 connector) and RS-422/RS-485 (CN3 connector) communication functions are mutually exclusive. Do not use them at the same time. Refer to "Products on the Market for 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. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
5. This standard wiring diagram is common for 200 V AC, 100 V AC and 400 V AC type servo amplifiers.
6. When using MR-PRU03 parameter unit, use a commercial LAN cable (EIA568 compliant), and keep the wire length to a maximum of 10 m.

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-J4-03A6/MR-J4-03A6-RJ Standard Wiring Diagram Example: Position Control Operation

A A-RJ

Connecting to RD75D

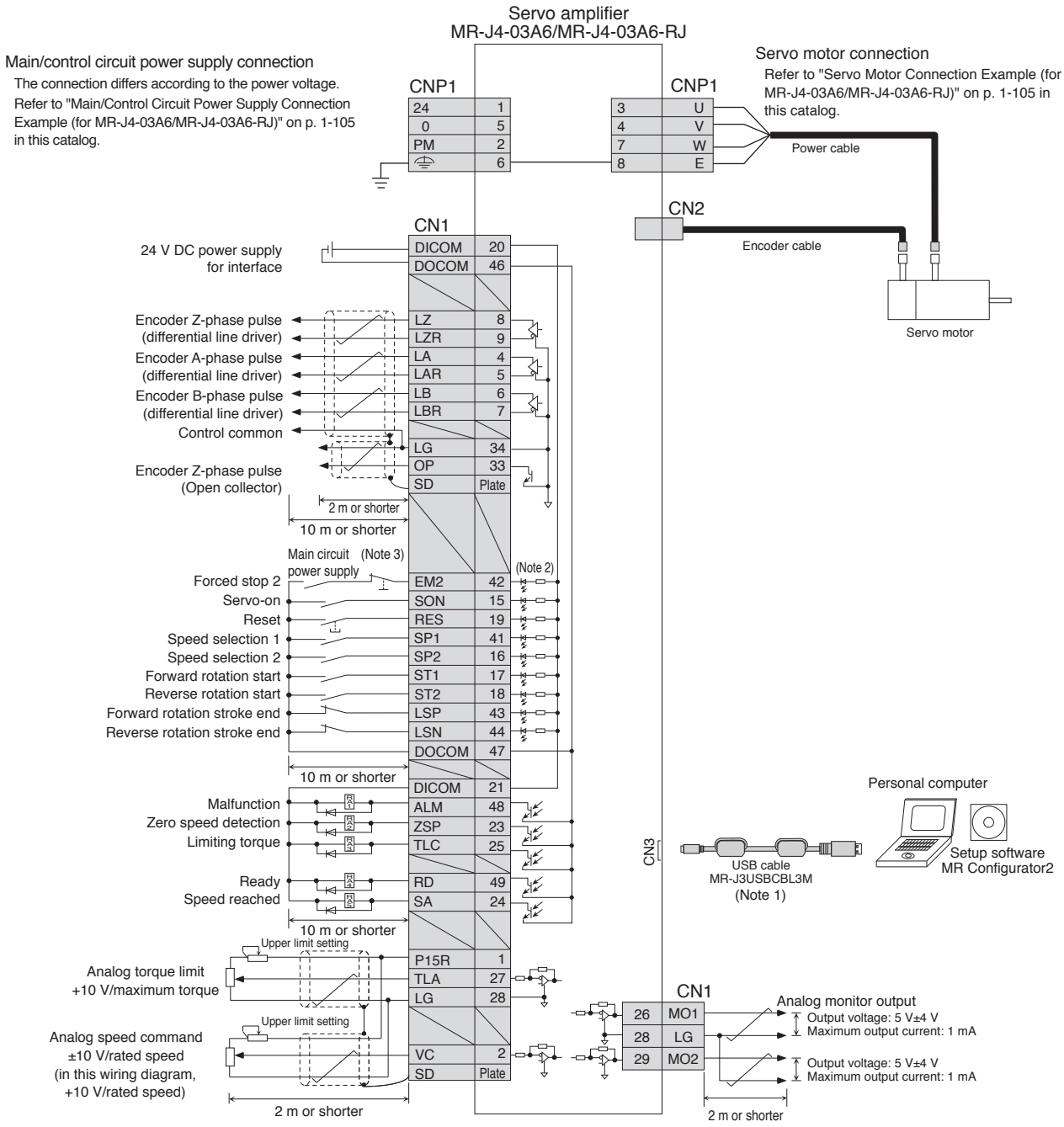


Notes: 1. This connection is not necessary for RD75D Positioning module. Note that the connection between LG and control common terminal is recommended for some Positioning modules to improve noise tolerance.
2. USB and RS-422 communication functions are mutually exclusive. Do not use them at the same time.
3. This is for sink wiring. Source wiring is also possible.
4. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
5. Pulse train input is available with sink input and source input of open-collector type. When using the source input, use PP2 and NP2 terminals. Refer to "MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) 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-J4-03A6/MR-J4-03A6-RJ Standard Wiring Diagram Example: Speed Control Operation

A A-RJ

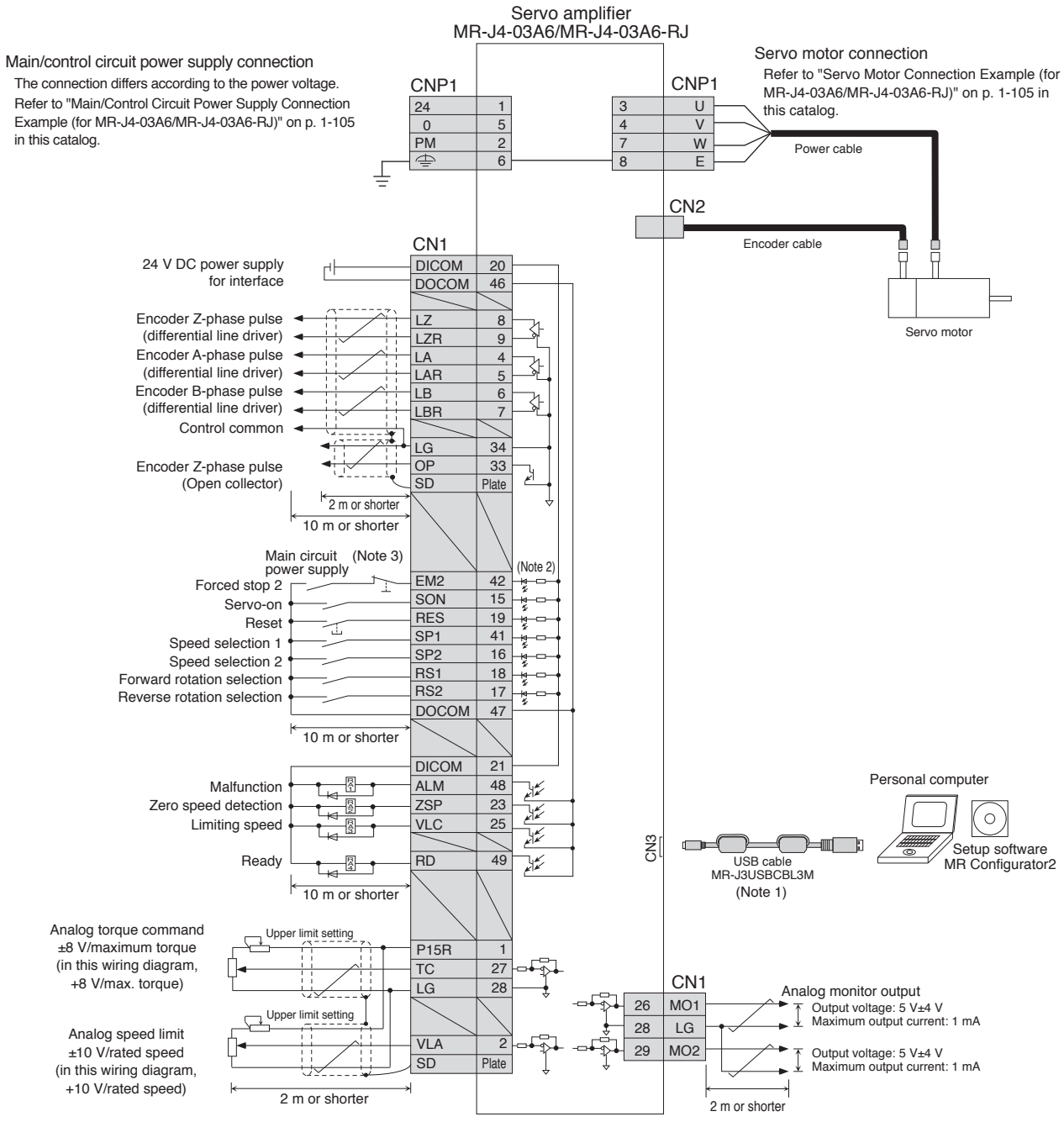


Notes: 1. USB and RS-422 communication functions are mutually exclusive. Do not use them at the same time.
2. This is for sink wiring. Source wiring is also possible.
3. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.

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-J4-03A6/MR-J4-03A6-RJ Standard Wiring Diagram Example: Torque Control Operation

A A-RJ

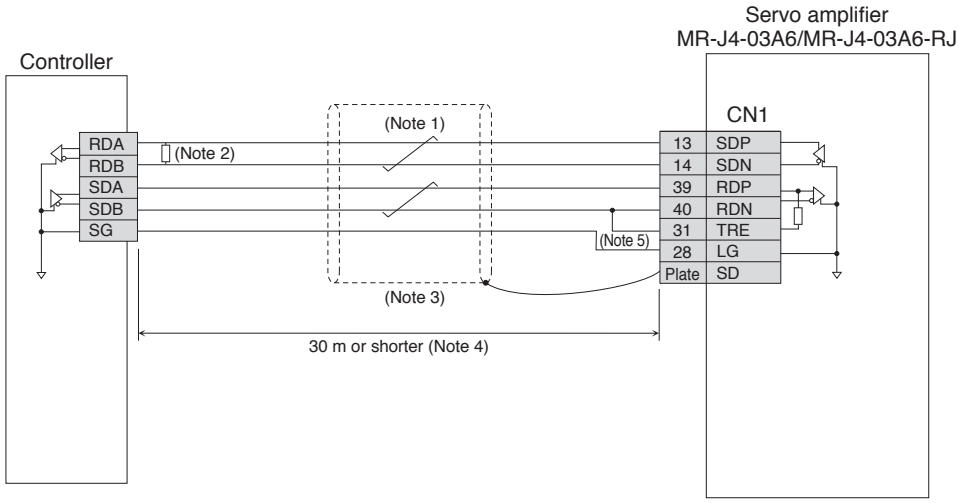


Notes: 1. USB and RS-422 communication functions are mutually exclusive. Do not use them at the same time.
2. This is for sink wiring. Source wiring is also possible.
3. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.

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-J4-03A6/MR-J4-03A6-RJ RS-422 Serial Communication Connection Example

A A-RJ

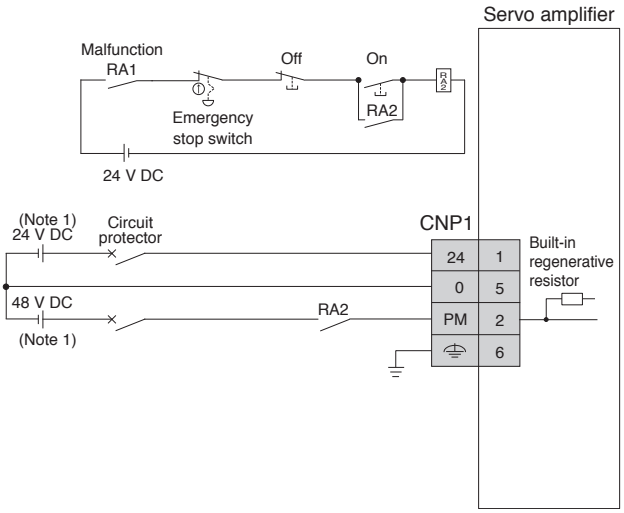


Notes: 1. Twist the wires from SDP and SDN together, and RDP and PDN together.
2. Refer to the controller manual to connect a termination resistor. If a termination resister is not specified, terminate with a 150 Ω resistor.
3. It is recommended that the cable be shielded.
4. The cable length must be 30 m or shorter in a low-noise environment. When connecting multiple axes, also keep the overall length within 30 m.
5. Connect TRE and RDN for the servo amplifier of the final axis.

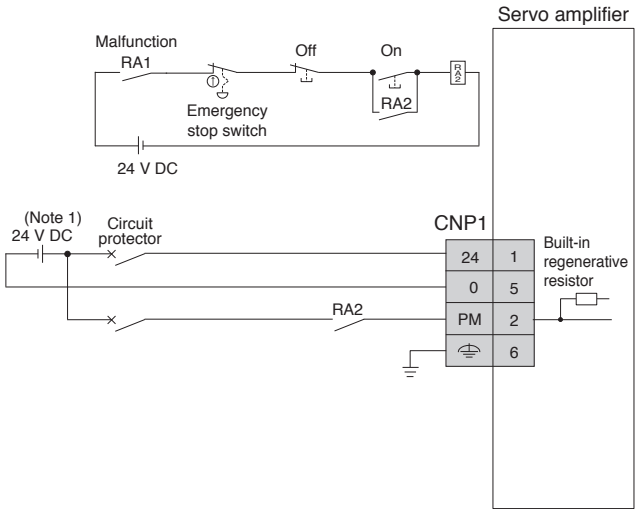
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

Main/Control Circuit Power Supply Connection Example (for MR-J4-03A6/MR-J4-03A6-RJ) A A-RJ

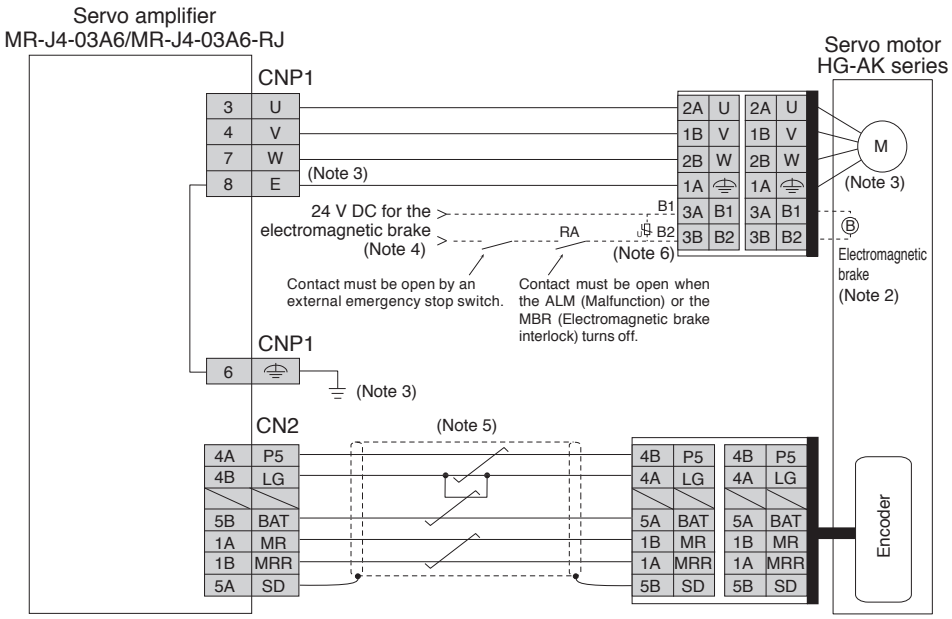
●For 48 V DC



●For 24 V DC



Servo Motor Connection Example (for MR-J4-03A6/MR-J4-03A6-RJ) A A-RJ



Notes: 1. Use 48 V DC and 24 V DC power supplies with reinforced insulation.
2. This is for the servo motor with electromagnetic brake. The electromagnetic brake terminals (B1, B2) do not have polarity.
3. Noiseless grounding ( ) terminal is connected to E terminal in the servo amplifier. Connect the noiseless ( ) terminal of CNP1 and the grounding terminal of the cabinet.
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. Be sure to install a surge absorber between B1 and B2.

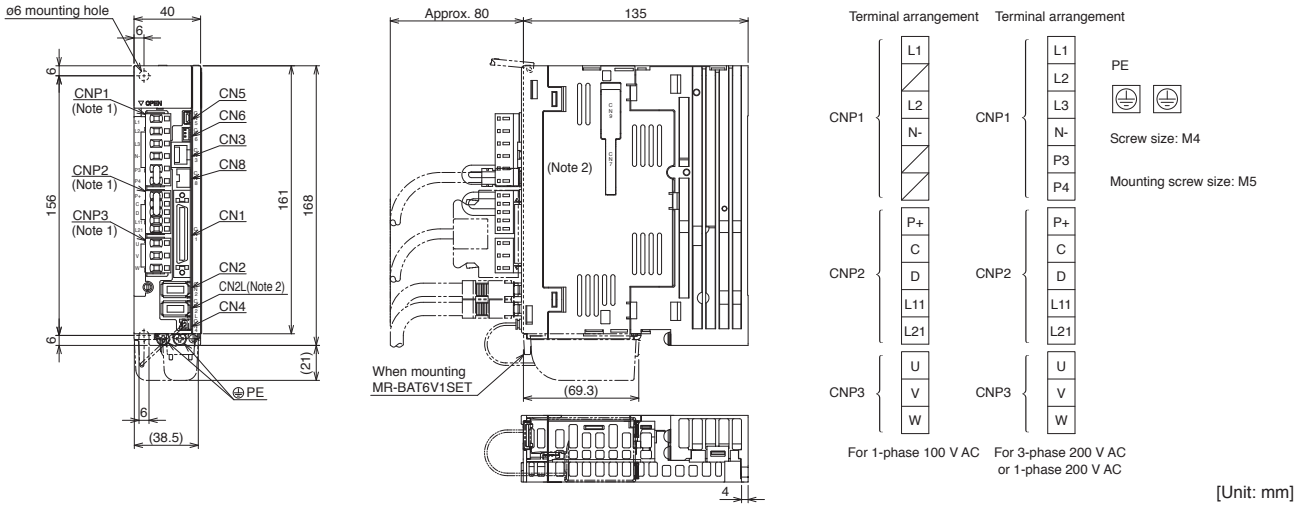
Be sure to read through Instruction Manual for the actual wiring and use. Use the equipment after you have a full knowledge of the equipment, safety information and instructions.

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

A A-RJ

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

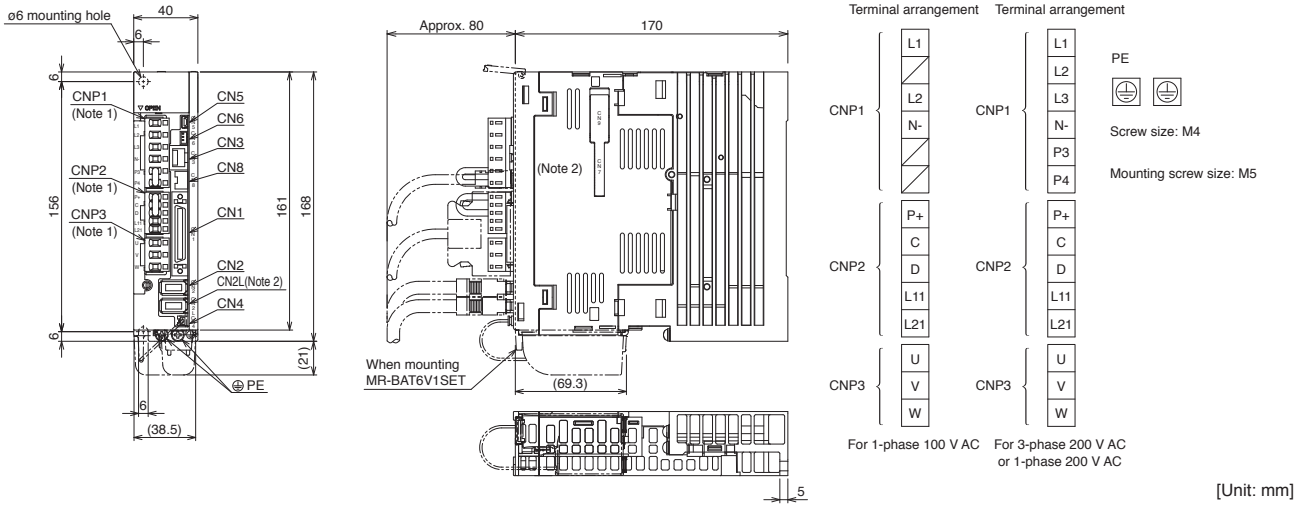
●MR-J4-20A, MR-J4-20A-RJ, MR-J4-20A1, MR-J4-20A1-RJ



[Unit: mm]

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

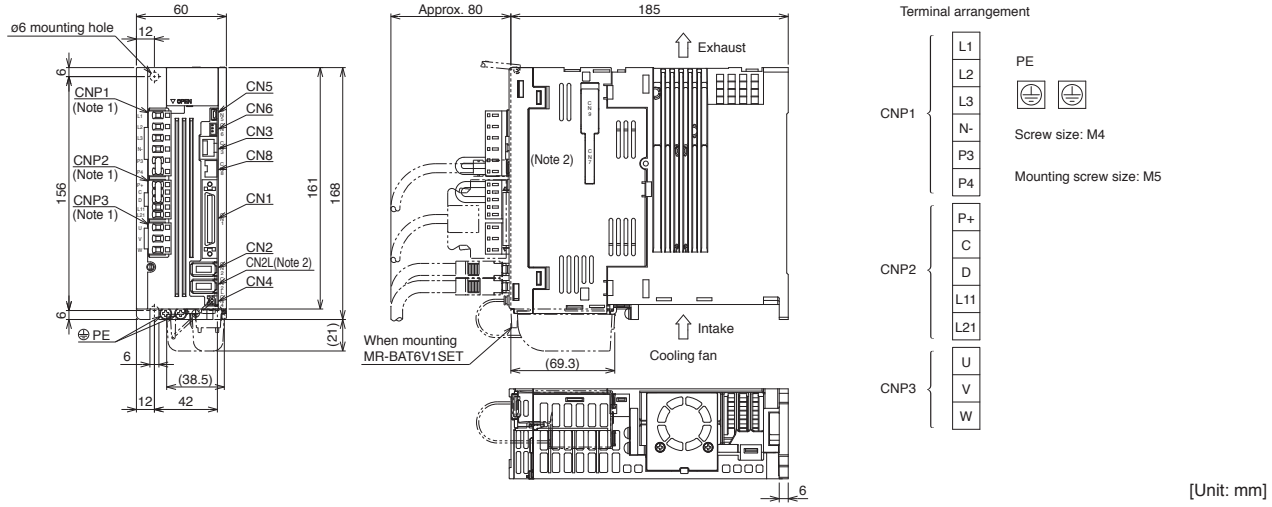
●MR-J4-60A, MR-J4-60A-RJ



[Unit: mm]

●MR-J4-70A, MR-J4-70A-RJ

●MR-J4-100A, MR-J4-100A-RJ



[Unit: mm]

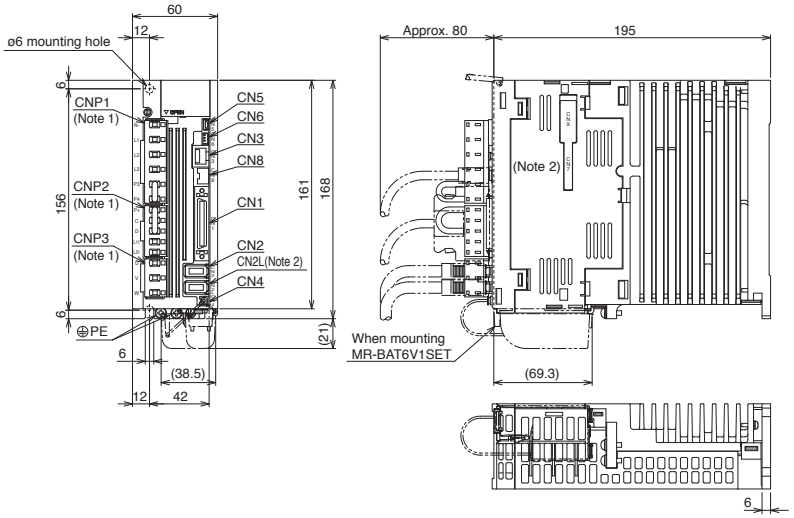
Notes: 1. CNP1, CNP2 and CNP3 connectors are supplied with the servo amplifier.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-A servo amplifier. CN9 connector is available for use with MR-J4-A-RJ servo amplifiers manufactured in November 2014 or later.

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

A A-RJ

●MR-J4-60A4, MR-J4-60A4-RJ

●MR-J4-100A4, MR-J4-100A4-RJ



Terminal arrangement

CNP1	N-, L1, L2, L3, P3, P4
CNP2	P+, C, D, L11, L21
CNP3	U, V, W

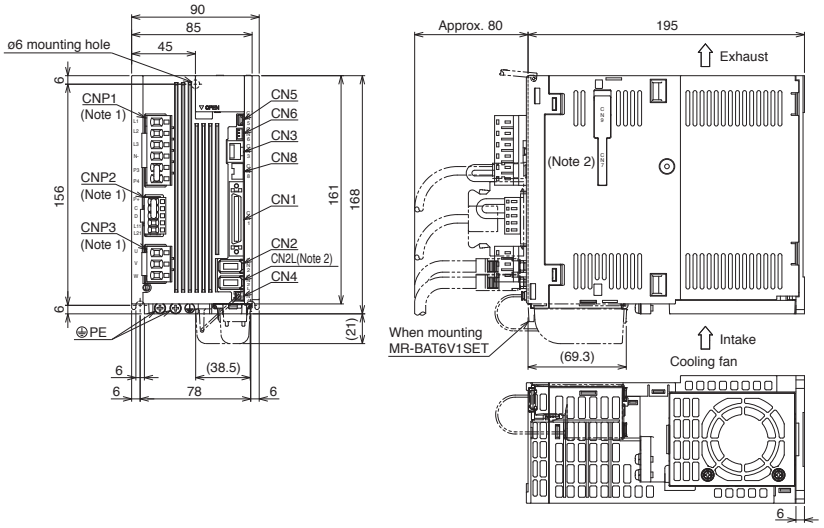
PE

Screw size: M4

Mounting screw size: M5

[Unit: mm]

●MR-J4-200A, MR-J4-200A-RJ



Terminal arrangement

CNP1	L1, L2, L3, N-, P3, P4
CNP2	P+, C, D, L11, L21
CNP3	U, V, W

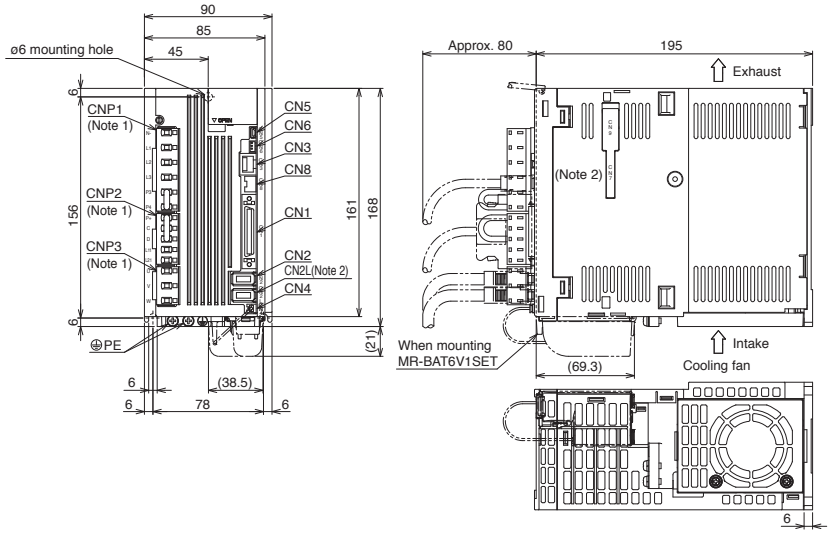
PE

Screw size: M4

Mounting screw size: M5

[Unit: mm]

●MR-J4-200A4, MR-J4-200A4-RJ



Terminal arrangement

CNP1	N-, L1, L2, L3, P3, P4
CNP2	P+, C, D, L11, L21
CNP3	U, V, W

PE

Screw size: M4

Mounting screw size: M5

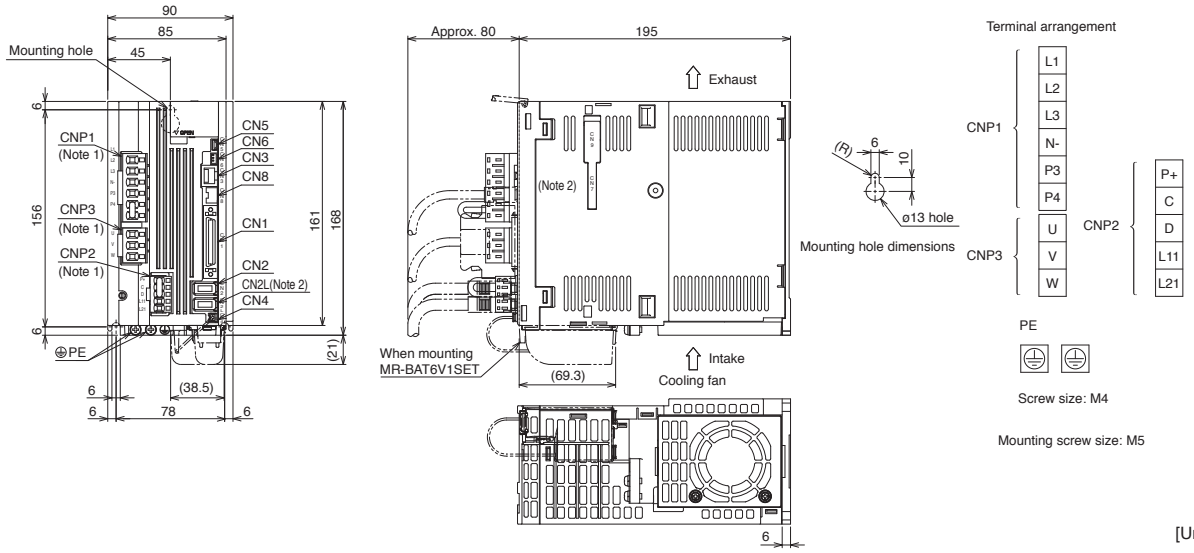
[Unit: mm]

Notes: 1. CNP1, CNP2 and CNP3 connectors are supplied with the servo amplifier.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-A servo amplifier. CN9 connector is available for use with MR-J4-A-RJ servo amplifiers manufactured in November 2014 or later.

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

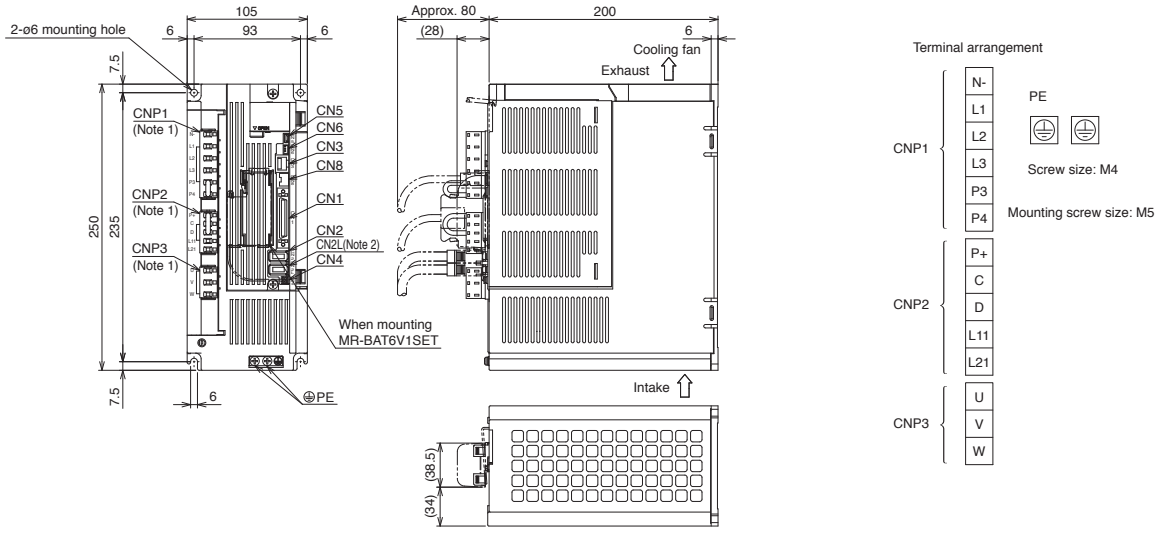
A A-RJ

●MR-J4-350A, MR-J4-350A-RJ



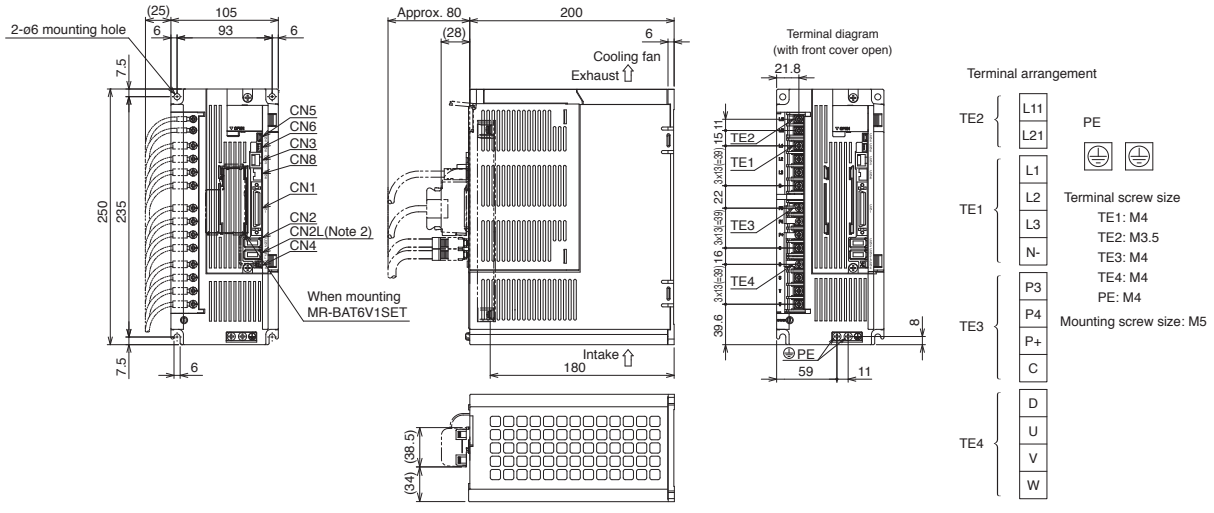
[Unit: mm]

●MR-J4-350A4, MR-J4-350A4-RJ



[Unit: mm]

●MR-J4-500A, MR-J4-500A-RJ



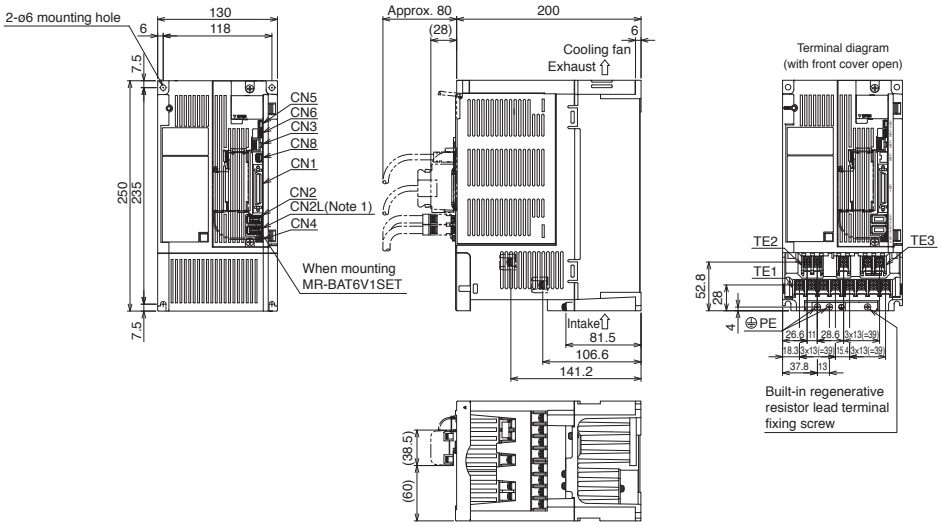
[Unit: mm]

Notes: 1. CNP1, CNP2 and CNP3 connectors are supplied with the servo amplifier.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-A servo amplifier. CN9 connector is available for use with MR-J4-A-RJ servo amplifiers manufactured in November 2014 or later.

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

A A-RJ

●MR-J4-500A4, MR-J4-500A4-RJ



Terminal screw size
TE1: M4
TE2: M3.5
TE3: M4
PE: M4

Mounting screw size: M5

Terminal arrangement

TE2

L11	L21

TE3

N-	P3	P4

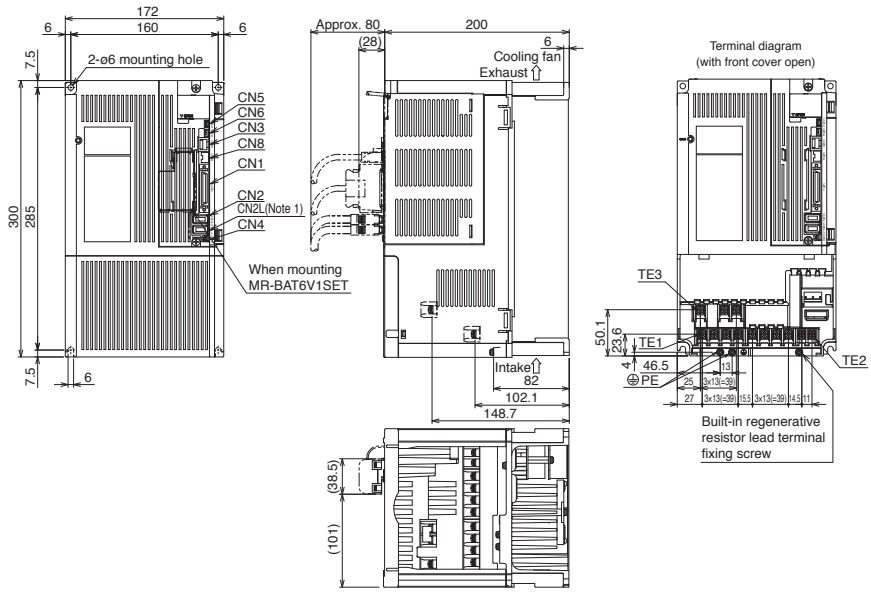
TE1

L1	L2	L3	P+	C	U	V	W

PE

[Unit: mm]

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



Terminal screw size
TE1: M4
TE2: M3.5
TE3: M4
PE: M4

Mounting screw size: M5

Terminal arrangement

TE3

N-	P3	P4

TE1

L1	L2	L3	P+	C	U	V	W

TE2

L11	L21

PE

[Unit: mm]

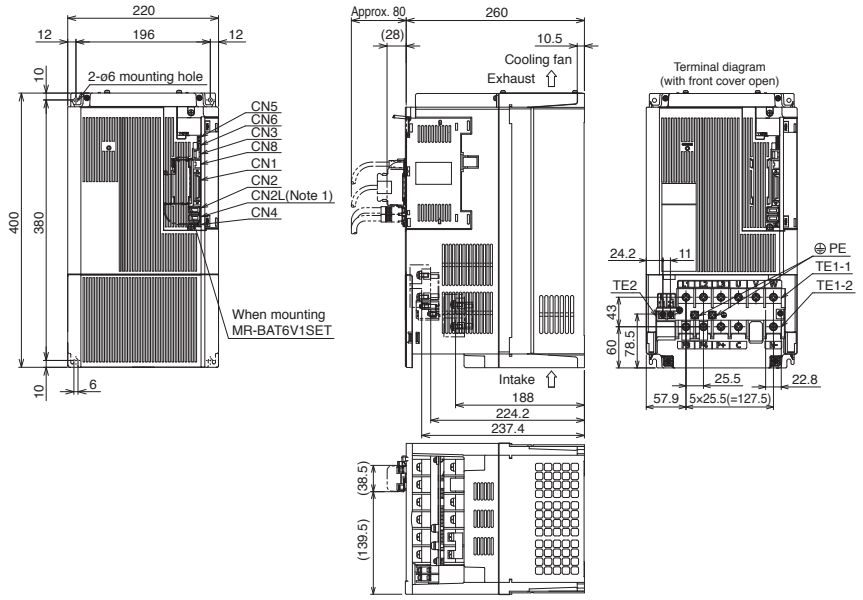
Notes: 1. CN2L, CN7, and CN9 connectors are not available for MR-J4-A servo amplifier. CN9 connector is available for use with MR-J4-A-RJ servo amplifiers manufactured in November 2014 or later.

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



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-

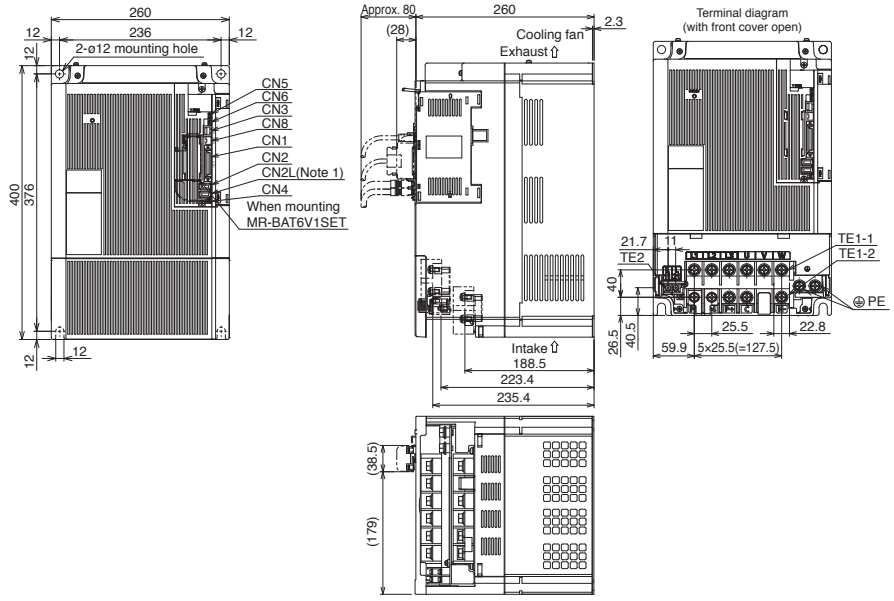
TE2

L11	L21

PE

[Unit: mm]

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



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]

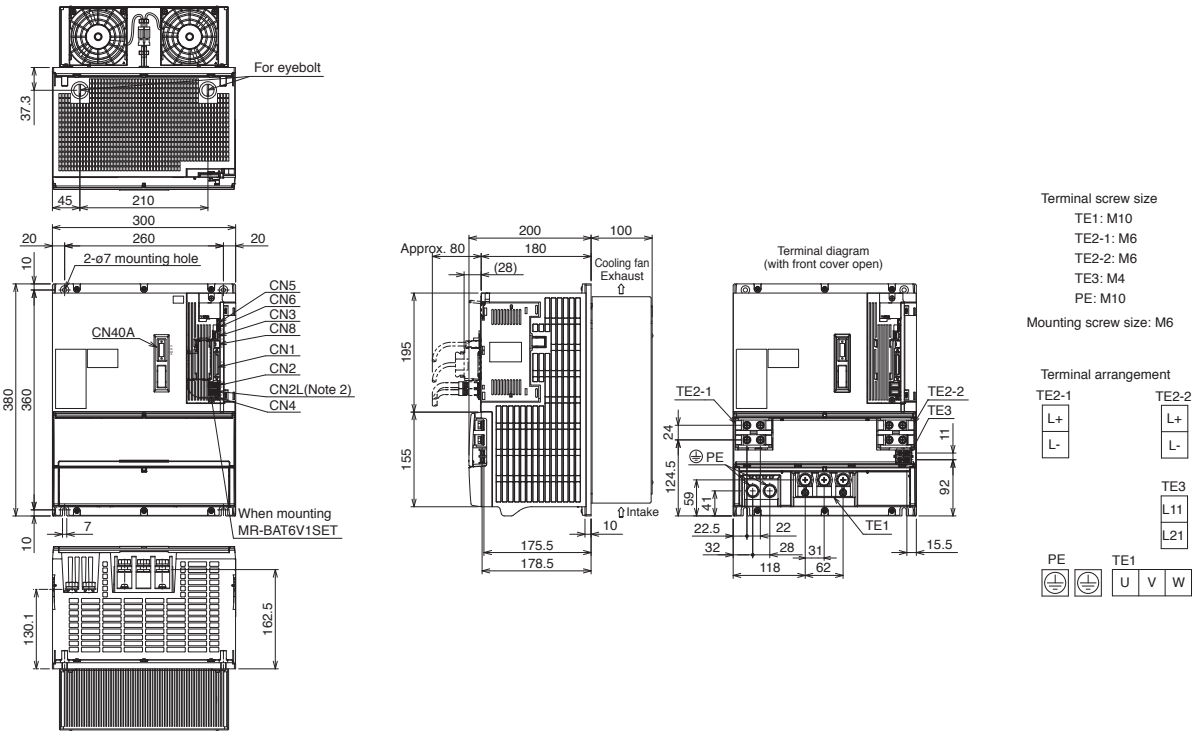
Notes: 1. CN2L, CN7, and CN9 connectors are not available for MR-J4-A servo amplifier. CN9 connector is available for use with MR-J4-A-RJ servo amplifiers manufactured in November 2014 or later.

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

A A-RJ

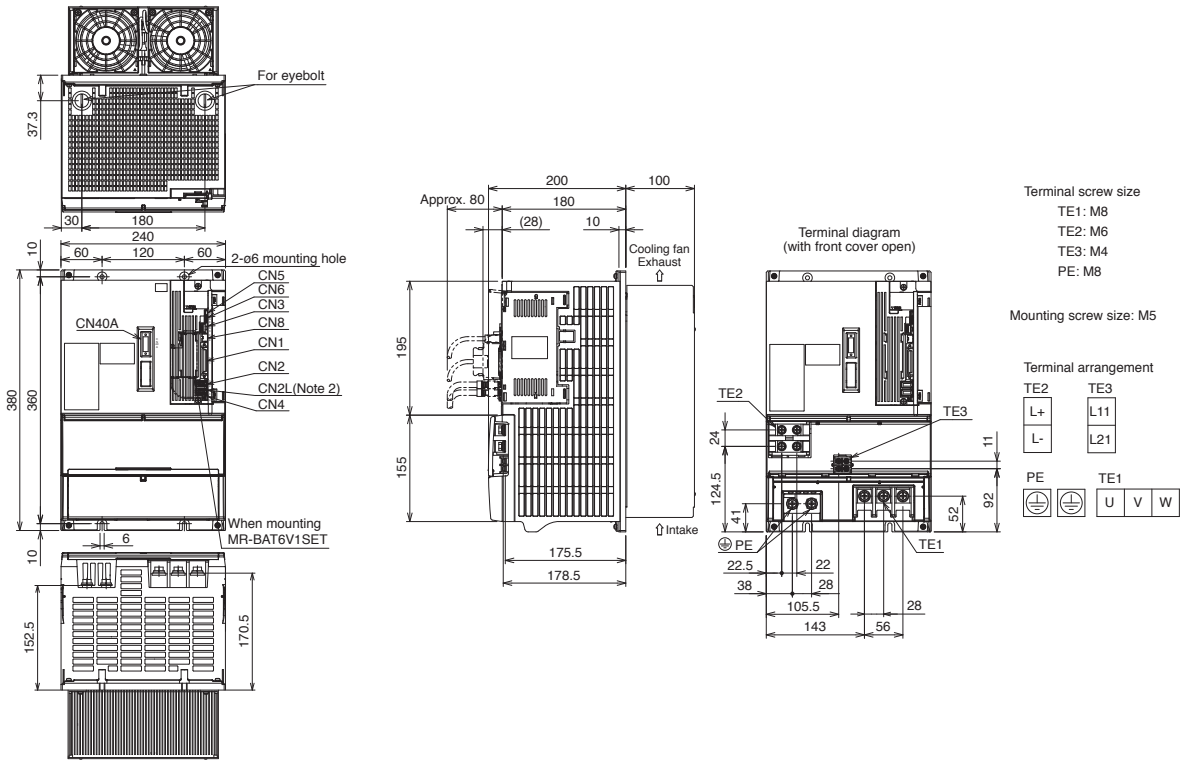
●MR-J4-DU30KA, MR-J4-DU30KA-RJ ●MR-J4-DU37KA, MR-J4-DU37KA-RJ

●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

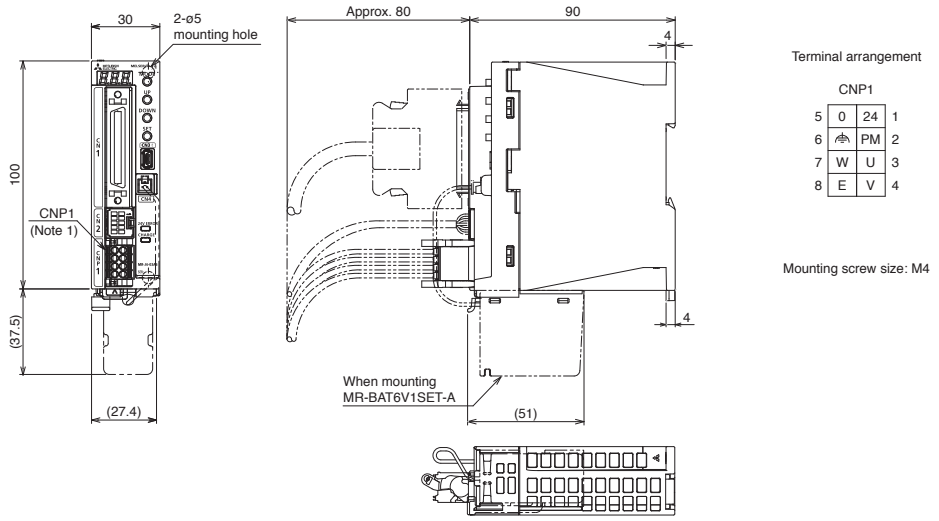


[Unit: mm]

Notes: 1. For the panel cut dimensions, refer to "Panel Cut Dimensions for Resistance Regeneration Converter Unit and Drive Unit" in this catalog.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-DU_A_ drive unit. CN9 connector is available for use with MR-J4-DU_A_-RJ drive unit manufactured in January 2015 or later.

MR-J4-03A6/MR-J4-03A6-RJ Dimensions

A A-RJ



[Unit: mm]

Notes: 1. CNP1 connector is supplied with the servo amplifier.

MR-J4-GF(-RJ)/MR-J4-A-RJ Positioning Function: Point Table Method

GF GF-RJ A-RJ

Set the position and speed data to the point table, and select the point table No. with the command interface signal to start the positioning operation.

Item				Description
Command method	Command interface	MR-J4-_GF_(-RJ)		CC-Link IE Field Network communication
		MR-J4-_A_-RJ		DI/O (Input: 11 points excluding EM2 (Forced stop 2), output: 8 points) RS-422/RS-485 communication (Note 3)
		MR-J4-03A6-RJ		DI/O (Input: 11 points excluding EM2 (Forced stop 2), output: 6 points) RS-422 communication (Note 4)
	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 [×10STM μm], -99.9999 to 99.9999 [×10STM inch], -999999 to 999999 [pulse], Setting range of rotation angle: -360.000 to 360.000 [degree] (Note 2)
		Incremental value command method		Set in the point table. Setting range of feed length per point: 0 to 999999 [×10STM μm], 0 to 99.9999 [×10STM inch], 0 to 999999 [pulse], Setting range of rotation angle: 0 to 999.999 [degree] (Note 2)
	Speed command input	MR-J4-_GF_(-RJ)		Set the acceleration/deceleration time constants in the point table. Set the S-pattern acceleration/deceleration time constants with [Pr. PT51].
		MR-J4-_A_-RJ MR-J4-03A6-RJ		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 (Note 2)			0 V DC to ±10 V DC/0% to 200%
	Torque limit	MR-J4-_GF_(-RJ)		Set by parameters or link devices
		MR-J4-_A_-RJ MR-J4-03A6-RJ		Set by parameters or external analog input (0 V DC to +10 V DC/maximum torque)
Operation mode	Automatic operation mode	One-time positioning operation		Point table No. input, position data input method One-time 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) automatic continuous operation to the point table selected at start, automatic continuous operation to the point table No. 1
	Manual operation mode	JOG operation	MR-J4-_GF_(-RJ)	Inching operation is executed with a CC-Link IE Field Network communication function based on speed commands set with a parameter.
			MR-J4-_A_-RJ MR-J4-03A6-RJ	Inching operation is executed with input signal or serial communication function (Note 3) based on speed commands set with a parameter.
		Manual pulse generator operation (Note 2)		Manual feeding is executed with a manual pulse generator. Command pulse multiplication: select from ×1, ×10, and ×100 with a parameter.
	Home position return mode	MR-J4-_GF_-RJ		Dog type (rear end detection, Z-phase reference), stopper type (stopper position reference), count type (front end detection, Z-phase reference), dog type (rear end detection, rear end reference), count type (front end detection, front end reference), dog cradle type, dog type last Z-phase reference, dog type front end reference, dogless Z-phase reference, Home position ignorance (servo-on position as home position), Homing on positive home switch and index pulse (method 3, 4), Homing on negative home switch and index pulse (method 5, 6), Homing on home switch and index pulse (method 7, 8, 11, 12), Homing without index pulse (method 19, 20, 21, 22, 23, 24, 27, 28), Homing on index pulse (method 33, 34), Homing on current position (method 35, 37)
		MR-J4-_A_-RJ MR-J4-03A6-RJ		Dog type, count type, data set type, stopper type, home position ignorance (servo-on position as home position), dog type rear end reference, count type front end reference, dog cradle type, dog type adjacent Z-phase reference, dog type front end reference, dogless Z-phase reference
	Automatic positioning to home position function			High-speed automatic positioning to a defined home position
Other functions		MR-J4-_GF_-RJ		Absolute position detection, overtravel prevention with limit switches, software stroke limit, simple cam function
		MR-J4-_A_-RJ MR-J4-03A6-RJ		Absolute position detection, backlash compensation, overtravel prevention with external limit switches (LSP/LSN), teaching function, roll feed display function, software stroke limit, mark detection (current position latch/interrupt positioning), simple cam function, infinite feed function (setting degree), 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. Supported by MR-J4-_A_-RJ and MR-J4-03A6-RJ.
3. Compatible with RS-422 communication (Mitsubishi Electric general-purpose AC servo protocol) and RS-485 communication (MODBUS® RTU protocol).
4. Compatible with RS-422 communication (Mitsubishi Electric general-purpose AC servo protocol).

MR-J4-GF(-RJ)/MR-J4-A-RJ Positioning Function: Point Table Method

GF GF-RJ A-RJ

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 (Note 1, 3) (position data)	-999999 to 999999 [×10^{STM} μm] -99.9999 to 99.9999 [×10^{STM} inch] -360.000 to 360.000 [degree] (Note 4) -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 (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 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 the point table with the absolute value command method 0: Automatic operation for a selected point table is performed. 1: Automatic continuous operation is performed without a stop to the next point table. 8: Automatic continuous operation is performed without a stop to the point table selected at startup. 9: Automatic continuous operation of the point table No. 1 is performed without a stop. (2) When using this point table with the incremental value command method 2: Automatic operation for a selected point table is performed. 3: Automatic continuous operation is performed without a stop to the next point table. 10: Automatic continuous operation for a point table selected at startup is performed. 11: Automatic continuous operation of the point table No. 1 is performed without a stop.
M code	0 to 99	Set a code to be outputted when the positioning completes.

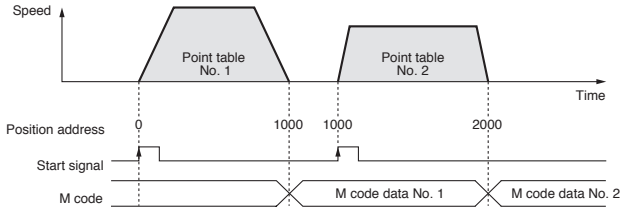
Notes: 1. Change the unit to μm/inch/degree/pulse with [Pr. PT01].
2. The speed unit is r/min for the rotary servo motors and the direct drive motors, and mm/s for the linear servo motors.
3. STM is the ratio to the setting value of the position data. STM can be changed with [Pr. PT03].
4. Supported by MR-J4-_A_-RJ and MR-J4-03A6-RJ.

Example of setting point table data

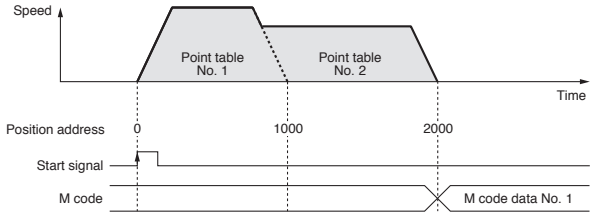
Point table No.	Target position (position data) [× 10^{STM} μm] (Note 1)	Servo motor speed [r/min]	Acceleration time constant [ms]	Deceleration time constant [ms]	Dwell [ms]	Sub function	M code (Note 2)
1	1000	2000	200	200	0	✻	1
2	2000	1600	100	100	0	0	2
:	:	:	:	:	:	:	:
255	3000	3000	100	100	0	2	99

✻ 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].
2. Supported by MR-J4-_A_-RJ and MR-J4-03A6-RJ.

MR-J4-GF(-RJ)/MR-J4-A-RJ Positioning Function: Point Table Method

GF GF-RJ A-RJ

Incremental value command method: travels from a current position based on 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 [×10^{STM} µm] 0 to 99.9999 [×10^{STM} inch] 0 to 999.999 [degree] (Note 4) 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: Automatic operation for a selected point table is performed. 1: Automatic continuous operation is performed without a stop to the next point table. 8: Automatic continuous operation is performed without a stop to the point table selected at startup. 9: Automatic continuous operation of the point table No. 1 is performed without a stop.
M code	0 to 99	Set a code to be outputted when the positioning completes.

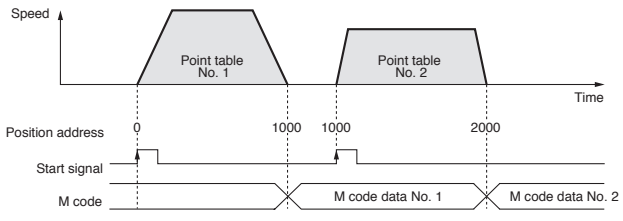
Notes: 1. Change the unit to µm/inch/degree/pulse with [Pr. PT01].
2. The speed unit is r/min for the rotary servo motors and the direct drive motors, and mm/s for the linear servo motors.
3. STM is the ratio to the setting value of the position data. STM can be changed with [Pr. PT03].
4. Supported by MR-J4-_A_-RJ and MR-J4-03A6-RJ.

Example of setting point table data

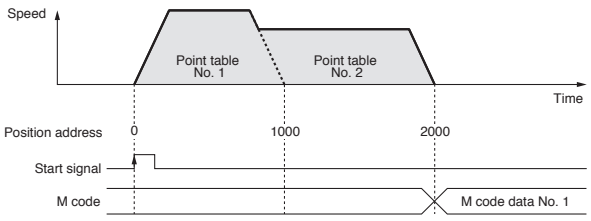
Point table No.	Target position (position data) [× 10^{STM} µm] (Note 1)	Servo motor speed [r/min]	Acceleration time constant [ms]	Deceleration time constant [ms]	Dwell [ms]	Sub function	M code (Note 2)
1	1000	2000	200	200	0	✻	1
2	1000	1600	100	100	0	0	2
:	:	:	:	:	:	:	:
255	3000	3000	100	100	0	0	99

✻ 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.



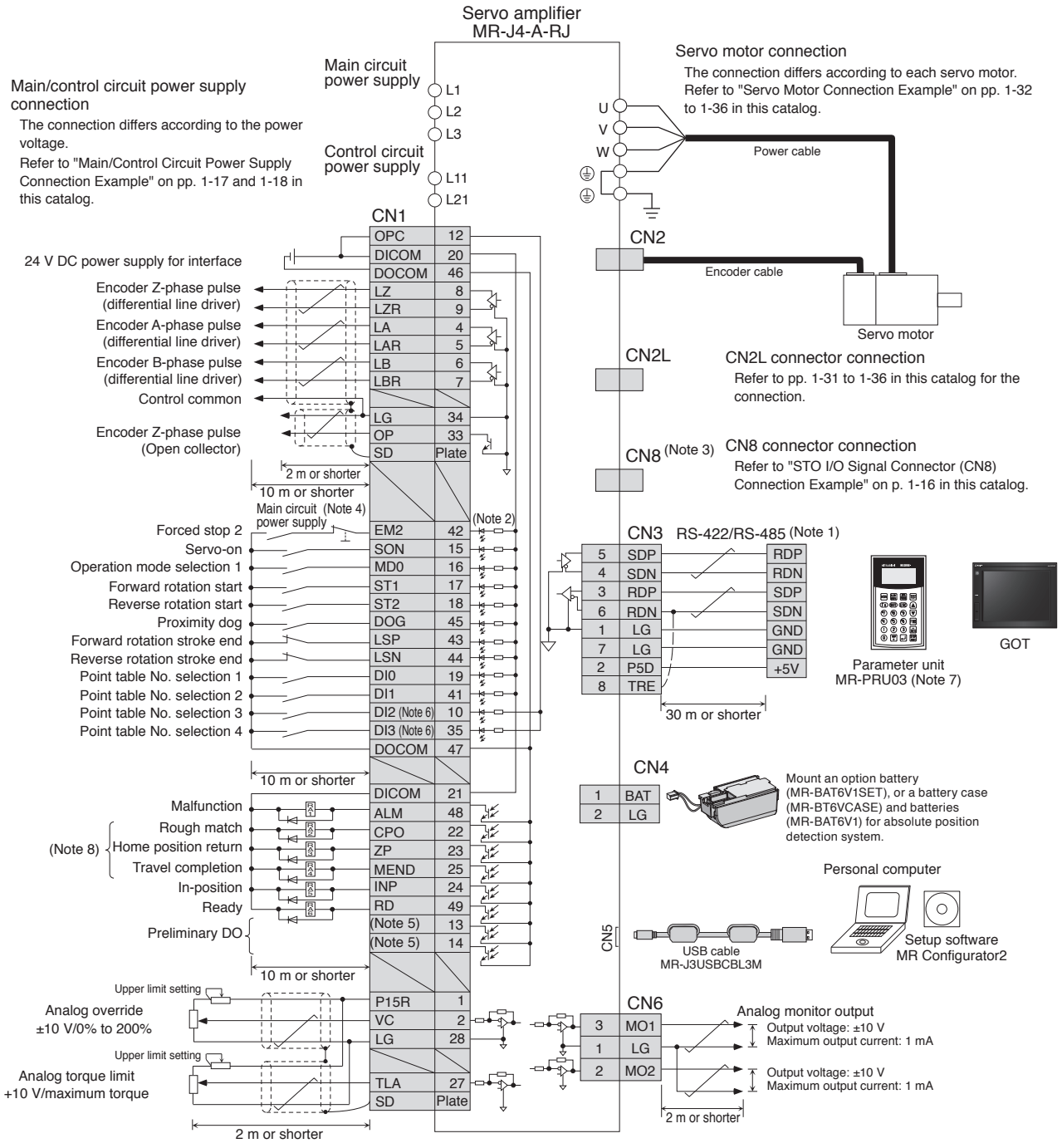
● **When the sub function is set to 1:**
Automatic continuous operation is executed based on the point table.



Notes: 1. STM is the ratio to the setting value of the position data. STM can be changed with [Pr. PT03].
2. Supported by MR-J4-_A_-RJ and MR-J4-03A6-RJ.

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

A-RJ



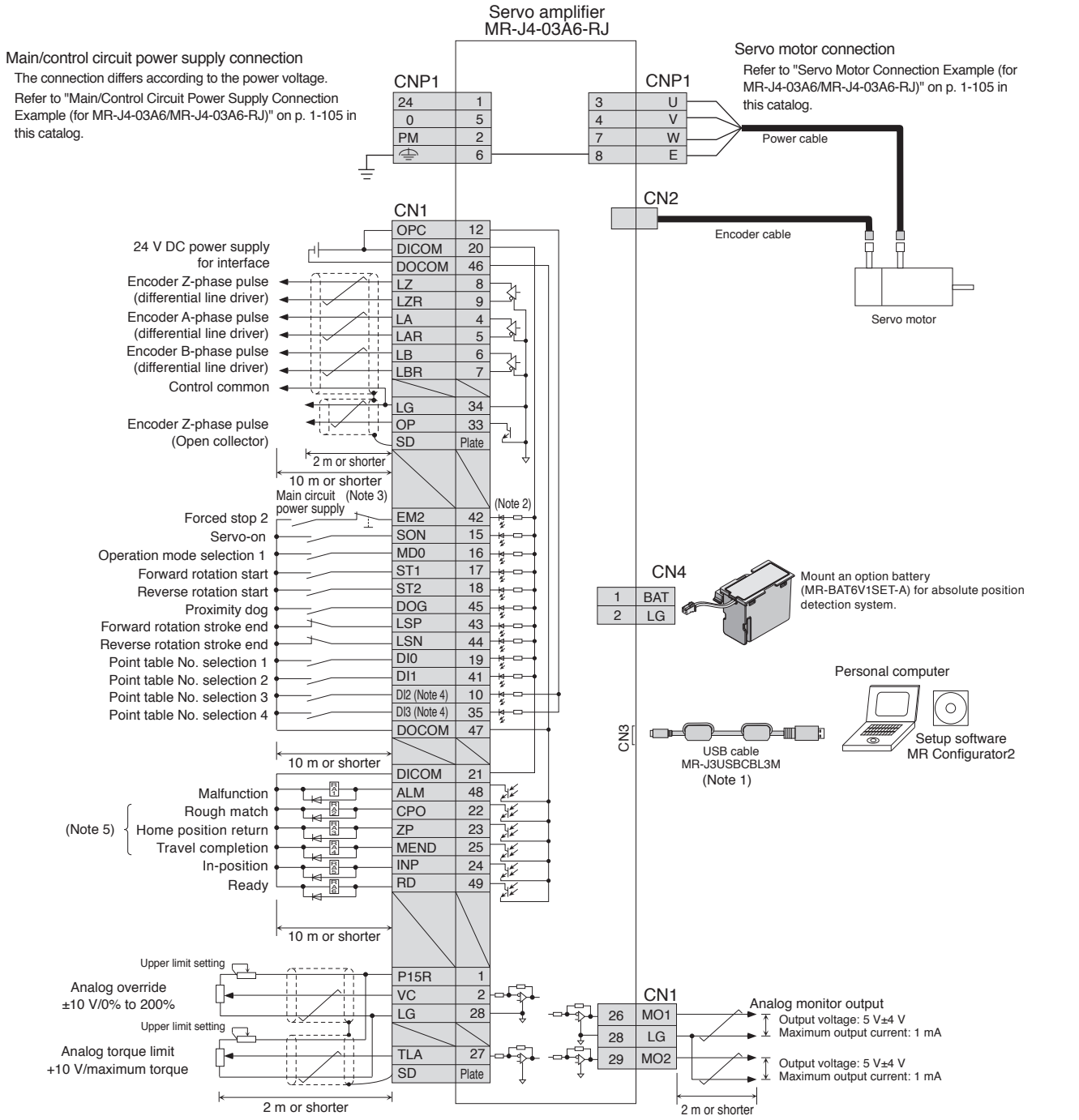
Notes: 1. It is also possible to connect a personal computer to CN3 connector with an RS-422/RS-232C conversion cable. However, USB (CN5 connector) and RS-422/RS-485 (CN3 connector) communication functions are mutually exclusive. Do not use them at the same time. Refer to "Products on the Market for 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 positioning mode, input devices are assigned in the initial setting. Refer to "MR-J4-_A_-RJ MR-J4-03A6-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. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
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. When using MR-PRU03 parameter unit, use a commercial LAN cable (EIA568 compliant), and keep the wire length to a maximum of 10 m.
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-J4-03A6-RJ Standard Wiring Diagram Example: Point Table Method

A-RJ



Notes: 1. USB and RS-422 communication functions are mutually exclusive. Do not use them at the same time.
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 positioning mode, input devices are assigned in the initial setting. Refer to "MR-J4-_A_-RJ MR-J4-03A6-RJ Servo Amplifier Instruction Manual (Positioning Mode)" for details.
3. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
4. 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.
5. 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

A-RJ

Create a program including the position data, the servo motor speed, and the acceleration/deceleration time constants, and select the program No. with the command interface signals to start the positioning operation. The program based method enables more complex positioning operation than the point table method. MR Configurator2 is required to create programs.

Item			Description
Command method	Command interface	MR-J4-_A_-RJ	DI/O (Input: 11 points excluding EM2 (Forced stop 2), output: 8 points) RS-422/RS-485 communication (Note 2)
		MR-J4-03A6-RJ	DI/O (Input: 11 points excluding EM2 (Forced stop 2), output: 6 points) RS-422 communication (Note 3)
	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 [×10^{STM} µm], -99.9999 to 99.9999 [×10^{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 [×10^{STM} µm], -99.9999 to 99.9999 [×10^{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 input signal or serial communication function (Note 2) based on speed commands set with a parameter.
		Manual pulse generator operation	Manual feeding is executed with a manual pulse generator. Command pulse multiplication: select from ×1, ×10, and ×100 with a parameter.
	Home position return mode		Dog type, count type, data set type, stopper type, home position ignorance (servo-on position as home position), dog type rear end reference, count type front end reference, dog cradle type, dog type adjacent Z-phase reference, dog type front end reference, dogless Z-phase reference
Other functions			Absolute position detection, backlash compensation, overtravel prevention with external limit switches (LSP/LSN), roll feed display function, software stroke limit, mark detection (current position latch/interrupt positioning/mark sensor input compensation), simple cam function, infinite feed function (setting degree), 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. Compatible with RS-422 communication (Mitsubishi Electric general-purpose AC servo protocol) and RS-485 communication (MODBUS® RTU protocol).
3. Compatible with RS-422 communication (Mitsubishi Electric general-purpose AC servo protocol).

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

A-RJ

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 [×10^{STM} µm] -99.9999 to 99.9999 [×10^{STM} inch] -360.000 to 360.000 [degree] -999999 to 999999 [pulse]	Travels based on the value set as an absolute value.
MOVA(setting value) (Note 4, 5)	Absolute value continuous travel command		Travels continuously based on 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 [×10^{STM} µm] -99.9999 to 99.9999 [×10^{STM} inch] -999.999 to 999.999 [degree] -999999 to 999999 [pulse]	Travels based on the value set as an incremental value.
MOVIA(setting value) (Note 4, 5)	Incremental value continuous travel command		Travels continuously based on 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 [×10^{STM} µm] -99.9999 to 99.9999 [×10^{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 [×10^{STM} µm] -99.9999 to 99.9999 [×10^{STM} inch] -999.999 to 999.999 [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	0 to 999999 [×10^{STM} µm] 0 to 99.9999 [×10^{STM} inch] 0 to 999.999 [degree] 0 to 999999 [pulse]	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

A-RJ

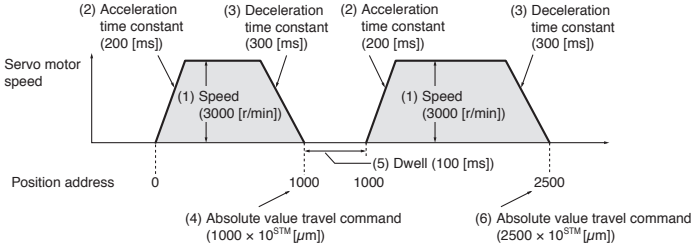
Command list

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 running 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 running 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.

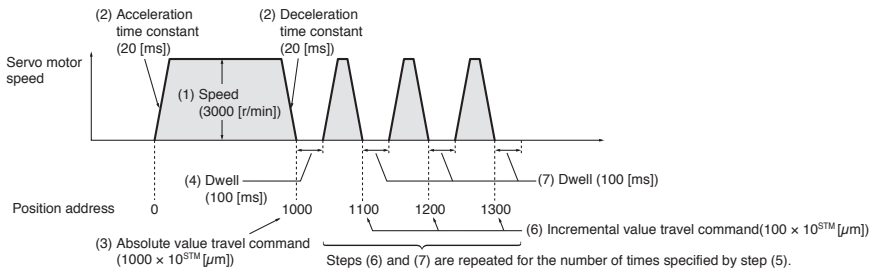
Step	Program (Note 1)	Description
(1)	SPN(3000)	Servo motor speed: 3000 [r/min]
(2)	STA(200)	Acceleration time constant: 200 [ms]
(3)	STB(300)	Deceleration time constant: 300 [ms]
(4)	MOV(1000)	Absolute value travel command: 1000 [×10^{STM} µm]
(5)	TIM(100)	Dwell: 100 [ms]
(6)	MOV(2500)	Absolute value travel command: 2500 [×10^{STM} µm]
(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.

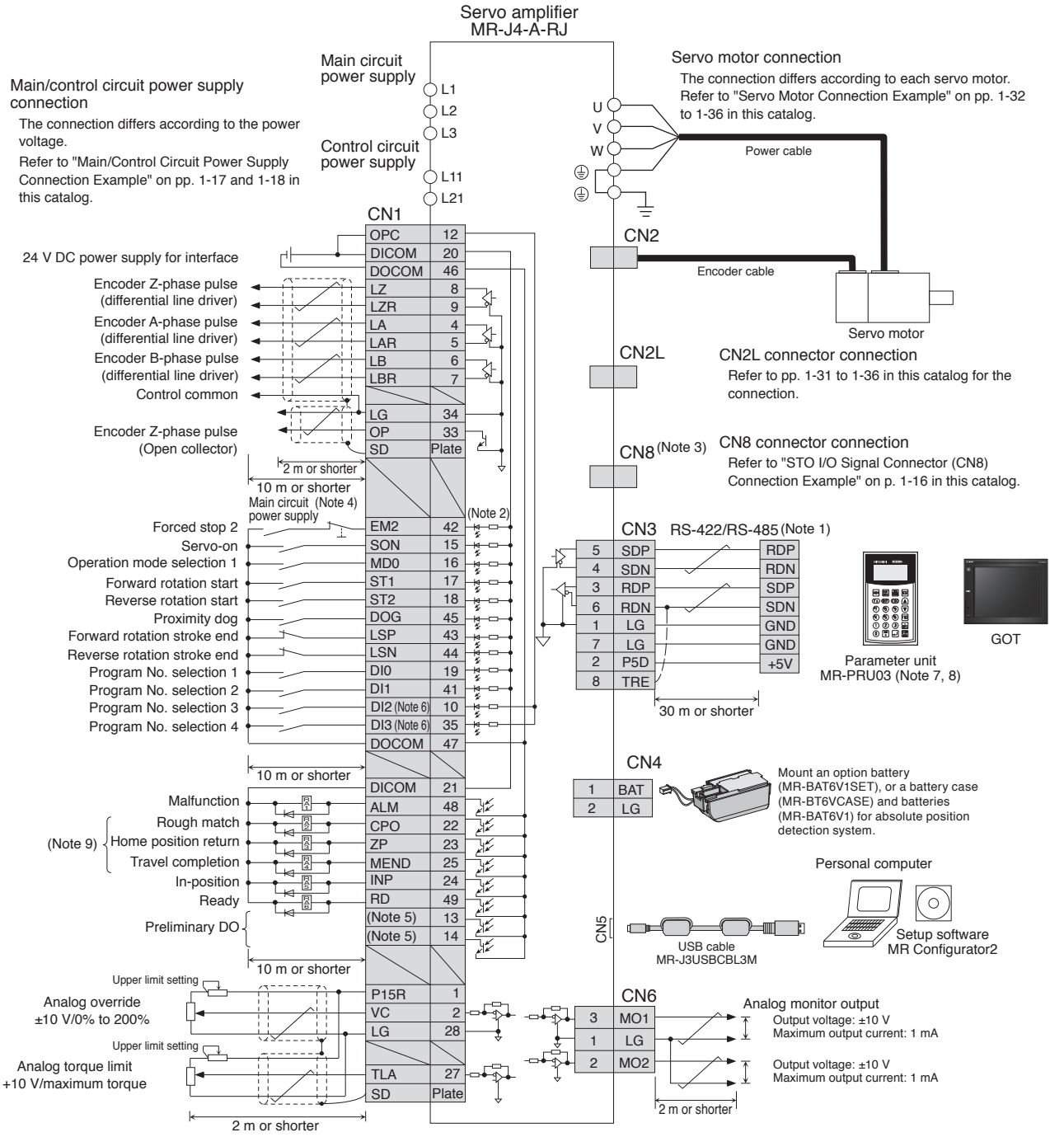
Step	Program (Note 1)	Description
(1)	SPN(3000)	Servo motor speed: 3000 [r/min]
(2)	STC(20)	Acceleration/deceleration time constants: 20 [ms]
(3)	MOV(1000)	Absolute value travel command: 1000 [×10^{STM} µm]
(4)	TIM(100)	Dwell: 100 [ms]
(5)	FOR(3)	Starting the step repeat command: 3 [number of times]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



Notes: 1. The values in [SPN], [STA], [STB], and [STC] commands remains valid until they are reset. The values will not be initialized at the start of the program. The settings are also valid in other programs.

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

A-RJ

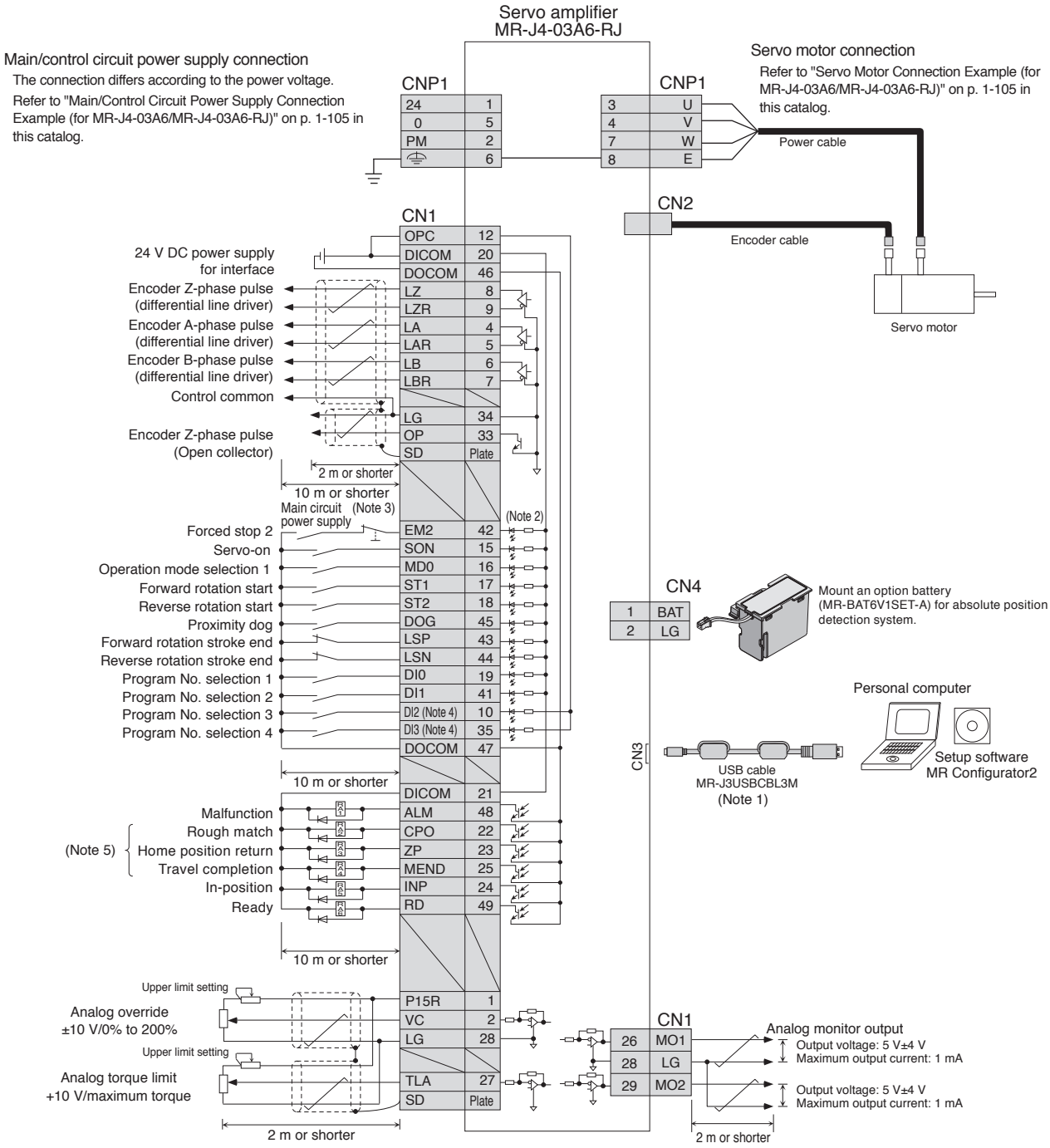


Notes: 1. It is also possible to connect a personal computer to CN3 connector with an RS-422/RS-232C conversion cable. However, USB (CN5 connector) and RS-422/RS-485 (CN3 connector) communication functions are mutually exclusive. Do not use them at the same time. Refer to "Products on the Market for 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 positioning mode, input devices are assigned in the initial setting. Refer to "MR-J4-_A_-RJ MR-J4-03A6-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. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
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. When using MR-PRU03 parameter unit, use a commercial LAN cable (EIA568 compliant), and keep the wire length to a maximum of 10 m.
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-J4-03A6-RJ Standard Wiring Diagram Example: Program Method

A-RJ



Notes: 1. USB and RS-422 communication functions are mutually exclusive. Do not use them at the same time.
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 positioning mode, input devices are assigned in the initial setting. Refer to "MR-J4-_A_-RJ MR-J4-03A6-RJ Servo Amplifier Instruction Manual (Positioning Mode)" for details.
3. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
4. 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.
5. 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-GF(-RJ)/MR-J4-A-RJ Positioning Function: Indexer Method

GF GF-RJ A-RJ

Positioning is executed in accordance with the specified stations (maximum of 255 stations).
The servo amplifier automatically calculates the travel distance from the number of stations and gear teeth in the machine and servo motor sides set in the parameters.

Item			Description
Command method	Command interface	MR-J4-_GF_(-RJ)	CC-Link IE Field Network communication
		MR-J4-_A_-RJ	DI/O (Input: 11 points excluding EM2 (Forced stop 2), output: 8 points) RS-422/RS-485 communication (Note 1)
		MR-J4-03A6-RJ	DI/O (Input: 11 points excluding EM2 (Forced stop 2), output: 6 points) RS-422 communication (Note 2)
	Operating specification		Positioning in accordance with the specified stations The maximum number of divisions: 255
	Speed command input	MR-J4-_GF_(-RJ)	Select from the point table with the remote register, Set the speed command data (speed and acceleration/deceleration time constants)
		MR-J4-_A_-RJ MR-J4-03A6-RJ	Select the rotation speed and acceleration/deceleration time by input signal
	System		Rotation direction specifying indexer, shortest rotating indexer
	Digital override (Note 3)		Select the override multiplying factor by input signal
	Torque limit	MR-J4-_GF_(-RJ)	Set by parameters or link devices
		MR-J4-_A_-RJ MR-J4-03A6-RJ	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	MR-J4-_GF_(-RJ)	Torque limit changing dog type, torque limit changing data set type, Homing on current position (Method 35, 37)
		MR-J4-_A_-RJ MR-J4-03A6-RJ	Torque limit changing dog type, torque limit changing data set type
Other functions		MR-J4-_GF_(-RJ)	Absolute position detection, overtravel prevention with limit switches
		MR-J4-_A_-RJ MR-J4-03A6-RJ	Absolute position detection, backlash compensation, overtravel prevention with external limit switches (LSP/LSN), digital override function

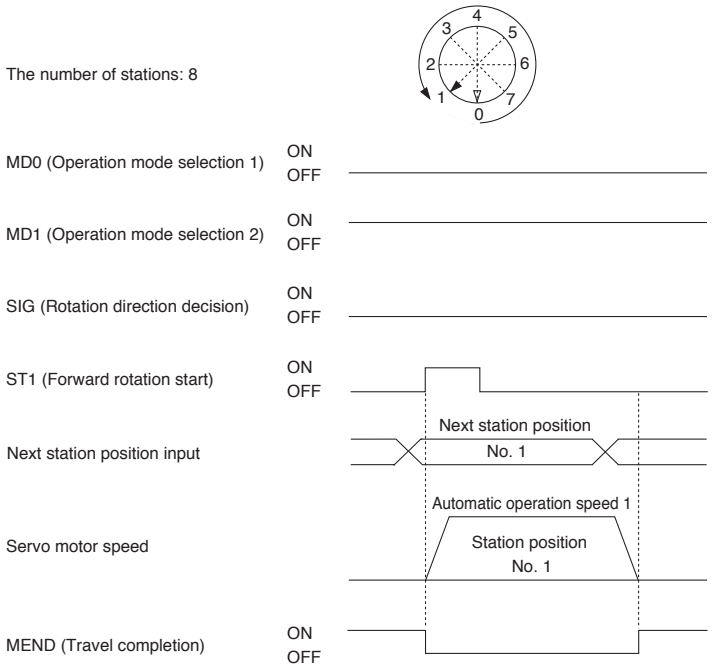
Notes: 1. Compatible with RS-422 communication (Mitsubishi Electric general-purpose AC servo protocol) and RS-485 communication (MODBUS® RTU protocol).
2. Compatible with RS-422 communication (Mitsubishi Electric general-purpose AC servo protocol).
3. Supported by MR-J4-_A_-RJ and MR-J4-03A6-RJ.

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

GF GF-RJ A-RJ

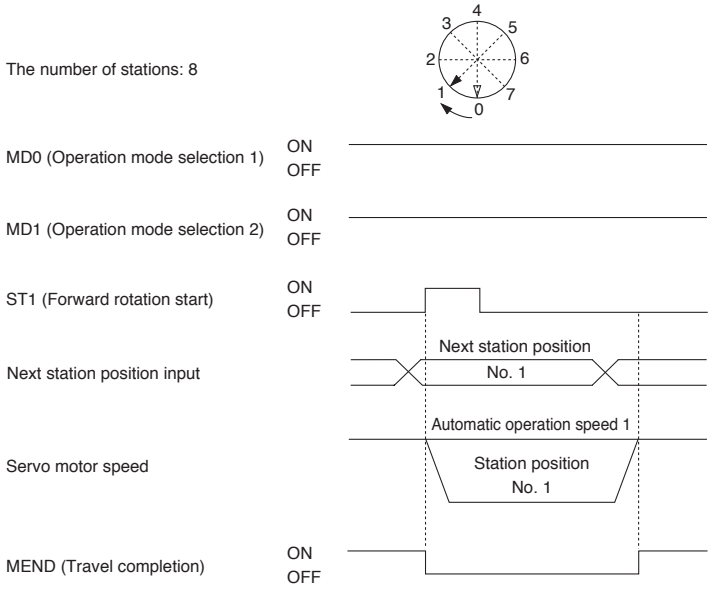
Rotation direction specifying indexer

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 start) 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.



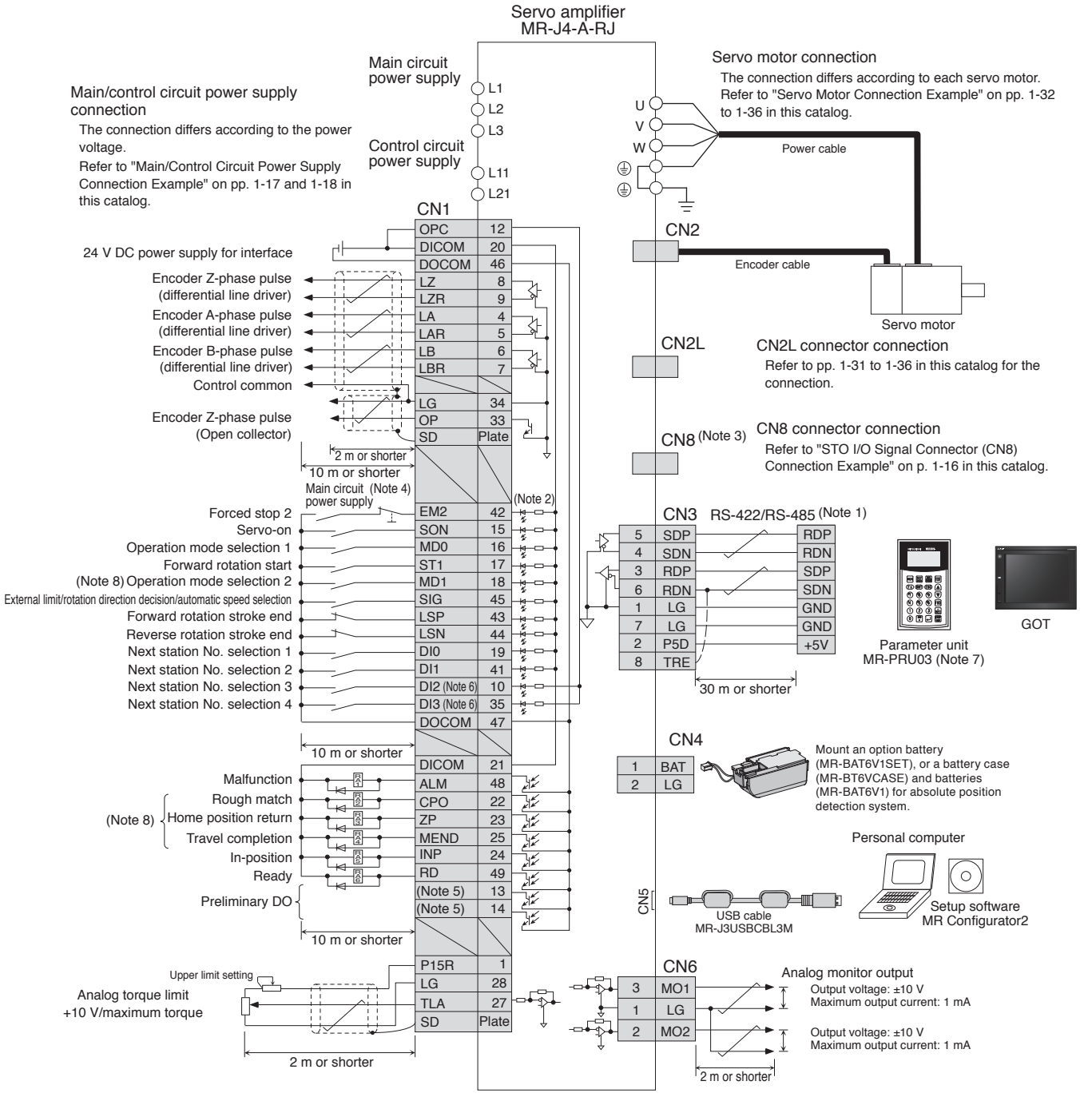
Shortest rotating indexer

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 start) 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 Method

A-RJ



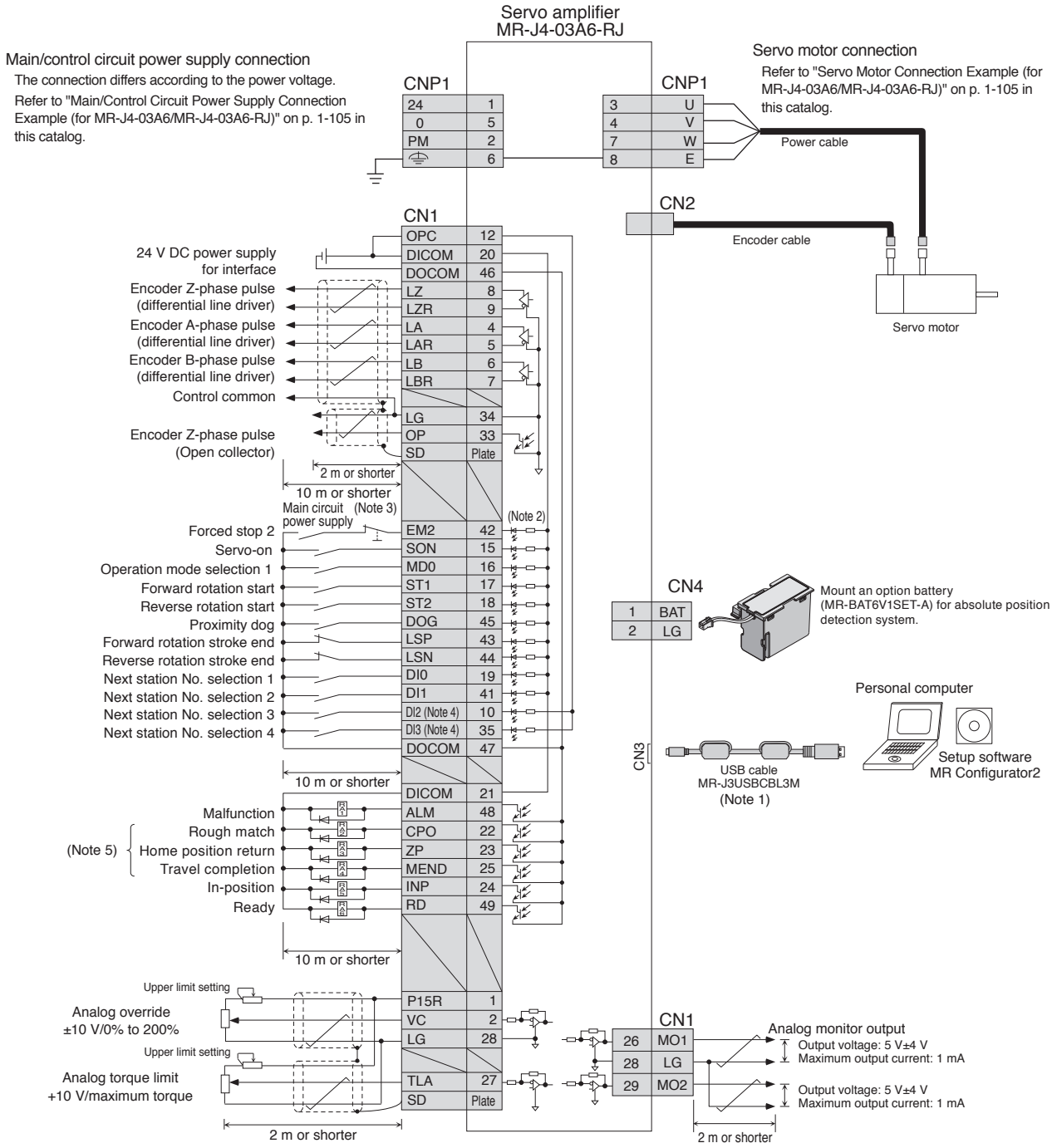
Notes: 1. It is also possible to connect a personal computer to CN3 connector with an RS-422/RS-232C conversion cable. However, USB (CN5 connector) and RS-422/RS-485 (CN3 connector) communication functions are mutually exclusive. Do not use them at the same time. Refer to "Products on the Market for 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 positioning mode, input devices are assigned in the initial setting. Refer to "MR-J4-_A_-RJ MR-J4-03A6-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. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
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. When using MR-PRU03 parameter unit, use a commercial LAN cable (EIA568 compliant), and keep the wire length to a maximum of 10 m.
8. Assign the output devices mentioned to CN1-18 pin, 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-J4-03A6-RJ Standard Wiring Diagram Example: Indexer Method

A-RJ



Notes: 1. USB and RS-422 communication functions are mutually exclusive. Do not use them at the same time.
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 positioning mode, input devices are assigned in the initial setting. Refer to "MR-J4-_A_-RJ MR-J4-03A6-RJ Servo Amplifier Instruction Manual (Positioning Mode)" for details.
3. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
4. 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.
5. Assign the output devices mentioned to CN1-18 pin, 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.

MODBUS® RTU Specifications (Note 1)

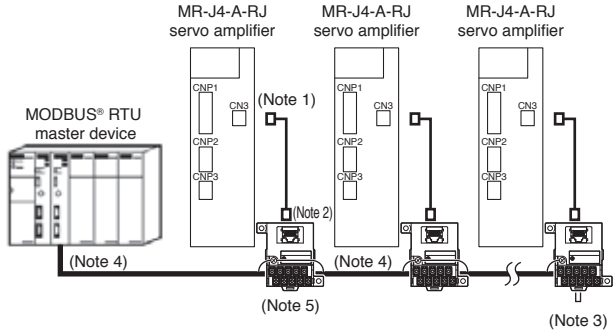
A-RJ

Item		Specifications
Communication protocol		MODBUS® RTU protocol
Compliance with standards		EIA-485 (RS-485)
Numbers connected		1:n (maximum 32) Set stations 1 to 247 by a parameter. (Station 0 is for broadcast communication)
Communication baud rate [bps]		4800/9600/19200/38400/57600/115200 (set by a parameter)
Control process		Asynchronous system
Communication method		Half duplex/full duplex
Maximum overall extension distance [m]		30
Communication specifications	Character method	Binary (8-bit fixed)
	Start bit	1-bit
	Stop bit length	Select from the following by a parameter. • Even parity, stop bit length 1-bit (initial value) • Odd parity, stop bit length 1-bit • No parity, stop bit length 2-bit
	Parity check	
	Error check	CRC-16 method
	Terminator	None
Waiting time setting		None
Master/slave classification		Slave

Notes: 1. MR-J4-03A6-RJ is not compatible with MODBUS® RTU.

MODBUS® RTU Wiring (For Multi-Drop) (Note 6)

A-RJ



Notes: 1. Use RJ-45 compatible cable (DSV-CABMD06) designed for MR-J4-A-RJ.
2. Use RJ-45 compatible junction connector terminal block (PX7D-10V4-RJ45).
3. For the final axis, connect 6-pin and 8-pin of RJ-45 compatible junction connector terminal block (PX7D-10V4-RJ45).
4. Use a shielded twisted pair cable between a master device and RJ-45 compatible junction connector terminal block (PX7D-10V4-RJ45), and between each of RJ-45 compatible junction connector terminal blocks (PX7D-10V4-RJ45).
5. Connect the shield of the shielded twisted pair cable mentioned in Note 4 to E terminal of RJ-45 compatible junction connector terminal block (PX7D-10V4-RJ45).
6. RJ-45 junction connector terminal block (PX7D-10V4-RJ45) and RJ-45 compatible cable (DSV-CABMD06) designed for MR-J4-A-RJ are required even for connecting single axis.

MODBUS® RTU Compatible Function Codes

A-RJ

MR-J4-_A_-RJ servo amplifier and MR-J4-DU_A_-RJ drive unit are compatible with following function code.

Code	Function name	Description
03h	Read holding registers	Reading holding registers Reads data stored in holding registers from a master.
08h	Diagnostics	Functional diagnostics When this function code is sent from a master to slaves, the slaves return the data as it is. This function can be used for checking the communication status.
10h	Preset multiple registers	Writing to multiple registers Writes a series of multiple data to holding registers from a master.

MODBUS® RTU Functions

A-RJ

The functions of MODBUS® RTU are as follows. MODBUS® RTU can operate and maintain the servo amplifier by remote control.

Function	Description
Status monitor	Reads the items of "Display All" in the monitor function of MR Configurator2 such as servo motor speed and position deviation.
Parameter setting	Reads and writes parameters.
Point table setting	Reads and writes point table data.
Current alarm reading	Reads an alarm No. currently generated.
Alarm history reading	Reads all 16 alarm histories.
Parameter error No. reading/ point table error No. reading	Reads corresponding parameter No. for parameter error and corresponding point table No. for point table error.
Input/output monitor	Reads on/off status of external I/O signals and monitor situation of I/O devices.
Motor driving	Drives servo motors.
Servo amplifier information reading	Reads servo amplifier model, software version, and cumulative power-on time.

Simple Cam Specifications (Note 1)

GF GF-RJ A-RJ

Items			Specifications
Memory capacity	Storage area for cam data		8 Kbytes (non-volatile memory)
	Working area for cam data		8 Kbytes (RAM)
Number of registration			Maximum 8 (depending on cam resolution and the number of coordinates)
Comment			Maximum 32 single-byte characters for each cam data
Cam data	Stroke ratio data type	Cam resolution (Maximum number of registration)	256 (8), 512 (4), 1024 (2), 2048 (1)
		Stroke ratio	-100.000% to 100.000%
	Coordinate data type	Number of coordinates (Maximum number of registration)	2 to 1024 Example: 128 (8), 256 (4), 512 (2), 1024 (1)
		Coordinate data	Input value: 0 to 999999 Output value: -999999 to 999999
Cam curve			12 types (constant speed/constant acceleration/5th curve/single hypotenuse/ cycloid/distorted trapezoid/distorted sine/distorted constant speed/trapecloid/reverse trapecloid/double hypotenuse/reverse double hypotenuse)

Notes: 1. Simple cam is not supported by MR-J4-03A6-RJ.

MEMO

2 Rotary Servo Motors

Model Designation 2-1

Combinations of Rotary Servo Motor and Servo Amplifier 2-4

Combinations of HG-JR Servo Motor Series and Servo Amplifier for Increasing the Maximum Torque to 400% of the Rated Torque 2-7

Combinations for Increasing the Maximum Torque 2-7

Combinations of Servo Motor with Functional Safety and Servo Amplifier 2-8

Specifications

HG-KR series 2-11

HG-MR series 2-13

HG-SR series 2-15

HG-JR series 2-21

HG-RR series 2-35

HG-UR series 2-37

HG-AK series 2-39

Dimensions

HG-KR series 2-42

HG-MR series 2-42

HG-SR series 2-43

HG-JR series 2-44

HG-RR series 2-50

HG-UR series 2-51

HG-AK series 2-52

Geared Servo Motor Specifications

HG-KR series (G1, G5, and G7) 2-53

HG-SR series (G1, G1H, G5, and G7) 2-60

Sizing Example 2-71

* Refer to p. 5-97 in this catalog for conversion of units.

Model Designation (Note 11)

For 200 V class

HG-KR 05 3 B

Symbol	Special specification
None	Standard
W0C	Servo motors with functional safety (Note 10)

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

Symbol	Gear reducer (Note 5)
None	None
G1	With gear reducer for general industrial machines, flange mounting
G1H	With gear reducer for general industrial machines, foot mounting
G5	With flange-output type gear reducer for high precision applications, flange mounting
G7	With shaft-output type gear 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 without oil seal. Contact your local sales office for more details. For HG-SR series, dimensions are the same regardless of whether or not oil seal is installed.
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" in this catalog for details.
10. Contact your local sales office for the servo motors with functional safety.
11. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.

Model Designation (Note 10)

For 400 V class

HG-SR 5 2 4 B

Symbol	Special specification
None	Standard
W0C	Servo motors with functional safety (Note 9)

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

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

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

Symbol	Electromagnetic brake
None	None
B	Installed (Note 1)

400 V class

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

Symbol	Rated output [kW]	Symbol	Rated output [kW]	Symbol	Rated output [kW]
5	0.5	11K	11	150K	150
7	0.75	12K	12	180K	180
10	1.0	15K	15	200K	200
15	1.5	20K	20	220K	220
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	110K	110		

Symbol	Inertia/capacity
HG-SR	Medium inertia, medium capacity
HG-JR	Low inertia, medium/large/ultra-large 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 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" in this catalog for details.
9. Contact your local sales office for the servo motors with functional safety.
10. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.

Model Designation (Note 3)

For 48 V DC/24 V DC

H G - A K 0 1 3 6 B -

Symbol	Special specification
None	Standard
S100	Vertical encoder cable lead

Symbol	Shaft end
None	Standard (Straight shaft)
D	D-cut shaft (Note 2)

Symbol	Electromagnetic brake
None	None
B	Installed (Note 1)

Symbol	Power supply
6	48 V DC/24 V DC

Symbol	Rated speed [r/min]
3	3000

Symbol	Rated output [W]
01	10
02	20
03	30

Symbol	Inertia/capacity
HG-AK	Ultra-compact size, ultra-small capacity

Notes: 1. Refer to "HG-AK Series Electromagnetic Brake Specifications" in this catalog for the available models and detailed specifications.
2. Refer to "HG-AK Series Special Shaft End Specifications" in this catalog for details.
3. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.

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-J4-10GF(-RJ), MR-J4-10GF1(-RJ), MR-J4-10B(-RJ), MR-J4-10B1(-RJ), MR-J4-10A(-RJ), MR-J4-10A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	HG-KR13(B)	MR-J4-10GF(-RJ), MR-J4-10GF1(-RJ), MR-J4-10B(-RJ), MR-J4-10B1(-RJ), MR-J4-10A(-RJ), MR-J4-10A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	HG-KR23(B)	MR-J4-20GF(-RJ), MR-J4-20GF1(-RJ), 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
	HG-KR43(B)	MR-J4-40GF(-RJ), MR-J4-40GF1(-RJ), 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
	HG-KR73(B)	MR-J4-70GF(-RJ), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
HG-MR series	HG-MR053(B)	MR-J4-10GF(-RJ), MR-J4-10GF1(-RJ), MR-J4-10B(-RJ), MR-J4-10B1(-RJ), MR-J4-10A(-RJ), MR-J4-10A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	HG-MR13(B)	MR-J4-10GF(-RJ), MR-J4-10GF1(-RJ), MR-J4-10B(-RJ), MR-J4-10B1(-RJ), MR-J4-10A(-RJ), MR-J4-10A1(-RJ)	MR-J4W2-22B, MR-J4W2-44B	MR-J4W3-222B, MR-J4W3-444B
	HG-MR23(B)	MR-J4-20GF(-RJ), MR-J4-20GF1(-RJ), 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
	HG-MR43(B)	MR-J4-40GF(-RJ), MR-J4-40GF1(-RJ), 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
	HG-MR73(B)	MR-J4-70GF(-RJ), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
HG-SR 1000 r/min series	HG-SR51(B)	MR-J4-60GF(-RJ), MR-J4-60B(-RJ), MR-J4-60A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	HG-SR81(B)	MR-J4-100GF(-RJ), MR-J4-100B(-RJ), MR-J4-100A(-RJ)	MR-J4W2-1010B	-
	HG-SR121(B)	MR-J4-200GF(-RJ), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	HG-SR201(B)	MR-J4-200GF(-RJ), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	HG-SR301(B)	MR-J4-350GF(-RJ), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	HG-SR421(B)	MR-J4-500GF(-RJ), MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
HG-SR 2000 r/min series	HG-SR52(B)	MR-J4-60GF(-RJ), MR-J4-60B(-RJ), MR-J4-60A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	HG-SR102(B)	MR-J4-100GF(-RJ), MR-J4-100B(-RJ), MR-J4-100A(-RJ)	MR-J4W2-1010B	-
	HG-SR152(B)	MR-J4-200GF(-RJ), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	HG-SR202(B)	MR-J4-200GF(-RJ), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	HG-SR352(B)	MR-J4-350GF(-RJ), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	HG-SR502(B)	MR-J4-500GF(-RJ), MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
	HG-SR702(B)	MR-J4-700GF(-RJ), MR-J4-700B(-RJ), MR-J4-DU900B(-RJ), MR-J4-700A(-RJ)	-	-
HG-JR 3000 r/min series	HG-JR53(B)	MR-J4-60GF(-RJ), MR-J4-60B(-RJ), MR-J4-60A(-RJ)	MR-J4W2-77B	-
	HG-JR73(B)	MR-J4-70GF(-RJ), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	HG-JR103(B)	MR-J4-100GF(-RJ), MR-J4-100B(-RJ), MR-J4-100A(-RJ)	MR-J4W2-1010B	-

Notes: 1. Any combination of the servo motors is available. Refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-8 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
HG-JR 3000 r/min series	HG-JR153(B)	MR-J4-200GF(-RJ), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	HG-JR203(B)	MR-J4-200GF(-RJ), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	HG-JR353(B)	MR-J4-350GF(-RJ), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	HG-JR503(B)	MR-J4-500GF(-RJ), MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
	HG-JR703(B)	MR-J4-700GF(-RJ), MR-J4-700B(-RJ), MR-J4-DU900B(-RJ), MR-J4-700A(-RJ)	-	-
	HG-JR903(B)	MR-J4-11KGF(-RJ), MR-J4-11KB(-RJ), MR-J4-DU900B(-RJ), MR-J4-11KA(-RJ)	-	-
HG-JR 1000 r/min series	HG-JR601(B)	MR-J4-700GF(-RJ), MR-J4-700B(-RJ), MR-J4-DU900B(-RJ), MR-J4-700A(-RJ)	-	-
	HG-JR801(B)	MR-J4-11KGF(-RJ), MR-J4-11KB(-RJ), MR-J4-DU900B(-RJ), MR-J4-11KA(-RJ)	-	-
	HG-JR12K1(B)	MR-J4-11KGF(-RJ), MR-J4-11KB(-RJ), MR-J4-DU11KB(-RJ), MR-J4-11KA(-RJ)	-	-
	HG-JR15K1	MR-J4-15KGF(-RJ), MR-J4-15KB(-RJ), MR-J4-DU15KB(-RJ), MR-J4-15KA(-RJ)	-	-
	HG-JR20K1	MR-J4-22KGF(-RJ), MR-J4-22KB(-RJ), MR-J4-DU22KB(-RJ), MR-J4-22KA(-RJ)	-	-
	HG-JR25K1	MR-J4-22KGF(-RJ), MR-J4-22KB(-RJ), MR-J4-DU22KB(-RJ), 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-J4-700GF(-RJ), MR-J4-700B(-RJ), MR-J4-DU900B(-RJ), MR-J4-700A(-RJ)	-	-
	HG-JR11K1M(B)	MR-J4-11KGF(-RJ), MR-J4-11KB(-RJ), MR-J4-DU11KB(-RJ), MR-J4-11KA(-RJ)	-	-
	HG-JR15K1M(B)	MR-J4-15KGF(-RJ), MR-J4-15KB(-RJ), MR-J4-DU15KB(-RJ), MR-J4-15KA(-RJ)	-	-
	HG-JR22K1M	MR-J4-22KGF(-RJ), MR-J4-22KB(-RJ), MR-J4-DU22KB(-RJ), 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-J4-200GF(-RJ), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	HG-RR153(B)	MR-J4-200GF(-RJ), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	HG-RR203(B)	MR-J4-350GF(-RJ), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	HG-RR353(B)	MR-J4-500GF(-RJ), MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
	HG-RR503(B)	MR-J4-500GF(-RJ), MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
HG-UR series	HG-UR72(B)	MR-J4-70GF(-RJ), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B MR-J4W2-1010B	-
	HG-UR152(B)	MR-J4-200GF(-RJ), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	HG-UR202(B)	MR-J4-350GF(-RJ), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	HG-UR352(B)	MR-J4-500GF(-RJ), MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
	HG-UR502(B)	MR-J4-500GF(-RJ), 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. 1-8 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-J4-60GF4(-RJ), MR-J4-60B4(-RJ), MR-J4-60A4(-RJ)	-	-
	HG-SR1024(B)	MR-J4-100GF4(-RJ), MR-J4-100B4(-RJ), MR-J4-100A4(-RJ)	-	-
	HG-SR1524(B)	MR-J4-200GF4(-RJ), MR-J4-200B4(-RJ), MR-J4-200A4(-RJ)	-	-
	HG-SR2024(B)	MR-J4-200GF4(-RJ), MR-J4-200B4(-RJ), MR-J4-200A4(-RJ)	-	-
	HG-SR3524(B)	MR-J4-350GF4(-RJ), MR-J4-350B4(-RJ), MR-J4-350A4(-RJ)	-	-
	HG-SR5024(B)	MR-J4-500GF4(-RJ), MR-J4-500B4(-RJ), MR-J4-500A4(-RJ)	-	-
	HG-SR7024(B)	MR-J4-700GF4(-RJ), MR-J4-700B4(-RJ), MR-J4-DU900B4(-RJ), MR-J4-700A4(-RJ)	-	-
HG-JR 3000 r/min series	HG-JR534(B)	MR-J4-60GF4(-RJ), MR-J4-60B4(-RJ), MR-J4-60A4(-RJ)	-	-
	HG-JR734(B)	MR-J4-100GF4(-RJ), MR-J4-100B4(-RJ), MR-J4-100A4(-RJ)	-	-
	HG-JR1034(B)	MR-J4-100GF4(-RJ), MR-J4-100B4(-RJ), MR-J4-100A4(-RJ)	-	-
	HG-JR1534(B)	MR-J4-200GF4(-RJ), MR-J4-200B4(-RJ), MR-J4-200A4(-RJ)	-	-
	HG-JR2034(B)	MR-J4-200GF4(-RJ), MR-J4-200B4(-RJ), MR-J4-200A4(-RJ)	-	-
	HG-JR3534(B)	MR-J4-350GF4(-RJ), MR-J4-350B4(-RJ), MR-J4-350A4(-RJ)	-	-
	HG-JR5034(B)	MR-J4-500GF4(-RJ), MR-J4-500B4(-RJ), MR-J4-500A4(-RJ)	-	-
	HG-JR7034(B)	MR-J4-700GF4(-RJ), MR-J4-700B4(-RJ), MR-J4-DU900B4(-RJ), MR-J4-700A4(-RJ)	-	-
	HG-JR9034(B)	MR-J4-11KGF4(-RJ), MR-J4-11KB4(-RJ), MR-J4-DU900B4(-RJ), MR-J4-11KA4(-RJ)	-	-
HG-JR 1000 r/min series	HG-JR6014(B)	MR-J4-700GF4(-RJ), MR-J4-700B4(-RJ), MR-J4-DU900B4(-RJ), MR-J4-700A4(-RJ)	-	-
	HG-JR8014(B)	MR-J4-11KGF4(-RJ), MR-J4-11KB4(-RJ), MR-J4-DU900B4(-RJ), MR-J4-11KA4(-RJ)	-	-
	HG-JR12K14(B)	MR-J4-11KGF4(-RJ), MR-J4-11KB4(-RJ), MR-J4-DU11KB4(-RJ), MR-J4-11KA4(-RJ)	-	-
	HG-JR15K14	MR-J4-15KGF4(-RJ), MR-J4-15KB4(-RJ), MR-J4-DU15KB4(-RJ), MR-J4-15KA4(-RJ)	-	-
	HG-JR20K14	MR-J4-22KGF4(-RJ), MR-J4-22KB4(-RJ), MR-J4-DU22KB4(-RJ), MR-J4-22KA4(-RJ)	-	-
	HG-JR25K14	MR-J4-22KGF4(-RJ), MR-J4-22KB4(-RJ), MR-J4-DU22KB4(-RJ), 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-J4-700GF4(-RJ), MR-J4-700B4(-RJ), MR-J4-DU900B4(-RJ), MR-J4-700A4(-RJ)	-	-
	HG-JR11K1M4(B)	MR-J4-11KGF4(-RJ), MR-J4-11KB4(-RJ), MR-J4-DU11KB4(-RJ), MR-J4-11KA4(-RJ)	-	-
	HG-JR15K1M4(B)	MR-J4-15KGF4(-RJ), MR-J4-15KB4(-RJ), MR-J4-DU15KB4(-RJ), MR-J4-15KA4(-RJ)	-	-
	HG-JR22K1M4	MR-J4-22KGF4(-RJ), MR-J4-22KB4(-RJ), MR-J4-DU22KB4(-RJ), 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 Rotary Servo Motor and Servo Amplifier (48 V DC/24 V DC Class)

Rotary servo motor		Servo amplifier		
		MR-J4	MR-J4W2 (Note 1)	MR-J4W3
HG-AK series	HG-AK0136(B)	MR-J4-03A6(-RJ)	MR-J4W2-0303B6	-
	HG-AK0236(B)	MR-J4-03A6(-RJ)	MR-J4W2-0303B6	-
	HG-AK0336(B)	MR-J4-03A6(-RJ)	MR-J4W2-0303B6	-

Notes: 1. Any combination of the servo motors is available. Refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-8 in this catalog.

Combinations of HG-JR Servo Motor Series and Servo Amplifier (200 V/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
HG-JR 3000 r/min series (200 V class)	HG-JR53(B) (Note 2)	MR-J4-100GF(-RJ), MR-J4-100B(-RJ), MR-J4-100A(-RJ)	MR-J4W2-1010B	-
	HG-JR73(B) (Note 2)	MR-J4-200GF(-RJ), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	HG-JR103(B) (Note 2)	MR-J4-200GF(-RJ), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	HG-JR153(B)	MR-J4-350GF(-RJ), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	HG-JR203(B)	MR-J4-350GF(-RJ), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	HG-JR353(B)	MR-J4-500GF(-RJ), MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
	HG-JR503(B)	MR-J4-700GF(-RJ), MR-J4-700B(-RJ), MR-J4-DU900B(-RJ), MR-J4-700A(-RJ)	-	-
HG-JR 3000 r/min series (400 V class)	HG-JR534(B)	MR-J4-100GF4(-RJ), MR-J4-100B4(-RJ), MR-J4-100A4(-RJ)	-	-
	HG-JR734(B)	MR-J4-200GF4(-RJ), MR-J4-200B4(-RJ), MR-J4-200A4(-RJ)	-	-
	HG-JR1034(B)	MR-J4-200GF4(-RJ), MR-J4-200B4(-RJ), MR-J4-200A4(-RJ)	-	-
	HG-JR1534(B)	MR-J4-350GF4(-RJ), MR-J4-350B4(-RJ), MR-J4-350A4(-RJ)	-	-
	HG-JR2034(B)	MR-J4-350GF4(-RJ), MR-J4-350B4(-RJ), MR-J4-350A4(-RJ)	-	-
	HG-JR3534(B)	MR-J4-500GF4(-RJ), MR-J4-500B4(-RJ), MR-J4-500A4(-RJ)	-	-
	HG-JR5034(B)	MR-J4-700GF4(-RJ), MR-J4-700B4(-RJ), MR-J4-DU900B4(-RJ), MR-J4-700A4(-RJ)	-	-

Notes: 1. Any combination of the servo motors is available. Refer to "Combinations of Multi-Axis Servo Amplifier and Servo Motors" on p. 1-8 in this catalog.
2. When a 1-phase 200 V AC input is used, increasing the maximum torque to 400% is not possible with HG-JR servo motor series.

Combinations for Increasing the Maximum Torque (200 V/400 V Class)

With the following combinations of the servo motors and the drive units, the maximum torque of the servo motors can be increased when the "Selection of maximally increasing torque function with drive unit" is enabled with a parameter.

Rotary servo motor		Drive unit
HG-SR series	HG-SR702(B)	MR-J4-DU900B(-RJ)
	HG-SR7024(B)	MR-J4-DU900B4(-RJ)
HG-JR series	HG-JR703(B)	MR-J4-DU900B(-RJ)
	HG-SR701M(B)	MR-J4-DU900B(-RJ)
	HG-JR7034(B)	MR-J4-DU900B4(-RJ)
	HG-SR701M4(B)	MR-J4-DU900B4(-RJ)

Combinations of Servo Motor with Functional Safety and Servo Amplifier (200 V Class)

The safety sub-function can be expanded with the combination of the servo motor with functional safety, MR-J4-GF-RJ/MR-J4-B-RJ/MR-J4-A-RJ servo amplifier, and MR-D30 functional safety unit. The servo motors with functional safety are available in HG-KR/HG-SR/HG-JR series.

The specifications and dimensions of the servo motors with functional safety are the same as the standard. Combine MR-D30 with the following servo amplifiers to expand the safety sub-function by using the servo motors with functional safety.

Servo motors with functional safety	Servo amplifier		
	MR-J4	MR-J4W2	MR-J4W3
HG-KR053(B)W0C	MR-J4-10GF-RJ, MR-J4-10GF1-RJ, MR-J4-10B-RJ, MR-J4-10B1-RJ, MR-J4-10A-RJ, MR-J4-10A1-RJ	-	-
HG-KR13(B)W0C	MR-J4-10GF-RJ, MR-J4-10GF1-RJ, MR-J4-10B-RJ, MR-J4-10B1-RJ, MR-J4-10A-RJ, MR-J4-10A1-RJ	-	-
HG-KR23(B)W0C	MR-J4-20GF-RJ, MR-J4-20GF1-RJ, MR-J4-20B-RJ, MR-J4-20B1-RJ, MR-J4-20A-RJ, MR-J4-20A1-RJ	-	-
HG-KR43(B)W0C	MR-J4-40GF-RJ, MR-J4-40GF1-RJ, MR-J4-40B-RJ, MR-J4-40B1-RJ, MR-J4-40A-RJ, MR-J4-40A1-RJ	-	-
HG-KR73(B)W0C	MR-J4-70GF-RJ, MR-J4-70B-RJ, MR-J4-70A-RJ	-	-
HG-SR51(B)W0C	MR-J4-60GF-RJ, MR-J4-60B-RJ, MR-J4-60A-RJ	-	-
HG-SR81(B)W0C	MR-J4-100GF-RJ, MR-J4-100B-RJ, MR-J4-100A-RJ	-	-
HG-SR121(B)W0C	MR-J4-200GF-RJ, MR-J4-200B-RJ, MR-J4-200A-RJ	-	-
HG-SR201(B)W0C	MR-J4-200GF-RJ, MR-J4-200B-RJ, MR-J4-200A-RJ	-	-
HG-SR301(B)W0C	MR-J4-350GF-RJ, MR-J4-350B-RJ, MR-J4-350A-RJ	-	-
HG-SR421(B)W0C	MR-J4-500GF-RJ, MR-J4-500B-RJ, MR-J4-500A-RJ	-	-
HG-SR52(B)W0C	MR-J4-60GF-RJ, MR-J4-60B-RJ, MR-J4-60A-RJ	-	-
HG-SR102(B)W0C	MR-J4-100GF-RJ, MR-J4-100B-RJ, MR-J4-100A-RJ	-	-
HG-SR152(B)W0C	MR-J4-200GF-RJ, MR-J4-200B-RJ, MR-J4-200A-RJ	-	-
HG-SR202(B)W0C	MR-J4-200GF-RJ, MR-J4-200B-RJ, MR-J4-200A-RJ	-	-
HG-SR352(B)W0C	MR-J4-350GF-RJ, MR-J4-350B-RJ, MR-J4-350A-RJ	-	-
HG-SR502(B)W0C	MR-J4-500GF-RJ, MR-J4-500B-RJ, MR-J4-500A-RJ	-	-
HG-SR702(B)W0C	MR-J4-700GF-RJ, MR-J4-700B-RJ, MR-J4-DU900B-RJ (Note 3), MR-J4-700A-RJ	-	-
HG-JR53(B)W0C	MR-J4-60GF-RJ, MR-J4-100GF-RJ (Note 1, 2), MR-J4-60B-RJ, MR-J4-100B-RJ (Note 1, 2), MR-J4-60A-RJ, MR-J4-100A-RJ (Note 1, 2)	-	-
HG-JR73(B)W0C	MR-J4-70GF-RJ, MR-J4-200GF-RJ (Note 1, 2), MR-J4-70B-RJ, MR-J4-200B-RJ (Note 1, 2), MR-J4-70A-RJ, MR-J4-200A-RJ (Note 1, 2)	-	-
HG-JR103(B)W0C	MR-J4-100GF-RJ, MR-J4-200GF-RJ (Note 1, 2), MR-J4-100B-RJ, MR-J4-200B-RJ (Note 1, 2), MR-J4-100A-RJ, MR-J4-200A-RJ (Note 1, 2)	-	-
HG-JR153(B)W0C	MR-J4-200GF-RJ, MR-J4-350GF-RJ (Note 1), MR-J4-200B-RJ, MR-J4-350B-RJ (Note 1), MR-J4-200A-RJ, MR-J4-350A-RJ (Note 1)	-	-
HG-JR203(B)W0C	MR-J4-200GF-RJ, MR-J4-350GF-RJ (Note 1), MR-J4-200B-RJ, MR-J4-350B-RJ (Note 1), MR-J4-200A-RJ, MR-J4-350A-RJ (Note 1)	-	-
HG-JR353(B)W0C	MR-J4-350GF-RJ, MR-J4-500GF-RJ (Note 1), MR-J4-350B-RJ, MR-J4-500B-RJ (Note 1), MR-J4-350A-RJ, MR-J4-500A-RJ (Note 1)	-	-
HG-JR503(B)W0C	MR-J4-500GF-RJ, MR-J4-700GF-RJ (Note 1), MR-J4-500B-RJ, MR-J4-700B-RJ (Note 1), MR-J4-DU900B-RJ (Note 1), MR-J4-500A-RJ, MR-J4-700A-RJ (Note 1)	-	-
HG-JR703(B)W0C	MR-J4-700GF-RJ, MR-J4-700B-RJ, MR-J4-DU900B-RJ (Note 3), MR-J4-700A-RJ	-	-
HG-JR903(B)W0C	MR-J4-11KGF-RJ, MR-J4-11KB-RJ, MR-J4-DU900B(-RJ), MR-J4-11KA-RJ	-	-
HG-JR701M(B)W0C	MR-J4-700GF-RJ, MR-J4-700B-RJ, MR-J4-DU900B-RJ (Note 3), MR-J4-700A-RJ	-	-
HG-JR11K1M(B)W0C	MR-J4-11KGF-RJ, MR-J4-11KB-RJ, MR-J4-DU11KB-RJ, MR-J4-11KA-RJ	-	-
HG-JR15K1M(B)W0C	MR-J4-15KGF-RJ, MR-J4-15KB-RJ, MR-J4-DU15KB-RJ, MR-J4-15KA-RJ	-	-
HG-JR22K1MW0C	MR-J4-22KGF-RJ, MR-J4-22KB-RJ, MR-J4-DU22KB-RJ, MR-J4-22KA-RJ	-	-

Notes: 1. This combination increases the maximum torque from 300% to 400% of the rated torque.
2. When a 1-phase 200 V AC input is used, increasing the maximum torque to 400% is not possible with HG-JR servo motor series.
3. The maximum torque can be increased when the "Selection of maximally increasing torque function with drive unit" is enabled with a parameter.

Combinations of Servo Motor with Functional Safety and Servo Amplifier (400 V Class)

Servo motors with functional safety	Servo amplifier		
	MR-J4	MR-J4W2	MR-J4W3
HG-SR524(B)W0C	MR-J4-60GF4-RJ, MR-J4-60B4-RJ, MR-J4-60A4-RJ	-	-
HG-SR1024(B)W0C	MR-J4-100GF4-RJ, MR-J4-100B4-RJ, MR-J4-100A4-RJ	-	-
HG-SR1524(B)W0C	MR-J4-200GF4-RJ, MR-J4-200B4-RJ, MR-J4-200A4-RJ	-	-
HG-SR2024(B)W0C	MR-J4-200GF4-RJ, MR-J4-200B4-RJ, MR-J4-200A4-RJ	-	-
HG-SR3524(B)W0C	MR-J4-350GF4-RJ, MR-J4-350B4-RJ, MR-J4-350A4-RJ	-	-
HG-SR5024(B)W0C	MR-J4-500GF4-RJ, MR-J4-500B4-RJ, MR-J4-500A4-RJ	-	-
HG-SR7024(B)W0C	MR-J4-700GF4-RJ, MR-J4-700B4-RJ, MR-J4-DU900B4-RJ (Note 2), MR-J4-700A4-RJ	-	-
HG-JR534(B)W0C	MR-J4-60GF4-RJ, MR-J4-100GF4-RJ (Note 1), MR-J4-60B4-RJ, MR-J4-100B4-RJ (Note 1), MR-J4-60A4-RJ, MR-J4-100A4-RJ (Note 1)	-	-
HG-JR734(B)W0C	MR-J4-100GF4-RJ, MR-J4-200GF4-RJ (Note 1), MR-J4-100B4-RJ, MR-J4-200B4-RJ (Note 1), MR-J4-100A4-RJ, MR-J4-200A4-RJ (Note 1)	-	-
HG-JR1034(B)W0C	MR-J4-100GF4-RJ, MR-J4-200GF4-RJ (Note 1), MR-J4-100B4-RJ, MR-J4-200B4-RJ (Note 1), MR-J4-100A4-RJ, MR-J4-200A4-RJ (Note 1)	-	-
HG-JR1534(B)W0C	MR-J4-200GF4-RJ, MR-J4-350GF4-RJ (Note 1), MR-J4-200B4-RJ, MR-J4-350B4-RJ (Note 1), MR-J4-200A4-RJ, MR-J4-350A4-RJ (Note 1)	-	-
HG-JR2034(B)W0C	MR-J4-200GF4-RJ, MR-J4-350GF4-RJ (Note 1), MR-J4-200B4-RJ, MR-J4-350B4-RJ (Note 1), MR-J4-200A4-RJ, MR-J4-350A4-RJ (Note 1)	-	-
HG-JR3534(B)W0C	MR-J4-350GF4-RJ, MR-J4-500GF4-RJ (Note 1), MR-J4-350B4-RJ, MR-J4-500B4-RJ (Note 1), MR-J4-350A4-RJ, MR-J4-500A4-RJ (Note 1)	-	-
HG-JR5034(B)W0C	MR-J4-500GF4-RJ, MR-J4-700GF4-RJ (Note 1), MR-J4-500B4-RJ, MR-J4-700B4-RJ (Note 1), MR-J4-DU900B4-RJ (Note 1), MR-J4-500A4-RJ, MR-J4-700A4-RJ (Note 1)	-	-
HG-JR7034(B)W0C	MR-J4-700GF4-RJ, MR-J4-700B4-RJ, MR-J4-DU900B4-RJ (Note 2), MR-J4-700A4-RJ	-	-
HG-JR9034(B)W0C	MR-J4-11KGF4-RJ, MR-J4-11KB4-RJ, MR-J4-DU900B4-RJ, MR-J4-11KA4-RJ	-	-
HG-JR701M4(B)W0C	MR-J4-700GF4-RJ, MR-J4-700B4-RJ, MR-J4-DU900B4-RJ (Note 2), MR-J4-700A4-RJ	-	-
HG-JR11K1M4(B)W0C	MR-J4-11KGF4-RJ, MR-J4-11KB4-RJ, MR-J4-DU11KB4-RJ, MR-J4-11KA4-RJ	-	-
HG-JR15K1M4(B)W0C	MR-J4-15KGF4-RJ, MR-J4-15KB4-RJ, MR-J4-DU15KB4-RJ, MR-J4-15KA4-RJ	-	-
HG-JR22K1M4W0C	MR-J4-22KGF4-RJ, MR-J4-22KB4-RJ, MR-J4-DU22KB4-RJ, MR-J4-22KA4-RJ	-	-

Servo motors with functional safety	Servo amplifier	
	Drive unit	Power regeneration converter unit
HG-JR110K24W0C (Note 3)	MR-J4-DU55KB4-RJ100 x 2	MR-CV55K4 x 2
HG-JR150K24W0C (Note 3)	MR-J4-DU45KB4-RJ100 x 4	MR-CV55K4 x 4
HG-JR180K24W0C (Note 3)	MR-J4-DU45KB4-RJ100 x 4	MR-CV55K4 x 4
HG-JR200K24W0C (Note 3)	MR-J4-DU55KB4-RJ100 x 4	MR-CV55K4 x 4
HG-JR220K24W0C (Note 3)	MR-J4-DU55KB4-RJ100 x 4	MR-CV55K4 x 4

Notes: 1. This combination increases the maximum torque from 300% to 400% of the rated torque.
2. The maximum torque can be increased when the "Selection of maximally increasing torque function with drive unit" is enabled with a parameter.
3. Refer to "Compatible Controllers" on p. 1-50 in this catalog for compatible controllers.

MEMO

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-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-4 in this catalog.				
		MR-J4W_-					
Power supply capacity *1		[kVA]	0.3	0.3	0.5	0.9	1.3
Continuous running duty (Note 6)	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 (Note 6)		[r/min]	3000				
Maximum speed (Note 6)		[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))			
Thermistor			None				
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)				
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust				
	Altitude		2000 m or less above sea level (Note 5)				
	Vibration resistance *4		X: 49 m/s^2 Y: 49 m/s^2				
Vibration rank			V10 *6				
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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 gear reducer portion is equivalent to IP44. Refer to the asterisk 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-41 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.
5. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
6. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

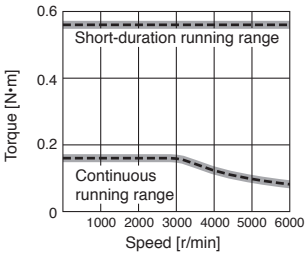
HG-KR Series Electromagnetic Brake Specifications (Note 1)

Model		HG-KR	053B	13B	23B	43B	73B
Type			Spring actuated type safety brake				
Rated voltage			24 V DC$^{0}_{-10}$%				
Power consumption		[W] at 20 °C	6.3	6.3	7.9	7.9	10
Electromagnetic brake static friction torque		[N•m]	0.32 or higher	0.32 or higher	1.3 or higher	1.3 or higher	2.4 or higher
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 braking times		20000	20000	20000	20000	20000
	Work per braking	[J]	5.6	5.6	22	22	64

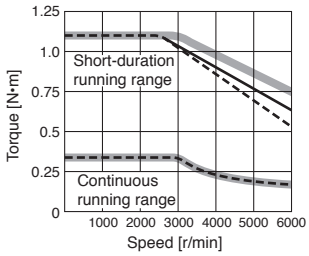
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-KR Series Torque Characteristics

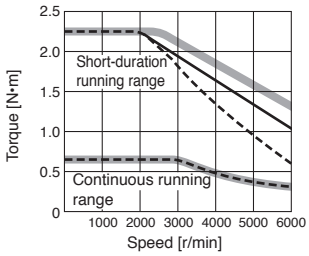
HG-KR053(B) (Note 1, 2, 3, 4)



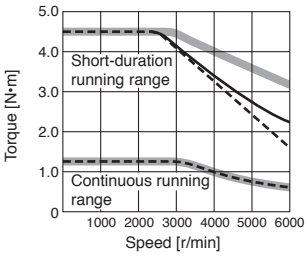
HG-KR13(B) (Note 1, 2, 3, 4)



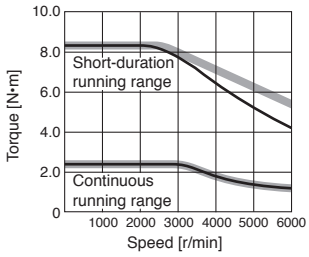
HG-KR23(B) (Note 1, 2, 3, 4)



HG-KR43(B) (Note 1, 2, 3, 4)



HG-KR73(B) (Note 1, 3, 4)

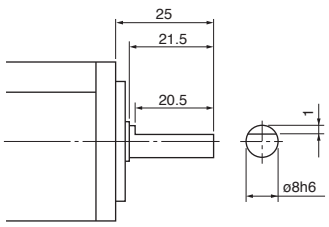


Notes: 1. ▬▬ : For 3-phase 200 V AC or 1-phase 230 V AC.
2. - - - - : For 1-phase 100 V AC.
3. ——— : For 1-phase 200 V AC. This line is drawn only where differs from the other two lines.
4. Torque drops when the power supply voltage is below the specified value.

HG-KR Series Special Shaft End Specifications

Motors with the following specifications are also available.

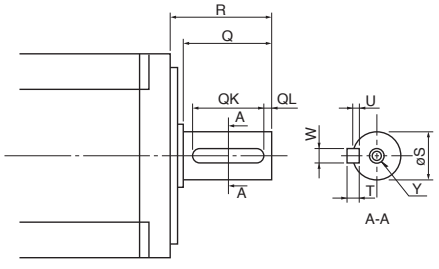
D-cut shaft (Note 1): 50 W and 100 W



[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. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
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. 2-4 in this catalog.				
Power supply capacity *1		[kVA]	0.3	0.3	0.5	0.9	1.3
Continuous running duty (Note 6)	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 (Note 6)		[r/min]	3000				
Maximum speed (Note 6)		[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))			
Thermistor			None				
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)				
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust				
	Altitude		2000 m or less above sea level (Note 5)				
	Vibration resistance *4		X: 49 m/s^2 Y: 49 m/s^2				
Vibration rank			V10 *6				
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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. 2-41 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.
5. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
6. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

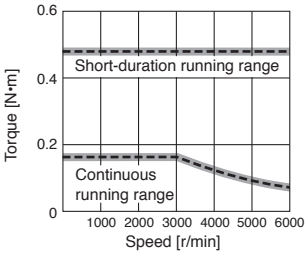
HG-MR Series Electromagnetic Brake Specifications (Note 1)

Model		HG-MR	053B	13B	23B	43B	73B
Type			Spring actuated type safety brake				
Rated voltage			24 V DC$^{0}_{-10}$%				
Power consumption		[W] at 20 °C	6.3	6.3	7.9	7.9	10
Electromagnetic brake static friction torque		[N•m]	0.32 or higher	0.32 or higher	1.3 or higher	1.3 or higher	2.4 or higher
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 braking times		20000	20000	20000	20000	20000
	Work per braking	[J]	5.6	5.6	22	22	64

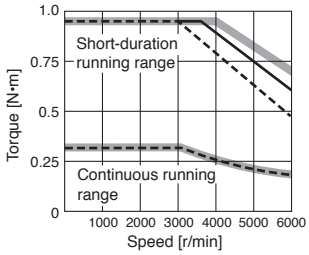
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-MR Series Torque Characteristics

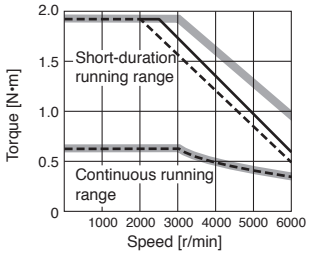
HG-MR053(B) (Note 1, 2, 3, 4)



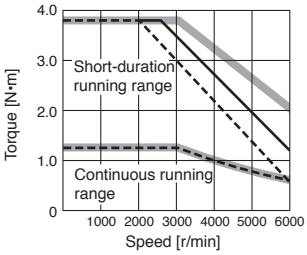
HG-MR13(B) (Note 1, 2, 3, 4)



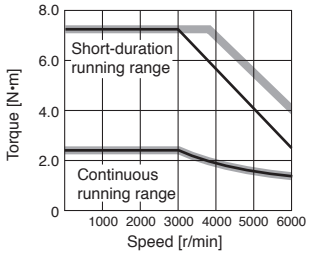
HG-MR23(B) (Note 1, 2, 3, 4)



HG-MR43(B) (Note 1, 2, 3, 4)



HG-MR73(B) (Note 1, 3, 4)

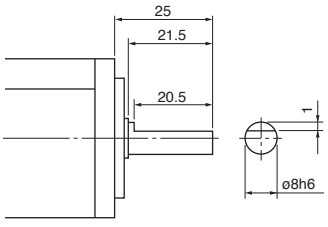


Notes: 1. ——— : For 3-phase 200 V AC or 1-phase 230 V AC.
2. - - - - : For 1-phase 100 V AC.
3. ——— : For 1-phase 200 V AC. This line is drawn only where differs from the other two lines.
4. Torque drops when the power supply voltage is below the specified value.

HG-MR Series Special Shaft End Specifications

Motors with the following specifications are also available.

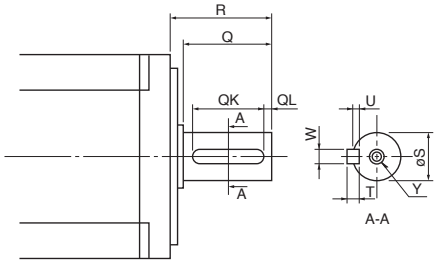
D-cut shaft (Note 1): 50 W and 100 W



[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. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
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. 2-4 in this catalog.					
Power supply capacity *1		[kVA]	1.0	1.5	2.1	3.5	4.8	6.3
Continuous running duty (Note 5)	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 (Note 5)		[r/min]	1000					
Maximum speed (Note 5)		[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))					
Thermistor			None					
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)					
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust					
	Altitude		2000 m or less above sea level (Note 4)					
	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 with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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. 2-41 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. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
5. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

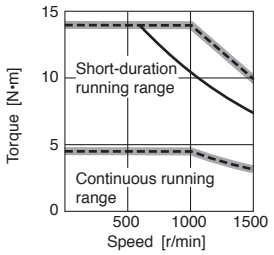
HG-SR 1000 r/min Series Electromagnetic Brake Specifications (Note 1)

Model	HG-SR	51B	81B	121B	201B	301B	421B
Type		Spring actuated type safety brake					
Rated voltage		24 V DC$^{0}_{-10}$%					
Power consumption	[W] at 20 °C	20	20	34	34	34	34
Electromagnetic brake static friction torque	[N•m]	8.5 or higher	8.5 or higher	44 or higher	44 or higher	44 or higher	44 or higher
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 braking times	20000	20000	20000	20000	20000	20000
	Work per braking [J]	200	200	1000	1000	1000	1000

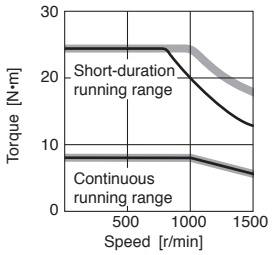
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-SR 1000 r/min Series Torque Characteristics

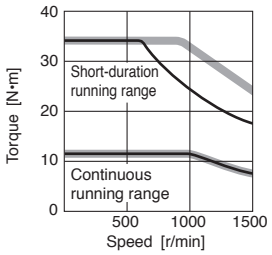
HG-SR51(B) (Note 1, 2, 3, 4)



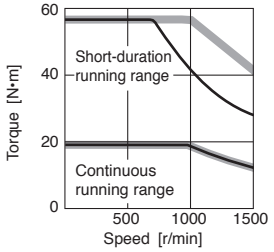
HG-SR81(B) (Note 1, 3, 4)



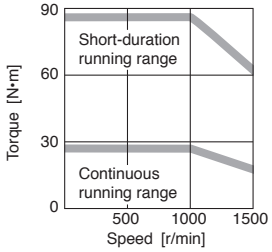
HG-SR121(B) (Note 1, 3, 4)



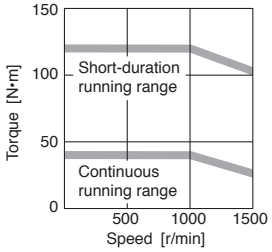
HG-SR201(B) (Note 1, 3, 4)



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 differs from the other two lines.
4. Torque drops when the power supply voltage is below the specified value.

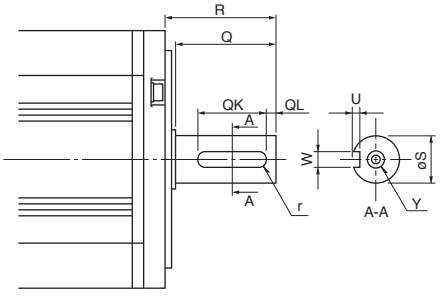
HG-SR 1000 r/min Series Special Shaft End Specifications

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 $^{0}_{-0.036}$	36	5	4 $^{+0.2}_{0}$	4	M8 screw Depth: 20
HG-SR121(B)K, 201(B)K, 301(B)K, 421(B)K	35 $^{+0.010}_{0}$	79	75	10 $^{0}_{-0.036}$	55	5	5 $^{+0.2}_{0}$	5	

Notes: 1. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
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. 2-4 in this catalog.						
Power supply capacity *1		[kVA]	1.0	1.7	2.5	3.5	5.5	7.5	10
Continuous running duty (Note 7)	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 <134> (Note 5)
Rated speed (Note 7)		[r/min]	2000						
Maximum speed (Note 7)		[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 <116> (Note 5)
Regenerative braking frequency *2	MR-J4-	[times/min]	31	38	139	47	28	29	25 (Note 6)
	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))						
Thermistor			None						
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)						
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust						
	Altitude		2000 m or less above sea level (Note 4)						
	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 with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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 gear reducer portion is equivalent to IP44. Refer to the asterisk 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-41 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. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
5. The value in angle brackets is applicable when the servo motor is combined with MR-J4-DU900B(-RJ) drive unit, and the maximum torque is increased with a parameter setting.
6. This value is applicable when the servo motor is combined with MR-J4-700GF(-RJ)/MR-J4-700B(-RJ)/MR-J4-700A(-RJ) servo amplifier. Contact your local sales office for the regenerative braking frequency with MR-J4-DU900B(-RJ) drive unit.
7. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

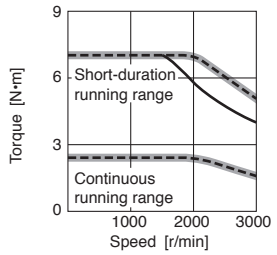
HG-SR 2000 r/min Series (200 V Class) Electromagnetic Brake Specifications (Note 1)

Model	HG-SR	52B	102B	152B	202B	352B	502B	702B
Type		Spring actuated type safety brake						
Rated voltage		24 V DC$^{0}_{-10}$%						
Power consumption	[W] at 20 °C	20	20	20	34	34	34	34
Electromagnetic brake static friction torque	[N•m]	8.5 or higher	8.5 or higher	8.5 or higher	44 or higher	44 or higher	44 or higher	44 or higher
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 braking times	20000	20000	20000	20000	20000	20000	20000
	Work per braking [J]	200	200	200	1000	1000	1000	1000

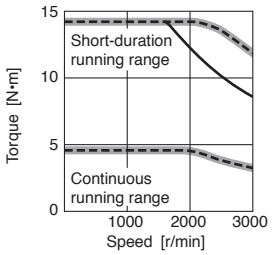
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-SR 2000 r/min Series (200 V Class) Torque Characteristics

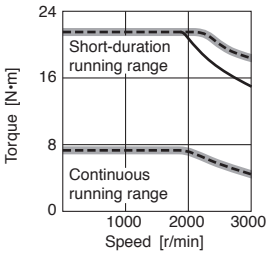
HG-SR52(B) (Note 1, 2, 3, 4)



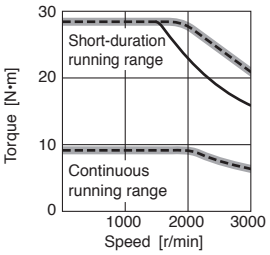
HG-SR102(B) (Note 1, 2, 3, 4)



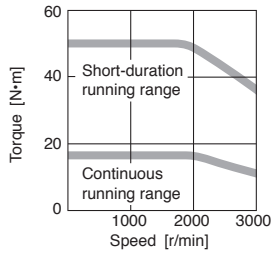
HG-SR152(B) (Note 1, 2, 3, 4)



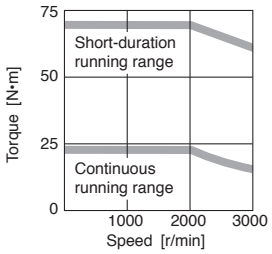
HG-SR202(B) (Note 1, 2, 3, 4)



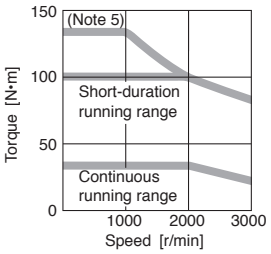
HG-SR352(B) (Note 1, 4)



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 differs from the other two lines.
4. Torque drops when the power supply voltage is below the specified value.
5. This value is applicable when the servo motor is combined with MR-J4-DU900B(-RJ) drive unit, and the maximum torque is increased with a parameter setting.

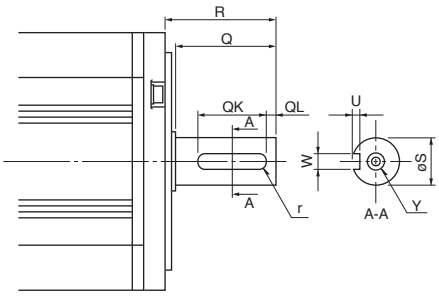
HG-SR 2000 r/min Series (200 V Class) Special Shaft End Specifications

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. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
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. 2-6 in this catalog.						
Power supply capacity *1		[kVA]	1.0	1.7	2.5	3.5	5.5	7.5	10
Continuous running duty (Note 7)	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 <134> (Note 5)
Rated speed (Note 7)		[r/min]	2000						
Maximum speed (Note 7)		[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 <59> (Note 5)
Regenerative braking frequency *2	MR-J4-	[times/min]	46	29	139	47	34	29	25 (Note 6)
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))						
Thermistor			None						
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)						
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust						
	Altitude		2000 m or less above sea level (Note 4)						
	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 with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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 gear reducer portion is equivalent to IP44. Refer to the asterisk 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-41 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. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
5. The value in angle brackets is applicable when the servo motor is combined with MR-J4-DU900B4(-RJ) drive unit, and the maximum torque is increased with a parameter setting.
6. This value is applicable when the servo motor is combined with MR-J4-700GF4(-RJ)/MR-J4-700B4(-RJ)/MR-J4-700A4(-RJ) servo amplifier. Contact your local sales office for the regenerative braking frequency with MR-J4-DU900B4(-RJ) drive unit.
7. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

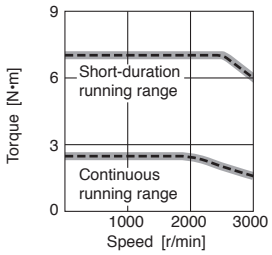
HG-SR 2000 r/min Series (400 V Class) Electromagnetic Brake Specifications (Note 1)

Model	HG-SR	524B	1024B	1524B	2024B	3524B	5024B	7024B
Type		Spring actuated type safety brake						
Rated voltage		24 V DC$^{0}_{-10}$%						
Power consumption	[W] at 20 °C	20	20	20	34	34	34	34
Electromagnetic brake static friction torque	[N•m]	8.5 or higher	8.5 or higher	8.5 or higher	44 or higher	44 or higher	44 or higher	44 or higher
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 braking times	20000	20000	20000	20000	20000	20000	20000
	Work per braking [J]	200	200	200	1000	1000	1000	1000

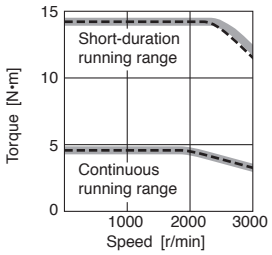
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-SR 2000 r/min Series (400 V Class) Torque Characteristics

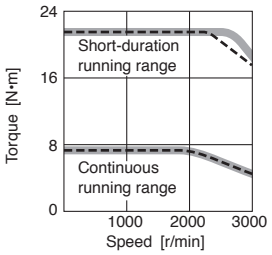
HG-SR524(B) (Note 1, 2, 3)



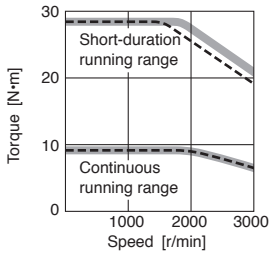
HG-SR1024(B) (Note 1, 2, 3)



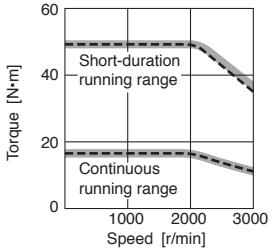
HG-SR1524(B) (Note 1, 2, 3)



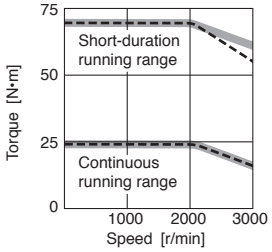
HG-SR2024(B) (Note 1, 2, 3)



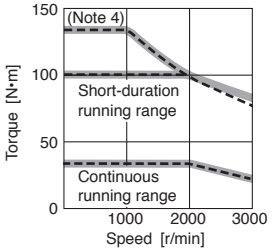
HG-SR3524(B) (Note 1, 2, 3)



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.
4. This value is applicable when the servo motor is combined with MR-J4-DU900B4(-RJ) drive unit, and the maximum torque is increased with a parameter setting.

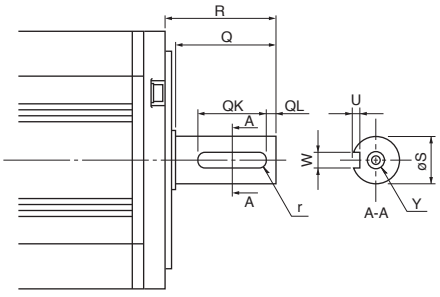
HG-SR 2000 r/min Series (400 V Class) Special Shaft End Specifications

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. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
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-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on pp. 2-4 and 2-5 in this catalog.								
		MR-J4W_-									
Power supply capacity *1		[kVA]	1.0	1.3	1.7	2.5	3.5	5.5	7.5	10	13
Continuous running duty (Note 10)	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		[N•m]	4.8 <6.4> (Note 5)	7.2 <9.6> (Note 5)	9.6 <12.7> (Note 5)	14.3 <19.1> (Note 5)	19.1 <25.5> (Note 5)	32.0 <44.6> (Note 5)	47.7 <63.7> (Note 5)	66.8 <78.0> (Note 8)	85.8
Rated speed (Note 10)		[r/min]	3000								
Maximum speed (Note 10)		[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		[A]	9.0 <12> (Note 5)	17 <23> (Note 5)	17 <23> (Note 5)	32 <43> (Note 5)	32 <43> (Note 5)	51 <71> (Note 5)	81 <108> (Note 5)	103 <134> (Note 8)	134
Regenerative braking frequency *2	MR-J4-	[times/min]	67 <137> (Note 5)	98 <511> (Note 5)	76 <396> (Note 5)	271 <271> (Note 5)	206 <206> (Note 5)	73 <98> (Note 5)	68 <89> (Note 5, 9)	56 (Note 9)	204 (Note 6, 9)
	MR-J4W_-	[times/min]	328 <328> (Note 5)	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			Installed								
Thermistor			None								
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)								
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust								
	Altitude		2000 m or less above sea level (Note 7)								
	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 with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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. 2-41 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 combined with MR-J4-500GF(-RJ)/MR-J4-500B(-RJ)/MR-J4-500A(-RJ) servo amplifier.
5. The value in angle brackets is applicable when the maximum torque is increased with a combination with a larger-capacity servo amplifier. Refer to "Combinations of HG-JR Servo Motor Series and Servo Amplifier (200 V/400 V Class) for Increasing the Maximum Torque to 400% of the Rated Torque" on p. 2-7 in this catalog for the available combinations.
6. This value is applicable when the external regenerative resistors, GRZG400-_Ω (standard accessory) are used with cooling fans (two units of 92 mm × 92 mm, minimum airflow: 1.0 m^3/min). Note that [Pr. PA02] must be changed.
7. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
8. The value in angle brackets is applicable when the servo motor is combined with MR-J4-DU900B(-RJ) drive unit, and the maximum torque is increased with a parameter setting.
9. This value is applicable when the servo motor is combined with MR-J4-_GF(-RJ)/MR-J4-_B(-RJ)/MR-J4-_A(-RJ) servo amplifier. Contact your local sales office for the regenerative braking frequency with MR-J4-DU900B(-RJ) drive unit.
10. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

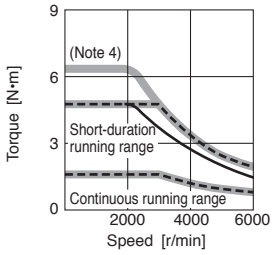
HG-JR 3000 r/min Series (200 V Class) Electromagnetic Brake Specifications (Note 1)

Model		HG-JR	53B	73B	103B	153B	203B	353B	503B	703B	903B
Type			Spring actuated type safety brake								
Rated voltage			24 V DC$^{0}_{-10}$%								
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 or higher	6.6 or higher	6.6 or higher	6.6 or higher	6.6 or higher	16 or higher	16 or higher	44 or higher	44 or higher
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 braking times		5000	5000	5000	5000	5000	5000	5000	20000	20000
	Work per braking	[J]	64	64	64	64	64	400	400	1000	1000

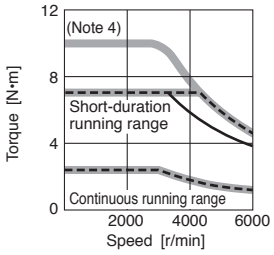
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 3000 r/min Series (200 V Class) Torque Characteristics

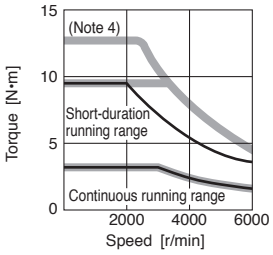
HG-JR53(B) (Note 1, 2, 3, 5, 6)



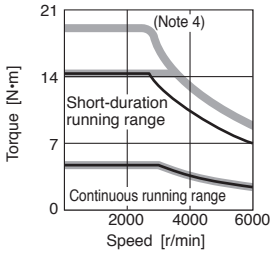
HG-JR73(B) (Note 1, 2, 3, 5, 6)



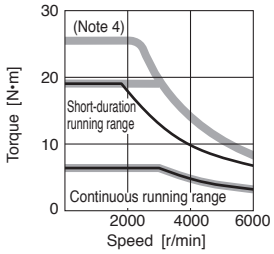
HG-JR103(B) (Note 1, 3, 5, 6, 7)



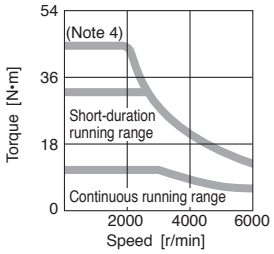
HG-JR153(B) (Note 1, 3, 5, 6, 7)



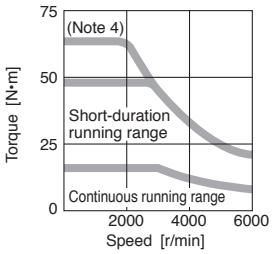
HG-JR203(B) (Note 1, 3, 5, 6, 7)



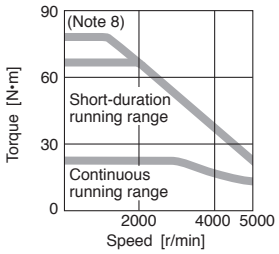
HG-JR353(B) (Note 1, 5)



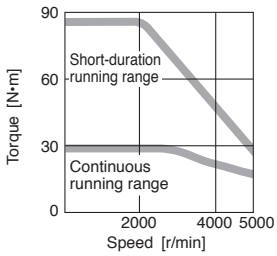
HG-JR503(B) (Note 1, 5)



HG-JR703(B) (Note 1, 5)



HG-JR903(B) (Note 1, 5)



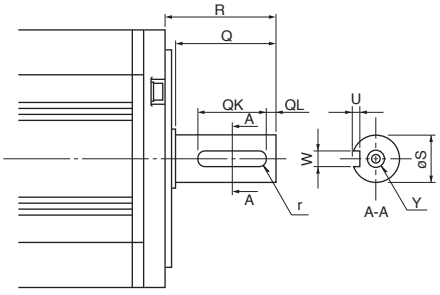
Notes: 1. ——— : For 3-phase 200 V AC.
2. - - - - : For 1-phase 230 V AC.
3. ——— : For 1-phase 200 V AC. This line is drawn only where differs from the other two lines.
4. This value is applicable when the maximum torque is increased with a combination with a larger-capacity servo amplifier. Refer to "Combinations of HG-JR Servo Motor Series and Servo Amplifier (200 V/400 V Class) for Increasing the Maximum Torque to 400% of the Rated Torque" on p. 2-7 in this catalog.
5. Torque drops when the power supply voltage is below the specified value.
6. When a 1-phase 200 V AC input is used, increasing the maximum torque to 400% is not possible with HG-JR servo motor series.
7. Contact your local sales office for the torque characteristics when using the servo amplifier with 1-phase 200 V AC input.
8. This value is applicable when the servo motor is combined with MR-J4-DU900B(-RJ) drive unit, and the maximum torque is increased with a parameter setting.

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	



[Unit: mm]

Notes: 1. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
2. A key is not supplied with the servo motor. The key shall be installed by the user.

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. 2-6 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 (Note 10)	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		[N•m]	4.8 <6.4> (Note 5)	7.2 <9.6> (Note 5)	9.6 <12.7> (Note 5)	14.3 <19.1> (Note 5)	19.1 <25.5> (Note 5)	32.0 <44.6> (Note 5)	47.7 <63.7> (Note 5)	66.8 <78.0> (Note 8)	85.8
Rated speed (Note 10)		[r/min]	3000								
Maximum speed (Note 10)		[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		[A]	4.5 <6.0> (Note 5)	8.4 <12> (Note 5)	8.4 <12> (Note 5)	17 <22> (Note 5)	17 <22> (Note 5)	26 <36> (Note 5)	41 <54> (Note 5)	52 <69> (Note 8)	67
Regenerative braking frequency *2	MR-J4-	[times/min]	99 <100> (Note 5)	72 <489> (Note 5)	56 <382> (Note 5)	265 <275> (Note 5)	203 <209> (Note 5)	75 <98> (Note 5)	68 <89> (Note 5, 9)	56 (Note 9)	205 (Note 6, 9)
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			Installed								
Thermistor			None								
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)								
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust								
	Altitude		2000 m or less above sea level (Note 7)								
	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 with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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. 2-41 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 combined with MR-J4-500GF4(-RJ)/MR-J4-500B4(-RJ)/MR-J4-500A4(-RJ) servo amplifier.
5. The value in angle brackets is applicable when the maximum torque is increased with a combination with a larger-capacity servo amplifier. Refer to "Combinations of HG-JR Servo Motor Series and Servo Amplifier (200 V/400 V Class) for Increasing the Maximum Torque to 400% of the Rated Torque" on p. 2-7 in this catalog for the available combinations.
6. This value is applicable when the external regenerative resistors, GRZG400-_Ω (standard accessory) are used with cooling fans (two units of 92 mm × 92 mm, minimum airflow: 1.0 m^3/min). Note that [Pr. PA02] must be changed.
7. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
8. The value in angle brackets is applicable when the servo motor is combined with MR-J4-DU900B4(-RJ) drive unit, and the maximum torque is increased with a parameter setting.
9. This value is applicable when the servo motor is combined with MR-J4-_GF4(-RJ)/MR-J4-_B4(-RJ)/MR-J4-_A4(-RJ) servo amplifier. Contact your local sales office for the regenerative braking frequency with MR-J4-DU900B4(-RJ) drive unit.
10. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

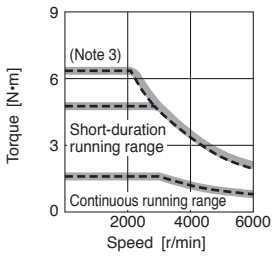
HG-JR 3000 r/min Series (400 V Class) Electromagnetic Brake Specifications (Note 1)

Model		HG-JR	534B	734B	1034B	1534B	2034B	3534B	5034B	7034B	9034B
Type			Spring actuated type safety brake								
Rated voltage			24 V DC$_{-10}^{0}$%								
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 or higher	6.6 or higher	6.6 or higher	6.6 or higher	6.6 or higher	16 or higher	16 or higher	44 or higher	44 or higher
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 braking times		5000	5000	5000	5000	5000	5000	5000	20000	20000
	Work per braking	[J]	64	64	64	64	64	400	400	1000	1000

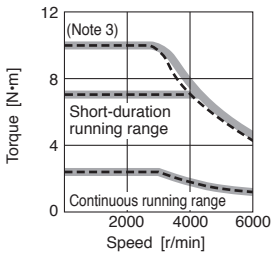
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 3000 r/min Series (400 V Class) Torque Characteristics

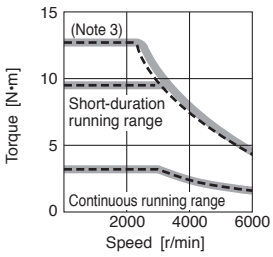
HG-JR534(B) (Note 1, 2, 4)



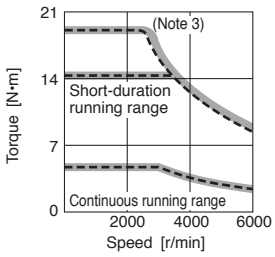
HG-JR734(B) (Note 1, 2, 4)



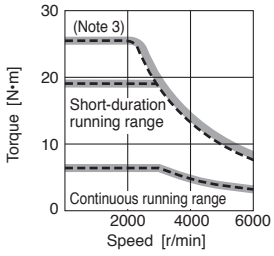
HG-JR1034(B) (Note 1, 2, 4)



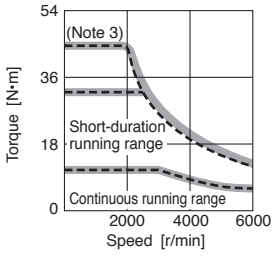
HG-JR1534(B) (Note 1, 2, 4)



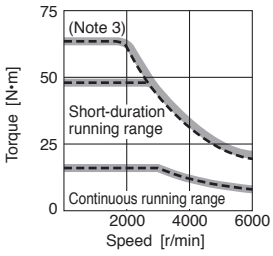
HG-JR2034(B) (Note 1, 2, 4)



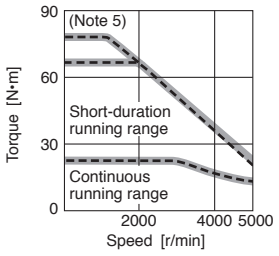
HG-JR3534(B) (Note 1, 2, 4)



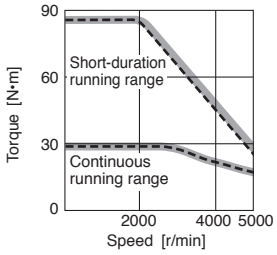
HG-JR5034(B) (Note 1, 2, 4)



HG-JR7034(B) (Note 1, 2, 4)



HG-JR9034(B) (Note 1, 2, 4)



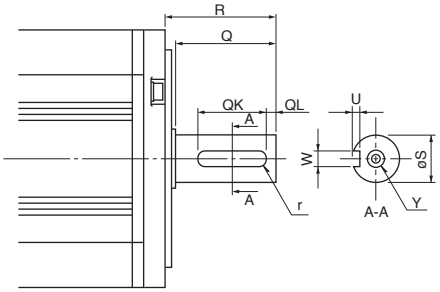
Notes: 1. ——— : For 3-phase 400 V AC.
2. - - - - : For 3-phase 380 V AC.
3. This value is applicable when the maximum torque is increased with a combination with a larger-capacity servo amplifier. Refer to "Combinations of HG-JR Servo Motor Series and Servo Amplifier (200 V/400 V Class) for Increasing the Maximum Torque to 400% of the Rated Torque" on p. 2-7 in this catalog.
4. Torque drops when the power supply voltage is below the specified value.
5. This value is applicable when the servo motor is combined with MR-J4-DU900B4(-RJ) drive unit, and the maximum torque is increased with a parameter setting.

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	



[Unit: mm]

Notes: 1. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
2. A key is not supplied with the servo motor. The key shall be installed by the user.

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. 2-5 in this catalog.							
Power supply capacity *1		[kVA]	8.6	12	18	22	30	38	48	59
Continuous running duty (Note 7)	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 (Note 7)		[r/min]	1000							
Maximum speed (Note 7)		[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 (Note 6)	322 (Note 4, 6)	224 (Note 4, 6)	234 (Note 4, 6)	183 (Note 4, 6)	150 (Note 4, 6)	- (Note 6)	- (Note 6)
Moment of inertia J	Standard	[× 10^{-4} kg•m^2]	176	220	315	489	627	764	1377	1637
	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			Installed							
Thermistor			None			Built-in				
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)							
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust							
	Altitude		2000 m or less above sea level (Note 5)							
	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 with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.							
Permissible load for the shaft *5	L	[mm]	85	116	116	140	140	140	140	140
	Radial	[N]	2450	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		-	-	-	3-phase 200 V AC to 240 V AC				
	Frequency	[Hz]	-	-	-	50	60	50	60	50	60	50	60	50	60
	Input	[W]	-	-	-	65	85	65	85	65	85	130	225	130	225
	Current	[A]	-	-	-	0.20	0.23	0.20	0.23	0.20	0.23	0.47	0.60	0.47	0.60

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. 2-41 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. This value is applicable when the external regenerative resistors, GRZG400-_Ω (standard accessory) are used with cooling fans (two units of 92 mm × 92 mm, minimum airflow: 1.0 m^3/min). Note that [Pr. PA02] must be changed.
5. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
6. This value is applicable when the servo motor is combined with MR-J4-_GF(-RJ)/MR-J4-_B(-RJ)/MR-J4-_A(-RJ) servo amplifier. Contact your local sales office for the regenerative braking frequency with MR-J4-DU_B(-RJ)/MR-J4-DU_A(-RJ) drive unit.
7. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

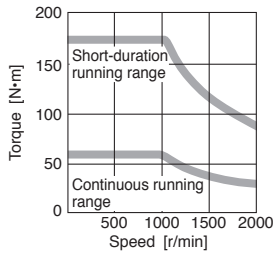
HG-JR 1000 r/min Series (200 V Class) Electromagnetic Brake Specifications (Note 1)

Model		HG-JR	601B	801B	12K1B
Type			Spring actuated type safety brake		
Rated voltage			24 V DC$^{0}_{-10}$%		
Power consumption		[W] at 20 °C	32	32	32
Electromagnetic brake static friction torque		[N•m]	126 or higher	126 or higher	126 or higher
Permissible braking work	Per braking	[J]	5000	5000	5000
	Per hour	[J]	45200	45200	45200
Electromagnetic brake life (Note 2)	Number of braking times		20000	20000	20000
	Work per braking	[J]	400	400	400

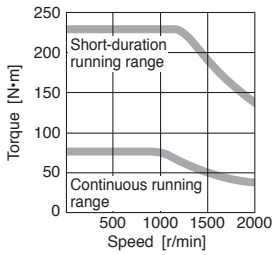
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 1000 r/min Series (200 V Class) Torque Characteristics

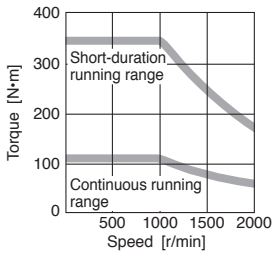
HG-JR601(B) (Note 1, 2)



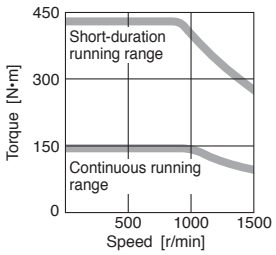
HG-JR801(B) (Note 1, 2)



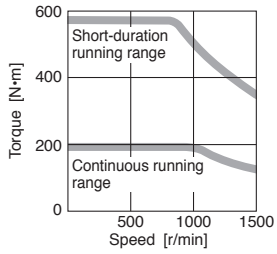
HG-JR12K1(B) (Note 1, 2)



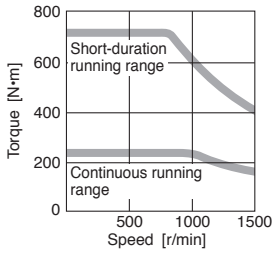
HG-JR15K1 (Note 1, 2)



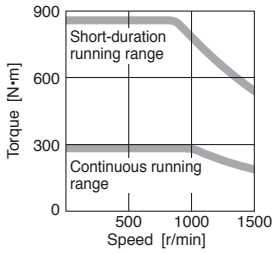
HG-JR20K1 (Note 1, 2)



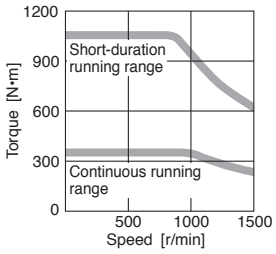
HG-JR25K1 (Note 1, 2)



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	B

Notes: 1. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
2. A key is not supplied with the servo motor. The key shall be installed by the user.

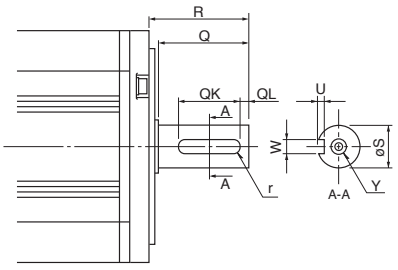


Fig. A

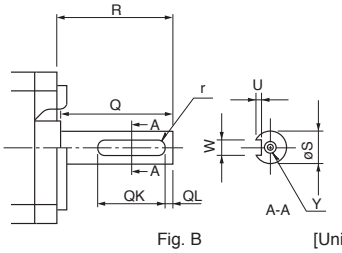


Fig. B [Unit: mm]

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. 2-6 in this catalog.							
Power supply capacity *1		[kVA]	8.6	12	18	22	30	38	48	59
Continuous running duty (Note 7)	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 (Note 7)		[r/min]	1000							
Maximum speed (Note 7)		[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 (Note 6)	331 (Note 4, 6)	229 (Note 4, 6)	239 (Note 4, 6)	187 (Note 4, 6)	152 (Note 4, 6)	- (Note 6)	- (Note 6)
Moment of inertia J	Standard	[× 10^{-4} kg•m^2]	176	220	315	489	627	764	1377	1637
	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			Installed							
Thermistor			None			Built-in				
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)							
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust							
	Altitude		2000 m or less above sea level (Note 5)							
	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 with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.							
Permissible load for the shaft *5	L	[mm]	85	116	116	140	140	140	140	140
	Radial	[N]	2450	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		-	-	-	3-phase 380 V AC to 480 V AC			3-phase 380 V AC to 460 V AC	
	Frequency	[Hz]	-	-	-	50	60	50	60	50	60	50	60	50	60
	Input	[W]	-	-	-	65	90	65	90	65	90	130	230	130	230
	Current	[A]	-	-	-	0.12	0.14	0.12	0.14	0.12	0.14	0.25	0.33	0.25	0.33

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. Refer to the asterisk 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-41 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. This value is applicable when the external regenerative resistors, GRZG400-_Ω (standard accessory) are used with cooling fans (two units of 92 mm × 92 mm, minimum airflow: 1.0 m^3/min). Note that [Pr. PA02] must be changed.
5. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
6. This value is applicable when the servo motor is combined with MR-J4-_GF4(-RJ)/MR-J4-_B4(-RJ)/MR-J4-_A4(-RJ) servo amplifier. Contact your local sales office for the regenerative braking frequency with MR-J4-DU_B4(-RJ)/MR-J4-DU_A4(-RJ) drive unit.
7. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

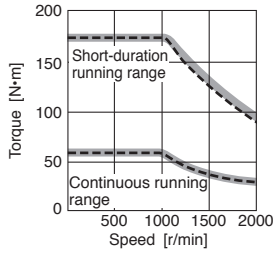
HG-JR 1000 r/min Series (400 V Class) Electromagnetic Brake Specifications (Note 1)

Model		HG-JR	6014B	8014B	12K14B
Type			Spring actuated type safety brake		
Rated voltage			24 V DC$^{0}_{-10}$%		
Power consumption		[W] at 20 °C	32	32	32
Electromagnetic brake static friction torque		[N•m]	126 or higher	126 or higher	126 or higher
Permissible braking work	Per braking	[J]	5000	5000	5000
	Per hour	[J]	45200	45200	45200
Electromagnetic brake life (Note 2)	Number of braking times		20000	20000	20000
	Work per braking	[J]	400	400	400

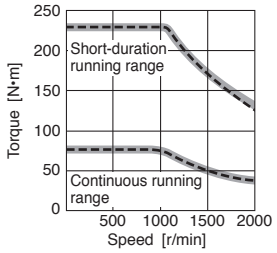
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 1000 r/min Series (400 V Class) Torque Characteristics

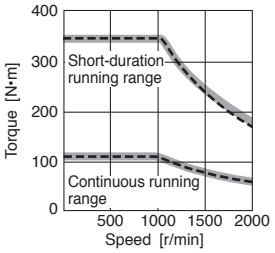
HG-JR6014(B) (Note 1, 2, 3)



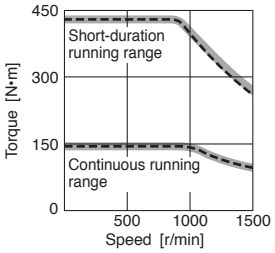
HG-JR8014(B) (Note 1, 2, 3)



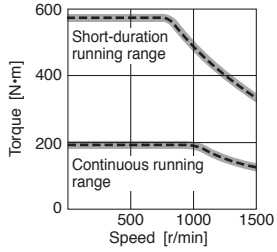
HG-JR12K14(B) (Note 1, 2, 3)



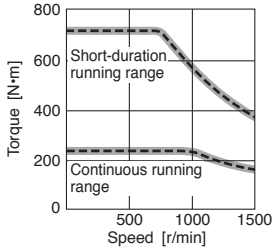
HG-JR15K14 (Note 1, 2, 3)



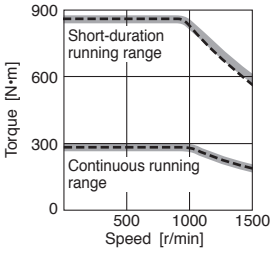
HG-JR20K14 (Note 1, 2, 3)



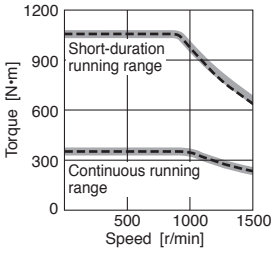
HG-JR25K14 (Note 1, 2, 3)



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. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
2. A key is not supplied with the servo motor. The key shall be installed by the user.

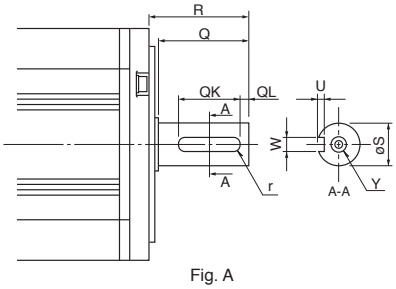


Fig. A

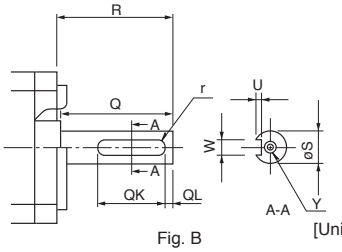


Fig. B

[Unit: mm]

HG-JR 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. 2-5 in this catalog.					
Power supply capacity *1		[kVA]	10	16	22	33	48	59
Continuous running duty (Note 8)	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 <156> (Note 6)	210	286	420	573	707
Rated speed (Note 8)		[r/min]	1500					
Maximum speed (Note 8)		[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 <130> (Note 6)	200	246	315	479	561
Regenerative braking frequency *2	MR-J4-	[times/min]	36 (Note 7)	143 (Note 4, 7)	162 (Note 4, 7)	104 (Note 4, 7)	- (Note 7)	- (Note 7)
Moment of inertia J	Standard	[× 10^{-4} kg•m^2]	176	220	315	489	627	764
	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			Installed					
Thermistor			None			Built-in		
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)					
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust					
	Altitude		2000 m or less above sea level (Note 5)					
	Vibration resistance *4		X: 24.5 m/s^2 Y: 24.5 m/s^2					
Vibration rank			V10 *6					
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.					
Permissible load for the shaft *5	L	[mm]	85	116	116	140	140	140
	Radial	[N]	2450	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		-	-	-	3-phase 200 V AC to 240 V AC		
	Frequency	[Hz]	-	-	-	50 / 60	50 / 60	50 / 60
	Input	[W]	-	-	-	65 / 85	65 / 85	65 / 85
	Current	[A]	-	-	-	0.20 / 0.23	0.20 / 0.23	0.20 / 0.23

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. 2-41 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. This value is applicable when the external regenerative resistors, GRZG400-_Ω (standard accessory) are used with cooling fans (two units of 92 mm × 92 mm, minimum airflow: 1.0 m^3/min). Note that [Pr. PA02] must be changed.
5. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
6. The value in angle brackets is applicable when the servo motor is combined with MR-J4-DU900B(-RJ) drive unit, and the maximum torque is increased with a parameter setting.
7. This value is applicable when the servo motor is combined with MR-J4-_GF(-RJ)/MR-J4-_B(-RJ)/MR-J4-_A(-RJ) servo amplifier. Contact your local sales office for the regenerative braking frequency with MR-J4-DU_B(-RJ)/MR-J4-DU_A(-RJ) drive unit.
8. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

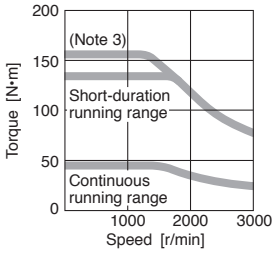
HG-JR 1500 r/min Series (200 V Class) Electromagnetic Brake Specifications (Note 1)

Model		HG-JR	701MB	11K1MB	15K1MB
Type			Spring actuated type safety brake		
Rated voltage			24 V DC$^{0}_{-10}$%		
Power consumption		[W] at 20 °C	32	32	32
Electromagnetic brake static friction torque		[N•m]	126 or higher	126 or higher	126 or higher
Permissible braking work	Per braking	[J]	5000	5000	5000
	Per hour	[J]	45200	45200	45200
Electromagnetic brake life (Note 2)	Number of braking times		20000	20000	20000
	Work per braking	[J]	400	400	400

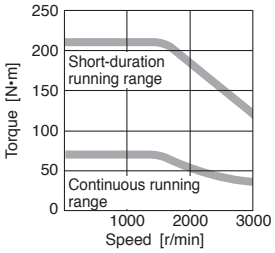
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 1500 r/min Series (200 V Class) Torque Characteristics

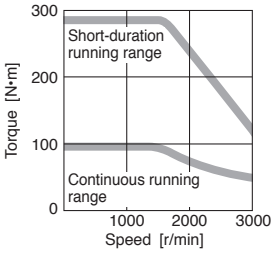
HG-JR701M(B) (Note 1, 2)



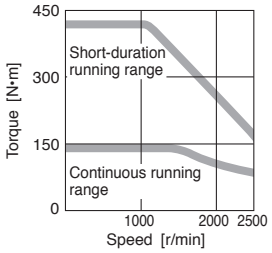
HG-JR11K1M(B) (Note 1, 2)



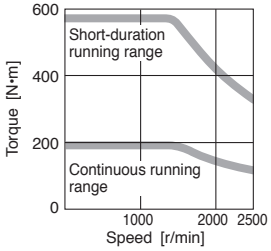
HG-JR15K1M(B) (Note 1, 2)



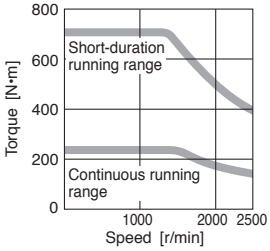
HG-JR22K1M (Note 1, 2)



HG-JR30K1M (Note 1, 2)



HG-JR37K1M (Note 1, 2)



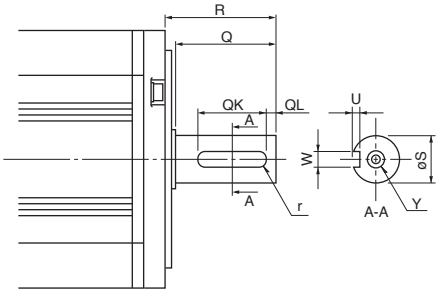
Notes: 1. ▬ : For 3-phase 200 V AC.
2. Torque drops when the power supply voltage is below the specified value.
3. This value is applicable when the servo motor is combined with MR-J4-DU900B(-RJ) drive unit, and the maximum torque is increased with a parameter setting.

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 $^{0}_{-0.040}$	70	5	5 $^{+0.2}_{0}$	6	M8 screw Depth: 19.8
HG-JR11K1M(B)K, 15K1M(B)K	55m6	116	110	16 $^{0}_{-0.040}$	90	5	6 $^{+0.2}_{0}$	8	M10 screw Depth: 27
HG-JR22K1MK, 30K1MK, 37K1MK	65m6	140	130	18 $^{0}_{-0.040}$	120	5	7 $^{+0.2}_{0}$	9	M12 screw Depth: 25



[Unit: mm]

Notes: 1. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
2. A key is not supplied with the servo motor. The key shall be installed by the user.

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. 2-6 in this catalog.							
Power supply capacity *1		[kVA]	10	16	22	33	48	59	71	80
Continuous running duty (Note 8)	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 <156> (Note 6)	210	286	420	573	707	859	1050
Rated speed (Note 8)		[r/min]	1500							
Maximum speed (Note 8)		[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 <65> (Note 6)	100	123	170	235	263	288	357
Regenerative braking frequency *2	MR-J4-	[times/min]	36 (Note 7)	143 (Note 4, 7)	162 (Note 4, 7)	104 (Note 4, 7)	- (Note 7)	- (Note 7)	- (Note 7)	- (Note 7)
Moment of inertia J	Standard	[× 10^{-4} kg•m^2]	176	220	315	489	627	764	1377	1637
	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			Installed							
Thermistor			None			Built-in				
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)							
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust							
	Altitude		2000 m or less above sea level (Note 5)							
	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 with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.							
Permissible load for the shaft *5	L	[mm]	85	116	116	140	140	140	140	140
	Radial	[N]	2450	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		-	-	-	3-phase 380 V AC to 480 V AC			3-phase 380 V AC to 460 V AC	
	Frequency	[Hz]	-	-	-	50	60	50	60	50	60	50	60	50	60
	Input	[W]	-	-	-	65	90	65	90	65	90	130	230	130	230
	Current	[A]	-	-	-	0.12	0.14	0.12	0.14	0.12	0.14	0.25	0.33	0.25	0.33

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. Refer to the asterisk 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-41 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. This value is applicable when the external regenerative resistors, GRZG400-_Ω (standard accessory) are used with cooling fans (two units of 92 mm × 92 mm, minimum airflow: 1.0 m^3/min). Note that [Pr. PA02] must be changed.
5. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
6. The value in angle brackets is applicable when the servo motor is combined with MR-J4-DU900B4(-RJ) drive unit, and the maximum torque is increased with a parameter setting.
7. This value is applicable when the servo motor is combined with MR-J4-_GF4(-RJ)/MR-J4-_B4(-RJ)/MR-J4-_A4(-RJ) servo amplifier. Contact your local sales office for the regenerative braking frequency with MR-J4-DU_B4(-RJ)/MR-J4-DU_A4(-RJ) drive unit.
8. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

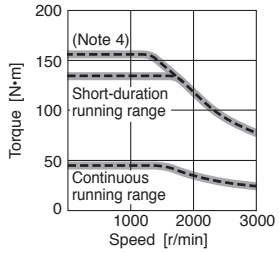
HG-JR 1500 r/min Series (400 V Class) Electromagnetic Brake Specifications (Note 1)

Model		HG-JR	701M4B	11K1M4B	15K1M4B
Type			Spring actuated type safety brake		
Rated voltage			24 V DC$^{0}_{-10}$%		
Power consumption		[W] at 20 °C	32	32	32
Electromagnetic brake static friction torque		[N•m]	126 or higher	126 or higher	126 or higher
Permissible braking work	Per braking	[J]	5000	5000	5000
	Per hour	[J]	45200	45200	45200
Electromagnetic brake life (Note 2)	Number of braking times		20000	20000	20000
	Work per braking	[J]	400	400	400

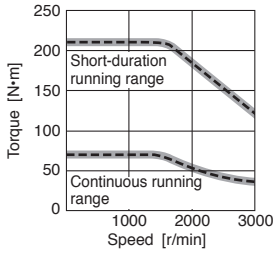
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-JR 1500 r/min Series (400 V Class) Torque Characteristics

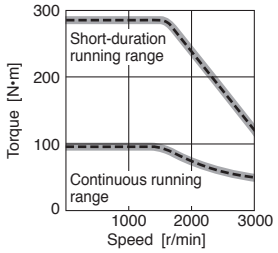
HG-JR701M4(B) (Note 1, 2, 3)



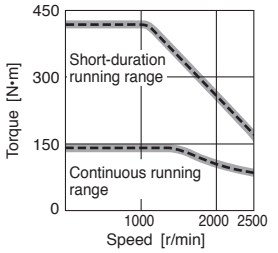
HG-JR11K1M4(B) (Note 1, 2, 3)



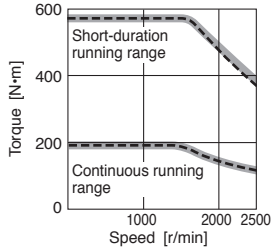
HG-JR15K1M4(B) (Note 1, 2, 3)



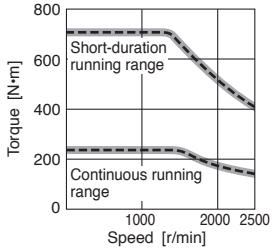
HG-JR22K1M4 (Note 1, 2, 3)



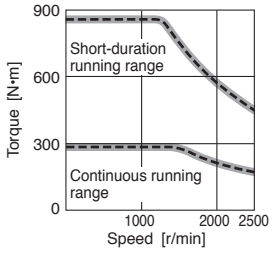
HG-JR30K1M4 (Note 1, 2, 3)



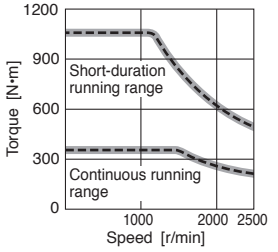
HG-JR37K1M4 (Note 1, 2, 3)



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.
4. This value is applicable when the servo motor is combined with MR-J4-DU900B4(-RJ) drive unit, and the maximum torque is increased with a parameter setting.

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	B

Notes: 1. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
2. A key is not supplied with the servo motor. The key shall be installed by the user.

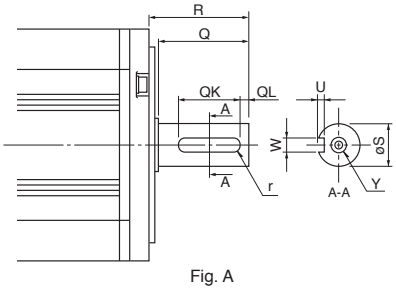


Fig. A

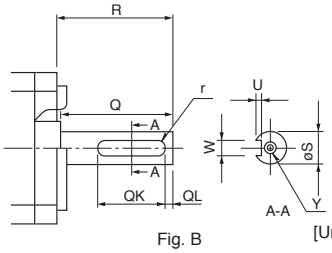


Fig. B

[Unit: mm]

HG-JR 2000 r/min Series (Low Inertia, Ultra-Large Capacity) (400 V Class) Specifications

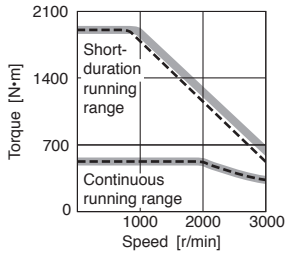
Rotary servo motor model HG-JR			110K24W0C		150K24W0C		180K24W0C		200K24W0C		220K24W0C	
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Rotary Servo Motor and Servo Amplifier (Drive Unit and Power Regeneration Converter Unit)" on p. 2-9 in this catalog.									
Power supply capacity *1		[kVA]	156		213		256		284		312	
Continuous running duty (Note 5)	Rated output	[kW]	110		150		180		200		220	
	Rated torque (Note 3)	[N•m]	525		716		859		954		1050	
Maximum torque		[N•m]	1900		2600		3300		4100		3600	
Rated speed (Note 5)		[r/min]	2000									
Maximum speed (Note 5)		[r/min]	3000									
Permissible instantaneous speed		[r/min]	3450									
Power rate at continuous rated torque		[kW/s]	804		1184		1361		1334		799	
Rated current		[A]	170		295		293		357		357	
Maximum current		[A]	772		1344		1321		1653		1539	
Moment of inertia J		[× 10^{-4} kg•m^2]	3430		4330		5420		6820		13800	
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			Installed									
Thermistor			Built-in									
Insulation class			155 (F)									
Structure			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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)									
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust									
	Altitude		2000 m or less above sea level (Note 4)									
	Vibration resistance *4		X: 9.8 m/s^2 Y: 9.8 m/s^2									
Vibration rank			V10 *6									
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.									
Permissible load for the shaft *5	L	[mm]	175		175		175		175		200	
	Radial	[N]	5000		5000		5000		5000		6000	
	Thrust	[N]	5000		5000		5000		5000		5000	
Mass		[kg]	420		520		730		755		870	
Cooling fan (per fan)	Power supply voltage		1-phase 200 V AC	1-phase 200 V AC to 230 V AC	1-phase 200 V AC	1-phase 200 V AC to 230 V AC	1-phase 200 V AC	1-phase 200 V AC to 230 V AC	1-phase 200 V AC	1-phase 200 V AC to 230 V AC	1-phase 200 V AC	1-phase 200 V AC to 230 V AC
	Frequency	[Hz]	50	60	50	60	50	60	50	60	50	60
	Input	[W]	60	86	60	86	60	86	60	86	60	86
	Current	[A]	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.5

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. 2-41 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. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
5. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

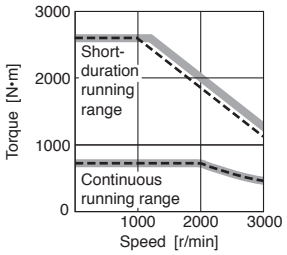
Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

HG-JR 2000 r/min Series (400 V Class) Torque Characteristics

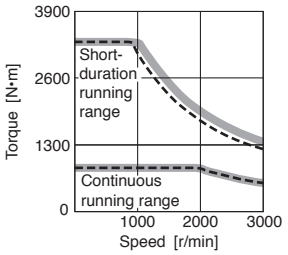
HG-JR110K24W0C (Note 1, 2, 3)



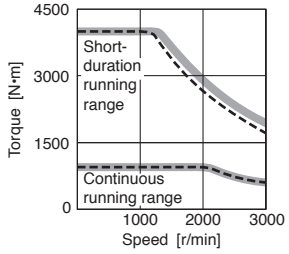
HG-JR150K24W0C (Note 1, 2, 3)



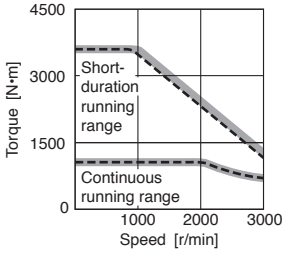
HG-JR180K24W0C (Note 1, 2, 3)



HG-JR200K24W0C (Note 1, 2, 3)



HG-JR220K24W0C (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.

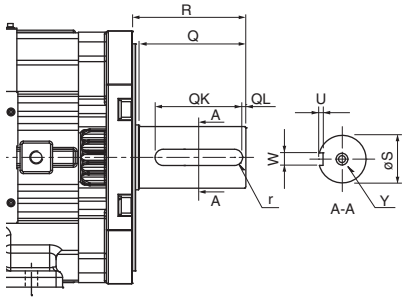
HG-JR 2000 r/min Series (400 V Class) Special Shaft End Specifications

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-JR110K24KW0C HG-JR150K24KW0C HG-JR180K24KW0C HG-JR200K24KW0C	95h6	175	165	25 $^{0}_{-0.04}$	135	5	9 $^{+0.2}_{0}$	12.5	M16 screw Depth: 30
HG-JR220K24KW0C	120h6	200	190	32 $^{0}_{-0.062}$	180	5	11 $^{+0.2}_{0}$	16	M24 screw Depth: 45

Notes: 1. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
2. A key is not supplied with the servo motor. The key shall be installed by the user.



[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. 2-5 in this catalog.				
Power supply capacity *1		[kVA]	1.7	2.5	3.5	5.5	7.5
Continuous running duty (Note 5)	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 (Note 5)		[r/min]	3000				
Maximum speed (Note 5)		[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
Moment of inertia J	Standard	[× 10^{-4} kg•m^2]	1.50	1.90	2.30	8.30	12.0
	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			Installed				
Thermistor			None				
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)				
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust				
	Altitude		2000 m or less above sea level (Note 4)				
	Vibration resistance *4		X: 24.5 m/s^2 Y: 24.5 m/s^2				
Vibration rank			V10 *6				
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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. 2-41 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. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
5. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

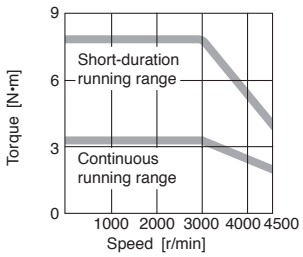
HG-RR Series Electromagnetic Brake Specifications (Note 1)

Model	HG-RR	103B	153B	203B	353B	503B
Type		Spring actuated type safety brake				
Rated voltage		24 V DC$^{0}_{-10}$%				
Power consumption	[W] at 20 °C	19	19	19	23	23
Electromagnetic brake static friction torque	[N•m]	7.0 or higher	7.0 or higher	7.0 or higher	17 or higher	17 or higher
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 braking times	20000	20000	20000	20000	20000
	Work per braking [J]	200	200	200	200	200

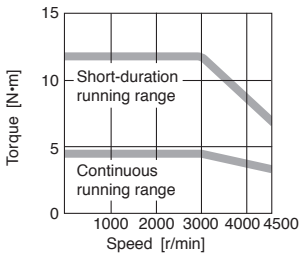
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-RR Series Torque Characteristics

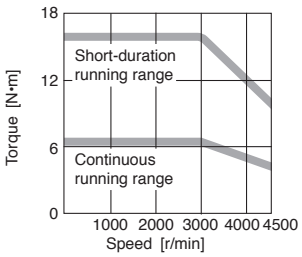
HG-RR103(B) (Note 1, 2, 3)



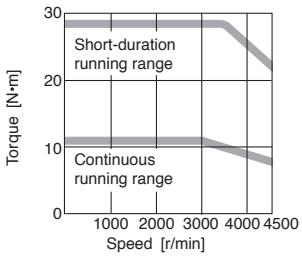
HG-RR153(B) (Note 1, 2, 3)



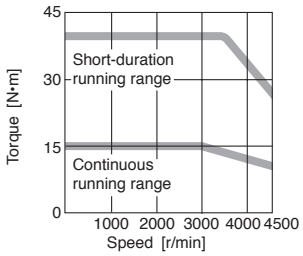
HG-RR203(B) (Note 1, 2)



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.
3. Contact your local sales office for the torque characteristics when using the servo amplifier with 1-phase 200 V AC input.

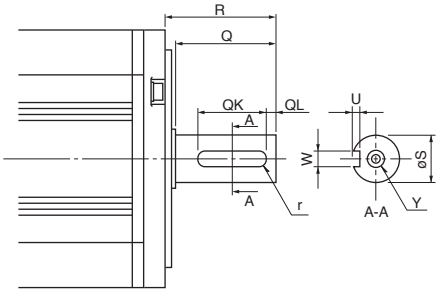
HG-RR Series Special Shaft End Specifications

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. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
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. 2-5 in this catalog.				
Power supply capacity *1		[kVA]	1.3	2.5	3.5	5.5	7.5
Continuous running duty (Note 5)	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 (Note 5)		[r/min]	2000				
Maximum speed (Note 5)		[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			Installed				
Thermistor			None				
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: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)				
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust				
	Altitude		2000 m or less above sea level (Note 4)				
	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 with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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. 2-41 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. Refer to "Servo Motor Instruction Manual (Vol. 3)" for the restrictions when using the servo motors at altitude exceeding 1000 m and up to 2000 m above sea level.
5. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 1 to 6.

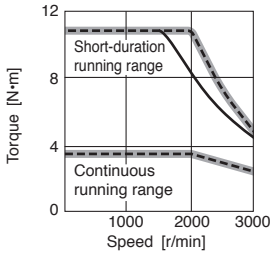
HG-UR Series Electromagnetic Brake Specifications (Note 1)

Model	HG-UR	72B	152B	202B	352B	502B
Type		Spring actuated type safety brake				
Rated voltage		24 V DC$^{0}_{-10}$%				
Power consumption	[W] at 20 °C	19	19	34	34	34
Electromagnetic brake static friction torque	[N•m]	8.5 or higher	8.5 or higher	44 or higher	44 or higher	44 or higher
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 braking times	20000	20000	20000	20000	20000
	Work per braking [J]	200	200	1000	1000	1000

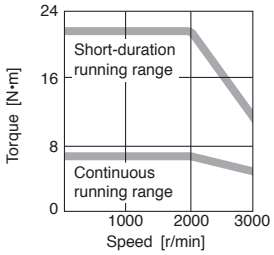
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-UR Series Torque Characteristics

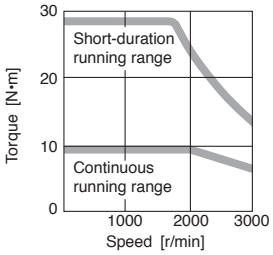
HG-UR72(B) (Note 1, 2, 3, 4)



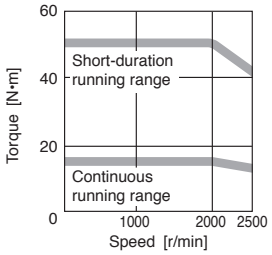
HG-UR152(B) (Note 1, 4, 5)



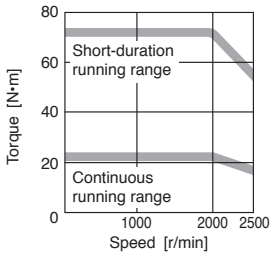
HG-UR202(B) (Note 1, 4)



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.
5. Contact your local sales office for the torque characteristics when using the servo amplifier with 1-phase 200 V AC input.

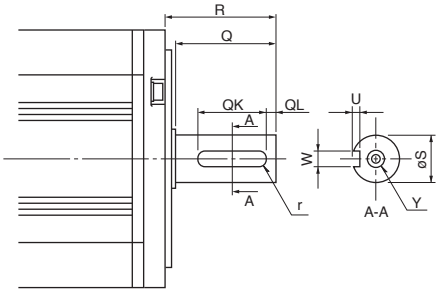
HG-UR Series Special Shaft End Specifications

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. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
2. A key is not supplied with the servo motor. The key shall be installed by the user.



[Unit: mm]

HG-AK Series (Ultra-Compact Size, Ultra-Small Capacity) Specifications (Note 4)

Servo motor model		HG-AK	0136(B)	0236(B)	0336(B)
Compatible servo amplifier model			Refer to "Combinations of Rotary Servo Motor and Servo Amplifier" on p. 2-7 in this catalog.		
Power supply capacity *8		[W]	230	360	480
Continuous running duty (Note 5)	Rated output	[W]	10	20	30
	Rated torque (Note 3)	[N•m]	0.032	0.064	0.095
Maximum torque		[N•m]	0.095	0.191	0.286
Rated speed (Note 5)		[r/min]	3000		
Maximum speed (Note 5)	48 V DC	[r/min]	6000		
	24 V DC	[r/min]	6000		5000
Permissible instantaneous speed	48 V DC	[r/min]	6900		
	24 V DC	[r/min]	6900		5750
Power rate at continuous rated torque	Standard	[kW/s]	3.54	9.01	14.95
	With electromagnetic brake	[kW/s]	2.41	6.99	12.32
Rated current		[A]	2.1	2.1	2.2
Maximum current		[A]	6.3	6.3	6.6
Regenerative braking frequency *2		[times/min]	1700	1200	900
Moment of inertia J	Standard	[× 10^{-4} kg•m^2]	0.0029	0.0045	0.0061
	With electromagnetic brake	[× 10^{-4} kg•m^2]	0.0042	0.0058	0.0074
Recommended load to motor inertia ratio (Note 1)			30 times or less		
Speed/position detector			Absolute/incremental 18-bit encoder (resolution: 262144 pulses/rev)		
Oil seal			None		
Thermistor			None		
Insulation class			130 (B)		
Structure			Totally enclosed, natural cooling (IP rating: IP55) (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: 10 %RH to 80 %RH (non-condensing), storage: 10 %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 *4		X: 49 m/s^2 Y: 49 m/s^2		
Vibration rank			V10 *6		
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.		
Permissible load for the shaft *5	L	[mm]	16	16	16
	Radial	[N]	34	44	49
	Thrust	[N]	14	14	14
Mass	Standard	[kg]	0.12	0.14	0.16
	With electromagnetic brake	[kg]	0.22	0.24	0.26

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, the connector, and the power cable leading part are excluded. Refer to the asterisk 7 of "Annotations for Rotary Servo Motor Specifications" on p. 2-41 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. Specifications of HG-AK_-S100 are the same as those of HG-AK_ except for the dimensions.
5. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.

Refer to "Annotations for Rotary Servo Motor Specifications" on p. 2-41 in this catalog for the asterisks 2 to 6 and 8.

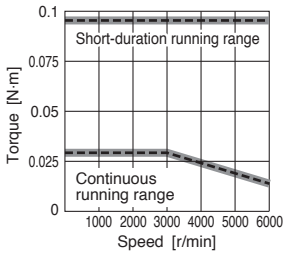
HG-AK Series Electromagnetic Brake Specifications (Note 1)

Model		HG-AK	0136B	0236B	0336B
Type			Spring actuated type safety brake		
Rated voltage			24 V DC$^{0}_{-10}$%		
Power consumption		[W] at 20 °C	1.8		
Electromagnetic brake static friction torque		[N•m]	0.095 or higher		
Permissible braking work	Per braking	[J]	4.6		
	Per hour	[J]	46		
Electromagnetic brake life (Note 2)	Number of braking times		20000		
	Work per braking	[J]	1		

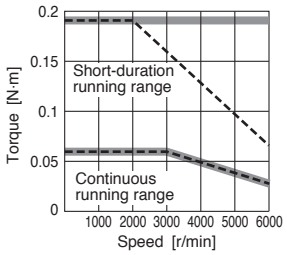
Notes: 1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until the readjustment is needed.

HG-AK Series Torque Characteristics

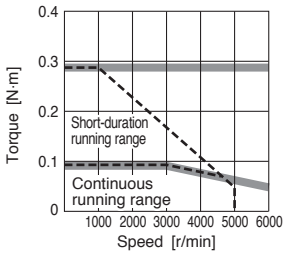
HG-AK0136(B) (Note 1, 2, 3, 4)



HG-AK0236(B) (Note 1, 2, 3, 4)



HG-AK0336(B) (Note 1, 2, 3, 4)

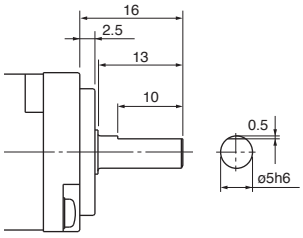


Notes: 1. ▬▬: For 48 V DC.
2. - - - -: For 24 V DC.
3. Torque drops when the power supply voltage is below the specified value.
4. The torque characteristics are applicable when option MR-J4W03PWCBL5M-H or MR-J4W03PWBRCBL5M-H is used between the servo amplifier and the servo motor. When an option cable longer than 5 m is used, the torque characteristics in the short-duration running range may be lower because of voltage drop.

HG-AK Series Special Shaft End Specifications (Note 1)

Motors with the following specifications are also available.

D-cut shaft

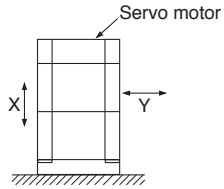


[Unit: mm]

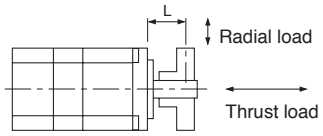
Notes: 1. Specifications of HG-AK_-S100 are the same as those of HG-AK_ except for the dimensions.

Annotations for Rotary Servo Motor Specifications

* 1. The power supply capacity varies depending on the power supply impedance.
  The listed values are the power supply capacity for one servo motor. For the multi-axis servo amplifiers, calculate the power supply capacity with the equation below:
  Power supply capacity [kVA] = Sum of power supply capacity [kVA] of the connected servo motors
* 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 permissible 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 drive system sizing software Motorizer. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a 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 load side).
  Fretting tends to occur on the bearing when the servo motor stops. Thus, maintain vibration level at approximately one-half of the allowable value.

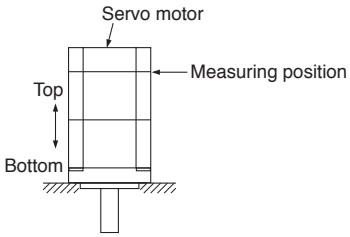


* 5. Refer to the diagram below for the permissible load for the shaft. Do not apply a load exceeding the value specified in the table on the shaft. The values in the table are applicable when each load is applied singly.

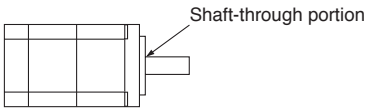


L: Distance between the flange mounting surface and the center of load

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



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

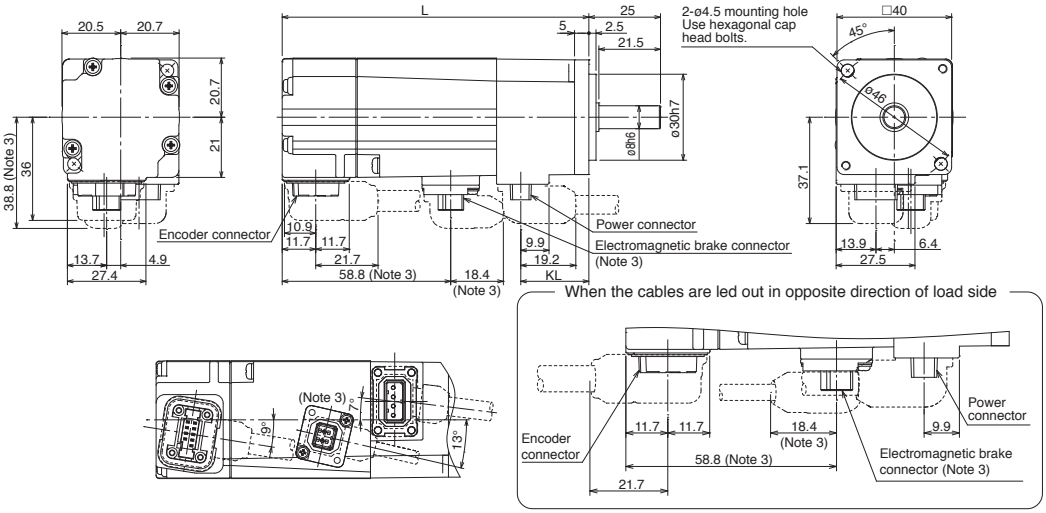


* 8. The power supply capacity varies depending on the DC power supply and the wiring impedance.
  The listed values are the power supply capacity for one servo motor. For the multi-axis servo amplifiers, calculate the power supply capacity with the equation below:
  Power supply capacity [W] = Sum of power supply capacity [W] of the connected servo motors

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	E
2	U
3	V
4	W

Electromagnetic brake connector (Note 2)

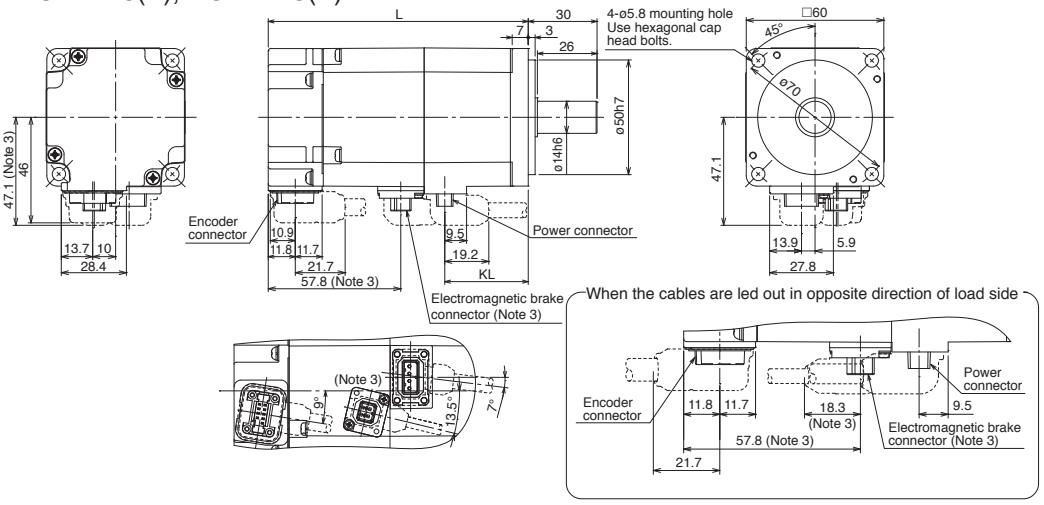
Pin No.	Signal name
1	B1
2	B2

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	E
2	U
3	V
4	W

Electromagnetic brake connector (Note 2)

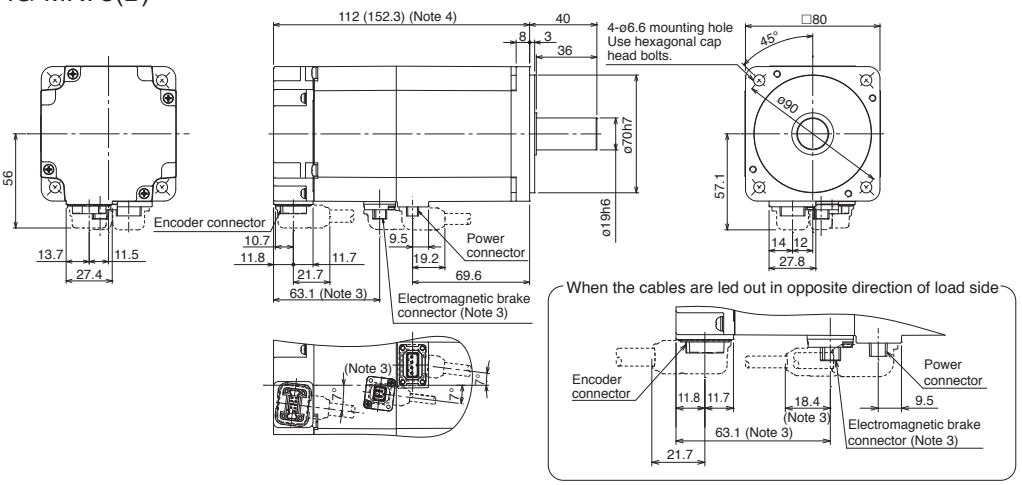
Pin No.	Signal name
1	B1
2	B2

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)

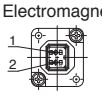
●HG-MR73(B)



Power connector

Pin No.	Signal name
1	E
2	U
3	V
4	W

Electromagnetic brake connector (Note 2)



Pin No.	Signal name
1	B1
2	B2

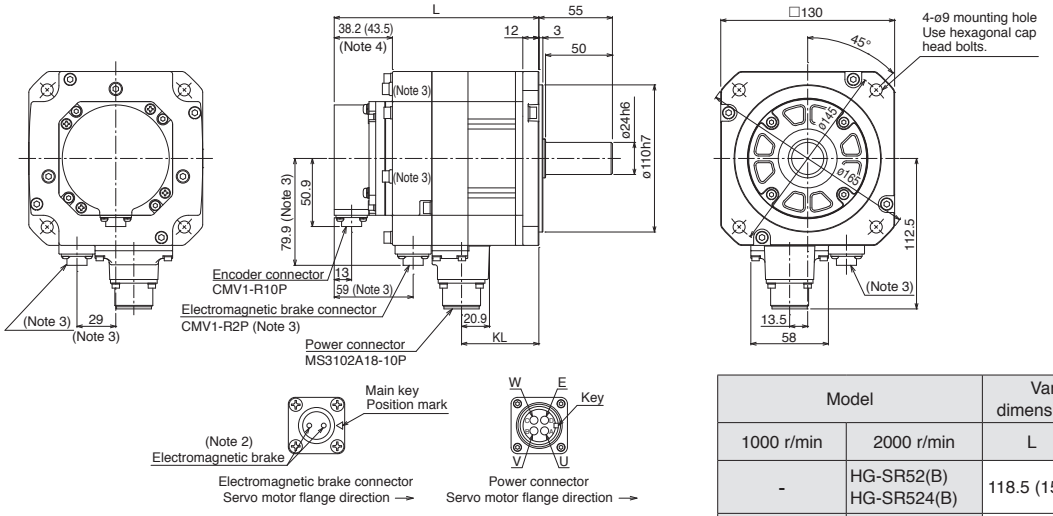
[Unit: mm]

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, 6)

●HG-SR51(B), HG-SR81(B)

●HG-SR52(B), HG-SR102(B), HG-SR152(B), HG-SR524(B), HG-SR1024(B), HG-SR1524(B)

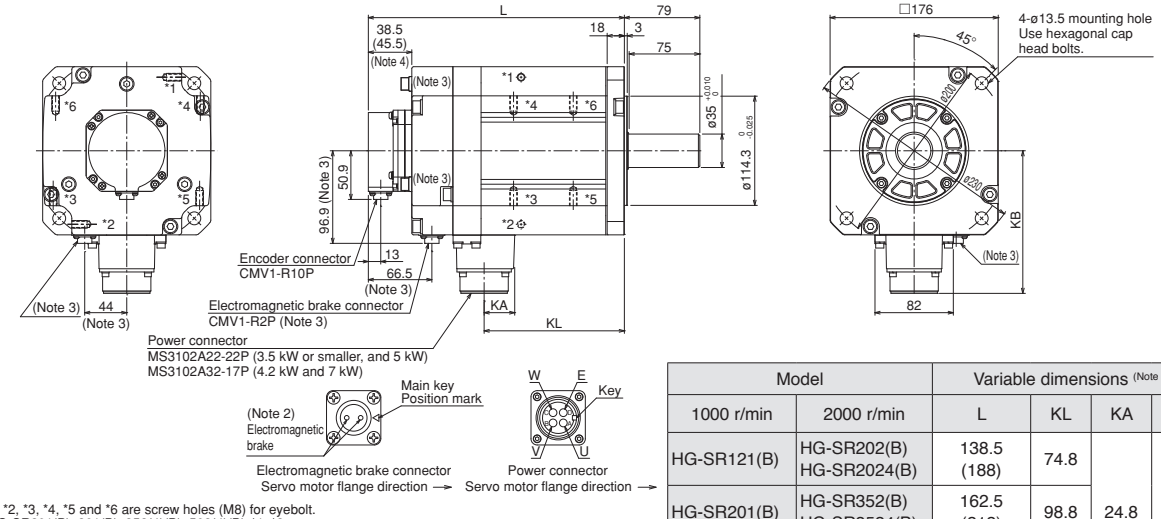


Model		Variable dimensions (Note 4)	
1000 r/min	2000 r/min	L	KL
-	HG-SR52(B) HG-SR524(B)	118.5 (153)	57.8
HG-SR51(B)	HG-SR102(B) HG-SR1024(B)	132.5 (167)	71.8
HG-SR81(B)	HG-SR152(B) HG-SR1524(B)	146.5 (181)	85.8

[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)



*1, *2, *3, *4, *5 and *6 are screw holes (M8) for eyebolt.
•HG-SR201(B), 301(B), 352(4)(B), 502(4)(B):*1, *2
•HG-SR421(B), 702(4)(B): *3, *4, *5, *6

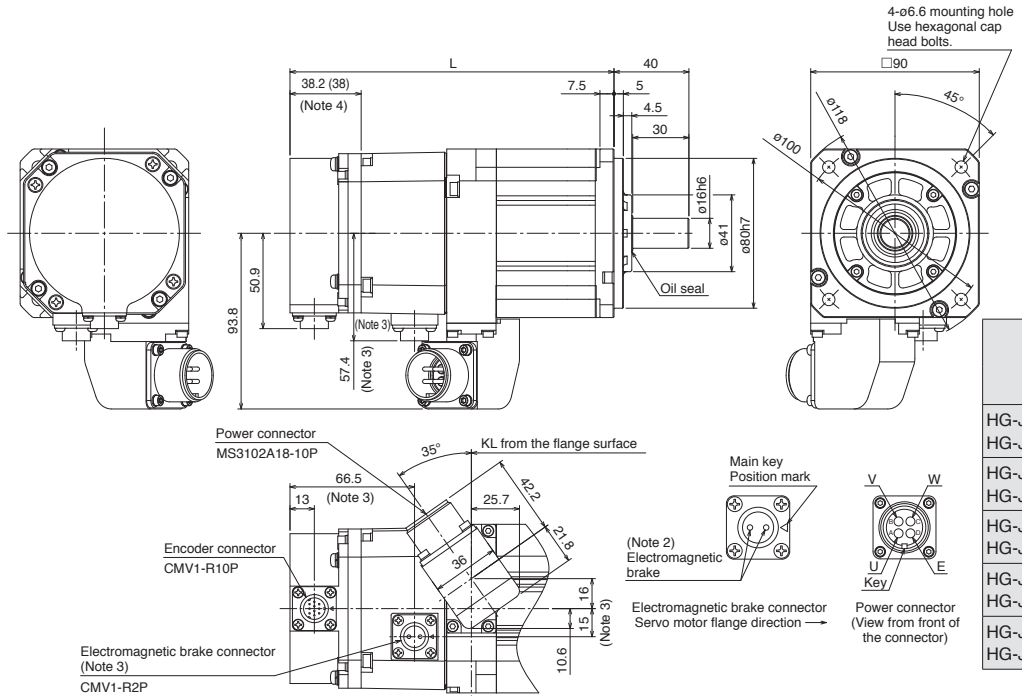
Model		Variable dimensions (Note 4)			
1000 r/min	2000 r/min	L	KL	KA	KB
HG-SR121(B)	HG-SR202(B) HG-SR2024(B)	138.5 (188)	74.8	24.8	140.9
HG-SR201(B)	HG-SR352(B) HG-SR3524(B)	162.5 (212)	98.8		
HG-SR301(B)	HG-SR502(B) HG-SR5024(B)	178.5 (228)	114.8		
HG-SR421(B)	HG-SR702(B) HG-SR7024(B)	218.5 (268)	146.8	32	149.1

[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.
6. For HG-SR series, dimensions are the same regardless of whether or not oil seal is installed.

HG-JR Series Dimensions (Note 1, 5)

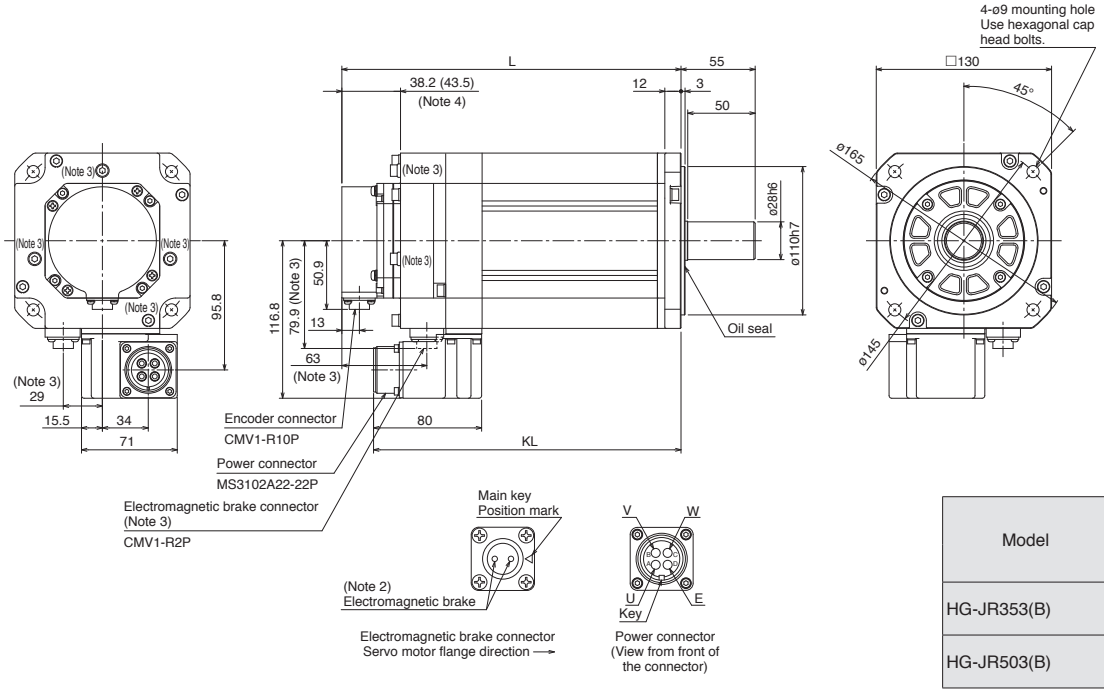
●HG-JR53(B), HG-JR73(B), HG-JR103(B), HG-JR153(B), HG-JR203(B), HG-JR534(B), HG-JR734(B), HG-JR1034(B), HG-JR1534(B), HG-JR2034(B)



Model	Variable dimensions (Note 4)	
	L	KL
HG-JR53(B) HG-JR534(B)	127.5 (173)	76
HG-JR73(B) HG-JR734(B)	145.5 (191)	94
HG-JR103(B) HG-JR1034(B)	163.5 (209)	112
HG-JR153(B) HG-JR1534(B)	199.5 (245)	148
HG-JR203(B) HG-JR2034(B)	235.5 (281)	184

[Unit: mm]

●HG-JR353(B), HG-JR503(B)



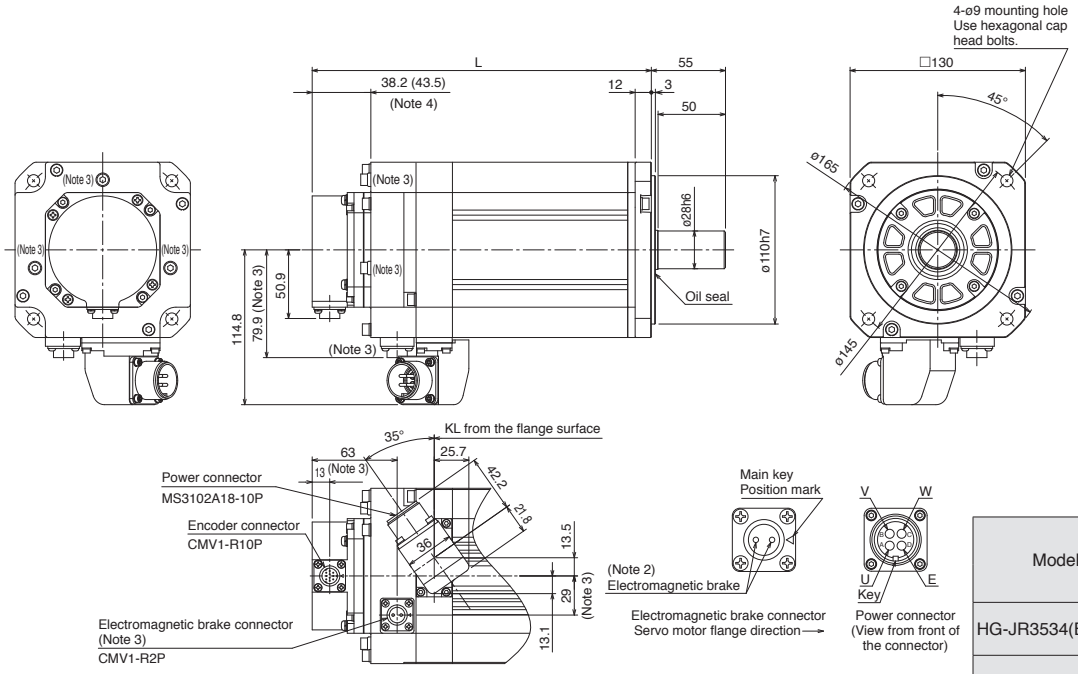
Model	Variable dimensions (Note 4)	
	L	KL
HG-JR353(B)	213 (251.5)	228
HG-JR503(B)	267 (305.5)	282

[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)

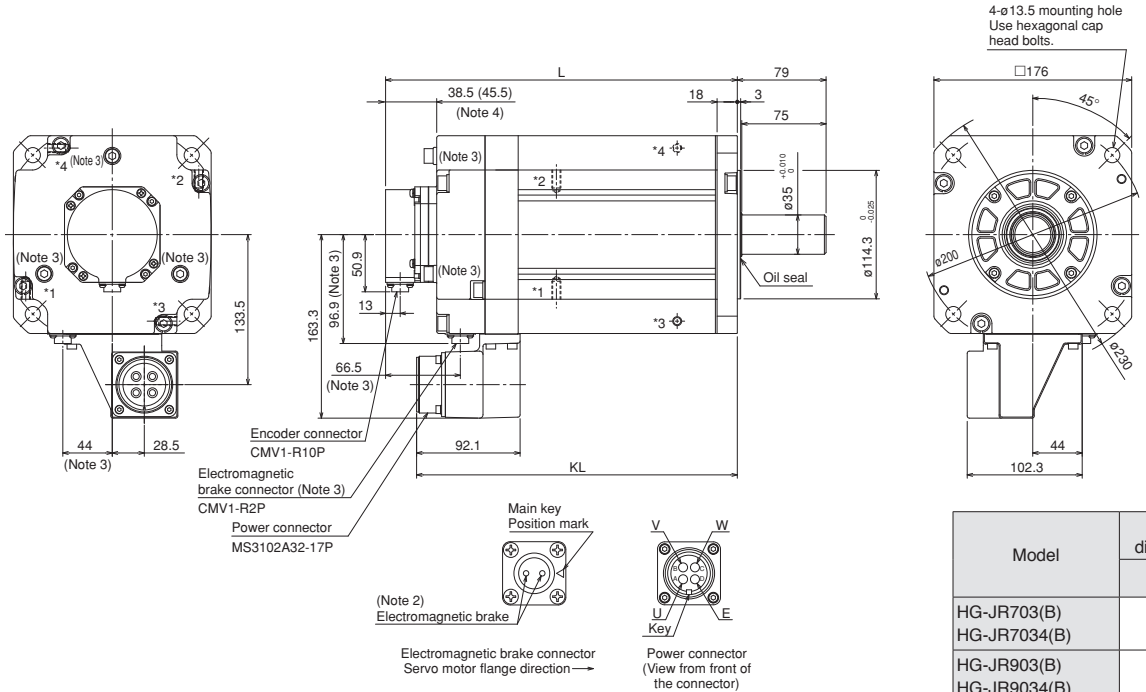
●HG-JR3534(B), HG-JR5034(B)



Model	Variable dimensions (Note 4)	
	L	KL
HG-JR3534(B)	213 (251.5)	161
HG-JR5034(B)	267 (305.5)	215

[Unit: mm]

●HG-JR703(B), HG-JR903(B), HG-JR7034(B), HG-JR9034(B)



Model	Variable dimensions (Note 4)	
	L	KL
HG-JR703(B) HG-JR7034(B)	263.5 (313)	285.4
HG-JR903(B) HG-JR9034(B)	303.5 (353)	325.4

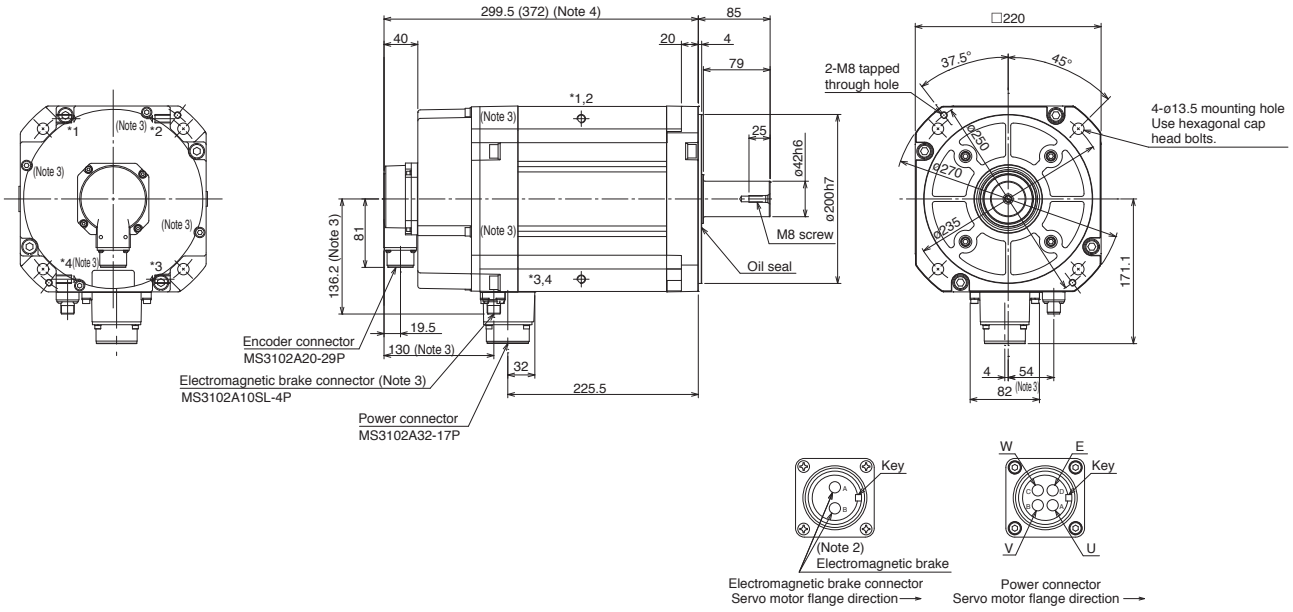
*1, *2, *3, and *4 are screw holes (M8) for eyebolt.

[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-JR601(B), HG-JR701M(B), HG-JR6014(B), HG-JR701M4(B)

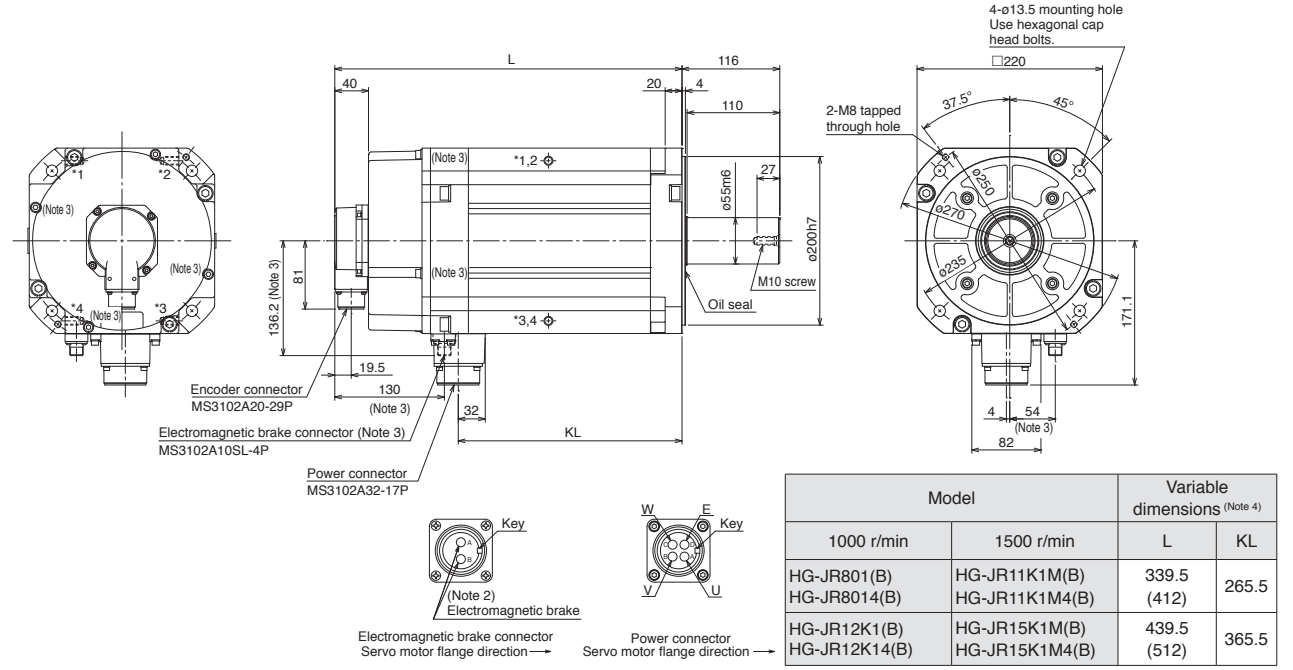


*1, *2, *3, and *4 are screw holes (M10) for eyebolt.

[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)



Model		Variable dimensions (Note 4)	
1000 r/min	1500 r/min	L	KL
HG-JR801(B) HG-JR8014(B)	HG-JR11K1M(B) HG-JR11K1M4(B)	339.5 (412)	265.5
HG-JR12K1(B) HG-JR12K14(B)	HG-JR15K1M(B) HG-JR15K1M4(B)	439.5 (512)	365.5

*1, *2, *3, and *4 are screw holes (M10) for eyebolt.

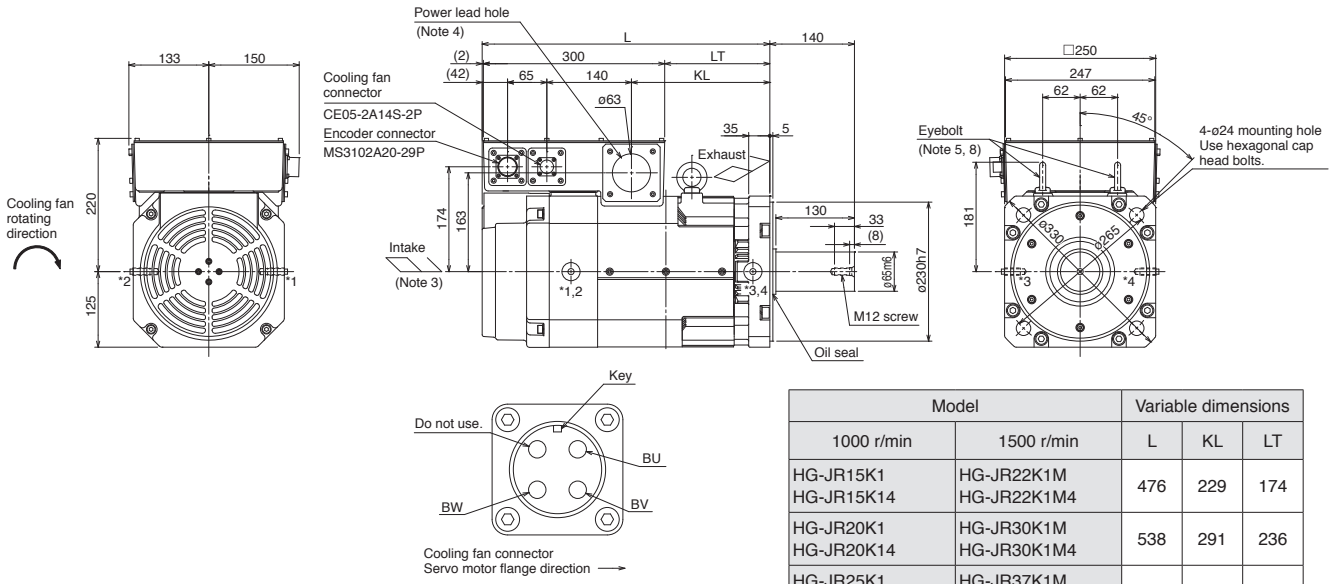
[Unit: mm]

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, 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



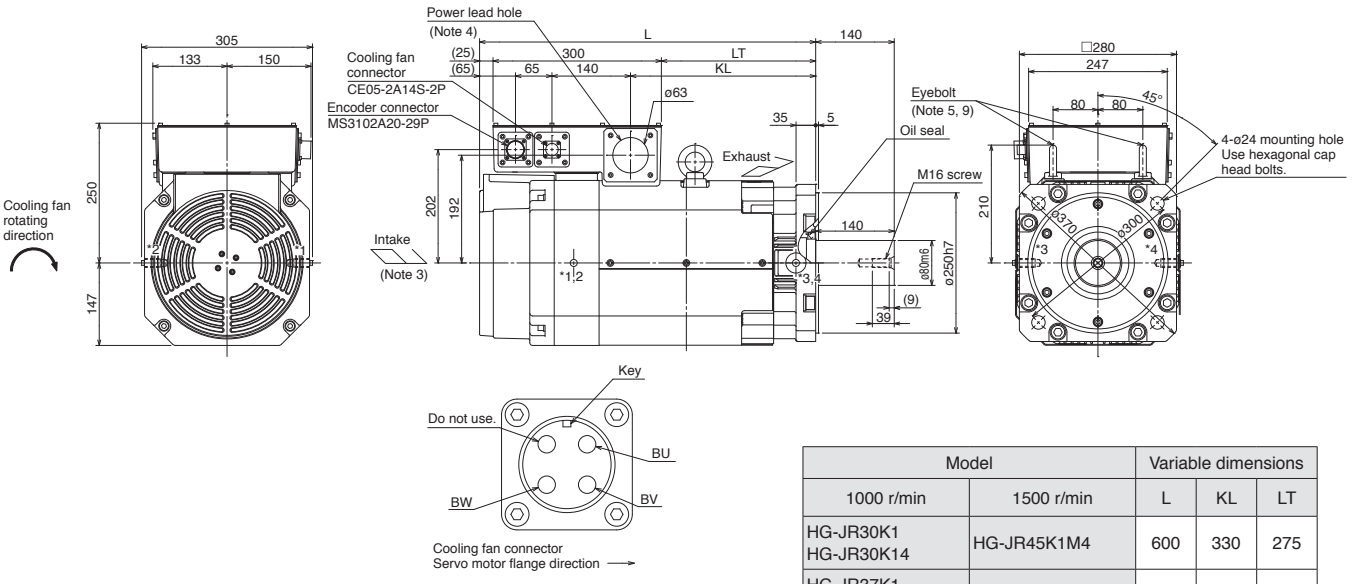
Model		Variable dimensions		
1000 r/min	1500 r/min	L	KL	LT
HG-JR15K1 HG-JR15K14	HG-JR22K1M HG-JR22K1M4	476	229	174
HG-JR20K1 HG-JR20K14	HG-JR30K1M HG-JR30K1M4	538	291	236
HG-JR25K1 HG-JR25K14	HG-JR37K1M HG-JR37K1M4	600	353	298

*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



Model		Variable dimensions		
1000 r/min	1500 r/min	L	KL	LT
HG-JR30K1 HG-JR30K14	HG-JR45K1M4	600	330	275
HG-JR37K1 HG-JR37K14	HG-JR55K1M4	664	394	339

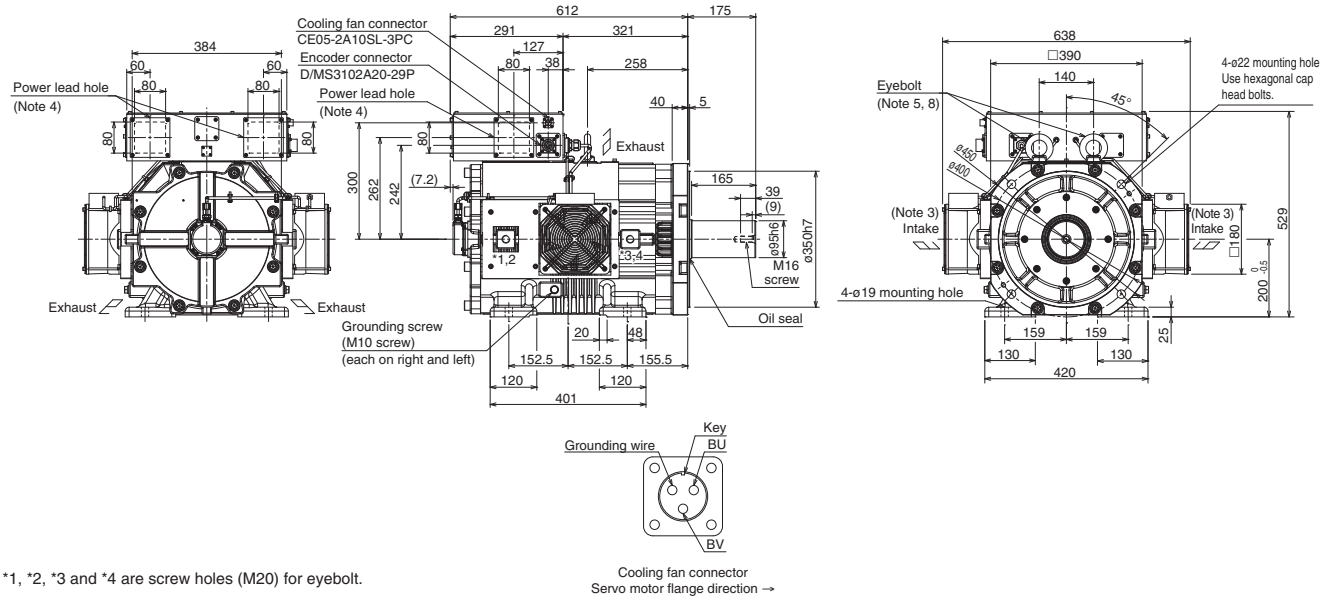
*1, *2, *3, and *4 are screw holes (M16) for eyebolt.

[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 × 20 or shorter.
9. When using the servo motor without the eyebolt, plug the threaded hole with a bolt of M16 × 20 or shorter.

HG-JR Series Dimensions (Note 1, 2, 6, 7)

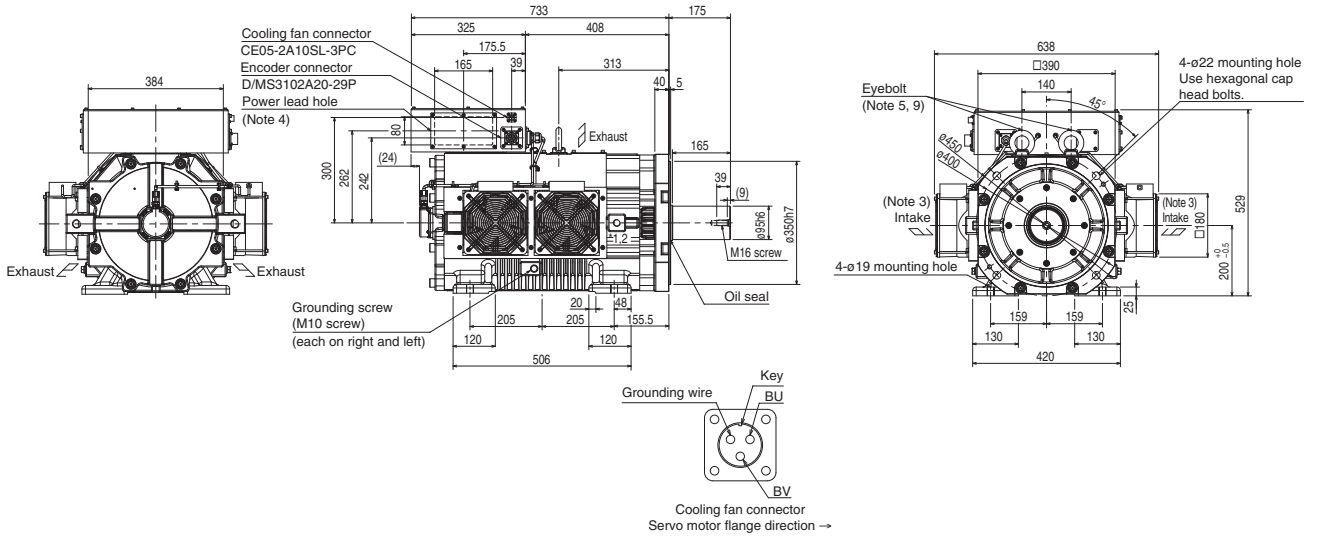
●HG-JR110K24W0C



*1, *2, *3 and *4 are screw holes (M20) for eyebolt.

[Unit: mm]

●HG-JR150K24W0C



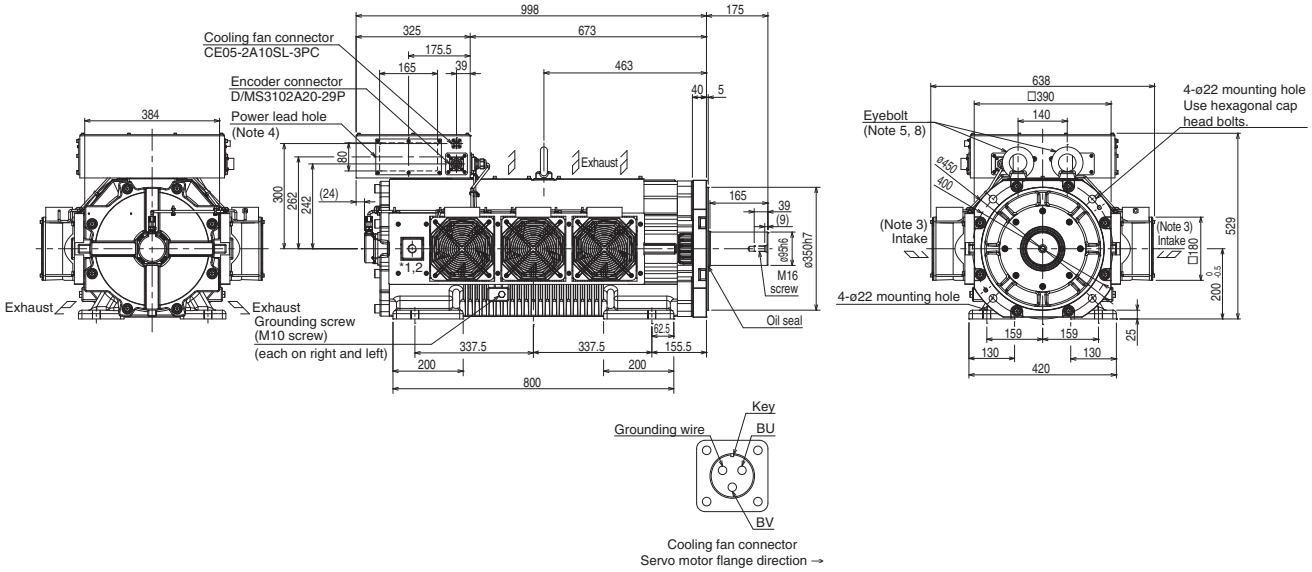
*1 and *2 are screw holes (M30) for eyebolt.

[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 300 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 M8 screws for the motor power input (U, V, and W).
7. The servo motor must be installed with the shaft end horizontal or downward. Do not install the servo motor with the shaft end upward. When mounting the servo motor with the shaft horizontal, fix the servo motor with the feet, keeping the feet downward. When mounting the servo motor with the shaft vertical, fix the servo motor with the flange and also fix the feet to support the servo motor.
8. When using the servo motor without the eyebolt, plug the threaded hole with a bolt of M20 × 25 or shorter.
9. When using the servo motor without the eyebolt, plug the threaded hole with a bolt of M30 × 45 or shorter.

HG-JR Series Dimensions (Note 1, 2, 6, 7)

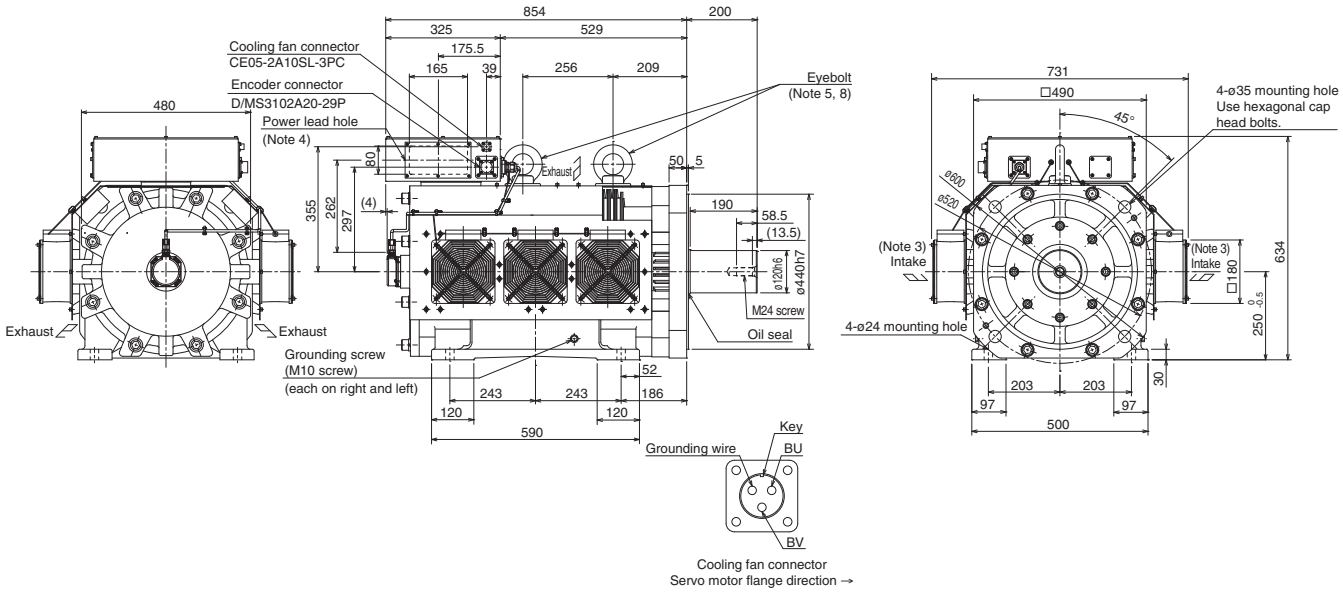
●HG-JR180K24W0C, HG-JR200K24W0C



*1 and *2 are screw holes (M30) for eyebolt.

[Unit: mm]

●HG-JR220K24W0C

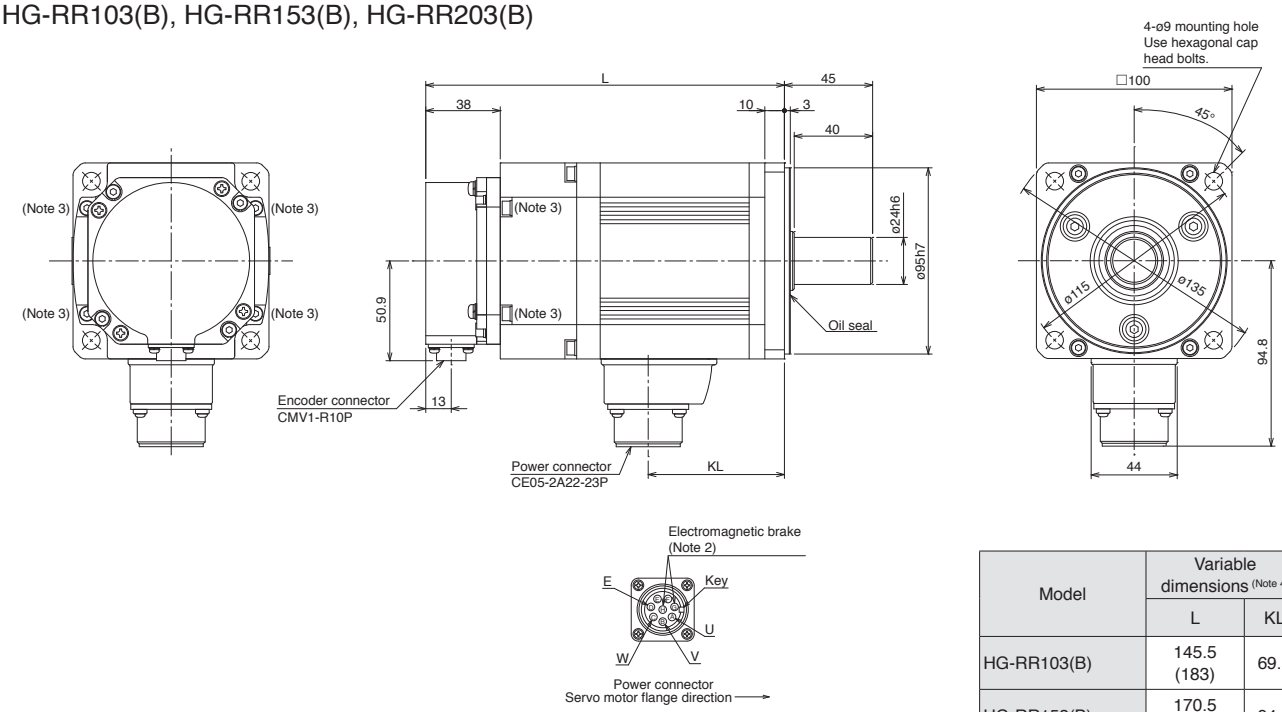


[Unit: mm]

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 300 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 M8 screws for the motor power input (U, V, and W).
7. The servo motor must be installed with the shaft end horizontal or downward. Do not install the servo motor with the shaft end upward. When mounting the servo motor with the shaft horizontal, fix the servo motor with the feet, keeping the feet downward. When mounting the servo motor with the shaft vertical, fix the servo motor with the flange and also fix the feet to support the servo motor.
8. When using the servo motor without the eyebolt, plug the threaded hole with a bolt of M30 × 45 or shorter.

HG-RR Series Dimensions (Note 1, 5)

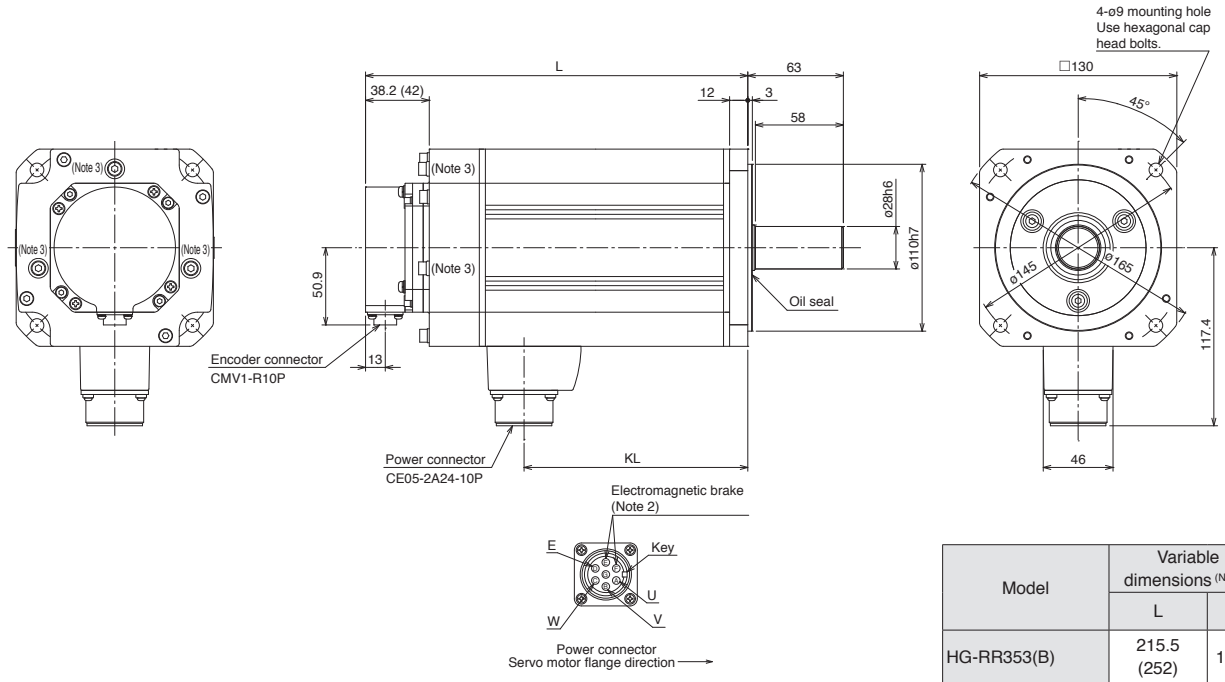
●HG-RR103(B), HG-RR153(B), HG-RR203(B)



Model	Variable dimensions (Note 4)	
	L	KL
HG-RR103(B)	145.5 (183)	69.5
HG-RR153(B)	170.5 (208)	94.5
HG-RR203(B)	195.5 (233)	119.5

[Unit: mm]

●HG-RR353(B), HG-RR503(B)



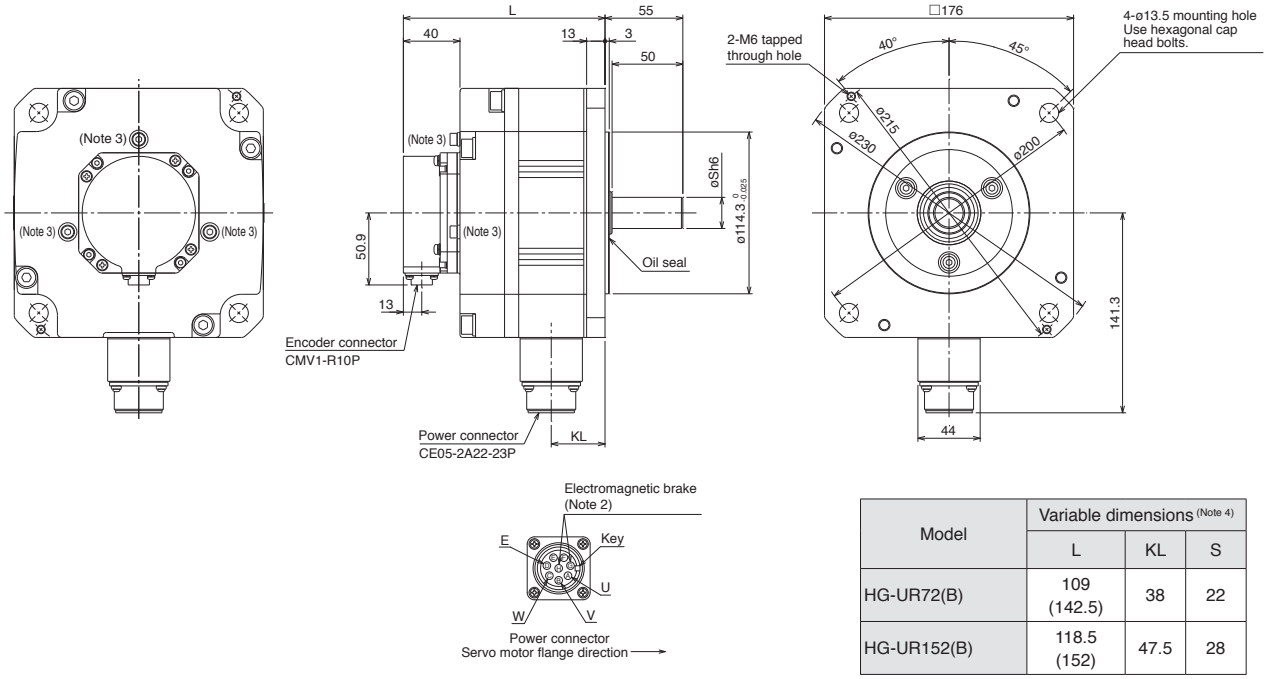
Model	Variable dimensions (Note 4)	
	L	KL
HG-RR353(B)	215.5 (252)	147.5
HG-RR503(B)	272.5 (309)	204.5

[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)

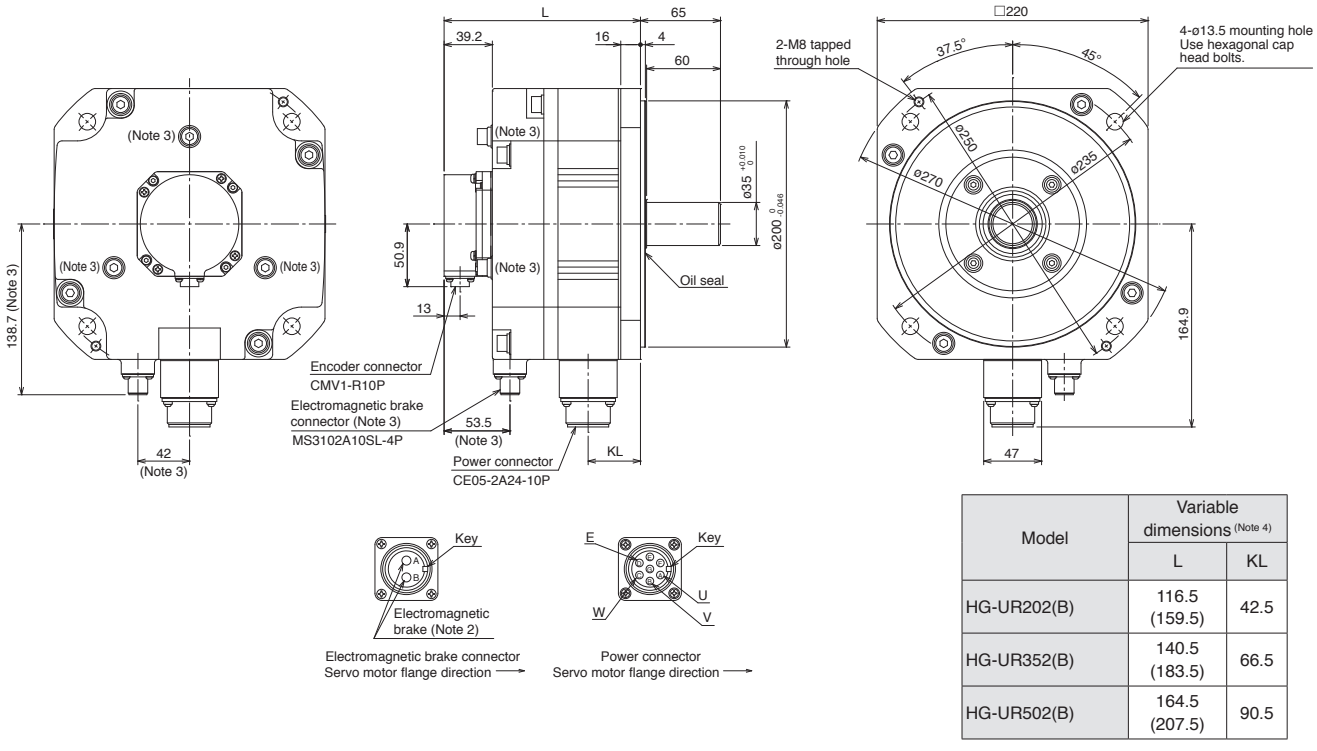
●HG-UR72(B), HG-UR152(B)



Model	Variable dimensions (Note 4)		
	L	KL	S
HG-UR72(B)	109 (142.5)	38	22
HG-UR152(B)	118.5 (152)	47.5	28

[Unit: mm]

●HG-UR202(B), HG-UR352(B), HG-UR502(B)



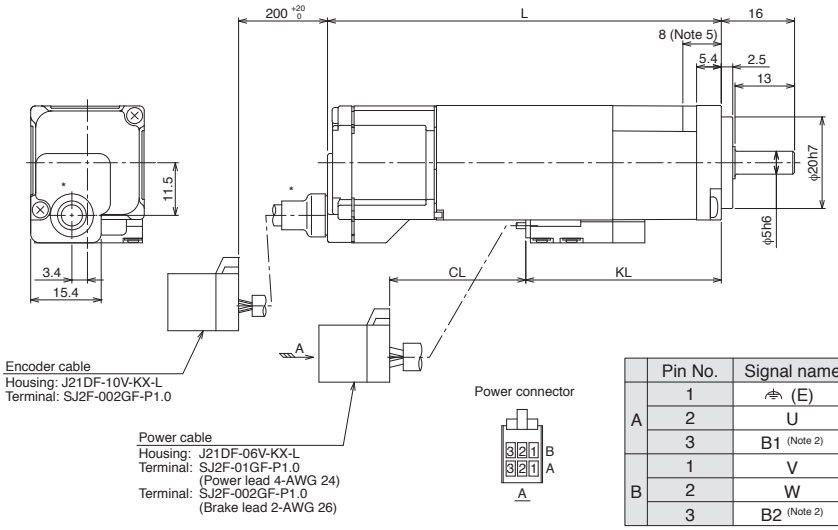
Model	Variable dimensions (Note 4)	
	L	KL
HG-UR202(B)	116.5 (159.5)	42.5
HG-UR352(B)	140.5 (183.5)	66.5
HG-UR502(B)	164.5 (207.5)	90.5

[Unit: mm]

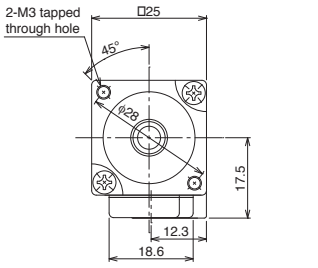
Notes: 1. For dimensions without tolerance, general tolerance applies.
2. The electromagnetic brake terminals do not have polarity.
3. Only for the models with electromagnetic brake.
4. Dimensions in brackets are for the models with electromagnetic brake.
5. Use a friction coupling to fasten a load.

HG-AK Series Dimensions (Note 1, 4)

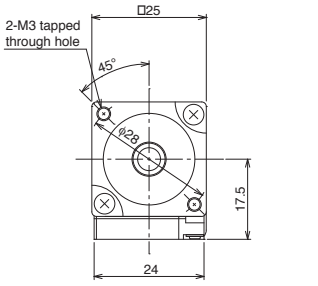
●HG-AK0136(B), HG-AK0236(B), HG-AK0336(B)



	Pin No.	Signal name
A	1	⏚ (E)
	2	U
	3	B1 (Note 2)
B	1	V
	2	W
	3	B2 (Note 2)



For servo motor without electromagnetic brake



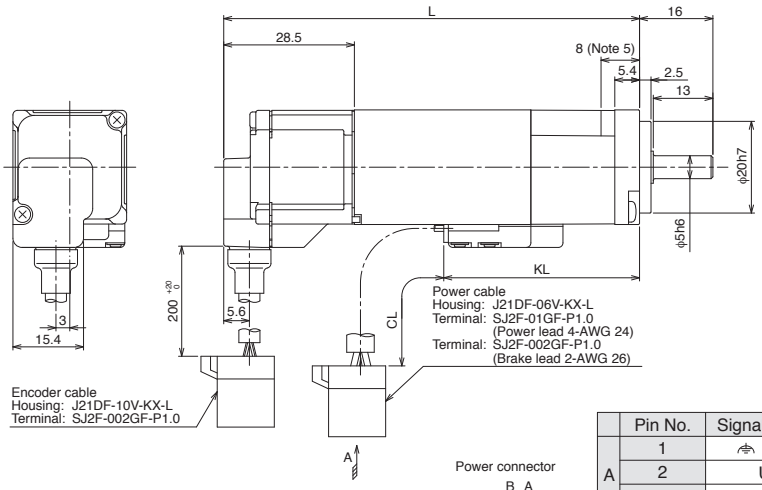
For servo motor with electromagnetic brake

* The encoder cable leading portion has been modified from April 2013 production.

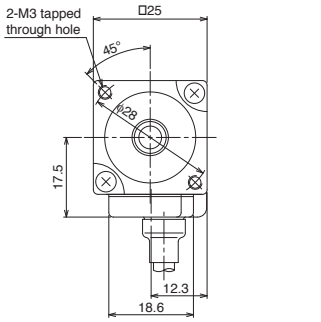
Model	Variable dimensions (Note 3)		
	L	KL	CL
HG-AK0136(B)	54 (86)	30.7 (42.7)	225^{+20}_{0} (245^{+20}_{0})
HG-AK0236(B)	61 (93)	37.7 (49.7)	
HG-AK0336(B)	68 (100)	44.7 (56.7)	

[Unit: mm]

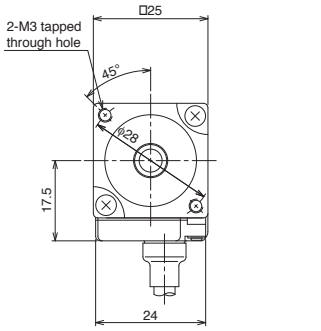
●HG-AK0136(B)-S100, HG-AK0236(B)-S100, HG-AK0336(B)-S100



	Pin No.	Signal name
A	1	⏚ (E)
	2	U
	3	B1 (Note 2)
B	1	V
	2	W
	3	B2 (Note 2)



For servo motor without electromagnetic brake



For servo motor with electromagnetic brake

Model	Variable dimensions (Note 3)		
	L	KL	CL
HG-AK0136(B)-S100	58.7 (90.7)	30.7 (42.7)	225^{+20}_{0} (245^{+20}_{0})
HG-AK0236(B)-S100	65.7 (97.7)	37.7 (49.7)	
HG-AK0336(B)-S100	72.7 (104.7)	44.7 (56.7)	

[Unit: mm]

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

HG-KR Series Geared Servo Motor Specifications

With gear reducer for general industrial machines: G1

Model	Output [W]	Reduction ratio	Actual reduction ratio	Moment of inertia J [× 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 gear reducer output shaft
Maximum torque	Three times of the rated torque (Refer to HG-KR series specifications in this catalog for the rated torque.)
Maximum speed (at servo motor shaft)	4500 r/min (permissible instantaneous speed: 5175 r/min)
IP rating (gear reducer part)	Equivalent to IP44
Gear reducer efficiency (Note 3)	40% to 85%

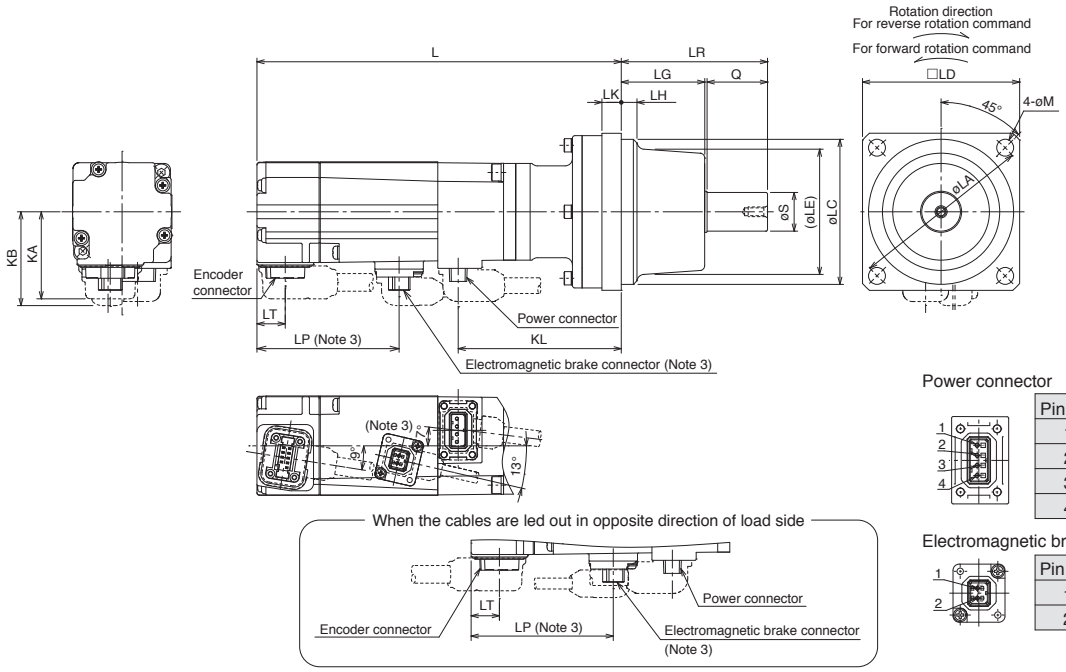
Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft of the servo motor with gear reducer (and with electromagnetic brake).
2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
3. The gear reducer efficiency varies depending on the reduction ratio and also varies with 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 gear 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.



Power connector

Pin No.	Signal name
1	E
2	U
3	V
4	W

Electromagnetic brake connector (Note 2)

Pin No.	Signal name
1	B1
2	B2

[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)																	
HG-KR13(B)G1	1/5 (9/44)	126.1 (166.7)								83.5								
	1/12 (49/576)	144.9 (185.5)								102.3								
	1/20 (25/484)																	
HG-KR23(B)G1	1/5 (19/96)	129.8 (166.6)	100	82h7	90	76	25h6	8	10	89.6	38	35	74	9	46	47.1 (47.1)	11.8	– (57.8)
	1/12 (961/11664)	149.6 (186.4)				75				109.4								
	1/20 (513/9984)																	
HG-KR43(B)G1	1/5 (19/96)	151.5 (188.3)				76				111.3								
	1/12 (961/11664)	171.3 (208.1)				75				131.1								
	1/20 (7/135)	175.3 (212.1)	115	95h7	100	83	32h6	9.5		135.1	39	50	90		56	57.1 (57.1)		– (63.1)
HG-KR73(B)G1	1/5 (1/5)	177 (217.3)				81		10		134.6								
	1/12 (7/87)	199 (239.3)				83		9.5		156.6								
	1/20 (625/12544)	212 (252.3)	140	115h7	120	98	40h6	11.5	15	169.6	44.5	60	105.5	14				

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 gear 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 gear reducer for high precision applications, flange mounting: G5

Model	Output [W]	Reduction ratio (Note 3)	Moment of inertia J [× 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)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 5)	3 minutes or less at gear reducer output shaft
Maximum torque	Three times of the rated torque (Refer to HG-KR series specifications in this catalog for the rated torque.)
Maximum speed (at servo motor shaft)	6000 r/min (permissible instantaneous speed: 6900 r/min)
IP rating (gear reducer part)	Equivalent to IP44
Gear reducer efficiency (Note 4)	1/5 (60 × 60): 12%, 1/11, 1/21, 1/33 and 1/45 of HG-KR053(B)G5: 22% to 34% 1/5 (40 × 40) and 1/9 of HG-KR053(B)G5, and HG-KR13(B)G5 to HG-KR73(B)G5: 48% to 84%

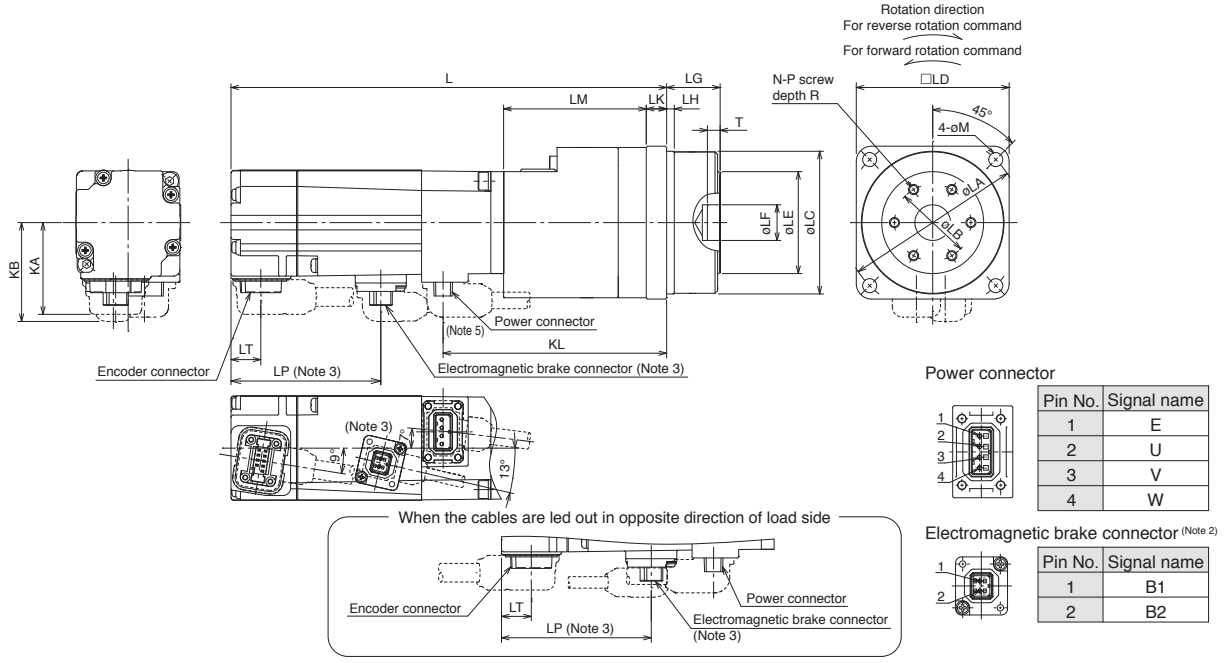
Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft of the servo motor with gear reducer (and with electromagnetic brake).
2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
3. The values in brackets represent the dimensions of flange.
4. The gear reducer efficiency varies depending on the reduction ratio and also varies with 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.
5. The backlash can be converted: 1 minute = 0.0167°

HG-KR Series Geared Servo Motor Dimensions (Note 1)

With flange-output type gear reducer for high precision applications, flange mounting

●HG-KR_(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.



Power connector

Pin No.	Signal name
1	E
2	U
3	V
4	W

Electromagnetic brake connector (Note 2)

Pin No.	Signal name
1	B1
2	B2

[Unit: mm]

Model	Reduction ratio (Note 6)	Variable dimensions (Note 4)																				
		L	LA	LB	LC	LD	LE	LF	LG	LH	LK	LM	KL	T	N	P	R	M	KA	KB	LT	LP
HG-KR053(B)G5	1/5 (40 × 40)	105.9 (146.5)	46	18	40h7	40	24	5H7	$15^{+0.25}_{-0.20}$	2.5	5	34.5	63.3	3	3	M4	6	3.4	36	37.1 (38.8)	11.7	– (58.8)
	1/5 (60 × 60) (Note 5)	130.4 (171)	70	30	56h7	60	40	14H7	$21^{+0.4}_{-0.5}$	3	8	56	87.8	5	6		7	5.5				
	1/9	105.9 (146.5)	46	18	40h7	40	24	5H7	$15^{+0.25}_{-0.20}$	2.5	5	34.5	63.3	3	3		6	3.4				
	1/11 (Note 5)	130.4 (171)	70	30	56h7	60	40	14H7	$21^{+0.4}_{-0.5}$	3	8	56	87.8	5	6		7	5.5				
	1/21 (Note 5)																					
	1/33 (Note 5)																					
	1/45 (Note 5)																					
HG-KR13(B)G5	1/5 (40 × 40)	121.9 (162.5)	46	18	40h7	40	24	5H7	$15^{+0.25}_{-0.20}$	2.5	5	34.5	79.3	3	3		6	3.4				
	1/5 (60 × 60) (Note 5)	146.4 (187)	70	30	56h7	60	40	14H7	$21^{+0.4}_{-0.5}$	3	8	56	103.8	5	6		7	5.5				
	1/11 (Note 5)																					
	1/21 (Note 5)																					
	1/33 (Note 5)	148.9 (189.5)	105	45	85h7	90	59	24H7	$27^{+0.4}_{-0.5}$	8	10	56.5	106.3			M6	10	9				
	1/45 (Note 5)																					
HG-KR23(B)G5	1/5	140.6 (177.4)	70	30	56h7	60	40	14H7	$21^{+0.4}_{-0.5}$	3	8	56	100.4			M4	7	5.5	46	47.1 (47.1)	11.8	– (57.8)
	1/11																					
	1/21 (Note 5)	147.6 (184.4)	105	45	85h7	90	59	24H7	$27^{+0.4}_{-0.5}$	8	10	61	107.4			M6	10	9				
	1/33 (Note 5)																					
	1/45 (Note 5)																					
HG-KR43(B)G5	1/5	162.3 (199.1)	70	30	56h7	60	40	14H7	$21^{+0.4}_{-0.5}$	3	8	56	122.1	5	6	M4	7	5.5				
	1/11	169.3 (206.1)	105	45	85h7	90	59	24H7	$27^{+0.4}_{-0.5}$	8	10	61	129.1			M6	10	9				
	1/21																					
	1/33	181.3 (218.1)	135	60	115h7	120	84	32H7	$35^{+0.4}_{-0.5}$	13	13	70	141.1			M8	12	11				
	1/45																					
HG-KR73(B)G5	1/5	190 (230.3)	105	45	85h7	90	59	24H7	$27^{+0.4}_{-0.5}$	8	10	68	147.6			M6	10	9	56	57.1 (57.1)		– (63.1)
	1/11																					
	1/21	200 (240.3)	135	60	115h7	120	84	32H7	$35^{+0.4}_{-0.5}$	13	13	75	157.6			M8	12	11				
	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 gear 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. Lead out the power cable in opposite direction of the motor shaft.
6. The values in brackets represent the dimensions of flange.

HG-KR Series Geared Servo Motor Specifications

With shaft-output type gear reducer for high precision applications, flange mounting: G7

Model	Output [W]	Reduction ratio (Note 3)	Moment of inertia J [× 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)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 5)	3 minutes or less at gear reducer output shaft
Maximum torque	Three times of the rated torque (Refer to HG-KR series specifications in this catalog for the rated torque.)
Maximum speed (at servo motor shaft)	6000 r/min (permissible instantaneous speed: 6900 r/min)
IP rating (gear reducer part)	Equivalent to IP44
Gear reducer efficiency (Note 4)	1/5 (60 × 60): 12%, 1/11, 1/21, 1/33 and 1/45 of HG-KR053(B)G7: 22% to 34% 1/5 (40 × 40) and 1/9 of HG-KR053(B)G7, and HG-KR13(B)G7 to HG-KR73(B)G7: 48% to 84%

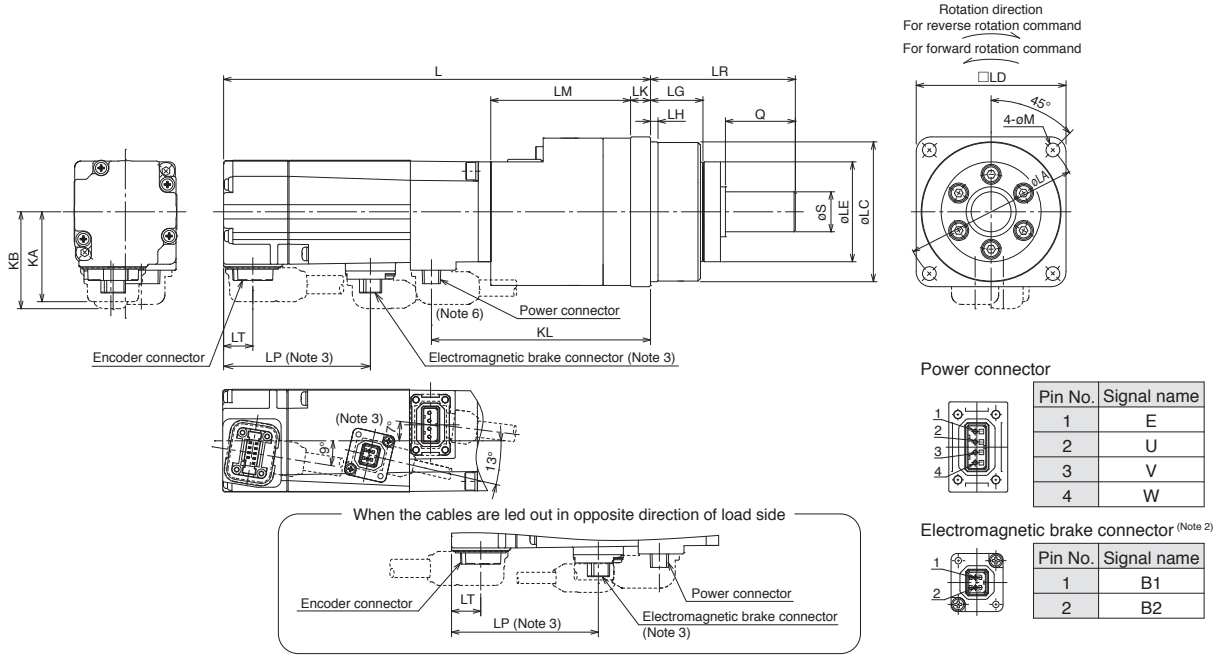
Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft of the servo motor with gear reducer (and with electromagnetic brake).
2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
3. The values in brackets represent the dimensions of flange.
4. The gear reducer efficiency varies depending on the reduction ratio and also varies with 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.
5. The backlash can be converted: 1 minute = 0.0167°

HG-KR Series Geared Servo Motor Dimensions (Note 1, 5, 8)

With shaft-output type gear 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.



Power connector

Pin No.	Signal name
1	E
2	U
3	V
4	W

Electromagnetic brake connector (Note 2)

Pin No.	Signal name
1	B1
2	B2

[Unit: mm]

Model	Reduction ratio (Note 7)	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				
	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)																		
	1/21 (Note 6)																		
	1/33 (Note 6)	148.9 (189.5)	105	85h7	90	59	25h7	27	8	42	80	10	56.5	106.3	9				
	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	46	47.1 (47.1)	11.8	– (57.8)
	1/11																		
	1/21 (Note 6)	147.6 (184.4)	105	85h7	90	59	25h7	27	8	42	80	10	61	107.4	9				
	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				
	1/11	169.3 (206.1)	105	85h7	90	59	25h7	27	8	42	80	10	61	129.1	9				
	1/21																		
	1/33	181.3 (218.1)	135	115h7	120	84	40h7	35	13	82	133	13	70	141.1	11				
	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																		
	1/21	200 (240.3)	135	115h7	120	84	40h7	35	13	82	133	13	75	157.6	11				
	1/33																		
	1/45																		

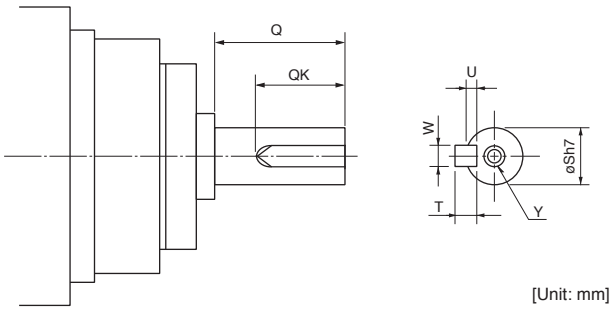
Notes: 1. For dimensions without tolerance, general tolerance applies. The actual dimensions may be 1 mm to 3 mm larger than the dimensions indicated since the outer frame of the gear reducer is made by casting. Make allowance for the actual dimensions in the design of a machine.
2. The electromagnetic 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.
6. Lead out the power cable in opposite direction of the motor shaft.
7. The values in brackets represent the dimensions of flange.
8. 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 gear 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 gear 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 (Note 4)	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							
	1/21							
	1/33	25	42	8	36	4	7	M6 screw Depth: 12
	1/45							
HG-KR23(B)G7K	1/5	16	28	5	25	3	5	M4 screw Depth: 8
	1/11							
	1/21	25	42	8	36	4	7	M6 screw Depth: 12
	1/33							
	1/45							
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							
	1/33	40	82	12	70	5	8	M10 screw Depth: 20
	1/45							
HG-KR73(B)G7K	1/5	25	42	8	36	4	7	M6 screw Depth: 12
	1/11							
	1/21	40	82	12	70	5	8	M10 screw Depth: 20
	1/33							
	1/45							



[Unit: mm]

Notes: 1. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
2. A 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.
4. The values in brackets represent the dimensions of flange.

HG-SR Series Geared Servo Motor Specifications

With gear reducer for general industrial machines, flange mounting: G1

Model	Output [kW]	Reduction ratio	Moment of inertia J [× 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 (Note 5)	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					
		1/35	8.26	10.5		27	29		
		1/43	8.22	10.4					
		1/59	8.18	10.4					
HG-SR102(B)G1 HG-SR1024(B)G1	1.0	1/6	14.8	17.0	4 times or less	30	32	Grease (filled)	Any direction
		1/11	13.3	15.5					
		1/17	12.9	15.1					
		1/29	12.6	14.8					
		1/35	12.6	14.8					
		1/43	13.8	16.0		49	51	Oil (Note 3)	Shaft horizontal (Note 4)
		1/59	19.1	21.3		81	83		
HG-SR152(B)G1 HG-SR1524(B)G1	1.5	1/6	19.2	21.4	4 times or less	31	33	Grease (filled)	Any direction
		1/11	17.7	19.9					
		1/17	17.3	19.5					
		1/29	18.4	20.6		50	52	Oil (Note 3)	Shaft horizontal (Note 4)
		1/35	18.3	20.5					
		1/43	23.6	25.8		82	84		
		1/59	23.5	25.7					
HG-SR202(B)G1 HG-SR2024(B)G1	2.0	1/6	50.0	59.4	4 times or less	36	42	Grease (filled)	Any direction
		1/11	48.4	57.8					
		1/17	48.1	57.5					
		1/29	54.8	64.2		87	93	Oil (Note 3)	Shaft horizontal (Note 4)
		1/35	54.5	63.9					
		1/43	54.3	63.7					
		1/59	54.2	63.6					
HG-SR352(B)G1 HG-SR3524(B)G1	3.5	1/6	87.1	96.5	4 times or less	60	66	Oil (Note 3)	Shaft horizontal (Note 4)
		1/11	82.8	92.2					
		1/17	81.5	90.9					
		1/29	86.6	96.0		92	98		
		1/35	86.3	95.7					
		1/43	105	114		134	140	Oil	
		1/59	104	113					
HG-SR502(B)G1 HG-SR5024(B)G1	5.0	1/6	126	135	4 times or less	96	102	Oil (Note 3)	Shaft horizontal (Note 4)
		1/11	114	123					
		1/17	110	119					
		1/29	141	150		165	171	Oil	
		1/35	140	150					
		1/43	139	149					
		1/59	138	147					
HG-SR702(B)G1 HG-SR7024(B)G1	7.0	1/6	177	187	4 times or less	103	109	Oil (Note 3)	Shaft horizontal (Note 4)
		1/11	190	199		145	151	Oil	
		1/17	182	192					
		1/29	192	202		172	178		
		1/35	192	201					
		1/43	267	277		240	246		
		1/59	266	275					

Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft of the servo motor with gear 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. For applications where the servo motor moves, order a grease lubricated servo motor (special specification) instead of the oil lubricated. Note that the maximum speed of the grease lubricated servo motor is the same as that of the oil lubricated.
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. 2-70 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. The lubricant oil is removed from the gear reducer before shipment, and thus please purchase the required lubricant oil and fill the oil into the gear reducer.

HG-SR Series Geared Servo Motor Specifications

With gear 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 gear 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.)
Maximum 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 (gear reducer part)	Equivalent to IP44
Gear reducer efficiency (Note 1)	85% to 94%

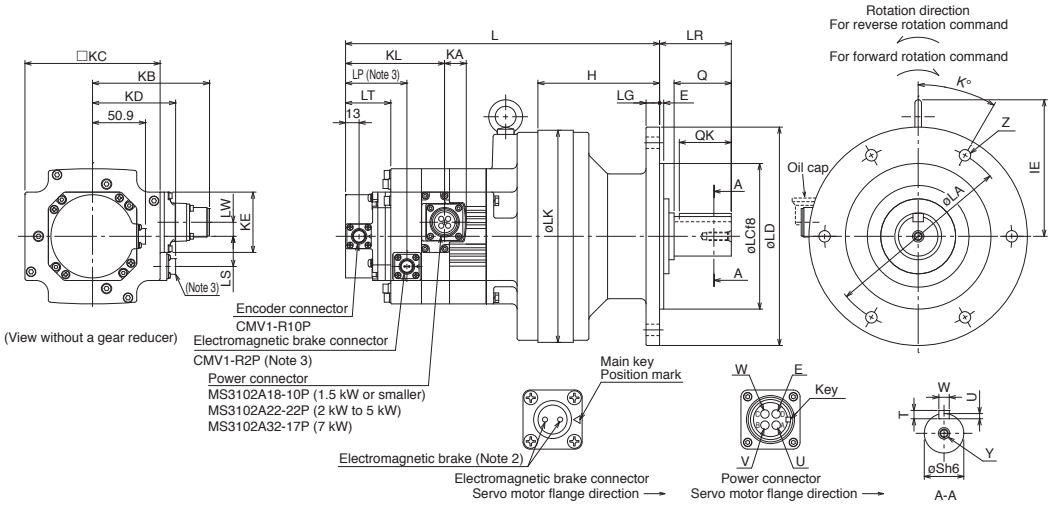
Notes: 1. The gear reducer efficiency varies depending on the reduction ratio and also varies with the conditions of use, such as output torque, speed, and temperature.
The values in the table represent typical values at the rated torque and speed and at the normal temperature. They are not guaranteed 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 gear 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]

Model	Reduction ratio	Variable dimensions (Note 4)																											
		L	LA	LC	LD	LG	LK	LR	IE	KL	KA	LP	LT	LW	LS	KE	Z	K	E	H	KB	KD	KC	Q	QK	S	T	U	W	Y
HG-SR52(B)G1 HG-SR524(B)G1	1/6 1/11 1/17 1/29	275 (309.5)	134	110	160	9	150	48	119	60.7 (95.2)	20.9	(59)	38.2 (43.5)	13.5	(29)	58	4-φ11	45	3	108	112.5	(79.9)	130	35	32	28	7	4	8	M8 screw Depth: 20
	1/35 1/43 1/59	267.5 (302)	180	140	210	13	204	69	132	60.7 (95.2)	20.9	(59)	38.2 (43.5)	13.5	(29)	58	6-φ11	30	4	117	112.5	(79.9)	130	55	50	38	8	5	10	
HG-SR102(B)G1 HG-SR1024(B)G1	1/6 1/11 1/17 1/29 1/35	281.5 (316)	180	140	210	13	204	69	132	60.7 (95.2)	20.9	(59)	38.2 (43.5)	13.5	(29)	58	6-φ11	30	4	117	112.5	(79.9)	130	55	50	38	8	5	10	M8 screw Depth: 20
	1/43	327 (361.5)	230	200	260	15	230	76	145	60.7 (95.2)	20.9	(59)	38.2 (43.5)	13.5	(29)	58	6-φ11	60	4	164	112.5	(79.9)	130	70	56	50	9	5.5	14	M10 screw Depth: 18
	1/59	384.5 (419)	310	270	340	20	300	89	192	60.7 (95.2)	20.9	(59)	38.2 (43.5)	13.5	(29)	58	6-φ11	60	4	219	112.5	(79.9)	130	90	80	60	11	7	18	
HG-SR152(B)G1 HG-SR1524(B)G1	1/6 1/11 1/17	295.5 (330)	180	140	210	13	204	69	132	60.7 (95.2)	20.9	(59)	38.2 (43.5)	13.5	(29)	58	6-φ11	30	4	117	112.5	(79.9)	130	55	50	38	8	5	10	M8 screw Depth: 20
	1/29 1/35	341 (375.5)	230	200	260	15	230	76	145	60.7 (95.2)	20.9	(59)	38.2 (43.5)	13.5	(29)	58	6-φ11	60	4	164	112.5	(79.9)	130	70	56	50	9	5.5	14	M10 screw Depth: 18
	1/43 1/59	398.5 (433)	310	270	340	20	300	89	192	60.7 (95.2)	20.9	(59)	38.2 (43.5)	13.5	(29)	58	6-φ11	60	4	219	112.5	(79.9)	130	90	80	60	11	7	18	
HG-SR202(B)G1 HG-SR2024(B)G1	1/6 1/11 1/17	305.5 (355)	180	140	210	13	204	69	142	63.7 (113.2)	24.8	(66.5)	38.5 (45.5)	0	(44)	82	6-φ11	30	4	117	140.9	(96.9)	176	55	50	38	8	5	10	M8 screw Depth: 20
	1/29 1/35 1/43 1/59	402.5 (452)	310	270	340	20	300	89	181	63.7 (113.2)	24.8	(66.5)	38.5 (45.5)	0	(44)	82	6-φ11	60	4	219	140.9	(96.9)	176	90	80	60	11	7	18	M10 screw Depth: 18
HG-SR352(B)G1 HG-SR3524(B)G1	1/6 1/11 1/17	372 (421.5)	230	200	260	15	230	76	145	63.7 (113.2)	24.8	(66.5)	38.5 (45.5)	0	(44)	82	6-φ11	60	4	164	140.9	(96.9)	176	70	56	50	9	5.5	14	M10 screw Depth: 18
	1/29 1/35	426.5 (476)	310	270	340	20	300	89	181	63.7 (113.2)	24.8	(66.5)	38.5 (45.5)	0	(44)	82	6-φ11	60	4	219	140.9	(96.9)	176	90	80	60	11	7	18	
	1/43 1/59	466 (515.5)	360	316	400	22	340	94	181	63.7 (113.2)	24.8	(66.5)	38.5 (45.5)	0	(44)	82	8-φ14	22.5	5	258	140.9	(96.9)	176	90	80	70	12	7.5	20	M12 screw Depth: 24
HG-SR502(B)G1 HG-SR5024(B)G1	1/6 1/11 1/17	442.5 (492)	310	270	340	20	300	89	181	63.7 (113.2)	24.8	(66.5)	38.5 (45.5)	0	(44)	82	6-φ11	60	4	219	140.9	(96.9)	176	90	80	60	11	7	18	M10 screw Depth: 18
	1/29 1/35 1/43 1/59	506 (555.5)	390	345	430	22	370	110	176	63.7 (113.2)	24.8	(66.5)	38.5 (45.5)	0	(44)	82	8-φ18	22.5	5	279	140.9	(96.9)	176	110	100	80	14	9	22	M12 screw Depth: 24
HG-SR702(B)G1 HG-SR7024(B)G1	1/6	482.5 (532)	310	270	340	20	300	89	181	71.7 (121.2)	32	(66.5)	38.5 (45.5)	0	(44)	82	6-φ11	60	4	219	149.1	(96.9)	176	90	80	60	11	7	18	M10 screw Depth: 18
	1/11 1/17	522 (571.5)	360	316	400	22	340	94	181	71.7 (121.2)	32	(66.5)	38.5 (45.5)	0	(44)	82	8-φ14	22.5	5	258	149.1	(96.9)	176	90	80	70	12	7.5	20	M12 screw Depth: 24
	1/29 1/35	546 (595.5)	390	345	430	22	370	110	176	71.7 (121.2)	32	(66.5)	38.5 (45.5)	0	(44)	82	8-φ18	22.5	5	279	149.1	(96.9)	176	110	100	80	14	9	22	
	1/43 1/59	602 (651.5)	450	400	490	30	430	145	210	71.7 (121.2)	32	(66.5)	38.5 (45.5)	0	(44)	82	12-φ18	15	6	320	149.1	(96.9)	176	135	125	95	14	9	25	M20 screw Depth: 34

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 gear 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 lubricant oil is removed from the gear reducer before shipment, and thus please purchase the required lubricant oil and fill the oil into the gear reducer.

HG-SR Series Geared Servo Motor Specifications

With gear reducer for general industrial machines, foot mounting: G1H

Model	Output [kW]	Reduction ratio	Moment of inertia J [× 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 (Note 5)	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					
		1/35	8.26	10.5		28	30		
		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					
		1/35	12.6	14.8					
		1/43	13.8	16.0		50	52	Oil (Note 3)	Shaft horizontal (Note 4)
		1/59	19.1	21.3		86	88		
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	Oil (Note 3)	Shaft horizontal (Note 4)
		1/35	18.3	20.5					
		1/43	23.6	25.8		87	89		
		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	Oil (Note 3)	Shaft horizontal (Note 4)
		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 (Note 3)	Shaft horizontal (Note 4)
		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		137	143	Oil	
		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 (Note 3)	Shaft horizontal (Note 4)
		1/11	114	123					
		1/17	110	119					
		1/29	141	150		178	184	Oil	
		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 (Note 3)	Shaft horizontal (Note 4)
		1/11	190	199		148	154	Oil	
		1/17	182	192					
		1/29	192	202		185	191		
		1/35	192	201					
		1/43	267	277		256	262		
		1/59	266	275					

Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft of the servo motor with gear 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. For applications where the servo motor moves, order a grease lubricated servo motor (special specification) instead of the oil lubricated. Note that the maximum speed of the grease lubricated servo motor is the same as that of the oil lubricated.
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. 2-70 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. The lubricant oil is removed from the gear reducer before shipment, and thus please purchase the required lubricant oil and fill the oil into the gear reducer.

HG-SR Series Geared Servo Motor Specifications

With gear 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.)
Maximum 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 (gear reducer part)	Equivalent to IP44
Gear reducer efficiency (Note 1)	85% to 94%

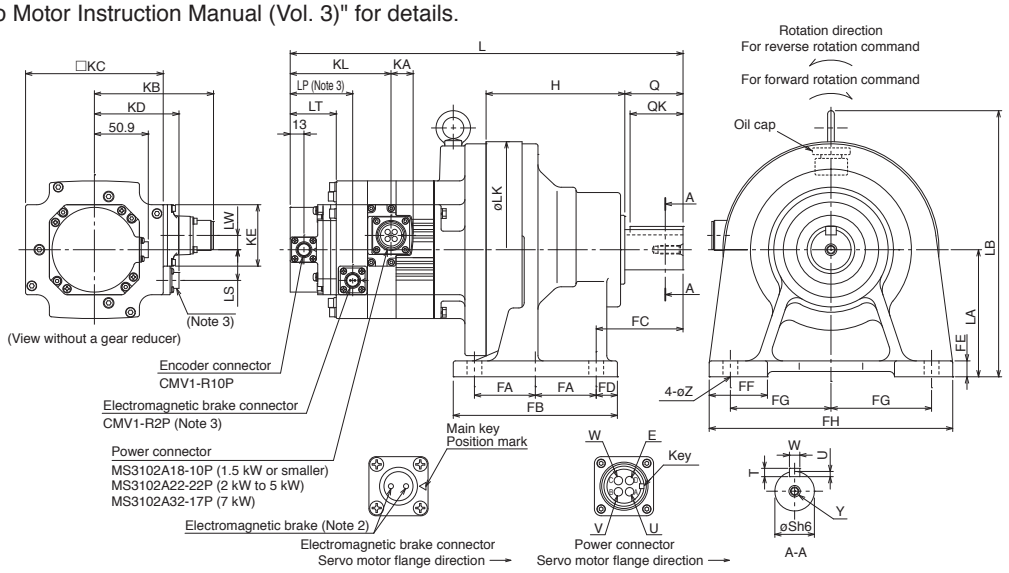
Notes: 1. The gear reducer efficiency varies depending on the reduction ratio and also varies with the conditions of use, such as output torque, speed, and temperature.
The values in the table represent typical values at the rated torque and speed and at the normal temperature. They are not guaranteed 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 gear 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 1/17 1/29	323 (357.5)	100	219	150	(29)	38.2 (43.5)	(59)	13.5	121	60.7 (95.2)	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
	1/35 1/43 1/59	336.5 (371)	120	252	204	(29)	38.2 (43.5)	(59)	13.5	131	60.7 (95.2)	20.9	112.5	(79.9)	130	58	14	57.5	155	82	20	15	55	95	230	55	50	38	8	5	10	
HG-SR102(B)G1H HG-SR1024(B)G1H	1/6 1/11 1/17 1/29 1/35	350.5 (385)	120	252	204	(29)	38.2 (43.5)	(59)	13.5	131	60.7 (95.2)	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
	1/43	403 (437.5)	150	295	230	(29)	38.2 (43.5)	(59)	13.5	170	60.7 (95.2)	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	M10 screw Depth: 18
	1/59	473.5 (508)	160	352	300	(29)	38.2 (43.5)	(59)	13.5	218	60.7 (95.2)	20.9	112.5	(79.9)	130	58	18	75	238	139	44	25	75	185	410	90	80	60	11	7	18	
HG-SR152(B)G1H HG-SR1524(B)G1H	1/6 1/11 1/17	364.5 (399)	120	252	204	(29)	38.2 (43.5)	(59)	13.5	131	60.7 (95.2)	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
	1/29 1/35	417 (451.5)	150	295	230	(29)	38.2 (43.5)	(59)	13.5	170	60.7 (95.2)	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	M10 screw Depth: 18
	1/43 1/59	487.5 (522)	160	352	300	(29)	38.2 (43.5)	(59)	13.5	218	60.7 (95.2)	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 1/17	374.5 (424)	120	262	204	(44)	38.5 (45.5)	(66.5)	0	131	63.7 (113.2)	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
	1/29 1/35 1/43 1/59	491.5 (541)	160	341	300	(44)	38.5 (45.5)	(66.5)	0	218	63.7 (113.2)	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
HG-SR352(B)G1H HG-SR3524(B)G1H	1/6 1/11 1/17	448 (497.5)	150	295	230	(44)	38.5 (45.5)	(66.5)	0	170	63.7 (113.2)	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
	1/29 1/35	515.5 (565)	160	341	300	(44)	38.5 (45.5)	(66.5)	0	218	63.7 (113.2)	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 1/59	560 (609.5)	200	381	340	(44)	38.5 (45.5)	(66.5)	0	262	63.7 (113.2)	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	M12 screw Depth: 24
HG-SR502(B)G1H HG-SR5024(B)G1H	1/6 1/11 1/17	531.5 (581)	160	341	300	(44)	38.5 (45.5)	(66.5)	0	218	63.7 (113.2)	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
	1/29 1/35 1/43 1/59	616 (665.5)	220	405	370	(44)	38.5 (45.5)	(66.5)	0	279	63.7 (113.2)	24.8	140.9	(96.9)	176	82	22	160	380	145	30	30	85	210	470	110	100	80	14	9	22	M12 screw Depth: 24
HG-SR702(B)G1H HG-SR7024(B)G1H	1/6	571.5 (621)	160	341	300	(44)	38.5 (45.5)	(66.5)	0	218	71.7 (121.2)	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 1/17	616 (665.5)	200	381	340	(44)	38.5 (45.5)	(66.5)	0	262	71.7 (121.2)	32	149.1	(96.9)	176	82	22	137.5	335	125	30	30	80	190	430	90	80	70	12	7.5	20	M12 screw Depth: 24
	1/29 1/35	656 (705.5)	220	405	370	(44)	38.5 (45.5)	(66.5)	0	279	71.7 (121.2)	32	149.1	(96.9)	176	82	22	160	380	145	30	30	85	210	470	110	100	80	14	9	22	
	1/43 1/59	747 (796.5)	250	465	430	(44)	38.5 (45.5)	(66.5)	0	330	71.7 (121.2)	32	149.1	(96.9)	176	82	26	190	440	170	30	35	90	240	530	135	125	95	14	9	25	M20 screw Depth: 34

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 gear 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 lubricant oil is removed from the gear reducer before shipment, and thus please purchase the required lubricant oil and fill the oil into the gear reducer.

HG-SR Series Geared Servo Motor Specifications

With flange-output type gear reducer for high precision applications, flange mounting: G5

Model	Output [kW]	Reduction ratio	Moment of inertia J [× 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-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					
		1/21	53.2	62.9		29	35		
		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 gear 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.)
Maximum speed (at servo motor shaft)	3000 r/min (permissible instantaneous speed: 3450 r/min)
IP rating (gear reducer part)	Equivalent to IP44
Gear reducer efficiency (Note 3)	77% to 92%

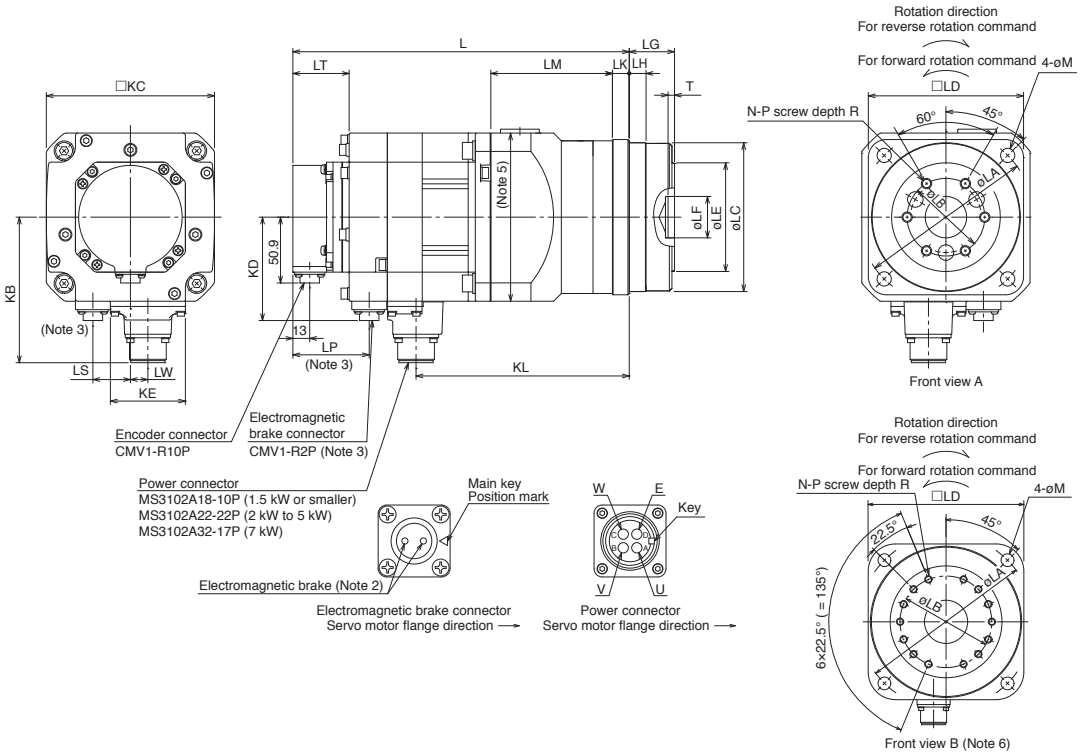
Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft of the servo motor with gear reducer (and with electromagnetic brake).
2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
3. The gear reducer efficiency varies depending on the reduction ratio and also varies with 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 gear 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	105	45	85h7	90	59	24H7	27 $^{+0.4}_{-0.5}$	8	10	85	38.2	152.8	(59)	13.5	(29)	5	6	M6	10	9	112.5	(79.9)	130	58	A
	1/11	(248)											(43.5)														
	1/21	225.5	135	60	115h7	120	84	32H7	35 $^{+0.4}_{-0.5}$	13	13	94	38.2	164.8	(59)	13.5	(29)	5	6	M8	12	11	112.5	(79.9)	130	58	A
	1/33	(260)											(43.5)														
	1/45																										
HG-SR102(B)G5 HG-SR1024(B)G5	1/5	227.5	105	45	85h7	90	59	24H7	27 $^{+0.4}_{-0.5}$	8	10	85	38.2	166.8	(59)	13.5	(29)	5	6	M6	10	9	112.5	(79.9)	130	58	A
		(262)											(43.5)														
	1/11	239.5	135	60	115h7	120	84	32H7	35 $^{+0.4}_{-0.5}$	13	13	94	38.2	178.8	(59)	13.5	(29)	5	6	M8	12	11	112.5	(79.9)	130	58	A
	1/21	(274)											(43.5)														
	1/33	255.5	190	100	165h8	170	122	47H7	53 $^{+0.5}_{-0.8}$	13	16	107	38.2	194.8	(59)	13.5	(29)	7	14	M8	12	14	112.5	(79.9)	130	58	B
	1/45	(290)											(43.5)														
HG-SR152(B)G5 HG-SR1524(B)G5	1/5	241.5	105	45	85h7	90	59	24H7	27 $^{+0.4}_{-0.5}$	8	10	85	38.2	180.8	(59)	13.5	(29)	5	6	M6	10	9	112.5	(79.9)	130	58	A
		(276)											(43.5)														
	1/11	253.5	135	60	115h7	120	84	32H7	35 $^{+0.4}_{-0.5}$	13	13	94	38.2	192.8	(59)	13.5	(29)	5	6	M8	12	11	112.5	(79.9)	130	58	A
		(288)											(43.5)														
	1/21	269.5	190	100	165h8	170	122	47H7	53 $^{+0.5}_{-0.8}$	13	16	107	38.2	208.8	(59)	13.5	(29)	7	14	M8	12	14	112.5	(79.9)	130	58	B
	1/33	(304)											(43.5)														
	1/45																										
HG-SR202(B)G5 HG-SR2024(B)G5	1/5	267.5	135	60	115h7	120	84	32H7	35 $^{+0.4}_{-0.5}$	13	13	116	38.5	203.8	(66.5)	0	(44)	5	6	M8	12	11	140.9	(96.9)	176	82	A
	1/11	(317)										(Note 5)	(45.5)														
	1/21	287.5	190	100	165h8	170	122	47H7	53 $^{+0.5}_{-0.8}$	13	16	133	38.5	223.8	(66.5)	0	(44)	7	14	M8	12	14	140.9	(96.9)	176	82	B
	1/33	(337)										(Note 5)	(45.5)														
	1/45																										
HG-SR352(B)G5 HG-SR3524(B)G5	1/5	291.5	135	60	115h7	120	84	32H7	35 $^{+0.4}_{-0.5}$	13	13	116	38.5	227.8	(66.5)	0	(44)	5	6	M8	12	11	140.9	(96.9)	176	82	A
		(341)										(Note 5)	(45.5)														
	1/11	311.5	190	100	165h8	170	122	47H7	53 $^{+0.5}_{-0.8}$	13	16	133	38.5	247.8	(66.5)	0	(44)	7	14	M8	12	14	140.9	(96.9)	176	82	B
	1/21	(361)										(Note 5)	(45.5)														
HG-SR502(B)G5 HG-SR5024(B)G5	1/5	327.5	190	100	165h8	170	122	47H7	53 $^{+0.5}_{-0.8}$	13	16	133	38.5	263.8	(66.5)	0	(44)	7	14	M8	12	14	140.9	(96.9)	176	82	B
	1/11	(377)										(Note 5)	(45.5)														
HG-SR702(B)G5 HG-SR7024(B)G5	1/5	367.5	190	100	165h8	170	122	47H7	53 $^{+0.5}_{-0.8}$	13	16	133	38.5	295.8	(66.5)	0	(44)	7	14	M8	12	14	149.1	(96.9)	176	82	B
		(417)										(Note 5)	(45.5)														

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 gear 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 gear reducer for high precision applications, flange mounting: G7

Model	Output [kW]	Reduction ratio	Moment of inertia J [× 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-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 gear 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.)
Maximum speed (at servo motor shaft)	3000 r/min (permissible instantaneous speed: 3450 r/min)
IP rating (gear reducer part)	Equivalent to IP44
Gear reducer efficiency (Note 3)	77% to 92%

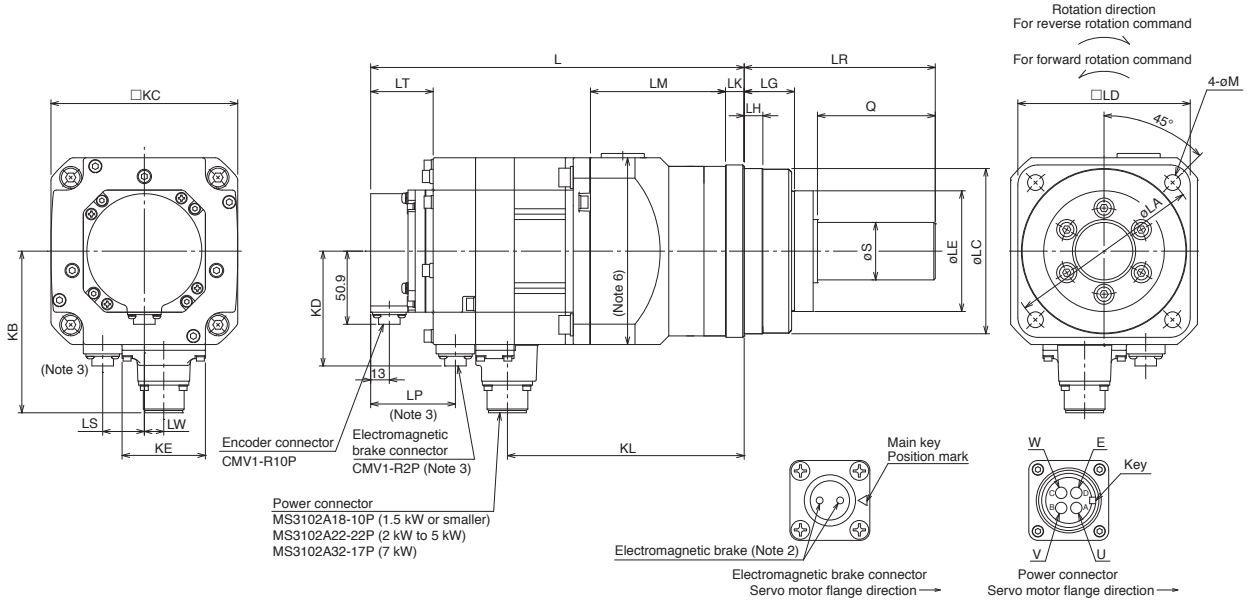
Notes: 1. The moments of inertia in the table are the values that are converted into motor shaft of the servo motor with gear reducer (and with electromagnetic brake).
2. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
3. The gear reducer efficiency varies depending on the reduction ratio and also varies with 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 gear 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	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
	1/33																						
	1/45																						
HG-SR102(B)G7 HG-SR1024(B)G7	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																						
	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																						
HG-SR152(B)G7 HG-SR1524(B)G7	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
	1/21	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
	1/33																						
	1/45																						
HG-SR202(B)G7 HG-SR2024(B)G7	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
	1/11																						
	1/21	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
	1/33																						
	1/45																						
HG-SR352(B)G7 HG-SR3524(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-SR502(B)G7 HG-SR5024(B)G7	1/5	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
	1/11																						
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

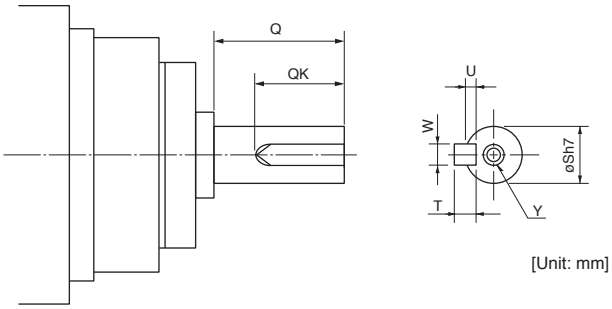
Notes: 1. For dimensions without tolerance, general tolerance applies. The actual dimensions may be 1 mm to 3 mm larger than the dimensions indicated since the outer frame of the gear reducer is made by casting. Make allowance for the actual dimensions in the design of a machine.
2. The electromagnetic 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 × 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 gear reducer for general industrial machines) has a key shaft (with key).
Standard HG-SR_(B)G7 (with shaft-output type gear 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	40	82	12	70	5	8	M10 screw Depth: 20
	1/33							
	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							
	1/33	50	82	14	70	5.5	9	M10 screw Depth: 20
	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							
	1/21	50	82	14	70	5.5	9	M10 screw Depth: 20
	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	50	82	14	70	5.5	9	M10 screw Depth: 20
	1/21							
HG-SR502(B)G7K HG-SR5024(B)G7K	1/5							
	1/11							
HG-SR702(B)G7K HG-SR7024(B)G7K	1/5							

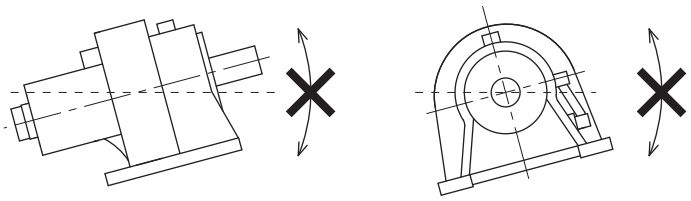


[Unit: mm]

Notes: 1. Do not use servo motors with key shafts for applications that start/stop frequently because the key shaft may break and cause an accident.
2. A 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

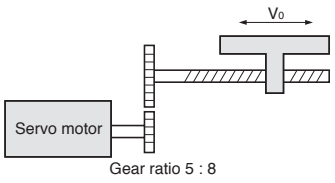
* 1. Do not mount the following servo motor in a way tilted to the shaft direction or to the shaft rotation direction.
- HG-SR102(4)(B)G1/G1H 1/43, 1/59
- HG-SR152(4)(B)G1/G1H 1/29, 1/35, 1/43, 1/59
- HG-SR202(4)(B)G1/G1H 1/29, 1/35, 1/43, 1/59
- HG-SR352(4)(B)G1/G1H all reduction ratios
- HG-SR502(4)(B)G1/G1H 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 mm/min	D_B = ball screw diameter	20 mm
Feed length per cycle	ℓ = 400 mm	L_B = ball screw length	500 mm
Positioning time	t_0 = within 1 s	D_{G1} = gear diameter (servo motor shaft)	25 mm
Number of feed times	40 times/min	D_{G2} = gear diameter (load shaft)	40 mm
(Operating cycle	t_f = 1.5 s)	L_G = gear tooth thickness	10 mm
Reduction ratio	1/n = 5/8		
Moving part mass	W = 60 kg		
Drive system efficiency	η = 0.8		
Friction coefficient	μ = 0.2		
Ball screw lead	P_B = 16 mm		

(2) Servo motor speed

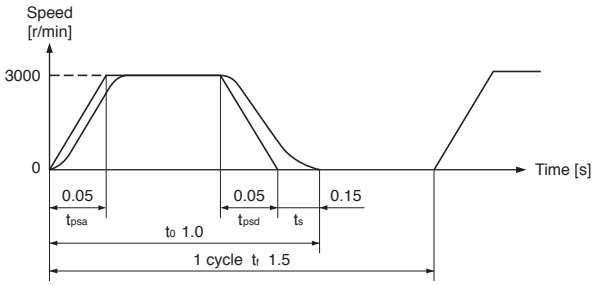
$$N_0 = \frac{V_0}{P_B} \times \frac{1}{1/n} = \frac{30000}{16} \times \frac{8}{5} = 3000 \text{ r/min}$$

(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) Operation pattern



2. Selecting rotary servo motor

(1) Load torque (converted into the servo motor shaft)

Travel distance per servo motor revolution

$$\triangle S = P_B \times \frac{1}{n} = 10 \text{ mm}$$

$$T_L = \frac{\mu \times W \times g \times \triangle S}{2 \times 10^3 \pi \eta} = 0.23 \text{ N•m}$$

(2) Moment of inertia of load (converted into the servo motor shaft)

Moving part

$$J_{L1} = W \times \left(\frac{\triangle S \times 10^{-3}}{2\pi}\right)^2 = 1.52 \times 10^{-4} \text{ kg•m}^2$$

Ball screw

$$J_{L2} = \frac{\pi \times \rho \times L_B}{32} \times D_B^4 \times \left(\frac{1}{n}\right)^2 = 0.24 \times 10^{-4} \text{ kg•m}^2$$

$\rho = 7.8 \times 10^3$ kg/m^3 (iron)

Gear (servo motor shaft)

$$J_{L3} = \frac{\pi \times \rho \times L_G}{32} \times D_{G1}^4 = 0.03 \times 10^{-4} \text{ kg•m}^2$$

Gear (load shaft)

$$J_{L4} = \frac{\pi \times \rho \times L_G}{32} \times D_{G2}^4 \times \left(\frac{1}{n}\right)^2 = 0.08 \times 10^{-4} \text{ kg•m}^2$$

Moment of inertia of all loads (converted into the servo motor shaft)

$$J_L = J_{L1} + J_{L2} + J_{L3} + J_{L4} = 1.87 \times 10^{-4} \text{ kg•m}^2$$

(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 × 10^{-4} kg•m^2)

(4) Acceleration/deceleration torque

Torque required during acceleration

$$T_{Ma} = \frac{(J_L/\eta + J_M) \times N_0}{9.55 \times 10^4 \times t_{psa}} + T_L = 1.84 \text{ N•m}$$

J_M: moment of inertia of servo motor

Torque required during deceleration

$$T_{Md} = -\frac{(J_L \times \eta + J_M) \times N_0}{9.55 \times 10^4 \times t_{psd}} + T_L = -0.85 \text{ N•m}$$

Torque required during acceleration/deceleration must be equal to or lower than the max. torque of the servo motor.

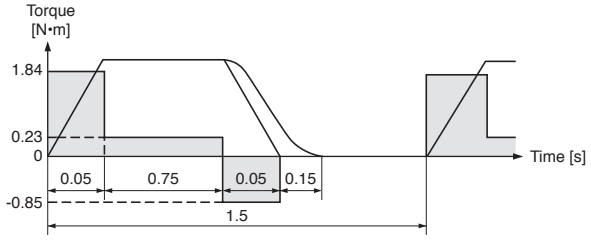
(5) Continuous effective load torque

$$T_{rms} = \sqrt{\frac{T_{Ma}^2 \times t_{psa} + T_L^2 \times t_c + T_{Md}^2 \times t_{psd}}{t_f}} = 0.40 \text{ N•m}$$

$t_c = t_0 - t_s - t_{psa} - t_{psd}$

Continuous effective load torque must be equal to or lower than the rated torque of the servo motor.

(6) Torque pattern



(7) Result

Select the following:

Servo motor: HG-KR23

Servo amplifier: MR-J4-20B

[Drive System Sizing Software Motorizer]

Motorizer does all the calculations for you. Contact your local sales office for more details.

3 Linear Servo Motors

Model Designation 3-1

Combinations of Linear Servo Motor and Servo Amplifier 3-5

Specifications

LM-H3 series 3-7

LM-F series 3-9

LM-K2 series 3-11

LM-U2 series 3-13

Dimensions

LM-H3 series 3-15

LM-F series 3-17

LM-K2 series 3-19

LM-U2 series 3-21

List of Linear Encoders 3-23

Sizing Example 3-24

* Refer to p. 5-97 in this catalog for conversion of units.

Model Designation (Note 1)

●LM-H3 series

L M - H 3 P 2 A - 0 7 P - □ (Primary side: coil)

Symbol	Linear servo motor model
BSS0	LM-H3P2A-07P
CSS0	LM-H3P3A-12P
	LM-H3P3B-24P
	LM-H3P3C-36P
	LM-H3P3D-48P
ASS0	LM-H3P7A-24P
	LM-H3P7B-48P
	LM-H3P7C-72P
	LM-H3P7D-96P

Symbol	Maximum speed [m/s]
P	3.0

Symbol	Continuous thrust [N]
07	70
12	120
24	240
36	360
48	480
72	720
96	960

Symbol	Length (nominal) [mm]
A	128
B	224
C	320
D	416

Symbol	Width (nominal) [mm]
2	50
3	65
7	100

Primary side (coil)

L M - H 3 S 2 0 - 2 8 8 - □ (Secondary side: magnet)

Symbol	Linear servo motor model
BSS0	LM-H3S20-288
	LM-H3S20-384
	LM-H3S20-480
	LM-H3S20-768
CSS0	LM-H3S30-288
	LM-H3S30-384
	LM-H3S30-480
	LM-H3S30-768
ASS0	LM-H3S70-288
	LM-H3S70-384
	LM-H3S70-480
	LM-H3S70-768

Symbol	Length (nominal) [mm]
288	288
384	384
480	480
768	768

Symbol	Width (nominal) [mm]
2	42
3	60
7	95

Secondary side (magnet)

Notes: 1. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.

Model Designation (Note 1)

●LM-F series

L M - F P 2 B - 0 6 M - □ (Primary side: coil)

Symbol	Linear servo motor model
1SS0	LM-FP2B-06M
	LM-FP2D-12M
	LM-FP2F-18M
	LM-FP4B-12M
	LM-FP4D-24M
	LM-FP4F-36M
	LM-FP4H-48M
	LM-FP5H-60M

Symbol	Maximum speed [m/s]
M	2.0

Symbol	Continuous thrust [N]	
	Natural cooling	Liquid cooling
06	300	600
12	600	1200
18	900	1800
24	1200	2400
36	1800	3600
48	2400	4800
60	3000	6000

Symbol	Length (nominal) [mm]
B	290
D	530
F	770
H	1010

Symbol	Width (nominal) [mm]
2	120
4	200
5	240

Primary side (coil)

L M - F S 2 0 - 4 8 0 - □ (Secondary side: magnet)

Symbol	Linear servo motor model
1SS0	LM-FS20-480
	LM-FS20-576
	LM-FS40-480
	LM-FS40-576
	LM-FS50-480
	LM-FS50-576

Symbol	Length (nominal) [mm]
480	480
576	576

Symbol	Width (nominal) [mm]
2	120
4	200
5	240

Secondary side (magnet)

Notes: 1. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.

Model Designation (Note 1)

●LM-K2 series

L M - K 2 P 1 A - 0 1 M - □ (Primary side: coil)

Symbol	Linear servo motor model
2SS1	LM-K2P1A-01M
	LM-K2P1C-03M
1SS1	LM-K2P2A-02M
	LM-K2P2C-07M
	LM-K2P2E-12M
	LM-K2P3C-14M
	LM-K2P3E-24M

Symbol	Maximum speed [m/s]
M	2.0

Symbol	Continuous thrust [N]
01	120
02	240
03	360
07	720
12	1200
14	1440
24	2400

Symbol	Length (nominal) [mm]
A	138
C	330
E	522

Symbol	Height (nominal) [mm]
1	54
2	74.5
3	114.5

Primary side (coil)

L M - K 2 S 1 0 - 2 8 8 - □ (Secondary side: magnet)

Symbol	Linear servo motor model
2SS1	LM-K2S10-288
	LM-K2S10-384
	LM-K2S10-480
	LM-K2S10-768
1SS1	LM-K2S20-288
	LM-K2S20-384
	LM-K2S20-480
	LM-K2S20-768
	LM-K2S30-288
	LM-K2S30-384
	LM-K2S30-480
	LM-K2S30-768

Symbol	Length (nominal) [mm]
288	288
384	384
480	480
768	768

Symbol	Width (nominal) [mm]
1	46
2	61
3	101

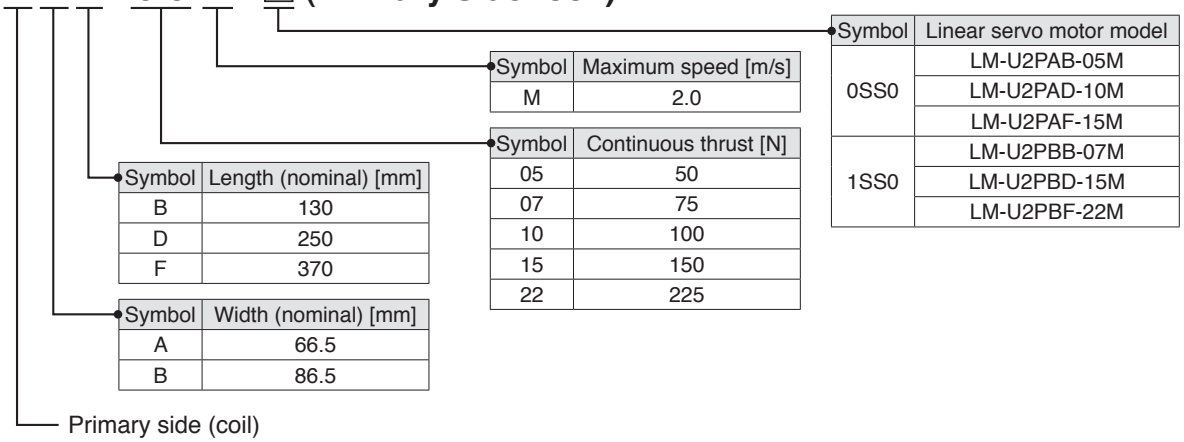
Secondary side (magnet)

Notes: 1. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.

Model Designation (Note 1)

●LM-U2 (medium thrust) series

L M - U 2 P A B - 0 5 M - □ (Primary side: coil)



Symbol	Length (nominal) [mm]
B	130
D	250
F	370

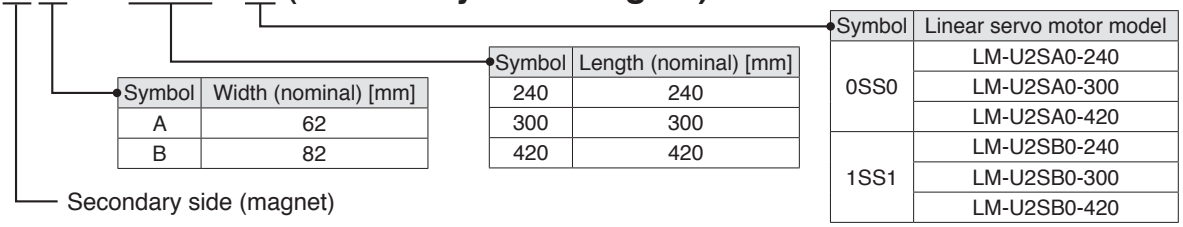
Symbol	Width (nominal) [mm]
A	66.5
B	86.5

Symbol	Maximum speed [m/s]
M	2.0

Symbol	Continuous thrust [N]
05	50
07	75
10	100
15	150
22	225

Symbol	Linear servo motor model
0SS0	LM-U2PAB-05M
	LM-U2PAD-10M
	LM-U2PAF-15M
1SS0	LM-U2PBB-07M
	LM-U2PBD-15M
	LM-U2PBF-22M

L M - U 2 S A 0 - 2 4 0 - □ (Secondary side: magnet)



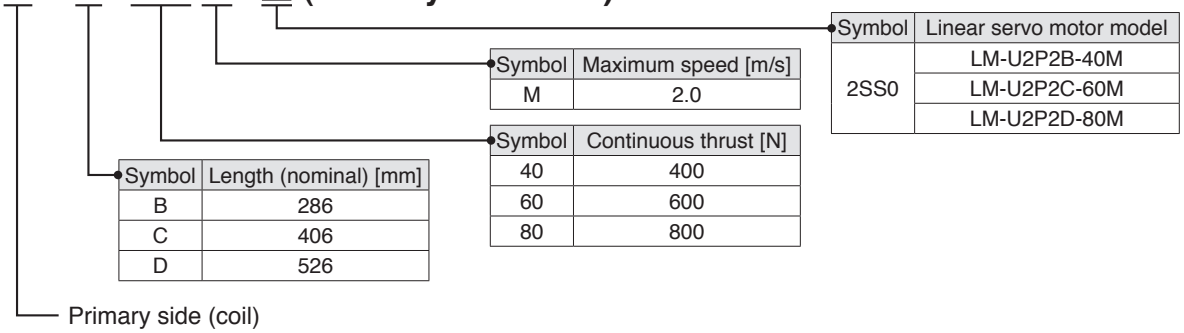
Symbol	Width (nominal) [mm]
A	62
B	82

Symbol	Length (nominal) [mm]
240	240
300	300
420	420

Symbol	Linear servo motor model
0SS0	LM-U2SA0-240
	LM-U2SA0-300
	LM-U2SA0-420
1SS1	LM-U2SB0-240
	LM-U2SB0-300
	LM-U2SB0-420

●LM-U2 (large thrust) series

L M - U 2 P 2 B - 4 0 M - □ (Primary side: coil)



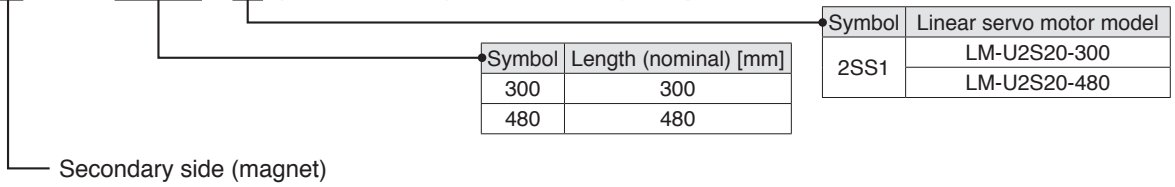
Symbol	Length (nominal) [mm]
B	286
C	406
D	526

Symbol	Maximum speed [m/s]
M	2.0

Symbol	Continuous thrust [N]
40	400
60	600
80	800

Symbol	Linear servo motor model
2SS0	LM-U2P2B-40M
	LM-U2P2C-60M
	LM-U2P2D-80M

L M - U 2 S 2 0 - 3 0 0 - □ (Secondary side: magnet)



Symbol	Length (nominal) [mm]
300	300
480	480

Symbol	Linear servo motor model
2SS1	LM-U2S20-300
	LM-U2S20-480

Notes: 1. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.

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-J4-40GF(-RJ) (Note 2), MR-J4-40GF1(-RJ), 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-J4-40GF(-RJ) (Note 2), MR-J4-40GF1(-RJ), 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-J4-70GF(-RJ) (Note 2), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-H3P3C-36P-CSS0		MR-J4-70GF(-RJ) (Note 2), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-H3P3D-48P-CSS0		MR-J4-200GF(-RJ) (Note 2), 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-J4-70GF(-RJ) (Note 2), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-H3P7B-48P-ASS0		MR-J4-200GF(-RJ) (Note 2), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	LM-H3P7C-72P-ASS0		MR-J4-200GF(-RJ) (Note 2), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	LM-H3P7D-96P-ASS0		MR-J4-350GF(-RJ) (Note 2), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
LM-F series	LM-FP2B-06M-1SS0	LM-FS20-480-1SS0, LM-FS20-576-1SS0	MR-J4-200GF(-RJ) (Note 2), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	LM-FP2D-12M-1SS0		MR-J4-500GF(-RJ) (Note 2), MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
	LM-FP2F-18M-1SS0		MR-J4-700GF(-RJ) (Note 2), MR-J4-700B(-RJ), MR-J4-DU900B(-RJ), MR-J4-700A(-RJ)	-	-
	LM-FP4B-12M-1SS0	LM-FS40-480-1SS0, LM-FS40-576-1SS0	MR-J4-500GF(-RJ) (Note 2), MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
	LM-FP4D-24M-1SS0		MR-J4-700GF(-RJ) (Note 2), MR-J4-700B(-RJ), MR-J4-DU900B(-RJ), MR-J4-700A(-RJ)	-	-
	LM-FP4F-36M-1SS0		MR-J4-11KGF(-RJ) (Note 2), MR-J4-11KB(-RJ), MR-J4-DU11KB(-RJ), MR-J4-11KA(-RJ)	-	-
	LM-FP4H-48M-1SS0		MR-J4-15KGF(-RJ) (Note 2), MR-J4-15KB(-RJ), MR-J4-DU15KB(-RJ), MR-J4-15KA(-RJ)	-	-
	LM-FP5H-60M-1SS0	LM-FS50-480-1SS0, LM-FS50-576-1SS0	MR-J4-22KGF4(-RJ) (Note 2), MR-J4-22KB4(-RJ), MR-J4-DU22KB4(-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. 1-8 in this catalog.
2. MR-J4-_GF(-RJ) with software version A1 or later supports the linear servo motor.

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, LM-K2S10-768-2SS1	MR-J4-40GF(-RJ) (Note 2), MR-J4-40GF1(-RJ), 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		MR-J4-200GF(-RJ) (Note 2), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	LM-K2P2A-02M-1SS1	LM-K2S20-288-1SS1, LM-K2S20-384-1SS1, LM-K2S20-480-1SS1, LM-K2S20-768-1SS1	MR-J4-70GF(-RJ) (Note 2), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-K2P2C-07M-1SS1		MR-J4-350GF(-RJ) (Note 2), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	LM-K2P2E-12M-1SS1		MR-J4-500GF(-RJ) (Note 2), MR-J4-500B(-RJ), MR-J4-500A(-RJ)	-	-
	LM-K2P3C-14M-1SS1	LM-K2S30-288-1SS1, LM-K2S30-384-1SS1, LM-K2S30-480-1SS1, LM-K2S30-768-1SS1	MR-J4-350GF(-RJ) (Note 2), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	LM-K2P3E-24M-1SS1		MR-J4-500GF(-RJ) (Note 2), 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-J4-20GF(-RJ) (Note 2), MR-J4-20GF1(-RJ), 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-J4-40GF(-RJ) (Note 2), MR-J4-40GF1(-RJ), 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-J4-40GF(-RJ) (Note 2), MR-J4-40GF1(-RJ), 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-U2SB0-240-1SS1, LM-U2SB0-300-1SS1, LM-U2SB0-420-1SS1	MR-J4-20GF(-RJ) (Note 2), MR-J4-20GF1(-RJ), 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-J4-60GF(-RJ) (Note 2), MR-J4-60B(-RJ), MR-J4-60A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-U2PBF-22M-1SS0		MR-J4-70GF(-RJ) (Note 2), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	LM-U2P2B-40M-2SS0	LM-U2S20-300-2SS1, LM-U2S20-480-2SS1	MR-J4-200GF(-RJ) (Note 2), MR-J4-200B(-RJ), MR-J4-200A(-RJ)	-	-
	LM-U2P2C-60M-2SS0		MR-J4-350GF(-RJ) (Note 2), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	LM-U2P2D-80M-2SS0		MR-J4-500GF(-RJ) (Note 2), 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. 1-8 in this catalog.
2. MR-J4-_GF(-RJ) with software version A1 or later supports the linear servo motor.

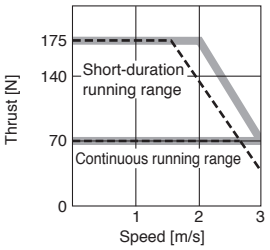
LM-H3 Series Specifications

Linear servo motor model	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
	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-	Refer to "Combinations of Linear Servo Motor and Servo Amplifier" on p. 3-5 in this catalog.								
		MR-J4W_-									
Power supply capacity (Note 6)		[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 (Note 7)			Maximum of 35 times the mass of the linear servo motor primary side								
Thermistor			Built-in								
Insulation class			155 (F)								
Structure			Open (IP rating: IP00)								
Environment (Note 8)	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)								
	Ambient humidity		Operation: 10 %RH to 80 %RH (non-condensing), storage: 10 %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		49 m/s^2								
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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			

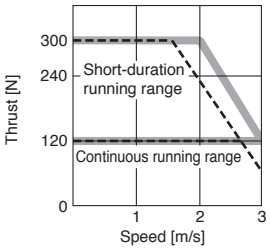
Notes: 1. The maximum speed of the linear servo motor or the rated speed of the linear encoder, whichever is smaller, is the upper limit of the linear servo motor speed.
2. The regenerative braking frequency shows the permissible frequency when the linear servo motor, without a load and a regenerative 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 permissible 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 drive system sizing software Motorizer. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a 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 at 70% or less of the effective load ratio when it is in the servo lock state or in a small reciprocating motion.
6. The power supply capacity varies depending on the power supply impedance.
The listed values are the power supply capacity for one servo motor. For the multi-axis servo amplifiers, calculate the power supply capacity with the equation below:
Power supply capacity [kVA] = Sum of power supply capacity [kVA] of the connected servo motors
7. This is the ratio of the load to the linear servo motor primary side mass. Contact your local sales office if the load to motor mass ratio exceeds the value in the table.
8. Do not use the linear servo motors in the environment where the linear servo motors are exposed to oil mist, oil and/or water.

LM-H3 Series Thrust Characteristics

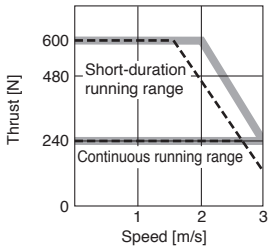
LM-H3P2A-07P-BSS0 (Note 1, 2, 4)



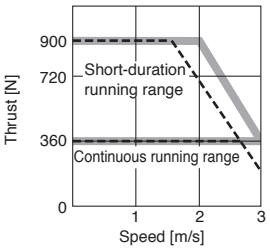
LM-H3P3A-12P-CSS0 (Note 1, 2, 4)



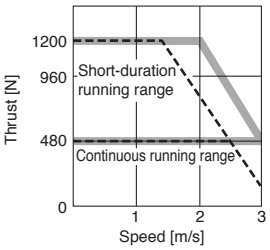
LM-H3P3B-24P-CSS0 (Note 1, 3, 4)



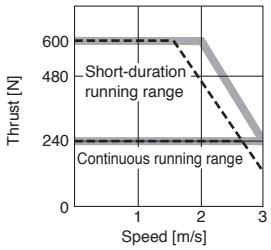
LM-H3P3C-36P-CSS0 (Note 1, 3, 4)



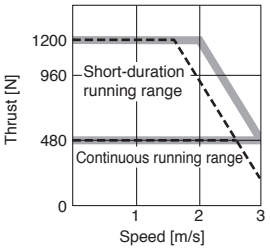
LM-H3P3D-48P-CSS0 (Note 1, 3, 4)



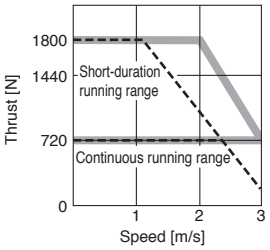
LM-H3P7A-24P-ASS0 (Note 1, 3, 4)



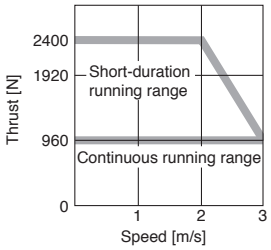
LM-H3P7B-48P-ASS0 (Note 1, 3, 4)



LM-H3P7C-72P-ASS0 (Note 1, 3, 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.

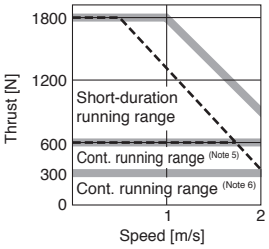
LM-F Series Specifications

Linear servo motor model	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 (Note 3)
	Secondary side (magnet)	LM-F	S20-480-1SS0 S20-576-1SS0			S40-480-1SS0 S40-576-1SS0				S50-480-1SS0 (Note 3) S50-576-1SS0 (Note 3)
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 (Note 5)		[kVA]	3.5	7.5	10	7.5	10	14	18	22
Cooling method			Natural cooling or liquid cooling							
Thrust	Continuous (natural cooling) (Note 4)	[N]	300	600	900	600	1200	1800	2400	3000
	Continuous (liquid cooling) (Note 4)	[N]	600	1200	1800	1200	2400	3600	4800	6000
	Maximum	[N]	1800	3600	5400	3600	7200	10800	14400	18000
Maximum speed (Note 1)		[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 (Note 2)	MR-J4- Natural cooling	[times/min]	348	264	318	393	169	577	715	4230
	MR-J4- Liquid cooling	[times/min]	671	396	No limit	366	224	859	1050	No limit
Recommended load to motor mass ratio (Note 6)			Maximum of 15 times the mass of the linear servo motor primary side							
Thermistor			Built-in							
Insulation class			155 (F)							
Structure			Open (IP rating: IP00)							
Environment (Note 7)	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)							
	Ambient humidity		Operation: 10 %RH to 80 %RH (non-condensing), storage: 10 %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		49 m/s^2							
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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

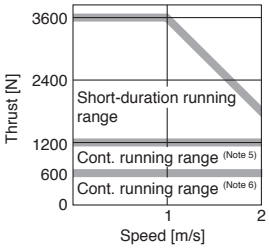
Notes: 1. The maximum speed of the linear servo motor or the rated speed of the linear encoder, whichever is smaller, is the upper limit of the linear servo motor speed.
2. The regenerative braking frequency shows the permissible frequency when the linear servo motor, without a load and a regenerative 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 permissible 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 drive system sizing software Motorizer. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a regenerative option is used.
3. Use a 400 V AC type servo amplifier for this linear servo motor.
4. Use the linear servo motor at 70% or less of the effective load ratio when it is in the servo lock state or in a small reciprocating motion.
5. The power supply capacity varies depending on the power supply impedance.
The listed values are the power supply capacity for one servo motor. For the multi-axis servo amplifiers, calculate the power supply capacity with the equation below:
Power supply capacity [kVA] = Sum of power supply capacity [kVA] of the connected servo motors
6. This is the ratio of the load to the linear servo motor primary side mass. Contact your local sales office if the load to motor mass ratio exceeds the value in the table.
7. Do not use the linear servo motors in the environment where the linear servo motors are exposed to oil mist, oil and/or water.

LM-F Series Thrust Characteristics

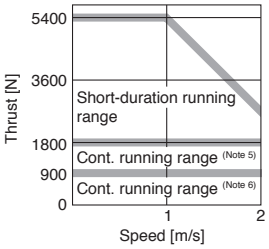
LM-FP2B-06M-1SS0 (Note 1, 3, 4)



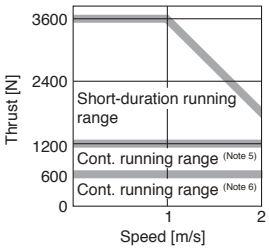
LM-FP2D-12M-1SS0 (Note 1, 4)



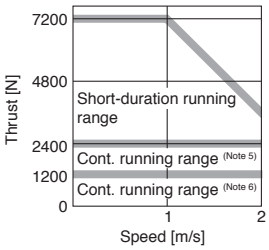
LM-FP2F-18M-1SS0 (Note 1, 4)



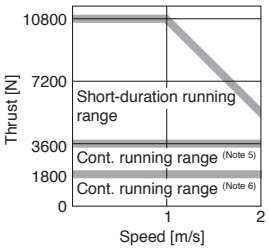
LM-FP4B-12M-1SS0 (Note 1, 4)



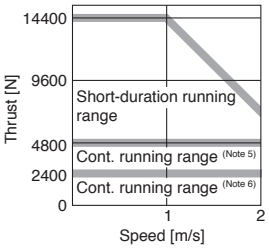
LM-FP4D-24M-1SS0 (Note 1, 4)



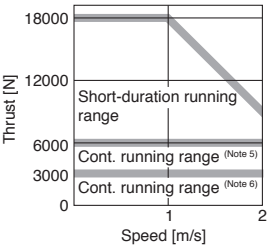
LM-FP4F-36M-1SS0 (Note 1, 4)



LM-FP4H-48M-1SS0 (Note 1, 4)



LM-FP5H-60M-1SS0 (Note 2, 4)



Notes: 1. ▬ : For 3-phase 200 V AC.
2. ▬ : For 3-phase 400 V AC.
3. - - - - : For 1-phase 200 V AC.
4. Thrust drops when the power supply voltage is below the specified value.
5. Continuous running range (liquid cooling)
6. Continuous running range (natural cooling)

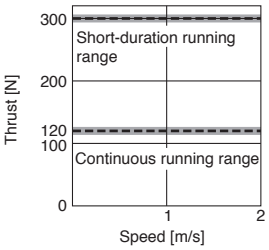
LM-K2 Series Specifications

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-	Refer to "Combinations of Linear Servo Motor and Servo Amplifier" on p. 3-6 in this catalog.						
		MR-J4W_-							
Power supply capacity (Note 8)		[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 (Note 6)		[N]	0						
Magnetic attraction force (one side) (Note 7)		[N]	800	2400	1100	3200	5300	6400	10700
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 (Note 9)			Maximum of 30 times the mass of the linear servo motor primary side						
Thermistor			Built-in						
Insulation class			155 (F)						
Structure			Open (IP rating: IP00)						
Environment (Note 10)	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)						
	Ambient humidity		Operation: 10 %RH to 80 %RH (non-condensing), storage: 10 %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		49 m/s^2						
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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	

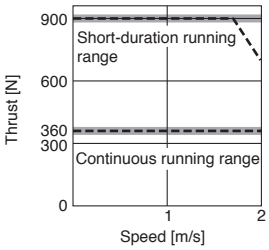
Notes: 1. The maximum speed of the linear servo motor or the rated speed of the linear encoder, whichever is smaller, is the upper limit of the linear servo motor speed.
2. The regenerative braking frequency shows the permissible frequency when the linear servo motor, without a load and a regenerative 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 permissible 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 drive system sizing software Motorizer. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a 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 at 70% or less of the effective load ratio when it is in the servo lock state or in a small reciprocating motion.
6. Magnetic attraction force is caused by assembly precision, etc.
7. Magnetic attraction force which occurs on one side of the secondary side is shown.
8. The power supply capacity varies depending on the power supply impedance.
The listed values are the power supply capacity for one servo motor. For the multi-axis servo amplifiers, calculate the power supply capacity with the equation below:
Power supply capacity [kVA] = Sum of power supply capacity [kVA] of the connected servo motors
9. This is the ratio of the load to the linear servo motor primary side mass. Contact your local sales office if the load to motor mass ratio exceeds the value in the table.
10. Do not use the linear servo motors in the environment where the linear servo motors are exposed to oil mist, oil and/or water.

LM-K2 Series Thrust Characteristics

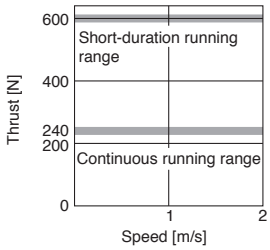
LM-K2P1A-01M-2SS1 (Note 1, 3, 5)



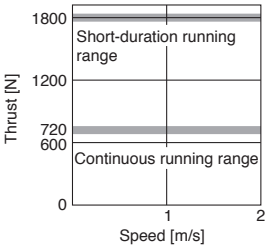
LM-K2P1C-03M-2SS1 (Note 2, 4, 5)



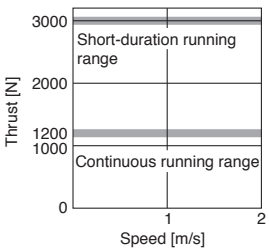
LM-K2P2A-02M-1SS1 (Note 1, 5)



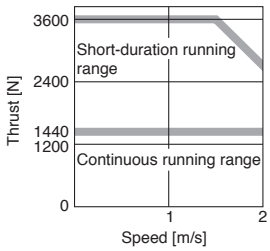
LM-K2P2C-07M-1SS1 (Note 2, 5)



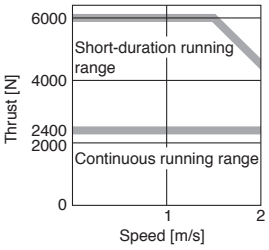
LM-K2P2E-12M-1SS1 (Note 2, 5)



LM-K2P3C-14M-1SS1 (Note 2, 5)



LM-K2P3E-24M-1SS1 (Note 2, 5)



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. - - - - : For 1-phase 200 V AC.
5. Thrust drops when the power supply voltage is below the specified value.

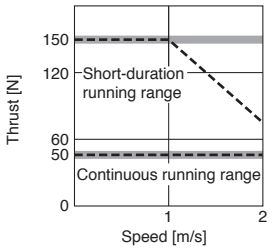
LM-U2 Series Specifications

Linear servo motor model	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
	Secondary side (magnet) LM-U2		SA0-240-0SS0 SA0-300-0SS0 SA0-420-0SS0			SB0-240-1SS1 SB0-300-1SS1 SB0-420-1SS1			S20-300-2SS1 S20-480-2SS1		
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Linear Servo Motor and Servo Amplifier" on p. 3-6 in this catalog.								
		MR-J4W_-									
Power supply capacity (Note 4)		[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 (Note 5)			Maximum of 30 times the mass of the linear servo motor primary side								
Thermistor			Built-in								
Insulation class			155 (F)								
Structure			Open (IP rating: IP00)								
Environment (Note 6)	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)								
	Ambient humidity		Operation: 10 %RH to 80 %RH (non-condensing), storage: 10 %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		49 m/s^2								
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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		

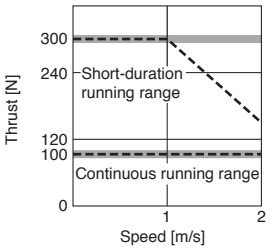
Notes: 1. The maximum speed of the linear servo motor or the rated speed of the linear encoder, whichever is smaller, is the upper limit of the linear servo motor speed.
2. The regenerative braking frequency shows the permissible frequency when the linear servo motor, without a load and a regenerative 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 permissible 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 drive system sizing software Motorizer. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a regenerative option is used.
3. Use the linear servo motor at 70% or less of the effective load ratio when it is in the servo lock state or in a small reciprocating motion.
4. The power supply capacity varies depending on the power supply impedance.
The listed values are the power supply capacity for one servo motor. For the multi-axis servo amplifiers, calculate the power supply capacity with the equation below:
Power supply capacity [kVA] = Sum of power supply capacity [kVA] of the connected servo motors
5. This is the ratio of the load to the linear servo motor primary side mass. Contact your local sales office if the load to motor mass ratio exceeds the value in the table.
6. Do not use the linear servo motors in the environment where the linear servo motors are exposed to oil mist, oil and/or water.

LM-U2 Series Thrust Characteristics

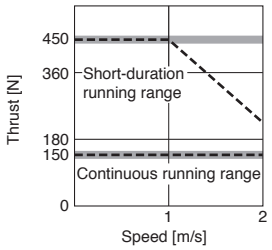
LM-U2PAB-05M-0SS0 (Note 1, 3, 5)



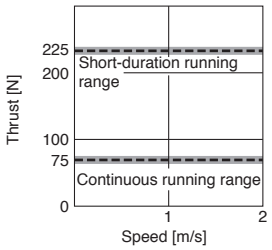
LM-U2PAD-10M-0SS0 (Note 1, 3, 5)



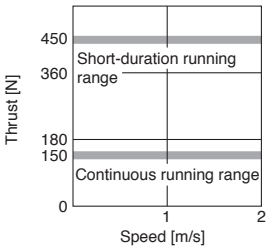
LM-U2PAF-15M-0SS0 (Note 1, 3, 5)



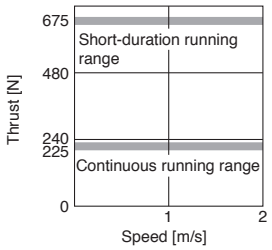
LM-U2PBB-07M-1SS0 (Note 1, 3, 5)



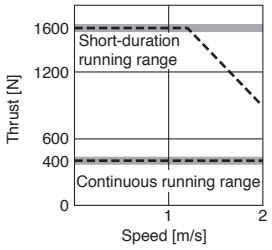
LM-U2PBD-15M-1SS0 (Note 1, 5)



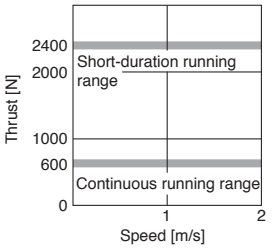
LM-U2PBF-22M-1SS0 (Note 1, 5)



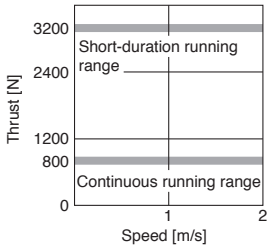
LM-U2P2B-40M-2SS0 (Note 2, 4, 5)



LM-U2P2C-60M-2SS0 (Note 2, 5)



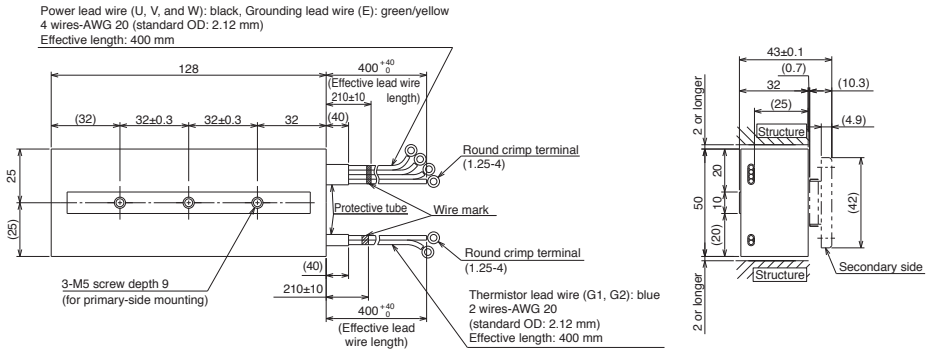
LM-U2P2D-80M-2SS0 (Note 2, 5)



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. - - - - : For 1-phase 200 V AC.
5. Thrust drops when the power supply voltage is below the specified value.

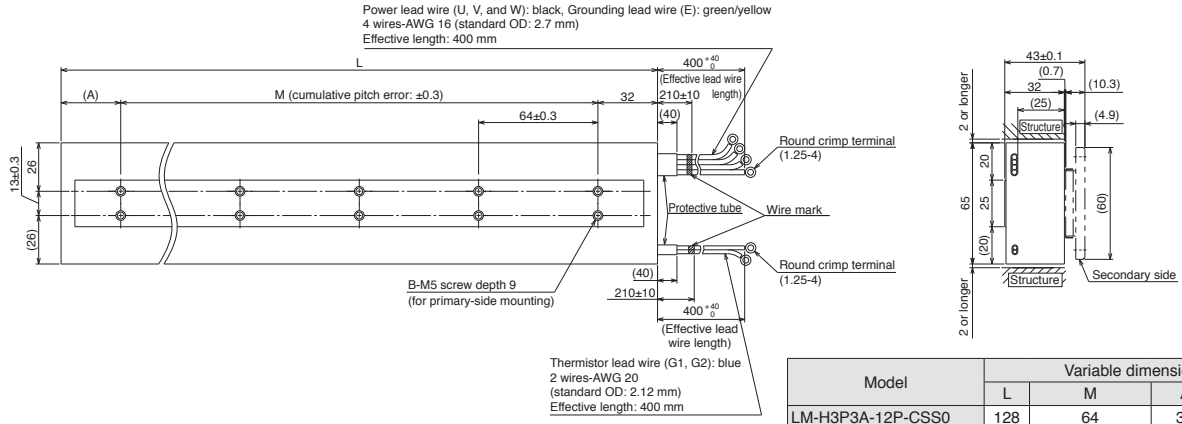
LM-H3 Series Primary Side (Coil) Dimensions (Note 1, 2)

●LM-H3P2A-07P-BSS0



[Unit: mm]

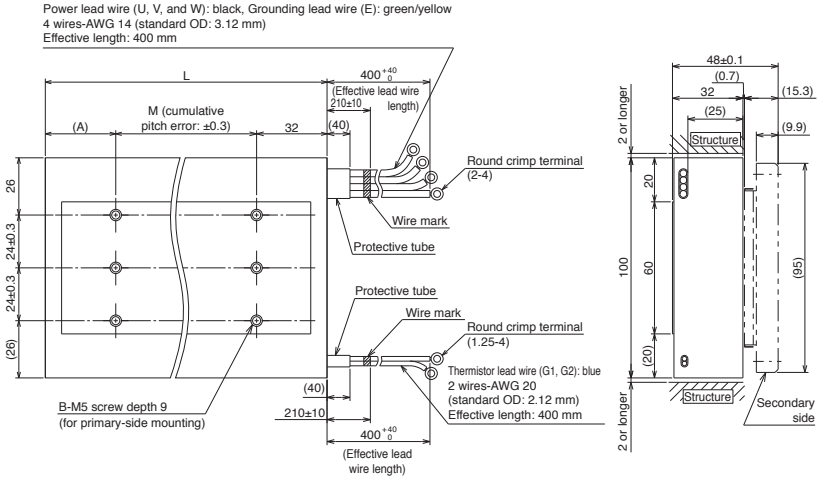
●LM-H3P3A-12P-CSS0 ●LM-H3P3B-24P-CSS0 ●LM-H3P3C-36P-CSS0
●LM-H3P3D-48P-CSS0



[Unit: mm]

Model	Variable dimensions			
	L	M	A	B
LM-H3P3A-12P-CSS0	128	64	32	2 × 2
LM-H3P3B-24P-CSS0	224	2 × 64 = 128	64	2 × 3
LM-H3P3C-36P-CSS0	320	4 × 64 = 256	32	2 × 5
LM-H3P3D-48P-CSS0	416	5 × 64 = 320	64	2 × 6

●LM-H3P7A-24P-ASS0 ●LM-H3P7B-48P-ASS0 ●LM-H3P7C-72P-ASS0
●LM-H3P7D-96P-ASS0



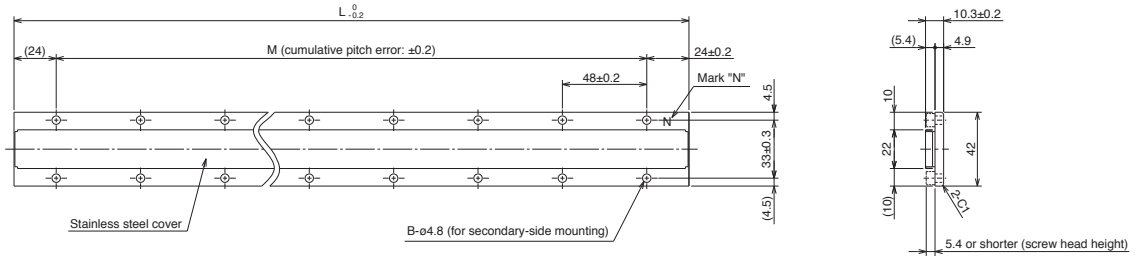
[Unit: mm]

Model	Variable dimensions			
	L	M	A	B
LM-H3P7A-24P-ASS0	128	64	32	3 × 2
LM-H3P7B-48P-ASS0	224	2 × 64 = 128	64	3 × 3
LM-H3P7C-72P-ASS0	320	4 × 64 = 256	32	3 × 5
LM-H3P7D-96P-ASS0	416	5 × 64 = 320	64	3 × 6

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-H3 Series Secondary Side (Magnet) Dimensions

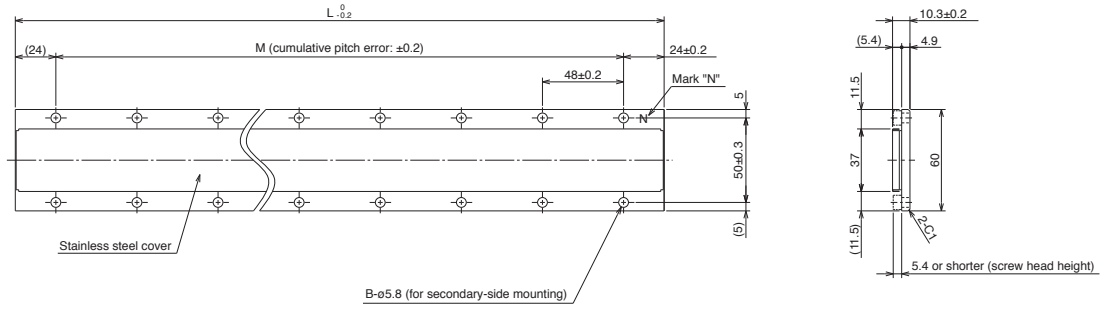
●LM-H3S20-288-BSS0 ●LM-H3S20-384-BSS0 ●LM-H3S20-480-BSS0
●LM-H3S20-768-BSS0



[Unit: mm]

Model	Variable dimensions		
	L	M	B
LM-H3S20-288-BSS0	288	5 × 48 = 240	2 × 6
LM-H3S20-384-BSS0	384	7 × 48 = 336	2 × 8
LM-H3S20-480-BSS0	480	9 × 48 = 432	2 × 10
LM-H3S20-768-BSS0	768	15 × 48 = 720	2 × 16

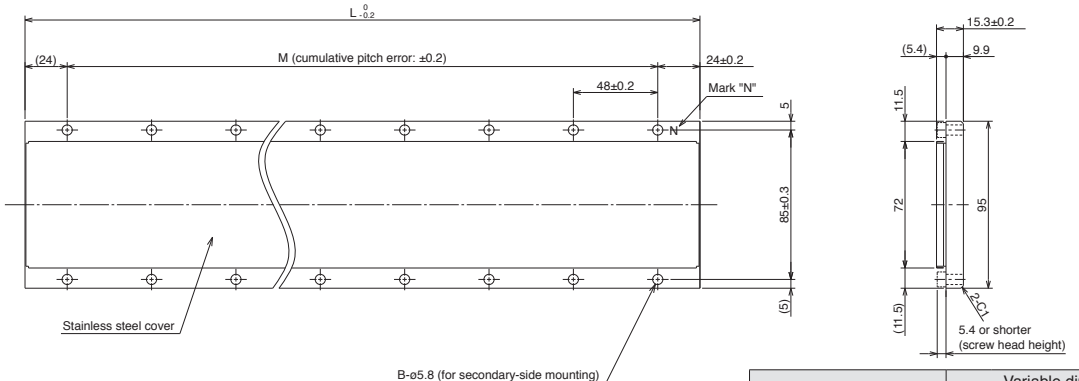
●LM-H3S30-288-CSS0 ●LM-H3S30-384-CSS0 ●LM-H3S30-480-CSS0
●LM-H3S30-768-CSS0



[Unit: mm]

Model	Variable dimensions		
	L	M	B
LM-H3S30-288-CSS0	288	5 × 48 = 240	2 × 6
LM-H3S30-384-CSS0	384	7 × 48 = 336	2 × 8
LM-H3S30-480-CSS0	480	9 × 48 = 432	2 × 10
LM-H3S30-768-CSS0	768	15 × 48 = 720	2 × 16

●LM-H3S70-288-ASS0 ●LM-H3S70-384-ASS0 ●LM-H3S70-480-ASS0
●LM-H3S70-768-ASS0

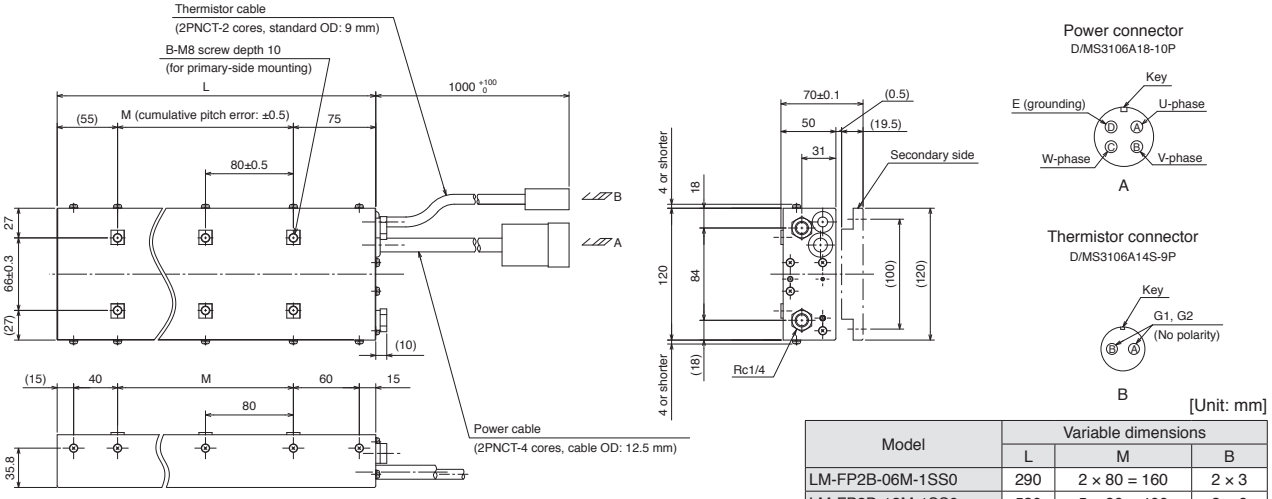


[Unit: mm]

Model	Variable dimensions		
	L	M	B
LM-H3S70-288-ASS0	288	5 × 48 = 240	2 × 6
LM-H3S70-384-ASS0	384	7 × 48 = 336	2 × 8
LM-H3S70-480-ASS0	480	9 × 48 = 432	2 × 10
LM-H3S70-768-ASS0	768	15 × 48 = 720	2 × 16

LM-F Series Primary Side (Coil) Dimensions (Note 1, 2)

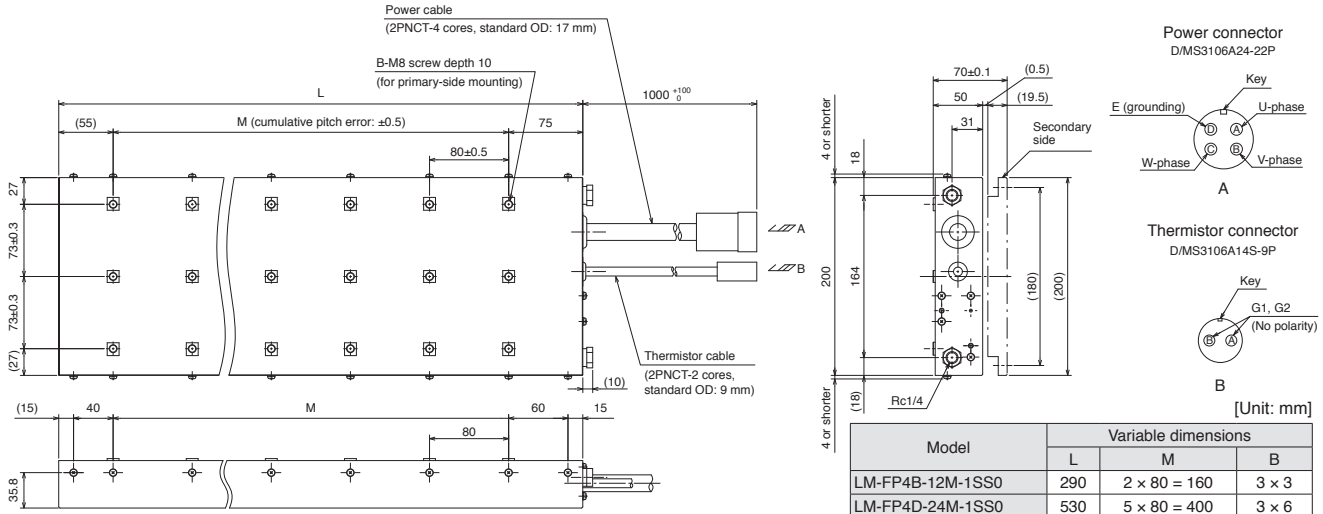
●LM-FP2B-06M-1SS0 ●LM-FP2D-12M-1SS0 ●LM-FP2F-18M-1SS0



[Unit: mm]

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

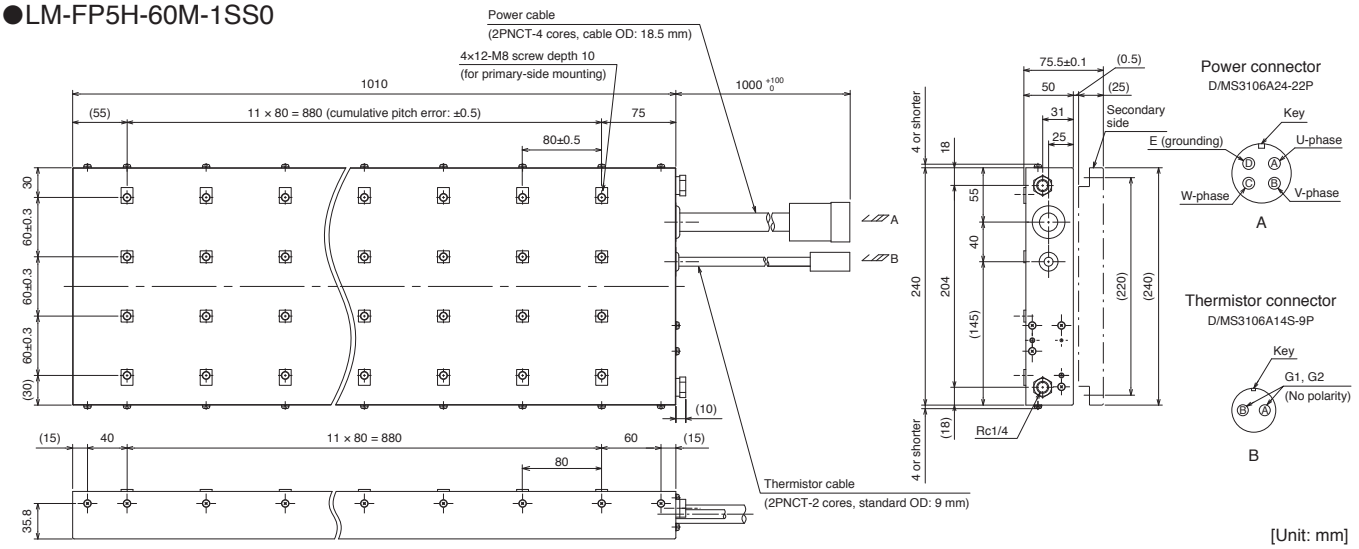
●LM-FP4B-12M-1SS0 ●LM-FP4D-24M-1SS0 ●LM-FP4F-36M-1SS0 ●LM-FP4H-48M-1SS0



[Unit: mm]

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

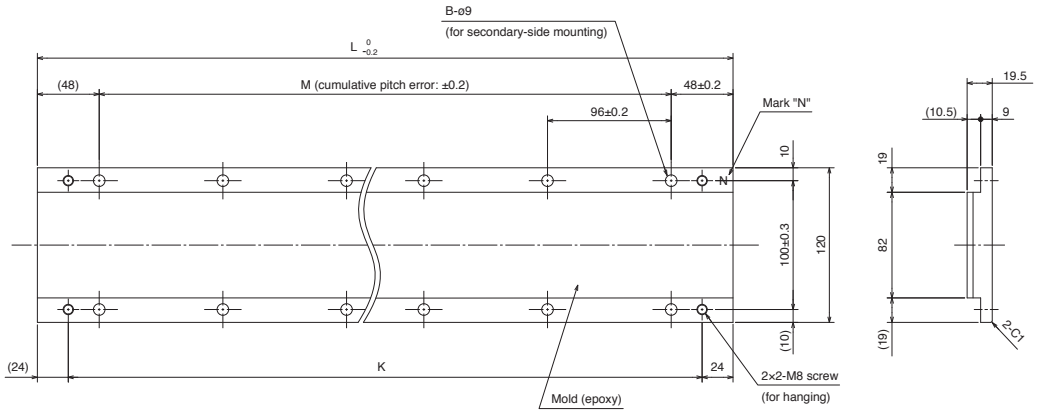


[Unit: mm]

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

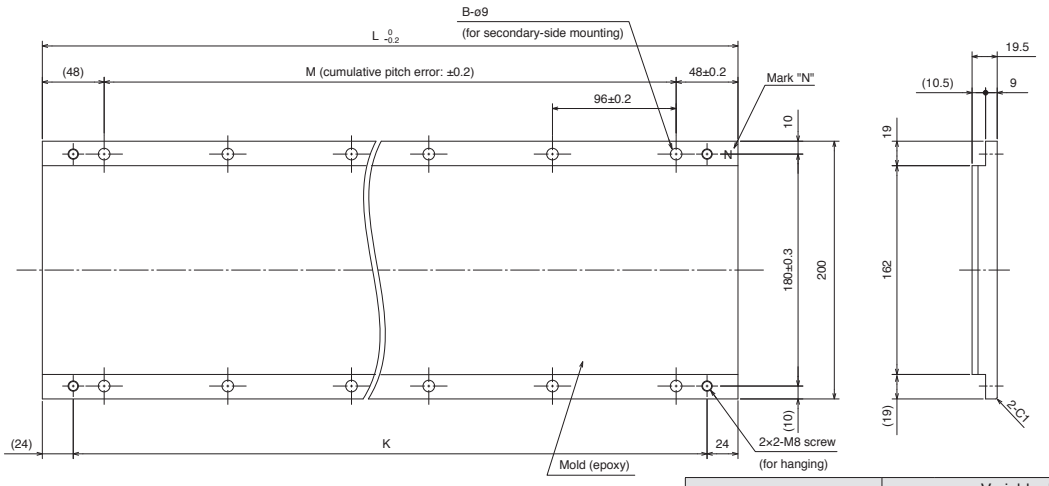
●LM-FS20-480-1SS0 ●LM-FS20-576-1SS0



[Unit: mm]

Model	Variable dimensions			
	L	M	B	K
LM-FS20-480-1SS0	480	4 × 96 = 384	2 × 5	432
LM-FS20-576-1SS0	576	5 × 96 = 480	2 × 6	528

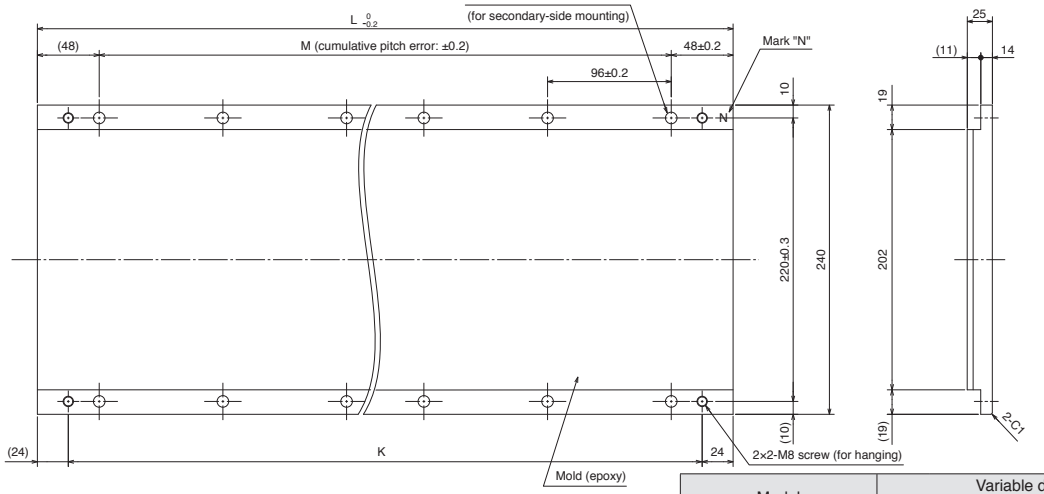
●LM-FS40-480-1SS0 ●LM-FS40-576-1SS0



[Unit: mm]

Model	Variable dimensions			
	L	M	B	K
LM-FS40-480-1SS0	480	4 × 96 = 384	2 × 5	432
LM-FS40-576-1SS0	576	5 × 96 = 480	2 × 6	528

●LM-FS50-480-1SS0 ●LM-FS50-576-1SS0

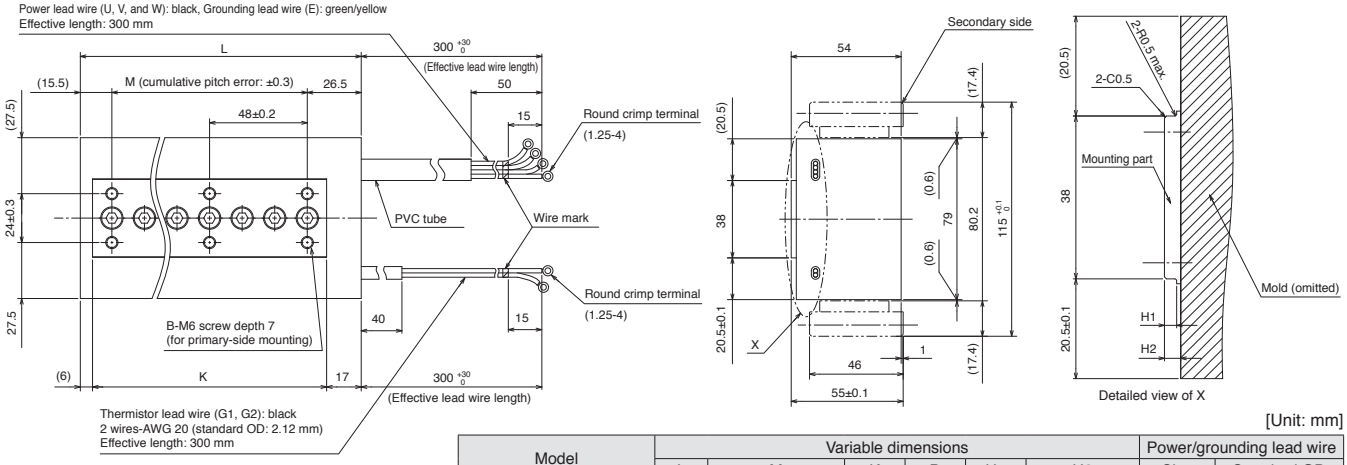


[Unit: mm]

Model	Variable dimensions			
	L	M	B	K
LM-FS50-480-1SS0	480	4 × 96 = 384	2 × 5	432
LM-FS50-576-1SS0	576	5 × 96 = 480	2 × 6	528

LM-K2 Series Primary Side (Coil) Dimensions (Note 1, 2)

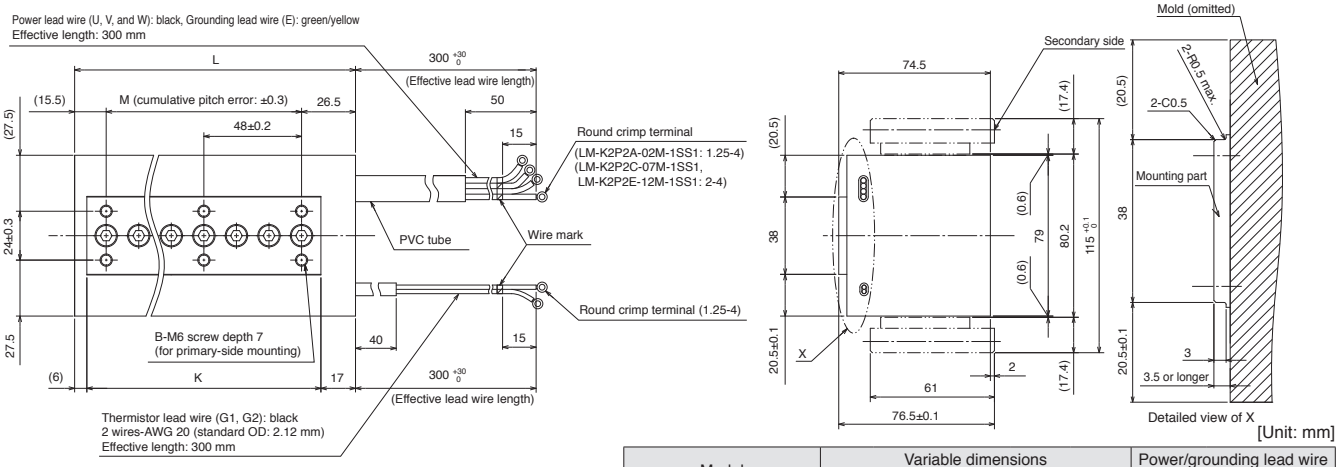
●LM-K2P1A-01M-2SS1 ●LM-K2P1C-03M-2SS1



[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

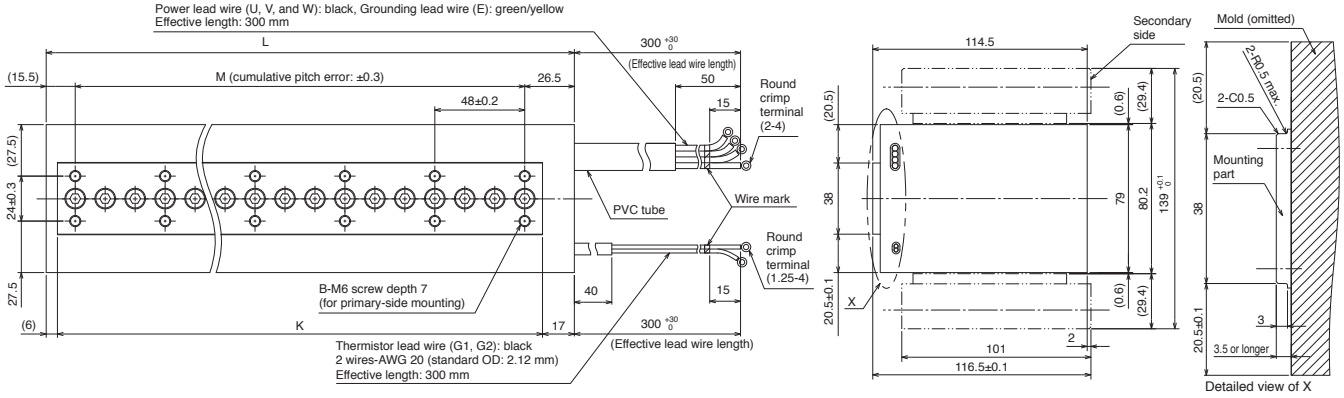
●LM-K2P2A-02M-1SS1 ●LM-K2P2C-07M-1SS1 ●LM-K2P2E-12M-1SS1



[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



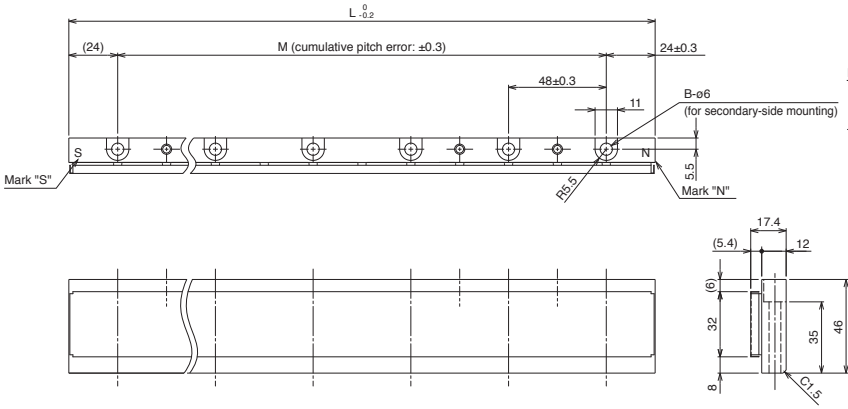
[Unit: mm]

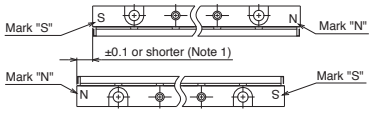
Model	Variable dimensions				Power/grounding lead wire	
	L	M	K	B	Size	Standard OD
LM-K2P3C-14M-1SS1	330	6 × 48 = 288	307	2 × 7	AWG 14	3.12
LM-K2P3E-24M-1SS1	522	10 × 48 = 480	499	2 × 11		

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



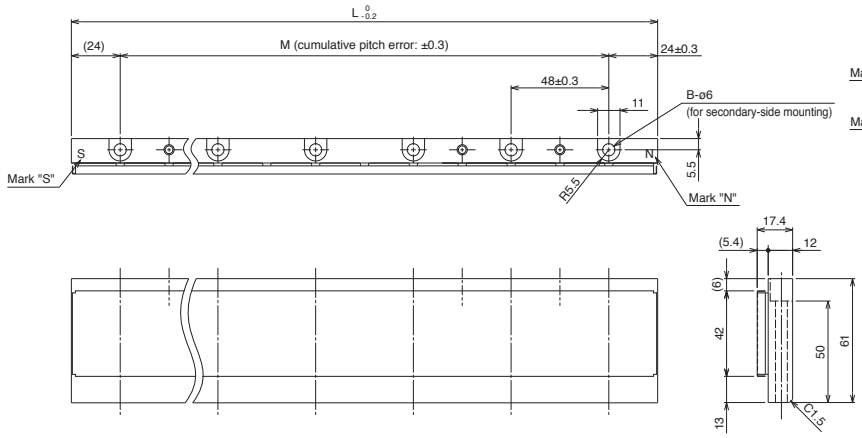


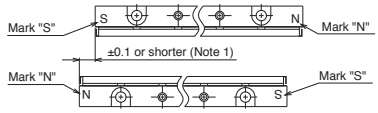
Detailed view of secondary-side ends

[Unit: mm]

Model	Variable dimensions		
	L	M	B
LM-K2S10-288-2SS1	288	5 × 48 = 240	6
LM-K2S10-384-2SS1	384	7 × 48 = 336	8
LM-K2S10-480-2SS1	480	9 × 48 = 432	10
LM-K2S10-768-2SS1	768	15 × 48 = 720	16

●LM-K2S20-288-1SS1 ●LM-K2S20-384-1SS1 ●LM-K2S20-480-1SS1
●LM-K2S20-768-1SS1



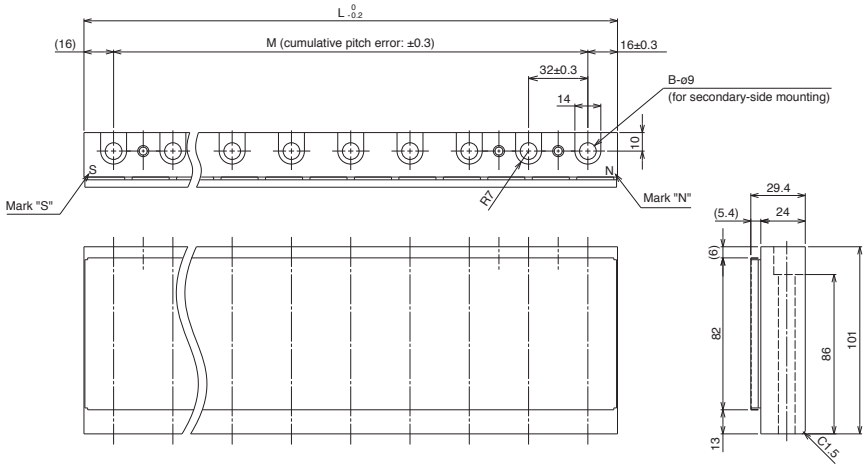


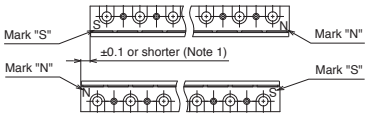
Detailed view of secondary-side ends

[Unit: mm]

Model	Variable dimensions		
	L	M	B
LM-K2S20-288-1SS1	288	5 × 48 = 240	6
LM-K2S20-384-1SS1	384	7 × 48 = 336	8
LM-K2S20-480-1SS1	480	9 × 48 = 432	10
LM-K2S20-768-1SS1	768	15 × 48 = 720	16

●LM-K2S30-288-1SS1 ●LM-K2S30-384-1SS1 ●LM-K2S30-480-1SS1
●LM-K2S30-768-1SS1





Detailed view of secondary-side ends

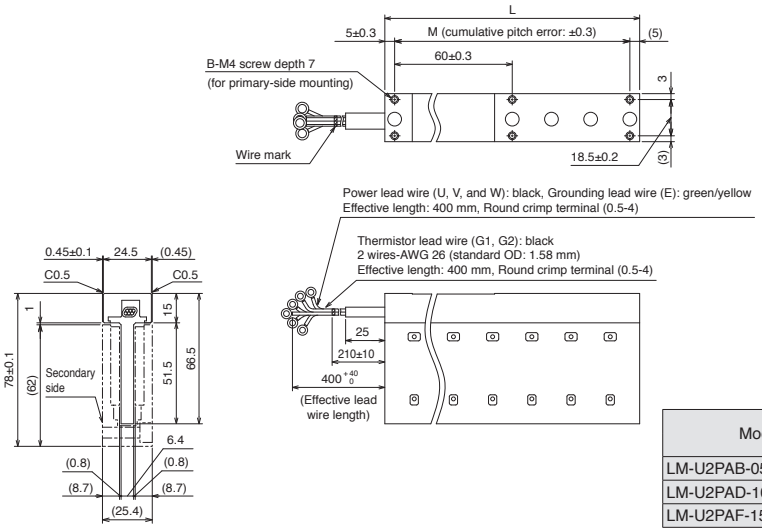
[Unit: mm]

Model	Variable dimensions		
	L	M	B
LM-K2S30-288-1SS1	288	8 × 32 = 256	9
LM-K2S30-384-1SS1	384	11 × 32 = 352	12
LM-K2S30-480-1SS1	480	14 × 32 = 448	15
LM-K2S30-768-1SS1	768	23 × 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)

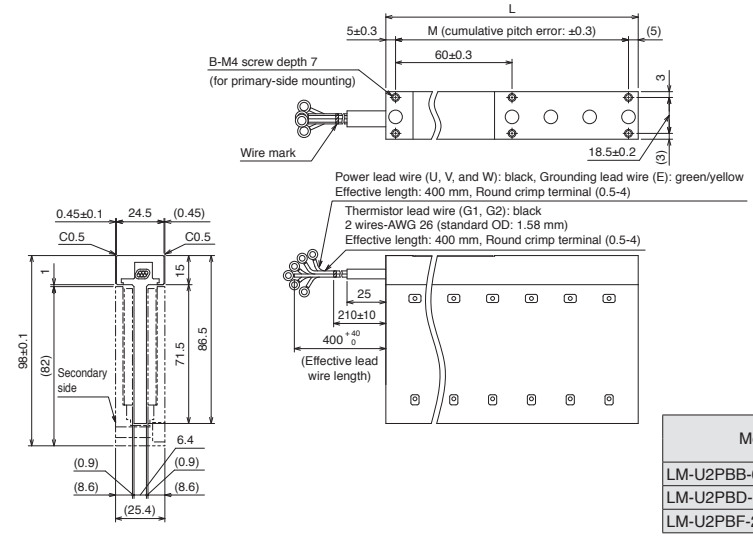
●LM-U2PAB-05M-0SS0 ●LM-U2PAD-10M-0SS0 ●LM-U2PAF-15M-0SS0



[Unit: mm]

Model	Variable dimensions			Power/grounding lead wire	
	L	M	B	Size	Standard OD
LM-U2PAB-05M-0SS0	130	2 × 60 = 120	2 × 3	AWG 26	1.58
LM-U2PAD-10M-0SS0	250	4 × 60 = 240	2 × 5		
LM-U2PAF-15M-0SS0	370	6 × 60 = 360	2 × 7		

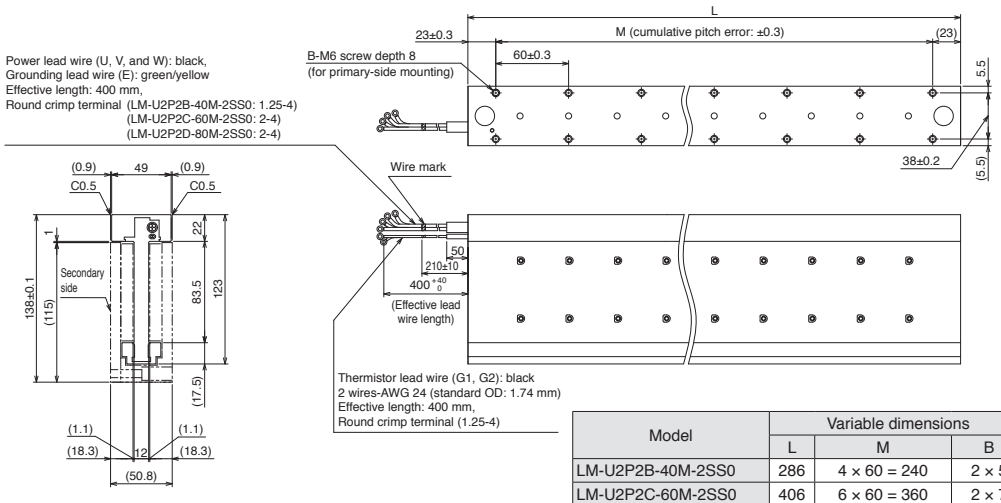
●LM-U2PBB-07M-1SS0 ●LM-U2PBD-15M-1SS0 ●LM-U2PBF-22M-1SS0



[Unit: mm]

Model	Variable dimensions			Power/grounding lead wire	
	L	M	B	Size	Standard OD
LM-U2PBB-07M-1SS0	130	2 × 60 = 120	2 × 3	AWG 26	1.58
LM-U2PBD-15M-1SS0	250	4 × 60 = 240	2 × 5		
LM-U2PBF-22M-1SS0	370	6 × 60 = 360	2 × 7		

●LM-U2P2B-40M-2SS0 ●LM-U2P2C-60M-2SS0 ●LM-U2P2D-80M-2SS0



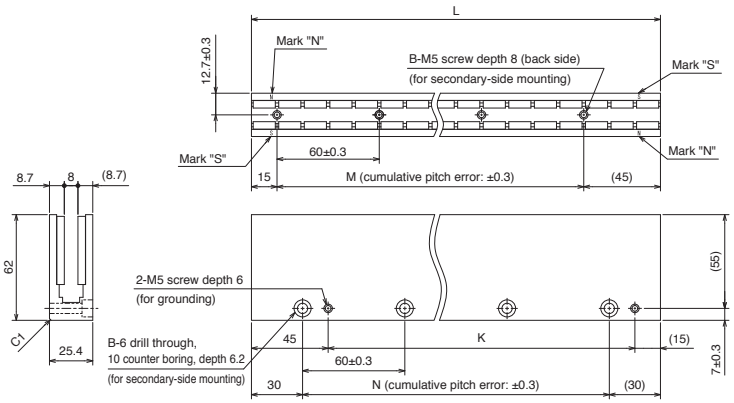
[Unit: mm]

Model	Variable dimensions			Power/grounding lead wire	
	L	M	B	Size	Standard OD
LM-U2P2B-40M-2SS0	286	4 × 60 = 240	2 × 5	AWG 16	2.7
LM-U2P2C-60M-2SS0	406	6 × 60 = 360	2 × 7	AWG 14	3.12
LM-U2P2D-80M-2SS0	526	8 × 60 = 480	2 × 9		

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

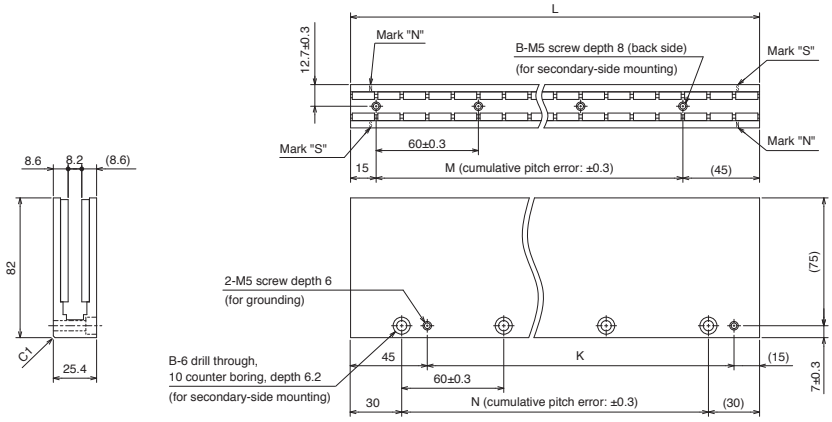
●LM-U2SA0-240-0SS0 ●LM-U2SA0-300-0SS0 ●LM-U2SA0-420-0SS0



[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

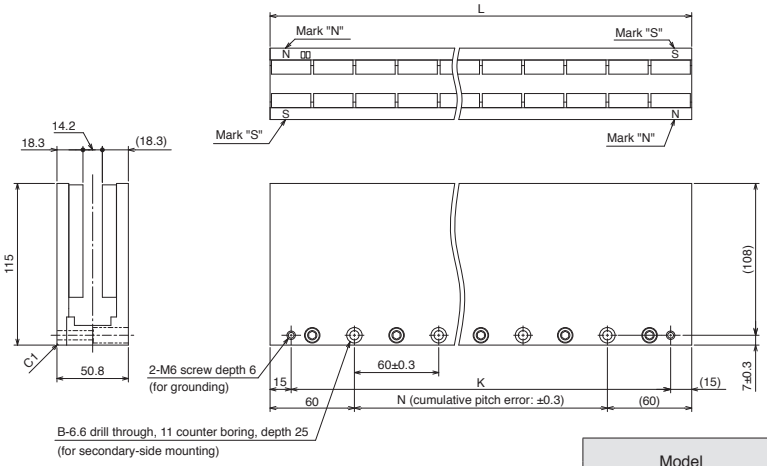
●LM-U2SB0-240-1SS1 ●LM-U2SB0-300-1SS1 ●LM-U2SB0-420-1SS1



[Unit: mm]

Model	Variable dimensions				
	L	M	B	K	N
LM-U2SB0-240-1SS1	240	3 × 60 = 180	4	180	3 × 60 = 180
LM-U2SB0-300-1SS1	300	4 × 60 = 240	5	240	4 × 60 = 240
LM-U2SB0-420-1SS1	420	6 × 60 = 360	7	360	6 × 60 = 360

●LM-U2S20-300-2SS1 ●LM-U2S20-480-2SS1



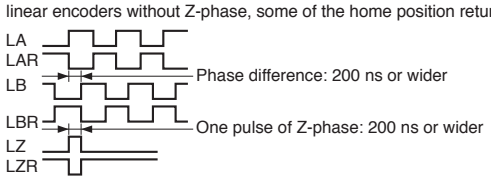
[Unit: mm]

Model	Variable dimensions			
	L	N	B	K
LM-U2S20-300-2SS1	300	3 × 60 = 180	4	270
LM-U2S20-480-2SS1	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 Electric 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	
			SR27A		0.01 µm	3.3 m/s	2040 mm	Two-wire type/ Four-wire type (Note 4)
			SR67A				3640 mm	
			SmartSCALE SQ47		0.005 µm	3.3 m/s	3740 mm	
			SmartSCALE SQ57				3770 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	5.0 m/s	6000 mm	
			ST742A					
			ST743A		0.1 µm			
			ST744A					
			ST748A					
			ST1341A		0.01 µm	8.0 m/s	12000 mm	
			ST1342A		0.001 µm		4200 mm	
		Renishaw	RESOLUTE RL40M		1 nm	100 m/s	2100 mm	Two-wire type
					50 nm		20990 mm	
			EVOLUTE EL40M		50 nm/100 nm/500 nm	100 m/s	10010 mm	
		Heidenhain	LC 495M		0.001 µm/0.01 µm	3.0 m/s	2040 mm	Four-wire type (Note 4)
			LC 195M				4240 mm	
			LIC 4193M		0.005 µm/0.01 µm	10.0 m/s	3040 mm	Two-wire type/ Four-wire type (Note 4)
			LIC 4195M				28440 mm	
			LIC 4197M				6040 mm	
			LIC 4199M				1020 mm	
			LIC 2197M		0.05 µm/0.1 µm	10.0 m/s	6020 mm	
			LIC 2199M				6020 mm	
		RSF Elektronik	MC15M		0.05 µm/0.1 µm	10.0 m/s	3020 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	10.0 m/s	100000 mm	
			SQ10 + PQ10 + MQ10		0.1 µm/0.05 µm	10.0 m/s	3800 mm	Two-wire type/ Four-wire type (Note 4)
		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)	4.0 m/s	10000 mm	
			LIDA 289					
			LIF 481	+ EIB 392M (/4096)	4 µm/4096 (Approx. 0.977 nm)	1.6 m/s	1020 mm	
			LIP 6081				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 listed values are the manufacturer's specifications. When combined with MELSERVO-J4 Series servo amplifiers, the specification is the lower value of either the listed value or the servo motor rated speed.
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, use MR-J4-_GF_-RJ/MR-J4-_B_-RJ/MR-J4-_A_-RJ servo amplifier. When using four-wire type linear encoder with the scale measurement function, use MR-J4-_GF_-RJ/MR-J4-_B_-RJ servo amplifier.
5. When using the A/B/Z-phase differential output type linear encoder, use MR-J4-_GF_-RJ/MR-J4-_B_-RJ/MR-J4-_A_-RJ servo amplifier.
6. Select the linear encoder within this range.
7. Use MR-J4-_B_(-RJ)/MR-J4W_-_B/MR-J4-_A_(-RJ) 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. For linear encoders without Z-phase, some of the home position return modes cannot be used. Refer to "Linear Servo Motor Instruction Manual" for details.



Selecting Linear Servo Motor

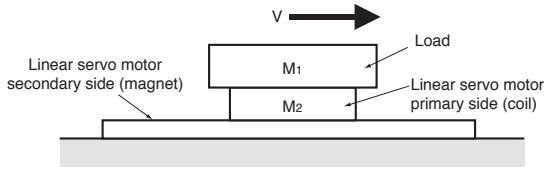
- **Linear servo motor must be selected according to the purpose of the application. Select the optimal linear servo motor after completely understanding the characteristics of the guides, the linear encoders and the linear servo motors.**
- **The maximum speed of LM-H3 series is 3.0 m/s and of LM-F, LM-K2 and LM-U2 series is 2.0 m/s. Note that the maximum speed may not be reached, depending on the selected linear encoder.**

Linear Servo Motor Sizing Example

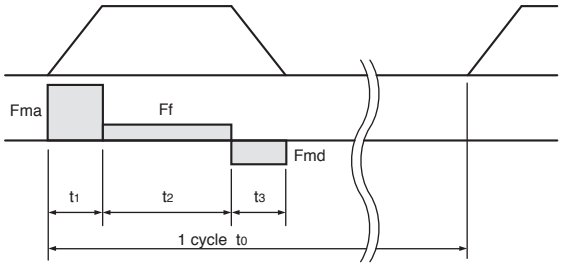
- **In order to select a suitable linear servo motor, it is necessary to calculate the maximum thrust required during acceleration/deceleration and the continuous effective load thrust according to the machine specifications and the operating patterns. Here the linear servo motor is selected according to linear acceleration/deceleration operating patterns.**

1. Selection criteria

(1) Configurations



(2) Operating pattern



Load mass	M_1 = 20 kg
Linear servo motor primary-side (coil) mass	M_2 = kg
(Determined after the motor is selected.)	
Acceleration	a = 14.4 m/s^2
Deceleration	d = 14.4 m/s^2
Resistive force (including friction, unbalance and cable chain)	Ff = N
(Determined after the motor is selected.)	
Feed speed	V = 1.8 m/s
Operating cycle	t_0 = 2 s
Acceleration time	t_1 = 0.125 s
Constant velocity time	t_2 = 0.75 s
Deceleration time	t_3 = 0.125 s
Mechanical efficiency	η = 1.0
Friction coefficient	μ = 0.020 (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

$M = M_1 + M_2 = 22.3$ kg

$Ff = \mu \cdot (M \cdot 9.8 +$ Magnetic attraction force [N]) (when considering friction only) = 48.4 N

Thrust during acceleration and deceleration

$Fma = M \cdot a + Ff = 369.5$ N

$Fmd = -M \cdot d + Ff = -272.7$ N

Continuous effective load thrust

$Frms = \sqrt{(Fma^2 \cdot t_1 + Ff^2 \cdot t_2 + Fmd^2 \cdot t_3) / t_0} = 118.6$ N

(3) Verify the selected linear servo motor.

$Frms/\eta \leq$ Continuous thrust [N] of the selected linear servo motor

$Fma/\eta \leq$ 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.

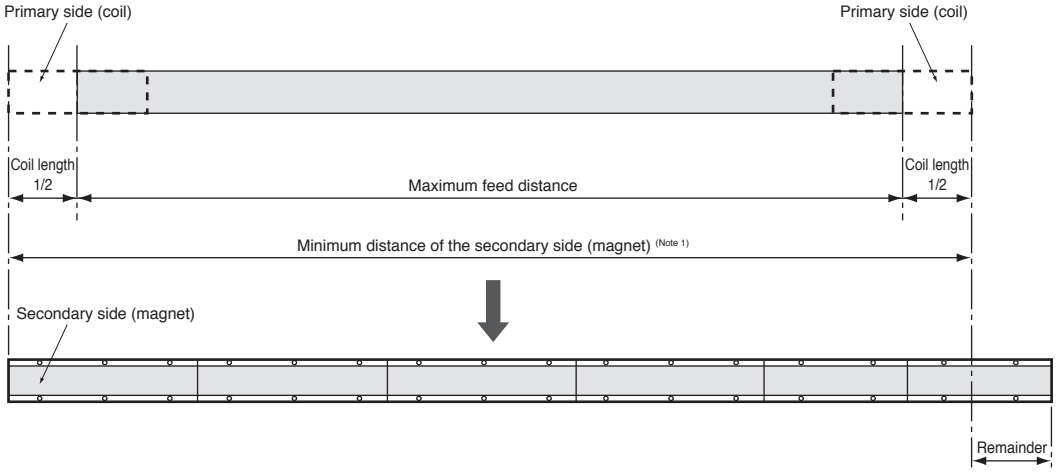
[Drive System Sizing Software Motorizer]

Motorizer does all the calculations for you. Contact your local sales office for more details.

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) :

(Total length of aligned secondary side (magnet)) ≥ (Maximum feed distance) + (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:

Regenerative energy P [W] = {-Fmd • (t_3 • Speed/2) • (Inverse efficiency/100) - 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 [%]	Permissible regenerative power of built-in regenerative resistor [W]	Permissible regenerative power of external regenerative resistor (standard accessory) [W] (Note 4)	Permissible 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-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 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 Direct Drive Motors

Model Designation 4-1

Combinations of Direct Drive Motor and Servo Amplifier 4-2

Specifications

TM-RG2M/TM-RU2M Series 4-3

TM-RFM Series 4-5

Machine Accuracy 4-8

Dimensions

TM-RG2M Series 4-9

TM-RU2M Series 4-11

TM-RFM Series 4-13

Sizing Example 4-15

* Refer to p. 5-97 in this catalog for conversion of units.

Model Designation (Note 1)

Low-profile series

●Flange type

T M - R G 2 M □ □ □

Direct drive motor series

Symbol	Rated torque [N•m]
002	2.2
004	4.5
009	9

Symbol	Motor outer diameter [mm] (Frame dimensions)
C	ø130
E	ø180
G	ø230

Symbol	Rated speed [r/min]
30	300

●Table type

T M - R U 2 M □ □ □

Direct drive motor series

Symbol	Rated torque [N•m]
002	2.2
004	4.5
009	9

Symbol	Motor outer diameter [mm] (Frame dimensions)
C	ø130
E	ø180
G	ø230

Symbol	Rated speed [r/min]
30	300

High-rigidity series

T M - R F M □ □ □

Direct drive motor series

Symbol	Rated torque [N•m]
002	2
004	4
006	6
012	12
018	18
040	40
048	48
072	72
120	120
240	240

Symbol	Motor outer diameter [mm] (Frame dimensions)
C	ø130
E	ø180
G	ø230
J	ø330

Symbol	Rated speed [r/min]
10	100
20	200

Notes: 1. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.

Combinations of Direct Drive Motor and Servo Amplifier

Direct drive motor		Servo amplifier		
		MR-J4	MR-J4W2 (Note 1)	MR-J4W3 (Note 1)
TM-RG2M/ TM-RU2M series	TM-RG2M002C30, TM-RU2M002C30	MR-J4-20GF(-RJ), MR-J4-20GF1(-RJ), MR-J4-20B(-RJ) (Note 3), MR-J4-20B1(-RJ) (Note 3), MR-J4-20A(-RJ) (Note 3), MR-J4-20A1(-RJ) (Note 3)	MR-J4W2-22B (Note 3), MR-J4W2-44B (Note 3)	MR-J4W3-222B (Note 3), MR-J4W3-444B (Note 3)
	TM-RG2M004E30, TM-RU2M004E30	MR-J4-20GF(-RJ), MR-J4-20GF1(-RJ), MR-J4-40GF(-RJ) (Note 2), MR-J4-40GF1(-RJ) (Note 2), MR-J4-20B(-RJ) (Note 3), MR-J4-20B1(-RJ) (Note 3), MR-J4-40B(-RJ) (Note 2, 3), MR-J4-40B1(-RJ) (Note 2, 3), MR-J4-20A(-RJ) (Note 3), MR-J4-20A1(-RJ) (Note 3), MR-J4-40A(-RJ) (Note 2, 3), MR-J4-40A1(-RJ) (Note 2, 3)	MR-J4W2-22B (Note 3), MR-J4W2-44B (Note 2, 3)	MR-J4W3-222B (Note 3), MR-J4W3-444B (Note 2, 3)
	TM-RG2M009G30, TM-RU2M009G30	MR-J4-40GF(-RJ), MR-J4-40GF1(-RJ), MR-J4-40B(-RJ) (Note 3), MR-J4-40B1(-RJ) (Note 3), MR-J4-40A(-RJ) (Note 3), MR-J4-40A1(-RJ) (Note 3)	MR-J4W2-44B (Note 3)	MR-J4W3-444B (Note 3)
TM-RFM series	TM-RFM002C20	MR-J4-20GF(-RJ) (Note 4), MR-J4-20GF1(-RJ), 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-J4-40GF(-RJ) (Note 4), MR-J4-40GF1(-RJ), 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-J4-60GF(-RJ) (Note 4), MR-J4-60B(-RJ), MR-J4-60A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	TM-RFM006E20	MR-J4-60GF(-RJ) (Note 4), MR-J4-60B(-RJ), MR-J4-60A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	TM-RFM012E20	MR-J4-70GF(-RJ) (Note 4), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	TM-RFM018E20	MR-J4-100GF(-RJ) (Note 4), MR-J4-100B(-RJ), MR-J4-100A(-RJ)	MR-J4W2-1010B	-
	TM-RFM012G20	MR-J4-70GF(-RJ) (Note 4), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	TM-RFM048G20	MR-J4-350GF(-RJ) (Note 4), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	TM-RFM072G20	MR-J4-350GF(-RJ) (Note 4), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	TM-RFM040J10	MR-J4-70GF(-RJ) (Note 4), MR-J4-70B(-RJ), MR-J4-70A(-RJ)	MR-J4W2-77B, MR-J4W2-1010B	-
	TM-RFM120J10	MR-J4-350GF(-RJ) (Note 4), MR-J4-350B(-RJ), MR-J4-350A(-RJ)	-	-
	TM-RFM240J10	MR-J4-500GF(-RJ) (Note 4), 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. 1-8 in this catalog.
2. This combination increases the rated and maximum torque.
3. Use the servo amplifiers with software version C8 or later.
4. MR-J4-_GF(-RJ) with software version A1 or later supports TM-RFM series direct drive motor.

TM-RG2M/TM-RU2M Series Specifications

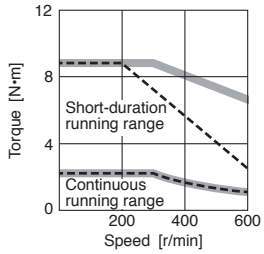
Direct drive motor model		TM-RG2M- / TM-RU2M-	002C30	004E30	009G30
Compatible servo amplifier model		MR-J4- / MR-J4W_-	Refer to "Combinations of Direct Drive Motor and Servo Amplifier" on p. 4-2 in this catalog.		
Motor outer diameter (frame dimensions)		[mm]	ø130	ø180	ø230
Power supply capacity *1 (Note 4)		[kVA]	0.25	0.5 <0.7>	0.9
Continuous running duty	Rated output (Note 4)	[W]	69	141 <188>	283
	Rated torque (Note 3, 4)	[N•m]	2.2	4.5 <6>	9
Maximum torque (Note 4)		[N•m]	8.8	13.5 <18>	27
Rated speed		[r/min]	300		
Maximum speed		[r/min]	600		
Permissible instantaneous speed		[r/min]	690		
Power rate at continuous rated torque (Note 4)		[kW/s]	6.1	3.4 <6.0>	5.5
Rated current (Note 4)		[A]	1.2	1.3 <1.7>	2.2
Maximum current (Note 4)		[A]	4.9	4.0 <5.3>	6.7
Regenerative braking frequency *2 (Note 4)	MR-J4-	[times/min]	1317	166 <167>	68
	MR-J4W_-	[times/min]	1317	166 <167>	68
Moment of inertia J		[× 10^{-4} kg•m^2]	7.88	60.2	147
Recommended load to motor inertia ratio (Note 1)			50 times or less	20 times or less	
Absolute accuracy (Note 6)		[s]	±15	±12.5	
Speed/position detector	Absolute/incremental *3		21-bit encoder 2097152 pulses/rev	22-bit encoder 4194304 pulses/rev	
Thermistor			Built-in		
Insulation class			155 (F)		
Structure			Totally enclosed, natural cooling (IP rating: IP40) (Note 2)		
Environment *4, *8	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)		
	Ambient humidity		Operation: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)		
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust		
	Altitude		2000 m or less above sea level (Note 5)		
	Vibration resistance *5		X: 49 m/s^2 Y: 49 m/s^2		
Vibration rank			V10 *7		
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.		
Rotor permissible load *6	Moment load	[N•m]	15	49	65
	Axial load	[N]	770	2300	3800
Mass		[kg]	2.7	5.5	8.3

Notes: 1. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
2. Connectors and a gap along the rotor (output shaft) 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.
4. The value in angle brackets is applicable when the rated and maximum torques are increased with a combination with a larger-capacity servo amplifier. Refer to "Combinations of Direct Drive Motor and Servo Amplifier" on p. 4-2 in this catalog for the combinations.
5. Refer to "TM-RFM TM-RG2M TM-RU2M Direct Drive Motor Instruction Manual" for the restrictions when using the direct drive motors at altitude exceeding 1000 m and up to 2000 m above sea level.
6. Absolute accuracy varies according to the mounting state of load and the surrounding environment.

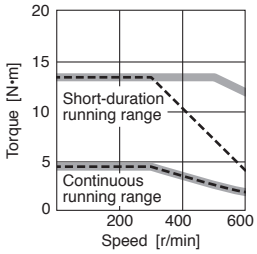
Refer to "Annotations for Direct Drive Motor Specifications" on p. 4-8 in this catalog for the asterisks 1 to 8.

TM-RG2M/TM-RU2M Series Torque Characteristics

TM-RG2M002C30, TM-RU2M002C30 (Note 1, 2, 3)

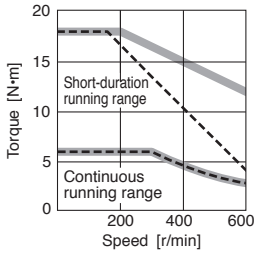


TM-RG2M004E30, TM-RU2M004E30 (Note 1, 2, 3)

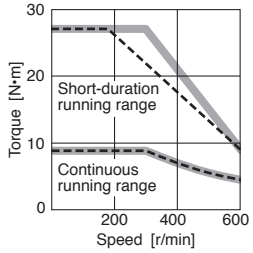


TM-RG2M004E30, TM-RU2M004E30 (Note 1, 2, 3, 4)

(when torque is increased)



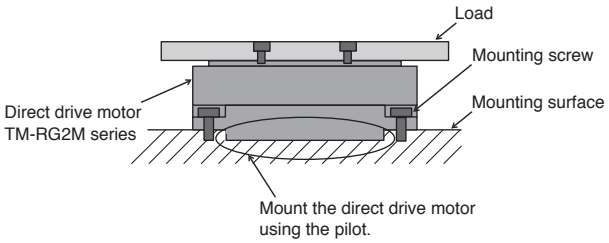
TM-RG2M009G30, TM-RU2M009G30 (Note 1, 2, 3)



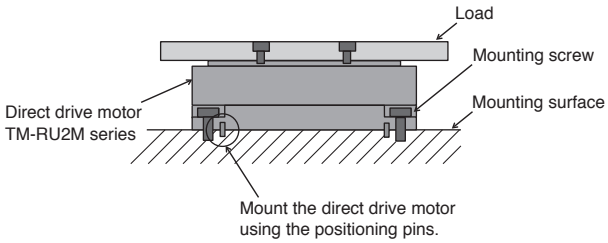
Notes: 1. ▬ : For 3-phase 200 V AC or 1-phase 230 V AC.
2. - - - - : For 1-phase 200 V AC or 1-phase 100 V AC.
3. Torque drops when the power supply voltage is below the specified value.
4. This value is applicable when the rated and maximum torques are increased with a combination with a larger-capacity servo amplifier. Refer to "Combinations of Direct Drive Motor and Servo Amplifier" on p. 4-2 in this catalog for the combinations.

Mounting of TM-RG2M/TM-RU2M Series

●Flange type (with pilot)



●Table type (with positioning pin holes)



Precautions when mounting the direct drive motor

- Fix the direct drive motor securely on a high-rigid mounting surface because a machine resonance may occur if the rigidity of the mounting surface is low.
- Fix the mounting screws of the direct drive motor and a rotating table securely to ensure enough rigidity.
- To ensure heat dissipation and accuracy, mount the direct drive motor on a high-rigid mounting surface which has enough heat dissipation area without gaps between the bottom of the direct drive motor and the mounting surface.
- The flange type has a higher mounting accuracy than the table type. When a high-mounting accuracy is required, select the flange type. Refer to "Direct Drive Motor Machine Accuracy" on p. 4-8 in this catalog for the machine accuracy of each direct drive motor, and refer to the dimensions in this catalog for the dimensional tolerance.

TM-RFM Series Specifications

Direct drive motor model		TM-RFM	002C20	004C20	006C20	006E20	012E20	018E20
Compatible servo amplifier model		MR-J4- / MR-J4W_-	Refer to "Combinations of Direct Drive Motor and Servo Amplifier" on p. 4-2 in this catalog.					
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	2.2	3.2	3.0	3.8	6.0
Maximum current		[A]	3.9	6.6	9.6	9.0	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 (Note 5)		[s]	±15			±12.5		
Speed/position detector			Absolute/incremental 20-bit encoder *3 (resolution: 1048576 pulses/rev)					
Thermistor			Built-in					
Insulation class			155 (F)					
Structure			Totally enclosed, natural cooling (IP rating: IP42) (Note 2)					
Environment *4, *8	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)					
	Ambient humidity		Operation: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)					
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust					
	Altitude		2000 m or less above sea level (Note 4)					
	Vibration resistance *5		X: 49 m/s^2 Y: 49 m/s^2					
Vibration rank			V10 *7					
Compliance with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 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 a gap along the rotor (output shaft) 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.
4. Refer to "TM-RFM TM-RG2M TM-RU2M Direct Drive Motor Instruction Manual" for the restrictions when using the direct drive motors at altitude exceeding 1000 m and up to 2000 m above sea level.
5. Absolute accuracy varies according to the mounting state of load and the surrounding environment.

Refer to "Annotations for Direct Drive Motor Specifications" on p. 4-8 in this catalog for the asterisks 1 to 8.

TM-RFM Series Specifications

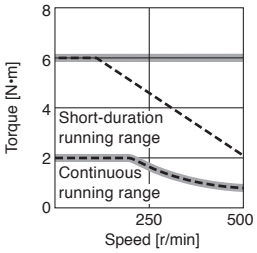
Direct drive motor model		TM-RFM	012G20	048G20	072G20	040J10	120J10	240J10
Compatible servo amplifier model		MR-J4- MR-J4W_-	Refer to "Combinations of Direct Drive Motor and Servo Amplifier" on p. 4-2 in this catalog.					
Motor outer diameter (frame dimensions)		[mm]	ø230			ø330		
Power supply capacity *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 (Note 5)		[s]	±12.5			±10		
Speed/position detector			Absolute/incremental 20-bit encoder *3 (resolution: 1048576 pulses/rev)					
Thermistor			Built-in					
Insulation class			155 (F)					
Structure			Totally enclosed, natural cooling (IP rating: IP42) (Note 2)					
Environment *4, *8	Ambient temperature		Operation: 0 °C to 40 °C (non-freezing), storage: -15 °C to 70 °C (non-freezing)					
	Ambient humidity		Operation: 10 %RH to 80 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)					
	Ambience		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust					
	Altitude		2000 m or less above sea level (Note 4)					
	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 with global standards			Refer to "Compliance with Global Standards and Regulations" on p. 55 in this catalog.					
Rotor permissible load *6	Moment load	[N•m]	93			350		
	Axial load	[N]	5500			16000		
Mass		[kg]	17	36	52	53	91	146

Notes: 1. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
2. Connectors and a gap along the rotor (output shaft) 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.
4. Refer to "TM-RFM TM-RG2M TM-RU2M Direct Drive Motor Instruction Manual" for the restrictions when using the direct drive motors at altitude exceeding 1000 m and up to 2000 m above sea level.
5. Absolute accuracy varies according to the mounting state of load and the surrounding environment.

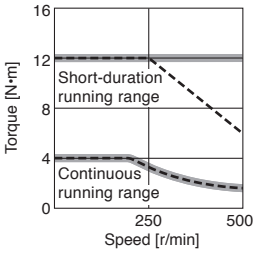
Refer to "Annotations for Direct Drive Motor Specifications" on p. 4-8 in this catalog for the asterisks 1 to 8.

TM-RFM Series Torque Characteristics

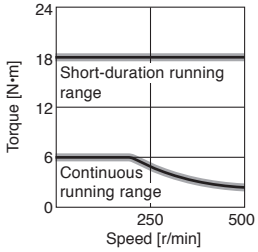
TM-RFM002C20 (Note 1, 2, 4)



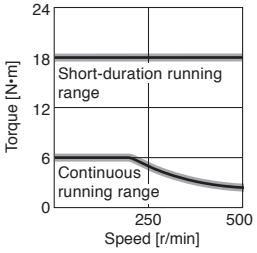
TM-RFM004C20 (Note 1, 2, 4)



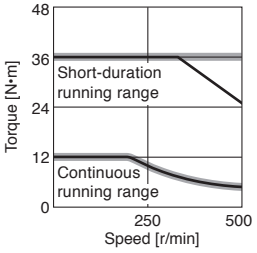
TM-RFM006C20 (Note 1, 3, 4)



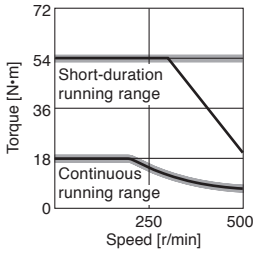
TM-RFM006E20 (Note 1, 3, 4)



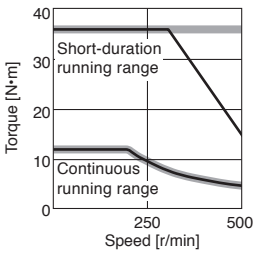
TM-RFM012E20 (Note 1, 3, 4)



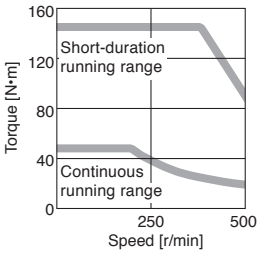
TM-RFM018E20 (Note 1, 3, 4)



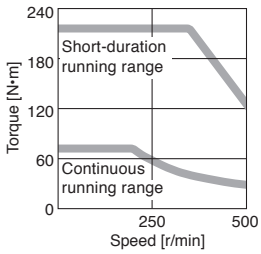
TM-RFM012G20 (Note 1, 3, 4)



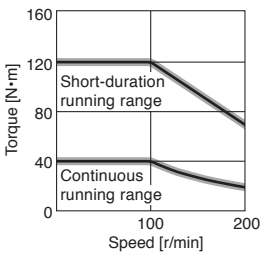
TM-RFM048G20 (Note 1, 4)



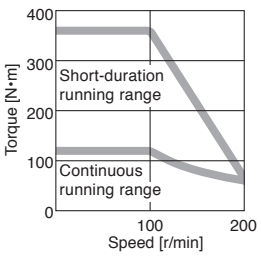
TM-RFM072G20 (Note 1, 4)



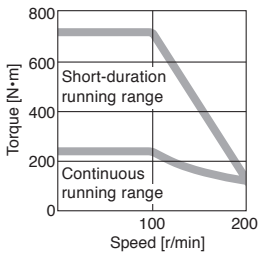
TM-RFM040J10 (Note 1, 3, 4)



TM-RFM120J10 (Note 1, 4)



TM-RFM240J10 (Note 1, 4)



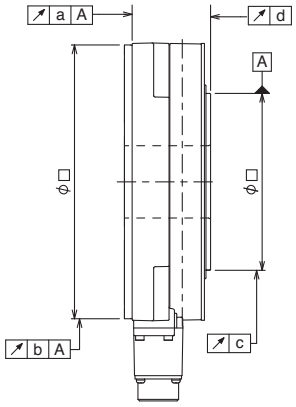
Notes: 1. ▬ : For 3-phase 200 V AC or 1-phase 230 V AC.
The following direct drive motors are compatible with 1-phase 230 V AC:
TM-RFM002C20, TM-RFM004C20, TM-RFM006C20, TM-RFM006E20, TM-RFM012E20, TM-RFM018E20, TM-RFM012G20, TM-RFM040J10
2. - - - - : For 1-phase 200 V AC or 1-phase 100 V AC.
3. ——— : For 1-phase 200 V AC.
4. Torque drops when the power supply voltage is below the specified value.

Direct Drive Motor Machine Accuracy

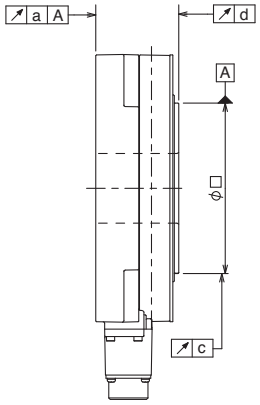
The machine accuracy related to the direct drive motor rotor (output shaft) and mounting is indicated below:

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

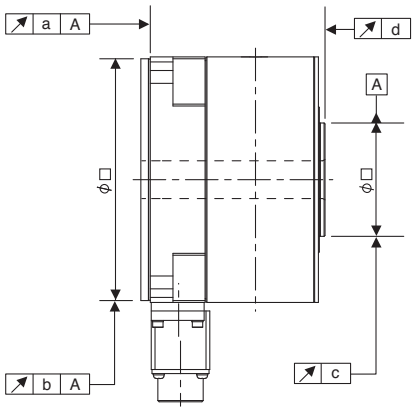
●TM-RG2M series



●TM-RU2M series

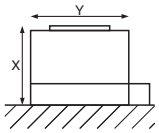


●TM-RFM series

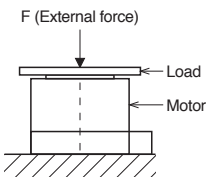


Annotations for Direct Drive Motor Specifications

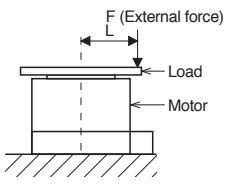
* 1. The power supply capacity varies depending on the power supply impedance.
The listed values are the power supply capacity for one servo motor. For the multi-axis servo amplifiers, calculate the power supply capacity with the equation below:
Power supply capacity [kVA] = Sum of power supply capacity [kVA] of the connected servo motors
* 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 permissible 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 drive system sizing software Motorizer. Refer to "Regenerative Option" in this catalog for the permissible regenerative power [W] when a regenerative option is used.
* 3. Be sure to connect the following options for absolute position detection system.
・MR-J4-GF: battery (MR-BAT6V1SET-A) and absolute position storage unit (MR-BTAS01)
・MR-J4-B/MR-J4-A: 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. Do not use the servo motors in the environment where the servo motors are exposed to oil mist, oil and/or water.
* 5. The vibration direction is shown in the diagram below. The numerical value indicates the maximum value of the component.
Fretting tends to occur on the bearing when the direct drive motor stops. Thus, maintain vibration level at approximately one-half of the allowable value.



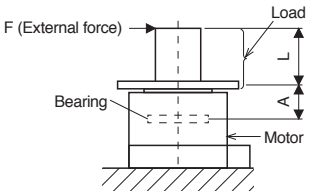
* 6. The following is calculation examples of axial and moment loads to the rotor (output shaft) of the direct drive motor. The axial and moment loads must be maintained equal to or below the permissible value.



Axial load
= F + Load mass



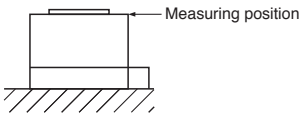
Axial load
= F + Load mass
Moment load
= F × L



Axial load = Load mass
Moment load = F × (L + A)

Motor outer diameter [mm] (Frame dimensions)	Dimension A [mm]	
	TM-RG2M series TM-RU2M series	TM-RFM series
ø130	20.6	19.1
ø180	20.7	20.2
ø230	18.0	24.4
ø330	-	32.5

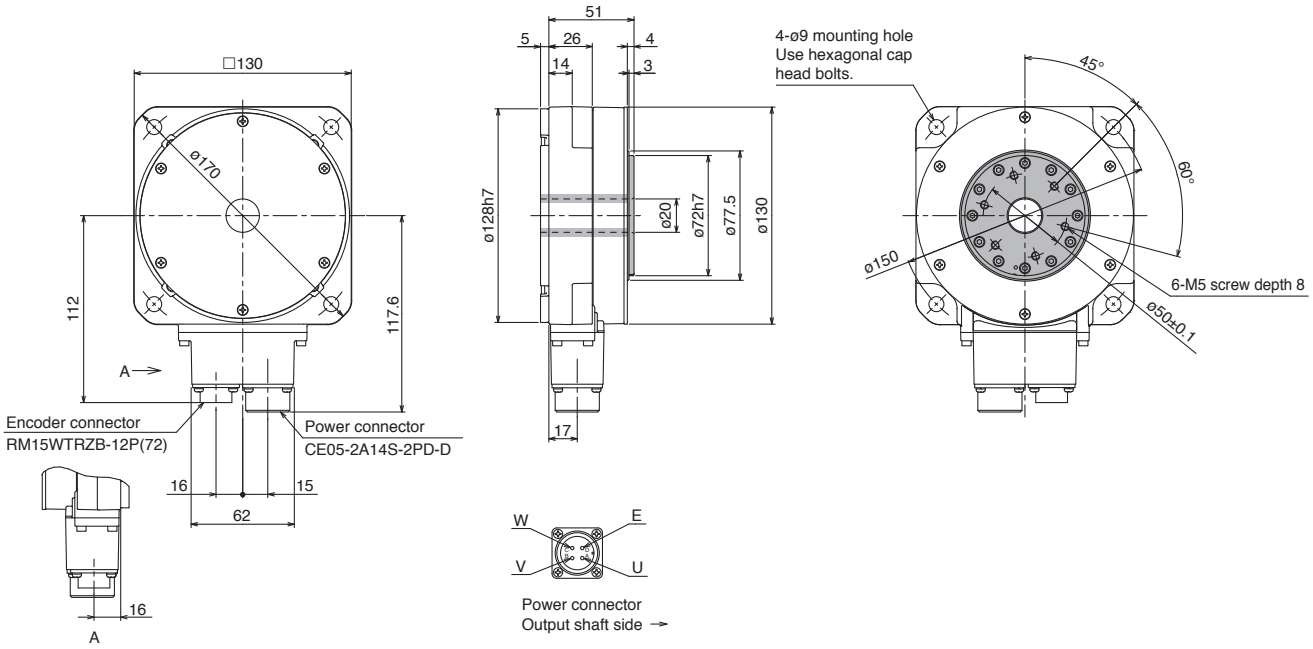
* 7. V10 indicates that the amplitude of the direct drive motor itself is 10 μm or less. The following shows mounting orientation and measuring position of the direct drive motor during the measurement:



* 8. Do not place any object (such as a magnet) which generates a magnetic force near the direct drive motor. If it is unavoidable, take a measure such as mounting a shielding plate and so on to cut off the magnetic force.

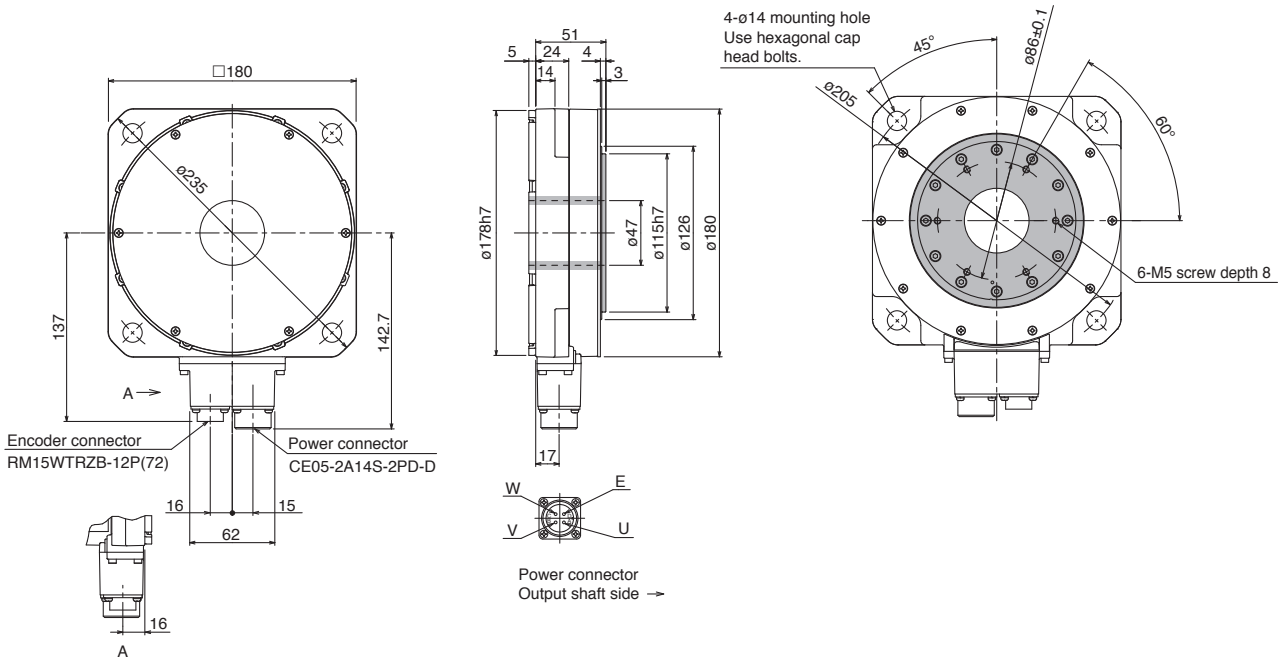
TM-RG2M Series Dimensions (Note 1, 2)

●TM-RG2M002C30



[Unit: mm]

●TM-RG2M004E30

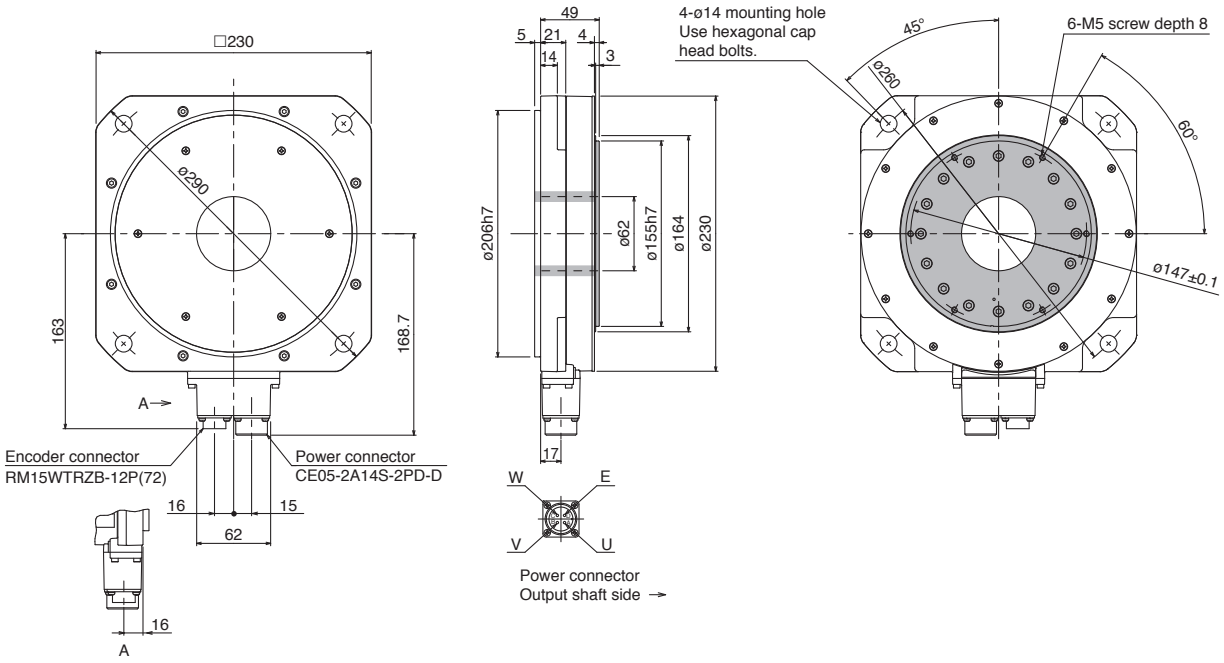


[Unit: mm]

Notes: 1. For dimensions without tolerance, general tolerance applies.
2. ▒ indicates rotor.

TM-RG2M Series Dimensions (Note 1, 2)

●TM-RG2M009G30

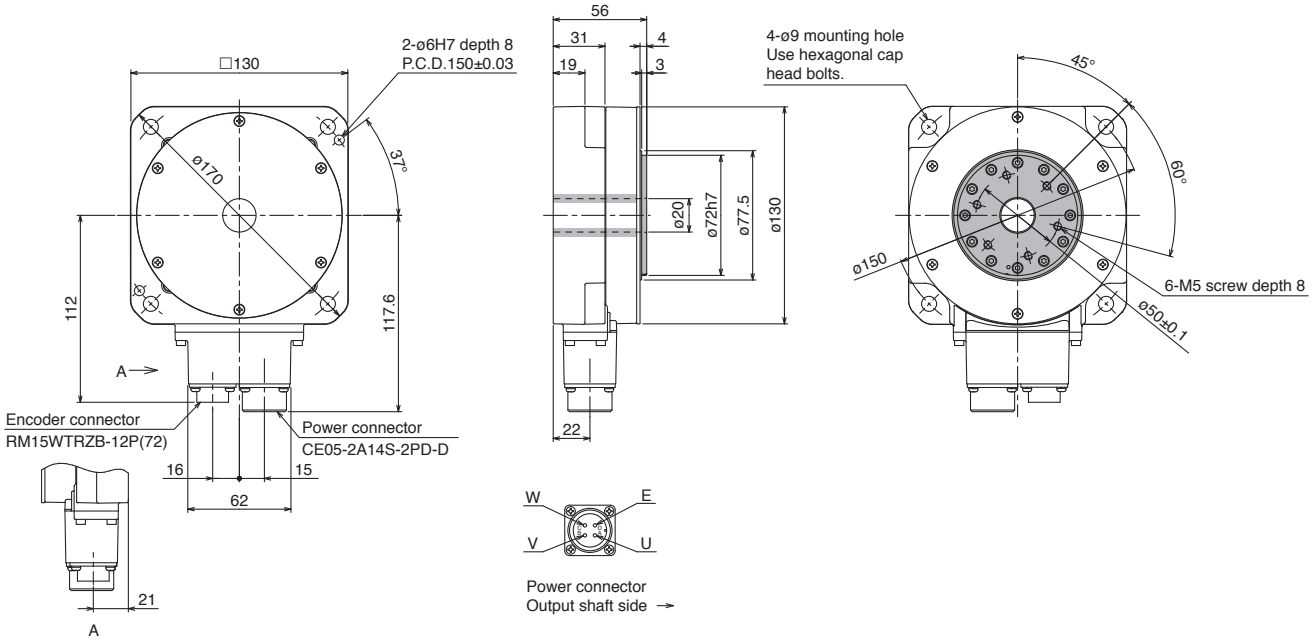


[Unit: mm]

Notes: 1. For dimensions without tolerance, general tolerance applies.
2. ▒ indicates rotor.

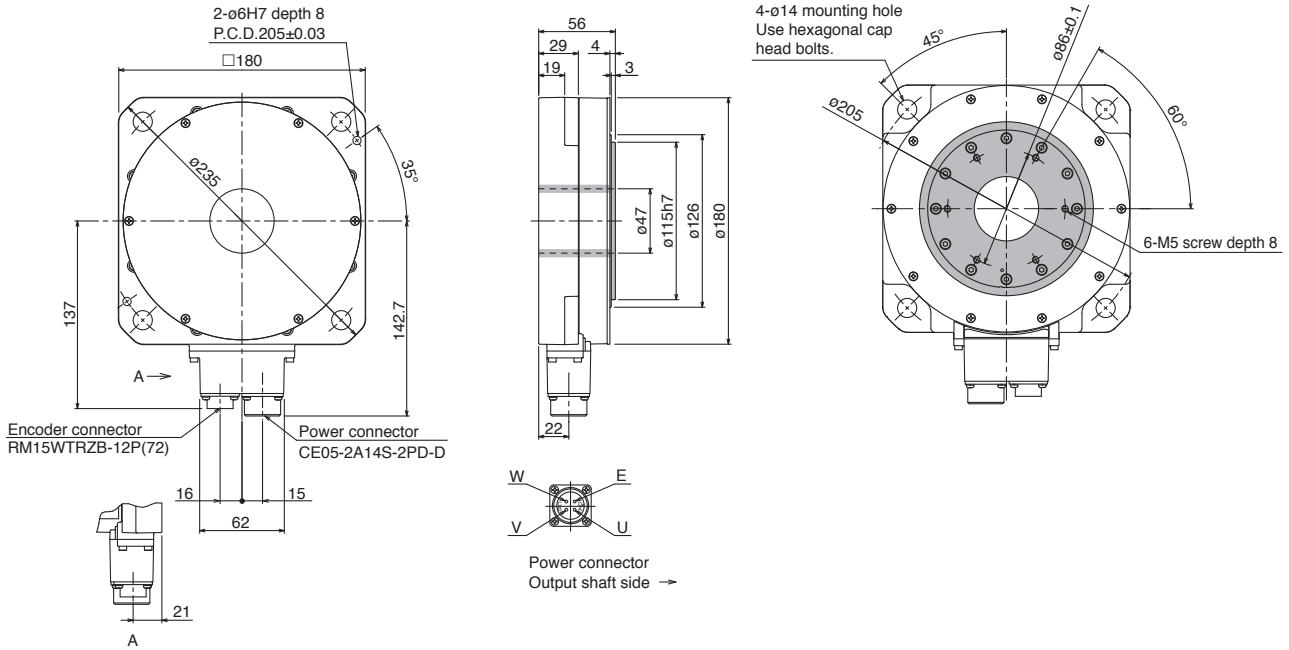
TM-RU2M Series Dimensions (Note 1, 2)

●TM-RU2M002C30



[Unit: mm]

●TM-RU2M004E30

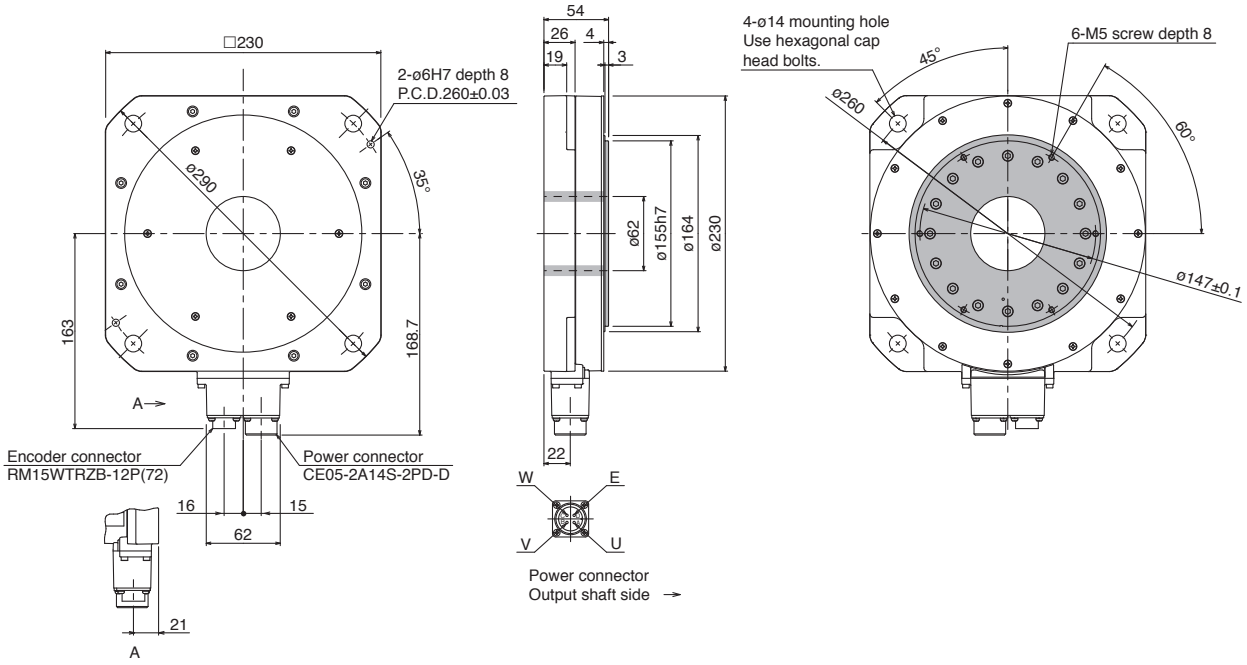


[Unit: mm]

Notes: 1. For dimensions without tolerance, general tolerance applies.
2. ▒ indicates rotor.

TM-RU2M Series Dimensions (Note 1, 2)

●TM-RU2M009G30

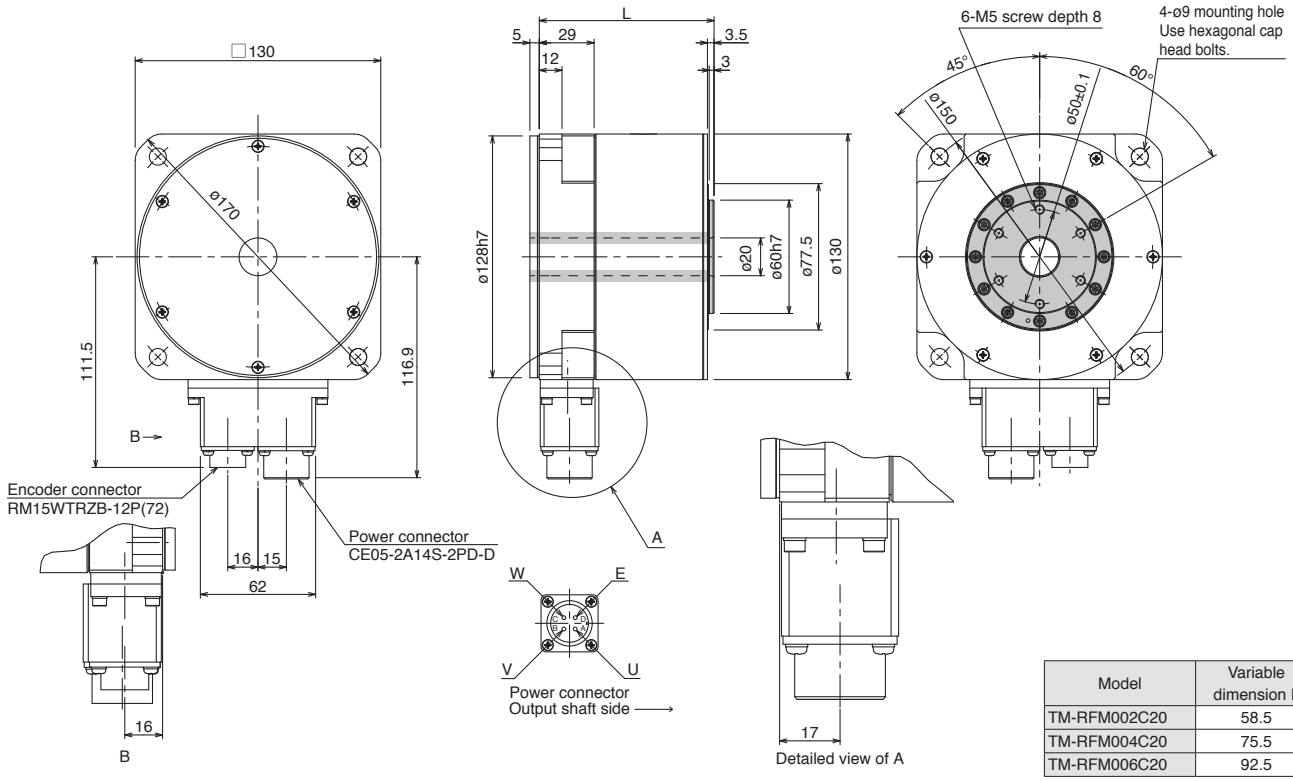


[Unit: mm]

Notes: 1. For dimensions without tolerance, general tolerance applies.
2. indicates rotor.

TM-RFM Series Dimensions (Note 1, 2)

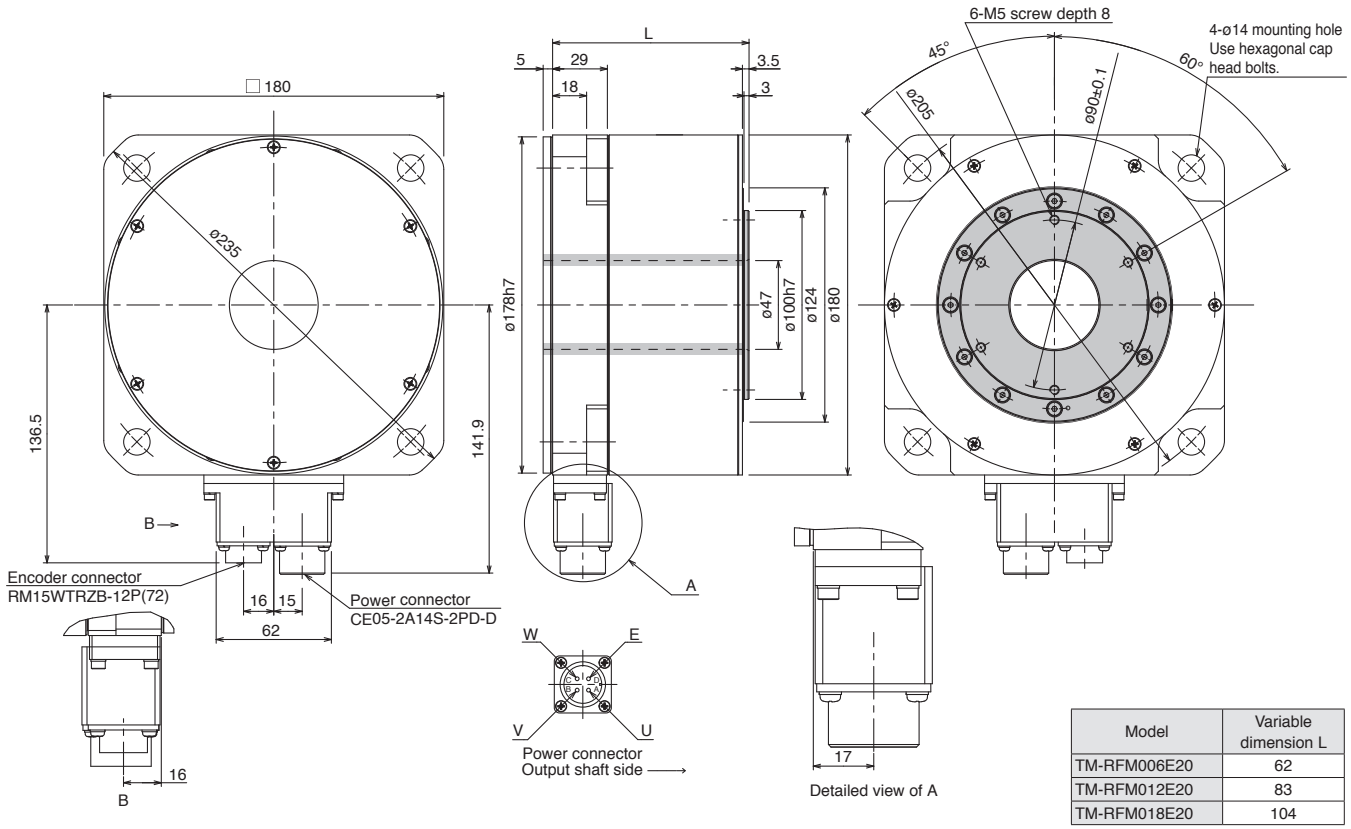
●TM-RFM002C20, TM-RFM004C20, TM-RFM006C20



Model	Variable dimension L
TM-RFM002C20	58.5
TM-RFM004C20	75.5
TM-RFM006C20	92.5

[Unit: mm]

●TM-RFM006E20, TM-RFM012E20, TM-RFM018E20



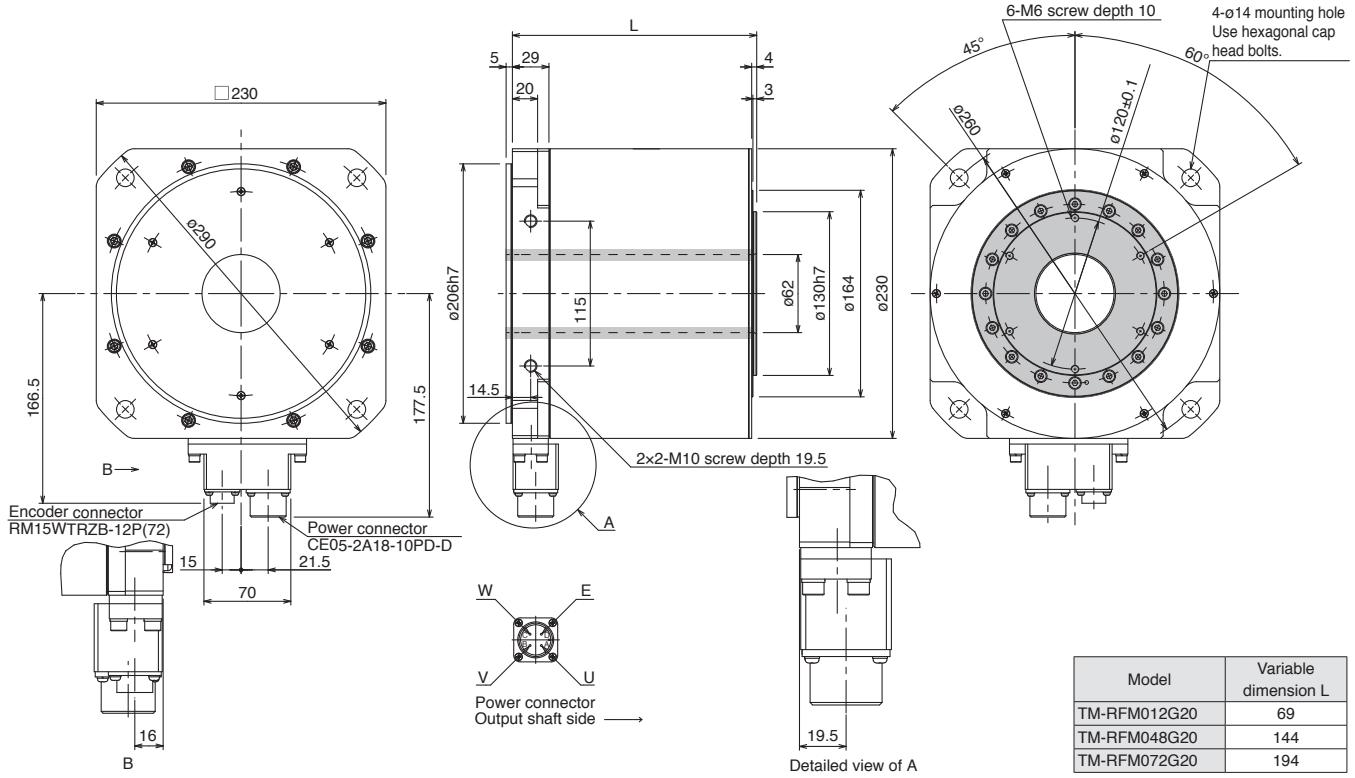
Model	Variable dimension L
TM-RFM006E20	62
TM-RFM012E20	83
TM-RFM018E20	104

[Unit: mm]

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)

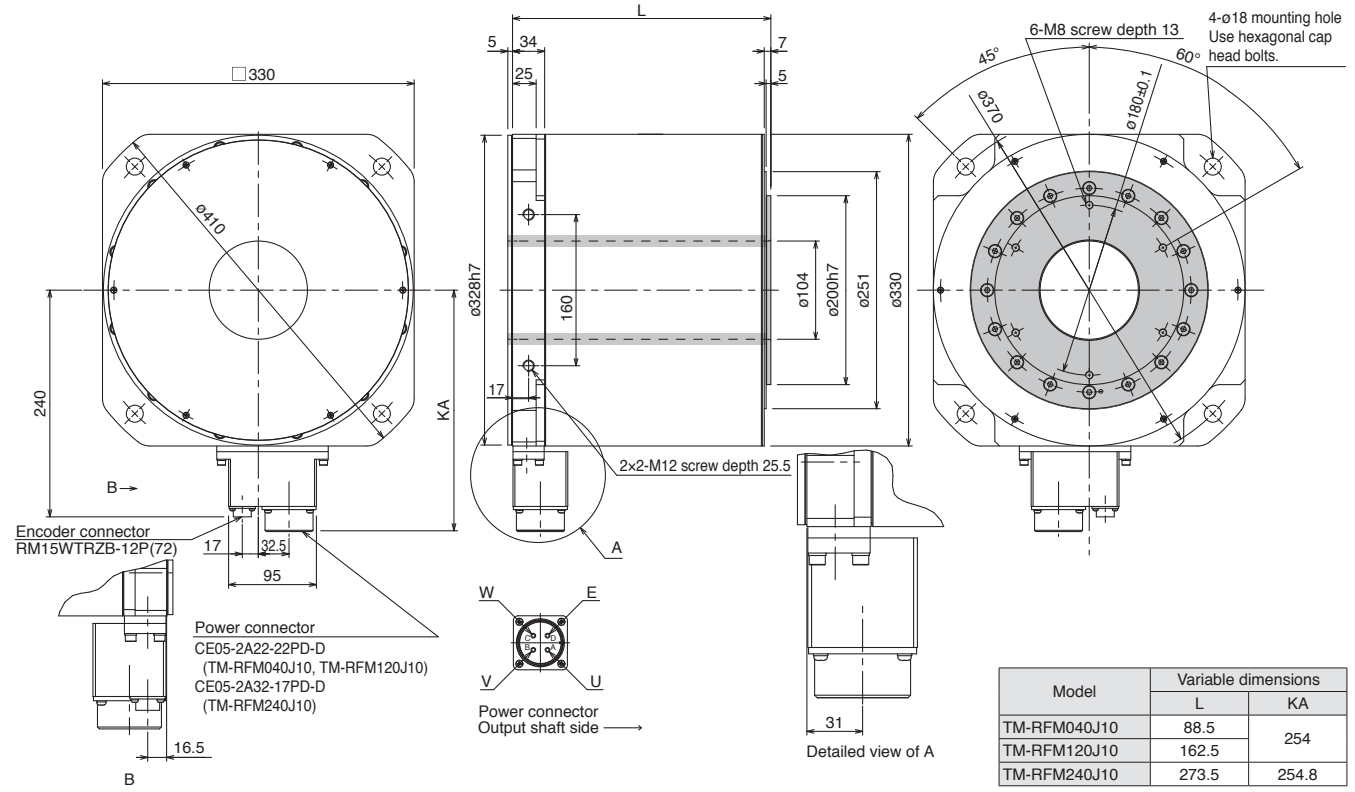
●TM-RFM012G20, TM-RFM048G20, TM-RFM072G20



Model	Variable dimension L
TM-RFM012G20	69
TM-RFM048G20	144
TM-RFM072G20	194

[Unit: mm]

●TM-RFM040J10, TM-RFM120J10, TM-RFM240J10



Model	Variable dimensions	
	L	KA
TM-RFM040J10	88.5	254
TM-RFM120J10	162.5	
TM-RFM240J10	273.5	254.8

[Unit: mm]

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

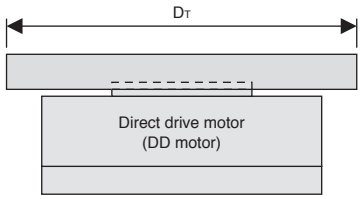


Table mass	W	= 19 kg
Rotation table diameter	D_T	= 300 mm
Rotation angle per cycle	θ	= 270 deg
Positioning time	t_0	= Within 0.45 s
Acceleration/deceleration time	$t_p = t_{psa} = t_{psd}$	= 0.125 s
Operating cycle	t_f	= 2.0 s
Load torque	T_L	= 0 N•m

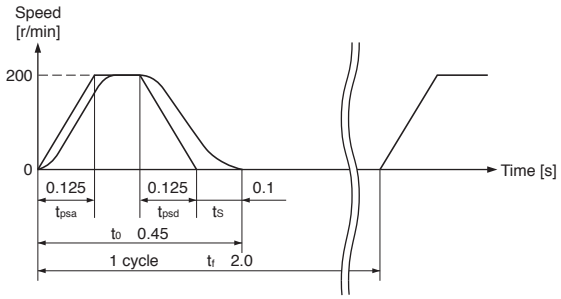
(2) Direct drive motor speed

$$N_0 = \frac{\theta}{360} \times \frac{60}{(t_0 - t_p - t_s)}$$

$$= \frac{270}{360} \times \frac{60}{(0.45 - 0.125 - 0.1)} = 200 \text{ r/min}$$

t_s: settling time. Here assumed 0.1 s.

(3) Operating pattern



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 × 10^{-4} kg•m^2)

(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.

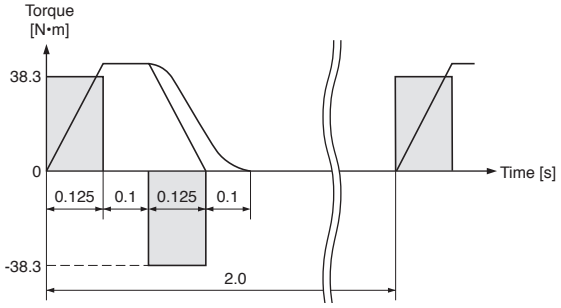
(5) Continuous effective load torque

$$T_{rms} = \sqrt{\frac{T_{Ma}^2 \times t_{psa} + T_L^2 \times t_c + T_{Md}^2 \times t_{psd}}{t_f}} = 13.5 \text{ N•m}$$

$$t_c = t_0 - t_s - t_{psa} - t_{psd}$$

Continuous effective load torque must be equal to or lower than the rated torque of the DD motor.

(6) Torque pattern



(7) Result

Select the following:

Direct drive motor: TM-RFM018E20

Servo amplifier: MR-J4-100B

[Drive System Sizing Software Motorizer]

Motorizer does all the calculations for you. Contact your local sales office for more details.

5 Options/Peripheral Equipment

Servo amplifier ●: Applicable

	GF	GF-RJ	B	B-RJ	B-RJ100	WB	A	A-RJ	
Introducing MELSERVO Model Selection System	●	●	●	●	●	●	●	●	5-1
Basic Cable Configurations for Servo Motors	●	●	●	●	●	●	●	●	5-2
Configuration Example for Servo Motors	●	●	●	●	●	●	●	●	5-4
Details of Option Connectors for Servo Motors	●	●	●	●	●	●	●	●	5-19
Products on the Market for Servo Motors	●	●	●	●	●	●	●	●	5-23
Configuration Example for MR-J4-_GF_(-RJ)	●	●							5-31
Configuration Example for MR-J4-_B_(-RJ)/MR-J4-DU_B_(-RJ)			●	●					5-32
Configuration Example for MR-J4-DU_B4-RJ100					●				5-33
Configuration Example for MR-J4W2-_B/MR-J4W3-_B						●			5-35
Configuration Example for MR-J4-_A_(-RJ)/MR-J4-DU_A_(-RJ)							●	●	5-36
Bus Bar			●	●	●				5-42
Configuration Example for MR-D30		●		●	●			●	5-44
Configuration Example for MR-J3-D05	●	●	●	●		●	●	●	5-44
Configuration Example for MR-D01								●	5-45
Details of Option Connectors for Servo Amplifiers/MR-D01/MR-D30/MR-J3-D05	●	●	●	●	●	●	●	●	5-46
Products on the Market for Servo Amplifiers	●	●	●	●	●	●	●	●	5-50
Functional Safety Unit		●		●	●			●	5-56
Safety Logic Unit	●	●	●	●		●	●	●	5-60
Extension IO Unit								●	5-62
Regenerative Option	●	●	●	●		●	●	●	5-64
Multifunction Regeneration Converter	●	●	●	●			●	●	5-70
Dynamic Brake	●	●	●	●	●		●	●	5-72
Battery	●	●	●	●	●	●	●	●	5-76
Battery for Junction Battery Cable and Junction Battery Cable	●	●	●	●	●		●	●	5-77
Battery Case and Battery	●	●	●	●		●	●	●	5-78
Absolute Position Storage Unit	●	●	●	●		●	●	●	5-79
Junction Terminal Block	●	●	●	●	●	●	●	●	5-80
Panel Through Attachment	●	●	●	●			●	●	5-82
Manual Pulse Generator								●	5-82
Parameter Unit					●		●	●	5-83
Radio Noise Filter/Line Noise Filter/Data Line Filter	●	●	●	●	●	●	●	●	5-84
Surge Killer	●	●	●	●	●	●	●	●	5-84
EMC Filter	●	●	●	●		●	●	●	5-85
Power Factor Improving Reactor	●	●	●	●	●	●	●	●	5-88
AC Reactor			●	●	●				5-94
Servo Support Software	●	●	●	●	●	●	●	●	5-95
Unit Conversion Table	●	●	●	●	●	●	●	●	5-97

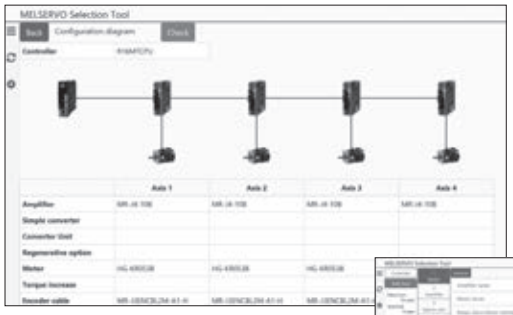
GF MR-J4-GF **GF-RJ** MR-J4-GF-RJ **B** MR-J4-B/MR-J4-DU_B **B-RJ** MR-J4-B-RJ/MR-J4-DU_B-RJ **B-RJ100** MR-J4-DU_B4-RJ100
WB MR-J4W2-B/MR-J4W3-B **A** MR-J4-A/MR-J4-DU_A **A-RJ** MR-J4-A-RJ/MR-J4-DU_A-RJ

* Note that options/peripheral equipment necessary for servo amplifiers with special specifications are the same as those for standard servo amplifiers. Refer to the servo amplifiers with the same rated output.
* Refer to p. 5-97 in this catalog for conversion of units.
* In this section, a term of servo amplifier includes a combination of drive unit and power regeneration converter unit or resistance regeneration converter unit.

Introducing MELSERVO Model Selection System

A new 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.



Configuration diagram window

In the configuration 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.

Servo motor selection 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.

Notes: 1. This system is designed for reference only. 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 option 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 letters in each list.

Capacity	Servo motor	Reference list		
		Encoder cable	Servo motor power cable	Electromagnetic brake cable (Note 1)
Ultra-small capacity	HG-AK	Column D in encoder cable list	Column D in servo motor power cable list	-
	HG-AK(B)	Column D in encoder cable list	Column E in servo motor power cable list	- (Note 3)
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	-	-
Ultra-large capacity	HG-JR 2000 r/min series 110 kW to 220 kW	Column E 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.
3. An electromagnetic brake cable is not required for HG-AK series as the power connector of servo motor has electromagnetic brake terminals.

Encoder cable list

	Cable length	IP rating (Note 1)	Cable lead out direction	Bending life (Note 2)	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-J3ENSCBL_M-H	pp. 5-12 and 5-13	
				Standard	Two types of cables are required: MR-J3JSCBL03M-A1-L, MR-J3ENSCBL_M-L		
			In opposite direction of load side	Long bending life	Two types of cables are required: MR-J3JSCBL03M-A2-L, MR-J3ENSCBL_M-H	pp. 5-12 and 5-13	
				Standard	Two types of cables are required: MR-J3JSCBL03M-A2-L, MR-J3ENSCBL_M-L		
B	2 m to 50 m	IP67	-	Long bending life	MR-J3ENSCBL_M-H	p. 5-13	Select one from this list.
	2 m to 30 m			Standard	MR-J3ENSCBL_M-L		
C	2 m to 50 m	IP67	-	Long bending life	MR-ENECBL_M-H-MTH	p. 5-14	-
D	1 m to 30 m	-	-	Long bending life	MR-J3W03ENCBL_M-A-H	p. 5-15	-
E	5 m to 50 m	IP67	-	Long bending life	MR-ENE4CBL_M-H-MTH	p. 5-15	-

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. Long bending life cables and standard cables are for moving parts and fixed parts respectively.

Servo motor power cable list

	Cable length	IP rating (Note 1)	Cable lead out direction	Bending life (Note 2)	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. 5-16	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. 5-16	
				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 (option cable).	p. 5-16	
			In opposite direction of load side		Connect a user-fabricated cable to MR-PWS2CBL03M-A2-L (option cable).	p. 5-16	

	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 (option connector set).	p. 5-16	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 (option connector set).	p. 5-16	
		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 (option connector set).	p. 5-16	
C	IP67	HG-RR103, 153, 203/ HG-UR72, 152	Fabricate a cable that fits to MR-PWCNS1 (option connector set).	p. 5-17	
		HG-RR353, 503/ HG-UR202, 352, 502	Fabricate a cable that fits to MR-PWCNS2 (option connector set).	p. 5-17	
D	-	HG-AK0136, 0236, 0336	MR-J4W03PWCBL_M-H	p. 5-17	-
E	-	HG-AK0136B, 0236B, 0336B	MR-J4W03PWBRCBL_M-H	p. 5-17	-

Electromagnetic brake cable list

	Cable length	IP rating (Note 1)	Cable lead out direction	Bending life (Note 2)	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. 5-18	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. 5-18	
				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 (option cable).	p. 5-18	
			In opposite direction of load side		Connect a user-fabricated cable to MR-BKS2CBL03M-A2-L (option cable).	p. 5-18	

	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 (option connector set) (straight type).	p. 5-18	Select one that is compatible with the servo motor.
			Fabricate a cable that fits to MR-BKCNS1A or MR-BKCNS2A (option connector set) (angle type).	p. 5-18	
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 (option connector set).	p. 5-18	

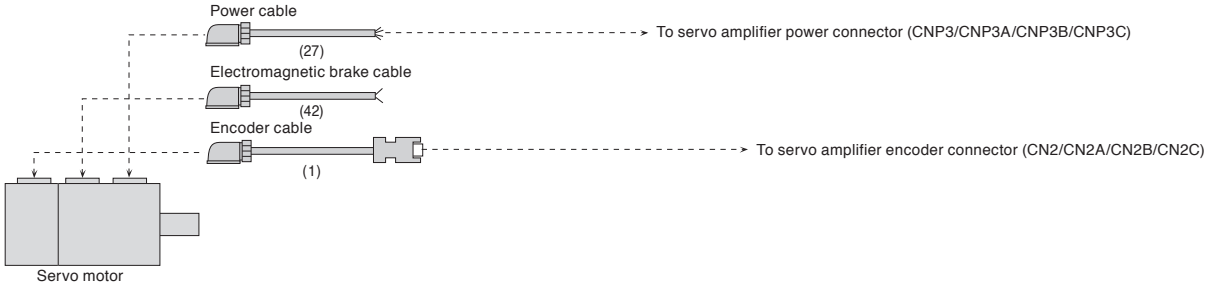
Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.
2. Long bending life cables and standard cables are for moving parts and fixed parts respectively.

Configuration Example for Servo Motors

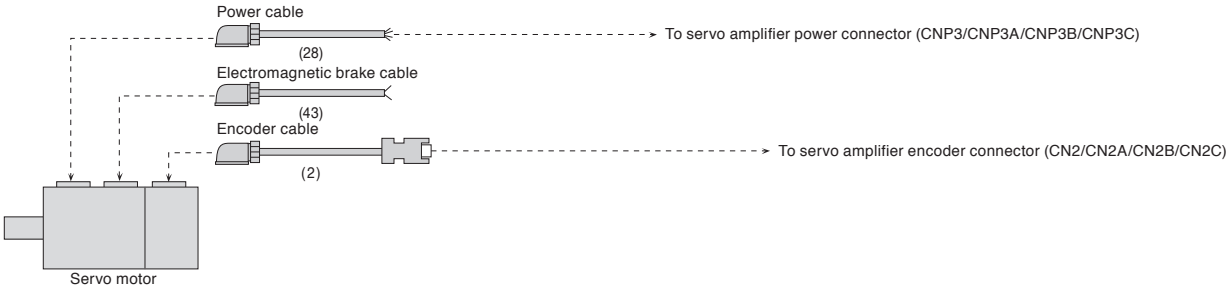
GF | GF-RJ | B | B-RJ | WB | A | A-RJ

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 4)

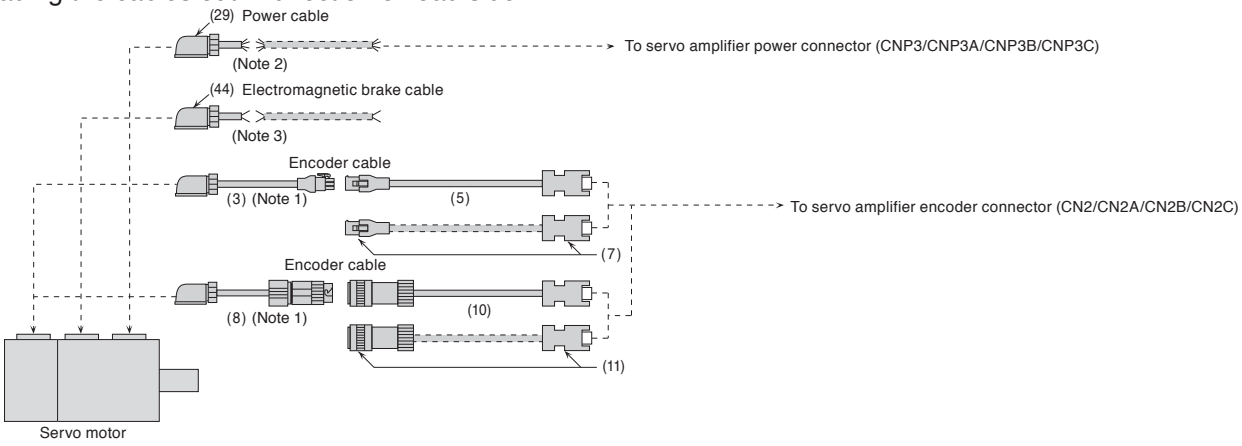


●For leading the cables out in opposite direction of load side (Note 4)

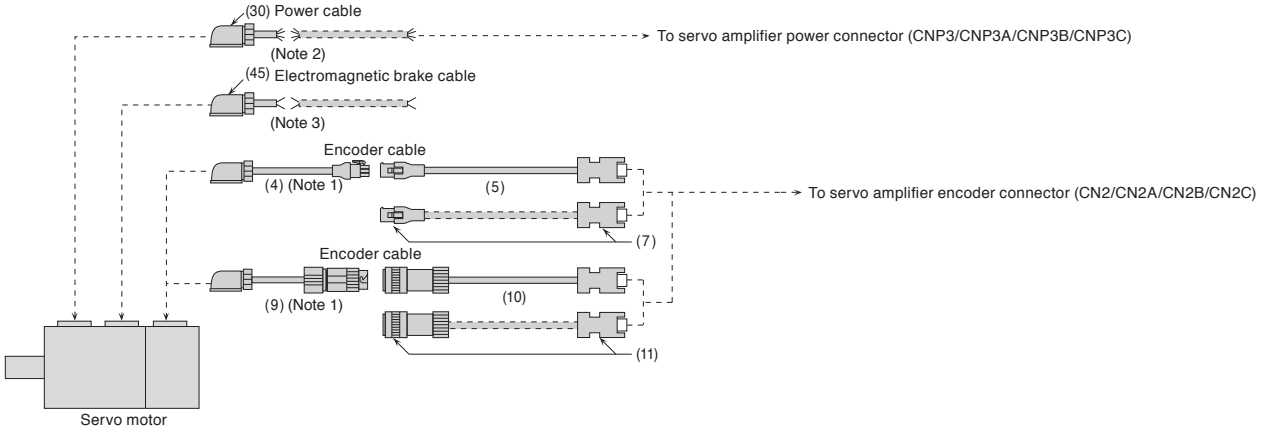


For HG-KR/HG-MR rotary servo motor series: encoder cable length over 10 m (Note 5)

●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)

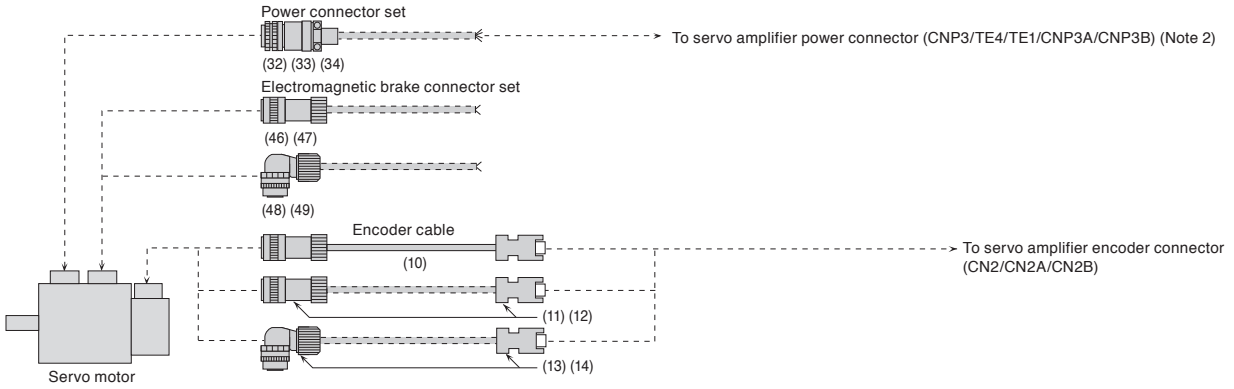


Notes: 1. This cable does not have a long bending life. Thus, be sure to fix the cable before using.
2. Relay a cable using MR-PWS2CBL03M-A1-L or MR-PWS2CBL03M-A2-L. This cable does not have a long bending life. Thus, be sure to fix the cable before using.
3. Relay a cable using MR-BKS2CBL03M-A1-L or 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.

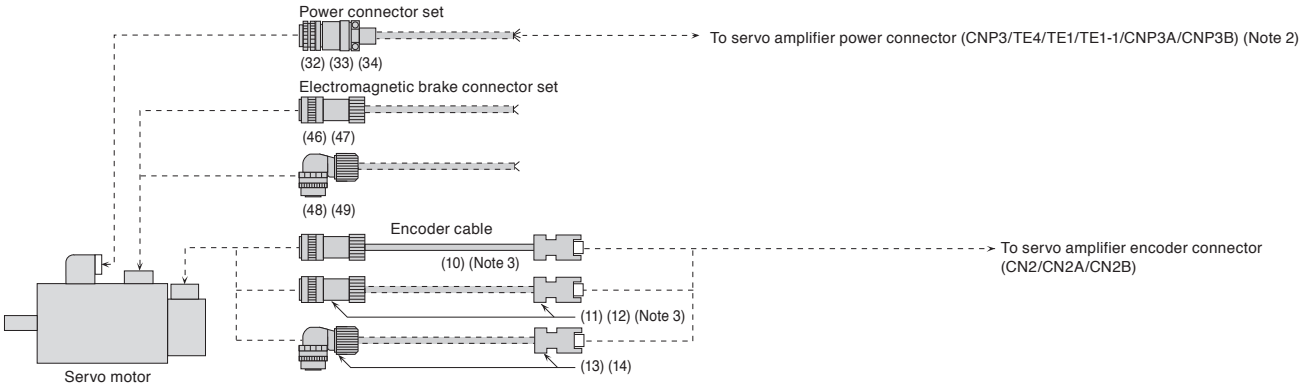
Configuration Example for Servo Motors (Note 1)

GF | GF-RJ | B | B-RJ | WB | A | A-RJ

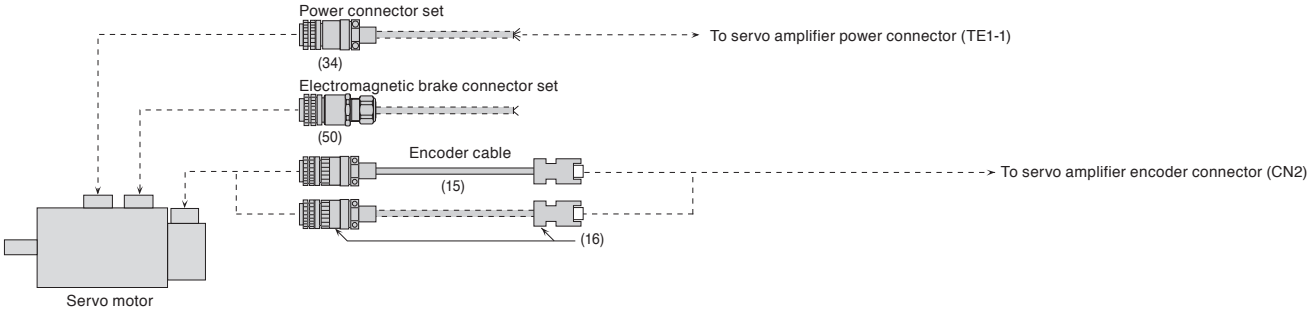
For HG-SR rotary servo motor series



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)

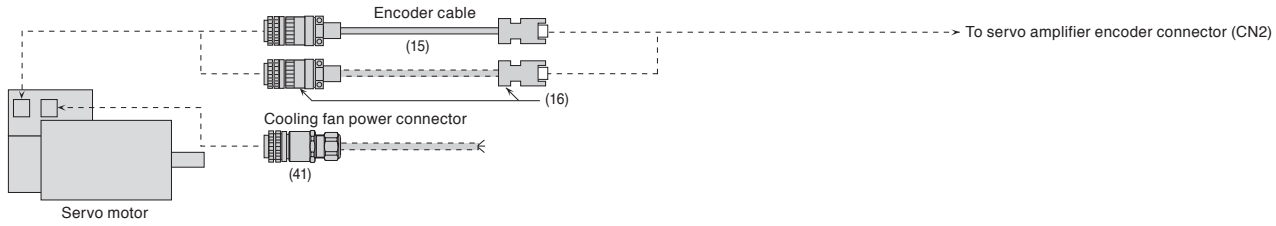


Notes: 1. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction Manual for fabricating the cables.
2. The connector for U, V, and W varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
3. For HG-JR703(B)/HG-JR7034(B)/HG-JR903(B)/HG-JR9034(B), straight types of (10), (11), and (12) cannot be used. Use an angle type of (13) or (14).

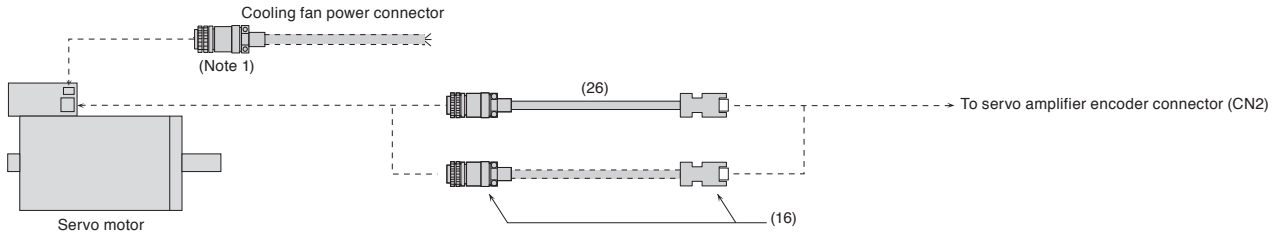
Configuration Example for Servo Motors (Note 5)

GF GF-RJ B B-RJ B-RJ100 WB A A-RJ

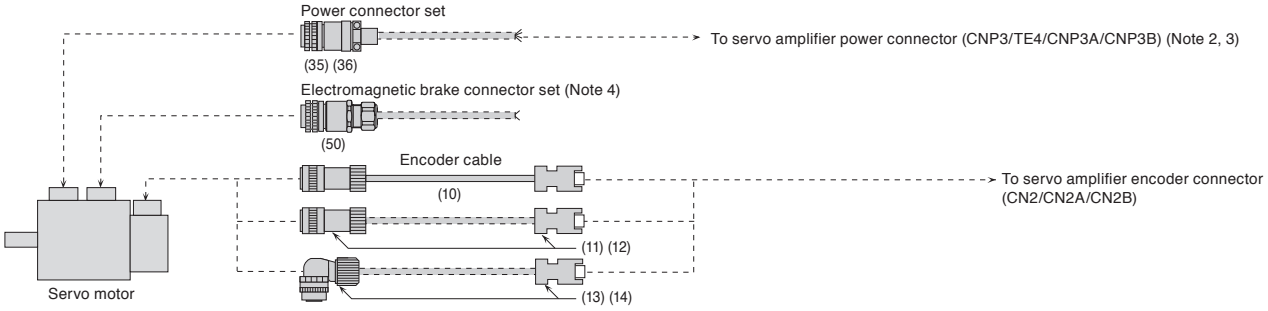
For HG-JR rotary servo motor 1000 r/min series (15 kW to 37 kW) and 1500 r/min series (22 kW to 55 kW)



For HG-JR rotary servo motor 2000 r/min series



For HG-RR/HG-UR rotary servo motor series

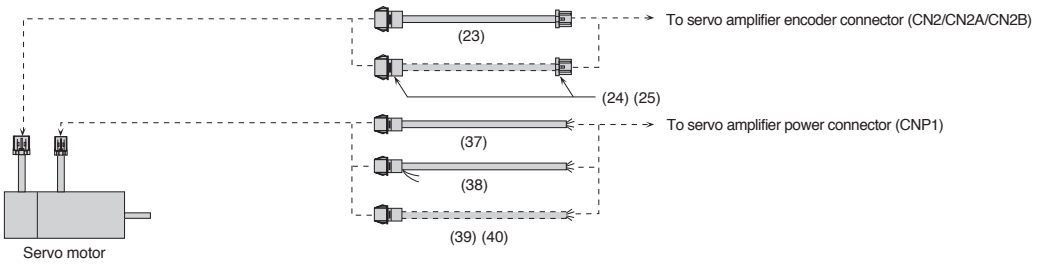


Notes: 1. Refer to "Products on the Market for Servo Motors" on p. 5-30 in this catalog for these connectors.
2. The connector for U, V, and W varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
3. HG-RR series is compatible only with the 1-axis servo amplifier.
4. 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.
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 2)

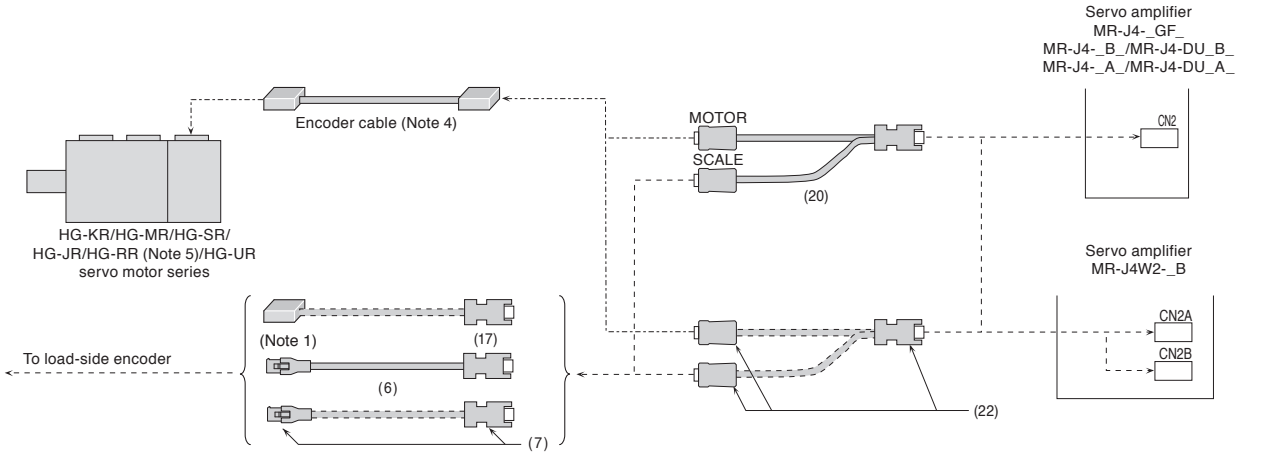
For HG-AK rotary servo motor series

WB A A-RJ



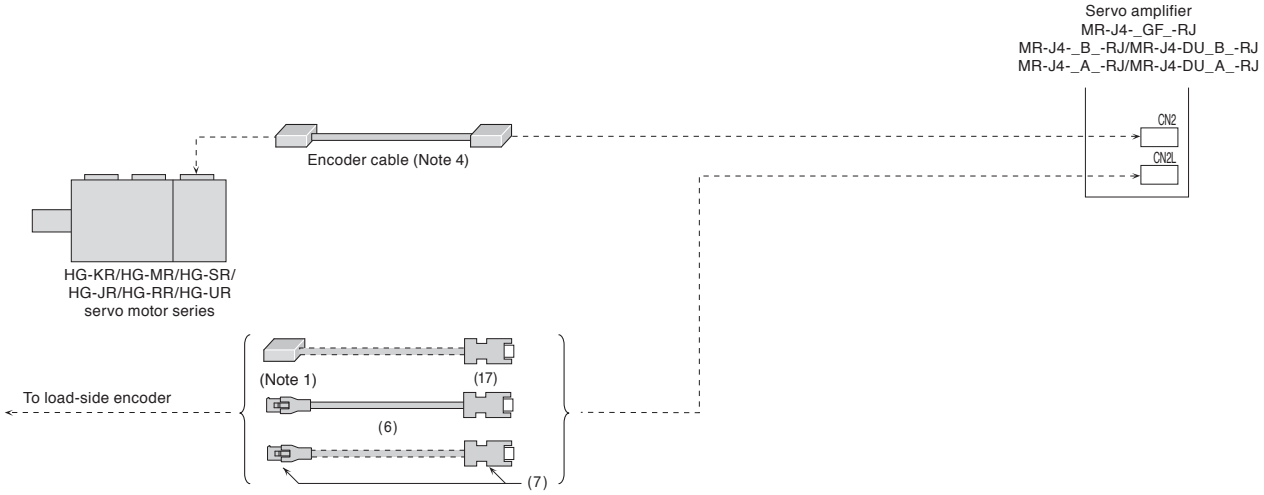
For fully closed loop control
(MR-J4-GF/B/A, MR-J4-DU_B/A, or MR-J4W2-B, and rotary servo motor) (Note 3)

GF B WB A



For fully closed loop control
(MR-J4-GF-RJ/B-RJ/A-RJ or MR-J4-DU_B-RJ/A-RJ, and rotary servo motor) (Note 3)

GF-RJ B-RJ A-RJ



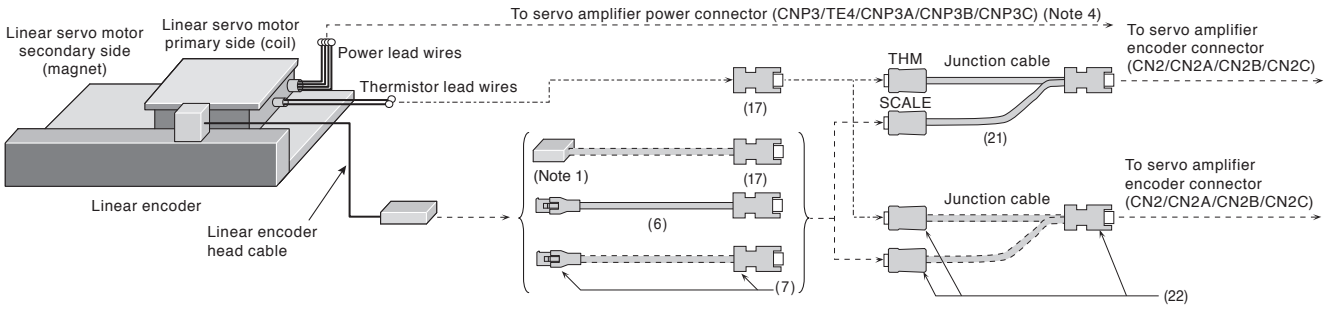
Notes: 1. Contact the relevant linear encoder manufacturers for connectors to connect with the head cables.
2. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction Manual for fabricating the cables.
3. Connections other than mentioned are the same as those for each rotary servo motor. Refer to cables and connectors for relevant servo motors in this catalog.
4. Necessary encoder cables vary depending on the servo motor series. Refer to cables and connectors for relevant servo motors in this catalog.
5. HG-RR series is compatible only with the 1-axis servo amplifier.

Configuration Example for Servo Motors (Note 3)

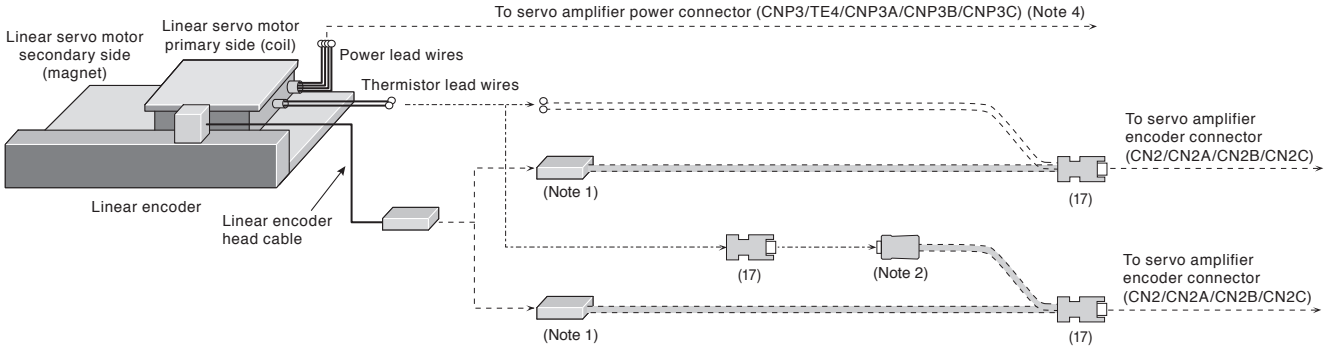
GF B WB A

For MR-J4-GF/B/A or MR-J4W_-B, and LM-H3/LM-K2/LM-U2 linear servo motor series

●When using a junction cable for linear servo motor

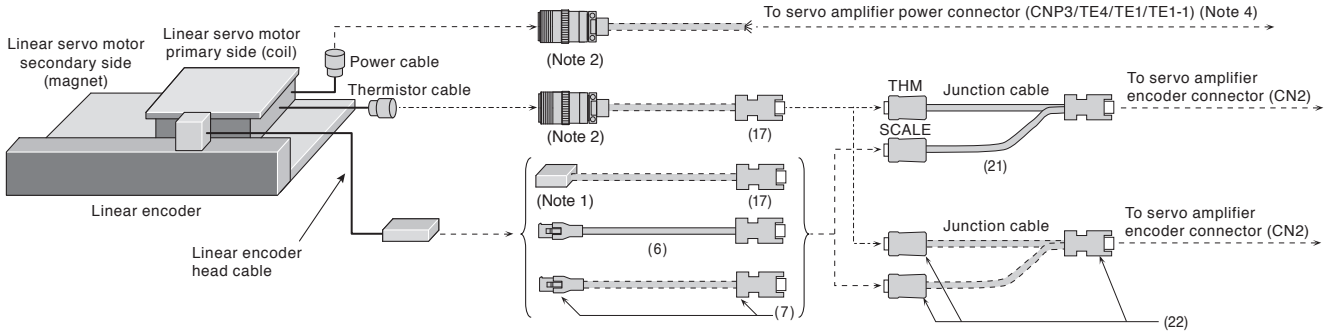


●When not using a junction cable for linear servo motor

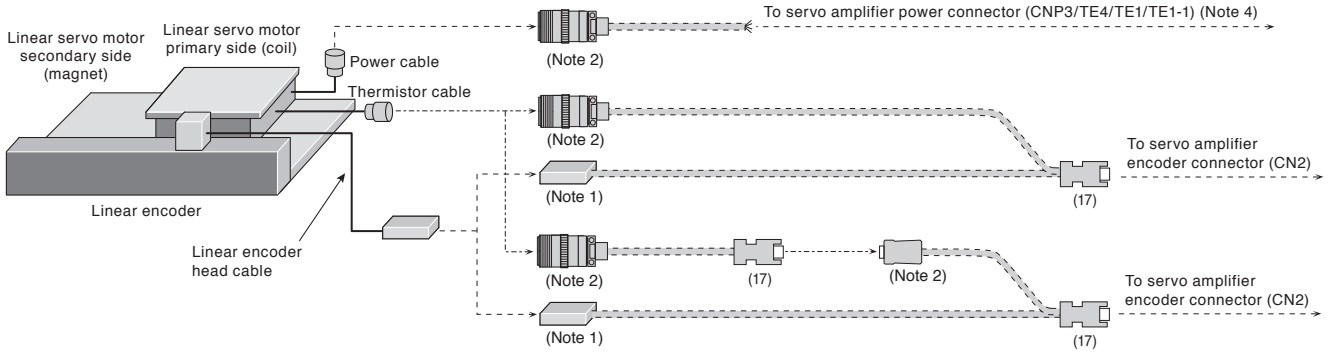


For MR-J4-GF/B/A and LM-F linear servo motor series

●When using a junction cable for linear servo motor



●When not using a junction cable for linear servo motor



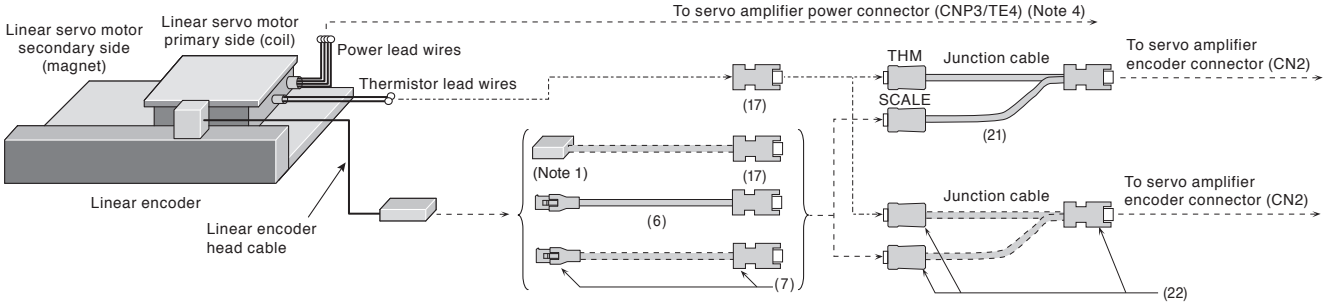
Notes: 1. Contact the relevant linear encoder manufacturers for connectors to connect with the head cables.
2. Refer to "Products on the Market for Servo Motors" in this catalog for these connectors.
3. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction 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)

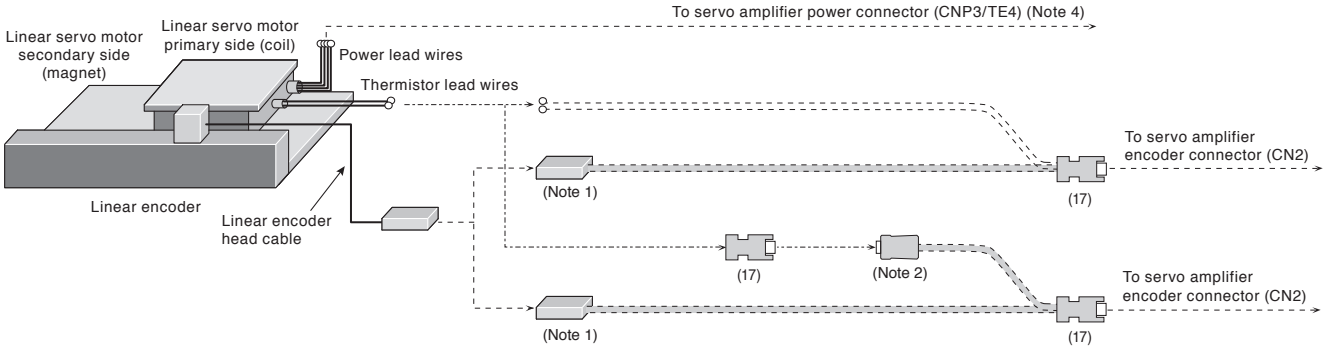
GF-RJ B-RJ A-RJ

For MR-J4-GF-RJ/B-RJ/A-RJ and LM-H3/LM-K2/LM-U2 linear servo motor series with a serial linear encoder

●When using a junction cable for linear servo motor

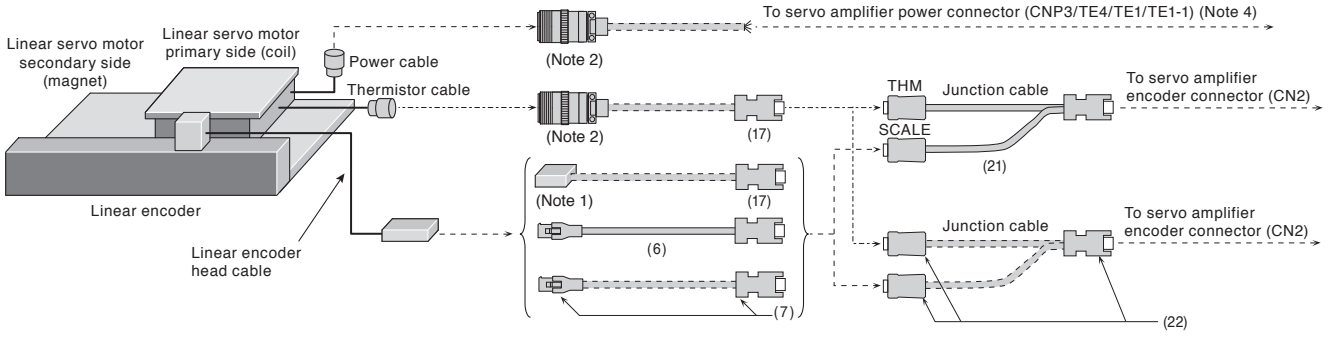


●When not using a junction cable for linear servo motor

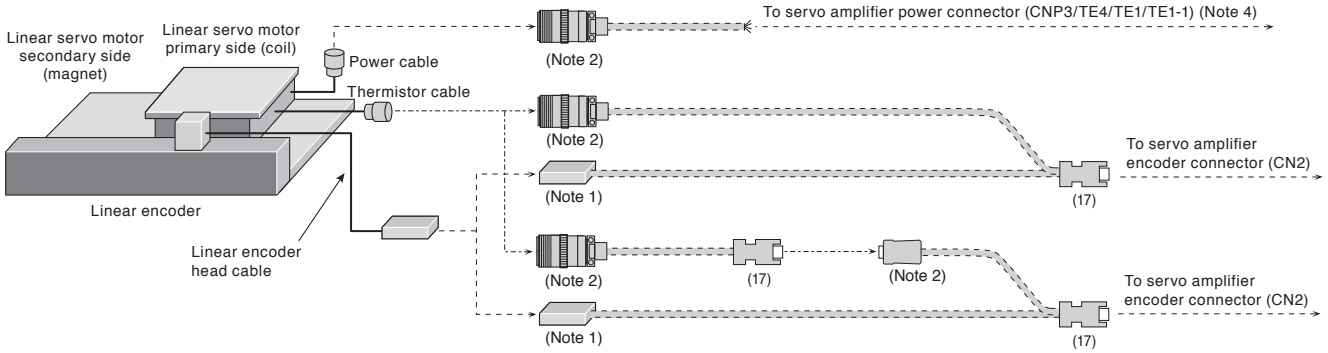


For MR-J4-GF-RJ/B-RJ/A-RJ and LM-F linear servo motor series with a serial linear encoder

●When using a junction cable for linear servo motor



●When not using a junction cable for linear servo motor

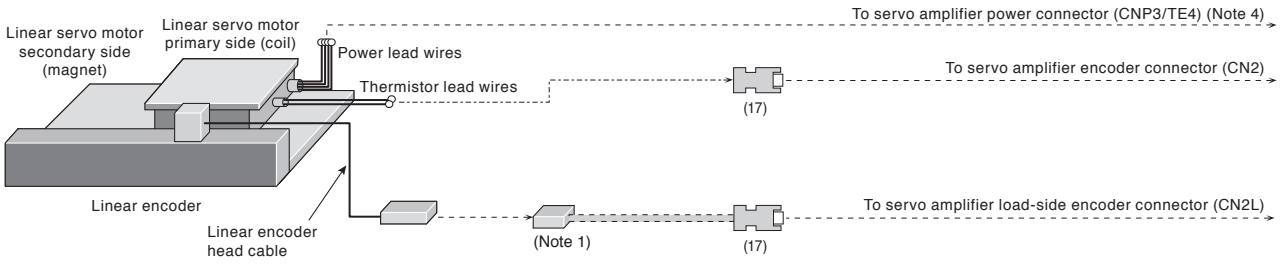


Notes: 1. Contact the relevant linear encoder manufacturers for connectors to connect with the head cables.
2. Refer to "Products on the Market for Servo Motors" in this catalog for these connectors.
3. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction 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.

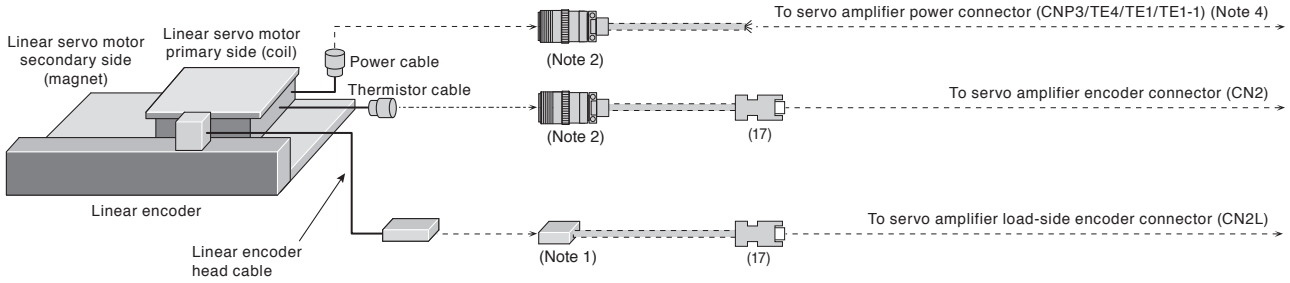
Configuration Example for Servo Motors (Note 3)

GF-RJ B-RJ A-RJ

For MR-J4-GF-RJ/B-RJ/A-RJ and LM-H3/LM-K2/LM-U2 linear servo motor series with an A/B/Z-phase differential output type linear encoder



For MR-J4-GF-RJ/B-RJ/A-RJ and LM-F linear servo motor series with an A/B/Z-phase differential output type linear encoder



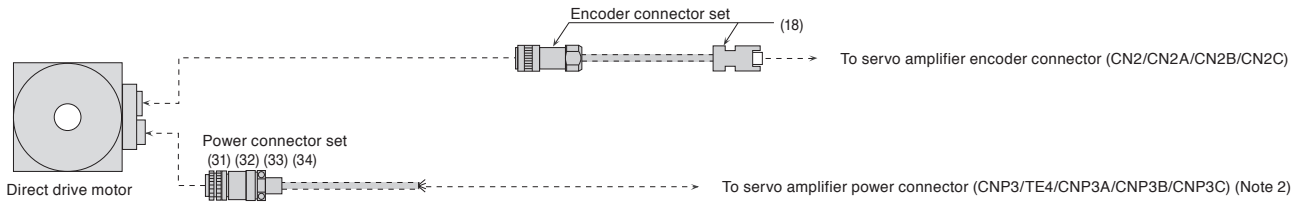
Notes: 1. Contact the relevant linear encoder manufacturers for connectors to connect with the head cables.
2. Refer to "Products on the Market for Servo Motors" in this catalog for these connectors.
3. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction 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)

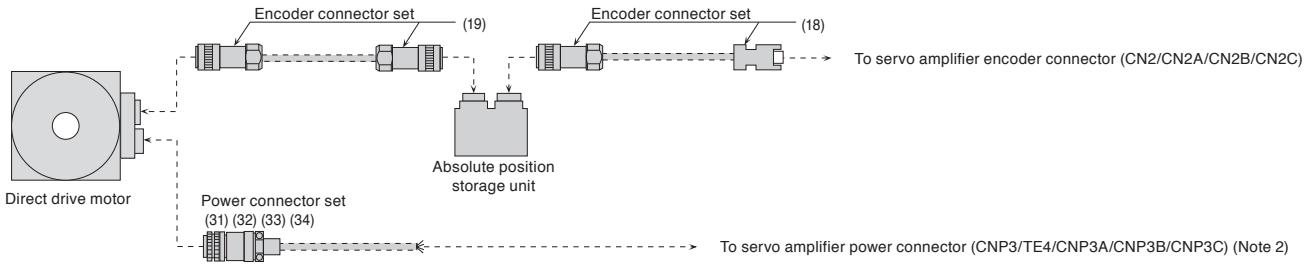
GF | GF-RJ | B | B-RJ | WB | A | A-RJ

For TM-RG2M/TM-RU2M/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 Option Connectors for Servo Motors" in this catalog for the detailed models.
Encoder cables are not subject to European Low Voltage Directive (50 V AC to 1000 V AC and 75 V DC to 1500 V DC).

	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)	Encoder connector / Servo amplifier connector
		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-J3JCBL03M-A1-L *1	0.3 m	IP20	For HG-KR/HG-MR (junction type)	Encoder connector / Junction connector Use this in combination with (5) or (7).
(4)	Encoder cable (Note 2) (opposite to load-side lead)	MR-J3JCBL03M-A2-L *1	0.3 m	IP20	For HG-KR/HG-MR (junction type)	
(5)	Encoder cable (Note 2)	MR-EKCBL20M-H *1	20 m	IP20	For HG-KR/HG-MR (junction type)	Junction connector / Servo amplifier connector Use this in combination with (3) or (4).
		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	Junction connector / Servo amplifier connector
		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	Junction connector (Note 6) / Servo amplifier connector (Note 6) Use this in combination with (3) or (4) for HG-KR/HG-MR series. Applicable cable Wire size: AWG 26 to 22 Cable OD: 7 mm to 9 mm
(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)	Encoder connector / Junction connector Use this in combination with (10) or (11).
(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)	

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 or MR-ECNM to connect to an output cable for AT343A, AT543A-SC or AT545A-SC scales manufactured by Mitutoyo Corporation.
6. The crimping tool (91529-1) manufactured by TE Connectivity Ltd. Company is required. Contact the manufacturer directly.

For unlisted lengths

*1. For unlisted lengths of the cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS SERVICE SECTION (Email: osb.webmaster@melsc.jp)

Cables and Connectors for Servo Motor Encoder

Refer to "Details of Option Connectors for Servo Motors" in this catalog for the detailed models.
Encoder cables are not subject to European Low Voltage Directive (50 V AC to 1000 V AC and 75 V DC to 1500 V DC).

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(10)	Encoder cable (Note 2)	MR-J3ENSCBL2M-H *1	2 m	IP67	For HG-KR/HG-MR (junction type) For HG-SR/ HG-JR53, 73, 103, 153, 203, 353, 503, 534, 734, 1034, 1534, 2034, 3534, 5034, 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.
		MR-J3ENSCBL5M-H *1	5 m			
		MR-J3ENSCBL10M-H *1	10 m			
		MR-J3ENSCBL20M-H *1	20 m			
		MR-J3ENSCBL30M-H *1	30 m			
		MR-J3ENSCBL40M-H *1	40 m			
		MR-J3ENSCBL50M-H *1	50 m			
		MR-J3ENSCBL2M-L *1	2 m			
		MR-J3ENSCBL5M-L *1	5 m			
		MR-J3ENSCBL10M-L *1	10 m			
		MR-J3ENSCBL20M-L *1	20 m			
		MR-J3ENSCBL30M-L *1	30 m			
(11)	Encoder connector set (Note 5) (one-touch connection type)	MR-J3SCNS	-	IP67	For HG-KR/HG-MR (junction type) For HG-SR/ HG-JR53, 73, 103, 153, 203, 353, 503, 534, 734, 1034, 1534, 2034, 3534, 5034, 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 mm² (AWG 20) or smaller Cable OD: 5.5 mm to 9.0 mm (Note 4)
(12)	Encoder connector set (Note 3, 5) (screw type)	MR-ENCNS2 *2	-	IP67	For HG-SR/ HG-JR53, 73, 103, 153, 203, 353, 503, 534, 734, 1034, 1534, 2034, 3534, 5034, HG-RR/HG-UR (straight type)	Encoder connector / Servo amplifier connector Applicable cable Wire size: 0.5 mm² (AWG 20) or smaller Cable OD: 5.5 mm to 9.0 mm (Note 4)
(13)	Encoder connector set (Note 5) (one-touch connection type)	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 mm² (AWG 20) or smaller Cable OD: 5.5 mm to 9.0 mm (Note 4)
(14)	Encoder connector set (Note 3, 5) (screw type)	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 contacts 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 SERVICE SECTION (Email: osb.webmaster@melsc.jp)
*2. For fabricating encoder cables with these connectors, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS SERVICE SECTION (Email: osb.webmaster@melsc.jp)

Cables and Connectors for Servo Motor Encoder

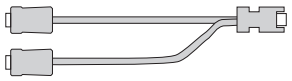
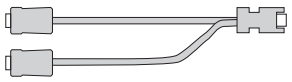
Refer to "Details of Option Connectors for Servo Motors" in this catalog for the detailed models.
Encoder cables are not subject to European Low Voltage Directive (50 V AC to 1000 V AC and 75 V DC to 1500 V DC).

	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	Encoder connector Servo amplifier connector
		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, 110K24W0C, 150K24W0C, 180K24W0C, 200K24W0C, 220K24W0C	Encoder connector Servo amplifier connector Applicable cable Wire size: 0.3 mm² to 1.25 mm² (AWG 22 to 16) Cable OD: 6.8 mm to 10 mm
(17)	Encoder connector set	MR-J3CN2	-	-	For connecting load-side encoder, linear encoder, or thermistor	Servo amplifier connector
(18)	Encoder connector set	MR-J3DDCNS	-	IP67	For TM-RG2M/ TM-RU2M/TM-RFM (connecting direct drive motor and servo amplifier, or absolute position storage unit and servo amplifier)	Encoder connector or absolute position storage unit connector Servo amplifier connector Applicable cable Wire size: 0.25 mm² to 0.5 mm² (AWG 23 to 20) Cable OD: 7.8 mm to 8.2 mm
(19)	Encoder connector set	MR-J3DDSPS	-	IP67	For TM-RG2M/ TM-RU2M/TM-RFM (connecting direct drive motor and absolute position storage unit)	Encoder connector Absolute position storage unit connector Applicable cable Wire size: 0.25 mm² to 0.5 mm² (AWG 23 to 20) Cable OD: 7.8 mm to 8.2 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/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.

Cables and Connectors for Servo Motor Encoder

Refer to "Details of Option Connectors for Servo Motors" in this catalog for the detailed models.
Encoder cables are not subject to European Low Voltage Directive (50 V AC to 1000 V AC and 75 V DC to 1500 V DC).

	Item	Model	Cable length	IP rating (Note 3)	Application	Description
(20)	Junction cable for fully closed loop control (Note 2)	MR-J4FCCBL03M	0.3 m	-	For branching load-side encoder	Junction connector Servo amplifier connector 
(21)	Junction cable for linear servo motor (Note 2)	MR-J4THCBL03M	0.3 m	-	For branching thermistor	Junction connector Servo amplifier connector 
(22)	Connector set	MR-J3THMCN2	-	-	For fully closed loop control or branching thermistor	Junction connector Servo amplifier connector
(23)	Encoder cable	MR-J3W03ENCBL1M-A-H *1	1 m	-	For HG-AK	Encoder connector Servo amplifier connector
		MR-J3W03ENCBL2M-A-H *1	2 m			
		MR-J3W03ENCBL5M-A-H *1	5 m			
		MR-J3W03ENCBL10M-A-H *1	10 m			
		MR-J3W03ENCBL20M-A-H *1	20 m			
		MR-J3W03ENCBL30M-A-H *1	30 m			
(24)	Encoder connector set (Qty: 2 sets)	MR-J3W03CN2-2P *2	-	-	For HG-AK	Encoder connector (Note 1) Servo amplifier connector (Note 1) Applicable cable Wire size: 0.2 mm² to 0.38 mm² (AWG 24 to 22) Insulator OD: 1.11 mm to 1.53 mm
(25)	Encoder connector set (Qty: 20 sets)	MR-J3W03CN2-20P *2	-	-	For HG-AK	
(26)	Encoder cable	MR-ENE4CBL5M-H-MTH	5 m	IP67	For HG-JR110K24W0C, 150K24W0C, 180K24W0C, 200K24W0C, 220K24W0C	Encoder connector Drive unit connector
		MR-ENE4CBL10M-H-MTH	10 m			
		MR-ENE4CBL20M-H-MTH	20 m			
		MR-ENE4CBL30M-H-MTH	30 m			
		MR-ENE4CBL40M-H-MTH	40 m			
		MR-ENE4CBL50M-H-MTH	50 m			

Notes: 1. The crimping tool (1762846-1) manufactured by TE Connectivity Ltd. Company is required for the servo amplifier connector, and the crimping tool (YRS-8861) manufactured by J.S.T Mfg. Co., Ltd is required for the encoder connector. Contact the manufacturer directly.
2. 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.
3. 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 unlisted lengths and fabricating cables

*1. For unlisted lengths of the cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS SERVICE SECTION (Email: osb.webmaster@melsc.jp)
*2. For fabricating encoder cables with these connectors, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS SERVICE SECTION (Email: osb.webmaster@melsc.jp)

Cables and Connectors for Servo Motor Power

Refer to "Details of Option Connectors for Servo Motors" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(27)	Power cable (Note 2) (load-side lead)	MR-PWS1CBL2M-A1-H *1	2 m	IP65	For HG-KR/HG-MR (direct connection type)	Power connector Lead-out * The cable is not shielded.
		MR-PWS1CBL5M-A1-H *1	5 m			
		MR-PWS1CBL10M-A1-H *1	10 m			
		MR-PWS1CBL2M-A1-L *1 (Note 3)	2 m			
		MR-PWS1CBL5M-A1-L *1 (Note 3)	5 m			
		MR-PWS1CBL10M-A1-L *1 (Note 3)	10 m			
(28)	Power cable (Note 2) (opposite to load-side lead)	MR-PWS1CBL2M-A2-H *1	2 m	IP65	For HG-KR/HG-MR (direct connection type)	
		MR-PWS1CBL5M-A2-H *1	5 m			
		MR-PWS1CBL10M-A2-H *1	10 m			
		MR-PWS1CBL2M-A2-L *1 (Note 3)	2 m			
		MR-PWS1CBL5M-A2-L *1 (Note 3)	5 m			
		MR-PWS1CBL10M-A2-L *1 (Note 3)	10 m			
(29)	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 * The cable is not shielded.
(30)	Power cable (Note 2) (opposite to load-side lead)	MR-PWS2CBL03M-A2-L	0.3 m	IP55	For HG-KR/HG-MR (junction type)	
(31)	Power connector set	MR-PWCNF *2	-	IP67	For TM-RG2M_/ TM-RU2M_/ TM-RFM_C20/ TM-RFM_E20	Power connector Applicable cable Wire size: 0.3 mm² to 1.25 mm² (AWG 22 to 16) Cable OD: 8.3 mm to 11.3 mm
(32)	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 mm² to 3.5 mm² (AWG 14 to 12) Cable OD: 10.5 mm to 14.1 mm
(33)	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 mm² to 8 mm² (AWG 10 to 8) Cable OD: 12.5 mm to 16 mm
(34)	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 mm² to 22 mm² (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 SERVICE SECTION (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 SERVICE SECTION (Email: osb.webmaster@melsc.jp)

Cables and Connectors for Servo Motor Power

Refer to "Details of Option Connectors for Servo Motors" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(35)	Power connector set	MR-PWCNS1 *2	-	IP67	For HG-RR103, 153, 203/ HG-UR72, 152	Power connector Applicable cable Wire size: 2 mm² to 3.5 mm² (AWG 14 to 12) Cable OD: 9.5 mm to 13 mm
(36)	Power connector set	MR-PWCNS2 *2	-	IP67	For HG-RR353, 503/ HG-UR202, 352, 502	Power connector Applicable cable Wire size: 5.5 mm² to 8 mm² (AWG 10 to 8) Cable OD: 13 mm to 15.5 mm
(37)	Servo motor power cable (for standard servo motor)	MR-J4W03PWCBL1M-H *1	1 m	-	For HG-AK	Power connector
		MR-J4W03PWCBL2M-H *1	2 m			
		MR-J4W03PWCBL5M-H *1	5 m			
		MR-J4W03PWCBL10M-H *1	10 m			
		MR-J4W03PWCBL20M-H *1	20 m			
		MR-J4W03PWCBL30M-H *1	30 m			
(38)	Servo motor power cable (for the servo motor with electromagnetic brake)	MR-J4W03PWBRCBL1M-H *1	1 m	-	For HG-AK	Power connector
		MR-J4W03PWBRCBL2M-H *1	2 m			
		MR-J4W03PWBRCBL5M-H *1	5 m			
		MR-J4W03PWBRCBL10M-H *1	10 m			
		MR-J4W03PWBRCBL20M-H *1	20 m			
		MR-J4W03PWBRCBL30M-H *1	30 m			
(39)	Servo motor power connector set (Qty: 2 pcs)	MR-J4W03CNP2-2P *2	-	-	For HG-AK	Power connector (Note 2) Applicable cable Wire size: 0.34 mm² to 0.75 mm² (AWG 22 to 19) Insulator OD: 1.4 mm to 1.9 mm
(40)	Servo motor power connector set (Qty: 20 pcs)	MR-J4W03CNP2-20P *2	-	-		

Cables and Connectors for Servo Motor Cooling Fan Power

Refer to "Details of Option Connectors for Servo Motors" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(41)	Cooling fan power connector set	MR-PWCNF *2	-	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 mm² to 1.25 mm² (AWG 22 to 16) Cable OD: 8.3 mm to 11.3 mm

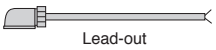
Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.
2. The crimping tool (YRF-1120) manufactured by J.S.T. Mfg. Co., Ltd is required. Contact the manufacturer directly.

For unlisted lengths and fabricating cables

*1. For unlisted lengths of the cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS SERVICE SECTION (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 SERVICE SECTION (Email: osb.webmaster@melsc.jp)

Cables and Connectors for Servo Motor Electromagnetic Brake

Refer to "Details of Option Connectors for Servo Motors" in this catalog for the detailed models.

	Item	Model	Cable length	IP rating (Note 1)	Application	Description
(42)	Electromagnetic brake cable (Note 2) (load-side lead)	MR-BKS1CBL2M-A1-H *1	2 m	IP65	For HG-KR/HG-MR (direct connection type)	Electromagnetic brake connector  Lead-out * The cable is not shielded.
		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			
(43)	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)	
		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			
(44)	Electromagnetic brake cable (Note 2) (load-side lead)	MR-BKS2CBL03M-A1-L	0.3 m	IP55	For HG-KR/HG-MR (junction type)	Electromagnetic brake connector Lead-out * The cable is not shielded.
(45)	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)	
(46)	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)	Electromagnetic brake connector Applicable cable Wire size: 1.25 mm² (AWG 16) or smaller Cable OD: 9.0 mm to 11.6 mm
(47)	Electromagnetic brake connector set (Note 3, 4) (screw type)	MR-BKCNS2 *2	-	IP67		
(48)	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)	Electromagnetic brake connector Applicable cable Wire size: 1.25 mm² (AWG 16) or smaller Cable OD: 9.0 mm to 11.6 mm
(49)	Electromagnetic brake connector set (Note 3, 4) (screw type)	MR-BKCNS2A *2	-	IP67		
(50)	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)	Electromagnetic brake connector Applicable cable Wire size: 0.3 mm² to 1.25 mm² (AWG 22 to 16) Cable OD: 5.0 mm to 8.3 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.
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 contacts for other plugs may damage the connector. Be sure to use the enclosed contacts.

For unlisted lengths and fabricating cables

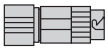
*1. For unlisted lengths of the cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS SERVICE SECTION (Email: osb.webmaster@melsc.jp)
*2. For fabricating servo motor power cables or electromagnetic brake cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS SERVICE SECTION (Email: osb.webmaster@melsc.jp)

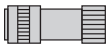
Details of Option Connectors for Servo Motors

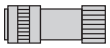
Model	Encoder connector	Servo amplifier connector
MR-J3ENCBL_M-A1-H (Note 2) MR-J3ENCBL_M-A1-L (Note 2) MR-J3ENCBL_M-A2-H (Note 2) MR-J3ENCBL_M-A2-L (Note 2)	 2174053-1 (TE Connectivity Ltd. Company)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex, LLC)

Model	Encoder connector	Junction connector
MR-J3JCBL03M-A1-L (Note 2) MR-J3JCBL03M-A2-L (Note 2)	 2174053-1 (TE Connectivity Ltd. Company)	 Contact: 1473226-1 (with ring) Housing: 1-172169-9 Cable clamp: 316454-1 (TE Connectivity Ltd. Company)

Model	Junction connector	Servo amplifier connector
MR-EKCBL_M-H MR-EKCBL_M-L MR-ECNM	 Housing: 1-172161-9 Connector pin: 170359-1 (TE Connectivity Ltd. Company) or an equivalent product Cable clamp: MTI-0002 (Toa Electric Industrial Co., Ltd.)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex, LLC)

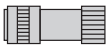
Model	Encoder connector	Junction connector
MR-J3JSCBL03M-A1-L (Note 2) MR-J3JSCBL03M-A2-L (Note 2)	 2174053-1 (TE Connectivity Ltd. Company)	 Cable receptacle: CM10-CR10P-M (DDK Ltd.)

Model	Encoder connector	Servo amplifier connector
MR-J3ENSCBL_M-H (Note 2) MR-J3ENSCBL_M-L (Note 2)	 For 10 m or shorter cable Straight plug: CMV1-SP10S-M1 Socket contact: CMV1-#22ASC-C1-100 For 20 m or longer cable Straight plug: CMV1-SP10S-M1 (long bending life) CMV1-SP10S-M2 (standard) Socket contact: CMV1-#22ASC-C2-100 (DDK Ltd.)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex, LLC)

Model	Junction connector/encoder connector	Servo amplifier connector
MR-J3SCNS (Note 2, 3)	 Straight plug: CMV1-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, LLC)

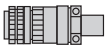
Notes: 1. Cable clamps and bushings for cable OD of 5.5 mm to 7.5 mm and of 7.0 mm to 9.0 mm are included in the set.
2. The cable or the connector set may contain different connectors but still usable.
3. The connector contains a plug and contacts. Using contacts for other plugs may damage the connector. Be sure to use the enclosed contacts.

Details of Option Connectors for Servo Motors

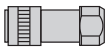
Model	Encoder connector	Servo amplifier connector
MR-ENCNS2 (Note 3)	 Straight plug: CMV1S-SP10S-M2 (Note 1) Socket contact: CMV1-#22ASC-S1-100 (DDK Ltd.)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex, LLC)

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, LLC)

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, LLC)

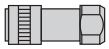
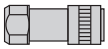
Model	Encoder connector	Servo amplifier connector
MR-ENECBL_M-H-MTH MR-ENECNS	 Plug: D/MS3106A20-29S(D190) Backshell: CE02-20BS-S-D (straight) Cable clamp: CE3057-12A-3-D (DDK Ltd.)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex, LLC)

Model	Servo amplifier connector
MR-J3CN2	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex, LLC)

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, LLC)

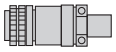
Notes: 1. Cable clamps and bushings for cable OD of 5.5 mm to 7.5 mm and of 7.0 mm to 9.0 mm are included in the set.
2. The cable or the connector set may contain different connectors but still usable.
3. The connector contains a plug and contacts. Using contacts for other plugs may damage the connector. Be sure to use the enclosed contacts.

Details of Option 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.)

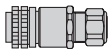
Model	Junction connector	Servo amplifier connector
MR-J4FCCBL03M MR-J4THCBL03M MR-J3THMCN2	 Plug: 36110-3000FD Shell kit: 36310-F200-008 (3M)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M)

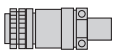
Model	Encoder connector	Servo amplifier connector
MR-J3W03ENCBL_M-A-H MR-J3W03CN2-2P MR-J3W03CN2-20P	 Tab housing: J21DPM-10V-KX Tab contact: SJ2M-01GF-M1.0N (J.S.T Mfg. Co., Ltd)	 Receptacle housing: 1-1827862-5 Receptacle contact: 1827587-2 (TE Connectivity Ltd. Company)

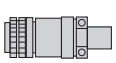
Model	Encoder connector	Drive unit connector
MR-ENE4CBLM-H-MTH	 Plug: D/MS3106A-20-29S-BSS (with waterproof straight backshell) Cable clamp: CE3057-12A-3-D (DDK Ltd.)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M)

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)

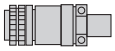
Model	Power connector/cooling fan power connector
MR-PWCNF	 Plug: CE05-6A14S-2SD-D (straight) (DDK Ltd.) Cable clamp: YSO14-9 to 11 (Daiwa Dengyo Co., Ltd.)

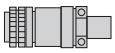
Model	Power connector
MR-PWCNS4	 Plug: CE05-6A18-10SD-D-BSS (straight) Cable clamp: CE3057-10A-1-D (DDK Ltd.)

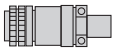
Model	Power connector
MR-PWCNS5	 Plug: CE05-6A22-22SD-D-BSS (straight) Cable clamp: CE3057-12A-1-D (DDK Ltd.)

Notes: 1. The cable or the connector set may contain different connectors but still usable.

Details of Option Connectors for Servo Motors

Model	Power connector	
MR-PWCNS3		Plug: CE05-6A32-17SD-D-BSS (straight) Cable clamp: CE3057-20A-1-D (DDK Ltd.)

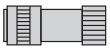
Model	Power connector	
MR-PWCNS1		Plug: CE05-6A22-23SD-D-BSS (straight) Cable clamp: CE3057-12A-2-D (DDK Ltd.)

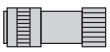
Model	Power connector	
MR-PWCNS2		Plug: CE05-6A24-10SD-D-BSS (straight) Cable clamp: CE3057-16A-2-D (DDK Ltd.)

Model	Power connector	
MR-J4W03PWCBL_M-H MR-J4W03PWBRCBL_M-H MR-J4W03CNP2-2P MR-J4W03CNP2-20P		Tab housing: J21DPM-06V-KX Tab contact: BJ2M-21GF-M1.0N (J.S.T. Mfg. Co., 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)

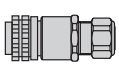
Model	Electromagnetic brake connector	
MR-BKS2CBL03M-A1-L MR-BKS2CBL03M-A2-L		Plug: JN4FT02SJ2-R Socket contact: ST-TMH-S-C1B-100-(A534G) (Japan Aviation Electronics Industry, Limited)

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.)

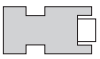
Model	Electromagnetic brake connector	
MR-BKCN		Plug: D/MS3106A10SL-4S(D190) (DDK Ltd.) Cable clamp: YSO10-5 to 8 (straight) (Daiwa Dengyo Co., Ltd.)

Notes: 1. The cable or the connector set may contain different connectors but still usable.
2. The connector contains a plug and contacts. Using contacts 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)



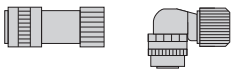
Application	Connector (3M)
Servo amplifier CN2 connector	Receptacle: 36210-0100PL Shell kit: 36310-3200-008
	Connector (Molex, LLC)
	54599-1019 (gray)
	54599-1016 (black)

Encoder connector for HG-KR/HG-MR series Rotary

Applicable servo motor	Feature (Note 1)	Connector (TE Connectivity Ltd. Company)	Crimping tool (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 mm² to 0.33 mm² (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

Straight type Angle type



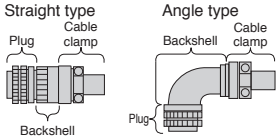
Applicable servo motor	Feature (Note 1)	Connector (DDK Ltd.)				Applicable cable example
		Type	Type of connection	Plug	Socket contact	Cable OD [mm]
HG-SR/ HG-JR53, 73, 103, 153, 203, 353, 503, 703, 903, 534, 734, 1034, 1534, 2034, 3534, 5034, 7034, 9034/ HG-RR/ HG-UR	IP67	Straight	One-touch connection 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 mm² (AWG 20) or smaller
Press bonding type	CMV1-#22ASC-C1-100	0.2 mm² to 0.5 mm² (AWG 24 to 20) Crimping tool (357J-53162T) is required.
	CMV1-#22ASC-C2-100	0.08 mm² to 0.2 mm² (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.

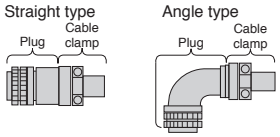
Products on the Market for Servo Motors

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	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	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			

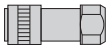
Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.
2. The wire size 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

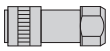
Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

Encoder connector for TM-RG2M/TM-RU2M/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-RG2M/ TM-RU2M/ TM-RFM	For encoder or absolute position storage unit (servo amplifier side)	IP67	Straight	RM15WTPZK-12S	JR13WCCA-8(72)	Wire size: 0.5 mm² (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-RG2M/TM-RU2M/TM-RFM series and absolute position storage unit connector (encoder side) **Direct**

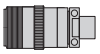


Applicable servo motor	Application	Feature (Note 1)	Plug (Hirose Electric Co., Ltd.)			Applicable cable example
			Type	Plug	Cord clamp	
TM-RG2M/ TM-RU2M/ TM-RFM	For absolute position storage unit (encoder side)	IP67	Straight	RM15WTPZ-12P(72)	JR13WCCA-8(72)	Wire size: 0.5 mm² (AWG 20) or smaller Cable 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 mm² (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 mm² to 1.25 mm² (AWG 22 to 16) Cable OD: 7.9 mm or smaller

Power connector for HG-KR/HG-MR series **Rotary**

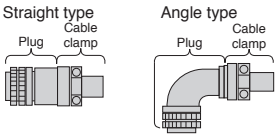
Applicable servo motor	Feature (Note 1)	Connector (Japan Aviation Electronics Industry, Limited)	Crimping tool (Japan Aviation Electronics Industry, Limited)	Applicable cable example
HG-KR/ HG-MR	IP65	Plug: KN4FT04SJ1-R Socket contact: ST-TMH-S-C1B-100-(A534G)	For contactor: CT170-14-TMH5B	Wire size: 0.3 mm² to 0.75 mm² (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

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**

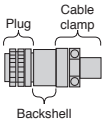
Applicable servo motor	Feature (Note 1)	Plug (with backshell) (DDK Ltd.)		Cable clamp (DDK Ltd.)	Applicable cable example	
		Type	Model	Model	Wire size (Note 3)	Cable OD [mm]
HG-SR51, 81, 52, 102, 152, 524, 1024, 1524/ HG-JR53, 73, 103, 153, 203, 534, 734, 1034, 1534, 2034, 3534, 5034/ TM-RFM012G20, 048G20, 072G20	IP67 EN compliant	Straight	CE05-6A18-10SD-D-BSS	CE3057-10A-2-D	2 mm² to 3.5 mm² (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 mm² to 3.5 mm² (AWG 14 to 12)	14.3 or smaller (bushing ID)
HG-SR121, 201, 301, 202, 352, 502, 2024, 3524, 5024/ HG-JR353, 503/ TM-RFM040J10, 120J10	IP67 EN compliant		CE05-6A22-22SD-D-BSS	CE3057-12A-2-D	5.5 mm² to 8 mm² (AWG 10 to 8)	9.5 to 13
				CE3057-12A-1-D		12.5 to 16
	General environment (Note 2)		D/MS3106B22-22S	D/MS3057-12A	5.5 mm² to 8 mm² (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/ TM-RFM240J10	IP67 EN compliant		CE05-6A32-17SD-D-BSS	CE3057-20A-1-D	14 mm² to 22 mm² (AWG 6 to 4)	22 to 23.8
	General environment (Note 2)		D/MS3106B32-17S	D/MS3057-20A	14 mm² to 22 mm² (AWG 6 to 4)	23.8 or smaller (bushing ID)
HG-SR51, 81, 52, 102, 152, 524, 1024, 1524/ HG-JR53, 73, 103, 153, 203, 534, 734, 1034, 1534, 2034, 3534, 5034	IP67 EN compliant	Angle	CE05-8A18-10SD-D-BAS	CE3057-10A-2-D	2 mm² to 3.5 mm² (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 mm² to 3.5 mm² (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 mm² to 8 mm² (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 mm² to 8 mm² (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 mm² to 22 mm² (AWG 6 to 4)	22 to 23.8
	General environment (Note 2)		D/MS3108B32-17S	D/MS3057-20A	14 mm² to 22 mm² (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

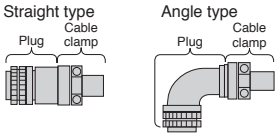
Products on the Market for Servo Motors

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 (Note 5)	CE3057-24A-1-D	22 mm² (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 mm² to 3.5 mm² (AWG 14 to 12)	9.5 to 13
				CE3057-12A-1-D		12.5 to 16
	General environment (Note 3)		D/MS3106B22-23S	D/MS3057-12A		15.9 or smaller (bushing ID)
HG-RR353, 503/ HG-UR202, 352, 502	IP67 EN compliant		CE05-6A24-10SD-D-BSS	CE3057-16A-2-D	5.5 mm² to 8 mm² (AWG 10 to 8)	13 to 15.5
				CE3057-16A-1-D		15 to 19.1
	General environment (Note 3)		D/MS3106B24-10S	D/MS3057-16A		19.1 or smaller (bushing ID)
HG-RR103, 153, 203/ HG-UR72, 152	IP67 EN compliant	Angle	CE05-8A22-23SD-D-BAS	CE3057-12A-2-D	2 mm² to 3.5 mm² (AWG 14 to 12)	9.5 to 13
				CE3057-12A-1-D		12.5 to 16
	General environment (Note 3)		D/MS3108B22-23S	D/MS3057-12A		15.9 or smaller (bushing ID)
HG-RR353, 503/ HG-UR202, 352, 502	IP67 EN compliant		CE05-8A24-10SD-D-BAS	CE3057-16A-2-D	5.5 mm² to 8 mm² (AWG 10 to 8)	13 to 15.5
				CE3057-16A-1-D		15 to 19.1
	General environment (Note 3)		D/MS3108B24-10S	D/MS3057-16A		19.1 or smaller (bushing ID)

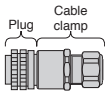
Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.
2. The wire size 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.
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.
5. This backshell is used to combine a plug (CE05-6A32-17SD-D) and a cable clamp (CE3057-24A-_-D). Contact the manufacturers directly.

Rotary Rotary servo motor Linear Linear servo motor Direct Direct drive motor

Products on the Market for Servo Motors

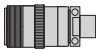
Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

Power connector for TM-RG2M/TM-RU2M/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-RG2M_, TM-RU2M_, TM-RFM002C20, 004C20, 006C20, 006E20, 012E20, 018E20	IP67 EN compliant	CE05-6A14S-2SD-D	Straight	ACS-08RL-MS14F	Nippon Flex Co., Ltd.	0.3 mm² to 1.25 mm² (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 mm² to 1.25 mm² (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 mm² to 3.5 mm² (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 mm² to 8 mm² (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.

Rotary Rotary servo motor **Linear** Linear servo motor **Direct** Direct drive motor

Products on the Market for Servo Motors

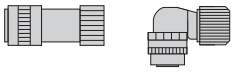
Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

Electromagnetic brake connector for HG-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: CT170-14-TMH5B	Wire size: 0.3 mm² to 0.5 mm² (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 mm² (AWG 16) or smaller
Press bonding type	CMV1-#22BSC-C3-100	0.5 mm² to 1.25 mm² (AWG 20 to 16) Crimping tool (357J-53164T) is required.

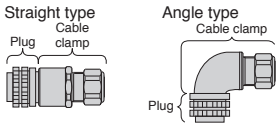
Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.
2. The wire size 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

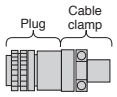
Contact the relevant manufacturers directly. When fabricating a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

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



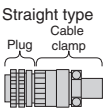
Applicable servo motor	Feature (Note 1)	Plug (DDK Ltd.)	Cable clamp (with backshell)			Applicable cable example	
		Model	Type	Model	Manufacturer	Wire size (Note 2)	Cable OD [mm]
HG-JR601B, 801B, 12K1B, 701MB, 11K1MB, 15K1MB, 6014B, 8014B, 12K14B, 701M4B, 11K1M4B, 15K1M4B/ HG-UR202B, 352B, 502B	IP67	D/MS3106A10SL-4S(D190)	Straight	ACS-08RL-MS10F	Nippon Flex Co., Ltd.	0.3 mm² to 1.25 mm² (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 mm² to 1.25 mm² (AWG 22 to 16)	5.6 or smaller (bushing ID)

Cooling fan power connector for HG-JR 2000 r/min series Rotary



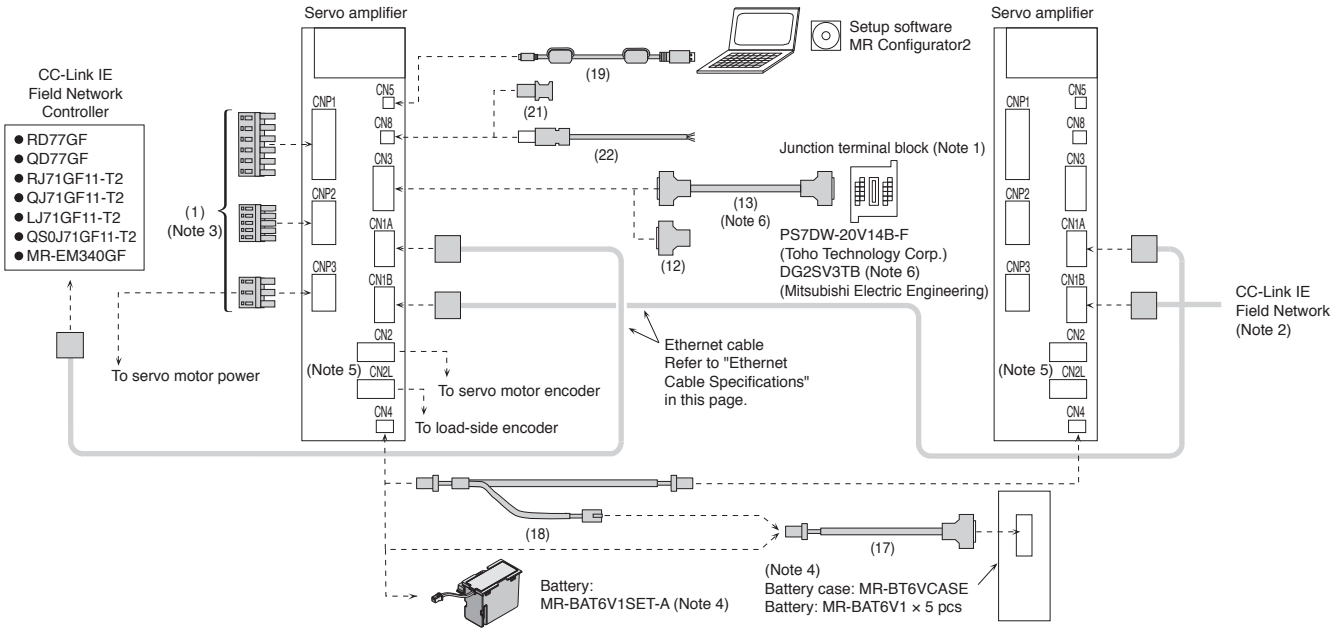
Applicable servo motor	Feature (Note 1)	Plug (DDK Ltd.)	Cable clamp (with backshell) (Nippon Flex Co., Ltd.)		Applicable cable example	
		Model	Type	Model	Wire size (Note 2)	Cable OD [mm]
HG-JR110K24W0C HG-JR150K24W0C HG-JR180K24W0C HG-JR200K24W0C HG-JR220K24W0C	IP67	CE05-6A10SL-3SC-D	Straight	ACS-10RL-MS10F	0.3 mm² to 1.25 mm² (AWG 22 to 16)	6 to 10

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.

Rotary Rotary servo motor **Linear** Linear servo motor **Direct** Direct drive motor

Configuration Example for MR-J4-_GF_(-RJ)

GF GF-RJ



Notes: 1. Refer to "Junction Terminal Block" in this catalog.
2. When branching off CC-Link IE Field Network (synchronous communication function) with a switching hub, use NZ2MHG-T8F2 (Mitsubishi Electric Corporation) or DT135TX (Mitsubishi Electric System & Service Co., Ltd.).
3. The connectors are for 3.5 kW or smaller servo amplifiers. Terminal blocks are mounted for 5 kW or larger servo amplifiers.
4. Refer to "Battery" or "Battery Case and Battery" in this catalog. Battery and battery case are not required when the linear servo motor is used or when the servo amplifier is used in incremental system.
5. CN2L connector is available for MR-J4-_GF_-RJ servo amplifiers.
6. When using a junction terminal block and a cable manufactured by Mitsubishi Electric Engineering, refer to p. 5-52 in this catalog.

Ethernet Cable Specifications (Note 1, 2)

Item		Description
Ethernet cable		Category 5e or higher, (double shielded/STP) straight cable
	Standard	The cable must meet the following: • 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.

[Recommended products]

Switching hub

Mitsubishi Electric has confirmed the operation of the following CC-Link IE Field Network compatible switching hubs. Contact the manufacturers for details.

Item	Model	Synchronous communications (Motion mode)	Asynchronous communications (I/O mode)	Manufacturer
Industrial managed switch	NZ2MHG-T8F2	○ (Up to 4 levels)	○	Mitsubishi Electric Corporation
Industrial switching hub	DT135TX	○ (Up to 4 levels)	○	Mitsubishi Electric System & Service Co., Ltd. (Note)
	NZ2EHG-T8N	—	○	Mitsubishi Electric Corporation

Ethernet Cable

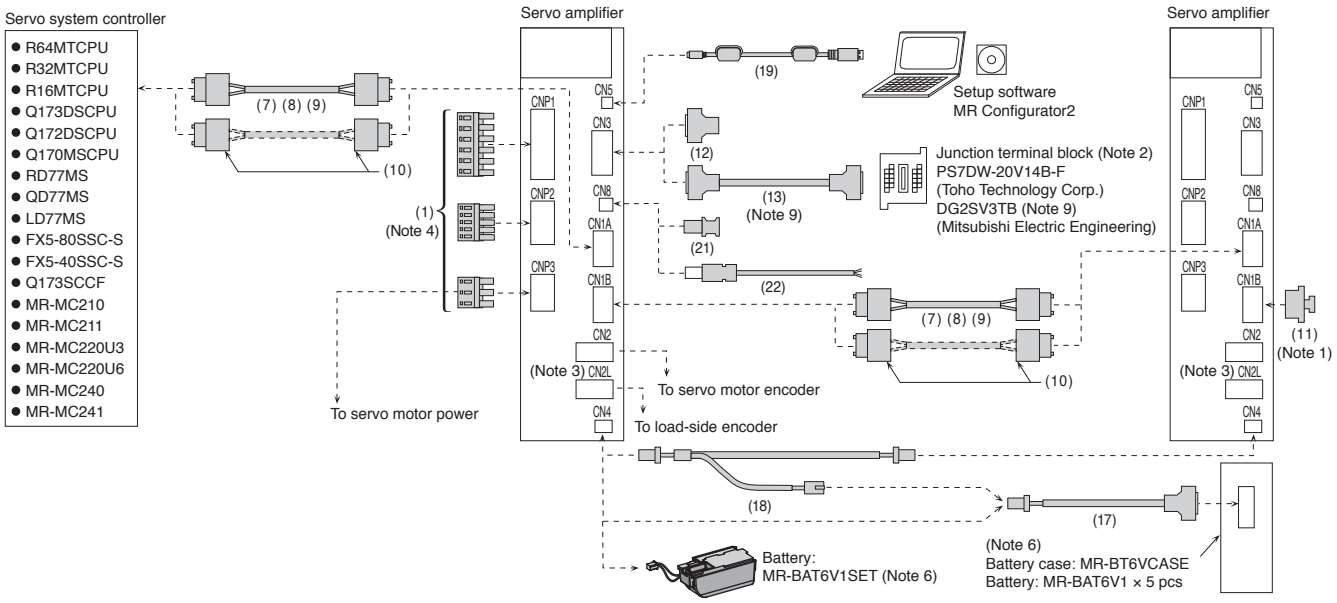
Item		Specification			Manufacturer
Ethernet cable	For indoor	SC-E5EW-S_M	_: cable length (100 m max., unit of 1 m)	Double shielded cable (Category 5e)	Mitsubishi Electric System & Service Co., Ltd. (Note)
	For moving part, indoor	SC-E5EW-S_M-MV	_: cable length (45 m max., unit of 1 m)		
	For indoor/outdoor	SC-E5EW-S_M-L	_: cable length (100 m max., unit of 1 m)		

(Note): For details, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS SERVICE SECTION (Email: osb.webmaster@melsc.jp)

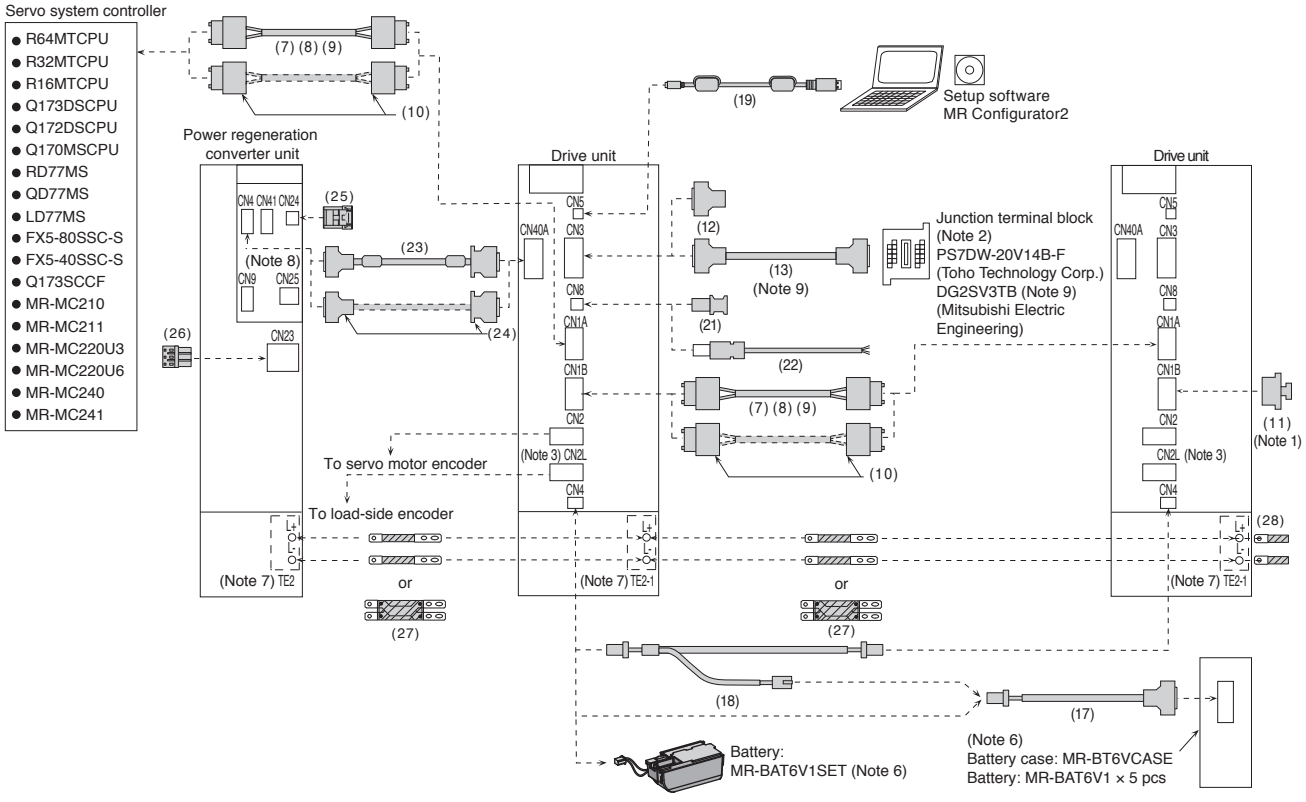
Configuration Example for MR-J4-_B_(-RJ)/MR-J4-DU_B_(-RJ) (Note 5)

B B-RJ

For MR-J4-_B_(-RJ)



For Combination of MR-CV_ and MR-J4-DU_B_(-RJ)

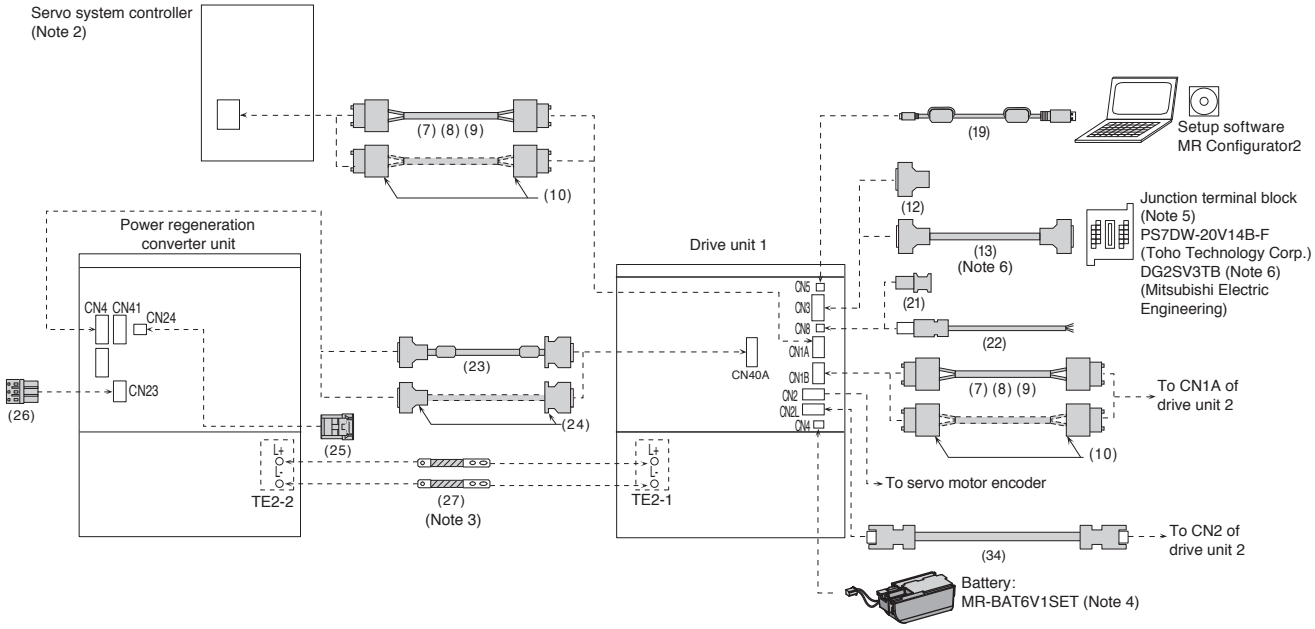


Notes: 1. Be sure to attach a cap to CN1B connector of the final axis.
2. Refer to "Junction Terminal Block" in this catalog.
3. CN2L connector is available for MR-J4-_B_-RJ servo amplifiers and MR-J4-DU_B_-RJ drive units.
4. The connectors are for 3.5 kW or smaller servo amplifiers. Terminal blocks are mounted for 5 kW or larger servo amplifiers.
5. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Amplifier Instruction Manual for fabricating the cables.
6. Refer to "Battery" or "Battery Case and Battery" in this catalog. Battery and battery case are not required when the linear servo motor is used or when the servo amplifier is used in incremental system.
7. Terminal varies depending on the capacity of the power regeneration converter unit and the drive unit. Refer to "MR-J4-DU_B/MR-J4-DU_B-RJ Dimensions" and "MR-CV_ Power Regeneration Converter Unit Dimensions" in this catalog.
8. Connect the wires directly to CN25 connector.
9. When using a junction terminal block and a cable manufactured by Mitsubishi Electric Engineering, refer to p. 5-52 in this catalog.

Configuration Example for MR-J4-DU_B4-RJ100 (Note 1)

B-RJ100

For MR-CV_ and MR-J4-DU_B4-RJ100

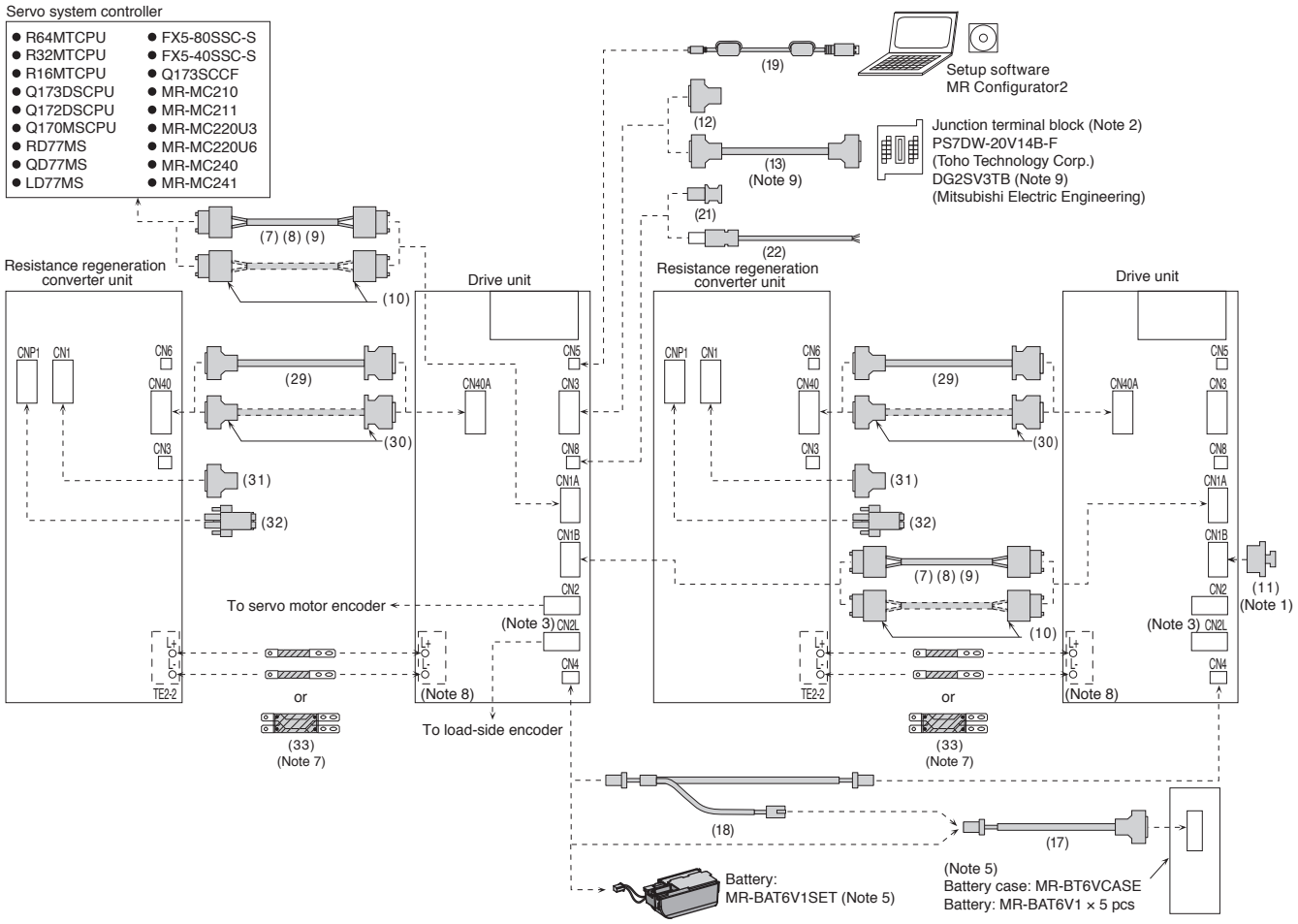


Notes: 1. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Motor Instruction Manual for fabricating the cables.
2. Refer to "Compatible Controllers" on p. 1-50 in this catalog for compatible controllers. Contact your local sales office for more details.
3. The bus bar is supplied with the drive unit.
4. For absolute position detection system, connect an option battery only to the drive unit of the encoder master servo amplifier. Do not connect the battery to the drive units of the encoder slave servo amplifiers.
5. Refer to "Junction Terminal Block" in this catalog.
6. When using a junction terminal block and a cable manufactured by Mitsubishi Electric Engineering, refer to p. 5-52 in this catalog.

Configuration Example for MR-J4-DU_B_(-RJ) (Note 4)

B B-RJ

For Combination of MR-CR_ and MR-J4-DU_B_(-RJ) (Note 6)

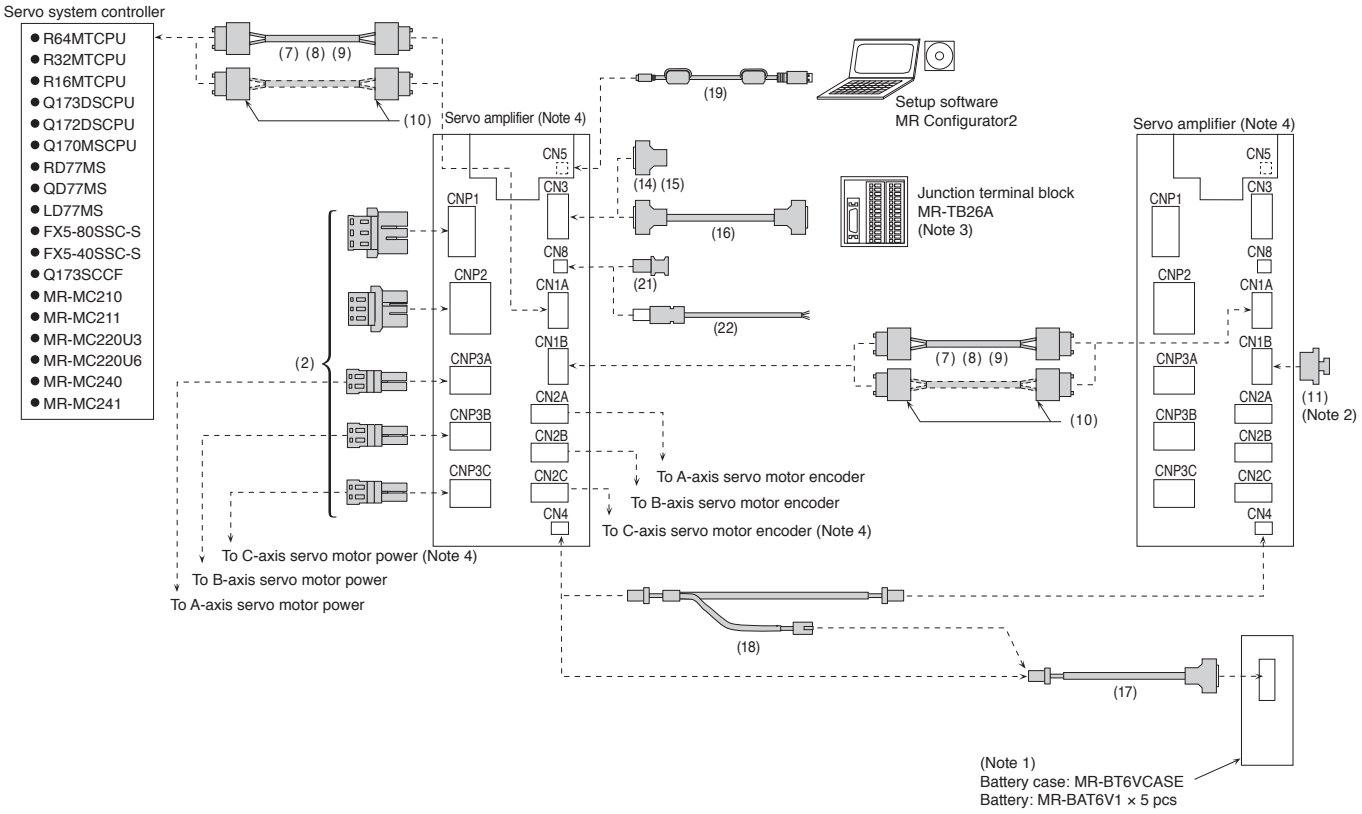


Notes: 1. Be sure to attach a cap to CN1B connector of the final axis.
2. Refer to "Junction Terminal Block" in this catalog.
3. CN2L connector is available for MR-J4-DU_B_-RJ drive units.
4. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Amplifier Instruction Manual for fabricating the cables.
5. Refer to "Battery" or "Battery Case and Battery" in this catalog. Battery and battery case are not required when the drive unit is used in incremental system.
6. The resistance regeneration converter units are supported only by 30 kW or larger drive units. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for details.
7. The bus bar is supplied with the drive unit.
8. Terminal varies depending on the capacity of the drive unit. Refer to "MR-J4-DU_B/MR-J4-DU_B-RJ Dimensions" in this catalog.
9. When using a junction terminal block and a cable manufactured by Mitsubishi Electric Engineering, refer to p. 5-52 in this catalog.

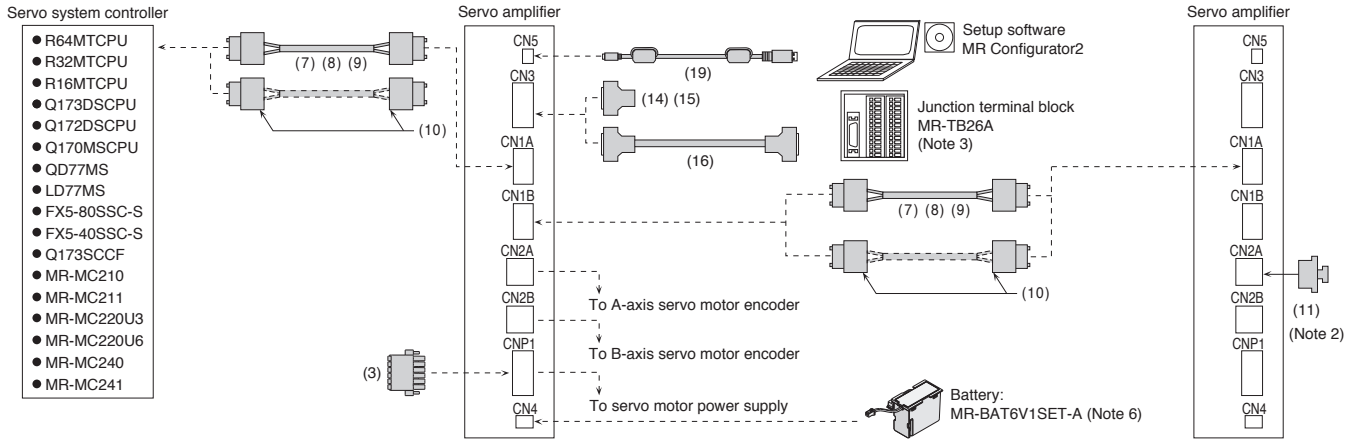
Configuration Example for MR-J4W2-_B/MR-J4W3-_B (Note 5)

WB

For MR-J4W2-22B to MR-J4W2-1010B/MR-J4W3-222B/MR-J4W3-444B



For MR-J4W2-0303B6

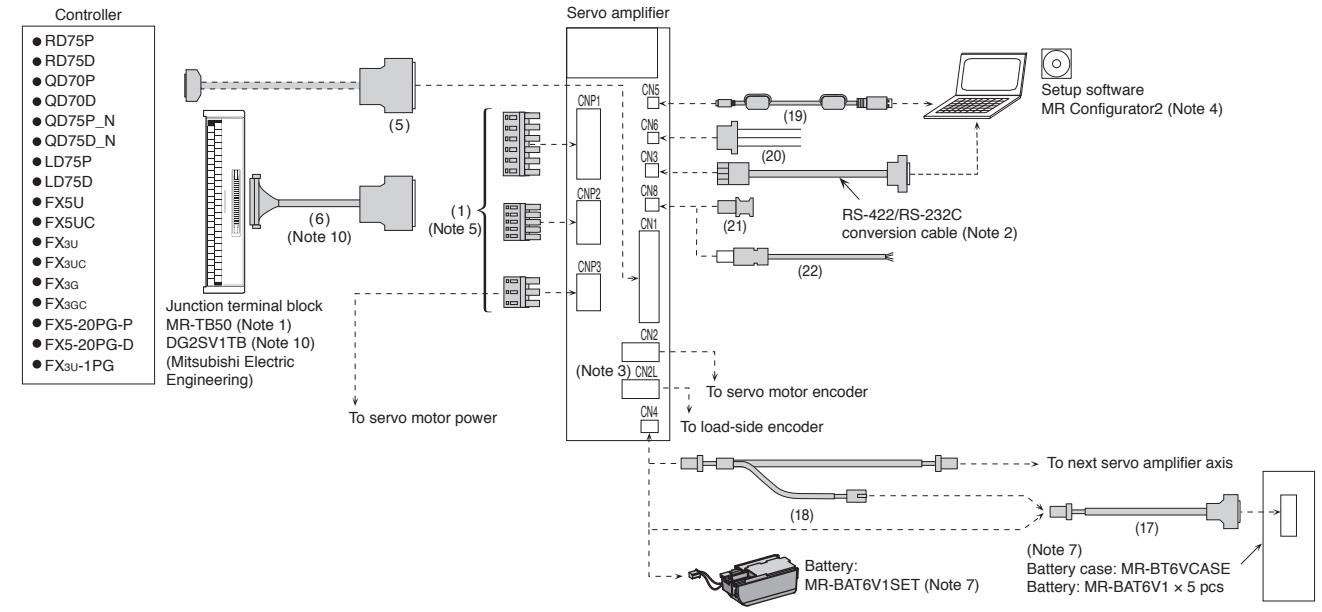


Notes: 1. Refer to "Battery Case and Battery" in this catalog. Battery and battery case are not required when the linear servo motor is used or when the servo amplifier is used in incremental system.
2. Be sure to attach a cap to CN1B connector of the final axis.
3. Refer to "Junction Terminal Block" in this catalog.
4. CNP3C and CN2C connectors are available for MR-J4W3-B servo amplifier.
5. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Amplifier Instruction Manual for fabricating the cables.
6. Refer to "Battery" in this catalog. Battery is not required when the servo amplifier is used in incremental system.

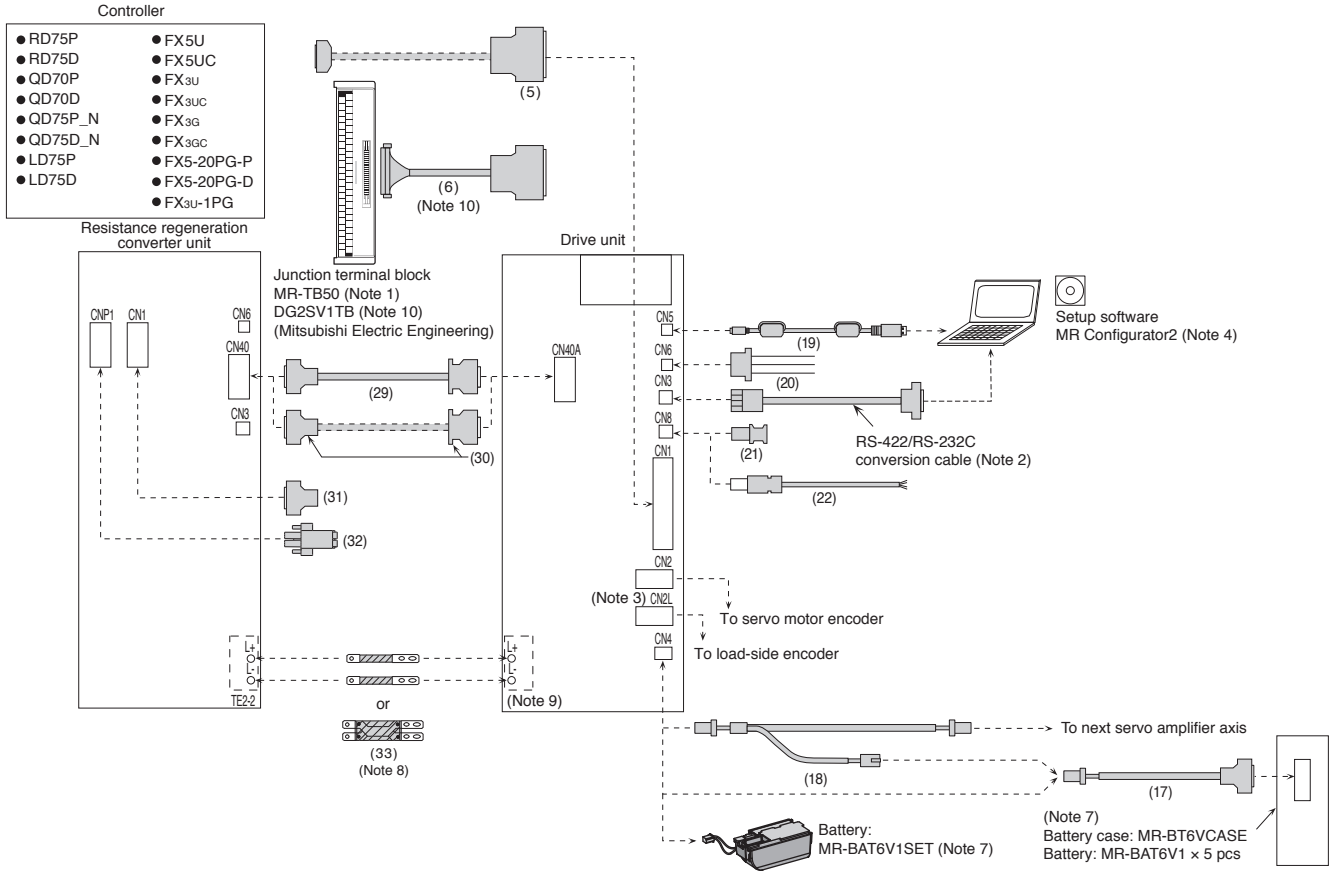
Configuration Example for MR-J4-_A_(-RJ)/MR-J4-DU_A_(-RJ) (Note 6)

A A-RJ

For MR-J4-_A_(-RJ)



For Combination of MR-CR_ and MR-J4-DU_A_(-RJ)

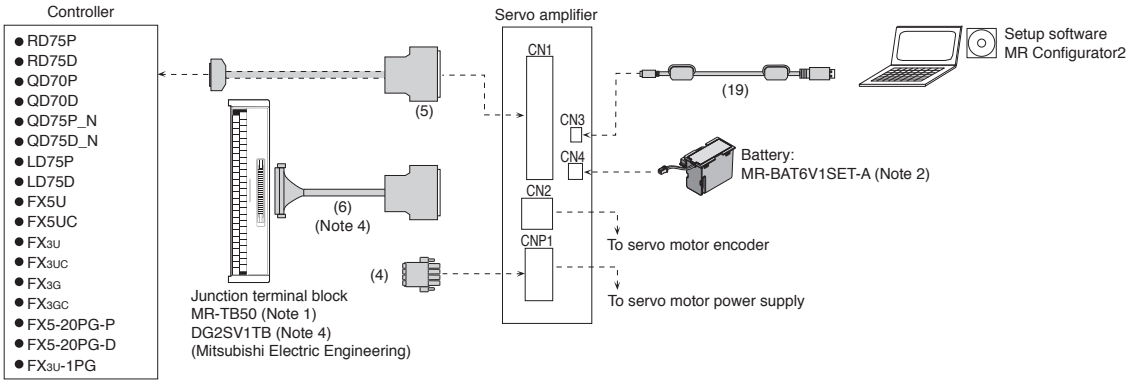


Notes: 1. Refer to "Junction Terminal Block" in this catalog.
2. A conversion cable is required for using RS-422 serial communication function. Refer to "Products on the Market for Servo Amplifiers" in this catalog for the RS-422/RS-232C conversion cable.
3. CN2L connector is available for MR-J4-_A_-RJ 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.
6. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Amplifier Instruction Manual for fabricating the cables.
7. Refer to "Battery" or "Battery Case and Battery" in this catalog. Battery and battery case are not required when the linear servo motor is used or when the servo amplifier/drive unit is used in incremental system.
8. The bus bar is supplied with the drive unit.
9. Terminal varies depending on the capacity of the drive unit. Refer to "MR-J4-DU_A/MR-J4-DU_A-RJ Dimensions" in this catalog.
10. When using a junction terminal block and a cable manufactured by Mitsubishi Electric Engineering, refer to p. 5-54 in this catalog.

Configuration Example of Cable and Connector for MR-J4-_A_(-RJ) (Note 3)

A A-RJ

For MR-J4-03A6(-RJ)



Notes: 1. Refer to "Junction Terminal Block" in this catalog.
2. Refer to "Battery" in this catalog. Battery is not required when the servo amplifier is used in incremental system.
3. Cables drawn with dashed lines need to be fabricated by user. Refer to relevant Servo Amplifier Instruction Manual for fabricating the cables.
4. When using a junction terminal block and a cable manufactured by Mitsubishi Electric Engineering, refer to p. 5-54 in this catalog.

Cables and Connectors for Servo Amplifiers

Refer to "Details of Option Connectors" 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)	(Standard accessory)	-	-	For MR-J4-100GF(-RJ) or smaller/ MR-J4-40GF1(-RJ) or smaller/ MR-J4-100B(-RJ) or smaller/ MR-J4-40B1(-RJ) 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: 3.9 mm or smaller
						For MR-J4-200GF(-RJ)/ MR-J4-200B(-RJ)/ MR-J4-200A(-RJ)/ MR-J4-350GF(-RJ)/ MR-J4-350B(-RJ)/ 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: 4.7 mm or smaller CNP2 connector Applicable wire size (Note 2): AWG 18 to 14 Insulator OD: 3.9 mm or smaller
						For MR-J4-350GF4(-RJ) or smaller/ 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: 3.9 mm or smaller
For CNP1/CNP2/CNP3_	(2)	Servo amplifier power connector set (Note 3)	(Standard accessory)	-	-	For MR-J4W2-_B/ MR-J4W3-_B	CNP1 connector Applicable wire size (Note 2): AWG 16 to 14 Insulator OD: 4.2 mm or smaller CNP2 connector Applicable wire size (Note 2): AWG 16 to 14 Insulator OD: 3.8 mm or smaller CNP3A/CNP3B/CNP3C connector, Open tool Applicable wire size (Note 2): AWG 18 to 14 Insulator OD: 3.8 mm or smaller
For CNP1	(3)	Servo amplifier power connector	(Standard accessory)	-	-	For MR-J4W2-0303B6	Power connector Wire size: 0.2 mm² to 1.5 mm² (AWG 24 to 16) Insulator OD: 2.9 mm or smaller
	(4)	Servo amplifier power connector	(Standard accessory)	-	-	For MR-J4-03A6(-RJ)	Power connector Wire size: 0.2 mm² to 1.5 mm² (AWG 24 to 16) Insulator OD: 2.9 mm or smaller

Notes: 1. This connector set is not required for 5 kW or larger servo amplifiers because 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-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual" for details.

Cables and Connectors for Servo Amplifiers

Refer to "Details of Option Connectors" in this catalog for the detailed models.

		Item	Model	Cable length	IP rating	Application	Description
For CN1	(5)	Connector set	MR-J3CN1	-	-	For MR-J4-_A_(-RJ)/ MR-J4-03A6(-RJ) MR-J4-DU_A_(-RJ)	Servo amplifier connector
	(6)	Junction terminal block cable	MR-J2M-CN1TBL05M	0.5 m	-	For connecting MR-J4-_A_(-RJ)/ MR-J4-03A6(-RJ) MR-J4-DU_A_(-RJ), MR-TB50	Junction terminal block connector / Servo amplifier connector
			MR-J2M-CN1TBL1M	1 m			
For controller/CN1A/CN1B	(7)	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(6)/ MR-J4W3-_B	SSCNET III(/H) connector SSCNET III(/H) connector
			MR-J3BUS03M	0.3 m	-		
			MR-J3BUS05M	0.5 m	-		
			MR-J3BUS1M	1 m	-		
			MR-J3BUS3M	3 m	-		
	(8)	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(6)/ MR-J4W3-_B	
			MR-J3BUS10M-A *1	10 m	-		
			MR-J3BUS20M-A *1	20 m	-		
	(9)	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(6)/ MR-J4W3-_B	
			MR-J3BUS40M-B *1	40 m	-		
			MR-J3BUS50M-B *1	50 m	-		
	(10)	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(6)/ MR-J4W3-_B	SSCNET III(/H) connector SSCNET III(/H) connector
For CN1B	(11)	SSCNET III connector cap Compatible with SSCNET III(/H)	(Standard accessory)	-	-	For MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4W2-_B(6)/ MR-J4W3-_B	
For CN3	(12)	Connector set	MR-CCN1	-	-	For MR-J4-_GF_(-RJ)/ MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)	Servo amplifier connector
	(13)	Junction terminal block cable	MR-J2HBUS05M	0.5 m	-	For connecting MR-J4-_GF_(-RJ)/ MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ PS7DW-20V14B-F	Servo amplifier connector / Junction terminal block connector
			MR-J2HBUS1M	1 m			
			MR-J2HBUS5M	5 m			
	(14)	Connector set (Qty: 1 pc)	MR-J2CMP2	-	-	For MR-J4W2-_B(6)/ MR-J4W3-_B	Servo amplifier connector
	(15)	Connector set (Qty: 20 pcs)	MR-ECN1	-	-	For MR-J4W2-_B(6)/ MR-J4W3-_B	
	(16)	Junction terminal block cable	MR-TBNATBL05M	0.5 m	-	For connecting MR-J4W2-_B(6)/ MR-J4W3-_B, MR-TB26A	Servo amplifier connector / Junction terminal block connector
			MR-TBNATBL1M	1 m			

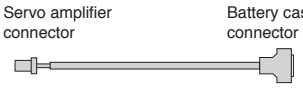
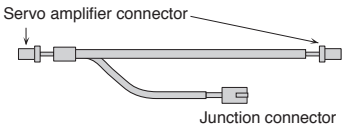
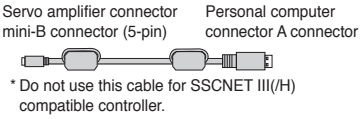
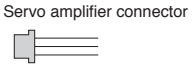
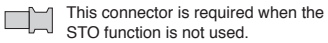
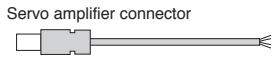
Notes: 1. Read carefully through the precautions enclosed with the options before use.
2. Dedicated tools are required. Contact your local sales office for more details.
3. When SSCNET III/H is used, refer to "Products on the Market for Servo Amplifiers" in this catalog for cables over 50 m or with ultra-long bending life.

For unlisted lengths

*1. For unlisted lengths of the cables, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS SERVICE SECTION (Email: osb.webmaster@melsc.jp)

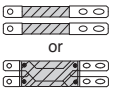
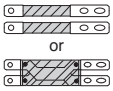
Cables and Connectors for Servo Amplifiers

Refer to "Details of Option Connectors" in this catalog for the detailed models.

		Item	Model	Cable length	IP rating	Application	Description
For CN4	(17)	Battery cable	MR-BT6V1CBL03M	0.3 m	-	For connecting MR-J4-_GF_(-RJ)/ MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_A_(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B, MR-BT6VCASE	
			MR-BT6V1CBL1M	1 m			
	(18)	Junction battery cable	MR-BT6V2CBL03M	0.3 m	-	For MR-J4-_GF_(-RJ)/ MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_A_(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	
			MR-BT6V2CBL1M	1 m			
For CN5	(19)	Personal computer communication cable (USB cable)	MR-J3USBCBL3M	3 m	-	For MR-J4-_GF_(-RJ)/ MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_A_(-RJ)/ MR-J4-03A6(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-_B(6)/ MR-J4W3-_B	
For CN6	(20)	Monitor cable	MR-J3CN6CBL1M	1 m	-	For MR-J4-_A_(-RJ)/ MR-J4-DU_A_(-RJ)	
For CN8	(21)	Short-circuit connector	(Standard accessory)	-	-	For MR-J4-_GF_(-RJ)/ MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_A_(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	
	(22)	STO cable	MR-D05UDL3M-B	3 m	-	For connecting MR-J3-D05 or other safety control device with MR-J4-_GF_(-RJ)/ MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_A_(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	

Cables and Connectors for Servo Amplifiers

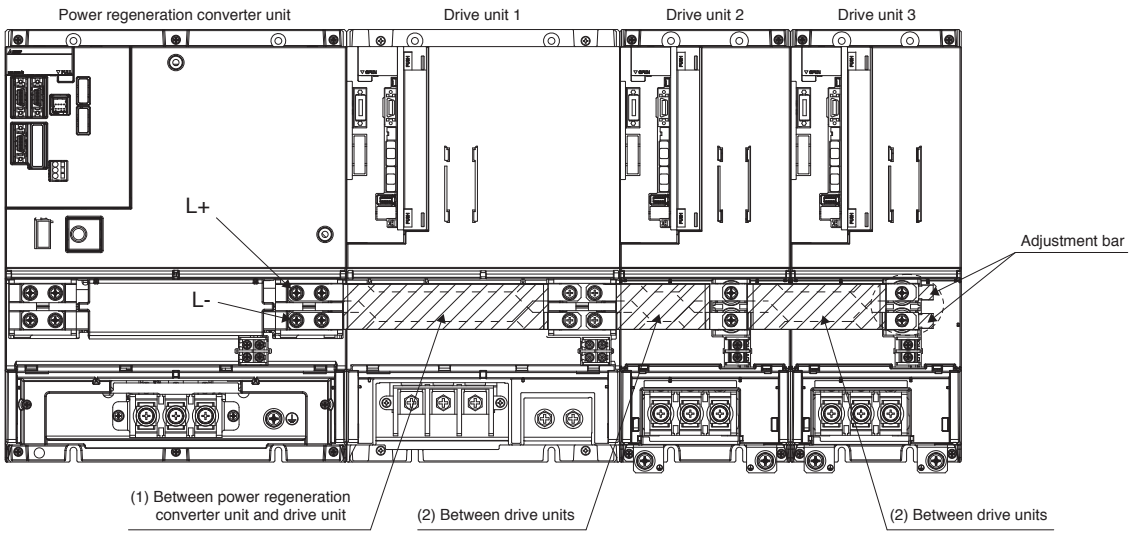
Refer to "Details of Option Connectors" in this catalog for the detailed models.

		Item	Model	Cable length	IP rating	Application	Description
For CN4 on power regeneration converter unit and CN40A on drive unit	(23)	Protection coordination cable	MR-CUL06M	0.6 m	-	For MR-J4-DU_B_(-RJ)/ MR-CV_	Power regeneration converter unit connector Drive unit connector
	(24)	Connector set	MR-J2CN1-A	-	-	For MR-J4-DU_B_(-RJ)/ MR-CV_	Power regeneration converter unit connector Drive unit connector
For CN24 on power regeneration converter unit	(25)	Connector set (Note 1)	MR-CVCN24S	-	-	-	Power regeneration converter unit connector
For CN23 on power regeneration converter unit	(26)	Magnetic contactor wiring connector	(Standard accessory)	-	-	For MR-CV_	Power regeneration converter unit connector Open tool
For power regeneration converter unit and drive unit	(27)	Bus bar (Note 2)	-	-	-	-	 Refer to "Bus Bar" in this catalog for details.
	(28)	Adjustment bar (Note 3)	MR-DCBAR035-B05	-	-	-	
For CN40 on resistance regeneration converter unit and CN40A on drive unit	(29)	Protection coordination cable	MR-J3CDL05M	0.5 m	-	For MR-J4-DU30KB_ or larger/ MR-J4-DU30KA_ or larger/ MR-CR55K_	Resistance regeneration converter unit connector Drive unit connector
			MR-CUL06M	0.6 m	-		Resistance regeneration converter unit connector Drive unit connector
	(30)	Connector set	MR-J2CN1-A	-	-	For MR-J4-DU30KB_ or larger/ MR-J4-DU30KA_ or larger/ MR-CR55K_	Resistance regeneration converter unit connector Drive unit connector
For CN1 on resistance regeneration converter unit	(31)	Digital input/output connector	(Standard accessory)	-	-	For MR-CR55K_	Resistance regeneration converter unit connector
For CNP1 on resistance regeneration converter unit	(32)	Magnetic contactor wiring connector	(Standard accessory)	-	-	For MR-CR55K_	Resistance regeneration converter unit connector
For resistance regeneration converter unit and drive unit	(33)	Bus bar	(Standard accessory)	-	-	For MR-J4-DU30KB or larger/ MR-J4-DU30KA or larger/ MR-J4-DU45KB4 or larger/ MR-J4-DU45KA4 or larger/ MR-CR55K_	
			(Standard accessory)	-	-	For MR-J4-DU30KB4/ MR-J4-DU37KB4/ MR-J4-DU30KA4/ MR-J4-DU37KA4/ MR-CR55K4	
For drive unit	(34)	Encoder cable between drive units (Note 4)	MR-J4CN2CBL1M-H	1 m	-	For MR-J4-DU45KB4-RJ100, MR-J4-DU55KB4-RJ100	Drive unit connector Drive unit connector
			MR-J4CN2CBL2M-H	2 m			
			MR-J4CN2CBL3M-H	3 m			
			MR-J4CN2CBL5M-H	5 m			

Notes: 1. A crimping tool (357J-22733) manufactured by DDK Ltd. is required. Contact the manufacturer directly.
2. The bus bar varies depending on the combination of the power regeneration converter unit and the drive unit. Refer to "Bus Bar" in this catalog for details.
3. The adjustment bar is required when the total number of MR-J4-DU900B(4)(-RJ) and MR-J4-DU11KB(4)(-RJ) drive units connected to the power regeneration converter unit is even because there is a gap between the bus bar and TE2 terminal block of the final drive unit axis (right end). Place the adjustment bars in the gap and tighten the screws.
4. Use these dedicated encoder cables between drive units. Using cables other than dedicated cables may lead to device failure.

Bus Bar (for 200 V)

B B-RJ



(1) Between power regeneration converter unit and drive unit

Unit mounted on the left side (Note 1)	Unit mounted on the right side (Note 1, 3)	Bus bar model
MR-CV11K	MR-J4-DU900B, MR-J4-DU11KB	MR-DCBAR137-B52
MR-CV18K	MR-J4-DU900B, MR-J4-DU11KB	MR-DCBAR137-B52
	MR-J4-DU15KB	MR-DCBAR235-B52
MR-CV30K	MR-J4-DU900B, MR-J4-DU11KB	MR-DCBAR159-B52
	MR-J4-DU15KB, MR-J4-DU22KB	MR-DCBAR255-B52
	MR-J4-DU30KB	MR-DCBAR105-C03
MR-CV37K, MR-CV45K	MR-J4-DU900B, MR-J4-DU11KB	MR-DCBAR159-B52
	MR-J4-DU15KB, MR-J4-DU22KB	MR-DCBAR255-B52
	MR-J4-DU30KB, MR-J4-DU37KB	MR-DCBAR105-C03
MR-CV55K	MR-J4-DU900B, MR-J4-DU11KB	MR-DCBAR159-B53
	MR-J4-DU15KB, MR-J4-DU22KB	MR-DCBAR257-B53
	MR-J4-DU30KB, MR-J4-DU37KB	MR-DCBAR106-C04 (Note 2)

(2) Between drive units

Unit mounted on the left side (Note 1, 3)	Unit mounted on the right side (Note 1, 3)	Bus bar model
MR-J4-DU900B	MR-J4-DU900B	MR-DCBAR170-B52
MR-J4-DU11KB	MR-J4-DU900B, MR-J4-DU11KB	MR-DCBAR170-B52
MR-J4-DU15KB	MR-J4-DU900B, MR-J4-DU11KB	MR-DCBAR137-B52
	MR-J4-DU15KB	MR-DCBAR235-B52
MR-J4-DU22KB	MR-J4-DU900B, MR-J4-DU11KB	MR-DCBAR137-B52
	MR-J4-DU15KB, MR-J4-DU22KB	MR-DCBAR235-B52
MR-J4-DU30KB	MR-J4-DU900B, MR-J4-DU11KB	MR-DCBAR159-B53
	MR-J4-DU15KB, MR-J4-DU22KB	MR-DCBAR257-B53
	MR-J4-DU30KB	MR-DCBAR106-C04 (Note 2)
MR-J4-DU37KB	MR-J4-DU900B, MR-J4-DU11KB	MR-DCBAR159-B53
	MR-J4-DU15KB, MR-J4-DU22KB	MR-DCBAR257-B53
	MR-J4-DU30KB, MR-J4-DU37KB	MR-DCBAR106-C04 (Note 2)

Notes: 1. "Unit mounted on the left side" and "Unit mounted on the right side" indicate the position when the units are seen from the front. Be sure to install the power regeneration converter unit on the left side of the drive unit.
2. This bus bar is supplied with the drive unit.
3. Note that the drive units with special specification (MR-J4-DU_B-RJ/-EB/-KS) also use the same bus bars listed.

Bus Bar (for 400 V)

B B-RJ B-RJ100

(1) Power regeneration converter unit and drive unit

Unit mounted on the left side (Note 1)	Unit mounted on the right side (Note 1, 3)	Bus bar model
MR-CV11K4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR137-B52
MR-CV18K4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR137-B52
	MR-J4-DU15KB4	MR-DCBAR235-B52
MR-CV30K4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR159-B52
	MR-J4-DU15KB4, MR-J4-DU22KB4	MR-DCBAR255-B52
	MR-J4-DU30KB4	MR-DCBAR082-C02
MR-CV37K4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR159-B52
	MR-J4-DU15KB4, MR-J4-DU22KB4	MR-DCBAR255-B52
	MR-J4-DU30KB4, MR-J4-DU37KB4	MR-DCBAR082-C02
MR-CV45K4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR159-B52
	MR-J4-DU15KB4, MR-J4-DU22KB4	MR-DCBAR255-B52
	MR-J4-DU30KB4, MR-J4-DU37KB4	MR-DCBAR082-C02
	MR-J4-DU45KB4	MR-DCBAR105-C03
MR-CV55K4, MR-CV75K4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR159-B53
	MR-J4-DU15KB4, MR-J4-DU22KB4	MR-DCBAR257-B53
	MR-J4-DU30KB4, MR-J4-DU37KB4	MR-DCBAR085-C03 (Note 2)
	MR-J4-DU45KB4, MR-J4-DU55KB4	MR-DCBAR106-C04 (Note 2)

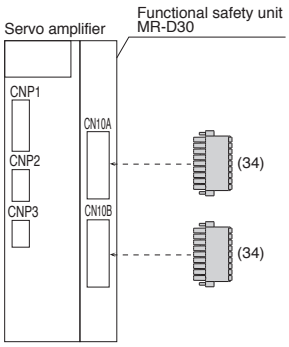
(2) Between drive units

Unit mounted on the left side (Note 1, 3)	Unit mounted on the right side (Note 1, 3)	Bus bar model
MR-J4-DU900B4	MR-J4-DU900B4	MR-DCBAR170-B52
MR-J4-DU11KB4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR170-B52
MR-J4-DU15KB4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR137-B52
	MR-J4-DU15KB4	MR-DCBAR235-B52
MR-J4-DU22KB4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR137-B52
	MR-J4-DU15KB4, MR-J4-DU22KB4	MR-DCBAR235-B52
MR-J4-DU30KB4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR310-B52
	MR-J4-DU15KB4, MR-J4-DU22KB4	MR-DCBAR409-B52
	MR-J4-DU30KB4	MR-DCBAR235-B52
MR-J4-DU37KB4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR310-B52
	MR-J4-DU15KB4, MR-J4-DU22KB4	MR-DCBAR409-B52
	MR-J4-DU30KB4, MR-J4-DU37KB4	MR-DCBAR235-B52
MR-J4-DU45KB4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR159-B53
	MR-J4-DU15KB4, MR-J4-DU22KB4	MR-DCBAR257-B53
	MR-J4-DU30KB4, MR-J4-DU37KB4	MR-DCBAR085-C03 (Note 2)
	MR-J4-DU45KB4	MR-DCBAR106-C04 (Note 2)
MR-J4-DU55KB4	MR-J4-DU900B4, MR-J4-DU11KB4	MR-DCBAR159-B53
	MR-J4-DU15KB4, MR-J4-DU22KB4	MR-DCBAR257-B53
	MR-J4-DU30KB4, MR-J4-DU37KB4	MR-DCBAR085-C03 (Note 2)
	MR-J4-DU45KB4, MR-J4-DU55KB4	MR-DCBAR106-C04 (Note 2)

Notes: 1. "Unit mounted on the left side" and "Unit mounted on the right side" indicate the position when the units are seen from the front. Be sure to install the power regeneration converter unit on the left side of the drive unit.
2. This bus bar is supplied with the drive unit.
3. Note that the drive units with special specification (MR-J4-DU_B-RJ/-RJ100/-EB/-KS) also use the same bus bars listed.

Configuration Example for MR-D30

GF-RJ B-RJ B-RJ100 A-RJ



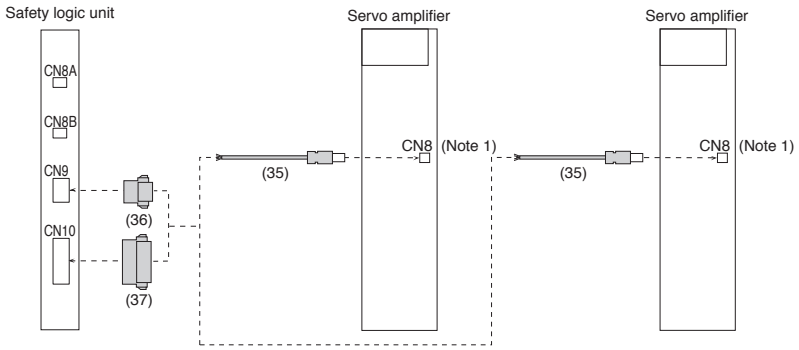
Cables and Connectors for MR-D30

Refer to "Details of Option Connector for MR-D30" in this catalog for the detailed models.

		Item	Model	Cable length	IP rating	Application	Description
For CN10A/CN10B	(34)	Connector (Qty: 2 pcs)	(Standard accessory of MR-D30)	-	-	For MR-D30	Functional safety connector

Configuration Example for MR-J3-D05

GF GF-RJ B B-RJ WB A A-RJ



Cables and Connectors for MR-J3-D05

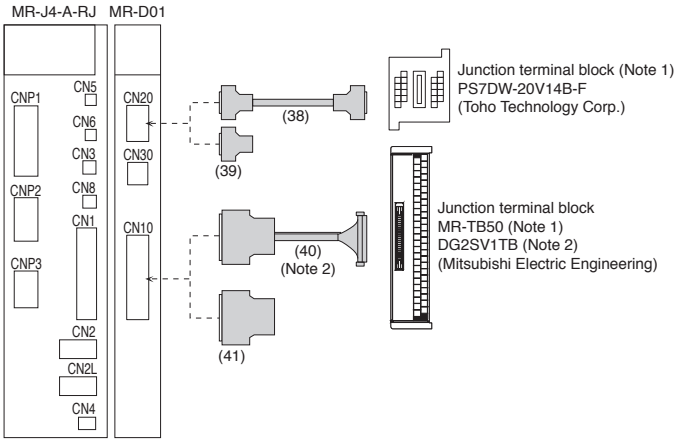
Refer to "Details of Option Connectors for MR-J3-D05" in this catalog for the detailed models.

		Item	Model	Cable length	IP rating	Application	Description
For CN8	(35)	STO cable	MR-D05UDL3M-B	3 m	-	For connecting MR-J3-D05 or other safety control device with MR-J4-_GF_(-RJ)/ MR-J4-_B_(-RJ)/ MR-J4-DU_B_(-RJ)/ MR-J4-_A_(-RJ)/ MR-J4-DU_A_(-RJ)/ MR-J4W2-_B/ MR-J4W3-_B	Servo amplifier connector
For CN9	(36)	Connector	(Standard accessory of MR-J3-D05)	-	-	For MR-J3-D05	Safety logic unit connector
For CN10	(37)	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.

Configuration Example for MR-D01

A-RJ



Cables and Connectors for MR-D01

Refer to "Details of Option Connectors for Servo Amplifiers/MR-D01" in this catalog for the detailed models.

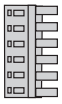
		Item	Model	Cable length	IP rating	Application	Description
For CN20	(38)	Junction terminal block cable	MR-J2HBUS05M	0.5 m	-	For MR-D01	MR-D01 connector / Junction terminal block connector
			MR-J2HBUS1M	1 m			
			MR-J2HBUS5M	5 m			
	(39)	Connector set	MR-CCN1	-	-		MR-D01 connector
For CN10	(40)	Junction terminal block cable	MR-J2M-CN1TBL05M	0.5 m	-		MR-D01 connector / Junction terminal block connector
			MR-J2M-CN1TBL1M	1 m			
	(41)	Connector set	MR-J3CN1	-	-		MR-D01 connector

Notes: 1. Refer to "Junction Terminal Block" in this catalog.
2. When using a junction terminal block and a cable manufactured by Mitsubishi Electric Engineering, refer to p. 5-54 in this catalog.

Details of Option Connectors for Servo Amplifiers/MR-D01

Model	CNP1 connector	CNP2 connector	CNP3 connector	Open tool
Servo amplifier power connector set For MR-J4-100GF(-RJ) or smaller/ MR-J4-40GF1(-RJ) or smaller/ MR-J4-100B(-RJ) or smaller/ MR-J4-40B1(-RJ) 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 (N) (J.S.T. Mfg. Co., Ltd.)

Model	CNP1 connector	CNP2 connector	CNP3 connector	Open tool
Servo amplifier power connector set For MR-J4-200GF(-RJ)/ MR-J4-200B(-RJ)/ MR-J4-200A(-RJ)/ MR-J4-350GF(-RJ)/ MR-J4-350B(-RJ)/ 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-J4-350GF4(-RJ) or smaller/ MR-J4-350B4(-RJ) or smaller/ MR-J4-350A4(-RJ) or smaller (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	Servo amplifier power connector
Servo amplifier power connector For MR-J4W2-0303B6 (Standard accessory)	 Connector: DFMC 1,5/ 6-ST-3,5-LR (Phoenix Contact) or an equivalent product

Model	Servo amplifier power connector
Servo amplifier power connector For MR-J4-03A6(-RJ) (Standard accessory)	 Connector: DFMC 1,5/ 4-ST-3,5-LR (Phoenix Contact) or an equivalent product

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/MR-D01 connector
MR-J3CN1	 Connector: 10150-3000PE Shell kit: 10350-52F0-008 (3M) or an equivalent product

Model	Junction terminal block connector	Servo amplifier/MR-D01 connector
MR-J2M-CN1TBL_M	 Connector: D7950-B500FL (3M)	 Press bonding type (Note 1) Connector: 10150-6000EL Shell kit: 10350-3210-000 (3M)

Notes: 1. Solder type (connector: 10150-3000PE and shell kit: 10350-52F0-008) (3M) is also usable. Contact the manufacturer directly.

Details of Option Connectors for Servo Amplifiers/MR-D01

Model	SSCNET III(/H) connector	SSCNET III(/H) connector
MR-J3BUS_M MR-J3BUS_M-A MR-J3BCN1	 Connector: PF-2D103 (Japan Aviation Electronics Industry, Limited)	 Connector: PF-2D103 (Japan Aviation Electronics Industry, Limited)

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/MR-D01 connector
MR-CCN1	 Solder type (Note 1) Connector: 10120-3000PE Shell kit: 10320-52F0-008 (3M) or an equivalent product

Model	Servo amplifier/MR-D01 connector	Junction terminal block connector
MR-J2HBUS_M	 Connector: 52316-2019 Shell kit: 52370-2070 (Molex, LLC) 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, LLC) 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-O (J.S.T. Mfg. Co., Ltd.)	 Solder type (Note 3) Connector: 10114-3000PE Shell kit: 10314-52F0-008 (3M) or an equivalent product

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: 10114-6000EL and shell kit: 10314-3210-000) (3M) is also usable. Contact the manufacturer directly.

Details of Option Connectors for Servo Amplifiers

Model	Servo amplifier connector	Junction connector
MR-BT6V2CBL_M	 Contact: SPHD-001G-P0.5 Housing: PAP-02V-O (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, LLC)

Details of Option Connectors for Drive Unit/Power Regeneration Converter Unit

Model	Power regeneration converter unit connector	Drive unit connector
MR-CUL06M MR-J2CN1-A	 Connector: 10120-3000PE Shell kit: 10320-52F0-008 (3M) or an equivalent product	 Connector: PCR-S20FS+ Case: PCR-LS20LA1 (Honda Tsushin Kogyo Co., Ltd.)

Model	Power regeneration converter unit connector
MR-CVCN24S	 Connector: DK-2100D-08R Contact: DK-2RECSLP1-100 (DDK Ltd.)

Model	Power regeneration converter unit connector	Open tool
Magnetic contactor wiring connector (Standard accessory of power regeneration converter unit)	 Connector: 03JFAT-SAXGSA-L (J.S.T. Mfg. Co., Ltd.)	 J-FAT-OT-EXL (J.S.T. Mfg. Co., Ltd.)

Model	Drive unit connector	Drive unit connector
MR-J4CN2CBL_M-H	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex, LLC)	 Receptacle: 36210-0100PL Shell kit: 36310-3200-008 (3M) or Connector set: 54599-1019 (Molex, LLC)

Details of Option Connectors for Drive Unit/Resistance Regeneration Converter Unit

Model	Resistance regeneration converter unit connector	Drive unit connector
MR-J3CDL05M MR-J2CN1-A	 Connector: 10120-3000PE Shell kit: 10320-52F0-008 (3M) or an equivalent product	 Connector: PCR-S20FS+ Case: PCR-LS20LA1 (Honda Tsushin Kogyo Co., Ltd.)

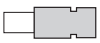
Model	Resistance regeneration converter unit connector
Digital input/output connector (Standard accessory of resistance regeneration converter unit)	 Connector: 17JE23090-02(D8A)K11-CG (DDK Ltd.)

Model	Resistance regeneration converter unit connector
Magnetic contactor wiring connector (Standard accessory of resistance regeneration converter unit)	 Socket: GFKC 2,5/ 2-STF-7,62 (Phoenix Contact)

Details of Option Connector 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 Option 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 B-RJ100 WB

Application	Model	Description
Ultra-long bending life fiber-optic cable for SSCNET III(/H)	SC-J3BUS_M-C _ = cable length (100 m maximum (Note 1), unit of 1 m)	Mitsubishi Electric System & Service Co., Ltd.

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.

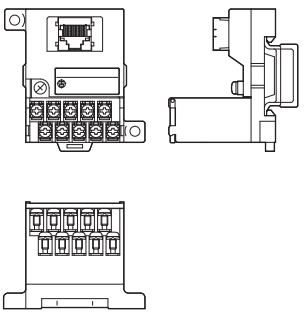
Cable for MODBUS® RTU (Note 2)

A-RJ

Application	Model	Cable length	Description
RJ-45 compatible cable designed for MR-J4-A-RJ	DSV-CABMD06	0.6 m	Servo amplifier connector — RJ-45 compatible junction connector terminal block Diatrend Corp.

RJ-45 compatible junction connector terminal block for MODBUS® RTU (Note 2)

A-RJ

Application	Model	Description
RJ-45 compatible junction connector terminal block	PX7D-10V4-RJ45 (spring-up screw)	 Toho Technology Corp., Kyoto Factory PS7D-10V4-RJ45 (self-up screw) is also usable.

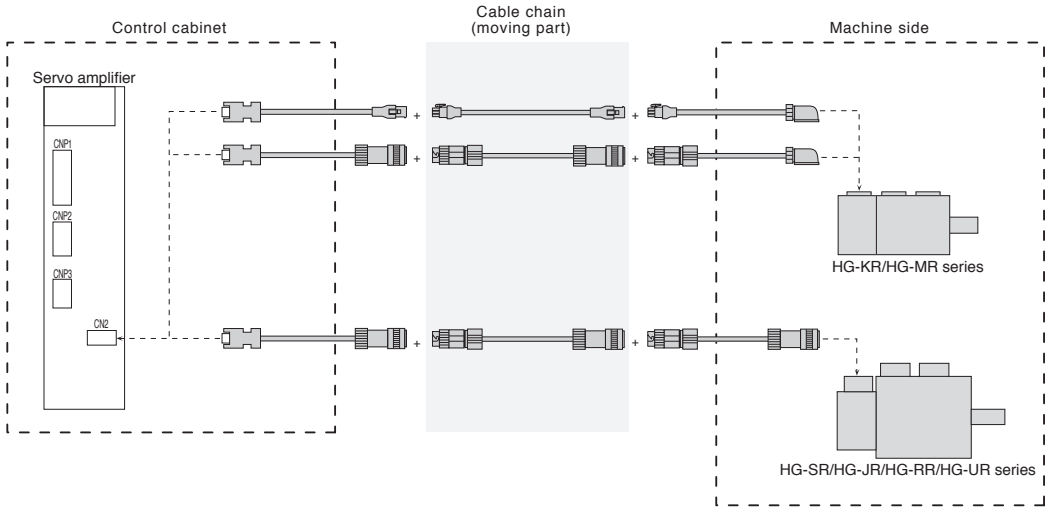
Notes: 1. The maximum wiring distance between stations is 100 m for SSCNET III/H and 50 m for SSCNET III.
2. This cannot be used with MR-J4-03A6(-RJ).

Application of connecting encoder junction cable

GF GF-RJ B B-RJ WB A A-RJ

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 SERVICE SECTION (Email: osb.webmaster@melsc.jp)

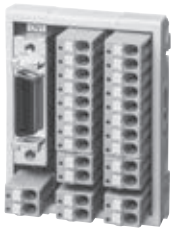
Example) Configuration using three encoder junction cables
- Replacing only the cable of the moving part in the cable chain is possible.
- Resetting after transporting a machine is easy because the servo amplifier side and the servo motor side can be separated.



Products on the Market for Servo Amplifiers

Mitsubishi Electric Engineering

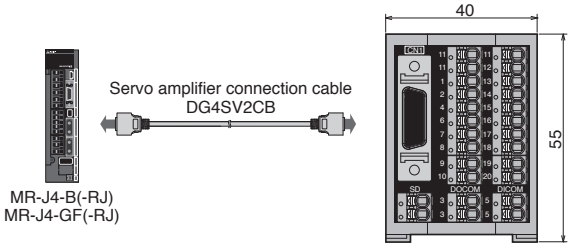
Network amplifier junction terminal block



Features

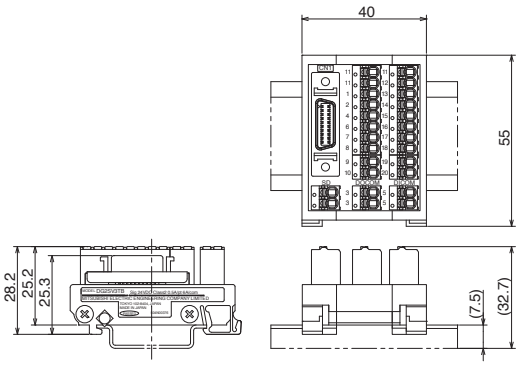
- **The spring clamp type reduces the installation area by about 40 % compared to the screw type (based on our research).**
- **When multiple servo amplifiers are connected, the interface power supply can be connected in series across terminal blocks.**

Connection with servo amplifier



Dimensions

■**DG2SV3TB**



[Unit: mm]

Product models

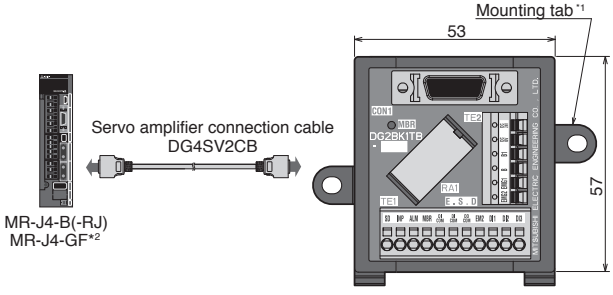
Item		Model	Description
Network amplifier junction terminal block		DG2SV3TB	For network-connectable 1-axis servo amplifier, sink/source common type External power supply voltage: 24 V DC ± 10 % Maximum usable current: 0.5 A for signal / 6 A for common line
	Servo amplifier connection cable	DG4SV2CB05	Length: 0.5 m
		DG4SV2CB10	Length: 1 m
		DG4SV2CB50	Length: 5 m

Junction terminal block for servo motors with brakes

Features

- **Easy to build a brake sequence circuit recommended for MR-J4-B/GF servo amplifiers.**
- **The new terminal block reduces the installation area by up to 50 % compared to preceding types. In addition, fewer wires are required inside the cabinet.**

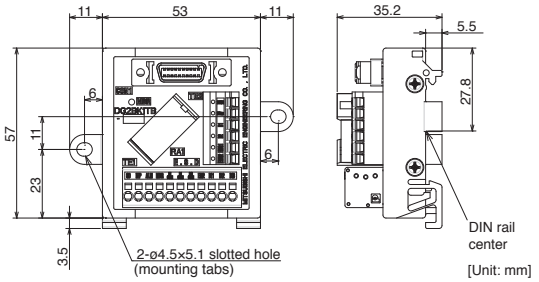
Connection with servo amplifier



*1: The DG2BK1TB-D and the DG2BK1TB-P01-D are without mounting tabs.
*2: MR-J4-GF-RJ is planned for future support.

Dimensions

■**DG2BK1TB, DG2BK1TB-P01**



[Unit: mm]

Notes: 1. The DG2BK1TB-D and the DG2BK1TB-P01-D are without mounting tabs.

Product models

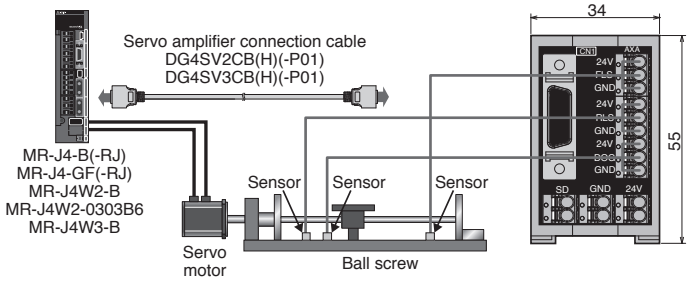
Item		Model	Description
Junction terminal block for motor with brake Applicable servo motor capacity: 50 W to 22 kW External power supply voltage For servo amplifier interface: 24 V DC ± 10 %, 0.3 A (max.) For electromagnetic brake: 24 V DC 0 to -10 %, 1.43 A (max.) Relay: DSP1a-DC24V (Panasonic Corporation)		DG2BK1TB	For network-connectable 1-axis servo amplifier, sink type
		DG2BK1TB-D	For network-connectable 1-axis servo amplifier, sink type For DIN rail installation
		DG2BK1TB-P01	For network-connectable 1-axis servo amplifier, source type
		DG2BK1TB-P01-D	For network-connectable 1-axis servo amplifier, source type For DIN rail installation
	Servo amplifier connection cable	DG4SV2CB05	Length: 0.5 m
		DG4SV2CB10	Length: 1 m
		DG4SV2CB50	Length: 5 m

FLS/RLS/DOG signal-specialized network amplifier terminal block

Features

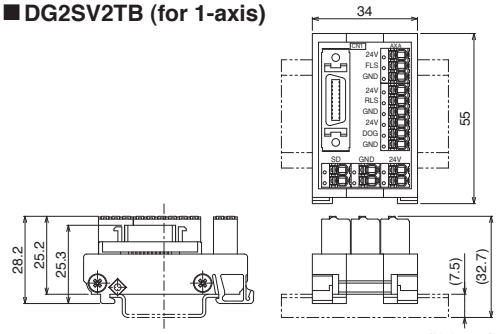
- **Compact terminal blocks designed specifically for the FLS/RLS (stroke limit) and DOG (proximity dog) signals.**
- **Long cables are available to install the terminal block near the machine. (Long bending life cables are also available.)**

Connection with servo amplifier



Dimensions

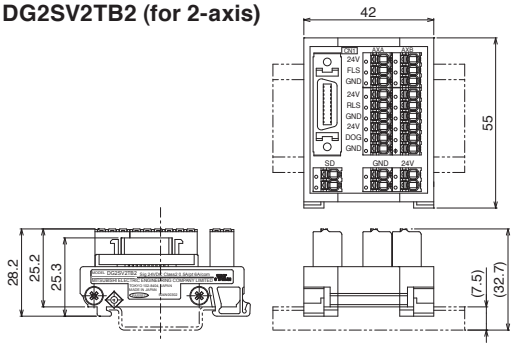
■ **DG2SV2TB (for 1-axis)**



[Unit: mm]

Dimensions

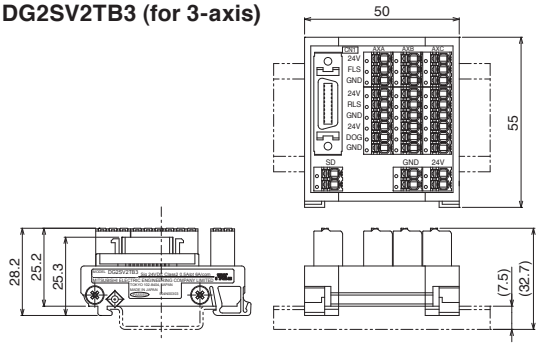
■ **DG2SV2TB2 (for 2-axis)**



[Unit: mm]

Dimensions

■ **DG2SV2TB3 (for 3-axis)**



[Unit: mm]

Product models

Item		Model	Description
FLS/RLS/DOG signal-specialized network amplifier terminal block (for 1-axis)		DG2SV2TB	For network-connectable 1-axis servo amplifier Sink/source common type, dedicated for FLS/RLS/DOG signals External power supply voltage: 24 V DC ± 10 % Maximum usable current: 0.5 A for signal / 6 A for common line
	Sink-interface servo amplifier connection cable (for 1-axis servo amplifier)	DG4SV2CB05	Length: 0.5 m
		DG4SV2CB10	Length: 1 m
		DG4SV2CB50	Length: 5 m
	Sink-interface servo amplifier connection cable (for 1-axis servo amplifier / long bending life)	DG4SV2CB50H	Length: 5 m
		DG4SV2CB100H	Length: 10 m
	Source-interface servo amplifier connection cable (for 1-axis servo amplifier)	DG4SV2CB05-P01	Length: 0.5 m
		DG4SV2CB10-P01	Length: 1 m
		DG4SV2CB50-P01	Length: 5 m
	Source-interface servo amplifier connection cable (for 1-axis servo amplifier / long bending life)	DG4SV2CB50H-P01	Length: 5 m
		DG4SV2CB100H-P01	Length: 10 m
FLS/RLS/DOG signal-specialized network amplifier terminal block (for 2-axis/ 3-axis servo amplifier)		DG2SV2TB2	For network-connectable 2-axis integrated servo amplifier Sink/source common type, dedicated for FLS/RLS/DOG signals External power supply voltage: 24 V DC ± 10 % Maximum usable current: 0.5 A for signal / 6 A for common line
		DG2SV2TB3	For network-connectable 3-axis integrated servo amplifier Sink/source common type, dedicated for FLS/RLS/DOG signals External power supply voltage: 24 V DC ± 10 % Maximum usable current: 0.5 A for signal / 6 A for common line
	Sink-interface servo amplifier connection cable (for 2-axis/3-axis servo amplifier)	DG4SV3CB05	Length: 0.5 m
		DG4SV3CB10	Length: 1 m
		DG4SV3CB50	Length: 5 m
	Sink-interface servo amplifier connection cable (for 2-axis/3-axis servo amplifier / long bending life)	DG4SV3CB50H	Length: 5 m
		DG4SV3CB100H	Length: 10 m
	Source-interface servo amplifier connection cable (for 2-axis/3-axis servo amplifier)	DG4SV3CB05-P01	Length: 0.5 m
		DG4SV3CB10-P01	Length: 1 m
		DG4SV3CB50-P01	Length: 5 m
	Source-interface servo amplifier connection cable (for 2-axis/3-axis servo amplifier / long bending life)	DG4SV3CB50H-P01	Length: 5 m
		DG4SV3CB100H-P01	Length: 10 m

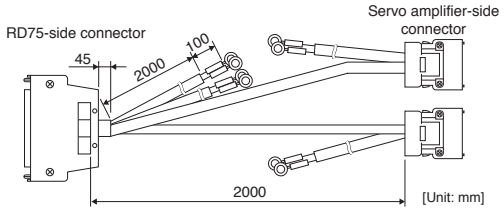
Servo amplifier connection cable for pulse train Positioning modules

Features

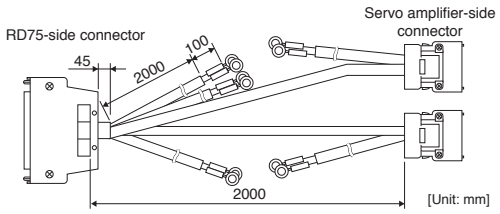
■ **This servo amplifier connection cable for pulse train Positioning modules enables easy wiring when the MELSEC Positioning module is used to control the MR-J4-A.**

Dimensions

■FA-CBLQ75M2J3, FA-CBLQ75PM2J3



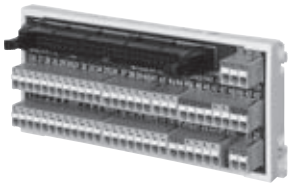
■FA-CBLQ75M2J3-P



Product models

Item	Model	Description
Servo amplifier connection cable for pulse train Positioning modules	FA-CBLQ75M2J3-P	Supported Positioning module: RD75D2, RD75D4, FX5-20PG-D Length: 2 m, with pulsar cables
	FA-CBLQ75M2J3	Supported Positioning module: RD75D2, RD75D4, FX5-20PG-D Length: 2 m, without pulsar cables
	FA-CBLQ75PM2J3	Supported Positioning module: RD75P2, RD75P4, FX5-20PG-P Length: 2 m, without pulsar cables

General-purpose interface amplifier junction terminal block

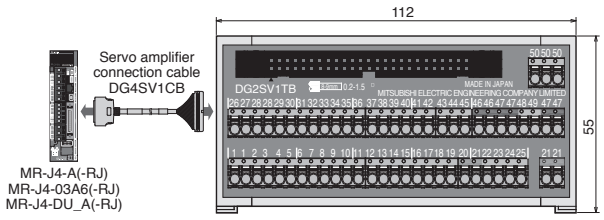


Features

■ **The spring clamp type reduces the installation area by 50 % compared to the screw type (based on our research).**

■ **When multiple servo amplifiers are connected, the interface power supply can be connected in series across up to four terminal blocks.**

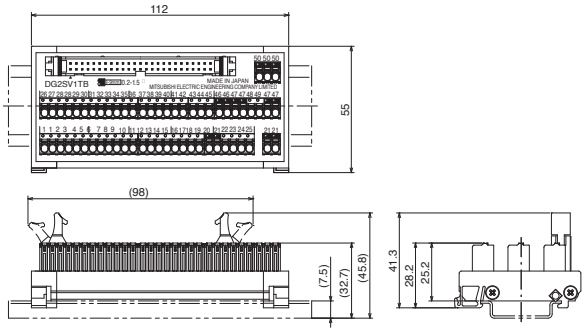
Connection with servo amplifier *1



*1: This can also be used for MR-D01.

Dimensions

■DG2SV1TB



[Unit: mm]

Product models

Item		Model	Description
General-purpose interface amplifier junction terminal block		DG2SV1TB	For general-purpose interface servo amplifier, sink/source common type External power supply voltage: 24 V DC ± 10 %, current capacity 1 A (max.)
	Servo amplifier connection cable	DG4SV1CB05	Length: 0.5 m
		DG4SV1CB10	Length: 1 m

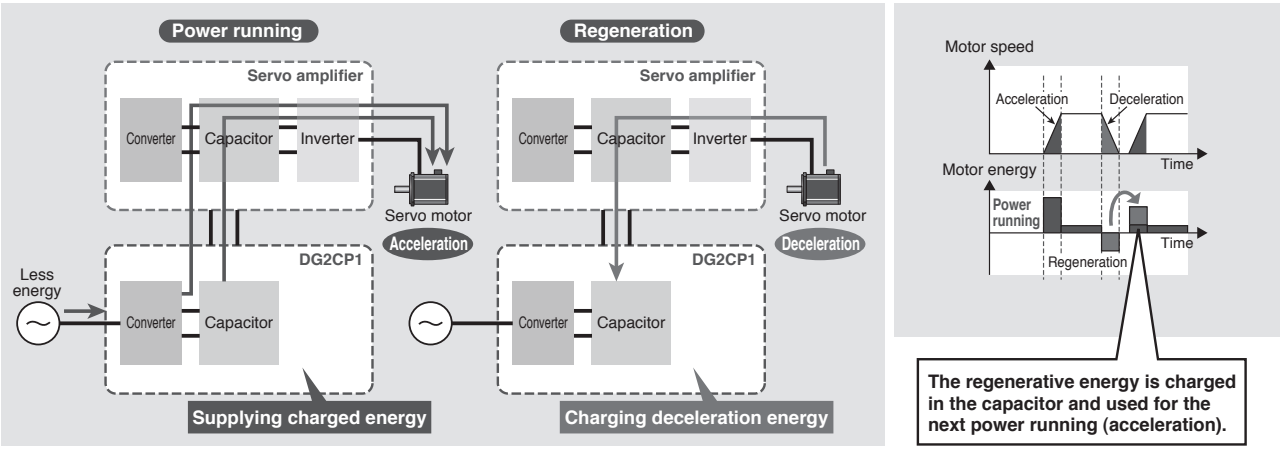
Instantaneous power failure protection module for servo amplifiers

Features

- **When an instantaneous power failure occurs, the main circuit's power failure tolerance time is secured by supplying energy from the instantaneous power failure protection module for servo amplifiers. This enables normal stopping.**
- **Heat generated in the cabinet can be reduced by reducing the dissipation of regeneration heat.**

Before and after introduction of unit

The regenerative energy at deceleration is charged in the capacitor and used for the next power running.



Product model

Item	Model
Instantaneous power failure protection module for servo amplifiers	DG2CP1

For inquiries about Mitsubishi Electric Engineering products,
please contact us at the following email address. (Supported languages: English and Japanese).
fagoods.products.faq@mitsubishielectricengineering.com

Functional Safety Unit (MR-D30) (Note 7)

GF-RJ B-RJ B-RJ100 A-RJ

Specifications

A combination of MR-D30 functional safety unit and MR-J4-GF-RJ/MR-J4-B-RJ/MR-J4-A-RJ servo amplifier or MR-J4-DU_B-RJ/MR-J4-DU_A-RJ drive unit expands the safety sub-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
Safety performance	Standards certified by CB	ISO 13849-1:2015 Category 4 PL e and Category 3 PL d IEC 61508 SIL 2 and SIL 3 IEC 62061 SIL CL 2 and SIL CL 3 IEC 61800-5-2
	Mean time to dangerous failure	MTTFd ≥ 100 [years] (313a)
	Effectiveness of safety observation system or safety observation subsystem	DC = High, 97.6 [%]
	Probability of dangerous Failure per Hour	PFH = 6.57 × 10^{-9} [1/h]
	Mission time	TM = 20 [years]
	Response performance (Note 1)	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)
	Position observation resolution	1/32 rev
	Input device	6 points × 2 systems (source/sink)
	Output device	Source: 3 points × 2 systems and 1 point × 1 system Sink: 1 point × 1 system
Safety sub-function (IEC 61800-5-2)	Safe torque off (STO)	Category 4 PL e, SIL 3 (Note 2)/Category 3 PL d, SIL 2
	Safe stop 1 (SS1)	Category 4 PL e, SIL 3 (Note 2)/Category 3 PL d, SIL 2
	Safe stop 2 (SS2) (Note 4, 5)	Category 4 PL e, SIL 3 (Note 2)/Category 3 PL d, SIL 2
	Safe operating stop (SOS) (Note 4, 5)	Category 4 PL e, SIL 3 (Note 2)/Category 3 PL d, SIL 2
	Safely-limited speed (SLS) (Note 4)	Category 4 PL e, SIL 3 (Note 2, 3)/Category 3 PL d, SIL 2
	Safe brake control (SBC)	Category 4 PL e, SIL 3 (Note 2)/Category 3 PL d, SIL 2
	Safe speed monitor (SSM) (Note 4)	Category 4 PL e, SIL 3 (Note 2, 3)/Category 3 PL d, SIL 2
	Status monitor (Note 6)	Category 4 PL e, SIL 3/Category 3 PL d, SIL 2
Compliance with global standards	CE marking	EMC: EN 61800-3 MD: EN ISO 13849-1:2015, 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	2000 m or less above sea level
	Vibration resistance	5.9 m/s^2 at 10 Hz to 57 Hz
Mass [kg]		0.15

Notes: 1. Time from STO input to energy shut off.
2. To meet Category 4 PL e, SIL 3, an input diagnosis using test pulse is required.
3. To meet Category 4 PL e, SIL 3, a combination with HG-KR_W0C, HG-SR_W0C, or HG-JR_W0C servo motor is required.
4. Linear servo system, direct drive servo system, and fully closed loop control system do not support SLS, SSM, SS2, and SOS.
5. To achieve SS2 and SOS, a combination with HG-KR_W0C, HG-SR_W0C, or HG-JR_W0C servo motor is required.
6. The status monitor is an original function of Mitsubishi Electric. Refer to "MR-D30 Instruction Manual" for the achievable safety level and the types of the status monitor.
7. This is not supported by MR-J4-03A6(-RJ).

Functional Safety Unit (MR-D30)

GF-RJ B-RJ B-RJ100 A-RJ

List of compatible software version

Achievable safety sub-function depends on the software versions of MR-D30 and the servo amplifier, and compatibility of the servo motor with functional safety. Refer to the table below:

For MR-J4-_GF_-RJ

Safety sub-function control by input device

MR-D30 software version	Servo amplifier software version	Safety sub-function (IEC/EN 61800-5-2)	Servo motors with functional safety	Servo amplifier
A1 or later	A3 or later	STO/SS1/SBC/SLS/SSM/ SOS/SS2	HG-KR_W0C HG-SR_W0C HG-JR_W0C	MR-J4-_GF_-RJ

Safety sub-function control by network

MR-D30 software version	Servo amplifier software version	Safety sub-function (IEC/EN 61800-5-2)	Servo motors with functional safety	Servo amplifier
A2 or later	A3 or later	STO/SS1/SBC/SLS/SSM/ SOS/SS2	HG-KR_W0C HG-SR_W0C HG-JR_W0C	MR-J4-_GF_-RJ

For MR-J4-_B_-RJ/MR-J4-DU_B_-RJ/MR-J4-_A_-RJ/MR-J4-DU_A_-RJ

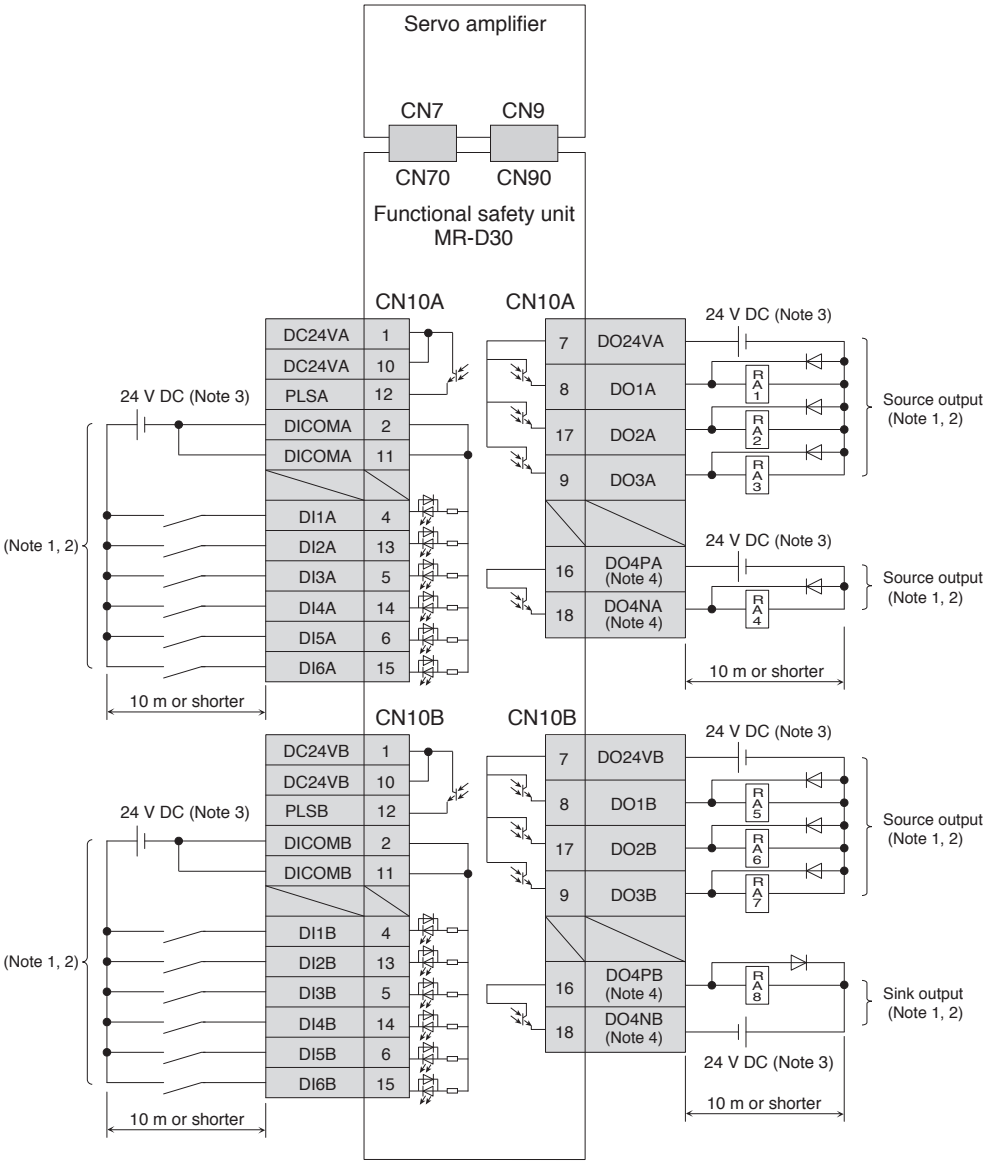
MR-D30 software version	Servo amplifier software version	Safety sub-function (IEC/EN 61800-5-2)	Servo motors with functional safety	Servo amplifier
A0	B3 or later	STO/SS1/SBC/SLS/SSM	Not compatible	MR-J4_B_-RJ
A1 or later	B3/B4	STO/SS1/SBC/SLS/SSM	Not compatible	MR-J4_B_-RJ
	B5 or later	STO/SS1/SBC/SLS/SSM/ SOS/SS2	HG-KR_W0C HG-SR_W0C HG-JR_W0C	MR-J4_B_-RJ MR-J4_A_-RJ (Note 1) MR-J4-DU_B_-RJ MR-J4-DU_A_-RJ (Note 2)

Notes: 1. MR-D30 is compatible with MR-J4_A_-RJ manufactured in November 2014 or later.
2. MR-D30 is compatible with MR-J4-DU_A_-RJ manufactured in January 2015 or later.

Functional Safety Unit (MR-D30)

GF-RJ B-RJ B-RJ100 A-RJ

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 input/output 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
DI1A (CN10A-4)/DI1B (CN10B-4)
DI2A (CN10A-13)/DI2B (CN10B-13)
DI3A (CN10A-5)/DI3B (CN10B-5)
DI4A (CN10A-14)/DI4B (CN10B-14)
DI5A (CN10A-6)/DI5B (CN10B-6)
DI6A (CN10A-15)/DI6B (CN10B-15)

Combination for output connector pin
DO1A (CN10A-8)/DO1B (CN10B-8)
DO2A (CN10A-17)/DO2B (CN10B-17)
DO3A (CN10A-9)/DO3B (CN10B-9)
DO4NA (CN10A-18)/DO4PB (CN10B-16)

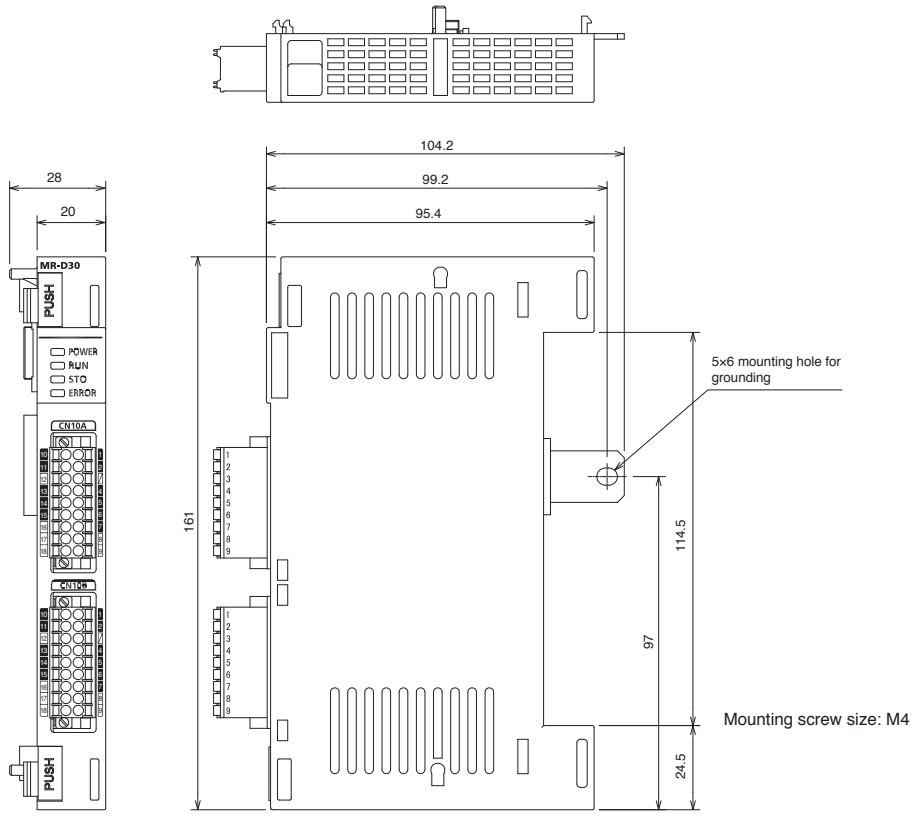
3. Provide an external power supply of 24 V DC ± 10% for the interface. When all input/output points are used, the total current capacity of 0.8 A is required. For convenience of illustration, the diagram shows separate 24 V DC power supplies for input and output signals. However, the input and output signals can share a common power supply.

4. DO4PA (CN10A-16), DO4NA (CN10A-18), DO4PB (CN10B-16) and DO4NB (CN10B-18) are not available with MR-D30 manufactured in September 2014 or earlier. Do not connect anything to these pins.

Functional Safety Unit (MR-D30)

GF-RJ B-RJ B-RJ100 A-RJ

Dimensions



[Unit: mm]

Safety Logic Unit (MR-J3-D05) (Note 5)

GF GF-RJ B B-RJ WB A A-RJ

The safety logic unit has SS1 and STO functions. A combination of the servo amplifier and the safety logic unit (MR-J3-D05) achieves SS1 (safe stop 1) function.

Specifications

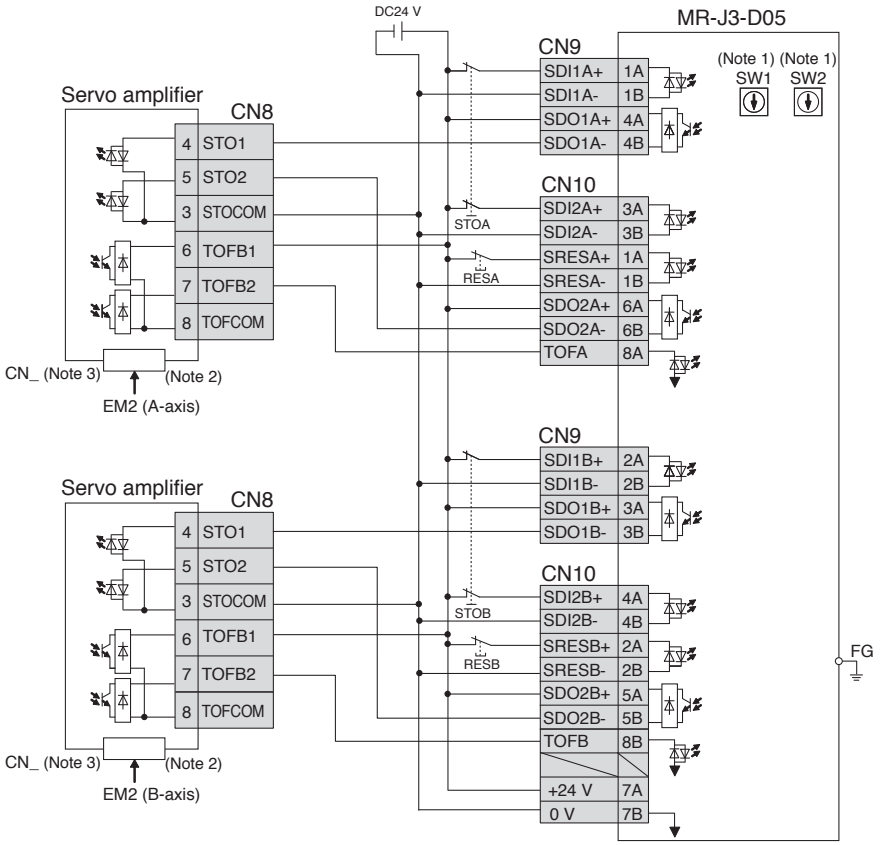
Safety logic unit model		MR-J3-D05
Control circuit power supply	Voltage	24 V DC
	Permissible voltage fluctuation	24 V DC ± 10%
	Required current capacity [A]	0.5 (Note 1, 2)
Compatible system		2 systems (A-axis, B-axis independent)
Shut-off input		4 points (2 points × 2 systems) SDI_ : source/sink compatible (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	ISO 13849-1:2015 Category 3 PL d, IEC 61508 SIL 2, IEC 62061 SIL CL 2, IEC 61800-5-2
	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)	MTTFd ≥ 100 [years] (516a)
	Diagnostic coverage (DC)	DC = Medium, 93.1 [%]
	Probability of dangerous Failure per Hour (PFH)	4.75×10^{-9} [1/h]
Compliance with global standards	CE marking	LVD: EN 61800-5-1 EMC: EN 61800-3 MD: EN ISO 13849-1:2015, 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: 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/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 indicates a number and axis name.
4. Contact your local sales office for test pulse input.
5. This is not supported by MR-J4W2-0303B6 and MR-J4-03A6(-RJ).

Safety Logic Unit (MR-J3-D05)

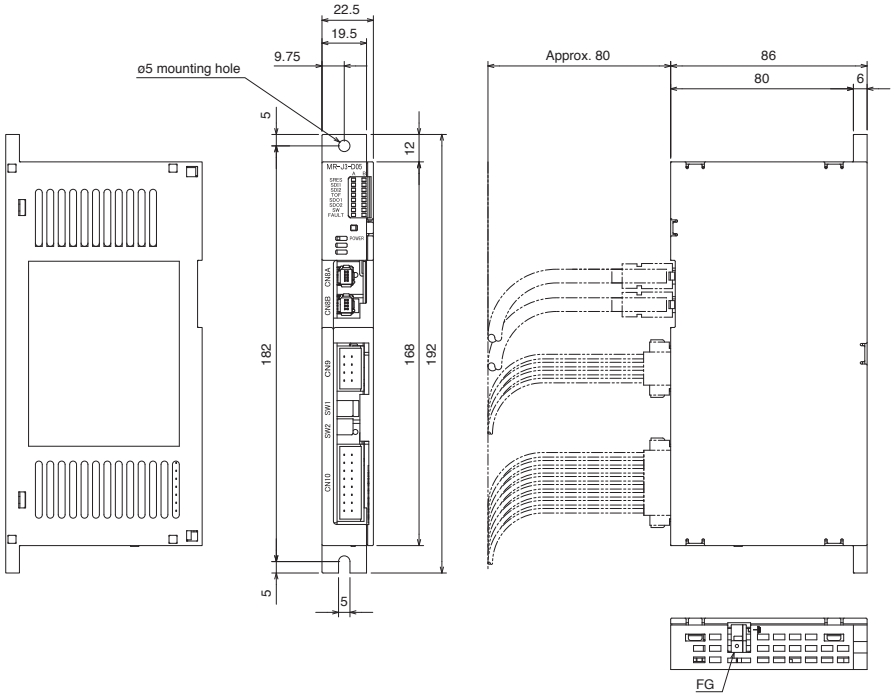
GF | GF-RJ | B | B-RJ | WB | A | A-RJ

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-_GF_(-RJ)/MR-J4-_B_(-RJ)/MR-J4-DU_B_(-RJ)/MR-J4W_-B, and CN1 for MR-J4-_A_(-RJ)/MR-J4-DU_A_(-RJ).

Dimensions



Mounting screw size: M4

[Unit: mm]

Extension IO Unit (MR-D01) (Note 3)

A-RJ

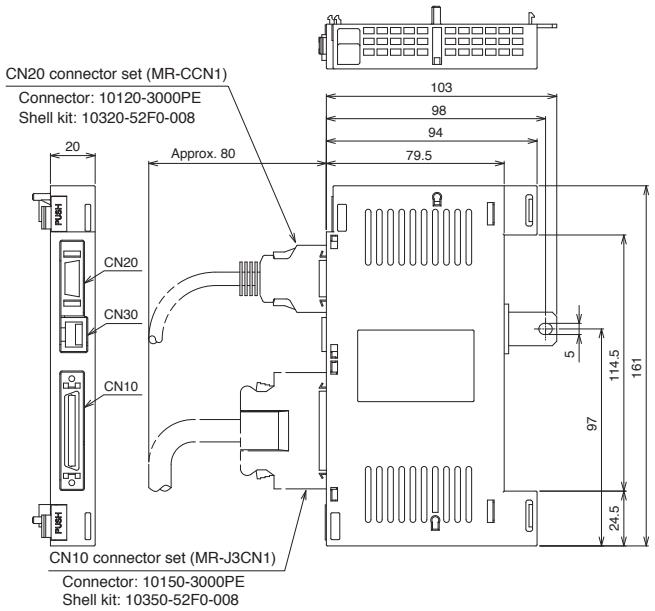
Digital/analog inputs and outputs can be increased by combining extension IO unit (MR-D01).

Specification

Extension IO unit model		MR-D01
Interface power supply		24 V DC ±10% (required current capacity: 0.8 A (Note 1))
Digital input		30 points, photocoupler insulation, sink/source compatible
Digital output		16 points, photocoupler insulation, sink/source compatible
Analog input		2 channels, 0 V DC to ±10 V DC (input impedance: 10 kΩ to 12 kΩ)
Analog output		2 channels, 0 V DC to ±12 V DC
Power supply for analog input signal		P15R: +15 V DC, permissible current: 30 mA (Note 2) N12R: -12 V DC, permissible current: 30 mA (Note 2)
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: 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/s^2 at 10 Hz to 55 Hz (directions of X, Y and Z axes)
Mass [g]		140

Notes: 1. A 24 V DC power supply for input/output signals can be shared by the servo amplifier and MR-D01. In this case, secure the power supply capacity corresponding to the points of the input/output signals to be used.
2. P15R can be used as a power supply for TLA and VC. N12R can be used as a power supply for VC. Note that the power voltage varies between -12 V to -15 V.
3. MR-D01 extension IO unit is supported by MR-J4-_A_-RJ servo amplifiers with software version B7 or later. Note that MR-D01 is not supported by MR-J4-03A6(-RJ) and the drive unit.

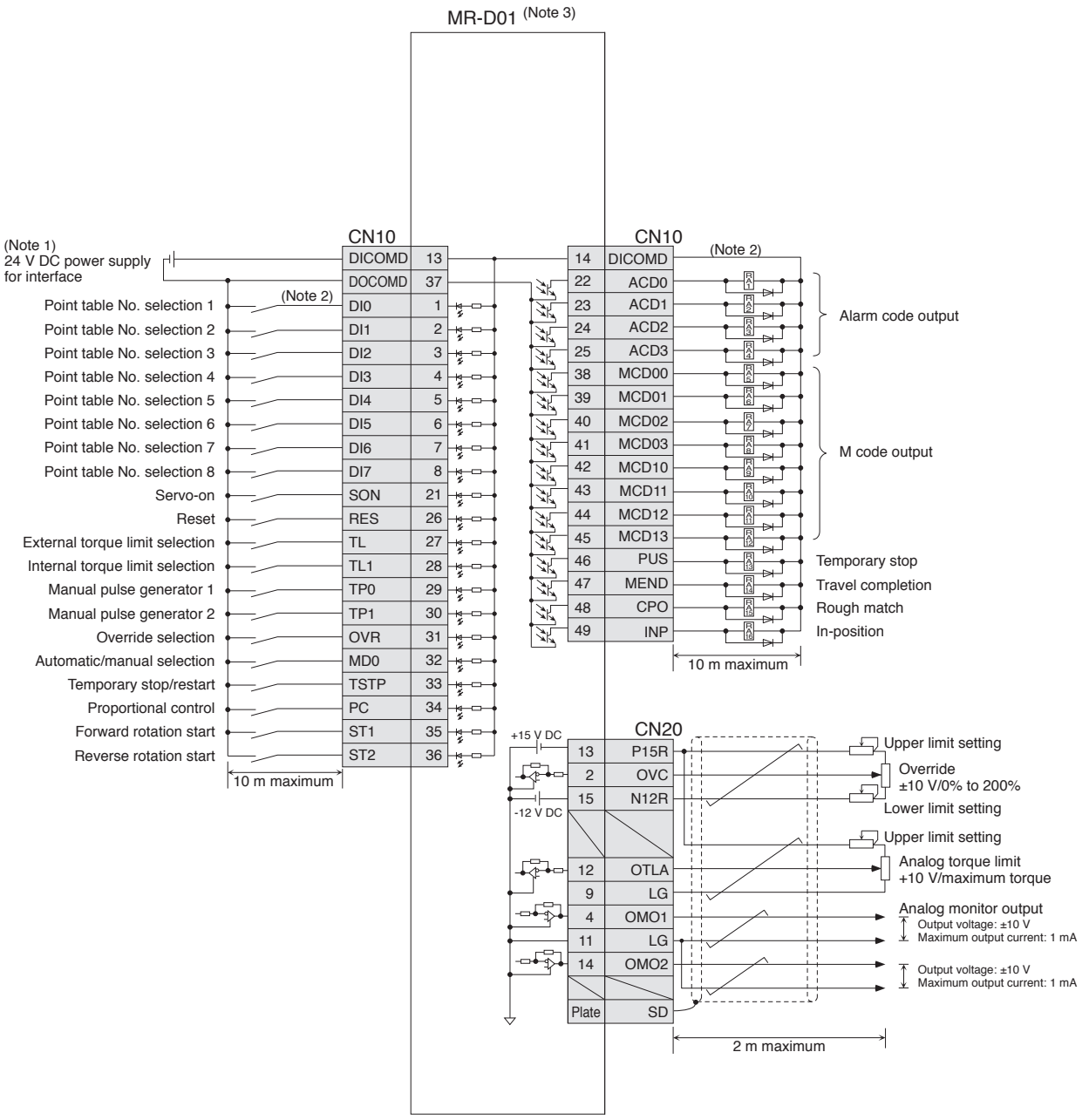
Dimensions



[Unit: mm]

Extension IO Unit (MR-D01): Connection Example (Point Table Positioning Operation)

A-RJ



Notes: 1. A 24 V DC power supply for input/output signals can be shared by the servo amplifier and MR-D01. In this case, secure the power supply capacity corresponding to the points of the input/output signals to be used.
2. This is for sink wiring. Source wiring is also possible. Refer to "MR-J4-_A_-RJ MR-J4-03A6-RJ Servo Amplifier Instruction Manual (Positioning Mode)" for details.
3. MR-D01 connects directly to CN7 connector of MR-J4-_A-RJ.

Regenerative Option

GF GF-RJ B B-RJ WB A A-RJ

200 V/100 V

Servo amplifier model	Permissible 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	12	30	3N	31	32	50 (Note 1)	5N (Note 1)	51 (Note 1)	5R (Note 2)	9F (Note 2)	9T (Note 2)	14	34
					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	2.5 Ω	26 Ω	26 Ω
MR-J4-10GF/B/A MR-J4-10GF1/B1/A1	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-
MR-J4-20GF/B/A MR-J4-20GF1/B1/A1	10	-	-	-	30	100	-	-	-	-	-	-	-	-	-	-	-	-
MR-J4-40GF/B/A MR-J4-40GF1/B1/A1	10	-	-	-	30	100	-	-	-	-	-	-	-	-	-	-	-	-
MR-J4-60GF/B/A	10	-	-	-	30	100	-	-	-	-	-	-	-	-	-	-	-	-
MR-J4-70GF/B/A	20	-	-	-	30	100	-	-	-	300	-	-	-	-	-	-	-	-
MR-J4-100GF/B/A	20	-	-	-	30	100	-	-	-	300	-	-	-	-	-	-	-	-
MR-J4-200GF/B/A	100	-	-	-	-	-	300	-	-	-	500	-	-	-	-	-	-	-
MR-J4-350GF/B/A	100	-	-	-	-	-	-	300	-	-	-	500	-	-	-	-	-	-
MR-J4-500GF/B/A	130	-	-	-	-	-	-	-	300	-	-	-	500	-	-	-	-	-
MR-J4-700GF/B/A	170	-	-	-	-	-	-	-	300	-	-	-	500	-	-	-	-	-
MR-J4-11KGF/B/A	-	500 (800)	-	-	-	-	-	-	-	-	-	-	-	500 (800)	-	-	-	-
MR-J4-15KGF/B/A	-	-	850 (1300)	-	-	-	-	-	-	-	-	-	-	-	850 (1300)	-	-	-
MR-J4-22KGF/B/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

Resistance regeneration converter unit model	Drive unit model	Permissible 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 m^3/min). The cooling fan must be prepared by user.
2. The value in brackets is applicable when cooling fans (two units of 92 mm × 92 mm, minimum air flow: 1.0 m^3/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.

* Precautions when mounting/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.
4. There are restrictions on the mounting direction of the regenerative option. Refer to relevant Servo Amplifier Instruction Manual for details.

Regenerative Option

GF GF-RJ B B-RJ WB A A-RJ

400 V

Servo amplifier model	Permissible 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-J4-60GF4/B4/A4	15	-	-	100	300	-	-	-	-	-	-	-	-
MR-J4-100GF4/B4/A4	15	-	-	100	300	-	-	-	-	-	-	-	-
MR-J4-200GF4/B4/A4	100	-	-	-	-	300	-	-	500	-	-	-	-
MR-J4-350GF4/B4/A4	100	-	-	-	-	300	-	-	500	-	-	-	-
MR-J4-500GF4/B4/A4	130 (Note 3)	-	-	-	-	-	300	-	-	500	-	-	-
MR-J4-700GF4/B4/A4	170 (Note 3)	-	-	-	-	-	-	300	-	-	500	-	-
MR-J4-11KGF/B4/A4	-	500 (800)	-	-	-	-	-	-	-	-	-	500 (800)	-
MR-J4-15KGF/B4/A4	-	-	850 (1300)	-	-	-	-	-	-	-	-	-	850 (1300)
MR-J4-22KGF/B4/A4	-	-	850 (1300)	-	-	-	-	-	-	-	-	-	850 (1300)

Resistance regeneration converter unit model	Drive unit model	Permissible 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 m^3/min). The cooling fan must be prepared by user.
2. The value in brackets is applicable when cooling fans (two units of 92 mm × 92 mm, minimum air flow: 1.0 m^3/min) are installed, and then [Pr. PA02] is changed.
3. The servo amplifier built-in regenerative resistor supports 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.

* Precautions when mounting/connecting the regenerative option

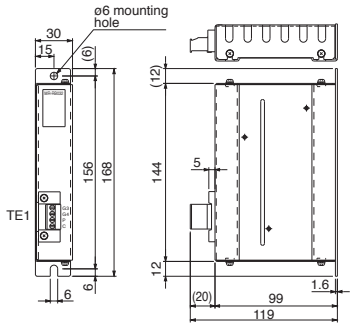
1. The regenerative option causes a temperature rise of 100 °C or higher relative to the ambient temperature. Fully examine heat dissipation, installation position, wires used before installing the unit. Use flame-retardant wires or apply flame retardant on wires, and keep the wires clear of the unit.
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.
4. There are restrictions on the mounting direction of the regenerative option. Refer to relevant Servo Amplifier Instruction Manual for details.

Regenerative Option

GF GF-RJ B B-RJ WB A A-RJ

Dimensions [Unit: mm]

MR-RB032 (for 200 V/100 V)



Terminal arrangement

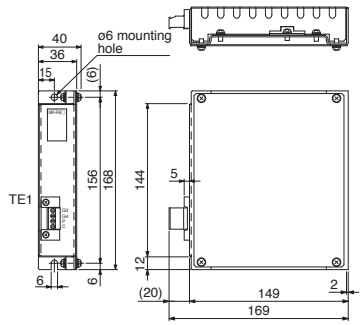
TE1

G3
G4
P
C

Applicable wire size (Note 3):
0.2 mm² to 2.5 mm² (AWG 24 to 12)
Mounting screw size: M5

Model	Mass [kg]
MR-RB032	0.5

MR-RB12 (for 200 V/100 V), MR-RB14 (for 200 V)



Terminal arrangement

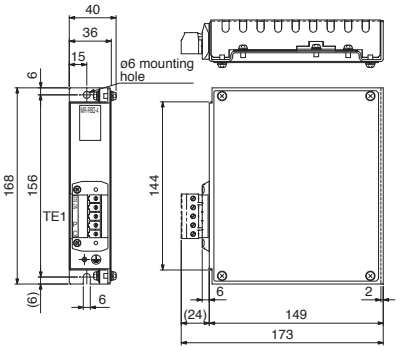
TE1

G3
G4
P
C

Applicable wire size (Note 3):
0.2 mm² to 2.5 mm² (AWG 24 to 12)
Mounting screw size: M5

Model	Mass [kg]
MR-RB12 MR-RB14	1.1

MR-RB1H-4 (for 400 V)



Terminal arrangement

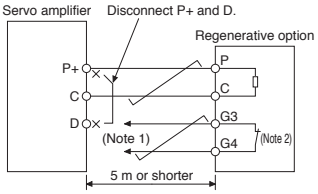
TE1

G3
G4
P
C

Applicable wire size (Note 3):
0.2 mm² to 4.0 mm² (AWG 24 to 10)
Mounting screw size: M5

Model	Mass [kg]
MR-RB1H-4	1.1

Connections



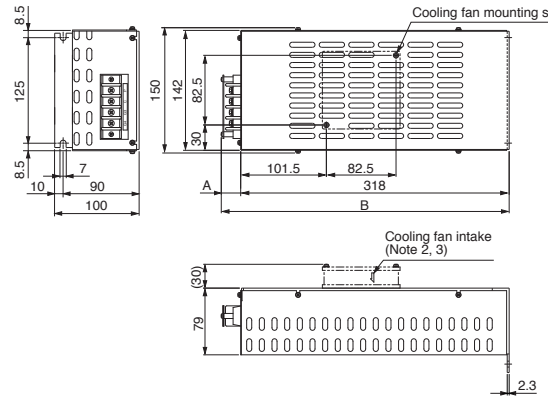
Notes: 1. Create a sequence circuit that turns off the magnetic contactor when abnormal overheating occurs.
2. G3 and G4 terminals are thermal sensor. G3-G4 opens when the regenerative option overheats abnormally.
3. The wire size shows wiring specification of the connector. Refer to "Wires, Molded-Case Circuit Breakers and Magnetic Contactors" in this catalog for examples of wire size selection.

Regenerative Option

GF GF-RJ B B-RJ WB A A-RJ

Dimensions [Unit: mm]

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)



Terminal arrangement

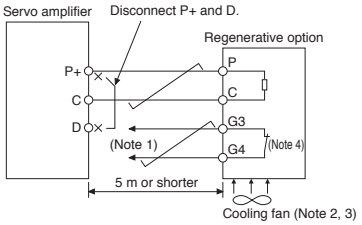
P
C
G3
G4

Terminal screw size: M4
Mounting screw size: M6

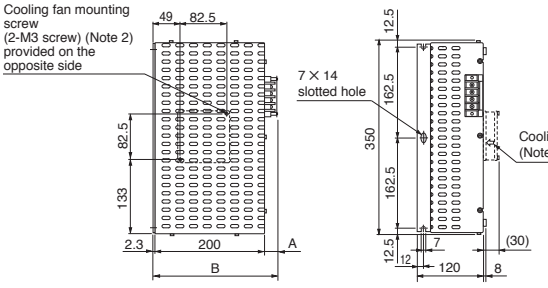
Model	Variable dimensions A	Variable dimensions B	Mass [kg]
MR-RB30	17	335	2.9
MR-RB3N			
MR-RB31			
MR-RB32			
MR-RB34			
MR-RB3M-4	23	341	
MR-RB3G-4			
MR-RB34-4			
MR-RB3U-4			

Connections

For MR-J4-500GF/B/A or smaller,
MR-J4-350GF4/B4/A4 or smaller, and
MR-J4W_-B



MR-RB50, MR-RB5N, MR-RB51 (for 200 V)
MR-RB5G-4, MR-RB54-4, MR-RB5U-4 (for 400 V)



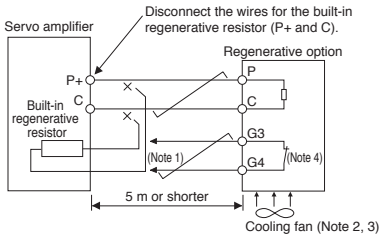
Terminal arrangement

P
C
G3
G4

Terminal screw size: M4
Mounting screw size: M6

Model	Variable dimensions A	Variable dimensions B	Mass [kg]
MR-RB50	17	217	5.6
MR-RB5N			
MR-RB51			
MR-RB5G-4	23	223	
MR-RB54-4			
MR-RB5U-4			

For MR-J4-500GF4/B4/A4 and
MR-J4-700GF(4)/B(4)/A(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 m^3/min). The cooling fan must be prepared by user.
3. When MR-RB30, MR-RB3N, MR-RB31, MR-RB32, or MR-RB34 is used, it may be necessary to cool the unit forcibly with a cooling fan (92 mm × 92 mm, minimum air flow: 1.0 m^3/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.

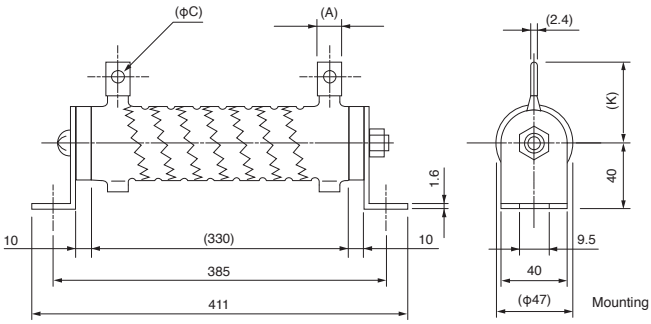
Regenerative Option

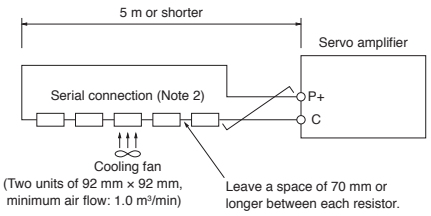
GF GF-RJ B B-RJ A A-RJ

Dimensions [Unit: mm]	Connections

Standard accessory (Note 1)

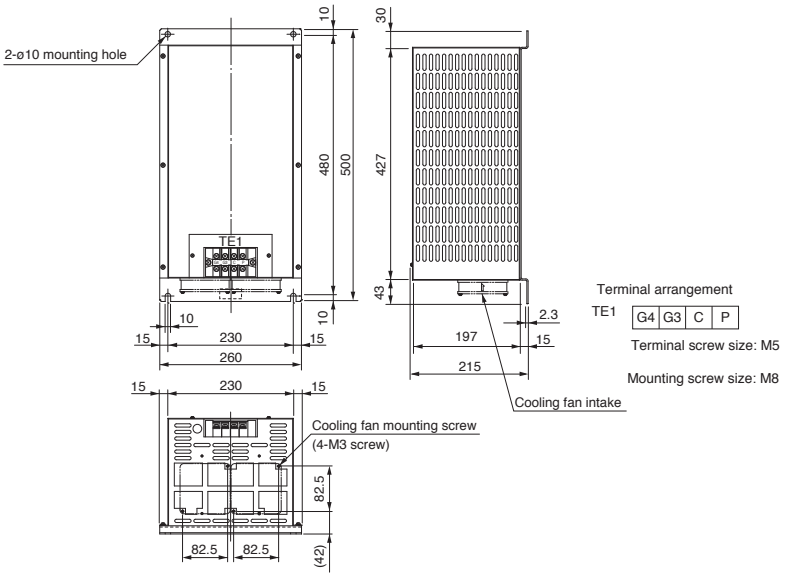
GRZG400-0.8Ω, GRZG400-0.6Ω, GRZG400-0.5Ω (for 200 V)
GRZG400-2.5Ω, GRZG400-2Ω (for 400 V)

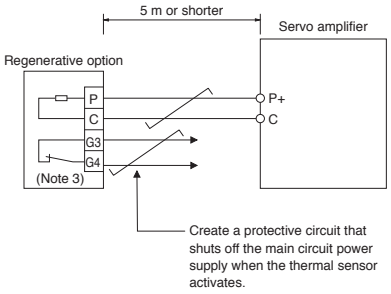




Model	Qty.	Permissible regenerative power [W]	With cooling fan [W]	Resistance value [Ω]	Variable dimensions A	C	K	Mass/ unit [kg]
GRZG400-0.8Ω	4	500	800	3.2 (0.8 Ω × 4)	10	5.5	39	0.8
GRZG400-0.6Ω	5	850	1300	3 (0.6 Ω × 5)	16	8.2	46	
GRZG400-0.5Ω	5	850	1300	2.5 (0.5 Ω × 5)				
GRZG400-2.5Ω	4	500	800	10 (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)





Model	Permissible 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

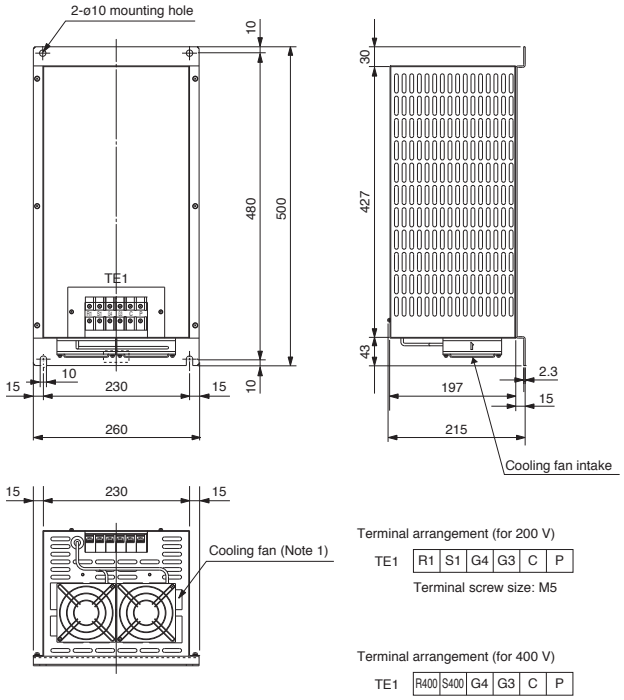
Notes: 1. To increase the regenerative braking frequency, install cooling fans (two units of 92 mm × 92 mm, minimum air flow: 1.0 m³/min), and then change [Pr. PA02]. The cooling fans must be prepared by user.
2. By installing a thermal sensor, create a safety circuit that shuts off the main circuit 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

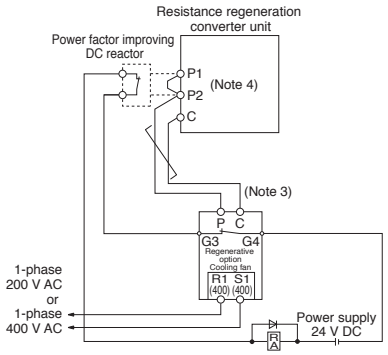
Terminal screw size: M5

Mounting screw size: M8

Model	Permissible 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

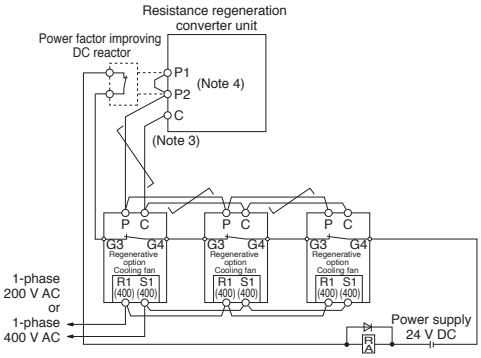
Connections

MR-RB139, MR-RB137-4



Create an external sequence circuit which opens the contact of the resistance regeneration 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 resistance regeneration 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 resistance regeneration converter unit.
3. Connect the regenerative option to the resistance regeneration 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.

Multifunction Regeneration Converter (FR-XC, FR-XC-H) (Note 5)

GF GF-RJ B B-RJ A A-RJ

FR-XC multifunction regeneration converter is suitable for 200 V class servo amplifiers ranged from 100 W to 22 kW, and FR-XC-H for 400 V class servo amplifiers ranged from 600 W to 22 kW. The multifunction regeneration converter is not compatible with multi-axis servo amplifiers.

Use the common bus regeneration mode with the harmonic suppression function disabled. The power regeneration mode and the harmonic suppression function are not supported.

200 V class

Multifunction regeneration converter FR-XC-		7.5K	11K	15K	22K	30K	37K	55K
Capacity [kW]		7.5	11	15	22	30	37	55
Maximum number of connectable servo amplifiers		10						
Total capacity of connectable servo amplifiers (Note 1) [kW]		3.5 (5.5)	5.5 (7.5)	7.5 (11)	22	30	37	55
Continuous output (Note 1) [kW]		3.5 (5.5)	5.5 (7.5)	7.5 (11)	18.5	22	30	45
Rated input current [A]	Power driving	33	47	63	92	124	151	223
	Regenerative driving	26	37	51	74	102	125	186
Overload current rating		100% continuous / 150% 60 s						
Power source	Rated input AC voltage/frequency	Three-phase 200 to 240 VAC, 50/60 Hz						
	Permissible AC voltage fluctuation	Three-phase 170 to 264 VAC, 50/60 Hz						
	Permissible frequency fluctuation	±5%						
	Power supply capacity [kVA]	17	20	28	41	52	66	100
IP rating (IEC 60529)		Open type (IP00)						
Cooling system		Forced air						
Environment	Surrounding air temperature	-10 °C to 50 °C (non-freezing)						
	Surrounding air humidity	90 %RH or less (non-condensing)						
	Storage temperature	-20 °C to 65 °C						
	Atmosphere	Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt)						
	Altitude	2500 m or less (For the installation at an altitude above 1000 m, consider a 3% reduction in the rated current per 500 m increase in altitude.)						
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y, Z axes)						
Molded-case circuit breaker or earth-leakage current breaker (Note 4)		100AF 60A (30AF 30A)	100AF 75A (50AF 50A)	225AF 125A (100AF 75A)	225AF 175A (100AF 100A)	225AF 225A (125AF 125A)	400AF 250A (125AF 125A)	400AF 250A (225AF 175A)
Magnetic contactor (Note 4)		S-T35 (S-T21)	S-T50 (S-T35)	S-T65 (S-T50)	S-T100 (S-T65)	S-N125 (S-T80)	S-N150 (S-T100)	S-N220 (S-N125)

400 V class

Multifunction regeneration converter FR-XC-H		7.5K	11K	15K	22K	30K	37K	55K
Capacity [kW]		7.5	11	15	22	30	37	55
Maximum number of connectable servo amplifiers		10						
Total capacity of connectable servo amplifiers (Note 1) [kW]		3.5 (5.5)	5.5 (7.5)	7.5 (11)	22	30	37	55
Continuous output (Note 1) [kW]		3.5 (5.5)	5.5 (7.5)	7.5 (11)	18.5	22	30	45
Rated input current [A]	Power driving	18	25	34	49	65	80	118
	Regenerative driving	14	20	27	39	54	66	98
Overload current rating		100% continuous / 150% 60 s						
Power source	Rated input AC voltage/frequency (Note 2)	Three-phase 380 to 500 VAC, 50/60 Hz						
	Permissible AC voltage fluctuation (Note 3)	Three-phase 323 to 550 VAC, 50/60 Hz						
	Permissible frequency fluctuation	±5%						
	Power supply capacity [kVA]	17	20	28	41	52	66	100
IP rating (IEC 60529)		Open type (IP00)						
Cooling system		Forced air						
Environment	Surrounding air temperature	-10 °C to 50 °C (non-freezing)						
	Surrounding air humidity	90 %RH or less (non-condensing)						
	Storage temperature	-20 °C to 65 °C						
	Atmosphere	Indoors (without corrosive gas, flammable gas, oil mist, dust and dirt)						
	Altitude	2500 m or less (For the installation at an altitude above 1000 m, consider a 3% reduction in the rated current per 500 m increase in altitude.)						
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y, Z axes)						
Molded-case circuit breaker or earth-leakage current breaker (Note 4)		30AF 30A (30AF 15A)	50AF 50A (30AF 20A)	100AF 60A (30AF 30A)	100AF 100A (50AF 50A)	225AF 125A (60AF 60A)	225AF 150A (100AF 75A)	225AF 200A (100AF 100A)
Magnetic contactor (Note 4)		S-T21	S-T25 (S-T21)	S-T35 (S-T21)	S-T50 (S-T25)	S-T65 (S-T35)	S-T80 (S-T50)	S-N125 (S-T65)

Notes: 1. The values in brackets are applicable when the number of connected servo amplifiers is six or less.
2. When connecting to a servo amplifier, use with a voltage range of 380 V to 480 V.
3. When connecting to a servo amplifier, use with a voltage range of 323 V to 528 V.
4. The models in brackets are applicable when the capacity [kW] of FR-XC-(H) ≥ Total rated capacity [kW] of servo amplifiers connected to FR-XC-(H) × 2
5. The following are specifications at the time of September 2020.
For selecting an FR-XC multifunction regeneration converter, refer to the latest "FR-XC Instruction Manual" and relevant Servo Amplifier Instruction Manual.

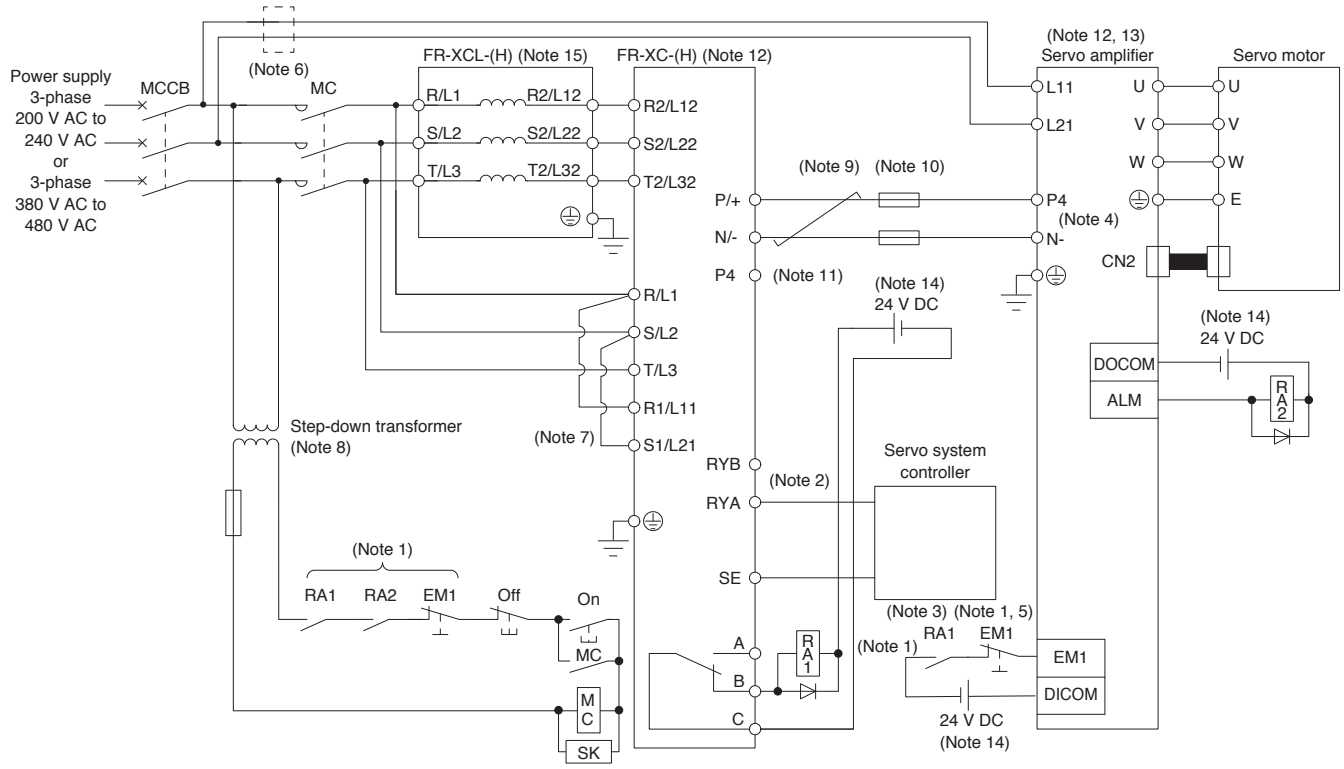
*** Precautions when selecting the multifunction regeneration converter**

1. Total rated capacity [kW] of servo amplifiers connected to FR-XC-(H) ≤ Capacity [kW] of FR-XC-(H)
2. Effective value [kW] of total output power of servo motors ≤ Continuous output [kW] of FR-XC-(H)
3. Maximum value [kW] of total output power of servo motors ≤ FR-XC-(H) capacity [kW] × 1.5

Multifunction Regeneration Converter (FR-XC, FR-XC-H)

GF GF-RJ B B-RJ A A-RJ

Connection example



Notes: 1. Create a sequence that shuts off the main circuit power when either:
An alarm occurs on FR-XC-(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-XC-(H) is ready.
3. Create a sequence that stops the servo motor with the emergency stop input to the servo system controller when an alarm occurs on FR-XC-(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.
4. Disconnect the short-circuit bar between P3 and P4 when using FR-XC-(H).
5. Set [Pr. PA04] to "0 0 _ _" to enable EM1 (Forced stop 1).
6. When wires used for L11 and L21 are thinner than those for L1, L2, and L3, use a molded-case circuit breaker.
7. When using a separate power supply for the control circuit, remove the short-circuit bars between R/L1 and R1/L11, and S/L2 and S1/L21 .
8. When FR-XC-H is used, a step-down transformer is required if coil voltage of the magnetic contactor is in 200 V class.
9. Use twisted wires for connecting the DC power supply between FR-XC-(H) and the servo amplifiers, and keep the wire length to a maximum of 5 m.
10. Install a fuse between each FR-XC-(H) and servo amplifier.
11. Do not connect anything to the P4 terminal of FR-XC-(H).
12. Inputs/outputs (main circuit) of FR-XC-(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 with the installation of a radio noise filter (FR-BIF or FR-BIF-H) or line noise filter (FR-BSF01 or FR-BLF).
13. When using 7 kW or smaller servo amplifiers, wire a built-in regenerative resistor.
14. 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.
15. When using FR-XC-(H), be sure to use the following dedicated stand-alone reactor (FR-XCL or FR-XCL-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-XC-(H).

Multifunction regeneration converter	Dedicated stand-alone reactor
FR-XC-7.5K	FR-XCL-7.5K
FR-XC-11K	FR-XCL-11K
FR-XC-15K	FR-XCL-15K
FR-XC-22K	FR-XCL-22K
FR-XC-30K	FR-XCL-30K
FR-XC-37K	FR-XCL-37K
FR-XC-55K	FR-XCL-55K

Multifunction regeneration converter	Dedicated stand-alone reactor
FR-XC-H7.5K	FR-XCL-H7.5K
FR-XC-H11K	FR-XCL-H11K
FR-XC-H15K	FR-XCL-H15K
FR-XC-H22K	FR-XCL-H22K
FR-XC-H30K	FR-XCL-H30K
FR-XC-H37K	FR-XCL-H37K
FR-XC-H55K	FR-XCL-H55K

Dynamic Brake

GF GF-RJ B B-RJ B-RJ100 A A-RJ

Use the following external dynamic brake (option) with the 9 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/ drive unit model	Dynamic brake model	Fig.
MR-J4-DU900B	DBU-7K-R6 DBU-11K (Note 1)	A
MR-J4-11KGF/B/A MR-J4-DU11KB	DBU-11K	
MR-J4-15KGF/B/A MR-J4-DU15KB	DBU-15K	
MR-J4-22KGF/B/A MR-J4-DU22KB	DBU-22K-R1	

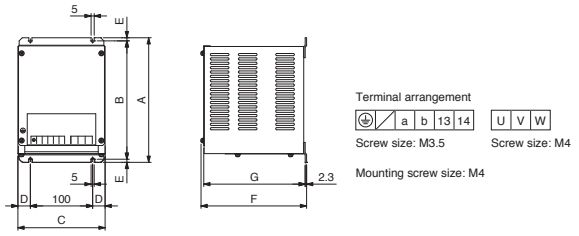
Servo amplifier/ drive unit model	Dynamic brake model	Fig.
MR-J4-DU900B4	DBU-7K-4-2R0 DBU-11K-4 (Note 2)	B
MR-J4-11KGF4/B4/A4 MR-J4-DU11KB4	DBU-11K-4	
MR-J4-15KGF4/B4/A4 MR-J4-DU15KB4 MR-J4-22KGF4/B4/A4 MR-J4-DU22KB4	DBU-22K-4	
MR-J4-DU30KB/A MR-J4-DU37KB/A	DBU-37K-R1	C
MR-J4-DU30KB4/A4 MR-J4-DU37KB4/A4 MR-J4-DU45KB4/A4 MR-J4-DU55KB4/A4	DBU-55K-4-R5	
MR-J4-DU45KB4-RJ100 MR-J4-DU55KB4-RJ100	DBU-P55K-4-B	D

Notes: 1. Use this dynamic brake when HG-JR801 or HG-JR903 servo motor is used.
2. Use this dynamic brake when HG-JR8014 or HG-JR9034 servo motor is used.

Dimensions

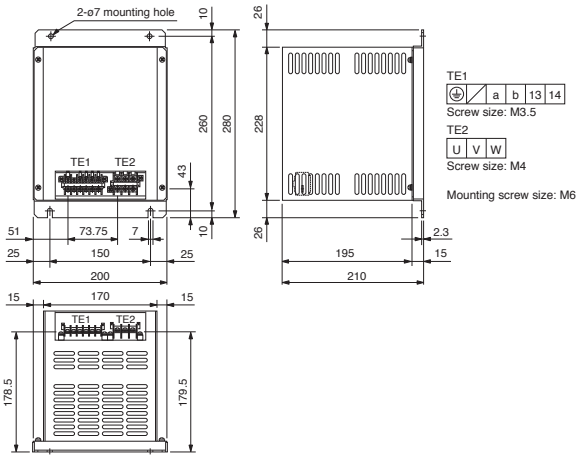
[Unit: mm]

A



Model	A	B	C	D	E	F	G	Mass [kg]	Wire size [mm²] (Note 1)	
									U, V, W	Other than U, V, and W
DBU-7K-R6	200	190	140	20	5	170	163.5	2	3.5 (AWG 12)	2 (AWG 14)
DBU-11K										
DBU-15K DBU-22K-R1	250	238	150	25	6	235	228	6	5.5 (AWG 10)	

B



Model	Mass [kg]	Wire size [mm²] (Note 1)	
		U, V, W	Other than U, V, and W
DBU-7K-4-2R0	6.7	3.5 (AWG 12)	2 (AWG 14)
DBU-11K-4		5.5 (AWG 10)	
DBU-22K-4			

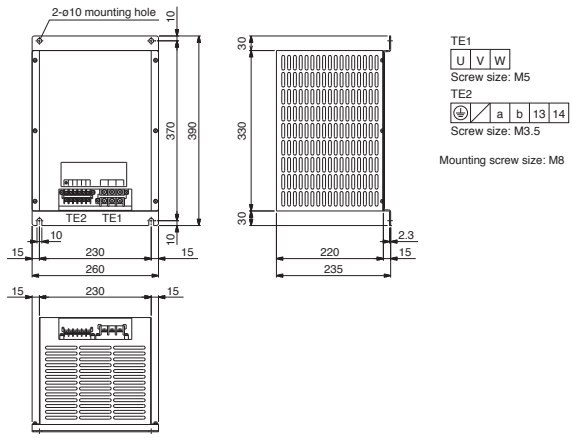
Notes: 1. The wire size is applicable when 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wires) is used.

Dynamic Brake

B | B-RJ | B-RJ100 | A | A-RJ

Dimensions [Unit: mm]

C

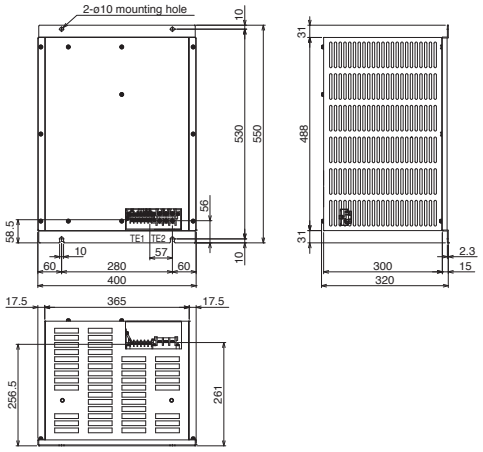


TE1
U | V | W
Screw size: M5
TE2
⏚ | a | b | 13 | 14
Screw size: M3.5

Mounting screw size: M8

Model	Mass [kg]	Wire size [mm²] (Note 1)	
		U, V, W	Other than U, V, and W
DBU-37K-R1	8	14 (AWG 6)	2 (AWG 14)
DBU-55K-4-R5	11		

D



TE1
⏚ | a | b | 13 | 14
Terminal screw size: M3.5
TE2
U | V | W
Terminal screw size: M5

Mounting screw size: M8

Model	Mass [kg]	Wire size [mm²] (Note 1)	
		U, V, W	Other than U, V, and W
DBU-P55K-4-B	25	14 (AWG 6)	2 (AWG 14)

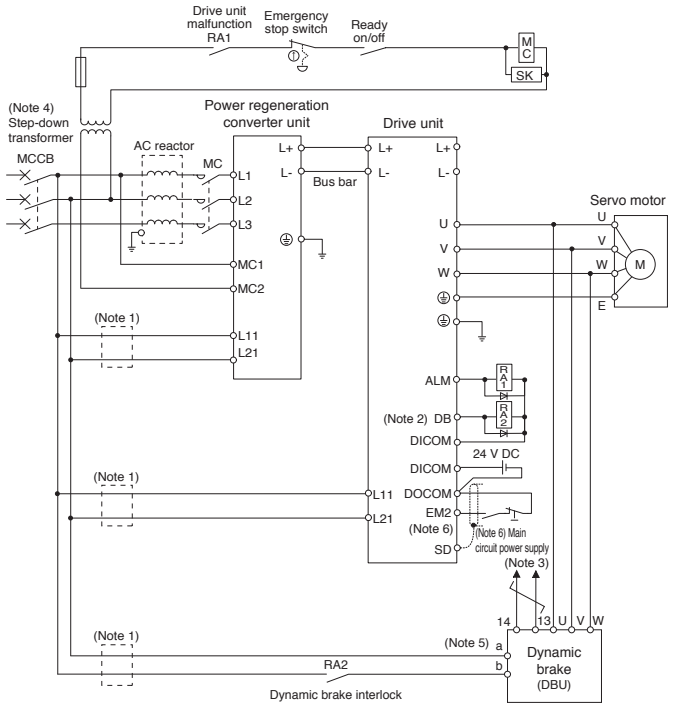
Notes: 1. The wire size is applicable when 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wires) is used.

Dynamic Brake

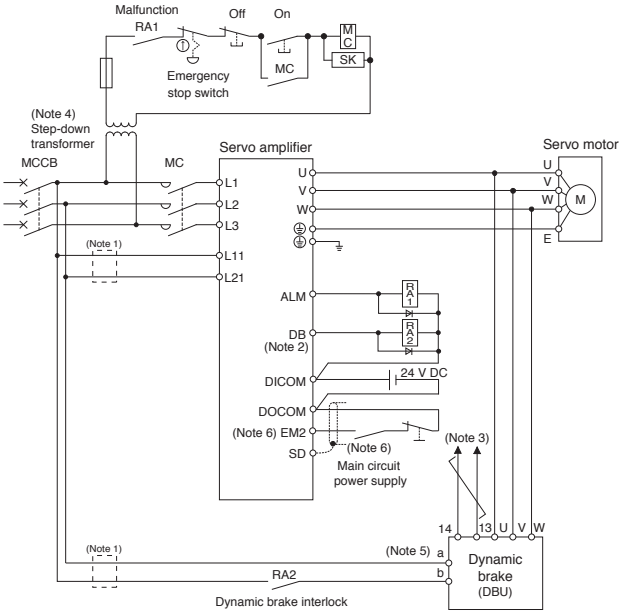
GF GF-RJ B B-RJ A A-RJ

Connections

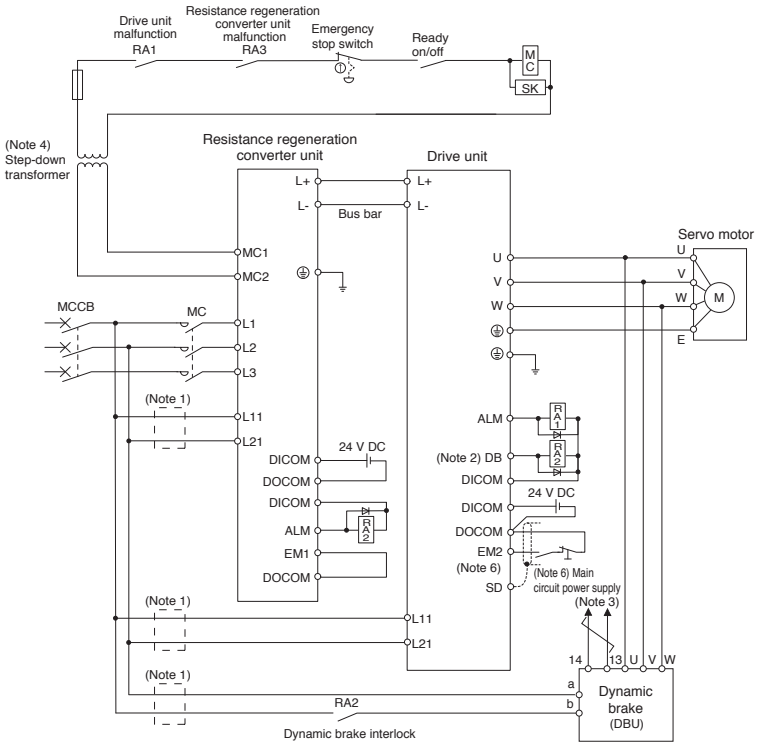
For MR-J4-DU900B(4), MR-J4-DU11KB(4), MR-J4-DU15KB(4), MR-J4-DU22KB(4)



For MR-J4-11KGF(4)/B(4)/A(4), MR-J4-15KGF(4)/B(4)/A(4), MR-J4-22KGF(4)/B(4)/A(4)



For MR-J4-DU30KB(4)/A(4) or larger



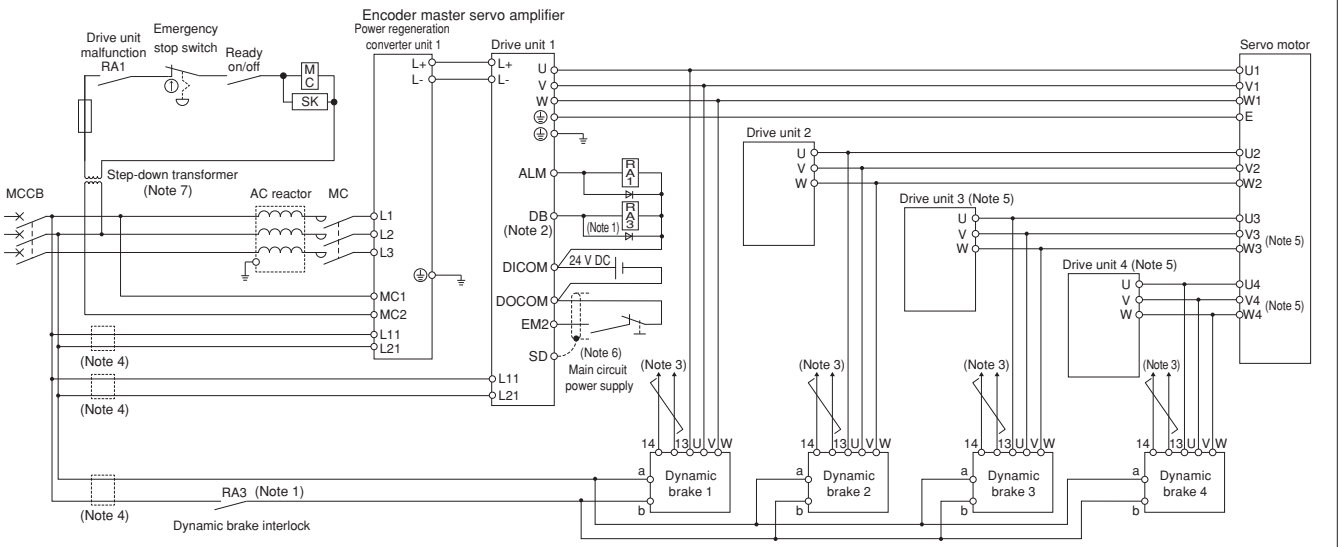
Notes: 1. Install an overcurrent protection device (molded-case circuit breaker, fuse, etc.) to protect the branch circuit.
2. Assign DB (Dynamic brake interlock) with [Pr. PD07] to [Pr. PD09] for MR-J4-B/MR-J4-B4/MR-J4-DU_B/MR-J4-DU_B4.
3. The terminals 13 and 14 are normally opened outputs. If the dynamic brake is welded, the terminals 13 and 14 will be opened. Thus, create an external sequence circuit so 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, power regeneration converter unit, or resistance regeneration converter unit is in 400 V class, and coil voltage of the magnetic contactor is in 200 V class.
5. When using DBU-7K-4-2R0, 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. To prevent an unexpected restart of the servo amplifier, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.

Dynamic Brake

B-RJ100

Connections

For MR-J4-DU_B4-RJ100

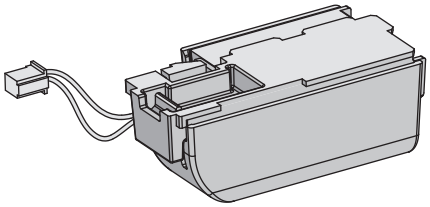
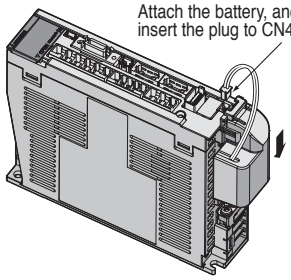
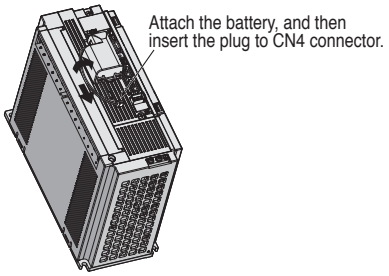


Notes: 1. The dynamic brake must be controlled by the drive unit of the encoder master servo amplifier.
2. Assign DB (Dynamic brake interlock) with [Pr. PD07] to [Pr. PD09].
3. The terminals 13 and 14 are normally opened outputs. If the dynamic brake is welded, the terminals 13 and 14 will be opened. Thus, create an external sequence circuit so that SON (Servo-on) does not turn on when the terminals 13 and 14 are opened.
4. Install an overcurrent protection device (molded-case circuit breaker, fuse, etc.) to protect the branch circuit. Refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual" for details.
5. This diagram is applicable when HG-JR150K24W0C, HG-JR180K24W0C, HG-JR200K24W0C, or HG-JR220K24W0C servo motor is used. For HG-JR110K24W0C, connections to drive unit 3 and 4 are not required.
6. To prevent an unexpected restart of the drive unit, create a circuit to turn off EM2 (Forced stop 2) when the main circuit power is turned off.
7. A step-down transformer is required if coil voltage of the magnetic contactor is in 200 V class.

Battery (MR-BAT6V1SET) (Note 1)

B B-RJ B-RJ100 A A-RJ

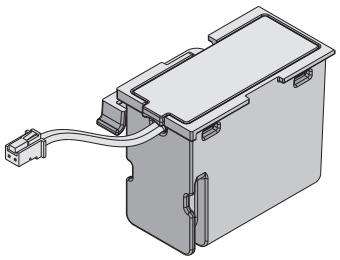
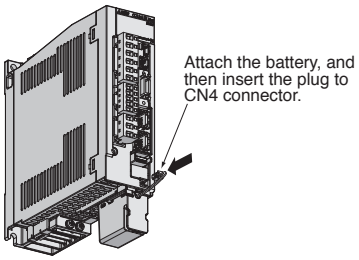
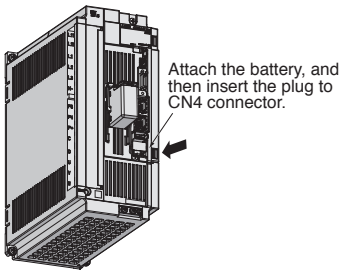
The absolute position data can be retained when the battery is mounted on the servo amplifier. When the battery life runs out, please replace the built-in MR-BAT6V1 battery. Refer to relevant Servo Amplifier Instruction Manual for installation of the battery.
MR-BAT6V1SET is not required for the linear servo system or the incremental system.

External appearance	Mounting method
 Model: MR-BAT6V1SET Nominal voltage: 6 V Nominal capacity: 1650 mAh Lithium content: 1.2 g Primary battery: 2CR17335A (CR17335A × 2 pcs. in series) Mass: 55 g (including MR-BAT6V1 battery)	For MR-J4-10B/A to MR-J4-350B/A, MR-J4-40B1/A1 or smaller, MR-J4-200B4/A4 or smaller  For MR-J4-500B/A or larger, MR-J4-350B4/A4 or larger, MR-J4-DU900B(4) or larger, MR-J4-DU30KA(4) or larger  * MR-J3BAT battery cannot be used because of the difference in voltage.

Battery (MR-BAT6V1SET-A) (Note 1)

GF GF-RJ WB A A-RJ

The absolute position data can be retained when the battery is mounted on the servo amplifier. When the battery life runs out, please replace the built-in MR-BAT6V1 battery. Refer to relevant Servo Amplifier Instruction Manual for installation of the battery.
MR-BAT6V1SET-A is not required for the linear servo system or the incremental system.

External appearance	Mounting method
 Model: MR-BAT6V1SET-A Nominal voltage: 6 V Nominal capacity: 1650 mAh Lithium content: 1.2 g Primary battery: 2CR17335A (CR17335A × 2 pcs. in series) Mass: 55 g (including MR-BAT6V1 battery)	MR-J4-10GF to MR-J4-350GF, MR-J4-40GF1 or smaller, MR-J4-200GF4 or smaller, MR-J4W2-0303B6, MR-J4-03A6  MR-J4-500GF or larger, MR-J4-350GF4 or larger  * MR-J3BAT battery cannot be used because of the difference in voltage.

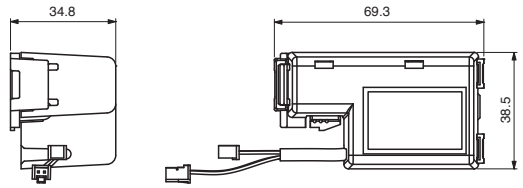
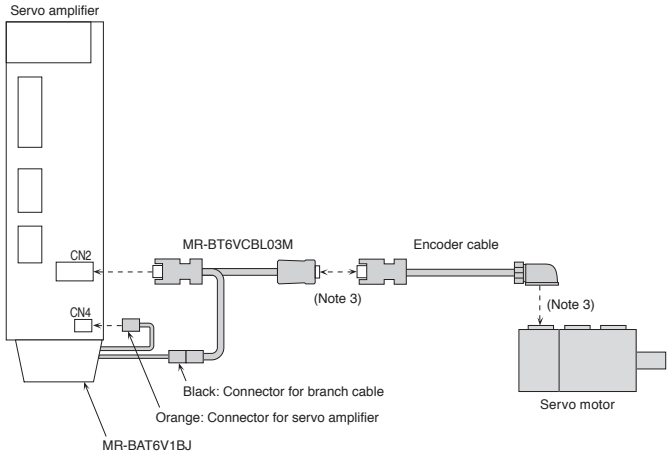
Notes: 1. MR-BAT6V1SET and MR-BAT6V1SET-A is an assembled battery composed of lithium metal batteries of CR17335A. This battery is not subject to the dangerous goods (Class 9) of the UN Recommendations. To transport lithium metal batteries and lithium metal batteries contained in equipment, take actions 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), the International Air Transport Association (IATA), 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.
Please dispose of the battery according to your local laws and regulations.

Battery for Junction Battery Cable (MR-BAT6V1BJ) (Note 1, 5, 6)

GF | GF-RJ | B | B-RJ | B-RJ100 | A | A-RJ

Junction Battery Cable (MR-BT6VCBL03M) (Note 5, 6)

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)
 Model: MR-BAT6V1BJ System: Electronic battery backup type Nominal voltage: 6 V Nominal capacity: 1650 mAh Primary battery: 2CR17335A (CR17335A × 2 pcs. in series) Mass: 66 g	

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, 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), the International Air Transport Association (IATA), 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.
Please dispose of the battery according to your local laws and regulations.
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.
5. This is not supported by MR-J4-03A6(-RJ).
6. When MR-BAT6V1BJ is installed to MR-J4-500GF(-RJ), the front cover does not open. Therefore, install MR-BAT6V1BJ after executing the wiring to the terminal. Contact your local sales office when using MR-BAT6V1BJ with MR-J4-350GF4(-RJ).

Battery Case (MR-BT6VCASE) (Note 2)

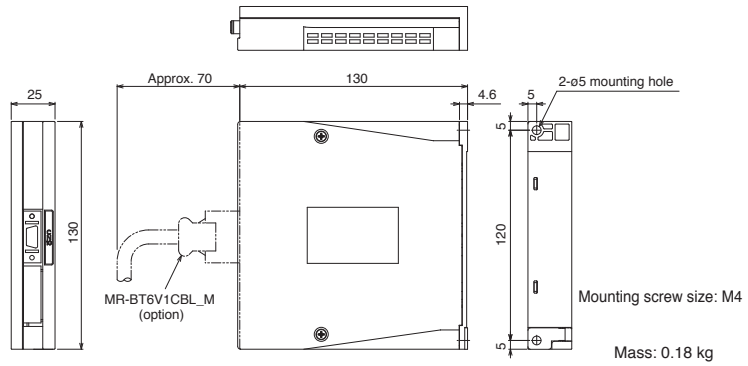
Battery (MR-BAT6V1) (Note 1, 2)

GF GF-RJ B B-RJ WB A A-RJ

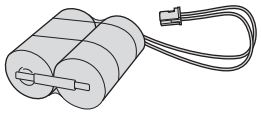
Absolute position data of up to eight axes of the servo motors can be retained when the battery case and the batteries are used. When the direct drive motors are used, the total number of axes connected to the direct drive motors must be four or less. Refer to the following table for the connectable 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]



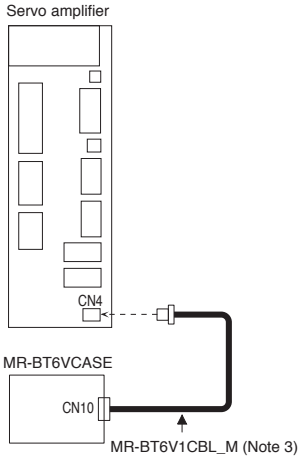
MR-BAT6V1



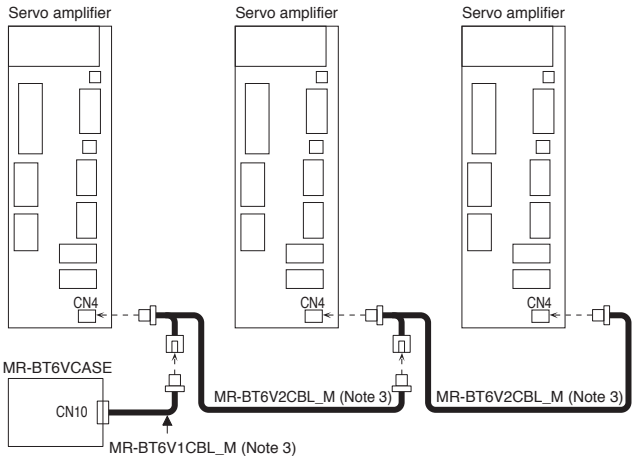
Model: MR-BAT6V1
Nominal voltage: 6 V
Nominal capacity: 1650 mAh
Lithium content: 1.2 g
Primary battery: 2CR17335A (CR17335A × 2 pcs. in series)
Mass: 34 g

Connections

For connecting to one unit of servo amplifier



For connecting up to eight servo amplifier axes



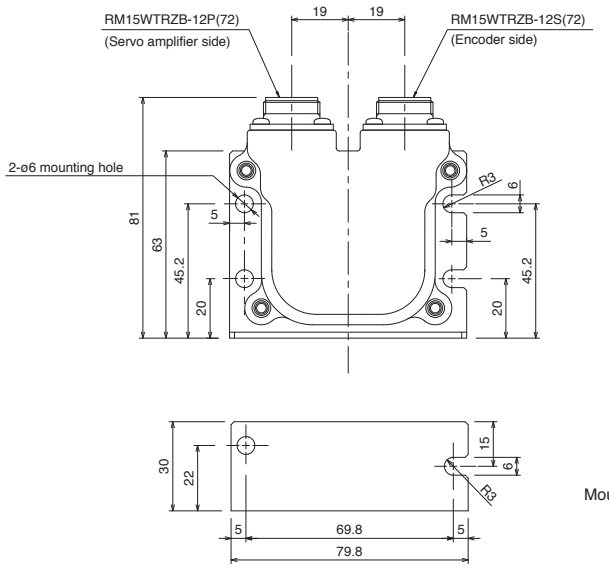
Notes: 1. MR-BAT6V1 is an assembled battery composed of lithium metal batteries of CR17335A. This battery is not subject to the dangerous goods (Class 9) of the UN Recommendations. To transport lithium metal batteries and lithium metal batteries contained in equipment, take actions to comply with the 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.
Please dispose of the battery according to your local laws and regulations.
2. This is not supported by MR-J4W2-0303B6, MR-J4-03A6(-RJ), and servo motors with functional safety.
3. This is an option cable. Refer to "Cables and Connectors for Servo Amplifiers" in this catalog.

Absolute Position Storage Unit (MR-BTAS01) (Note 2)

GF | GF-RJ | 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 system.

Dimensions [Unit: mm]



Mounting screw size: M5

Mass: 0.26 kg

Item	Environment
Ambient temperature	Operation: 0 °C to 55 °C (non-freezing), storage: -20 °C to 65 °C (non-freezing)
Ambient humidity	Operation: 10 %RH to 90 %RH (non-condensing), storage: 10 %RH to 90 %RH (non-condensing)
Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or splash of oil or water
Altitude	2000 m or less above sea level
Vibration resistance	When the surface A is mounted: 49 m/s^2 (directions of X, Y, and Z axes) When the surface B is mounted: 5.9 m/s^2 (directions of X, Y, and Z axes)

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.
2. This is not supported by MR-J4W2-0303B6 and MR-J4-03A6(-RJ).

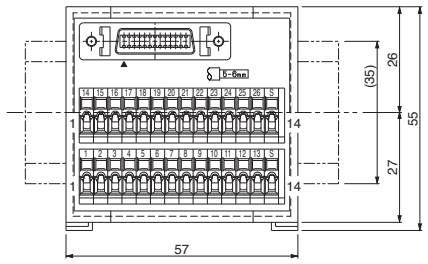
Junction Terminal Block (MR-TB26A)

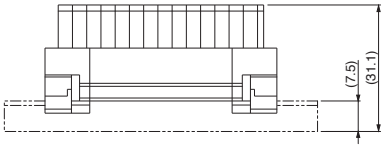
WB

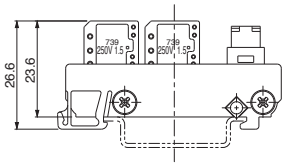
Connect all signals via the junction terminal block.

Dimensions (Note 1)

[Unit: mm]







Specifications

Rating		32 V AC/DC, 0.5 A
Applicable wire (terminal side)	Stranded wire	0.08 mm² to 1.5 mm² (AWG 28 to 14)
	Solid wire	ø0.32 mm to 1.2 mm
	Insulator OD	3.4 mm or shorter
Operating tool		210-619 (WAGO) or an equivalent 210-119SB (WAGO) or an equivalent
Strip length		5 mm to 6 mm

Notes: 1. The lengths in brackets are applicable when the junction terminal block is mounted on a 35 mm wide DIN rail.

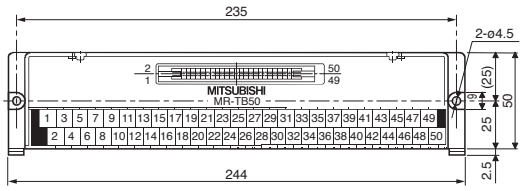
Junction Terminal Block (MR-TB50)

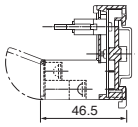
A A-RJ

Connect all signals via the junction terminal block.

Dimensions

[Unit: mm]





Terminal screw size: M3.5
Applicable wire: 2 mm² maximum
Crimp terminal width: 7.2 mm or shorter
Mounting screw size: M4

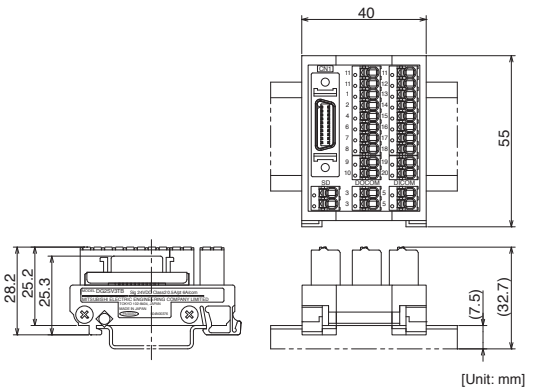
[Products on the Market]

Junction Terminal Block (DG2SV3TB), Servo Amplifier Connection Cable (DG4SV2CB_)

GF GF-RJ B B-RJ B-RJ100

This terminal block is used for wiring signals.

Dimensions [Unit: mm]



[Unit: mm]

Mitsubishi Electric Engineering Co., Ltd.

Applicable wire: 1.5 mm² maximum
(Wire insulator OD: ø2.8 mm or smaller)

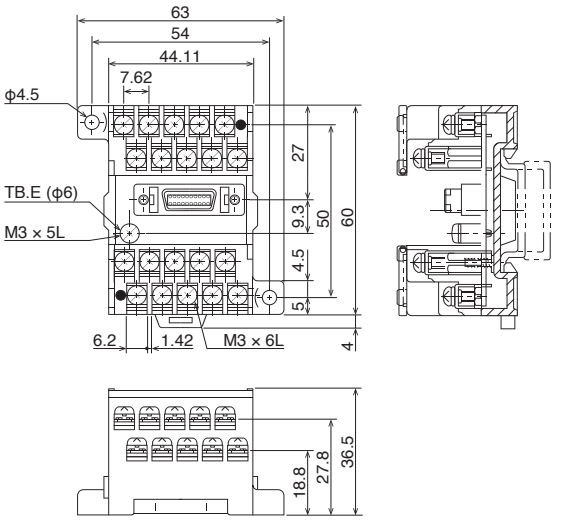
[Products on the Market]

Junction Terminal Block (PS7DW-20V14B-F)

GF GF-RJ B B-RJ B-RJ100

This terminal block is used for wiring signals.

Dimensions [Unit: mm]



Toho Technology Corp.,
Kyoto Factory

Applicable wire: 1.25 mm² maximum

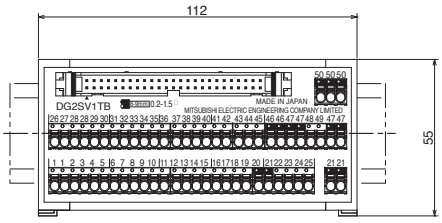
[Products on the Market]

Junction Terminal Block (DG2SV1TB), Servo Amplifier Connection Cable (DG4SV1CB_)

A A-RJ

This terminal block is used for wiring signals.

Dimensions [Unit: mm]



Mitsubishi Electric Engineering Co., Ltd.

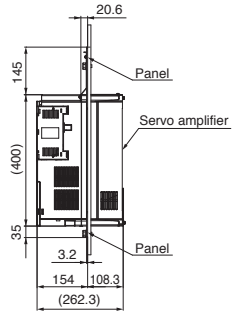
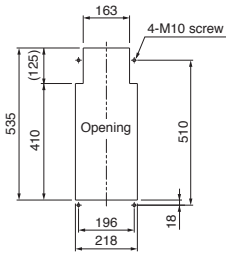
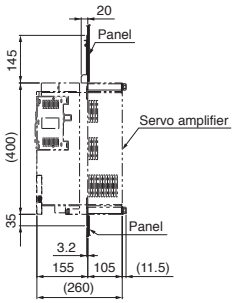
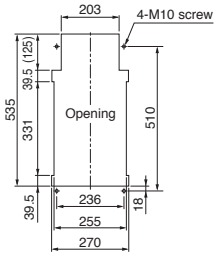
Applicable wire: 1.5 mm² maximum (Wire insulator OD: ø2.8 mm or smaller)

Panel Through Attachment (MR-J4ACN15K, MR-J3ACN)

GF GF-RJ B B-RJ A A-RJ

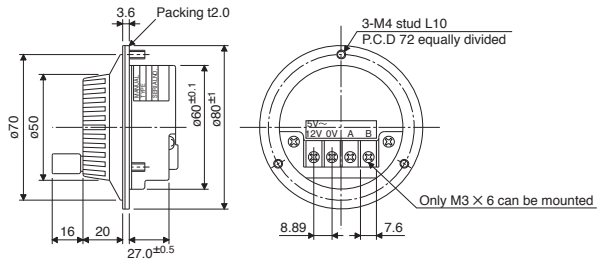
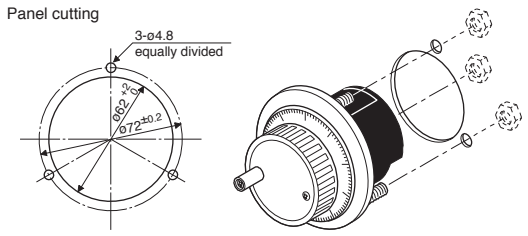
By using the panel through attachment on the servo amplifiers of 11 kW to 22 kW, the heat generating section can be mounted outside a cabinet, enabling to dissipate about 50% of the heat from the unit to outside the cabinet. This allows smaller cabinet size.

Servo amplifier model	Panel through attachment model	Fig.
MR-J4-11KGF/B/A, MR-J4-11KGF4/B4/A4 MR-J4-15KGF/B/A, MR-J4-15KGF4/B4/A4	MR-J4ACN15K	A
MR-J4-22KGF/B/A, MR-J4-22KGF4/B4/A4	MR-J3ACN	B

	Mounting [Unit: mm]	Panel cut dimensions [Unit: mm]
A		
B		

Manual Pulse Generator (MR-HDP01)

A-RJ

Dimensions [Unit: mm]	Mounting [Unit: mm]
	

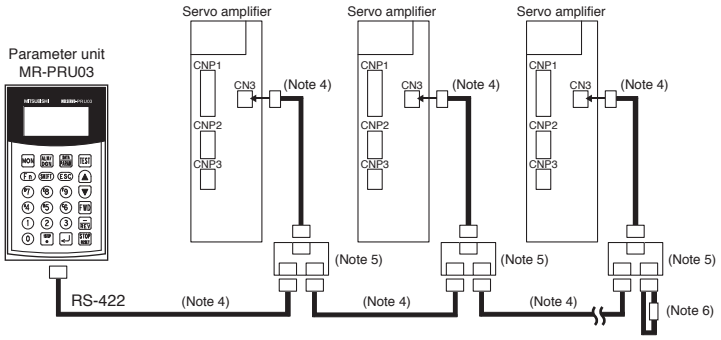
Parameter Unit (MR-PRU03) (Note 3)

A A-RJ

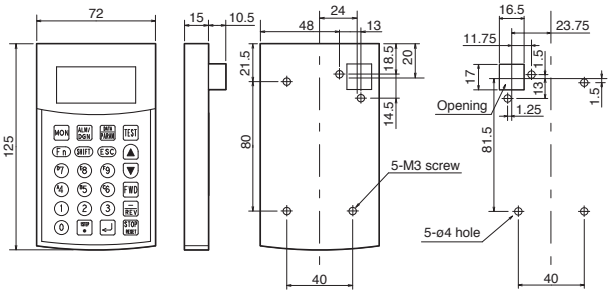
Parameter unit with a 16 characters × 4 lines display, is available as an option.
The parameter unit (Note 1) connected with servo amplifiers enables setting of point table data (Note 2) and parameters, and test operation without MR Configurator2.

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



[Unit: mm]

Specifications

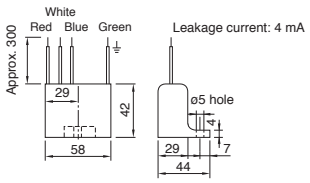
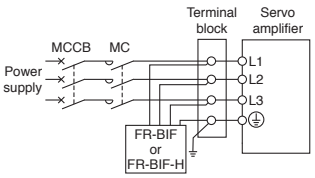
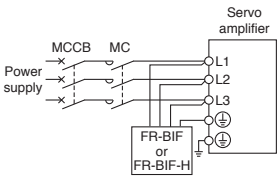
Parameter unit model		MR-PRU03
Power supply		Receives power from the servo amplifier (drive unit)
Functions	Parameter mode	Basic setting parameters, gain/filter parameters, extension setting parameters, I/O setting parameters, extension setting 2 parameters, extension setting 3 parameters, option setting parameters, special setting parameters, linear/DD motor setting parameters, positioning control parameters
	Monitor mode	Cumulative feedback pulses, servo motor speed, position deviation, cumulative command pulses, command pulse frequency, regenerative load ratio, effective load ratio, peak load ratio, load to motor inertia ratio, bus voltage, point table No./program No./station position No., step No., override voltage, cam axis current value per cycle, cam reference position, cam axis current feed value, execute cam No., execute cam stroke amount, main shaft current value, main shaft current value per cycle, etc.
	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 (16 characters × 4 lines)
Environment	Ambient temperature	Operation: -10 °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
Mass [g]		130

Notes: 1. Use MR-PRU03 with software version B0 or later. Parameter unit can be used by setting [Pr. PF34] to "1_ _ _".
2. Programs cannot be edited with the parameter unit.
3. This is not supported by MR-J4-03A6(-RJ).
4. Use 10BASE-T cable (EIA568 compliant), etc.
Keep the distance between the branch connector and servo amplifier as short as possible.
5. Branch connector, BMJ-8 (HACHIKO ELECTRIC CO., LTD) is recommended. Refer to "Products on the Market for Servo Amplifiers" in this catalog.
6. For the final axis, terminate RDP (3-pin) and RDN (6-pin) of the receiving side (servo amplifier) with 150 Ω resistor.

Radio Noise Filter (FR-BIF, FR-BIF-H)

GF GF-RJ B B-RJ B-RJ100 WB A A-RJ

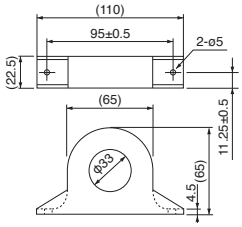
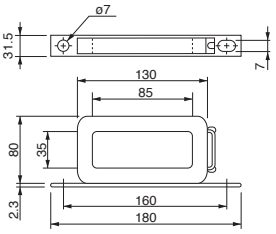
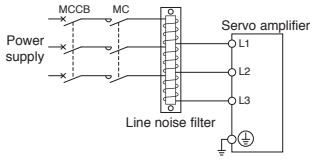
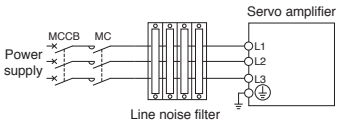
This filter suppresses noise from the power supply side of the servo amplifier, especially effective for the radio frequency bands of 10 MHz or lower. The FR-BIF(-H) is designed to be installed on the input side.

Dimensions [Unit: mm]	Connections
	Do not use the FR-BIF(-H) on the output side of the servo amplifier. Wiring should be as short as possible, and grounding is required. Be sure to insulate the unused wire when using the FR-BIF with a 1-phase power supply. For 3.5 kW or smaller 1-axis servo amplifiers, and multi-axis servo amplifiers  For 5 kW or larger 1-axis servo amplifiers  200 V /100 V class: FR-BIF 400 V class: FR-BIF-H

Line Noise Filter (FR-BSF01, FR-BLF)

GF GF-RJ B B-RJ B-RJ100 WB A A-RJ

This filter suppresses noise from the power supply side and the output side of the servo amplifier. The FR-BSF01 and FR-BLF are also effective in suppressing high-frequency leakage current (zero-phase current), especially the range of 0.5 MHz to 5 MHz.

Dimensions [Unit: mm]	Connections
FR-BSF01 For wire size of 3.5 mm² (AWG 12) or smaller  FR-BLF For wire size of 5.5 mm² (AWG 10) or larger 	The line noise filters can be mounted on lines of the main circuit power supply (L1, L2, and L3) and of the servo motor power (U, V, and W). Pass each of the wires through the line noise filter an equal number of times in the same direction. For wires of 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 lines, passes must be four times or less. Do not pass the grounding wire through the filter. Otherwise, the effect of the filter will drop. Wind the wires by passing through the filter to satisfy the required number of passes as shown in Example 1. If the wires are too thick to wind, use two or more filters to have the required number of passes as shown in Example 2. Place the line noise filters as close to the servo amplifier as possible for their best performance. Example 1  Example 2 

Data Line Filter

GF GF-RJ B B-RJ B-RJ100 WB 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 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

GF GF-RJ B B-RJ B-RJ100 WB 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

GF GF-RJ B B-RJ B-RJ100 WB 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	EMC filter model (Note 3)	Rated current [A]	Rated voltage [V AC]	Leakage current [mA]	Mass [kg]	Fig.
MR-J4-10GF/B/A to MR-J4-100GF/B/A MR-J4-10GF1/B1/A1 to MR-J4-40GF1/B1/A1 MR-J4W2-22B MR-J4W2-44B MR-J4W3-222B	HF3010A-UN (Note 1, 2)	10	250	5	3.5	A
MR-J4-200GF/B/A, MR-J4-350GF/B/A MR-J4W2-77B, MR-J4W2-1010B MR-J4W3-444B	HF3030A-UN (Note 1, 2)	30	250	5	5.5	B
MR-J4-500GF/B/A, MR-J4-700GF/B/A	HF3040A-UN (Note 1, 2)	40	250	6.5	6.0	
MR-J4-11KGF/B/A to MR-J4-22KGF/B/A	HF3100A-UN (Note 1, 2)	100	250	6.5	12	C
	FTB-100-355-L (Note 2, 4)	100	500	40	5.3	I
MR-J4-60GF4/B4/A4, MR-J4-100GF4/B4/A4	TF3005C-TX (Note 1)	5	500	5.5	6.0	D
MR-J4-200GF4/B4/A4 to MR-J4-700GF4/B4/A4	TF3020C-TX (Note 1)	20	500	5.5	6.0	
MR-J4-11KGF4/B4/A4	TF3030C-TX (Note 1)	30	500	5.5	7.5	
MR-J4-15KGF4/B4/A4	TF3040C-TX (Note 1)	40	500	5.5	12.5	E
MR-J4-22KGF4/B4/A4	TF3060C-TX (Note 1)	60	500	5.5	12.5	
	FTB-80-355-L (Note 2, 4)	80	500	80	5.3	I

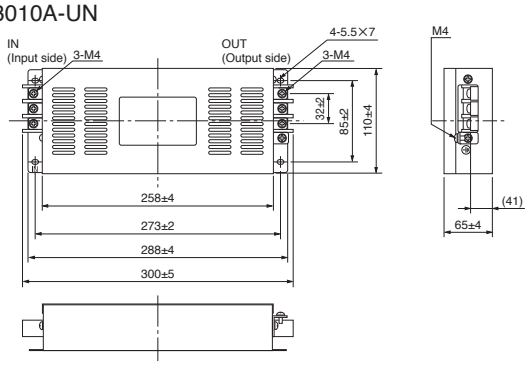
Power regeneration converter unit/ resistance regeneration converter unit	EMC filter model (Note 3)	Rated current [A]	Rated voltage [V AC]	Leakage current [mA]	Mass [kg]	Fig.
MR-CV11K MR-CV18K	HF3100A-UN (Note 1, 2)	100	250	6.5	12	C
	FTB-100-355-L (Note 2, 4)	100	500	40	5.3	I
MR-CV30K MR-CV37K MR-CV45K MR-CV55K MR-CR55K	HF3200A-UN (Note 1, 2)	200	250	9	18	F
MR-CV11K4	TF3030C-TX (Note 1)	30	500	5.5	7.5	D
	FTB-80-355-L (Note 2, 4)	80	500	80	5.3	I
MR-CV18K4	TF3060C-TX (Note 1)	60	500	5.5	12.5	E
	FTB-80-355-L (Note 2, 4)	80	500	80	5.3	I
MR-CV30K4 MR-CV37K4	TF3150C-TX (Note 1)	150	500	5.5	31	G
MR-CV45K4 MR-CV55K4 MR-CV75K4 MR-CR55K4	FTB-150-355-L (Note 2, 4)	150	500	80	7.8	H

Notes: 1. Manufactured by Soshin Electric Co., Ltd.
2. When using these EM filters, use a surge protector of RSPD series (manufactured by Okaya Electric Industries Co., Ltd.) or LT-CS-WS series (manufactured by Soshin Electric Co., Ltd.). Refer to "EMC Installation Guidelines" for details."
3. When using the EMC filter, install one EMC filter for each servo amplifier, power regeneration converter unit, or resistance regeneration converter unit.
4. Manufactured by COSEL Co., Ltd.

Dimensions [Unit: mm]

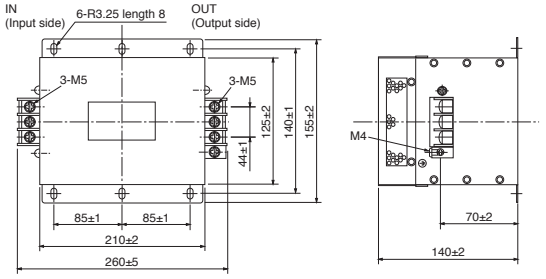
A

HF3010A-UN



B

HF3030A-UN, HF3040A-UN



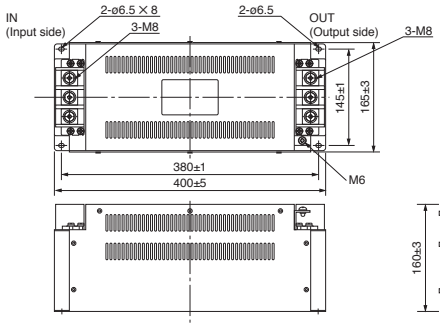
EMC Filter

GF | GF-RJ | B | B-RJ | B-RJ100 | WB | A | A-RJ

Dimensions [Unit: mm]

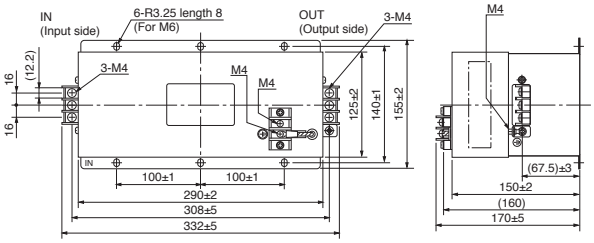
C

HF-3100A-UN



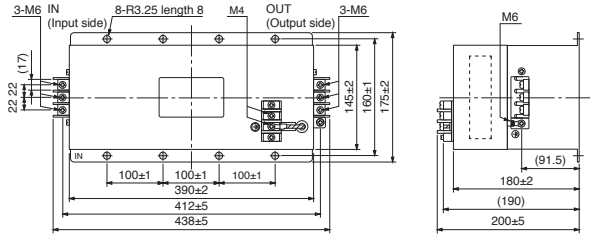
D

HF3005C-TX, HF-3020C-TX, HF3030C-TX



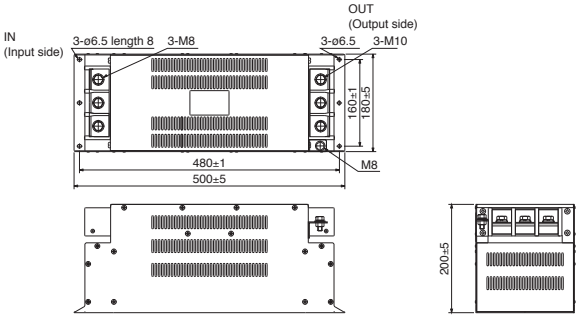
E

HF-3040C-TX, TF3060C-TX



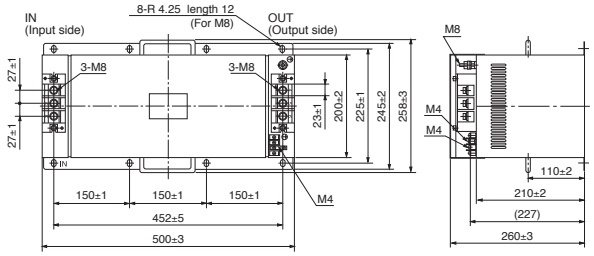
F

HF3200A-UN



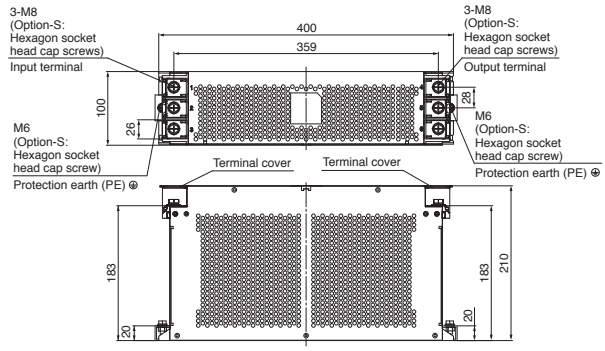
G

TF3150C-TX



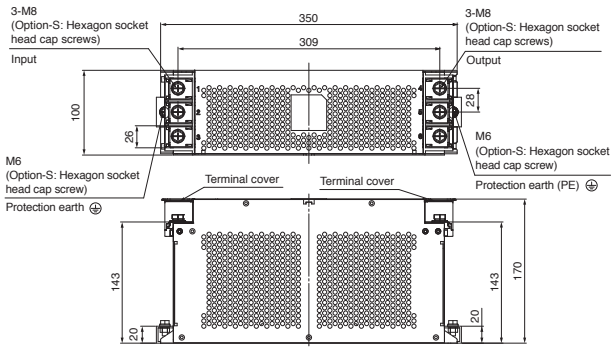
H

FTB-150-355-L



I

FTB-80-355-L, FTB-100-355-L



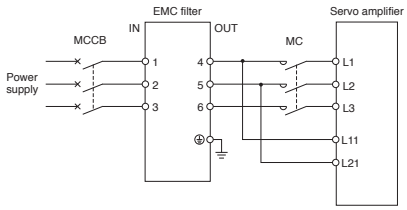
EMC Filter

GF | GF-RJ | B | B-RJ | B-RJ100 | WB | A | A-RJ

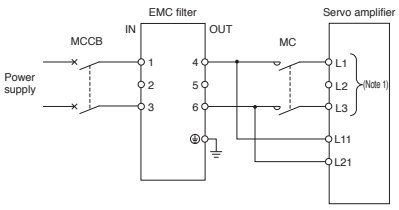
Connections

For MR-J4-GF/B/A, MR-J4W_-_B

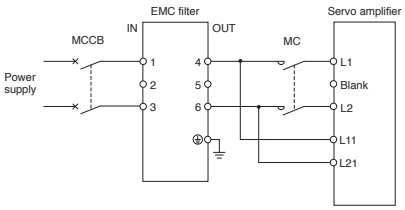
3-phase 200 V AC/400 V AC



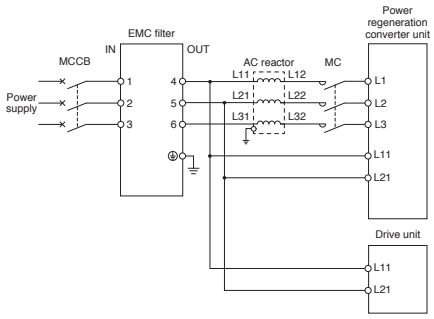
1-phase 200 V AC



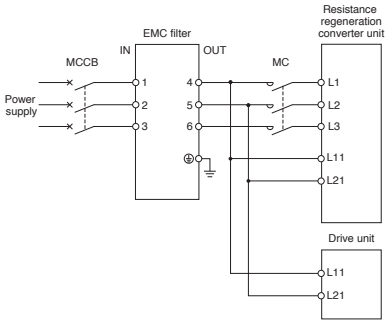
1-phase 100 V AC



For MR-CV and MR-J4-DU_B



For MR-CR and MR-J4-DU_B/A



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 DC Reactor (FR-HEL, FR-HEL-H, MR-DCL) GF GF-RJ B B-RJ A A-RJ

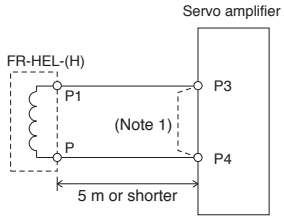
This boosts the power factor of servo amplifier and reduces the power supply capacity. Use either the DC reactor or the AC reactor. As compared to the AC reactor (FR-HAL or FR-HAL-H), the DC reactor (FR-HEL or FR-HEL-H) is more recommended since the DC reactor is more effective in power factor improvement, smaller and lighter, and its wiring is easier. (The DC reactor uses two wires, while the AC reactor uses six wires.)

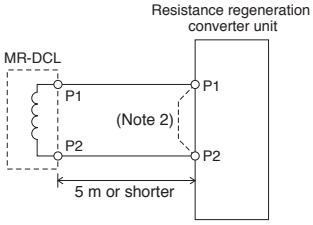
Servo amplifier model	Power factor improving DC reactor model	Fig.
MR-J4-10GF/B/A	FR-HEL-0.4K	A
MR-J4-20GF/B/A		
MR-J4-40GF/B/A	FR-HEL-0.75K	
MR-J4-60GF/B/A	FR-HEL-1.5K	
MR-J4-70GF/B/A		
MR-J4-100GF/B/A	FR-HEL-2.2K	
MR-J4-200GF/B/A	FR-HEL-3.7K	B
MR-J4-350GF/B/A	FR-HEL-7.5K	
MR-J4-500GF/B/A	FR-HEL-11K	
MR-J4-700GF/B/A	FR-HEL-15K	
MR-J4-11KGF/B/A		
MR-J4-15KGF/B/A	FR-HEL-22K	C
MR-J4-22KGF/B/A	FR-HEL-30K	
MR-J4-60GF4/B4/A4	FR-HEL-H1.5K	D
MR-J4-100GF4/B4/A4	FR-HEL-H2.2K	

Servo amplifier model	Power factor improving DC reactor model	Fig.
MR-J4-200GF4/B4/A4	FR-HEL-H3.7K	E
MR-J4-350GF4/B4/A4	FR-HEL-H7.5K	
MR-J4-500GF4/B4/A4	FR-HEL-H11K	
MR-J4-700GF4/B4/A4	FR-HEL-H15K	F
MR-J4-11KGF4/B4/A4		
MR-J4-15KGF4/B4/A4	FR-HEL-H22K	
MR-J4-22KGF4/B4/A4	FR-HEL-H30K	

Resistance regeneration 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

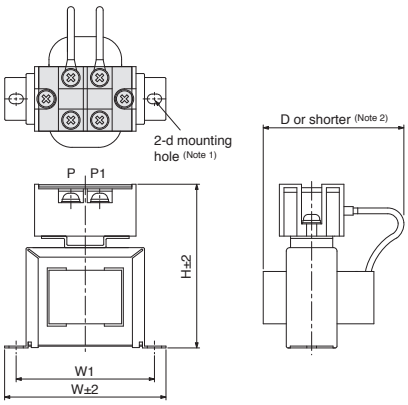




Notes: 1. Disconnect a short-circuit bar between P3 and P4 when using the power factor improving DC reactor.
2. Disconnect a short-circuit bar between P1 and P2 when using the power factor improving DC reactor.

Dimensions

A



Model	Variable dimensions [mm]					Mass [kg]	Terminal screw size	Wire size (Note 3) [mm²]
	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)

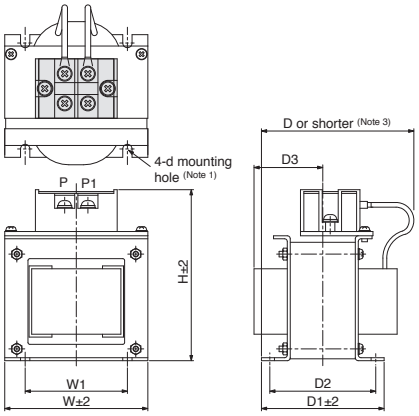
Notes: 1. Use this mounting hole for grounding.
2. This indicates the maximum dimension. The dimension varies depending on the bending degree of the input/output lines.
3. The wire size is applicable when 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wires) is used.

Power Factor Improving DC Reactor (FR-HEL, FR-HEL-H)

GF | GF-RJ | B | B-RJ | A | A-RJ

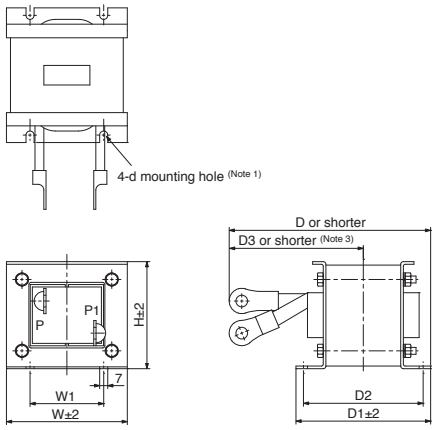
Dimensions

B



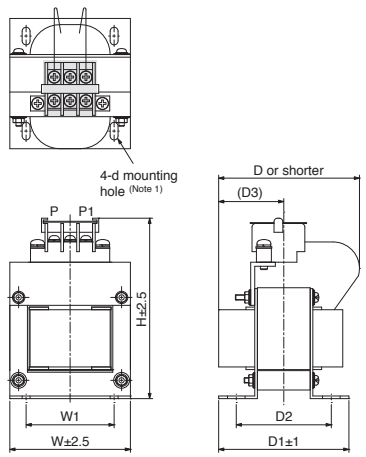
Model	Variable dimensions [mm]								Mass [kg]	Terminal screw size	Wire size (Note 4) [mm²]
	W	W1	H	D	D1	D2	D3	d			
FR-HEL-3.7K	77	55	92	82	66	57	37	M4	1.5	M4	2 (AWG 14)
FR-HEL-7.5K	86	60	113	98	81	72	43	M4	2.5	M5	3.5 (AWG 12)
FR-HEL-11K	105	64	133	112	92	79	47	M6	3.3	M6	5.5 (AWG 10)
FR-HEL-15K	105	64	133	115	97	84	48.5	M6	4.1	M6	8 (AWG 8) 14 (AWG 6) (Note 2)

C



Model	Variable dimensions [mm]								Mass [kg]	Terminal screw size	Wire size (Note 4) [mm²]
	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



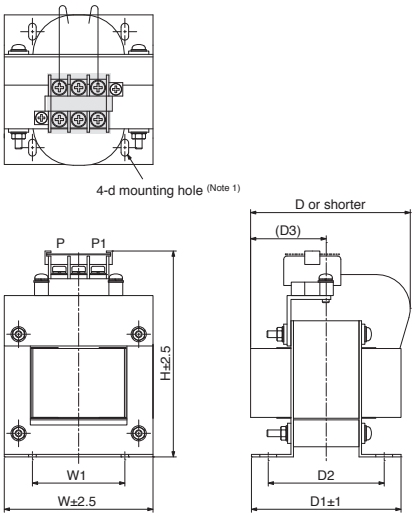
Model	Variable dimensions [mm]								Mass [kg]	Terminal screw size	Wire size (Note 4) [mm²]
	W	W1	H	D	D1	D2	D3	d			
FR-HEL-H1.5K	66	50	100	80	74	54	37	M4	1.0	M3.5	2 (AWG 14)
FR-HEL-H2.2K	76	50	110	80	74	54	37	M4	1.3	M3.5	2 (AWG 14)

Notes: 1. Use this mounting hole for grounding.
2. When using FR-HEL-15K, select a wire of 8 mm² (AWG 8) for MR-J4-700GF/B/A, and 14 mm² (AWG 6) for MR-J4-11KGF/B/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) GF GF-RJ B B-RJ A A-RJ

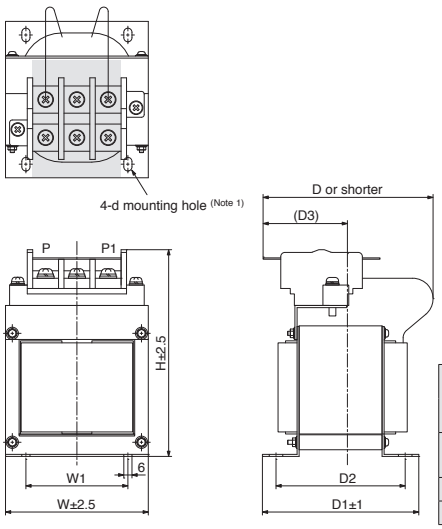
Dimensions

E



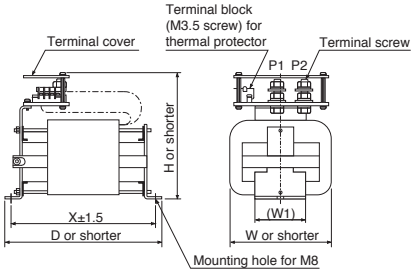
Model	Variable dimensions [mm]								Mass [kg]	Terminal screw size	Wire size (Note 3) [mm²]
	W	W1	H	D	D1	D2	D3	d			
FR-HEL-H3.7K	86	55	120	95	89	69	45	M4	2.3	M4	2 (AWG 14)
FR-HEL-H7.5K	96	60	128	105	100	80	50	M5	3.5	M4	2 (AWG 14)
FR-HEL-H11K	105	75	137	110	105	85	53	M5	4.5	M5	3.5 (AWG 12)

F



Model	Variable dimensions [mm]								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 [mm]					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								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-J4-700GF4/B4/A4, and 8 mm² (AWG 8) for MR-J4-11KGF4/B4/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) GF GF-RJ B B-RJ WB A A-RJ

This boosts the power factor of servo amplifier and reduces the power supply capacity.

For MR-J4-GF/B/A

Servo amplifier model	Power factor improving AC reactor model (Note 2)	Fig.
MR-J4-10GF/B/A	FR-HAL-0.4K	A
MR-J4-20GF/B/A		
MR-J4-10GF1/B1/A1	FR-HAL-0.75K	
MR-J4-40GF/B/A		
MR-J4-20GF1/B1/A1	FR-HAL-1.5K	
MR-J4-60GF/B/A		
MR-J4-70GF/B/A		
MR-J4-40GF1/B1/A1	FR-HAL-2.2K	
MR-J4-100GF/B/A (3-phase power supply input)		
MR-J4-100GF/B/A (1-phase power supply input)	FR-HAL-3.7K	
MR-J4-200GF/B/A (3-phase power supply input)		
MR-J4-200GF/B/A (1-phase power supply input)	FR-HAL-5.5K	
MR-J4-350GF/B/A	FR-HAL-7.5K	B
MR-J4-500GF/B/A	FR-HAL-11K	
MR-J4-700GF/B/A	FR-HAL-15K	
MR-J4-11KGF/B/A		
MR-J4-15KGF/B/A	FR-HAL-22K	C
MR-J4-22KGF/B/A	FR-HAL-30K	
MR-J4-60GF4/B4/A4	FR-HAL-H1.5K	D
MR-J4-100GF4/B4/A4	FR-HAL-H2.2K	
MR-J4-200GF4/B4/A4	FR-HAL-H3.7K	
MR-J4-350GF4/B4/A4	FR-HAL-H7.5K	E
MR-J4-500GF4/B4/A4	FR-HAL-H11K	
MR-J4-700GF4/B4/A4	FR-HAL-H15K	
MR-J4-11KGF4/B4/A4		
MR-J4-15KGF4/B4/A4	FR-HAL-H22K	F
MR-J4-22KGF4/B4/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	

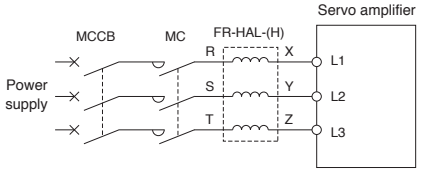
For MR-J4W3-B (Note 1)

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	

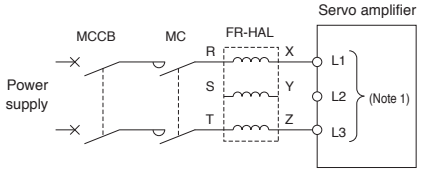
Notes: 1. Refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual" for selecting a power factor improving AC reactor when combining multiple servo motors among the rotary servo motor, the linear servo motor or the direct drive motor.
2. When using the power factor improving AC reactor, install one reactor for each servo amplifier.

Connections

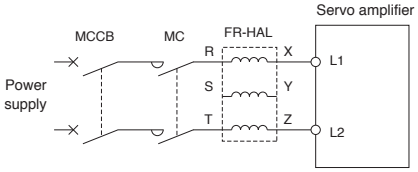
3-phase 200 V AC or
3-phase 400 V AC



1-phase 200 V AC



1-phase 100 V AC

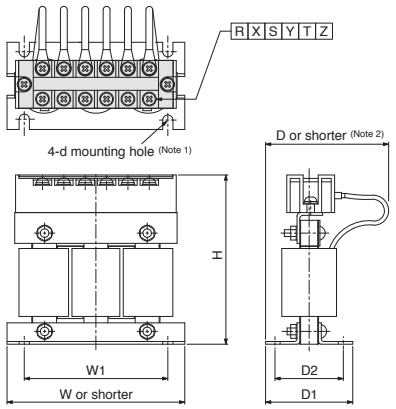


Notes: 1. Connect the power supply to L1 and L3 terminals. Do not connect anything to L2. The connections are different from MR-J3 series servo amplifiers. Be careful not to make a connection error when replacing MR-J3 with MR-J4.

Power Factor Improving AC Reactor (FR-HAL, FR-HAL-H) GF GF-RJ B B-RJ WB A A-RJ

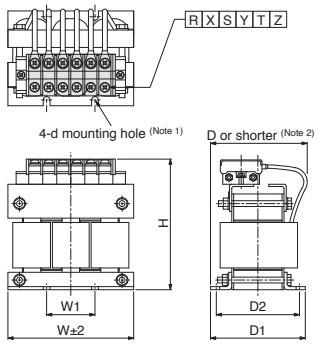
Dimensions

A



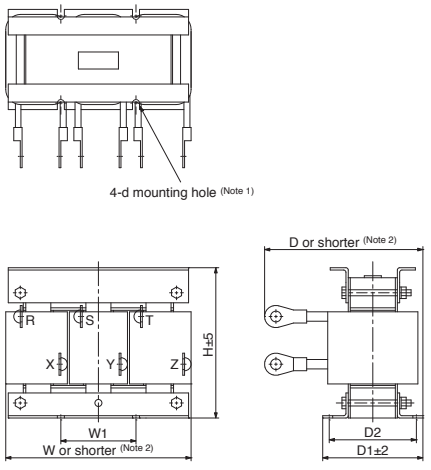
Model	Variable dimensions [mm]							Mass [kg]	Terminal screw size
	W	W1	H	D	D1	D2	d		
FR-HAL-0.4K	104±2	84	99	72	51	40	M5	0.6	M4
FR-HAL-0.75K	104±2	84	99	74	56	44	M5	0.8	M4
FR-HAL-1.5K	104±2	84	99	77	61	50	M5	1.1	M4
FR-HAL-2.2K	115 (Note 2)	40	115	77	71	57	M6	1.5	M4
FR-HAL-3.7K	115 (Note 2)	40	115	83	81	67	M6	2.2	M4
FR-HAL-5.5K	115 (Note 2)	40	115	83	81	67	M6	2.3	M4

B



Model	Variable dimensions [mm]							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 [mm]							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

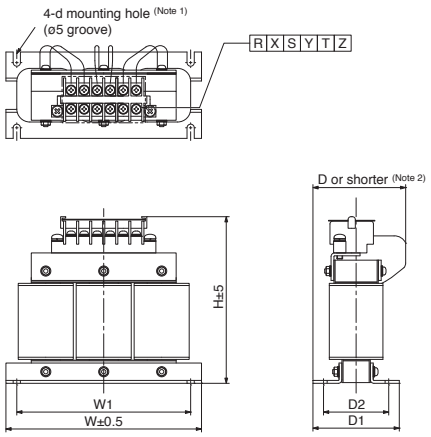
Notes: 1. Use this mounting hole for grounding.
2. This indicates the maximum dimension. The dimension varies depending on the bending degree of the input/output lines.

Power Factor Improving AC Reactor (FR-HAL, FR-HAL-H)

GF | GF-RJ | B | B-RJ | A | A-RJ

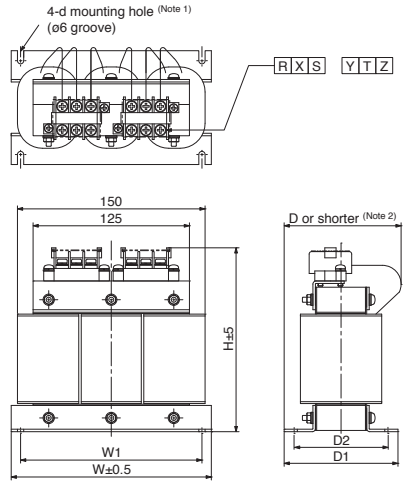
Dimensions

D



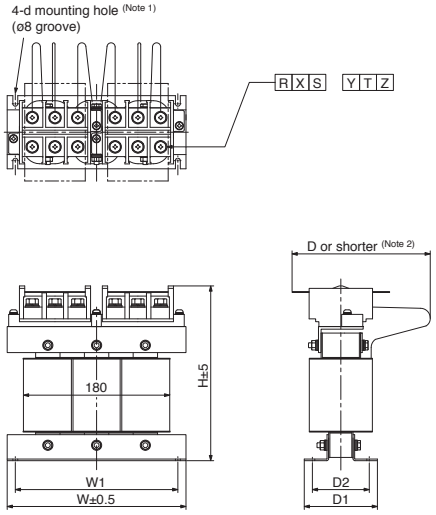
Model	Variable dimensions [mm]							Mass [kg]	Terminal screw size
	W	W1	H	D	D1	D2	d		
FR-HAL-H1.5K	135	120	115	59	59.6	45	M4	1.5	M3.5
FR-HAL-H2.2K	135	120	115	59	59.6	45	M4	1.5	M3.5
FR-HAL-H3.7K	135	120	115	69	70.6	57	M4	2.5	M3.5

E



Model	Variable dimensions [mm]							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 [mm]							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.

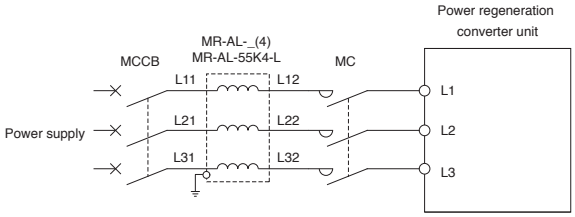
AC Reactor (MR-AL)

B B-RJ B-RJ100

Power regeneration converter unit model	AC reactor model	
MR-CV11K	MR-AL-11K	A
MR-CV18K	MR-AL-18K	
MR-CV30K	MR-AL-30K	
MR-CV37K	MR-AL-37K	
MR-CV45K	MR-AL-45K	
MR-CV55K	MR-AL-55K	

Power regeneration converter unit model	AC reactor model	
MR-CV11K4	MR-AL-11K4	A
MR-CV18K4	MR-AL-18K4	
MR-CV30K4	MR-AL-30K4	
MR-CV37K4	MR-AL-37K4	
MR-CV45K4	MR-AL-45K4	
MR-CV55K4	MR-AL-55K4	
MR-CV75K4	MR-AL-75K4	
MR-CV55K4 (parallel drive)	MR-AL-55K4-L (Note 1)	B

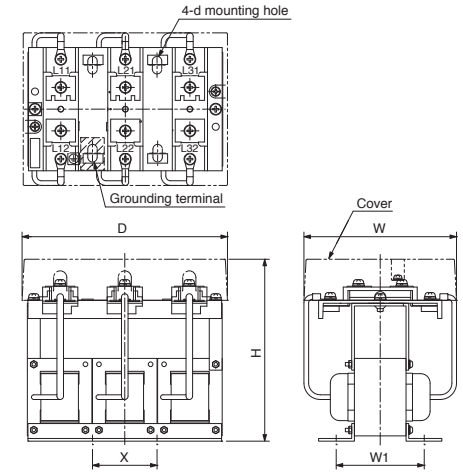
Connections



Dimensions

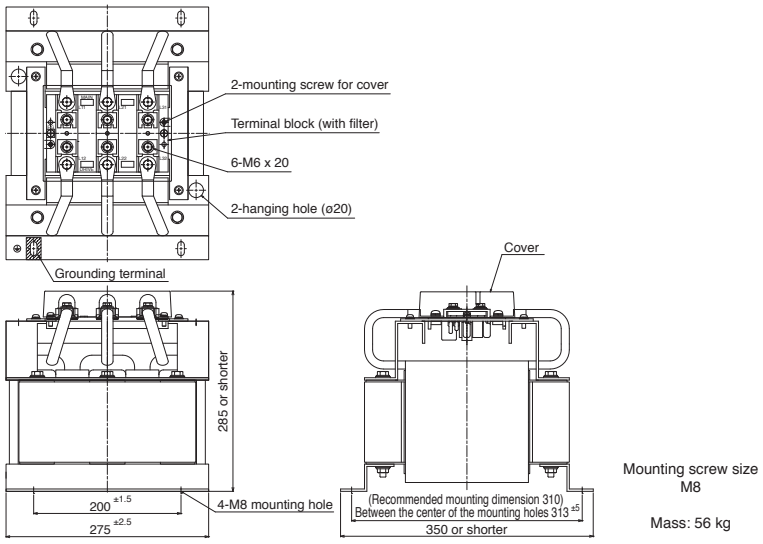
[Unit: mm]

A



Model	Variable dimensions [mm]						Mass [kg]	Terminal screw
	W	D	H	W1	X	d		
MR-AL-11K	145	175	155	75	55	M6	3.7	M5
MR-AL-18K	145	175	155	105	55	M6	5.3	M6
MR-AL-30K	145	175	155	110	55	M6	6.1	M6
MR-AL-37K	150	215	175	110	70	M6	8.6	M6
MR-AL-45K	160	215	175	120	70	M6	9.7	M6
MR-AL-55K	230	220	192	120	200	M8	11.5	M10
MR-AL-11K4	145	175	155	75	55	M6	3.7	M5
MR-AL-18K4	145	175	155	105	55	M6	5.3	M6
MR-AL-30K4	145	175	155	110	55	M6	6.0	M6
MR-AL-37K4	150	215	175	110	70	M6	8.5	M6
MR-AL-45K4	160	215	175	120	70	M6	9.8	M6
MR-AL-55K4	230	220	210	120	200	M8	10.5	M6
MR-AL-75K4	230	250	215	143	230	M8	13.0	M6

B



Mounting screw size
M8

Mass: 56 kg

Notes: 1. Use MR-AL-55K4-L for parallel drive. MR-AL-55K4 cannot be used.

Servo Support Software
Drive System Sizing Software Motorizer

Specifications

Item	Description
Types of motor/drive	Servo, Inverter, Sensorless servo
Types of load mechanism	Ball screw, Rack and pinion, Roll feed, Rotary table, Cart, Elevator/Hoist, Conveyor, Fan, Pump, Crank, Generic (Rotary), Generic (Linear), Linear servo
Types of transmission mechanism	Coupling, External gear reducer, V belt and pulley, Toothed belt/roller chain
Operation pattern	Constant speed/Pause, Acceleration/Deceleration, Trapezoid, Triangle, Speed CSV File, MELSOFT GX LogViewer file
Types of input support of moment of inertia calculation function	Solid cylinder, Hollow cylinder, Disk, Rectangular solid, Truncated cone, Sphere, Generic
Sizing results	Result, Motor type, Power supply voltage, Motor, Motor capacity, Drive, Drive capacity, Effective torque, Torque effective load rate, Peak torque, Peak load rate, Effective torque at stop, Effective load rate at stop, Motor output, Motor output rate, Maximum speed, Maximum speed rate, Maximum load inertia moment, Inertia moment ratio, Regenerative power, Regenerative load ratio, Regenerative option, Maximally increased torque, Rated speed, Brake, Oil seal, Structure specification, Graph of Motor side speed/Motor side torque/Motor output
Printing of output of results	Prints load mechanism, transmission mechanism, operation pattern, and sizing results.
Data saving	Load mechanism, transmission mechanism, operation pattern, motor selection, drive selection, and sizing results are saved with a file name.

Operating environment (Note 1)

Item	Description
OS	Microsoft® Windows® 10 (64-bit/32-bit)
	Microsoft® Windows® 8.1 (64-bit/32-bit)
	Microsoft® Windows® 7 (64-bit/32-bit) [Service Pack1 or later]
.NET Framework	.NET Framework 4.6 or later
CPU	Desktop PC: Intel® Celeron® processor 2.4 GHz or more recommended
	Laptop PC: Intel® Pentium® processor 1.9 GHz or more recommended
Memory	1 GB or more recommended (32-bit OS)
	2 GB or more recommended (64-bit OS)
Free hard disk space	For installation: 1 GB or more free hard disk capacity
	For operation: 512 MB or more free virtual memory capacity
Monitor	Resolution 1024 × 768 or more (XGA)
	Compatible with above personal computers

Notes: 1. This software may not run correctly on some personal computers.

Servo Support Software
MR Configurator2 (SW1DNC-MRC2-E) (Note 11)

MELSOFT

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 MELSOFT iQ Works, GX Works3, GX Works2, MT Works2, EM Software Development Kit, or CW Configurator, MR Configurator2 is available for free download.

Specifications

Item	Description
Project	New/Open/Save/Save As/Delete Project, Read Other Format, Write Other Format, System Setting, Print
Parameter	Parameter Setting, Axis Name Setting (Note 3), Parameter Converter (Note 4)
Safety (Note 8)	Safety parameter setting, Change password, Initialize password
Positioning-data	Point table (Note 10), Program (Note 9), Indirect addressing (Note 9), Cam data (Note 10)
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 Operation	JOG Operation (Note 7), Positioning Operation, Motor-Less Operation (Note 1), DO Forced Output, Program Operation, Single-Step Feed, Test Operation Information
Adjustment	One-Touch Tuning, Tuning, Machine Analyzer, Advanced Gain Search
Others	Servo Assistant, Update Parameter Setting Range, Machine Unit Conversion Setting (Note 2), Switch Display Language, Help

Notes: 1. Not available in the fully closed loop control mode, linear servo motor control mode, or direct drive motor control mode.
2. Available only with MR-J4-_B_, MR-J4-_B_-RJ, MR-J4-DU_B_, MR-J4-DU_B_-RJ, and MR-J4W_-B.
3. Available only with MR-J4-_A_, MR-J4-_A_-RJ, MR-J4-DU_A_, and MR-J4-DU_A_-RJ.
4. Available only with MR-J4-_A_, MR-J4-_A_-RJ, MR-J4-DU_A_, and MR-J4-DU_A_-RJ, but not in the fully closed loop control mode, linear servo motor control mode, or direct drive motor control mode.
5. Available only in the fully closed loop control mode.
6. Available only in the linear servo motor control mode.
7. Not available in the linear servo motor control mode.
8. Available when using MR-D30 Functional Safety unit.
9. Available only with MR-J4-_A_-RJ.
10. Available only with MR-J4-_GF_(-RJ) and MR-J4-_A_-RJ.
11. Be sure to use the latest version of this software. Contact your local sales office for updating your software.

Operating environment (Note 1)

Components	Description
OS	Microsoft® Windows® 10 Education Microsoft® Windows® 10 Enterprise Microsoft® Windows® 10 Pro Microsoft® Windows® 10 Home Microsoft® Windows® 8.1 Enterprise Microsoft® Windows® 8.1 Pro Microsoft® Windows® 8.1 Microsoft® Windows® 8 Enterprise Microsoft® Windows® 8 Pro Microsoft® Windows® 8 Microsoft® Windows® 7 Enterprise Microsoft® Windows® 7 Ultimate Microsoft® Windows® 7 Professional Microsoft® Windows® 7 Home Premium Microsoft® Windows® 7 Starter
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)	1 GB or more (32-bit OS), 2 GB or more (64-bit OS)
Free hard disk space	1.5 GB or more
Monitor	Resolution 1024 × 768 or more, 16-bit high color, Compatible with above personal computers
USB cable	MR-J3USBCBL3M

Notes: 1. This software may not run correctly on some personal computers.

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]	n × 9/5 + 32 [°F]

6 Low-Voltage Switchgear/Wires

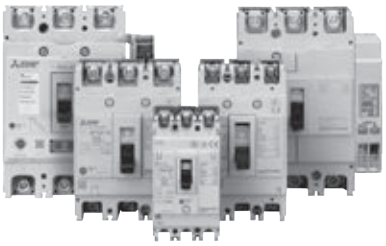
	Servo amplifier							
	GF	GF-RJ	B	B-RJ	WB	A	A-RJ	●: Applicable
Features of Low-Voltage Switchgear	●	●	●	●	●	●	●	6-1
Wires, Molded-Case Circuit Breakers and Magnetic Contactors	●	●	●	●	●	●	●	6-5
Type E Combination Motor Controller	●	●	●	●	●	●	●	6-9
Selection Example in HIV Wires for Servo Motors	●	●	●	●	●	●	●	6-10

GF MR-J4-GF **GF-RJ** MR-J4-GF-RJ **B** MR-J4-B/MR-J4-DU_B **B-RJ** MR-J4-B-RJ/MR-J4-DU_B-RJ **B-RJ100** MR-J4-DU_B4-RJ100

WB MR-J4W2-B/MR-J4W3-B **A** MR-J4-A/MR-J4-DU_A **A-RJ** MR-J4-A-RJ/MR-J4-DU_A-RJ

* Note that low-voltage switchgears/wires necessary for servo amplifiers with special specification are the same as those for standard servo amplifiers. Refer to the servo amplifiers with the same rated capacity.

Mitsubishi Electric Molded Case Circuit Breakers and Earth Leakage Circuit Breakers WS-V Series



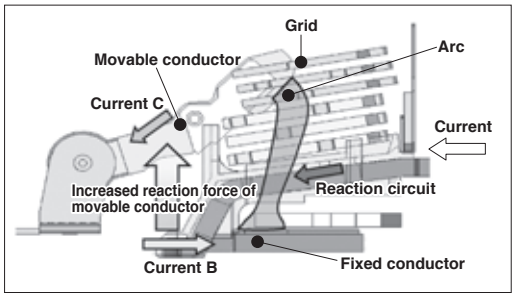
"WS-V Series" is the new circuit breakers that have a lot of superior aspects such as higher breaking capacity, design for easy use, standardization of accessory parts, and compliance with the global standards.

Features

Technologies based on long years of experience are brought together to achieve improved performance

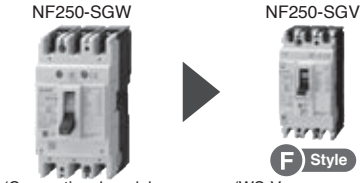
The new circuit breaking technology "Expanded ISTAC" has improved the current-limiting performance and upgraded the overall breaking capacity.
Expansion of the conductor under the stator shortens the contact parting time of the mover as compared to the conventional ISTAC structure.
The current-limiting performance has been improved remarkably. (The maximum peak current value has been reduced by approx. 10%.)

New circuit breaking technology (Expanded ISTAC)



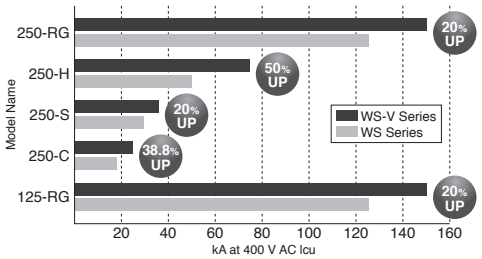
Compact design for ease of use

The thermal adjustable circuit breakers and electronic circuit breakers are smaller.



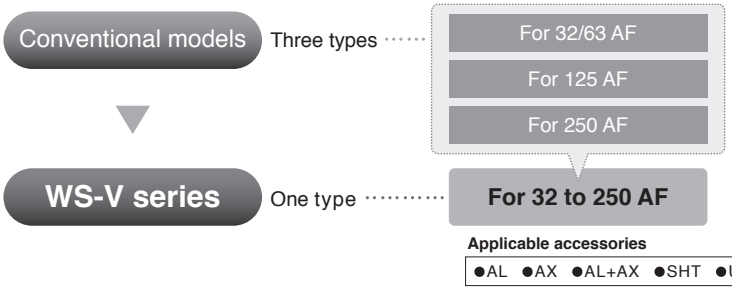
Volume ratio 79%
(Compared with our conventional models)

■ Breaking capacity comparison with a conventional model



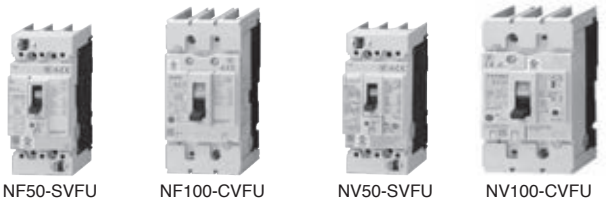
Types of internal accessories are reduced from 3 types to 1 type

Standardization of internal accessories contributes to a reduction of stock and delivery time.



Lineup of UL 489 listed circuit breakers with 54 mm width ***"Small Fit"*** F Style

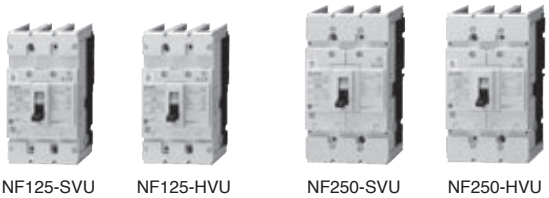
The compact breakers contribute to a size reduction of machines, and IEC 35 mm rail mounting is standard.



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 Electric Magnetic Motor Starters and Magnetic Contactors MS-T Series

S-T10

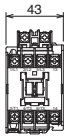
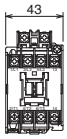
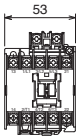
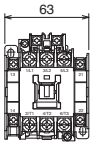
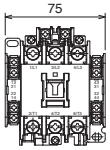
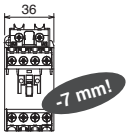
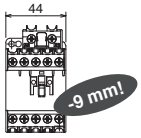
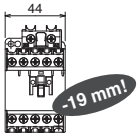
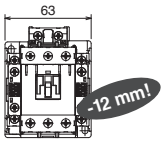
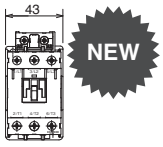
MS-T series is released!
The MS-T series is smaller than ever, enabling more compact control panel. The MS-T series is suitable for MELSERVO-J4 series as well as other Mitsubishi Electric FA equipment. In addition, the MS-T complies with a variety of global standards, supporting the global use.

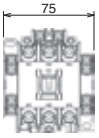
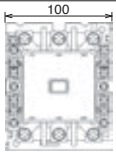
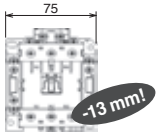
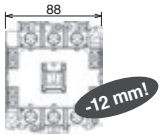
Features

Down-sizing

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 2016 in the general-purpose magnetic contactor industry for 10 A-frame class.

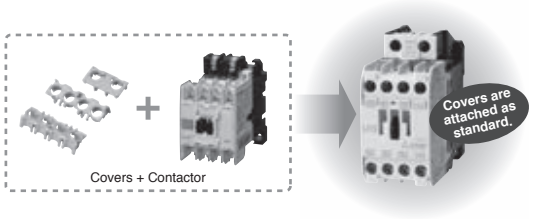
[Unit: mm]

Frame size		11 A	13 A		20 A	25 A	32 A
Conventional MS-N series	Front view	 S-N10	 S-N11 (Auxiliary 1-pole)	 S-N12 (Auxiliary 2-pole)	 S-N20	 S-N25	None
New MS-T series	Front view	 S-T10	 S-T12 (Auxiliary 2-pole)		 S-T20	 S-T25	 S-T32

Frame size		35 A	50 A	65 A	80 A	100 A
MS-N series	Front view	 S-N35	S-N50	S-N65	 S-N80	S-N95
New MS-T series	Front view	S-T35	 S-T50	S-T65	 S-T80	S-T100

Standardization

Covers provided as standard equipment (Target frame: 10 AF to 50 AF)
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 (Target frame: 10 AF to 35 AF)
The prior series had 13 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 seven types, 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
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

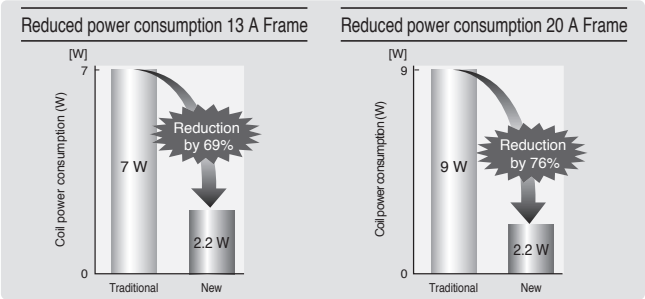
Coil designation	Rated voltage [V]
	50 Hz/60 Hz
AC24 V	24
AC48 V	48 to 50
AC100 V	100 to 127
AC200 V	200 to 240
AC300 V	260 to 300
AC400 V	380 to 440
AC500 V	460 to 550

* The conventional seven types are available for the 50 A and larger frames.

Capable of direct drive with transistor output of programmable controller, etc. (Target frame: 13 AF to 32 AF DC-operated models)
The adopted high-efficiency polarized electromagnet greatly reduces the coil power consumption, and enables all models to be directly driven with a DC 24 V, 0.1 A rating transistor output. (DC 24 V coil)

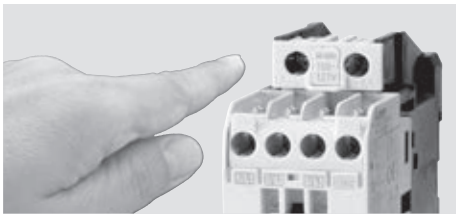
	Conventional Model	New Model	Lowering Rate
13 A Frame (Coil: DC 12/24 V)*	7 W	2.2 W	69%
20 A Frame (Coil: DC 12/24 V)	9 W	2.2 W	76%
32 A Frame (Coil: DC 12/24 V)	-	2.2 W	-

*DC 48 V to DC 220 V: 3.3 W

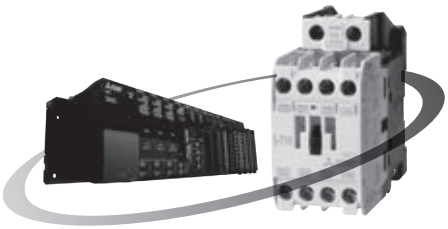


Safety & Quality

Terminal cover with finger protection function (Target frame: 10 AF to 50 AF)
In addition to the Magnetic Contactor, a terminal cover has been provided as a standard for the thermal, magnetic relay and auxiliary contact unit options. This realizes a finger protection function that complies with the DIN and VDE Standards, prevents electric shocks, and increases safety during maintenance and inspections.



A light touch (Target frame: All S-T Series)
The MS-T Series' auxiliary contacts can operate with load as light as 20 V 3 mA making it suitable for direct control/operation from a programmable controller output.



Smart wiring

Smart design means Smart wiring (Target frame: 10 AF to 50 AF)
The integrated terminal covers have an additional benefit in that they act as a guide to improve wiring efficiency but also retain the terminal screw in place: no mislaying the screw, no dropping it or having trouble reinserting it into the terminal block just fast efficient wiring. Fast wiring terminals (model name with suffix “BC”) are also available to further improve wiring efficiency, workability and hence productivity.

Image of Fast wiring terminals (BC type)

(1) Screw holder lifts up the screw. (2) Insert a ring crimp lug (3) Tighten the screw

Global Standard

Complies with main International Standards (Target frame: All S-T Series)
In addition to certification for use under various countries' standards such as IEC, JIS, UL, CE and CCC, etc., plans are also underway to obtain certification for the standards of other countries.
We aim to contribute to helping customers expand their overseas business.

Standard	Applicable Standard					Safety Standard
	International	Japan	Europe		China	U.S.A./ Canada
	IEC*1	JIS	EN / EC Directive	Certification Body	GB	c UL us
			CE	TÜV Rheinland	CCC	

*1. Compliant with the requirements for mirror contacts in standards such as IEC60947-4-1, and TÜV-certified.

Mitsubishi Electric Motor Circuit Breakers MMP-T Series

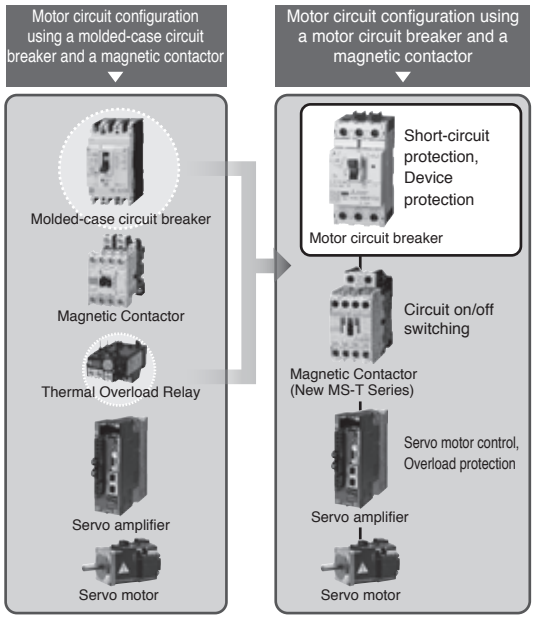
Motor circuit protection (against overload/phase loss/short-circuit) is achievable with the MMP-T series alone.
The wire-saving, space-saving design enables downsizing of the enclosure.
The MMP-T series can be used in combination with the MS-T series.

MMP-T32

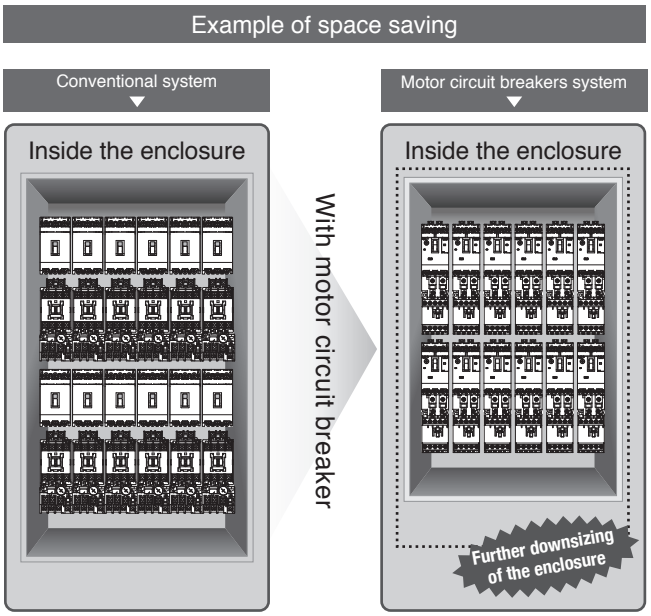
Features

What is the Motor Circuit Breaker?

The motor circuit breaker, applicable to the motor circuit, has the functions of a molded-case circuit breaker and a thermal overload relay in one unit. The motor circuit breaker provides protection against overload, phase loss, and short circuit.

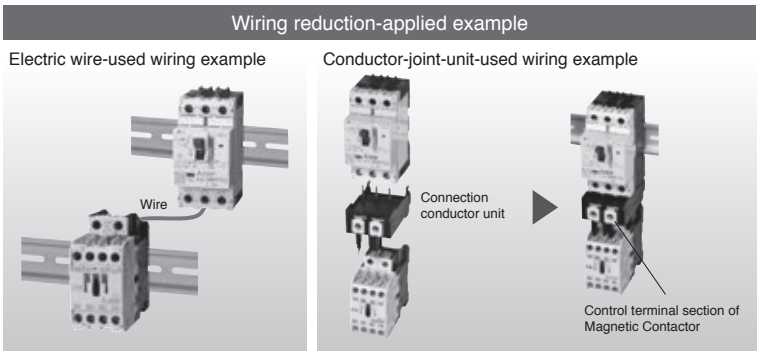


Space-saving design for downsizing of the enclosure



Wiring reduction

Using a connection conductor unit (option) for connecting a motor circuit breaker and a magnetic contactor reduces work hours required for wiring.



Global Standard

Complies with main International Standards

In addition to certification for use under various countries' standards such as IEC, JIS, UL, CE and CCC, etc., plans are also underway to obtain certification for the standards of other countries.
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	Applicable Standard					Safety Standard
	International	Japan	Europe		China	U.S.A./ Canada
Standard	IEC	JIS	EN / EC Directive	Certification Body	GB	c UL us
			CE	TÜV Rheinland	CCC	

UL60947-4-1A Type E/F is also covered.

In combination with MS-T, compliance of the device with UL's Type E/F combination can surely support export to the United States.

Wires, Molded-Case Circuit Breakers and Magnetic Contactors

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 E 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.

Example of Selection for MR-J4-GF/MR-J4-B/MR-J4-A

GF **GF-RJ** **B** **B-RJ** **A** **A-RJ**

Servo amplifier model	Molded-case circuit breaker (Note 5, 6, 7)	Magnetic contactor (Note 3, 6)	Wire size [mm²] (Note 5)			
			L1, L2, L3, ⏚	L11, L21	P+, C (Note 1)	U, V, W, E
MR-J4-10GF(1)/B(1)/A(1)	30 A frame 5 A (30 A frame 5 A)	S-T10	2 (AWG 14)	1.25 to 2 (AWG 16 to 14)	2 (AWG 14)	AWG 18 to 14 (Note 4)
MR-J4-20GF/B/A	30 A frame 5 A (30 A frame 5 A)	S-T10				
MR-J4-20GF1/B1/A1	30 A frame 10 A (30 A frame 10 A)	S-T10				
MR-J4-40GF/B/A	30 A frame 10 A (30 A frame 5 A)	S-T10				
MR-J4-40GF1/B1/A1	30 A frame 15 A (30 A frame 10 A)	S-T10				
MR-J4-60GF/B/A	30 A frame 15 A (30 A frame 10 A)	S-T10				
MR-J4-70GF/B/A	30 A frame 15 A (30 A frame 10 A)	S-T10				
MR-J4-100GF/B/A (3-phase power input)	30 A frame 15 A (30 A frame 10 A)	S-T10				
MR-J4-100GF/B/A (1-phase power input)	30 A frame 15 A (30 A frame 15 A)	S-T10				
MR-J4-200GF/B/A (3-phase power input)	30 A frame 20 A (30 A frame 20 A)	S-T21				AWG 16 to 10 (Note 4)
MR-J4-200GF/B/A (1-phase power input)	30 A frame 20 A (30 A frame 20 A)	S-T21	3.5 (AWG 12)			
MR-J4-350GF/B/A	30 A frame 30 A (30 A frame 30 A)	S-T21				
MR-J4-500GF/B/A (Note 2)	50 A frame 50 A (50 A frame 50 A)	S-T35	5.5 (AWG 10)			2 to 5.5 (AWG 14 to 10)
MR-J4-700GF/B/A (Note 2)	100 A frame 75 A (60 A frame 60 A)	S-T50	8 (AWG 8)			2 to 8 (AWG 14 to 8)
MR-J4-11KGF/B/A (Note 2)	100 A frame 100 A (100 A frame 100 A)	S-T50	14 (AWG 6)		3.5 (AWG 12)	5.5 (AWG 10), 8 (AWG 8), 14 (AWG 6)
MR-J4-15KGF/B/A (Note 2)	125 A frame 125 A (125 A frame 125 A)	S-T65	22 (AWG 4)		5.5 (AWG 10)	8 (AWG 8), 22 (AWG 4)
MR-J4-22KGF/B/A (Note 2)	225 A frame 175 A (225 A frame 175 A)	S-T100	38 (AWG 2)			38 (AWG 2)
MR-J4-60GF4/B4/A4	30 A frame 5 A (30 A frame 5 A)	S-T10	2 (AWG 14)		2 (AWG 14)	AWG 16 to 14 (Note 4)
MR-J4-100GF4/B4/A4	30 A frame 10 A (30 A frame 5 A)	S-T10	2 (AWG 14)			
MR-J4-200GF4/B4/A4	30 A frame 15 A (30 A frame 10 A)	S-T10	2 (AWG 14)			
MR-J4-350GF4/B4/A4	30 A frame 20 A (30 A frame 15 A)	S-T21	2 (AWG 14)			
MR-J4-500GF4/B4/A4 (Note 2)	30 A frame 20 A (30 A frame 20 A)	S-T21	2 (AWG 14)			3.5 (AWG 12)
MR-J4-700GF4/B4/A4 (Note 2)	30 A frame 30 A (30 A frame 30 A)	S-T21	3.5 (AWG 12)			5.5 (AWG 10)
MR-J4-11KGF4/B4/A4 (Note 2)	50 A frame 50 A (50 A frame 50 A)	S-T35	5.5 (AWG 10)			8 (AWG 8)
MR-J4-15KGF4/B4/A4 (Note 2)	60 A frame 60 A (60 A frame 60 A)	S-T35	8 (AWG 8)		3.5 (AWG 12)	
MR-J4-22KGF4/B4/A4 (Note 2)	100 A frame 100 A (100 A frame 100 A)	S-T50	14 (AWG 6)			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 relevant Servo Amplifier Instruction Manual for details.
When using a power improving reactor, use a molded-case circuit breaker listed in the brackets.
6. Install one molded-case circuit breaker and one magnetic contactor for each servo amplifier.
7. Use a molded-case circuit breaker having the operation characteristics equal to or higher than Mitsubishi Electric general-purpose products.

Wires, Molded-Case Circuit Breakers and Magnetic Contactors

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 E 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.

Example of Selection for Combination of MR-CV_ and MR-J4-DU_B

B B-RJ

Power regeneration converter unit model (Note 2)	Molded-case circuit breaker (Note 3, 4, 5)	Magnetic contactor (Note 1, 3)	Wire size [mm²] (Note 4, 6)	
			L1, L2, L3, ⏚	L11, L21
MR-CV11K	50 A frame 50 A	S-T35	8 (AWG 8)	1.25 to 2 (AWG 16 to 14)
MR-CV18K	100 A frame 100 A	S-T65	22 (AWG 4)	
MR-CV30K	225 A frame 150 A	S-N125	38 (AWG 2)	
MR-CV37K	225 A frame 175 A	S-N125	60 (AWG 2/0)	
MR-CV45K	225 A frame 225 A	S-N150	60 (AWG 2/0)	
MR-CV55K	400 A frame 300 A	S-N220	80 (AWG 3/0)	
MR-CV11K4	30 A frame 30 A	S-T21	5.5 (AWG 10)	
MR-CV18K4	50 A frame 50 A	S-T35	8 (AWG 8)	
MR-CV30K4	100 A frame 80 A	S-T65	14 (AWG 6)	
MR-CV37K4	100 A frame 100 A	S-T80	22 (AWG 4)	
MR-CV45K4	125 A frame 125 A	S-T100	22 (AWG 4)	
MR-CV55K4	225 A frame 150 A	S-N125	38 (AWG 2)	
MR-CV75K4	225 A frame 200 A	S-N150	60 (AWG 2/0)	

Example of Selection for Combination of MR-CV_ and MR-J4-DU_B4-RJ100

B-RJ100

Servo motor model (Note 2)	Drive unit model (Note 2)	Converter unit model (Note 2)	Molded-case circuit breaker (Note 3, 4, 5)	Magnetic contactor (Note 1, 3)	Wire size [mm²] (Note 4)	
					L1, L2, L3, ⏚	L11, L21
HG-JR110K24W0C	MR-J4-DU55KB4-RJ100	MR-CV55K4	225 A frame 175 A	S-N150	38 (AWG 2)	2 (AWG 14)
HG-JR150K24W0C	MR-J4-DU45KB4-RJ100	MR-CV55K4	225 A frame 125 A	S-T100	38 (AWG 2)	2 (AWG 14)
HG-JR180K24W0C	MR-J4-DU45KB4-RJ100	MR-CV55K4	225 A frame 150 A	S-N125	38 (AWG 2)	2 (AWG 14)
HG-JR200K24W0C	MR-J4-DU55KB4-RJ100	MR-CV55K4	225 A frame 175 A	S-N150	38 (AWG 2)	2 (AWG 14)
HG-JR220K24W0C	MR-J4-DU55KB4-RJ100	MR-CV55K4	225 A frame 175 A	S-N150	38 (AWG 2)	2 (AWG 14)

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. When connecting the wires to the terminal blocks, be sure to use the screws attached to the terminal blocks.
3. Install one molded-case circuit breaker and one magnetic contactor for each power regeneration converter unit.
4. When complying with IEC/EN/UL/CSA standard, refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual".
5. Use a molded-case circuit breaker having the operation characteristics equal to or higher than Mitsubishi Electric general-purpose products.
6. Wires are selected based on the highest rated current among the servo motors to be combined.

Example of Selection for Combination of MR-CR_ and MR-J4-DU_B/MR-J4-DU_A

B | B-RJ | A | A-RJ

Resistance regeneration converter unit model (Note 2)	Drive unit model	Molded-case circuit breaker (Note 3, 4, 5)	Magnetic contactor (Note 1, 3)	Wire size [mm²] (Note 4)		
				L1, L2, L3, ⏚	L11, L21	P2, C
MR-CR55K	MR-J4-DU30KB/A	225 A frame 175 A (225 A frame 150 A)	S-N150	38 (AWG 2)	1.25 to 2 (AWG 16 to 14)	5.5 (AWG 10)
	MR-J4-DU37KB/A	225 A frame 225 A (225 A frame 175 A)	S-N180	60 (AWG 2/0)		
MR-CR55K4	MR-J4-DU30KB4/A4	100 A frame 100 A (100 A frame 80 A)	S-T65	22 (AWG 4)		
	MR-J4-DU37KB4/A4	125 A frame 125 A (100 A frame 100 A)	S-T80	22 (AWG 4)		
	MR-J4-DU45KB4/A4	225 A frame 150 A (125 A frame 125 A)	S-T100	38 (AWG 2)		
	MR-J4-DU55KB4/A4	225 A frame 175 A (225 A frame 150 A)	S-N150	38 (AWG 2)		

Drive unit model (Note 2)	Wire size [mm²] (Note 4, 6)	
	U, V, W, E	L11, L21
MR-J4-DU900B	14 (AWG 6)	1.25 to 2 (AWG 16 to 14)
MR-J4-DU11KB	14 (AWG 6)	
MR-J4-DU15KB	22 (AWG 4)	
MR-J4-DU22KB	38 (AWG 2)	
MR-J4-DU30KB/A	60 (AWG 2/0)	
MR-J4-DU37KB/A	60 (AWG 2/0)	
MR-J4-DU900B4	8 (AWG 8)	
MR-J4-DU11KB4	8 (AWG 8)	
MR-J4-DU15KB4	8 (AWG 8)	
MR-J4-DU22KB4	14 (AWG 6)	
MR-J4-DU30KB4/A4	22 (AWG 4)	
MR-J4-DU37KB4/A4	22 (AWG 4)	
MR-J4-DU45KB4/A4	38 (AWG 2)	
MR-J4-DU55KB4/A4	38 (AWG 2)	

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. When connecting the wires to the terminal blocks, be sure to use the screws attached to the terminal blocks.
3. Install one molded-case circuit breaker and one magnetic contactor for each resistance regeneration converter unit.
4. When complying with IEC/EN/UL/CSA standard, refer to "MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual". When using a power improving reactor, use a molded-case circuit breaker listed in the brackets.
5. Use a molded-case circuit breaker having the operation characteristics equal to or higher than Mitsubishi Electric general-purpose products.
6. Wires are selected based on the highest rated current among the servo motors to be combined.

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 E 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 [mm²] (Note 3)			
			L1, L2, L3, ⏚	L11, L21	P+, C (Note 5)	U, V, W, E
MR-J4W2-22B	Refer to the following tables.	Refer to the following tables.	2 (AWG 14)			AWG 18 to 14 (Note 2)
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, 6, 7)	Magnetic contactor (Note 1, 6)
300 W or less	-	-	30 A frame 5 A	S-T10
Over 300 W to 600 W	150 N or less	100 W or less	30 A frame 10 A	S-T10
Over 600 W to 1 kW	Over 150 N to 300 N	Over 100 W to 252 W	30 A frame 15 A	S-T10
Over 1 kW to 2 kW	Over 300 N to 720 N	Over 252 W to 838 W	30 A frame 20 A	S-T21

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, 6, 7)	Magnetic contactor (Note 1, 6)
450 W or less	150 N or less	-	30 A frame 10 A	S-T10
Over 450 W to 800 W	Over 150 N to 300 N	252 W or less	30 A frame 15 A	S-T10
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-T21

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 "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual".
4. When different types of servo motors (rotary servo motor, linear servo motor, or direct drive motor) are connected to the multi-axis servo amplifier, refer to "MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual" for selecting a molded-case circuit breaker and a magnetic contactor.
5. Keep the wire length to the regenerative option within 5 m.
6. Install one molded-case circuit breaker and one magnetic contactor for each servo amplifier.
7. Use a molded-case circuit breaker having the operation characteristics equal to or higher than Mitsubishi Electric general-purpose products.

Wires (Example of Selection for MR-J4W2-0303B6/MR-J4-03A6)

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.

Servo amplifier model	Wire size	
	24, 0, PM, ⏚	U, V, W, E
MR-J4W2-0303B6	AWG 16 (Note 1)	AWG 19
MR-J4-03A6		

Notes: 1. A voltage drop occurs by the current supplied to the servo amplifier according to the wiring impedance.

Circuit Protector (Note 1)

WB A A-RJ

Power supply specifications	MR-J4W2-0303B6	MR-J4-03A6
Control circuit power supply (24 V DC)	CP30-BA 1P 1-M 1A	CP30-BA 1P 1-M 1A
Main circuit power supply (48 V DC)	CP30-BA 1P 1-M 5A	CP30-BA 1P 1-M 3A
Main circuit power supply (24 V DC)	CP30-BA 1P 1-M 10A	CP30-BA 1P 1-M 5A

Notes: 1. Use the circuit protector whose operation characteristic is medium-speed type.

Type E Combination Motor Controller

GF GF-RJ B B-RJ WB A A-RJ

The Type E Combination Motor Controller is comprised of the Manual Motor Starter, Short-circuit Display Unit "UT-TU", and Power Side Terminal Cover Kit "UT-CV3".

Servo amplifier	Rated input voltage AC [V]	Input phase (Note 2)	Manual Motor Starter			SCCR [kA] (Note 1)
			Model (Mitsubishi Electric)	Rated voltage AC [V]	Rated current [A] (Heater design)	
MR-J4-10GF/B/A	200 to 240	3-phase	MMP-T32	240	1.6	50
MR-J4-20GF/B/A					2.5	
MR-J4-40GF/B/A					4	
MR-J4-60GF/B/A					6.3	
MR-J4-70GF/B/A					6.3	
MR-J4-100GF/B/A					8	
MR-J4-200GF/B/A					18	
MR-J4-350GF/B/A					25	25
MR-J4-500GF/B/A					32	
MR-J4-60GF4/B4/A4	380 to 480			480Y/277	2.5	50
MR-J4-100GF4/B4/A4					4	
MR-J4-200GF4/B4/A4					8	
MR-J4-350GF4/B4/A4					13	
MR-J4-500GF4/B4/A4					18	
MR-J4-700GF4/B4/A4					25	25
MR-J4W2-22B	200 to 240			240	6.3	50
MR-J4W2-44B					8	
MR-J4W2-77B					13	
MR-J4W2-1010B					18	
MR-J4W3-222B					8	
MR-J4W3-444B					13	

Notes: 1. The value is applicable when the Type E Combination Motor Controller is combined with the servo amplifier.
2. 1-phase power input is not supported.

Selection Example in HIV Wires for Servo Motors GF GF-RJ B B-RJ B-RJ100 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. 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 model	Wire size [mm²]		
	For power and grounding (U, V, W, E)	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)	1.25 (AWG 16)	
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) (Note 6)		
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) (Note 6)		
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 (Note 6), 601, 701M (Note 6)	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 (Note 6), 6014, 701M4 (Note 6), 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)		

Rotary servo motor model	Wire size [mm²] (Note 3)	
	For power and grounding (U, V, W, E)	For cooling fan (BU, BV, E)
HG-JR110K24W0C HG-JR150K24W0C HG-JR180K24W0C HG-JR200K24W0C HG-JR220K24W0C	38 (AWG 2) (Note 8)	0.75 (AWG 18)

Notes: 1. Use a fluorine resin wire of 0.75 mm² (AWG 18) for wiring to the servo motor power supply.
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. The minimum wire size required by National Electrical Code is AWG14 (2 mm²). When not using a power cable provided by Mitsubishi Electric or Mitsubishi Electric System & Service Co., Ltd., use an RHH, RHW, RHW-2, XHH, XHHW, or XHHW-2 cable with thermosetting insulation. These insulation types are defined in the NEC.
4. Use a fluorine resin wire of 0.5 mm² (AWG 20) for wiring to servo motor electromagnetic brake.
5. The minimum wire size required by National Electrical Code is AWG14 (2 mm²).
6. The same wire size is applicable when the maximum torque is 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).
8. Use non-halogen, flame-retardant, flexible, cross-linked polyethylene insulated electric wires (EM-LMFC) for U, V, W.

Rotary servo motor model	Wire size [mm²]	
	For power and grounding (U, V, W, E)	B1, B2
HG-AK series	0.75 (AWG 18) (Note 1, 2)	0.75 (AWG 18) (Note 3, 4)

Notes: 1. Use a fluorine resin wire of 0.75 mm² (AWG 18) for wiring to the servo motor power supply.
2. This size is applicable for wiring length of 5 m or shorter. When an option cable longer than 5 m is used, the torque characteristics in the short-duration running range may be lower because of voltage drop.
3. Use a fluorine resin wire of 0.75 mm² (AWG 18) for wiring to servo motor electromagnetic brake.
4. This size is applicable for wiring length of 5 m or shorter. For over 5 m, extend the wire with HIV wire of 3.5 mm² (AWG 12).

Selection Example in HIV Wires for Servo Motors

GF GF-RJ 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 model Primary side		Wire size [mm²]	
		For power and grounding (U, V, W, E)	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 model	Wire size [mm²]
	For power and grounding (U, V, W, E)
TM-RG2M002C30, TM-RG2M004E30, TM-RG2M009G30, TM-RU2M002C30, TM-RU2M004E30, TM-RU2M009G30	0.75 (AWG 18) (Note 1, 4)
TM-RFM002C20, TM-RFM004C20, TM-RFM006C20, TM-RFM006E20, TM-RFM012E20, TM-RFM018E20, TM-RFM012G20	1.25 (AWG 16) (Note 1)
TM-RFM048G20, TM-RFM072G20	3.5 (AWG 12)
TM-RFM040J10	1.25 (AWG 16) (Note 1)
TM-RFM120J10	3.5 (AWG 12)
TM-RFM240J10	5.5 (AWG 10)

Notes: 1. The minimum wire size required by National Electrical Code is AWG14 (2 mm²).
2. Use a wire which has a heat resistance temperature of 105 °C for wiring to the servo motor power supply.
3. Use a wire which has a heat resistance temperature of 150 °C for wiring to the servo motor power supply.
4. The same wire size is applicable when the rated torque and the maximum torque are increased.

MEMO

Product List

Servo amplifiers

Item		Model	Rated output	Main circuit power supply
Servo amplifier MR-J4-GF	200 V class	MR-J4-10GF	0.1 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-20GF	0.2 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-40GF	0.4 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-60GF	0.6 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-70GF	0.75 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-100GF	1 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-200GF	2 kW	3-phase or 1-phase 200 V AC to 240 V AC
		MR-J4-350GF	3.5 kW	3-phase 200 V AC to 240 V AC
		MR-J4-500GF	5 kW	3-phase 200 V AC to 240 V AC
		MR-J4-700GF	7 kW	3-phase 200 V AC to 240 V AC
		MR-J4-11KGF	11 kW	3-phase 200 V AC to 240 V AC
		MR-J4-15KGF	15 kW	3-phase 200 V AC to 240 V AC
		MR-J4-22KGF	22 kW	3-phase 200 V AC to 240 V AC
	100 V class	MR-J4-10GF1	0.1 kW	1-phase 100 V AC to 120 V AC
		MR-J4-20GF1	0.2 kW	1-phase 100 V AC to 120 V AC
		MR-J4-40GF1	0.4 kW	1-phase 100 V AC to 120 V AC
	400 V class	MR-J4-60GF4	0.6 kW	3-phase 380 V AC to 480 V AC
		MR-J4-100GF4	1 kW	3-phase 380 V AC to 480 V AC
		MR-J4-200GF4	2 kW	3-phase 380 V AC to 480 V AC
		MR-J4-350GF4	3.5 kW	3-phase 380 V AC to 480 V AC
		MR-J4-500GF4	5 kW	3-phase 380 V AC to 480 V AC
		MR-J4-700GF4	7 kW	3-phase 380 V AC to 480 V AC
		MR-J4-11KGF4	11 kW	3-phase 380 V AC to 480 V AC
		MR-J4-15KGF4	15 kW	3-phase 380 V AC to 480 V AC
		MR-J4-22KGF4	22 kW	3-phase 380 V AC to 480 V AC
Servo amplifier MR-J4-GF-RJ	200 V class	MR-J4-10GF-RJ	0.1 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-20GF-RJ	0.2 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-40GF-RJ	0.4 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-60GF-RJ	0.6 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-70GF-RJ	0.75 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-100GF-RJ	1 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-200GF-RJ	2 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-350GF-RJ	3.5 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-500GF-RJ	5 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-700GF-RJ	7 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-11KGF-RJ	11 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-15KGF-RJ	15 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-22KGF-RJ	22 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
	100 V class	MR-J4-10GF1-RJ	0.1 kW	1-phase 100 V AC to 120 V AC
		MR-J4-20GF1-RJ	0.2 kW	1-phase 100 V AC to 120 V AC
		MR-J4-40GF1-RJ	0.4 kW	1-phase 100 V AC to 120 V AC

Servo amplifiers

Item		Model	Rated output	Main circuit power supply
Servo amplifier MR-J4-G-RJ	400 V class	MR-J4-60GF4-RJ	0.6 kW	3-phase 380 V AC to 480 V AC
		MR-J4-100GF4-RJ	1 kW	3-phase 380 V AC to 480 V AC
		MR-J4-200GF4-RJ	2 kW	3-phase 380 V AC to 480 V AC
		MR-J4-350GF4-RJ	3.5 kW	3-phase 380 V AC to 480 V AC
		MR-J4-500GF4-RJ	5 kW	3-phase 380 V AC to 480 V AC
		MR-J4-700GF4-RJ	7 kW	3-phase 380 V AC to 480 V AC
		MR-J4-11KGF4-RJ	11 kW	3-phase 380 V AC to 480 V AC
		MR-J4-15KGF4-RJ	15 kW	3-phase 380 V AC to 480 V AC
		MR-J4-22KGF4-RJ	22 kW	3-phase 380 V AC to 480 V AC
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 or 1-phase 200 V AC to 240 V AC
		MR-J4-200B	2 kW	3-phase or 1-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	200 V class	MR-J4-DU900B	9 kW	Main circuit power is supplied from the power regeneration converter unit to the drive unit.
		MR-J4-DU11KB	11 kW	
		MR-J4-DU15KB	15 kW	
		MR-J4-DU22KB	22 kW	
		MR-J4-DU30KB (Note 1)	30 kW	Main circuit power is supplied from the power regeneration converter unit or the resistance regeneration converter unit to the drive unit.
		MR-J4-DU37KB (Note 1)	37 kW	
	400 V class	MR-J4-DU900B4	9 kW	Main circuit power is supplied from the power regeneration converter unit to the drive unit.
		MR-J4-DU11KB4	11 kW	
		MR-J4-DU15KB4	15 kW	
		MR-J4-DU22KB4	22 kW	
		MR-J4-DU30KB4 (Note 1)	30 kW	Main circuit power is supplied from the power regeneration converter unit or the resistance regeneration converter unit to the drive unit.
		MR-J4-DU37KB4 (Note 1)	37 kW	
		MR-J4-DU45KB4 (Note 1)	45 kW	
		MR-J4-DU55KB4 (Note 1)	55 kW	

Notes:

1. When the drive unit is combined with a resistance regeneration converter unit, one unit of the resistance regeneration converter unit is required for each drive unit.

Product List

Servo amplifiers

Item		Model	Rated output	Main circuit power supply
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, 283 V DC to 340 V DC
		MR-J4-20B-RJ	0.2 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-40B-RJ	0.4 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-60B-RJ	0.6 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-70B-RJ	0.75 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-100B-RJ	1 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-200B-RJ	2 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-350B-RJ	3.5 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-500B-RJ	5 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-700B-RJ	7 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-11KB-RJ	11 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-15KB-RJ	15 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-22KB-RJ	22 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
	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
Drive unit MR-J4-DUB-RJ	200 V class	MR-J4-DU900B-RJ	9 kW	Main circuit power is supplied from the power regeneration converter unit to the drive unit.
		MR-J4-DU11KB-RJ	11 kW	
		MR-J4-DU15KB-RJ	15 kW	
		MR-J4-DU22KB-RJ	22 kW	
		MR-J4-DU30KB-RJ (Note 1)	30 kW	Main circuit power is supplied from the power regeneration converter unit or the resistance regeneration converter unit to the drive unit.
		MR-J4-DU37KB-RJ (Note 1)	37 kW	
	400 V class	MR-J4-DU900B4-RJ	9 kW	Main circuit power is supplied from the power regeneration converter unit to the drive unit.
		MR-J4-DU11KB4-RJ	11 kW	
		MR-J4-DU15KB4-RJ	15 kW	
		MR-J4-DU22KB4-RJ	22 kW	
		MR-J4-DU30KB4-RJ (Note 1)	30 kW	Main circuit power is supplied from the power regeneration converter unit or the resistance regeneration converter unit to the drive unit.
		MR-J4-DU37KB4-RJ (Note 1)	37 kW	
		MR-J4-DU45KB4-RJ (Note 1)	45 kW	
		MR-J4-DU55KB4-RJ (Note 1)	55 kW	
Drive unit MR-J4-DUB-RJ100	400 V class	MR-J4-DU45KB4-RJ100	45 kW	Main circuit power is supplied from the power regeneration converter unit to the drive unit.
		MR-J4-DU55KB4-RJ100	55 kW	

Notes:

1. When the drive unit is combined with a resistance regeneration converter unit, one unit of the resistance regeneration converter unit is required for each drive unit.

Servo amplifiers

Item		Model	Rated output	Main circuit power supply
Servo amplifier MR-J4W2-B	200 V class	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
	48 V DC/ 24 V DC	MR-J4W2-0303B6	30 W × 2 axes	48 V DC/24 V DC
Servo amplifier MR-J4W3-B	200 V class	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-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 or 1-phase 200 V AC to 240 V AC
		MR-J4-200A	2 kW	3-phase or 1-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
	48 V DC/ 24 V DC	MR-J4-03A6	30 W	48 V DC/24 V DC
Drive unit MR-J4-DUA (Note 1)	200 V class	MR-J4-DU30KA	30 kW	Main circuit power is supplied from the resistance regeneration 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	

Notes:

1. When the drive unit is combined with a resistance regeneration converter unit, one unit of the resistance regeneration converter unit is required for each drive unit.

Product List

Servo amplifiers

Item		Model	Rated output	Main circuit power supply
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, 283 V DC to 340 V DC
		MR-J4-20A-RJ	0.2 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-40A-RJ	0.4 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-60A-RJ	0.6 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-70A-RJ	0.75 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-100A-RJ	1 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-200A-RJ	2 kW	3-phase or 1-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-350A-RJ	3.5 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-500A-RJ	5 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-700A-RJ	7 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-11KA-RJ	11 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-15KA-RJ	15 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
		MR-J4-22KA-RJ	22 kW	3-phase 200 V AC to 240 V AC, 283 V DC to 340 V DC
	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
	48 V DC/ 24 V DC	MR-J4-03A6-RJ	30 W	48 V DC/24 V DC
Drive unit MR-J4-DUA-RJ (Note 1)	200 V class	MR-J4-DU30KA-RJ	30 kW	Main circuit power is supplied from the resistance regeneration 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	

Notes:

1. When the drive unit is combined with a resistance regeneration converter unit, one unit of the resistance regeneration converter unit is required for each drive unit.

Servo amplifiers

Item		Model	Rated output	Main circuit power supply
Power regeneration converter unit MR-CV	200 V class	MR-CV11K	11 kW	3-phase 200 V AC to 240 V AC
		MR-CV18K	18 kW	3-phase 200 V AC to 240 V AC
		MR-CV30K	30 kW	3-phase 200 V AC to 240 V AC
		MR-CV37K	37 kW	3-phase 200 V AC to 240 V AC
		MR-CV45K	45 kW	3-phase 200 V AC to 240 V AC
		MR-CV55K	55 kW	3-phase 200 V AC to 240 V AC
	400 V class	MR-CV11K4	11 kW	3-phase 380 V AC to 480 V AC
		MR-CV18K4	18 kW	3-phase 380 V AC to 480 V AC
		MR-CV30K4	30 kW	3-phase 380 V AC to 480 V AC
		MR-CV37K4	37 kW	3-phase 380 V AC to 480 V AC
		MR-CV45K4	45 kW	3-phase 380 V AC to 480 V AC
		MR-CV55K4	55 kW	3-phase 380 V AC to 480 V AC
		MR-CV75K4	75 kW	3-phase 380 V AC to 480 V AC
Resistance regeneration converter unit MR-CR (Note 1)	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. When the drive unit is combined with a resistance regeneration converter unit, one unit of the resistance regeneration converter unit is required for each drive unit.

Product List

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	-
Servo motors with functional safety HG-KR series B: With electromagnetic brake	HG-KR053(B)W0C	50 W	3000 r/min	-
	HG-KR13(B)W0C	100 W	3000 r/min	-
	HG-KR23(B)W0C	200 W	3000 r/min	-
	HG-KR43(B)W0C	400 W	3000 r/min	-
	HG-KR73(B)W0C	750 W	3000 r/min	-
HG-KR series With gear 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 gear 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

Rotary servo motors

Item		Model	Rated output	Rated speed	Reduction ratio
HG-KR series With shaft-output type gear 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
		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	-
Servo motors with functional safety HG-SR 1000 r/min series B: With electromagnetic brake		HG-SR51(B)W0C	0.5 kW	1000 r/min	-
		HG-SR81(B)W0C	0.85 kW	1000 r/min	-
		HG-SR121(B)W0C	1.2 kW	1000 r/min	-
		HG-SR201(B)W0C	2.0 kW	1000 r/min	-
		HG-SR301(B)W0C	3.0 kW	1000 r/min	-
		HG-SR421(B)W0C	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
Servo motors with functional safety HG-SR 2000 r/min series B: With electromagnetic brake	200 V class	HG-SR52(B)W0C	0.5 kW	2000 r/min	-
		HG-SR102(B)W0C	1.0 kW	2000 r/min	-
		HG-SR152(B)W0C	1.5 kW	2000 r/min	-
		HG-SR202(B)W0C	2.0 kW	2000 r/min	-
		HG-SR352(B)W0C	3.5 kW	2000 r/min	-
		HG-SR502(B)W0C	5.0 kW	2000 r/min	-
		HG-SR702(B)W0C	7.0 kW	2000 r/min	-
	400 V class	HG-SR524(B)W0C	0.5 kW	2000 r/min	-
		HG-SR1024(B)W0C	1.0 kW	2000 r/min	-
		HG-SR1524(B)W0C	1.5 kW	2000 r/min	-
		HG-SR2024(B)W0C	2.0 kW	2000 r/min	-
		HG-SR3524(B)W0C	3.5 kW	2000 r/min	-
		HG-SR5024(B)W0C	5.0 kW	2000 r/min	-
		HG-SR7024(B)W0C	7.0 kW	2000 r/min	-
HG-SR 2000 r/min series With gear 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

Rotary servo motors

Item		Model	Rated output	Rated speed	Reduction ratio
HG-SR 2000 r/min series With gear reducer for general industrial machines B: With electromagnetic brake G1: Flange mounting G1H: Foot mounting	200 V class	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
	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 gear 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
		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
	400 V class	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 gear 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
		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
	400 V class	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

Product List

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	-
Servo motors with functional safety HG-JR 1500 r/min series B: With electromagnetic brake	200 V class	HG-JR701M(B)W0C	7.0 kW	1500 r/min	-
		HG-JR11K1M(B)W0C	11 kW	1500 r/min	-
		HG-JR15K1M(B)W0C	15 kW	1500 r/min	-
		HG-JR22K1MW0C	22 kW	1500 r/min	-
	400 V class	HG-JR701M4(B)W0C	7.0 kW	1500 r/min	-
		HG-JR11K1M4(B)W0C	11 kW	1500 r/min	-
		HG-JR15K1M4(B)W0C	15 kW	1500 r/min	-
		HG-JR22K1M4W0C	22 kW	1500 r/min	-
Servo motors with functional safety HG-JR 2000 r/min series	400 V class	HG-JR110K24W0C	110 kW	2000 r/min	-
		HG-JR150K24W0C	150 kW	2000 r/min	-
		HG-JR180K24W0C	180 kW	2000 r/min	-
		HG-JR200K24W0C	200 kW	2000 r/min	-
		HG-JR220K24W0C	220 kW	2000 r/min	-

Rotary servo motors

Item		Model	Rated output	Rated speed	Reduction ratio
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	-
Servo motors with functional safety HG-JR 3000 r/min series B: With electromagnetic brake	200 V class	HG-JR53(B)W0C	0.5 kW	3000 r/min	-
		HG-JR73(B)W0C	0.75 kW	3000 r/min	-
		HG-JR103(B)W0C	1.0 kW	3000 r/min	-
		HG-JR153(B)W0C	1.5 kW	3000 r/min	-
		HG-JR203(B)W0C	2.0 kW	3000 r/min	-
		HG-JR353(B)W0C	3.3 kW (3.5 kW)	3000 r/min	-
		HG-JR503(B)W0C	5.0 kW	3000 r/min	-
		HG-JR703(B)W0C	7.0 kW	3000 r/min	-
		HG-JR903(B)W0C	9.0 kW	3000 r/min	-
	400 V class	HG-JR534(B)W0C	0.5 kW	3000 r/min	-
		HG-JR734(B)W0C	0.75 kW	3000 r/min	-
		HG-JR1034(B)W0C	1.0 kW	3000 r/min	-
		HG-JR1534(B)W0C	1.5 kW	3000 r/min	-
		HG-JR2034(B)W0C	2.0 kW	3000 r/min	-
		HG-JR3534(B)W0C	3.3 kW (3.5 kW)	3000 r/min	-
		HG-JR5034(B)W0C	5.0 kW	3000 r/min	-
		HG-JR7034(B)W0C	7.0 kW	3000 r/min	-
		HG-JR9034(B)W0C	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	-
HG-AK series B: With electromagnetic brake		HG-AK0136(B)	10 W	3000 r/min	-
		HG-AK0236(B)	20 W	3000 r/min	-
		HG-AK0336(B)	30 W	3000 r/min	-
HG-AK series B: With electromagnetic brake With a vertical encoder cable lead		HG-AK0136(B)-S100	10 W	3000 r/min	-
		HG-AK0236(B)-S100	20 W	3000 r/min	-
		HG-AK0336(B)-S100	30 W	3000 r/min	-

Product List

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-H3P7D-96P-ASS0	960 N	2400 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-U2SB0-240-1SS1	-	-	-	240 mm
	LM-U2SB0-300-1SS1	-	-	-	300 mm
	LM-U2SB0-420-1SS1	-	-	-	420 mm
	LM-U2S20-300-2SS1	-	-	-	300 mm
	LM-U2S20-480-2SS1	-	-	-	480 mm

Direct drive motors

Item	Model	Rated torque	Maximum torque	Rated speed
TM-RG2M series	TM-RG2M002C30	2.2 N•m	8.8 N•m	300 r/min
	TM-RG2M004E30	4.5 N•m	13.5 N•m	300 r/min
	TM-RG2M009G30	9 N•m	27 N•m	300 r/min
TM-RU2M series	TM-RU2M002C30	2.2 N•m	8.8 N•m	300 r/min
	TM-RU2M004E30	4.5 N•m	13.5 N•m	300 r/min
	TM-RU2M009G30	9 N•m	27 N•m	300 r/min
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

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)
	MR-J3ENCBL10M-A1-L	10 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)
	MR-J3ENCBL10M-A2-L	10 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
Encoder cable (load-side lead)	MR-J3JCBL03M-A1-L	0.3 m	Standard	IP20	For HG-KR/HG-MR (junction type) (Note 1)
Encoder cable (opposite to load-side lead)	MR-J3JCBL03M-A2-L	0.3 m	Standard	IP20	For HG-KR/HG-MR (junction type) (Note 1)
Encoder cable	MR-EKCBL20M-H	20 m	Long bending life	IP20	For HG-KR/HG-MR (junction type) (Note 2)
	MR-EKCBL30M-H	30 m	Long bending life	IP20	For HG-KR/HG-MR (junction type) (Note 2)
	MR-EKCBL40M-H	40 m	Long bending life	IP20	For HG-KR/HG-MR (junction type) (Note 2)
	MR-EKCBL50M-H	50 m	Long bending life	IP20	For HG-KR/HG-MR (junction type) (Note 2)
	MR-EKCBL20M-L	20 m	Standard	IP20	For HG-KR/HG-MR (junction type) (Note 2)
	MR-EKCBL30M-L	30 m	Standard	IP20	For HG-KR/HG-MR (junction type) (Note 2)
	MR-EKCBL2M-H	2 m	Long bending life	IP20	For connecting load-side encoder or linear encoder
	MR-EKCBL5M-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	
	MR-J3W03ENCBL1M-A-H	1 m	Long bending life	-	For HG-AK
	MR-J3W03ENCBL2M-A-H	2 m	Long bending life	-	
	MR-J3W03ENCBL5M-A-H	5 m	Long bending life	-	
	MR-J3W03ENCBL10M-A-H	10 m	Long bending life	-	
	MR-J3W03ENCBL20M-A-H	20 m	Long bending life	-	
	MR-J3W03ENCBL30M-A-H	30 m	Long bending life	-	

Notes:

1. Use this in combination with MR-EKCBL_M-H (20 m to 50 m), MR-EKCBL_M-L (20 m or 30 m), or MR-ECNM.
2. Use this in combination with MR-J3JCBL03M-A1-L or MR-J3JCBL03M-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 cables

Item	Model	Length	Bending life	IP rating	Application
Encoder cables	MR-ENE4CBL5M-H-MTH	5 m	Long bending life	IP67	For HG-JR110K24W0C, 150K24W0C, 180K24W0C, 200K24W0C, 220K24W0C
	MR-ENE4CBL10M-H-MTH	10 m	Long bending life	IP67	
	MR-ENE4CBL20M-H-MTH	20 m	Long bending life	IP67	
	MR-ENE4CBL30M-H-MTH	30 m	Long bending life	IP67	
	MR-ENE4CBL40M-H-MTH	40 m	Long bending life	IP67	
	MR-ENE4CBL50M-H-MTH	50 m	Long bending life	IP67	
Encoder cables between drive units	MR-J4CN2CBL1M-H	1 m	Long bending life	-	For MR-J4-DU45KB4-RJ100/ MR-J4-DU55KB4-RJ100
	MR-J4CN2CBL2M-H	2 m	Long bending life	-	
	MR-J4CN2CBL3M-H	3 m	Long bending life	-	
	MR-J4CN2CBL5M-H	5 m	Long bending life	-	

Junction cables

Item	Model	Length	Bending life	IP rating	Application
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

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, 110K24W0C, 150K24W0C, 180K24W0C, 200K24W0C, 220K24W0C
	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-RG2M/TM-RU2M/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-RG2M/TM-RU2M/TM-RFM (connecting direct drive motor and absolute position storage unit)
	MR-J3W03CN2-2P	Encoder connector × 2, Servo amplifier connector × 2	-	For HG-AK
	MR-J3W03CN2-20P	Encoder connector × 20, Servo amplifier connector × 20	-	For HG-AK
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-J3JCBL03M-A1-L or MR-J3JCBL03M-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.

Product List

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)
	MR-PWS1CBL10M-A1-L	10 m	Standard	IP65	For HG-KR/HG-MR (direct connection type)
Servo motor power cable (opposite to load-side lead, lead-out)	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)
	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 cable (For HG-AK series standard servo motors)	MR-J4W03PWCBL1M-H	1 m	Long bending life	-	For HG-AK
	MR-J4W03PWCBL2M-H	2 m	Long bending life	-	For HG-AK
	MR-J4W03PWCBL5M-H	5 m	Long bending life	-	For HG-AK
	MR-J4W03PWCBL10M-H	10 m	Long bending life	-	For HG-AK
	MR-J4W03PWCBL20M-H	20 m	Long bending life	-	For HG-AK
	MR-J4W03PWCBL30M-H	30 m	Long bending life	-	For HG-AK
Servo motor power cable (For HG-AK series servo motor with electromagnetic brake)	MR-J4W03PWBRCBL1M-H	1 m	Long bending life	-	For HG-AK
	MR-J4W03PWBRCBL2M-H	2 m	Long bending life	-	For HG-AK
	MR-J4W03PWBRCBL5M-H	5 m	Long bending life	-	For HG-AK
	MR-J4W03PWBRCBL10M-H	10 m	Long bending life	-	For HG-AK
	MR-J4W03PWBRCBL20M-H	20 m	Long bending life	-	For HG-AK
	MR-J4W03PWBRCBL30M-H	30 m	Long bending life	-	For HG-AK

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-RG2M/TM-RU2M/ 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
	MR-J4W03CNP2-2P	Power connector × 2	-	For HG-AK
	MR-J4W03CNP2-20P	Power connector × 20	-	For HG-AK

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/ DUB4-RJ100, and MR-J4W_-B_
	MR-J3BUS03M	0.3 m	Standard	-	For MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, and MR-J4W_-B_
	MR-J3BUS05M	0.5 m	Standard	-	For MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, and MR-J4W_-B_
	MR-J3BUS1M	1 m	Standard	-	For MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, and MR-J4W_-B_
	MR-J3BUS3M	3 m	Standard	-	For MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, 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/ DUB4-RJ100, and MR-J4W_-B_
	MR-J3BUS10M-A	10 m	Standard	-	For MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, and MR-J4W_-B_
	MR-J3BUS20M-A	20 m	Standard	-	For MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, 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/ DUB4-RJ100, and MR-J4W_-B_
	MR-J3BUS40M-B	40 m	Long bending life	-	For MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, and MR-J4W_-B_
	MR-J3BUS50M-B	50 m	Long bending life	-	For MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, 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/ DUB4-RJ100, and MR-J4W_-B_

Bus bar/Adjustment bar

Item	Model	Length	Application
Bus bar	MR-DCBAR137-B52	-	For connecting between power regeneration converter unit and drive unit, and between drive units
	MR-DCBAR159-B52	-	For connecting between power regeneration converter unit and drive unit
	MR-DCBAR170-B52	-	For connecting between drive units
	MR-DCBAR235-B52	-	For connecting between power regeneration converter unit and drive unit, and between drive units
	MR-DCBAR255-B52	-	For connecting between power regeneration converter unit and drive unit
	MR-DCBAR310-B52	-	For connecting between drive units
	MR-DCBAR409-B52	-	For connecting between drive units
	MR-DCBAR159-B53	-	For connecting between power regeneration converter unit and drive unit, and between drive units
	MR-DCBAR257-B53	-	For connecting between power regeneration converter unit and drive unit, and between drive units
	MR-DCBAR082-C02	-	For connecting between drive units
	MR-DCBAR105-C03	-	For connecting between drive units
Adjustment bar (Note 1)	MR-DCBAR035-B05	-	-

Notes:

1. The adjustment bar is required when the total number of MR-J4-DU900B(4)(-RJ) and MR-J4-DU11KB(4)(-RJ) drive units connected to the power regeneration converter unit is even.

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, MR-J4-03A6/ 03A6-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-J4-03A6/ 03A6-RJ, MR-J4-DUA_/ DUA_-RJ, MR-D01, and MR-TB50
	MR-J2M-CN1TBL1M	1 m	For connecting MR-J4-A_/ A_-RJ, MR-J4-03A6/ 03A6-RJ, MR-J4-DUA_/ DUA_-RJ, MR-D01, and MR-TB50
Junction terminal block cable (for PS7DW-20V14B-F)	MR-J2HBUS05M	0.5 m	For connecting MR-J4-GF_/ MR-J4-GF_-RJ, MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, MR-D01, PS7DW-20V14B-F (Toho Technology Corp.)
	MR-J2HBUS1M	1 m	For connecting MR-J4-GF_/ MR-J4-GF_-RJ, MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, MR-D01, PS7DW-20V14B-F (Toho Technology Corp.)
	MR-J2HBUS5M	5 m	For connecting MR-J4-GF_/ MR-J4-GF_-RJ, MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, MR-D01, PS7DW-20V14B-F (Toho Technology Corp.)

Batteries/Battery case/Battery cables

Item	Model	Length	Application
Battery	MR-BAT6V1SET	-	For MR-J4-B_/ B_-RJ, MR-J4-A_/ A_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, and MR-J4-DUA_/ DUA_-RJ
	MR-BAT6V1SET-A	-	For MR-J4-GF_/ GF_-RJ, MR-J4W2-0303B6, and MR-J4-03A6/ 03A6-RJ
	MR-BAT6V1	-	For MR-BAT6V1SET, MR-BAT6V1SET-A, and MR-BT6VCASE
Battery for junction battery cable	MR-BAT6V1BJ	-	For MR-BT6VCBL03M
Junction battery cable	MR-BT6VCBL03M	0.3 m	For MR-J4-GF_/ GF_-RJ, MR-J4-B_/ B_-RJ, MR-J4-A_/ A_-RJ, MR-J4-DUB_/ DUB_-RJ/ DUB4-RJ100, and MR-J4-DUA_/ DUA_-RJ
Battery case	MR-BT6VCASE	-	For MR-J4-GF_/ GF_-RJ, MR-J4-B_/ B_-RJ, 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	Permissible regenerative power	Resistance value	Application
Regenerative option (200 V/100 V)	MR-RB032	30 W	40 Ω	For MR-J4-10GF/ GF-RJ to 100GF/ GF-RJ, MR-J4-10B(1)/ B(1)-RJ to 100B/ B-RJ, and MR-J4-10A(1)/ A(1)-RJ to 100A/ A-RJ
	MR-RB12	100 W	40 Ω	For MR-J4-20GF/ GF-RJ to 100GF/ GF-RJ, MR-J4-20B(1)/ B(1)-RJ to 100B/ B-RJ, and MR-J4-20A(1)/ A(1)-RJ to 100A/ A-RJ
	MR-RB30	300 W	13 Ω	For MR-J4-200GF/ GF-RJ, MR-J4-200B/ B-RJ, and MR-J4-200A/ A-RJ
	MR-RB3N	300 W	9 Ω	For MR-J4-350GF/ GF-RJ, MR-J4-350B/ B-RJ, MR-J4-350A/ A-RJ, and MR-J4W2-77B, 1010B
	MR-RB31	300 W	6.7 Ω	For MR-J4-500GF/ GF-RJ, 700GF/ GF-RJ, MR-J4-500B/ B-RJ, 700B/ B-RJ, and MR-J4-500A/ A-RJ, 700A/ A-RJ
	MR-RB32	300 W	40 Ω	For MR-J4-70GF/ GF-RJ, 100GF/ GF-RJ, MR-J4-70B/ B-RJ, 100B/ B-RJ, and MR-J4-70A/ A-RJ, 100A/ A-RJ
	MR-RB50	500 W	13 Ω	For MR-J4-200GF/ GF-RJ, MR-J4-200B/ B-RJ, and MR-J4-200A/ A-RJ
	MR-RB5N	500 W	9 Ω	For MR-J4-350GF/ GF-RJ, MR-J4-350B/ B-RJ, and MR-J4-350A/ A-RJ
	MR-RB51	500 W	6.7 Ω	For MR-J4-500GF/ GF-RJ, 700GF/ GF-RJ, MR-J4-500B/ B-RJ, 700B/ B-RJ, and MR-J4-500A/ A-RJ, 700A/ A-RJ
	MR-RB5R	500 (800) W	3.2 Ω	For MR-J4-11KGF/ GF-RJ, MR-J4-11KB/ B-RJ, and MR-J4-11KA/ A-RJ
	MR-RB9F	850 (1300) W	3 Ω	For MR-J4-15KGF/ GF-RJ, MR-J4-15KB/ B-RJ, and MR-J4-15KA/ A-RJ
	MR-RB9T	850 (1300) W	2.5 Ω	For MR-J4-22KGF/ GF-RJ, MR-J4-22KB/ B-RJ, 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 resistance regeneration converter unit.

Regenerative options

Item	Model	Permissible regenerative power	Resistance value	Application
Regenerative option (400 V)	MR-RB1H-4	100 W	82 Ω	For MR-J4-60GF4/ GF4-RJ, 100GF4/ GF4-RJ, MR-J4-60B4/ B4-RJ, 100B4/ B4-RJ, and MR-J4-60A4/ A4-RJ, 100A4/ A4-RJ
	MR-RB3M-4	300 W	120 Ω	For MR-J4-60GF4/ GF4-RJ, 100GF4/ GF4-RJ, MR-J4-60B4/ B4-RJ, 100B4/ B4-RJ, and MR-J4-60A4/ A4-RJ, 100A4/ A4-RJ
	MR-RB3G-4	300 W	47 Ω	For MR-J4-200GF4/ GF4-RJ, 350GF4/ GF4-RJ, MR-J4-200B4/ B4-RJ, 350B4/ B4-RJ, and MR-J4-200A4/ A4-RJ, 350A4/ A4-RJ
	MR-RB34-4	300 W	26 Ω	For MR-J4-500GF4/ GF4-RJ, MR-J4-500B4/ B4-RJ, and MR-J4-500A4/ A4-RJ
	MR-RB3U-4	300 W	22 Ω	For MR-J4-700GF4/ GF4-RJ, MR-J4-700B4/ B4-RJ, and MR-J4-700A4/ A4-RJ
	MR-RB5G-4	500 W	47 Ω	For MR-J4-200GF4/ GF4-RJ, 350GF4/ GF4-RJ, MR-J4-200B4/ B4-RJ, 350B4/ B4-RJ, and MR-J4-200A4/ A4-RJ, 350A4/ A4-RJ
	MR-RB54-4	500 W	26 Ω	For MR-J4-500GF4/ GF4-RJ, MR-J4-500B4/ B4-RJ, and MR-J4-500A4/ A4-RJ
	MR-RB5U-4	500 W	22 Ω	For MR-J4-700GF4/ GF4-RJ, MR-J4-700B4/ B4-RJ, and MR-J4-700A4/ A4-RJ
	MR-RB5K-4	500 (800) W	10 Ω	For MR-J4-11KGF4/ GF4-RJ, MR-J4-11KB4/ B4-RJ, and MR-J4-11KA4/ A4-RJ
	MR-RB6K-4	850 (1300) W	10 Ω	For MR-J4-15KGF4/ GF4-RJ, 22KGF4/ GF4-RJ, MR-J4-15KB4/ B4-RJ, 22KB4/ B4-RJ, 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:

1. Please purchase three units of MR-RB13V-4 for each resistance regeneration converter unit.

Peripheral units

Item	Model	Application
Functional safety unit	MR-D30	For MR-J4-GF_-RJ, MR-J4-B_-RJ, MR-J4-A_-RJ, and MR-DUB_-RJ/ DUB4-RJ100
Safety logic unit	MR-J3-D05	For MR-J4-GF_/ GF_-RJ, MR-J4-B_/ B_-RJ, MR-J4-A_/ A_-RJ, MR-J4-DUB_/ DUB_-RJ, MR-J4-DUA_/ DUA_-RJ, and MR-J4W_-B
Extension IO unit	MR-D01	For MR-J4-A_-RJ
Absolute position storage unit	MR-BTAS01	For MR-J4-GF_/ GF_-RJ, 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)	DBU-7K-R6	For MR-J4-DU900B/ B-RJ
	DBU-11K	For MR-J4-11KGF/ GF-RJ, MR-J4-11KB/ B-RJ, MR-J4-11KA/ A-RJ, MR-J4-DU900B/ B-RJ, DU11KB/ B-RJ
	DBU-15K	For MR-J4-15KGF/ GF-RJ, MR-J4-15KB/ B-RJ, MR-J4-15KA/ A-RJ, MR-J4-DU15KB/ B-RJ
	DBU-22K-R1	For MR-J4-22KGF/ GF-RJ, MR-J4-22KB/ B-RJ, MR-J4-22KA/ A-RJ, MR-J4-DU22KB/ B-RJ
	DBU-37K-R1	For MR-J4-DU30B/ B-RJ, DU37B/ B-RJ, MR-J4-DU30A/ A-RJ, DU37A/ A-RJ
Dynamic brake (400 V)	DBU-7K-4-2R0	For MR-J4-DU900B4/ B4-RJ
	DBU-11K-4	For MR-J4-11KGF4/ GF4-RJ, MR-J4-11KB4/ B4-RJ, MR-J4-11KA4/ A4-RJ, MR-J4-DU900B4/ B4-RJ, DU11KB4/ B4-RJ
	DBU-22K-4	For MR-J4-15KGF4/ GF4-RJ, 22KGF4/ GF4-RJ, MR-J4-15KB4/ B4-RJ, 22KB4/ B4-RJ, MR-J4-15KA4/ A4-RJ, 22KA4/ A4-RJ, MR-J4-DU15KB4/ B4-RJ, DU22KB4/ B4-RJ
	DBU-55K-4-R5	For MR-J4-DU30KB4/ B4-RJ, DU37KB4/ B4-RJ, DU45KB4/ B4-RJ, DU55KB4/ B4-RJ, MR-J4-DU30KA4/ A4-RJ, DU37KA4/ A4-RJ, DU45KA4/ A4-RJ, DU55KA4/ A4-RJ
	DBU-P55K-4-B	MR-J4-DU45KB4-RJ100/ MR-J4-DU55KB4-RJ100
AC reactor	MR-AL-11K	For MR-CV11K
	MR-AL-18K	For MR-CV18K
	MR-AL-30K	For MR-CV30K
	MR-AL-37K	For MR-CV37K
	MR-AL-45K	For MR-CV45K
	MR-AL-55K	For MR-CV55K
	MR-AL-11K4	For MR-CV11K4
	MR-AL-18K4	For MR-CV18K4
	MR-AL-30K4	For MR-CV30K4
	MR-AL-37K4	For MR-CV37K4
	MR-AL-45K4	For MR-CV45K4
	MR-AL-55K4	For MR-CV55K4
	MR-AL-75K4	For MR-CV75K4
	MR-AL-55K4-L	For MR-CV55K4 + MR-J4-DU_B4-RJ100
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)
Panel through attachment	MR-J4ACN15K	For MR-J4-11KGF(4)/ GF(4)-RJ, 15KGF(4)/ GF(4)-RJ, MR-J4-11KB(4)/ B(4)-RJ, 15KB(4)/ B(4)-RJ, MR-J4-11KA(4)/ A(4)-RJ, 15KA(4)/ A(4)-RJ
	MR-J3ACN	For MR-J4-22KGF(4)/ GF(4)-RJ, MR-J4-22KB(4)/ B(4)-RJ, 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-GF_/ GF_-RJ, MR-J4-B_/ B_-RJ, 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-GF_/ GF_-RJ, MR-J4-B_/ B_-RJ, MR-J4-A_/ A_-RJ, MR-J4-DUB_/ DUB_-RJ, MR-J4-DUA_/ DUA_-RJ, and MR-J4W_-B_
Protection coordination cable	MR-CUL06M	0.6 m	For connecting power regeneration converter unit or resistance regeneration converter unit and drive unit
	MR-J3CDL05M	0.5 m	For connecting resistance regeneration converter unit and drive unit
Connector set	MR-J3CN1	-	For I/O signals of MR-J4-A_/ A_-RJ, MR-J4-03A6/ 03A6-RJ, MR-J4-DUA_/ DUA_-RJ, and MR-D01
	MR-CCN1	-	For I/O signals of MR-J4-GF_/ GF_-RJ, MR-J4-B_/ B_-RJ, MR-J4-DUB_/ DUB_-RJ, and MR-D01
	MR-J2CMP2	-	For MR-J4W_-B_ (Qty: 1 pc)
	MR-ECN1	-	For MR-J4W_-B_ (Qty: 20 pcs)
	MR-J2CN1-A	-	For connecting power regeneration converter unit or resistance regeneration converter unit and drive unit
	MR-CVCN24S	-	For power regeneration converter unit

Servo support software

Item	Model	Application
MELSOFT MR Configurator2 (Note 1)	SW1DNC-MRC2-E	Servo setup software for AC servo

Notes:

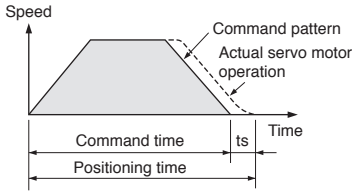
1. MR Configurator2 is included in MT Works2 with software version 1.34L or later, or GX works3.
   If you have MT Works2 with software version earlier than 1.34L or MELSOFT iQ Works, GX Works3, GX Works2, EM Software Development Kit, CW Configurator, MR Configurator2 is available for free download.

For your safety

- To use the products given in this catalog properly, be sure to read the "Instruction Manual" and the appended document prior to use.

Precautions 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 an anti-drop mechanism using springs and counter balances 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 operation patterns by considering the settling time (ts) to complete positioning.
- 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.
- 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.
- 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.
- To prevent a malfunction or a failure, do not use the servo system products under a strong electric field, magnetic field, or radiation environment.

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 for grounding the servo motor.
- 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 based on the cable bending life and wire type.

5. Initial settings

- For MR-J4-A(-RJ), select a control mode from position, speed or torque with [Pr. PA01]. Position control mode is set as default. Change the parameter setting value when using the other control modes. For MR-J4-GF(-RJ), 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.
- 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.
- When an error occurs, ensure safety by turning the power off, etc., before dealing with the error. Otherwise, it may cause an accident.
- If the protective functions of the servo amplifier activate, turn the power off immediately. Remove the cause before turning the power on again.
- 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. Make 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.
- In a maintenance inspection, make sure that the emergency stop circuit operates properly such that an operation can be stopped immediately and a power can be shut off by the emergency stop switch.

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.

Precautions for Ethernet cables

- Do not apply excessive tension on the Ethernet cable when cabling.
- Refer to relevant Ethernet cable manual to keep the bending radius within the range of specifications.
- Avoid laying the Ethernet cables and the power cables side by side or do not bundle them together. Separate the Ethernet cables from the power cables.

Precautions 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-A/-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.

Precautions 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.
- The temperature rise of the rotary servo motors and the direct drive motors varies depending on the installation environment and the operation conditions. Conduct a test run on the servo motors before an actual operation to make sure that no alarm occurs.

Precautions 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.

Precautions 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.
- Place a caution sign 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.
- Increase in the temperature of the linear servo motor causes a thrust drop. 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.
- Do not leave the product unattended.

For safety enhancement

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]

For terms of warranty, please contact your original place of purchase.

[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 loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:

(1) Damages caused by any cause found not to be the responsibility of Mitsubishi.

(2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.

(3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.

(4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

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.

MEMO

Extensive global support coverage providing expert help whenever needed

■ Global FA centers

EMEA

Europe FA Center
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Germany FA Center
MITSUBISHI ELECTRIC EUROPE B.V. German Branch
Tel: +49-2102-486-0

UK FA Center
MITSUBISHI ELECTRIC EUROPE B.V. UK Branch
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Czech Republic FA Center
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ASEAN

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MITSUBISHI ELECTRIC ASIA PTE. LTD.
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PT. MITSUBISHI ELECTRIC INDONESIA
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Ho Chi Minh FA Center
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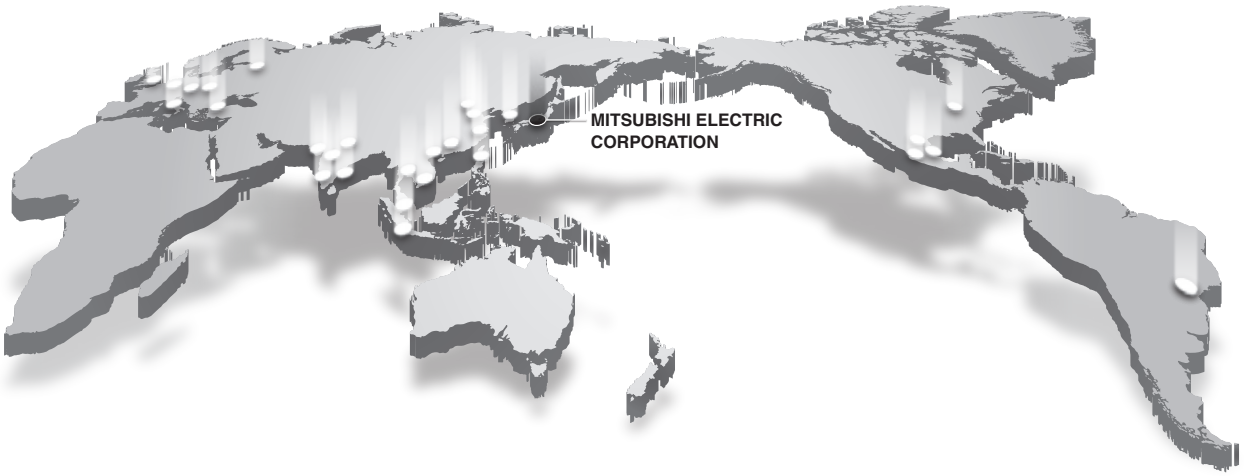

List of Instruction Manuals

Instruction Manuals for MELSERVO-J4 series are listed below:

Servo Amplifier

Manual name	Manual No.
MR-J4-_A_(-RJ) MR-J4-03A6(-RJ) Servo Amplifier Instruction Manual	SH-030107ENG
MR-J4-_A_-RJ MR-J4-03A6-RJ Servo Amplifier Instruction Manual (Positioning Mode)	SH-030143ENG
MR-J4-_A_-RJ Servo Amplifier Instruction Manual (Modbus-RTU Protocol)	SH-030175ENG
MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual	SH-030106ENG
MR-J4W2-_B MR-J4W3-_B MR-J4W2-0303B6 Servo Amplifier Instruction Manual	SH-030105ENG
MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (Motion Mode)	SH-030218ENG
MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (I/O Mode)	SH-030221ENG
MR-J4-_GF_(-RJ) Servo Amplifier Instruction Manual (CC-Link IE Field Network Basic)	SH-030273ENG
MELSERVO-J4 Servo Amplifier Instruction Manual (Troubleshooting)	SH-030109ENG
MR-CV_ MR-CR55K_ MR-J4-DU_B_(-RJ) MR-J4-DU_A_(-RJ) Instruction Manual	SH-030153ENG
MR-J4-DU_B4-RJ100 Drive Unit Instruction Manual	SH-030280ENG

Servo Motor

Manual name	Manual No.
HG-MR HG-KR HG-SR HG-JR HG-RR HG-UR HG-AK Servo Motor Instruction Manual (Vol. 3)	SH-030113ENG
LM-H3 LM-U2 LM-F LM-K2 Linear Servo Motor Instruction Manual	SH-030110ENG
TM-RFM TM-RG2M TM-RU2M Direct Drive Motor Instruction Manual	SH-030112ENG

Option

Manual name	Manual No.
Functional safety unit MR-D30 Instruction Manual	SH-030132ENG
Parameter Unit MR-PRU03 Instruction Manual (MR-J4)	SH-030186

Others

Manual name	Manual No.
EMC Installation Guidelines	IB-67310
Linear Encoder Instruction Manual	SH-030111ENG

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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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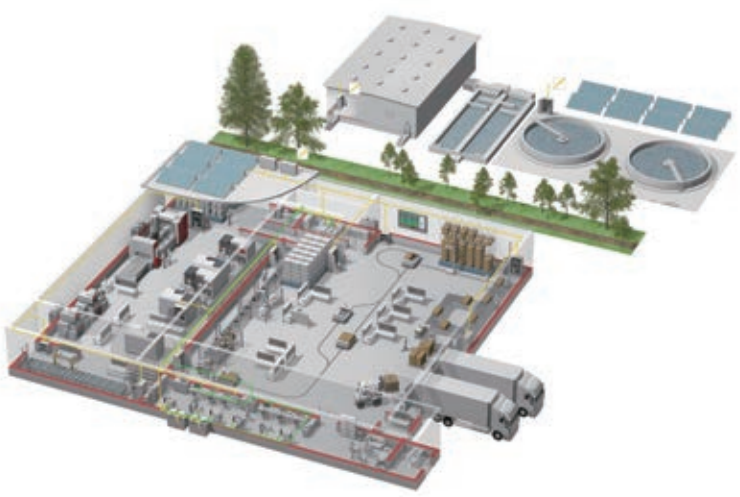

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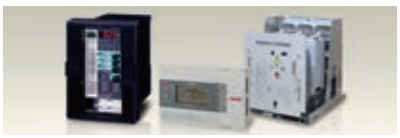

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Numerical Control (NC)

Industrial / Collaborative Robots

Processing machines: EDM, Lasers, IDS

Transformers, Air conditioning, Photovoltaic systems

* Not all products are available in all countries.

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