MITSUBISHI ELECTRIC
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Transition from MELSERVO-J3/J3W Series to J4 Series Handbook

MELSERVO-J3

Existing manufacturing assets are completely utilizable.

MELSERVO-J3/J3W to MELSERVO-J4

MITSUBISHI SERVO AMPLIFIERS & MOTORS

MELSERVO J4

● SAFETY INSTRUCTIONS ●

Please read the instructions carefully before using the equipment.

To ensure correct usage of the equipment, make sure to read through this Replacement Manual, the Instruction Manual, the Installation Guide, and the Appended Documents carefully before attempting to install, operate, maintain, or inspect the equipment. Do not use the equipment until you have a full knowledge of the equipment, safety information and instructions.
In this Replacement Manual, the safety instruction levels are classified under "WARNING" and "CAUTION".

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight injury to personnel or may cause physical damage.

Note that the ⚠ CAUTION level may lead to a serious consequence according to conditions.
Please follow the instructions of both levels because they are important to personnel safety.
What must not be done and what must be done are indicated by the following diagrammatic symbols.

⃠	Indicates prohibition (what must not be done). For example, "No Fire" is indicated by ⃠.
●	Indicates obligation (what must be done). For example, grounding is indicated by ⏚.

In this Replacement Manual, instructions of a lower level than the above, such as those that do not cause physical damage or instructions for other functions, are classified under "POINT".
After reading this Instruction Manual, keep it accessible to the operator.

1. To prevent electric shock, note the following

⚠ WARNING

- Before wiring or inspection, turn off the power and wait for 15 minutes or more until the charge lamp turns off. Then, confirm that the voltage between P+ and N- is safe with a voltage tester and others. Otherwise, an electric shock may occur. In addition, when confirming whether the charge lamp is off or not, always confirm it from the front of the servo amplifier.
- Ground the servo amplifier and servo motor securely.
- Any person who is involved in wiring and inspection should be fully competent to do the work.
- Do not attempt to wire the servo amplifier and servo motor until they have been installed. Doing so may cause an electric shock.
- Do not operate switches with wet hands. Otherwise, it may cause an electric shock.
- The cables should not be damaged, stressed, loaded, or pinched. Otherwise, it may cause an electric shock.
- During power-on or operation, do not open the front cover of the servo amplifier. Otherwise, it may cause an electric shock.
- Do not operate the servo amplifier with the front cover removed. High-voltage terminals and charging area are exposed and you may get an electric shock.
- Except for wiring and periodic inspection, do not remove the front cover of the servo amplifier even if the power is off. The servo amplifier is charged and you may get an electric shock.
- To prevent electric shock, always connect the protective earth (PE) terminal (⏚ marked) of the servo amplifier to the protective earth (PE) of the cabinet.
- To avoid an electric shock, insulate the connections of the power supply terminals.

2. To prevent fire, note the following

⚠ CAUTION

- Install the servo amplifier, servo motor, and regenerative resistor on incombustible material. Installing them directly or close to combustibles will lead to a fire.
- Always connect a magnetic contactor between the main circuit power supply and the converter unit and L1/L2/L3 of the servo amplifier in order to configure a power supply shut-off on the side of the servo amplifier's power supply. If a magnetic contactor is not connected, continuous flow of a large current may cause smoke and fire when the converter unit or the servo amplifier (drive unit) malfunctions.
- When using the regenerative resistor, switch power off with the alarm signal. Not doing so may cause smoke and fire when a regenerative transistor malfunctions or the like may overheat the regenerative resistor.
- Provide adequate protection to prevent screws and other conductive matter, oil and other combustible matter from entering the servo amplifier and servo motor.
- Always connect one no-fuse breaker or one fuse for each servo amplifier between the power supply and the main circuit power supply (L1/L2/L3) of the servo amplifier (including the converter unit) in order to configure a power supply shut-off on the side of the servo amplifier's power supply. If a no-fuse breaker or fuse is not connected, continuous flow of a large current may cause smoke and fire when the servo amplifier malfunctions.

3. Injury prevention

⚠ CAUTION

- ●Only the voltage specified in the Instruction Manual should be applied to each terminal. Otherwise, a burst, damage, etc. may occur.
- ●The cables must be connected to the correct terminals. Otherwise, a burst, damage, etc. may occur.
- ●Ensure that the polarity (+/-) is correct. Otherwise, a burst, damage, etc. may occur.
- ●The servo amplifier heat sink, regenerative resistor, servo motor, etc. may be hot while power is on or for some time after power-off. Take safety measures, e.g. provide covers, to avoid accidentally touching the parts (cables, etc.) by hand.

4. Additional instructions

The following instructions should also be fully noted. Incorrect handling may cause a malfunction, injury, electric shock, fire, etc.

(1) Transportation/installation

⚠ CAUTION

- ●Transport the products correctly according to their mass.
- ●Stacking in excess of the specified number of product packages is not allowed.
- ●Do not hold the front cover, cable and connector when transporting the servo amplifier. Otherwise, it may drop.
- ●Install the servo amplifier and the servo motor in a load-bearing place in accordance with the Instruction Manual.
- ●Do not get on or put heavy load on the equipment.
- ●The equipment must be installed in the specified direction.
- ●Secure the prescribed distance between the servo amplifier and the inner surface of the cabinet or other devices.
- ●Do not install or operate the servo amplifier and servo motor which have been damaged or have anyparts missing.
- ●Do not block the intake and exhaust areas of the servo amplifier. Otherwise, it may cause a malfunction.
- ●Do not drop or strike the servo amplifier and servo motor. Isolate them from all impact loads.
- ●Do not drop or apply heavy impact on the servo amplifiers and the servo motors. Otherwise, injury, malfunction, etc. may occur.
- ●Do not strike the connector. Otherwise, a connection failure, malfunction, etc. may occur.
- ●When you keep or use the equipment, please fulfill the following environment.

Item		Environment
Ambient temperature	Operation	0 °C to 55 °C (non-freezing)
	Storage	-20 °C to 65 °C (non-freezing)
Ambient humidity	Operation	5 %RH to 90 %RH (non-condensing)
	Storage	
Ambience		Indoors (no direct sunlight) and free from corrosive gas, flammable gas, oil mist, dust, and dirt
Altitude		The altitude varies depending on the model. (Check each servo amplifier instruction manual.)
Vibration resistance		5.9 m/s^2 or less at 10 to 55 Hz (directions of X, Y, Z axes)

- ●Contact your local sales if the product has been stored for an extended period of time.
- ●When handling the servo amplifier, be careful about the edged parts such as corners of the servo amplifier.
- ●The servo amplifier must be installed in a metal cabinet.

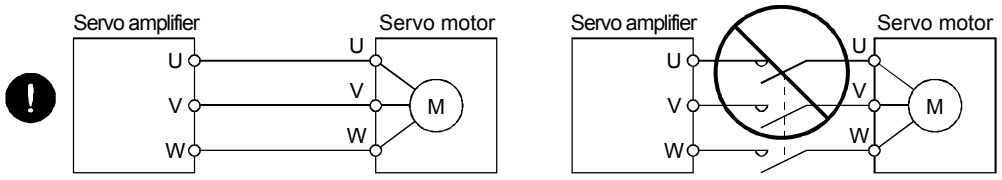
⚠ CAUTION

- 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 a 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, such as heat treatment. Additionally, disinfect and protect wood from insects before packing the products.
- To prevent a fire or injury from occurring in case of an earthquake or other natural disasters, securely install, mount, and wire the servo motor in accordance with Servo Amplifier Instruction Manual

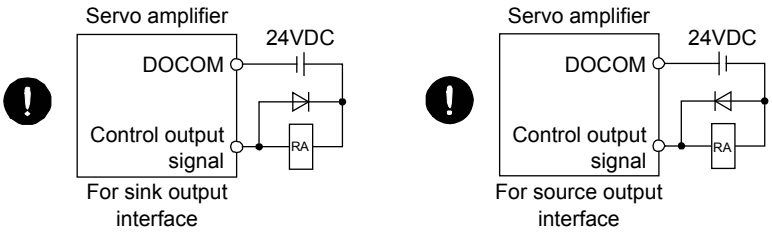
(2) Wiring

⚠ CAUTION

- Wire the equipment correctly and securely. Otherwise, the servo motor may operate unexpectedly.
- Make sure to connect the cables and connectors by using the fixing screws and the locking mechanism. Otherwise, the cables and connectors may be disconnected during operation.
- Do not install a power capacitor, surge killer, or radio noise filter (optional FR-BIF(-H)) on the output side of the servo amplifier.
- Because installation of these items may cause the servo motor to malfunction, connect the wires to the correct phase terminals (U/V/W) of the servo amplifier and servo motor power supply.
- Directly connect the servo amplifier power output (U/V/W) to the servo motor power input (U/V/W). Do not let a magnetic contactor, etc. intervene. Otherwise, it may cause a malfunction.



- The connection diagrams in this instruction manual are shown for sink interfaces, unless stated otherwise.
- The surge absorbing diode installed to the DC relay for control output should be fitted in the specified direction. Otherwise, the emergency stop and other protective circuits may not operate.



- When the cable is not tightened enough to the terminal block, the cable or terminal block may generate heat because of the poor contact. Be sure to tighten the cable with specified torque.
- To avoid a malfunction, do not connect the U, V, W, and CN2 phase terminals of the servo amplifier to the servo motor of an incorrect axis.
- Configure a circuit to turn off EM2 or EM1 when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
- To prevent malfunction, avoid bundling power lines (input/output) and signal cables together or running them in parallel to each other. Separate the power lines from the signal cables.

(3) Trial run/adjustment

⚠ CAUTION
●When executing a test run, follow the notice and procedures in this instruction manual. Otherwise, it may cause a malfunction, damage to the machine, or personal injury. ●Before operation, check the parameter settings. Improper settings may cause some machines to operate unexpectedly. ●Never perform extreme adjustment or changes to the parameters; otherwise, the operation may become unstable. ●Keep away from moving parts in a servo-on state.

(4) Usage

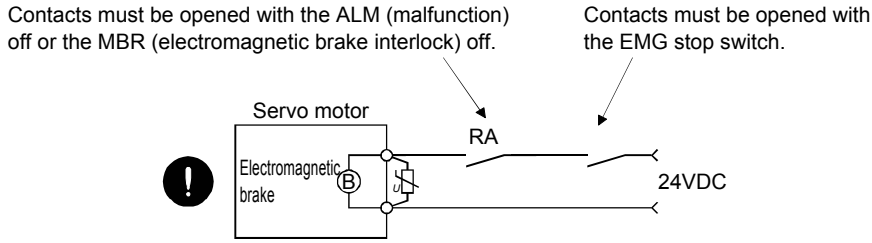
⚠ CAUTION
●Provide an external emergency stop circuit to ensure that operation can be stopped and power switched off immediately. ●For equipment in which the moving part of the machine may collide against the load side, install a limit switch or stopper to the end of the moving part. The machine may be damaged due to a collision. ●Do not disassemble, repair, or modify the product. Disassembled, repaired, and/or modified products are not covered under warranty. ●Before resetting an alarm, make sure that the run signal of the servo amplifier is off in order to prevent a sudden restart. Otherwise, it may cause an accident. ●The effect of electromagnetic interference must be reduced by using a noise filter or by other means. Electromagnetic interference may be given to the electronic equipment used near the servo amplifier. ●Burning or disassembling a servo amplifier may generate toxic gases. Do not burn or break it. ●Use the servo amplifier with the specified servo motor. ●Correctly wire options and peripheral equipment, etc. in the correct combination. Otherwise, it may cause an electric shock, fire, or injury. ●The electromagnetic brake on the servo motor is designed to hold the motor shaft and should not be used for ordinary braking. ●For such reasons as incorrect wiring, service life, and mechanical structure (e.g. where a ball screw and the servo motor are coupled via a timing belt), the electromagnetic brake may not hold the motor shaft. To ensure safety, install a stopper on the machine side. ●If the dynamic brake is activated at power-off, alarm occurrence, etc., do not rotate the servo motor by an external force. Otherwise, it may cause a fire.

(5) Corrective actions

⚠ CAUTION
●If it is assumed that a power failure, machine stoppage, or product malfunction may result in a hazardous situation, use a servo motor with an electromagnetic brake or provide an external brake system for holding purpose to prevent such hazard.

⚠ CAUTION

●Configure an electromagnetic brake circuit so that it is activated also by an external emergency stop switch.



●When any alarm has occurred, eliminate its cause, ensure safety, and deactivate the alarm before restarting operation.

●If the molded-case circuit breaker or fuse is activated, be sure to remove the cause and secure safety before switching the power on. If necessary, replace the servo amplifier and recheck the wiring. Otherwise, it may cause smoke, fire, or an electric shock.

●Provide an adequate protection to prevent unexpected restart after an instantaneous power failure.

●To prevent an electric shock, injury, or fire from occurring after an earthquake or other natural disasters, ensure safety by checking conditions, such as the installation, mounting, wiring, and equipment before switching the power on.

(6) Maintenance, inspection and parts replacement

⚠ CAUTION

●Make sure that the emergency stop circuit operates properly such that an operation can be stopped immediately and a power is shut off by the emergency stop switch.

●It is recommended that the servo amplifier be replaced every 10 years when it is used in general environment.

●When using a servo amplifier whose power has not been turned on for a long time, contact your local sales office.

(7) General precautions

●To illustrate details, the equipment in the diagrams of this Replacement Manual may have been drawn without covers and safety guards. When the equipment is operated, the covers and safety guards must be installed as specified. Operation must be performed in accordance with Instruction Manual.

● Disposal of Waste ●

When disposing of this product, the following two laws are applicable, and it is necessary to consider each law. In addition, because the following laws are effective only in Japan, local laws have priority outside Japan (overseas). We ask that the local laws be displayed on the final products or that a notice be issued as necessary.

1. Requirements of the Act on the Promotion of Effective Utilization of Resources (Commonly known as: the Law for Promotion of Effective Utilization of Resources Promotion Law)

   (1) Please recycle this product whenever possible when it becomes unnecessary.

   (2) It is recommended that this product be divided as necessary and sold to appropriate purchasers, as recycled resources are usually divided into iron, electrical parts, and so on, which are then sold to scrap processors.

2. Requirements of the Act on Waste Disposal & Cleaning (Commonly known as: The Waste Disposal Treatment Cleaning Act)

   (1) It is recommended to decrease waste through the sale of recyclables or through any other means as shown in the preceding Paragraph 1.

   (2) In case the unnecessary products cannot be sold and require disposal, such item falls under Industrial waste in the above act.

   (3) It is required that industrial waste be properly dealt with, including manifest management, by commissioning the disposal to an industrial waste disposal contractor licensed under the act.

   (4) Please dispose of batteries (primary batteries) used in servo amplifiers according to local regulations.

Measures against servo amplifier harmonics

This servo amplifier applies to "Harmonics control guidelines for customers receiving high voltage or special high voltage power" (published by current Ministry of Economy, Trade and Industry). Consumers subject to this guideline must check if a harmonic suppression measure is necessary, and measures must be enforced when the limit level is exceeded.

⚠ EEP-ROM life

The number of write times to the EEP-ROM, which stores parameter settings, etc., is limited to 100,000. If the total number of the following operations exceeds 100,000, the servo amplifier may malfunction when the EEP-ROM reaches the end of its useful life.

- Write to the EEP-ROM due to parameter setting changes
- Write to the EEP-ROM due to device changes

STO function of the servo amplifier

See the applicable "Servo Amplifier Instruction Manual" when using the STO function of the servo amplifier.

Dealing with overseas standards

See the following relevant manuals concerning dealing with overseas standards.

«About the manual»

This Replacement Manual and the following Instruction Manuals are necessary when using this servo for the first time. Ensure to prepare them to use the servo safely.

Relevant manuals

Manual name	Manual number
MELSERVO-J4 Series Instructions and Cautions for Safe Use of AC Servos (Packed with the servo amplifier)	IB(NA)0300175
MELSERVO-J4 Servo Amplifier Instruction Manual (Troubleshooting Edition)	SH(NA)030109
MELSERVO Servo Motor Instruction Manual (Vol. 3) (Note 1)	SH(NA)030113
MELSERVO Linear Servo Motor Instruction Manual (Note 2)	SH(NA)030110
MELSERVO Direct Drive Motor Instruction Manual (Note 3)	SH(NA)030112
MELSERVO Linear Encoder Instruction Manual (Note 2, 4)	SH(NA)030111
EMC Installation Guidelines	IB(NA)67310

Note 1. It is necessary for using a rotary servo motor.
2. It is necessary for using a linear servo motor.
3. It is necessary for using a direct drive motor.
4. It is necessary for using a fully closed loop system.

«Cables used for wiring»

The wiring cables mentioned in this Replacement Manual are selected based on an ambient temperature of 40°C.

«U.S. customary units»

U.S. customary units are not shown in this manual. Convert the values if necessary according to the following table.

Quantity	SI (metric) unit	U.S. customary unit
Mass	1 [kg]	2.2046 [lb]
Length	1 [mm]	0.03937 [inch]
Torque	1 [N•m]	141.6 [oz•inch]
Moment of inertia	1 [(× 10^{-4} kg•m^2)]	5.4675 [oz•$inch^2$]
Load (thrust load/axial load)	1 [N]	0.2248 [lbf]
Temperature	N [°C] × 9/5 + 32	N [°F]

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Part 9: Startup Procedure Manual	9- 1 to 9- 4

MEMO

Part 1
Summary of
MR-J3/MR-J3W Replacement

This document describes the review items for replacing MR-J3/MR-J3W with MR-J4. Some equipment may require review on items not described in this document. Please review those items after viewing the Instruction Manual and the catalogs.

Part 1: Summary of MR-J3/MR-J3W Replacement

1. SUMMARY OF MR-J3/MR-J3W REPLACEMENT

In this document, the flow when replacing a system using the MELSERVO "MR-J3" with the "MR-J4 series" is explained.
After deciding the replacement strategy (batch update or partial update of the servo amplifier, servo motor, and controller), please proceed with replacement by referring to the corresponding parts of this manual and the manual for each model.

2. MAJOR REPLACEMENT TARGET MODEL

2.1 Servo Amplifier Replacement Target Model

Series	Servo amplifier model
MR-J3 series	MR-J3-_A_
	MR-J3-_B_
MR-J3W series	MR-J3W-_B

→

Series	Servo amplifier Model
MR-J4 series	MR-J4-_A_
	MR-J4-_B_
	MR-J4W2-_B

2.2 Servo Motor Replacement Target Model

		Servo motor model
Small capacity	Low inertia	HF-KP_
	Ultra-low inertia	HF-MP_
		HF-MP_ (with reducer)
Medium capacity	medium inertia	HF-SP_
	Low inertia	HC-LP_
		HF-JP_
	Ultra-low inertia	HC-RP_
		HC-RP_ (with reducer)
	Flat	HC-UP_
Large capacity	Low inertia	HA-LP_

→

Servo motor model
HG-KR_
HG-MR_
HG-KR_ (with reducer)
HG-SR_
HG-JR_
HG-RR_
HG-SR_ (with reducer)
HG-UR_
HG-SR_
HG-JR_

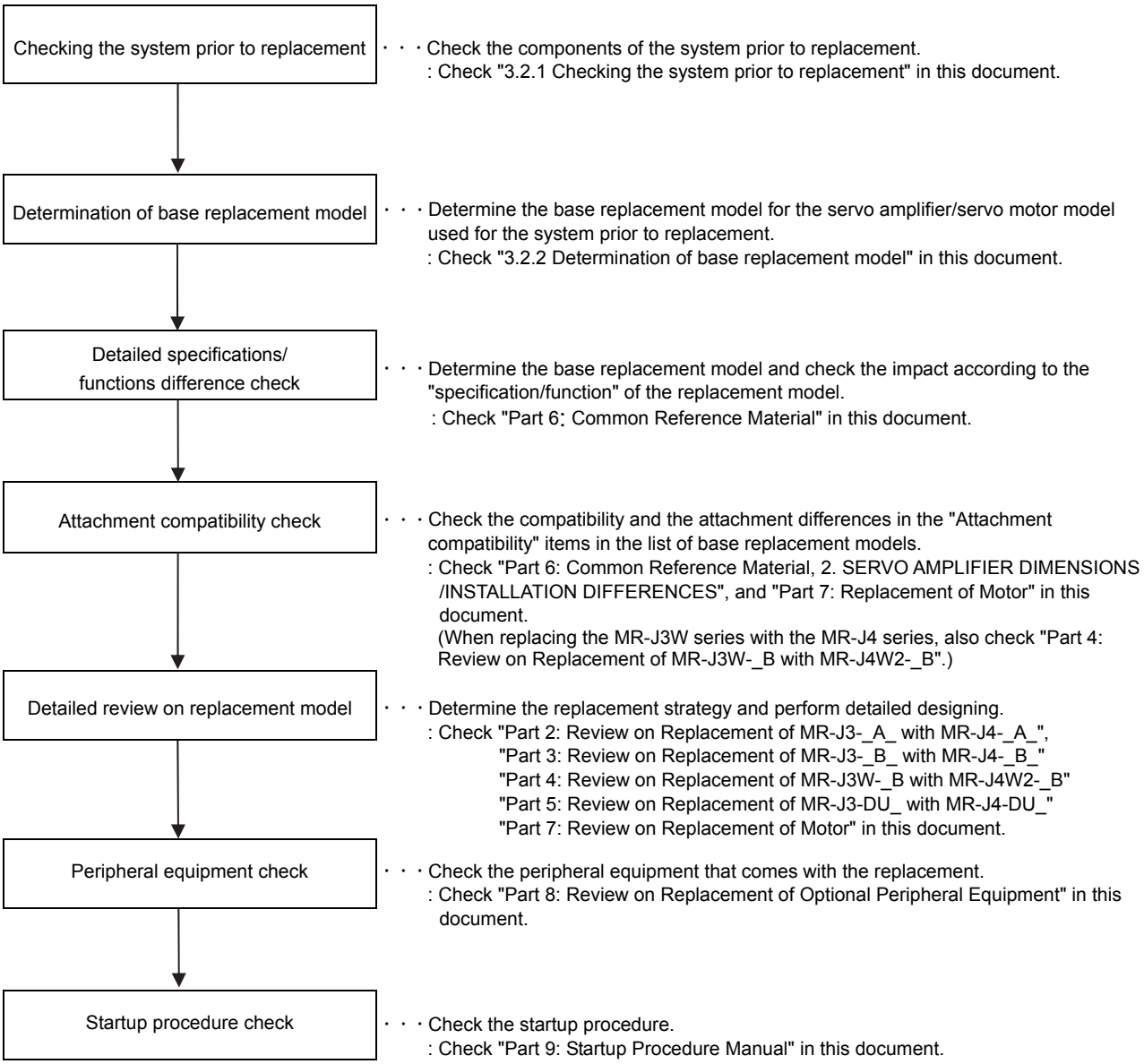
Note. For details, refer to "Part 7: Review on Replacement of Motor".

3. FLOW OF REPLACEMENT

3.1 Summary

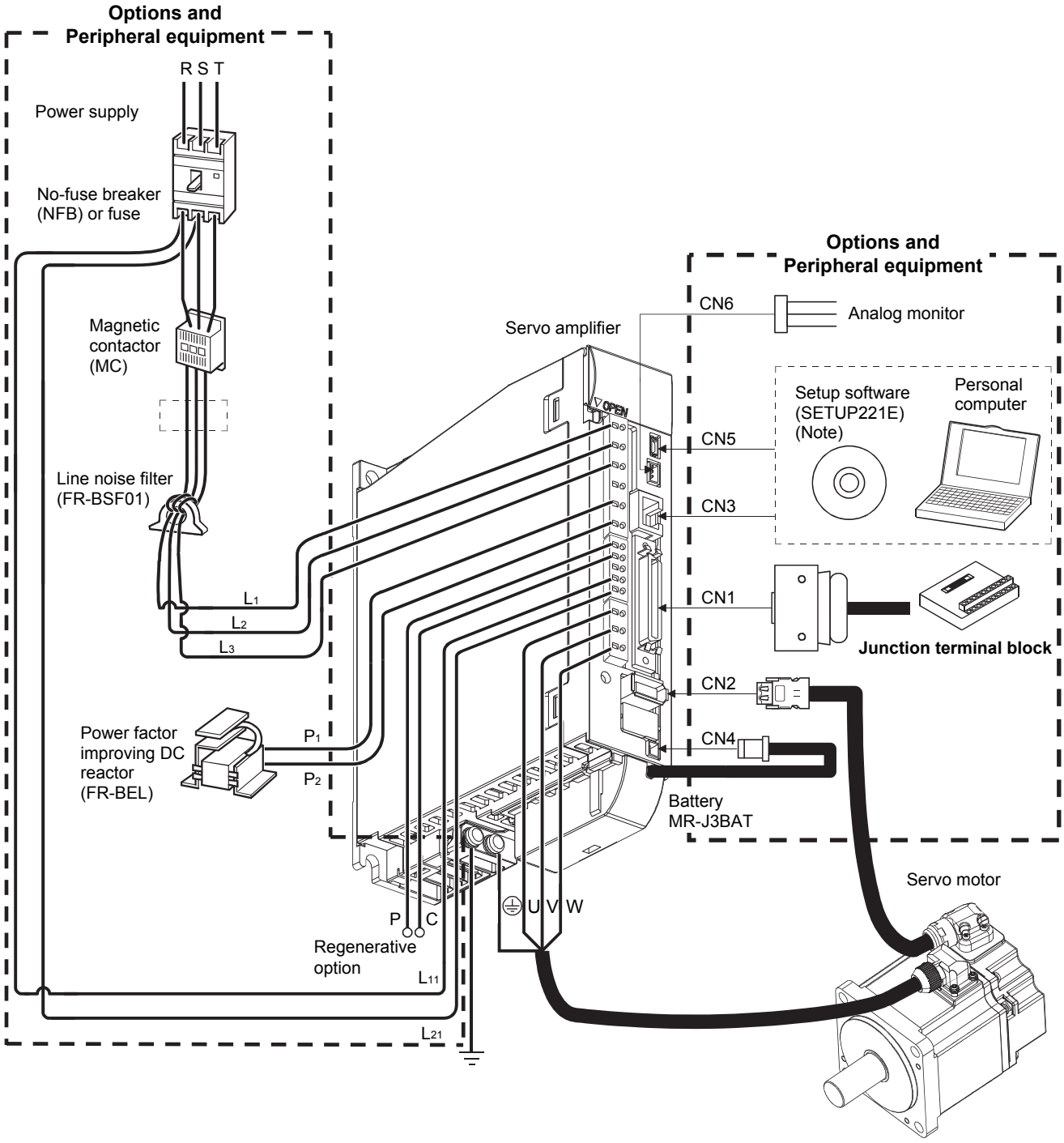
This section describes the flow of replacement when replacing a system using the MR-J3 series/MR-J3W series with a system using the MR-J4 series.

3.1.1 Flow of Review on Replacement



3.1.2 Configuration diagram

The following displays the review items when replacing MR-J3 series with MR-J4 series using MR-J3-100A or less as an example case.



Note. "MR Configurator2" can also be used for MR-J3 series/MR-J3W series.

3.1.3 Changes from MR-J3 series to MR-J4 series

POINT

- The following table summarizes the changes from MR-J3 series to MR-J4 series. For details, refer to the reference document/items.
- For large capacity models of 30 kW or more, Refer to "Part 5: Review on Replacement of MR-J3-DU_ with MR-J4-DU_"

Changes	Check items	Impact	Reference document/items
Servo amplifier	Connector	Connector shape, pin arrangement, signal abbreviation, and location are different.	Part 2, Section 3.3 Part 3, Section 3.4 Part 6, Section 1.2.2
	Terminal block	Terminal block shape, location, and method of drawing out wires are different.	Part 6, Section 1.2.1
	P3, P4 terminals	MR-J4 servo amplifier has P3 and P4 in the upstream of the inrush current suppression circuit. Note that the locations of the P1 and P terminals of MR-J3-11K_ to MR-J3-22K_ are different.	Part 6, Section 1.2.1
	Z-phase	There is no difference caused by the replacement from the MR-J3 servo amplifier to the MR-J4 servo amplifier.	Part 6, Section 1.2.7
	Parameter	General-purpose interface is upward compatible, but the parameter needs to be changed. The parameter converter function of MR Configurator2 can transfer the parameter setting for MR-J3 to the setting for MR-J4. For SSCNET III interface, the MR-J3 compatibility mode is available with the MR-J4 series and the parameter does not need to be changed.	Part 2, Section 3.5 Part 3, Section 3.6 Part 6, Section 2.2 Part 6, Section 2.3
	Dimensions	MR-J3 and MR-J4 have compatibility in mounting. Note that the positions (clearances) of mounting screws for the 5 kW (200 V), 3.5 kW (400 V), 11 kW, and 15 kW have been changed to reduce the size of external dimensions.	Part 6, Section 2.1.1 Part 6, Section 2.1.2
	Dynamic brake coasting distance	The servo motor has a different dynamic brake coasting distance.	Part 6, Section 1.2.3
	Forced stop deceleration	For MR-J4, in the shipping status, the servo motor decelerates to stop during a forced stop or when an alarm has occurred. The stop method for MR-J4 is different from the method of when an emergency stop or a forced stop of MR-J3 is enabled.	Part 6, Section 1.2.4 MR-J4-_A_Servo Amplifier Instruction Manual MR-J4-_B_Servo Amplifier Instruction Manual
	Initializing time	The time it takes to reach servo-on from power-on is different.	Part 6, Section 1.2.6
Options and peripheral equipment	Molded-case circuit breaker Fuse	Those for MR-J3 may not be usable. Select those for MR-J4.	Part 8, Section 4.3
	Magnetic contactor	Those for MR-J3 may not be usable. Select those for MR-J4.	Part 8, Section 4.3
	Power factor improving AC reactor	Those for MR-J3 may not be usable. FR-HAL is recommended.	Part 8, Section 7.2 Part 8, Section 7.5 Part 8, Section 7.6
	Power factor improving DC reactor	Those for MR-J3 may not be usable. FR-HEL is recommended.	Part 8, Section 7.1 Part 8, Section 7.3 Part 8, Section 7.4
	Regenerative option	Some regenerative options cannot be used for MR-J4.	Part 8, Chapter 1
	Setup software (SETUP221E)	Setup software (SETUP221E) cannot be used for MR-J4. Use MR Configurator2. "MR Configurator2" can also be used for MR-J4 series and MR-J3 series.	Part 8, Chapter 8
	Battery	Use MR-BAT6V1SET for MR-J4.	Part 8, Chapter 5
	Encoder cable	When more than 15 kW of HG-JR 1000 r/min series or more than 22 kW of HG-JR 1500 r/min series is used, setting changes are required for the following encoder cables. MR-ENECBL _ M-H-MTH	Part 6, Section 1.2.2 Part 8, Chapter 3

Changes	Check items	Impact	Reference document/items
Options and peripheral equipment	Wire	An HIV wire is recommended for MR-J4.	Part 8, Chapter 4
	Dynamic brakes	Some dynamic brakes cannot be used for MR-J4.	Part 8, Chapter 2
	EMC filter	There is no change in recommended products.	Part 8, Chapter 6
	Panel through attachment	MR-J3ACN cannot be used for MR-J4-11K_(4) or MR-J4-15K_(4).	Part 8, Chapter 9
Servo motor	Mounting compatibility	Some models have no mounting compatibility.	Part 7, Section 1.1
	Dimensions	The total length may differ depending on models.	Part 7, Section 2.1 Part 7, Section 2.2 Part 7, Section 2.3
	Reducer	The actual reduction ratio of HF-KP and HF-MP series G1 types may differ from that of HG-KR series G1 types depending on models.	Part 7, Section 2.3 Part 7, Section 2.4
	Moment of inertia	The moment of inertia of the HF-_P/HC-_P/HA-_P motor may differ from that of the HG motor depending on models. (Note 2)	Part 7, Section 2.5
	Load to motor inertia ratio	The range of the load to motor inertia ratio for the servo motor may differ between the HF-_P/HC-_P/HA-_P motor and the HG motor depending on models.	Part 7, Section 2.5
	Connector	The power connector, encoder connector, and electromagnetic brake connector may differ from one another in shape.	Part 7, Section 2.6
	Torque characteristics	The torque characteristics of the HF-_P/HC-_P/HA-_P motor may differ from those of the HG motor.	Part 7, Section 2.7
	Rated speed/maximum speed	The Rated speed/maximum speed of the HF-_P/HC-_P/HA-_P motor may differ from those of the HG motor.	Servo Motor Instruction Manual (Vol. 3)
	Thermal sensor (Note 1)	For HG-JR 1000 r/min series of 15 kW or more and HG-JR 1500 r/min series of 22 kW or more, the thermal sensor is replaced with a thermistor. For HG-JR 1000 r/min series of 12 kW or less and HG-JR 1500 r/min series of 15 kW or less, the thermal sensor is removed.	Servo Motor Instruction Manual (Vol. 3)
	Encoder resolution	The encoder resolution differs as follows. HF-_P/HC-_P/HA-_P motor: 18bit ABS HG motor: 22 bit ABS	Servo Motor Instruction Manual (Vol. 3)
Controller (SSCNET III interface only)		MR-J4-_B_ servo amplifiers have two operation modes. "J4 mode" is for using all functions with full performance and "J3 compatibility mode" is compatible with MR-J3-_B_ series for using the amplifiers as the conventional series. When you connect an amplifier with SSCNET III/H communication for the first controller communication with the factory setting, the operation mode will be fixed to "J4 mode". For SSCNET III communication, the operation mode will be fixed to "J3 compatibility mode".	

Note 1. For HG-JR 1000 r/min series of 15 kW or more and HG-JR 1500 r/min series of 22 kW or more, the thermal sensor is replaced with a thermistor. For HG-JR 1000 r/min series of 12 kW or less and HG-JR 1500 r/min series of 15 kW or less, the thermal sensor is removed. A new encoder cable laying is required because the motor thermal wiring differs.

2. This may change the motor inertia, making it necessary to adjust the servo gain.

3.1.4 Changes from MR-J3W series to MR-J4 series

POINT

●The following table summarizes the changes from MR-J3W series to MR-J4 series. For details, refer to the reference document/items.

Changes	Check items	Impact	Reference document/items
Servo amplifier	Connector	Connector shape, pin arrangement, signal abbreviation, and location are different.	Part 4, Section 3.6 Part 6, Section 1.2.2
	Parameter	For SSCNETIII interface, the MR-J3 compatibility mode is available with the MR-J4 series and parameters do not need to be changed.	Part 4, Section 3.7
	Dimensions	MR-J3W-22B/-44B ⇒ MR-J4W2-22B/-44B : The dimensions are the same. The number of mounting screws is different. MR-J3W-77B/-1010B ⇒ MR-J4W2-77B/-1010B : Note that the positions (clearances) and the number of mounting screws have been changed to reduce the size of external dimensions. MR-J3W-0303BN6 ⇒ MR-J4W2-0303B6 : The dimensions, the clearances and number of mounting screw are the same.	Part 6, Section 2.1.5
	Dynamic brake coasting distance	The servo motor has a different dynamic brake coasting distance.	Part 6, Section 1.2.3
	Forced stop deceleration	For MR-J4, in the shipping status, the servo motor decelerates to stop during a forced stop or when an alarm has occurred. The stop method for MR-J4 is different from the method of when an emergency stop or a forced stop of MR-J3W is enabled.	Part 6, Section 1.2.4 MR-J4W2-_B_ Servo Amplifier Instruction Manual
	Initializing time	The time it takes to reach servo-on from power-on is different.	Part 6, Section 1.2.6
Options and peripheral equipment	Molded-case circuit breaker Fuse	Those for MR-J3W may not be usable. Select those for MR-J4.	Part 8, Section 4.3
	Magnetic contactor	Those for MR-J3W may not be usable. Select those for MR-J4.	Part 8, Section 4.3
	Power factor improving AC reactor	Those for MR-J3W may not be usable. FR-HAL is recommended.	Part 8, Section 7.2 Part 8, Section 7.5
	Regenerative option	Some regenerative options cannot be used for MR-J4.	Part 8, Chapter 1
	Setup software (SETUP221E)	Setup software (SETUP221E) cannot be used for MR-J4. Use MR Configurator2. "MR Configurator2" can also be used for MR-J4 series and MR-J3W series.	Part 8, Chapter 8
	Battery	Use MR-BT6VCASE, MR-BAT6V1 for MR-J4.	Part 8, Chapter 5
	Encoder cable	MR-J3W cables can be used as they are.	Part 6, Section 1.2.2 Part 8, Chapter 3
	Wire	An HIV wire is recommended for MR-J4.	Part 8, Chapter 4
	EMC filter	Some EMC filters cannot be used for MR-J4.	Part 8, Chapter 6

Changes	Check items	Impact	Reference document/items
Servo motor	Mounting compatibility	Some models have no mounting compatibility.	Part 7, Section 1.1
	Dimensions	The total length may differ depending on models.	Part 7, Section 2.1 Part 7, Section 2.2 Part 7, Section 2.3
	Reducer	The actual reduction ratio of HF-KP and HF-MP series G1 types may differ from that of HG-KR series G1 types depending on models.	Part 7, Section 2.3 Part 7, Section 2.4
	Moment of inertia	The moment of inertia of the HF-_P/HC-_P/HA-_P motor may differ from that of the HG motor depending on models. (Note)	Part 7, Section 2.5
	Load to motor inertia ratio	The range of the load to motor inertia ratio for the servo motor may differ between the HF-_P/HC-_P motor and the HG motor depending on models.	Part 7, Section 2.5
	Connector	The power connector, encoder connector, and electromagnetic brake connector may differ from one another in shape.	Part 7, Section 2.6
	Torque characteristics	The torque characteristics of the HF-_P/HC-_P motor may differ from those of the HG motor.	Part 7, Section 2.7
	Rated speed/maximum speed	The Rated speed/maximum speed of the HF-_P/HC-_P motor may differ from those of the HG motor.	Servo Motor Instruction Manual (Vol. 3)
	Encoder resolution	The encoder resolution differs as follows. HF-_P/HC-_P motor: 18bit ABS HG motor: 22 bit ABS	Servo Motor Instruction Manual (Vol. 3)
Controller (SSCNET interface only)		MR-J4W2-_B servo amplifiers have two operation modes. "J4 mode" is for using all functions with full performance and "J3 compatibility mode" is compatible with MR-J3W-_B series for using the amplifiers as the conventional series. When you connect an amplifier with SSCNET III/H communication for the first controller communication with the factory setting, the operation mode will be fixed to "J4 mode". For SSCNET III communication, the operation mode will be fixed to "J3 compatibility mode".	

Note. This may change the motor inertia, making it necessary to adjust the servo gain.

3.2 Review on replacement

3.2.1 Checking the system prior to replacement

Check the components of the system prior to replacement.

Category	Controller model	Amplifier model		"Reference items" in this document	Remarks
Positioning module	QD75P(D)	MR-J3_A_	⇒	1) MR-J3 series "Part 2: Review on Replacement of MR-J3-_A_ with MR-J4-_A_" 2) MR-J3 series "Part 5: Review on Replacement of MR-J3-DU_ with MR-J4-DU_"	Positioning control
	A1SD75P(D)				
Controller from another company	Controller from another company	MR-J3_A_	⇒		
No controller connected	No controller	MR-J3-_A_	⇒		Speed control Torque control
SSCNET III Positioning module	QD75MH	MR-J3-_B_ MR-J3W-_B	⇒	1) MR-J3 series "Part 3: Review on Replacement of MR-J3-_B_ with MR-J4-_B_" 2) MR-J3W series "Part 4: Review on Replacement of MR-J3W-_B with MR-J4W2-_B" 3) MR-J3 series "Part 5: Review on Replacement of MR-J3-DU_ with MR-J4-DU_"	Positioning control
SSCNET III Motion controller	Q17_HCPU	MR-J3-_B_ MR-J3W-_B	⇒		
	Q170MCPU				
	Q17_DCPU				

3.2.2 Determination of base replacement model

(1) Models for replacement between MR-J3 series and MR-J4 series
Shown below are the base replacement models with the assumption that both the servo amplifier and servo motor will be replaced as a set.

(a) General-purpose interface 200 V class

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3-10A	MR-J4-10A	O	Refer to "Part 6: Common Reference Material".
MR-J3-20A	MR-J4-20A	O	
MR-J3-40A	MR-J4-40A	O	
MR-J3-60A	MR-J4-60A	O	
MR-J3-70A	MR-J4-70A	O	
MR-J3-100A	MR-J4-100A	O	
MR-J3-200A(N)(-RT)	MR-J4-200A	O	
MR-J3-350A	MR-J4-350A	O	
MR-J3-500A	MR-J4-500A	(Note)	
MR-J3-700A	MR-J4-700A	O	
MR-J3-11KA	MR-J4-11KA	(Note)	
MR-J3-11KA-LR			
MR-J3-15KA	MR-J4-15KA	(Note)	
MR-J3-15KA-LR			
MR-J3-22KA	MR-J4-22KA	O	

Note.Refer to Comparison of servo amplifier dimensions (Part 6 Common Reference Material) for dimensions of mounting holes.

(b) SSCNET interface 200 V class

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3-10B	MR-J4-10B	O	Refer to "Part 6: Common Reference Material".
MR-J3-20B	MR-J4-20B	O	
MR-J3-40B	MR-J4-40B	O	
MR-J3-60B	MR-J4-60B	O	
MR-J3-70B	MR-J4-70B	O	
MR-J3-100B	MR-J4-100B	O	
MR-J3-200B(N)(-RT)	MR-J4-200B	O	
MR-J3-350B	MR-J4-350B	O	
MR-J3-500B	MR-J4-500B	(Note)	
MR-J3-700B	MR-J4-700B	O	
MR-J3-11KB	MR-J4-11KB	(Note)	
MR-J3-11KB-LR			
MR-J3-15KB	MR-J4-15KB	(Note)	
MR-J3-15KB-LR			
MR-J3-22KB	MR-J4-22KB	O	

Note.Refer to Comparison of servo amplifier dimensions (Part 6 Common Reference Material) for dimensions of mounting holes.

(c) General-purpose interface 200 V class (30 kW or more)

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3-DU30KA + MR-J3-CR55K	MR-J4-DU30KA + MR-CR55K	O	Refer to "Part 5: Review on Replacement of MR-J3-DU_ with MR-J4-DU_"
MR-J3-DU37KA + MR-J3-CR55K	MR-J4-DU37KA + MR-CR55K	O	

(d) SSCNET interface 200 V class (30 kW or more)

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3-DU30KB + MR-J3-CR55K	MR-J4-DU30KB + MR-CR55K	O	Refer to "Part 5: Review on Replacement of MR-J3-DU_ with MR-J4-DU_"
MR-J3-DU37KB + MR-J3-CR55K	MR-J4-DU37KB + MR-CR55K	O	

(e) General-purpose interface 400 V class

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3-60A4	MR-J4-60A4	O	Refer to "Part 6: Common Reference Material".
MR-J3-100A4	MR-J4-100A4	O	
MR-J3-200A4	MR-J4-200A4	O	
MR-J3-350A4	MR-J4-350A4	(Note)	
MR-J3-500A4	MR-J4-500A4	O	
MR-J3-700A4	MR-J4-700A4	O	
MR-J3-11KA4	MR-J4-11KA4	(Note)	
MR-J3-11KA4-LR			
MR-J3-15KA4	MR-J4-15KA4	(Note)	
MR-J3-15KA4-LR			
MR-J3-22KA4	MR-J4-22KA4	O	

Note.Refer to Comparison of servo amplifier dimensions (Part 6 Common Reference Material) for dimensions of mounting holes.

(f) SSCNET interface 400 V class

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3-60B4	MR-J4-60B4	O	Refer to "Part 6: Common Reference Material".
MR-J3-100B4	MR-J4-100B4	O	
MR-J3-200B4	MR-J4-200B4	O	
MR-J3-350B4	MR-J4-350B4	(Note)	
MR-J3-500B4	MR-J4-500B4	O	
MR-J3-700B4	MR-J4-700B4	O	
MR-J3-11KB4	MR-J4-11KB4	(Note)	
MR-J3-11KB4-LR			
MR-J3-15KB4	MR-J4-15KB4	(Note)	
MR-J3-15KB4-LR			
MR-J3-22KB4	MR-J4-22KB4	O	

Note.Refer to Comparison of servo amplifier dimensions (Part 6 Common Reference Material) for dimensions of mounting holes.

(g) General-purpose interface 400 V class (30 kW or more)

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3-DU30KA4 + MR-J3-CR55K4	MR-J4-DU30KA4 + MR-CR55K4	O	Refer to "Part 5: Review on Replacement of MR-J3-DU_ with MR-J4-DU_"
MR-J3-DU37KA4 + MR-J3-CR55K4	MR-J4-DU37KA4 + MR-CR55K4	O	
MR-J3-DU45KA4 + MR-J3-CR55K4	MR-J4-DU45KA4 + MR-CR55K4	O	
MR-J3-DU55KA4 + MR-J3-CR55K4	MR-J4-DU55KA4 + MR-CR55K4	O	

(h) SSCNET interface 400 V class (30 kW or more)

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3-DU30KB4 + MR-J3-CR55K4	MR-J4-DU30KB4 + MR-CR55K4	O	Refer to "Part 5: Review on Replacement of MR-J3-DU_ with MR-J4-DU_"
MR-J3-DU37KB4 + MR-J3-CR55K4	MR-J4-DU37KB4 + MR-CR55K4	O	
MR-J3-DU45KB4 + MR-J3-CR55K4	MR-J4-DU45KB4 + MR-CR55K4	O	
MR-J3-DU55KB4 + MR-J3-CR55K4	MR-J4-DU55KB4 + MR-CR55K4	O	

(i) General-purpose interface 100 V class

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3-10A1	MR-J4-10A1	O	Refer to "Part 6: Common Reference Material".
MR-J3-20A1	MR-J4-20A1	O	
MR-J3-40A1	MR-J4-40A1	O	

(j) SSCNET interface 100 V class

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3-10B1	MR-J4-10B1	O	Refer to "Part 6: Common Reference Material".
MR-J3-20B1	MR-J4-20B1	O	
MR-J3-40B1	MR-J4-40B1	O	

(2) Models for replacement between MR-J3W series and MR-J4 series
Shown below are the base replacement models with the assumption that both the servo amplifier and servo motor will be replaced as a set.

(a) SSCNET interface 200 V class

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3W-22B	MR-J4W2-22B	(Note 1)	Refer to "Part 4: Review on Replacement of MR-J3W-_B with MR-J4W2-_B"
MR-J3W-44B	MR-J4W2-44B	(Note 1)	
MR-J3W-77B	MR-J4W2-77B	(Note 2)	
MR-J3W-1010B	MR-J4W2-1010B	(Note 2)	

Note 1. The dimensions are the same. The number of mounting screws is different.
2. Note that the positions (clearances) and the number of mounting screws have been changed to reduce the size of external dimensions.

(b) SSCNET interface 48 V DC/24 V DC class

Model	Replacement model (example)	Attachment compatibility (O: Compatible)	Check items
MR-J3W-0303BN6	MR-J4W2-0303B6	O	Refer to "Part 4: Review on Replacement of MR-J3W-_B with MR-J4W2-_B"

(3) Servo amplifier and servo motor combination for the MR-J4 series
For a review on the replacement of an existing motor with a new one, Refer to "Part 7: Review on Replacement of Motor".

(a) 200 V/100 V class

Servo amplifier	Rotary servo motor					
	HG-KR	HG-MR	HG-SR	HG-UR	HG-RR	HG-JR
MR-J4-10_(1)	053 13	053 13				
MR-J4-20_(1)	23	23				
MR-J4-40_(1)	43	43				
MR-J4-60_			51 52			53
MR-J4-70_	73	73		72		73
MR-J4-100_			81 102			53 (Note) 103
MR-J4-200_			121 201 152 202	152	103 153	73 (Note) 103 (Note) 153 203
MR-J4-350_			301 352	202	203	153 (Note) 203 (Note) 353
MR-J4-500_			421 502	352 502	353 503	353 (Note) 503
MR-J4-700_			702			503 (Note) 601 701M 703
MR-J4-11K_						801 12K1 11K1M 903
MR-J4-15K_						15K1 15K1M
MR-J4-22K_						20K1 25K1 22K1M
MR-J4-DU30K_						30K1 30K1M
MR-J4-DU37K_						37K1 37K1M
MR-J4W2-22B	053 13 23	053 13 23				
MR-J4W2-44B	053 13 23 43	053 13 23 43				
MR-J4W2-77B	43 73	43 73	51 52	72		53 73
MR-J4W2-1010B	43 73	43 73	51 81 52 102	72		53 (Note) 73 103

Note. The combination increases the rated torque and the maximum torque.

(b) 400 V class

Servo amplifier	Rotary servo motor	
	HG-SR	HG-JR
MR-J4-60_4	524	534
MR-J4-100_4	1024	534 (Note) 734 1034
MR-J4-200_4	1524 2024	734 (Note) 1034 (Note) 1534 2034
MR-J4-350_4	3524	1534 (Note) 2034 (Note) 3534
MR-J4-500_4	5024	3534 (Note) 5034
MR-J4-700_4	7024	5034 (Note) 6014 701M4 7034
MR-J4-11K_4		8014 12K14 11K1M4 9034
MR-J4-15K_4		15K14 15K1M4
MR-J4-22K_4		20K14 25K14 22K1M4
MR-J4-DU30K_4		30K14 30K1M4
MR-J4-DU37K_4		37K14 37K1M4
MR-J4-DU45K_4		45K1M4
MR-J4-DU55K_4		55K1M4

Note. The combination increases the rated torque and the maximum torque.

(c) 48 V DC/24 V DC class

Servo amplifier	Rotary servo motor
	HG-AK
MR-J4W2-0303B6	0136 0236 0336

3.2.3 Attachment compatibility check

Refer to "Part 6: Common Reference Material" and "Part 7: Review on Replacement of Motor".

3.2.4 Detailed review on replacement model

Refer to "Part 2: Review on Replacement of MR-J3-_A_ with MR-J4-_A_", "Part 3: Review on Replacement of MR-J3-_B_ with MR-J4-_B_", "Part 4: Review on Replacement of MR-J3W-_B with MR-J4W2-_B", and "Part 5: Review on Replacement of MR-J3-DU_ with MR-J4-DU_".

3.2.5 Peripheral equipment check

Refer to "Part 8: Review on Replacement of Optional Peripheral Equipment" in this document.

3.2.6 Startup procedure check

Refer to "Part 9: Startup Procedure Manual" in this document.

4. RELATED MATERIALS

4.1 Catalog

(1) Mitsubishi Electric General-Purpose AC Servo MELSERVO-J4

(2) Motion Controller Q17nDSCPU/Q170MSCPU

4.2 Instruction Manual

(1) MELSERVO-J4 Series MR-J4-_A(-RJ)/MR-J4-_A4(-RJ)/MR-J4-_A1(-RJ) Servo Amplifier Instruction Manual

(2) MELSERVO-J4 Series MR-J4-_B(-RJ)/MR-J4-_B4(-RJ)/MR-J4-_B1(-RJ) Servo Amplifier Instruction Manual

(3) MELSERVO-J4 Series MR-J4W2-_B/MR-J4W3-_B/MR-J4W2-0303B6 Servo Amplifier Instruction Manual

(4) MR-J4-DU-_(-RJ)/MR-J4-DU-_4(-RJ) Drive Unit MR-CR55K(4) Converter Unit Instruction Manual

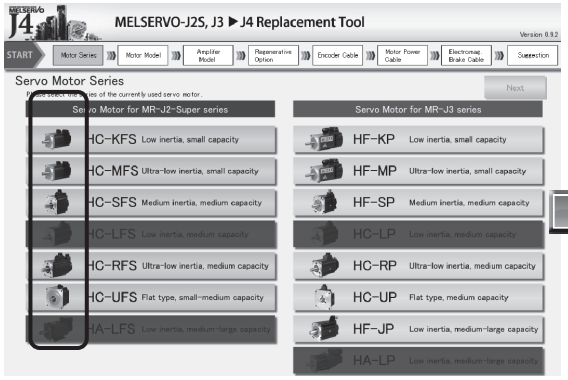
(5) HG-MR/HG-KR/HG-SR/HG-JR/HG-RR/HG-UR/HG-AK Servo Motor Instruction Manual (Vol.3)

(6) MELSERVO-J4 Servo Amplifier Instruction Manual (Troubleshooting Edition)

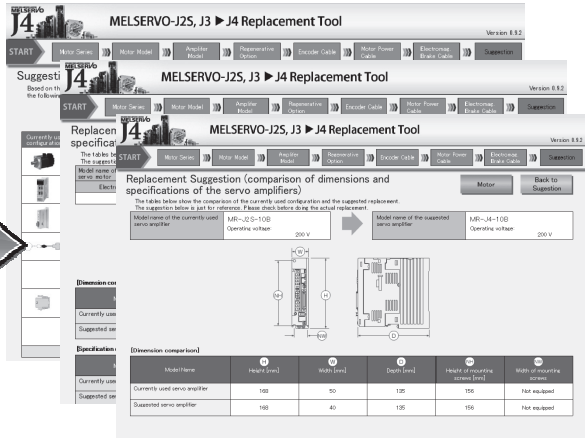
4.3 Replacement Tool for Replacing MR-J3 with MR-J4

This tool is a reference for replacing the in-use MR-J3 series with the MR-J4 series.
The replacement tool is available on the Mitsubishi Electric FA site.
When an in-use rotary servo motor or servo amplifier is selected, a corresponding MR-J4 series product can be selected.

Note 1. Use the results as just a reference. Refer to catalogs or instruction manuals. For details, contact your local sales office.
2. MR-J3W series is not compatible.



Servo motor series model, servo amplifier model, regenerative option, encoder motor power supply, and electromagnetic brake selection



Selection result configuration, servo motor dimensions/specification comparison, servo amplifier dimensions/specification comparison

4.4 MITSUBISHI ELECTRIC FA Global Website

http://www.mitsubishielectric.com/fa/

Part 2
Review on Replacement of MR-J3-_A_ with MR-J4-_A_

Part 2: Review on Replacement of MR-J3-_A_ with MR-J4-_A_

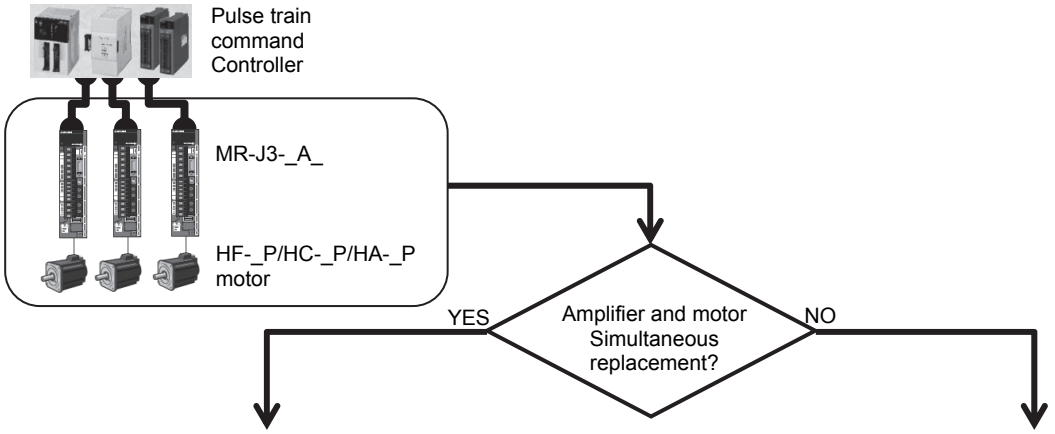
1. SUMMARY

This section describes the changes to be made when a system using MR-J3-_A_ is replaced with a system using MR-J4-_A_.

2. CASE STUDY ON REPLACEMENT OF MR-J3-_A_

2.1 Review on Replacement Method

POINT
●An HG motor cannot be driven by MR-J3-_A_. When a servo motor is replaced with an HG motor, servo amplifier also needs to be replaced with MR-J4-_A_ simultaneously.



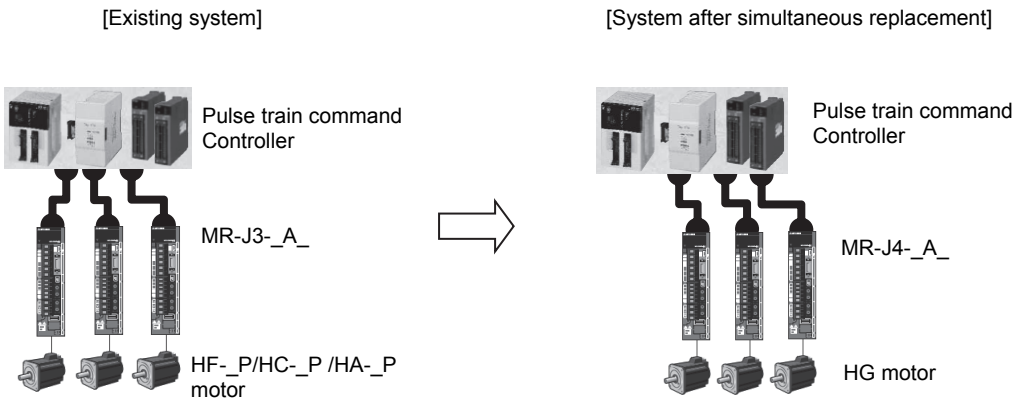
(1) Simultaneous replacement with MR-J4-_A_ and an HG motor
Although heavier burdens including a longer construction period need to be borne, once replaced the system can be operated for a long period of time. (Refer to Section 2.2 (1).)

(2) Separate repair of a servo amplifier is available. (Note)
For the available servo motors, refer to the following. (Refer to "Part 6: Common Reference Material".)

Note Separate repair means replacement.

2.2 Replacement Method

(1) Simultaneous replacement with MR-J4-_A_ and an HG motor
The currently used connectors or cables need to be replaced. The parameters of the existing system can be transferred with the parameter converter function of MR Configurator2. (Refer to "Part 6: Common Reference Material".)



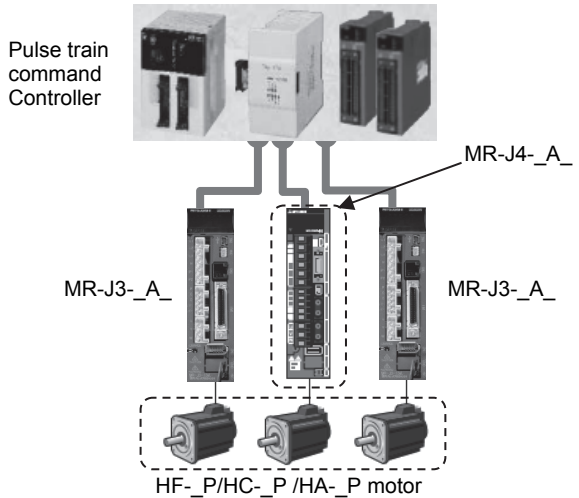
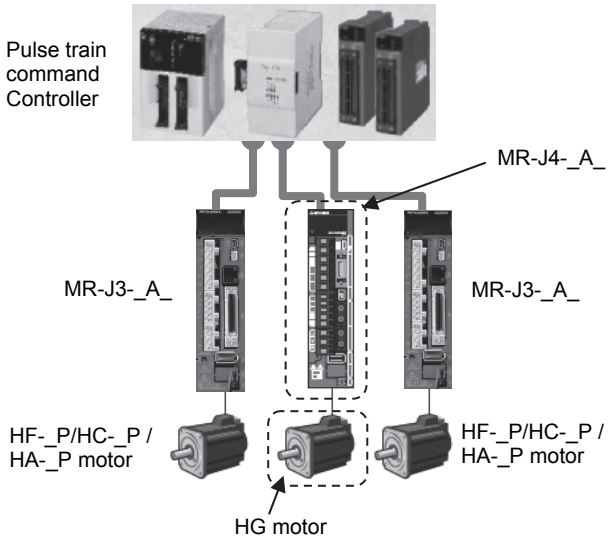
(2) Separate repair of servo amplifiers and servo motors

POINT

- An HG motor cannot be driven by MR-J3-_A_. When a servo motor is replaced with an HG motor, servo amplifier also needs to be replaced with MR-J4-_A_ simultaneously.
- When an "HC-_P motor" shown below is used, "simultaneous replacement with MR-J4-_A_ and an HG motor" is recommended. When an HG motor is adopted, the capacity of the servo amplifier needs to be changed. (Consider replacement, referring to "torque characteristics" described in "Part 7: Replacement of Motor".)
- The low inertia "HG-JR motor" is recommended for the replacement of "HC-LP motor".

  To use a servo motor other than the motors listed in following table, check the compatibility with the equipment because the motor inertia, etc. is different.

Existing device models		Replacement models for simultaneous replacement (example)	
Servo motor	Servo amplifier	Servo motor	Servo amplifier
HC-RP103(B)G5 1/_	MR-J3-200A(N)(-RT)	HG-SR102(B)G5 1/_	MR-J4-100A
HC-RP203(B)G5 1/_	MR-J3-350A	HG-SR202(B)G5 1/_	MR-J4-200A
HC-RP353(B)G5 1/_	MR-J3-500A	HG-SR352(B)G5 1/_	MR-J4-350A
HC-RP103(B)G7 1/_	MR-J3-200A(N)(-RT)	HG-SR102(B)G7 1/_	MR-J4-100A
HC-RP203(B)G7 1/_	MR-J3-350A	HG-SR202(B)G7 1/_	MR-J4-200A
HC-RP353(B)G7 1/_	MR-J3-500A	HG-SR352(B)G7 1/_	MR-J4-350A
HC-LP52(B)	MR-J3-60A	HG-JR73(B)	MR-J4-70A
HC-LP102(B)	MR-J3-100A	HG-JR153(B)	MR-J4-200A
HC-LP152(B)	MR-J3-200A(N)(-RT)	HG-JR353(B)	MR-J4-350A

Replacement of servo amplifier	Replacement of servo motor
	
Replacing the system allows the J3 series servo motors to drive in MR-J4-_A_. Refer to "Part 6: Common Reference Material" for target motors.	The HG motor cannot be driven by MR-J3-_A_. When a servo motor is replaced with an HG motor, servo amplifier also needs to be replaced with MR-J4-_A_ simultaneously.

3. DIFFERENCES BETWEEN MR-J3-_A_ AND MR-J4-_A_

3.1 Function Comparison Table

POINT

●Functions with difference are shown with shading.

(1) 200 V class

Item		MR-J3 series	MR-J4 series
1	Capacity range	0.1 kW to 22 kW/200 V	0.1 kW to 22 kW/200 V
2	Internal regenerative resistor	Built-in (0.2 kW to 7 kW) External (11kW to 22 kW)	Built-in (0.2 kW to 7 kW) External (11kW to 22 kW)
3	Dynamic brake	Built-in (0.1kW to 7kW) External (11kW to 22 kW)	Built-in (0.1 kW to 7 kW) External (11kW to 22 kW) **Coasting distance may differ. (Note)**
4	Control circuit power	1-phase 200 V AC to 230 V AC	1-phase 200 V AC to **240** V AC
5	Main circuit power	1-phase 200 V AC to 230 V AC (0.1 kW to 0.75 kW) 3-phase 200 V AC to 230 V AC (0.1 kW to 22 kW)	1-phase 200 V AC to **240** V AC (0.1 kW **to 2 kW**) 3-phase 200 V AC to **240** V AC (0.1 kW to 22 kW)
6	24 V DC power	External supply required	External supply required
7	Auto Tuning	Real-time auto tuning: 32 steps Advanced gain search	Real-time auto tuning: **40 steps** **One-touch tuning**
8	Control mode	・Position control mode (pulse command) ・Speed control mode (analog command) ・Torque control mode (analog command)	・Position control mode (pulse command) ・Speed control mode (analog command) ・Torque control mode (analog command)
9	Maximum input pulses	Differential pulse: 1 Mpulse/s Open-collector pulse: 200 kpulses/s Command pulse: Sink	Differential pulse: **4** Mpulses/s Open-collector pulse: 200 kpulses/s Command pulse: Sink
10	The number of DIO points (excluding EM1)	DI: 9 points, DO: 6 points	DI: 9 points, DO: 6 points
11	Encoder pulse output	A/B/Z-phase pulse (differential line driver) Z-phase pulse (open collector)	A/B/Z-phase pulse (differential line driver) Z-phase pulse (open collector)
12	DIO interface	input/output: sink/source	input/output: sink/source
13	Analog input/output	(Input) 2ch 10-bit torque, 14-bit speed or equivalent (Output) 10-bit or equivalent × 2ch	(Input) 2ch 10-bit torque, 14-bit speed or equivalent (Output) 10-bit or equivalent × 2ch
14	Number of internal speed commands	7 points	7 points
15	Parameter setting method	Setup software (SETUP221E) MR Configurator2 Push button	MR Configurator2 Push button
16	Setup software communication function	USB	USB
17	Servo motor (Encoder resolution)	HF-_P series (18-bit ABS) HA-_P series (18-bit ABS)	HG series (**22**-bit ABS)
18	Motor maximum torque	HF-KP 350%	HG-KR 350%
		HF-MP 300%	HG-MR 300%
		HF-SP 300%	HG-SR 300%
		HF-JP 300%	HG-JR 300%
		HA-LP 250%	**HG-JR 300%**
19	Button	4 buttons	4 buttons
20	LED display	7-segment 5-digit	7-segment 5-digit
21	Advanced vibration suppression control	Provided	Provided **(Advanced vibration suppression control II)**
22	Adaptive filter II	Provided	Provided
23	Notch filter	Provided (2 pcs)	Provided (5 pcs)
24	Tough drive	Unprovided	**Provided**
25	Drive recorder	Unprovided	**Provided**
26	Forced stop	EM1 (DB stop)	**EM1 (DB stop)/EM2 (deceleration to a stop)**

Note. For the coasting distance, refer to "1.2.3 Dynamic brake: coasting distance" in "Part 6 Common Reference Material".

(2) 400 V class

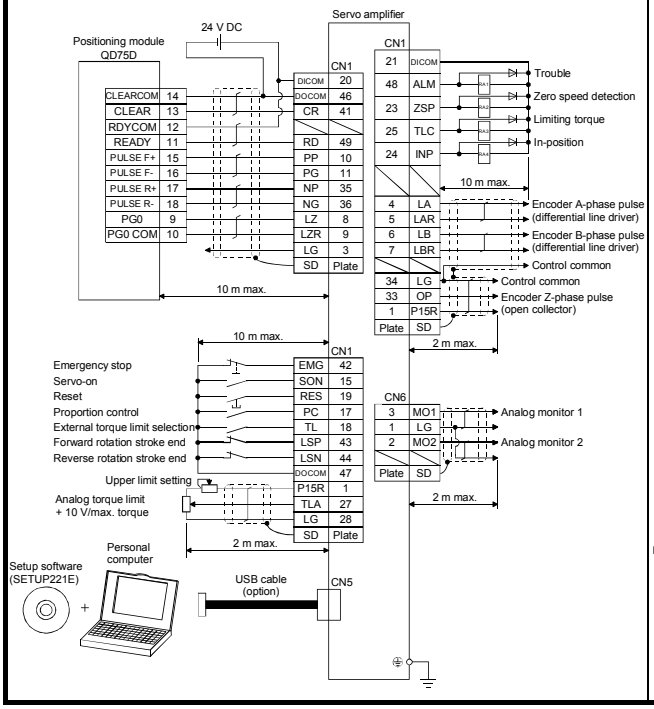
Item		MR-J3 series	MR-J4 series
1	Capacity range	0.6 kW to 22 kW/400 V	0.6 to 22 kW/400 V
2	Internal regenerative resistor	Built-in (0.6 kW to 7 kW) External (11kW to 22 kW)	Built-in (0.6 kW to 7 kW) External (11kW to 22 kW)
3	Dynamic brake	Built-in (0.6 kW to 7 kW) External (11kW to 22 kW)	Built-in (0.6 kW to 7 kW) External (11kW to 22 kW) **Coasting distance may differ. (Note)**
4	Control circuit power	1-phase 380 V AC to 480 V AC	1-phase 380 V AC to 480 V AC
5	Main circuit power	3-phase 380 V AC to 480 V AC	3-phase 380 V AC to 480 V AC
6	24 V DC power	External supply required	External supply required
7	Auto Tuning	Real-time auto tuning: 32 steps Advanced gain search	Real-time auto tuning: **40 steps** **One-touch tuning**
8	Control mode	・Position control mode (pulse command) ・Speed control mode (analog command) ・Torque control mode (analog command)	・Position control mode (pulse command) ・Speed control mode (analog command) ・Torque control mode (analog command)
9	Maximum input pulses	Differential pulse: 1 Mpulse/s Command pulse: Sink	Differential pulse: **4** Mpulses/s Command pulse: Sink
10	The number of DIO points (excluding EM1)	DI: 9 points, DO: 6 points	DI: 9 points, DO: 6 points
11	Encoder pulse output	A/B/Z-phase pulse (differential line driver)	A/B/Z-phase pulse (differential line driver)
12	DIO interface	input/output: sink/source	input/output: sink/source
13	Analog input/output	(Input) 2ch 10-bit torque, 14-bit speed or equivalent (Output) 10-bit or equivalent × 2ch	(Input) 2ch 10-bit torque, 14-bit speed or equivalent (Output) 10-bit or equivalent × 2ch
14	Number of internal speed commands	7 points	7 points
15	Parameter setting method	Setup software (SETUP221E) MR Configurator2 Push button	MR Configurator2 Push button
16	Setup software communication function	USB	USB
17	Servo motor (Encoder resolution)	HF-_P series (18-bit ABS) HA-_P series (18-bit ABS)	HG series (**22**-bit ABS)
18	Motor maximum torque	HF-SP 300%	HG-SR 300%
		HF-JP 300%	HG-JR 300%
		HA-LP 250%	**HG-JR 300%**
19	Button	4 buttons	4 buttons
20	LED display	7-segment 5-digit	7-segment 5-digit
21	Advanced vibration suppression control	Provided	Provided **(Advanced vibration suppression control II)**
22	Adaptive filter II	Provided	Provided
23	Notch filter	Provided (2 pcs)	Provided (5 pcs)
24	Tough drive	Unprovided	**Provided**
25	Drive recorder	Unprovided	**Provided**
26	Forced stop	EM1 (DB stop)	**EM1 (DB stop)/ EM2 (deceleration to a stop)**

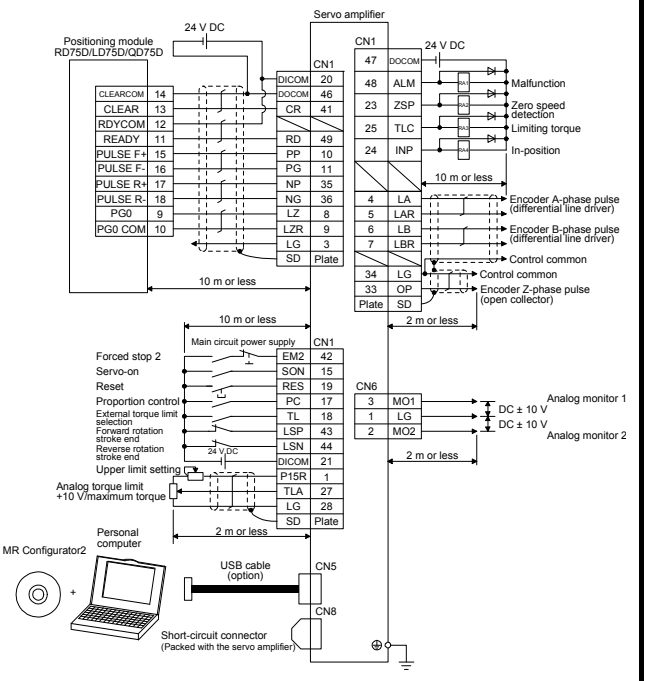
Note. For the coasting distance, refer to "1.2.3 Dynamic brake: coasting distance" in "Part 6 Common Reference Material".

3.2 Comparison of Standard Connection Diagrams

(1) Position control mode

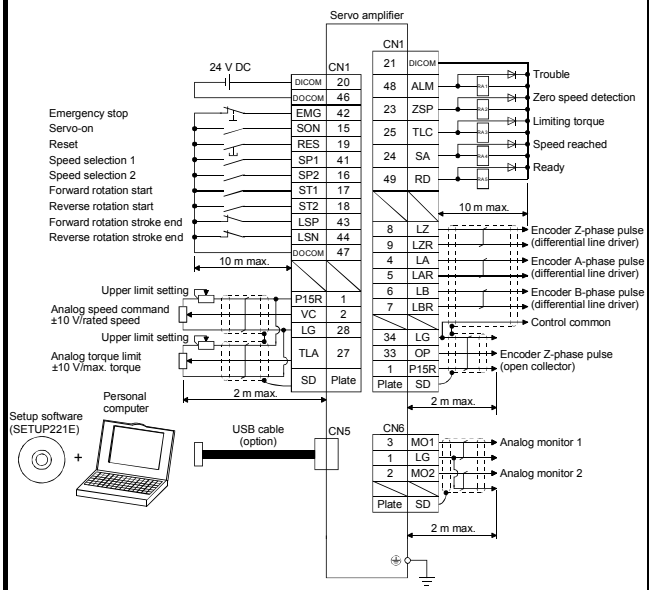
MR-J3-_A_	MR-J4-_A_
Example of connection to QD75D	Example of connection to QD75D

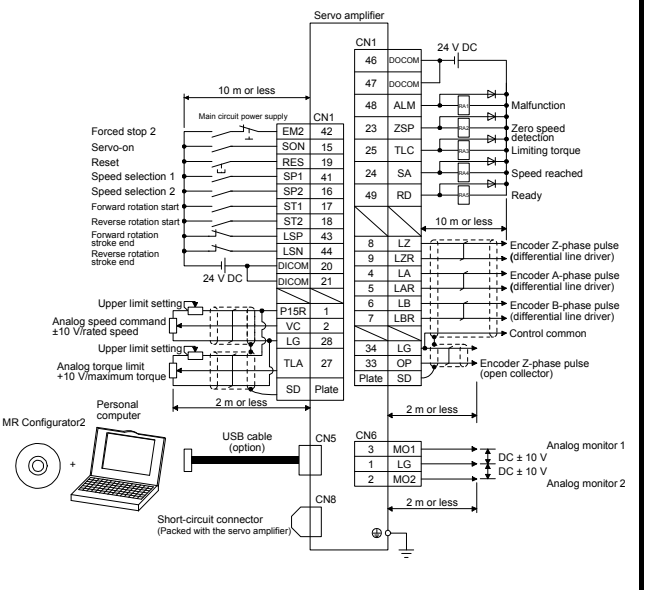




(2) Speed control mode

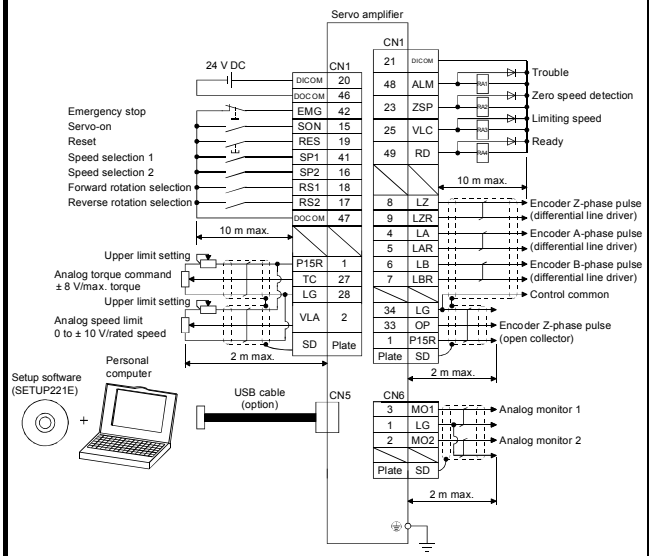
MR-J3-_A_	MR-J4-_A_

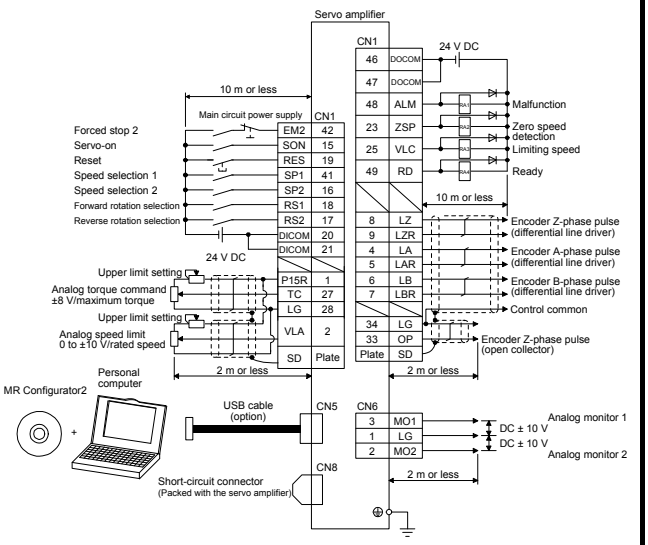




(3) Torque control mode

MR-J3-_A_	MR-J4-_A_



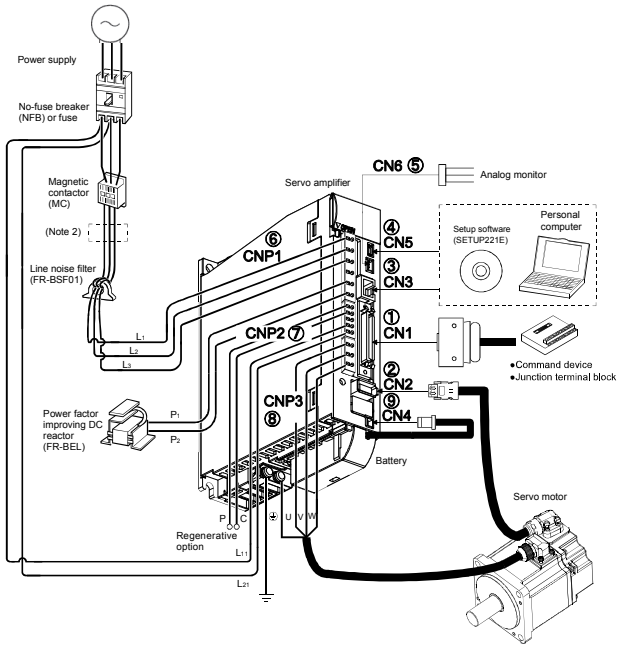


3.3 List of Corresponding Connectors and Terminal Blocks

(1) Connector comparison table

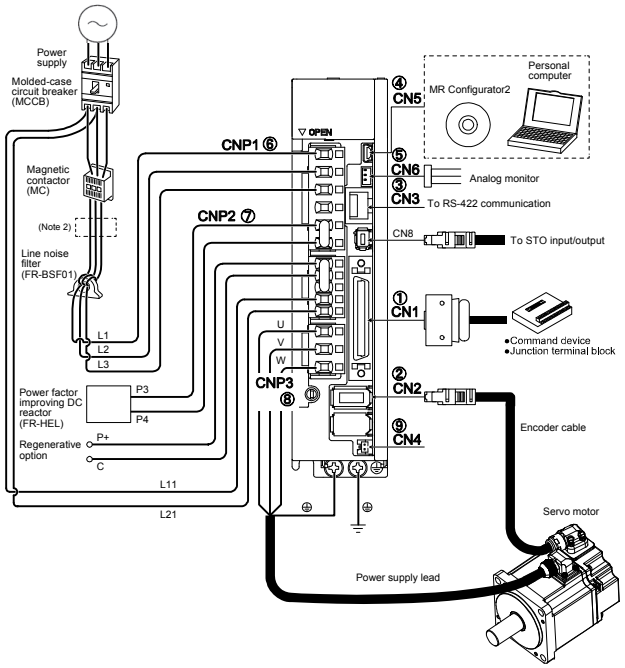
The following shows examples of connections with the peripheral equipment. For details of signals, refer to each servo amplifier instruction manual.

MR-J3-_A_



Note 1. The above configuration example is applied to MR-J3-200A or a system with less capacity.
2. The power factor improving AC reactor can also be used. In this case, the power factor improving DC reactor cannot be used.

MR-J4-_A_



Note 1. The above configuration example is applied to MR-J4-200A or a system with less capacity.
2. The power factor improving AC reactor can also be used. In this case, the power factor improving DC reactor cannot be used.

(2) List of connector and terminal block correspondence

MR-J3-_A_				MR-J4-_A_		Precautions
No.	Connector name	Connector No.		No.	Connector name	Connector No.	
①	I/O signal connector	CN1	→	①	I/O signal connector	CN1	
②	Encoder connector	CN2		②	Encoder connector	CN2	
③	RS-422 communication connector	CN3		③	RS-422 communication connector	CN3	
④	USB communication connector	CN5		④	USB communication connector	CN5	
⑤	Analog monitor connector	CN6		⑤	Main circuit power connector	CN6	
⑥	Main circuit power supply connector	CNP1		⑥	Main circuit power supply connector	CNP1	Switch to the power connector (enclosed with the amplifier).
⑦	Control circuit power supply connector	CNP2		⑦	Control circuit power supply connector	CNP2	
⑧	Servo motor power connector	CNP3		⑧	Servo motor power connector	CNP3	
⑨	Battery connector	CN4		⑨	Battery connector	CN4	Prepare a new battery.

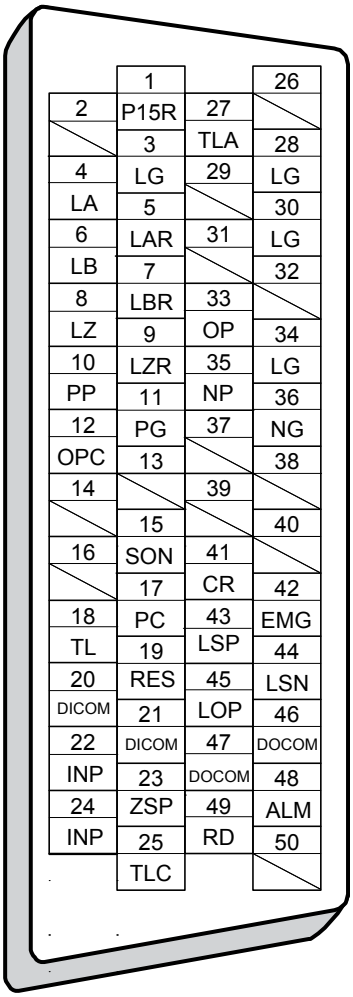
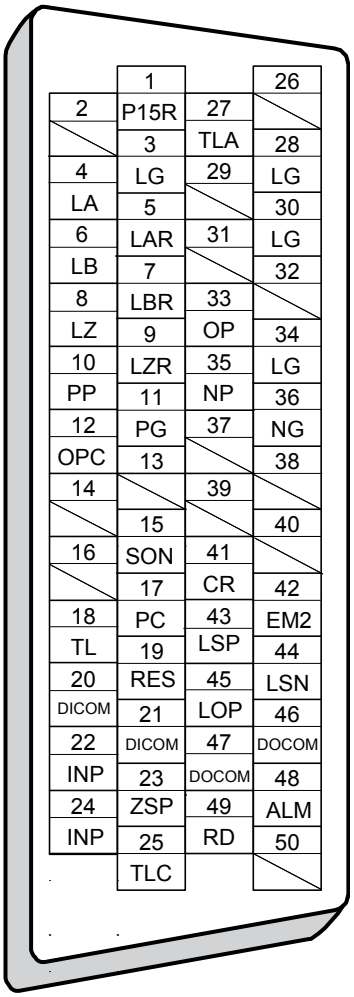
Note. When not using the STO function in MR-J4-_A_, attach the short-circuit connector supplied with the servo amplifier to CN8 (STO input signal connector).
The configuration of the main circuit terminal block differs depending on the capacity. Refer to "Part 6: Common Reference Material".

(3) Comparison of signals

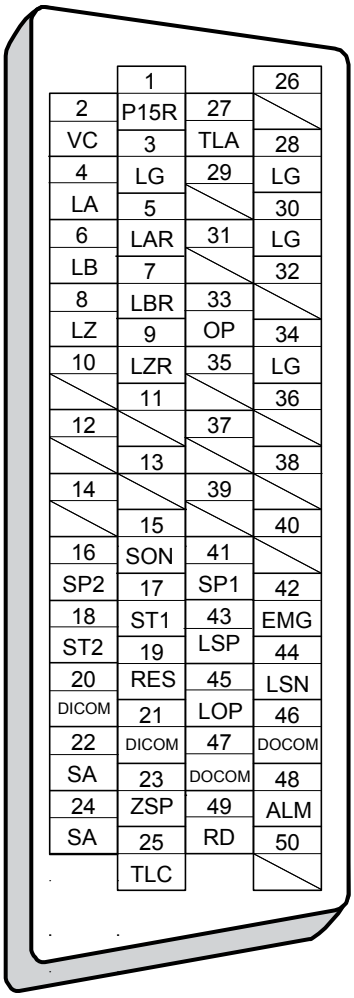
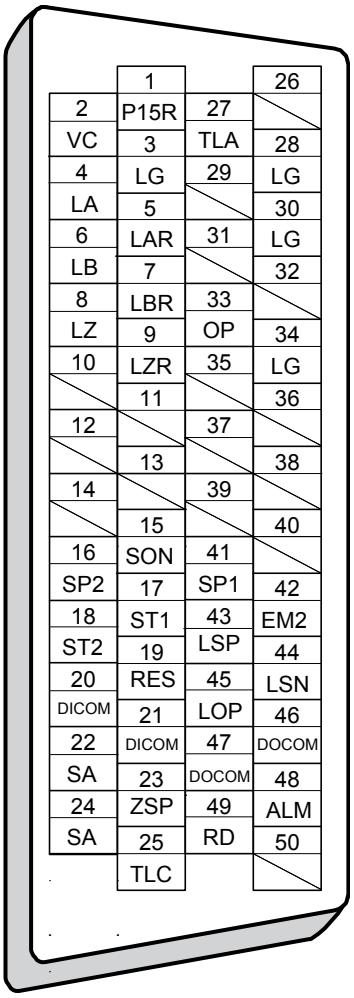
Signal abbreviations in parentheses are for MR-J4-_A_.

(a) CN1

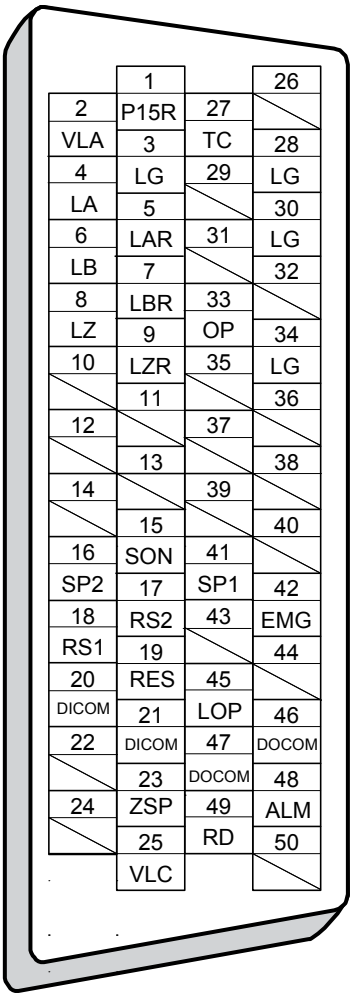
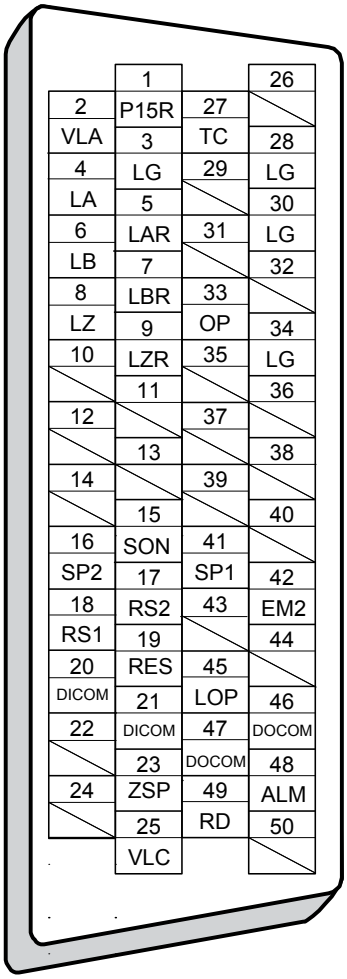
1) Position control mode

MR-J3-_A_		Signal abbreviation	MR-J4-_A_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
CN1 	CN1-1	P15R	CN1-1	CN1 
	CN1-2		CN1-2	
	CN1-3	LG	CN1-3	
	CN1-4	LA	CN1-4	
	CN1-5	LAR	CN1-5	
	CN1-6	LB	CN1-6	
	CN1-7	LBR	CN1-7	
	CN1-8	LZ	CN1-8	
	CN1-9	LZR	CN1-9	
	CN1-10	PP	CN1-10	
	CN1-11	PG	CN1-11	
	CN1-12	OPC	CN1-12	
	CN1-13		CN1-13	
	CN1-14		CN1-14	
	CN1-15	SON	CN1-15	
	CN1-16		CN1-16	
	CN1-17	PC	CN1-17	
	CN1-18	TL	CN1-18	
	CN1-19	RES	CN1-19	
	CN1-20	DICOM	CN1-20	
	CN1-21	DICOM	CN1-21	
	CN1-22	INP	CN1-22	
	CN1-23	ZSP	CN1-23	
	CN1-24	INP	CN1-24	
	CN1-25	TLC	CN1-25	
	CN1-26		CN1-26	
	CN1-27	TLA	CN1-27	
	CN1-28	LG	CN1-28	
	CN1-29		CN1-29	
	CN1-30	LG	CN1-30	
	CN1-31		CN1-31	
	CN1-32		CN1-32	
	CN1-33	OP	CN1-33	
	CN1-34	LG	CN1-34	
	CN1-35	NP	CN1-35	
	CN1-36	NG	CN1-36	
	CN1-37		CN1-37	
	CN1-38		CN1-38	
	CN1-39		CN1-39	
	CN1-40		CN1-40	
	CN1-41	CR	CN1-41	
	CN1-42	EMG (EM2)	CN1-42	
	CN1-43	LSP	CN1-43	
	CN1-44	LSN	CN1-44	
	CN1-45	LOP	CN1-45	
	CN1-46	DOCOM	CN1-46	
	CN1-47	DOCOM	CN1-47	
	CN1-48	ALM	CN1-48	
	CN1-49	RD	CN1-49	
	CN1-50		CN1-50	

2) Speed control mode

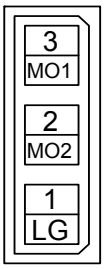
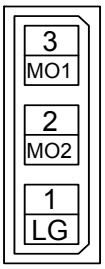
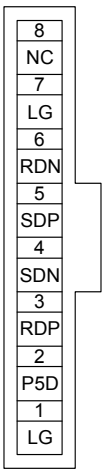
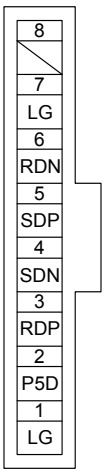
MR-J3-_A_		Signal abbreviation	MR-J4-_A_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
CN1 	CN1-1	P15R	CN1-1	CN1 
	CN1-2	VC	CN1-2	
	CN1-3	LG	CN1-3	
	CN1-4	LA	CN1-4	
	CN1-5	LAR	CN1-5	
	CN1-6	LB	CN1-6	
	CN1-7	LBR	CN1-7	
	CN1-8	LZ	CN1-8	
	CN1-9	LZR	CN1-9	
	CN1-10		CN1-10	
	CN1-11		CN1-11	
	CN1-12		CN1-12	
	CN1-13		CN1-13	
	CN1-14		CN1-14	
	CN1-15	SON	CN1-15	
	CN1-16	SP2	CN1-16	
	CN1-17	ST1	CN1-17	
	CN1-18	ST2	CN1-18	
	CN1-19	RES	CN1-19	
	CN1-20	DICOM	CN1-20	
	CN1-21	DICOM	CN1-21	
	CN1-22	SA	CN1-22	
	CN1-23	ZSP	CN1-23	
	CN1-24	SA	CN1-24	
	CN1-25	TLC	CN1-25	
	CN1-26		CN1-26	
	CN1-27	TLA	CN1-27	
	CN1-28	LG	CN1-28	
	CN1-29		CN1-29	
	CN1-30	LG	CN1-30	
	CN1-31		CN1-31	
	CN1-32		CN1-32	
	CN1-33	OP	CN1-33	
	CN1-34	LG	CN1-34	
	CN1-35		CN1-35	
	CN1-36		CN1-36	
	CN1-37		CN1-37	
	CN1-38		CN1-38	
	CN1-39		CN1-39	
	CN1-40		CN1-40	
	CN1-41	SP1	CN1-41	
	CN1-42	EMG (EM2)	CN1-42	
	CN1-43	LSP	CN1-43	
	CN1-44	LSN	CN1-44	
	CN1-45	LOP	CN1-45	
	CN1-46	DOCOM	CN1-46	
	CN1-47	DOCOM	CN1-47	
	CN1-48	ALM	CN1-48	
	CN1-49	RD	CN1-49	
	CN1-50		CN1-50	

3) Torque control mode

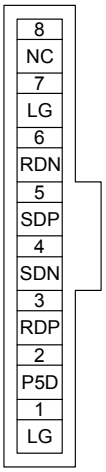
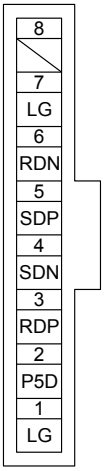
MR-J3-_A_		Signal abbreviation	MR-J4-_A_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
CN1 	CN1-1	P15R	CN1-1	CN1 
	CN1-2	VLA	CN1-2	
	CN1-3	LG	CN1-3	
	CN1-4	LA	CN1-4	
	CN1-5	LAR	CN1-5	
	CN1-6	LB	CN1-6	
	CN1-7	LBR	CN1-7	
	CN1-8	LZ	CN1-8	
	CN1-9	LZR	CN1-9	
	CN1-10		CN1-10	
	CN1-11		CN1-11	
	CN1-12		CN1-12	
	CN1-13		CN1-13	
	CN1-14		CN1-14	
	CN1-15	SON	CN1-15	
	CN1-16	SP2	CN1-16	
	CN1-17	RS2	CN1-17	
	CN1-18	RS1	CN1-18	
	CN1-19	RES	CN1-19	
	CN1-20	DICOM	CN1-20	
	CN1-21	DICOM	CN1-21	
	CN1-22		CN1-22	
	CN1-23	ZSP	CN1-23	
	CN1-24		CN1-24	
	CN1-25	VLC	CN1-25	
	CN1-26		CN1-26	
	CN1-27	TC	CN1-27	
	CN1-28	LG	CN1-28	
	CN1-29		CN1-29	
	CN1-30	LG	CN1-30	
	CN1-31		CN1-31	
	CN1-32		CN1-32	
	CN1-33	OP	CN1-33	
	CN1-34	LG	CN1-34	
	CN1-35		CN1-35	
	CN1-36		CN1-36	
	CN1-37		CN1-37	
	CN1-38		CN1-38	
	CN1-39		CN1-39	
	CN1-40		CN1-40	
	CN1-41	SP1	CN1-41	
	CN1-42	EMG (EM2)	CN1-42	
	CN1-43		CN1-43	
	CN1-44		CN1-44	
	CN1-45	LOP	CN1-45	
	CN1-46	DOCOM	CN1-46	
	CN1-47	DOCOM	CN1-47	
	CN1-48	ALM	CN1-48	
	CN1-49	RD	CN1-49	
	CN1-50		CN1-50	

(b) CN3

1) For 7 kW or less

MR-J3-_A_		Signal abbreviation	MR-J4-_A_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
CN6  	CN6-1	LG	CN6-1	CN6 
	CN6-2	MO1	CN6-2	
	CN6-3	MO2	CN6-3	
CN3  	CN3-1	LG	CN3-1	CN3 
	CN3-2	P5D	CN3-2	
	CN3-3	RDP	CN3-3	
	CN3-4	SDN	CN3-4	
	CN3-5	SDP	CN3-5	
	CN3-6	RDN	CN3-6	
	CN3-7	LG	CN3-7	
	CN3-8	NC (-)	CN3-8	

2) For 11 kW to 22 kW

MR-J3-_A_		Signal abbreviation	MR-J4-_A_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
CN3  	CN3-1	LG	CN3-1	CN3 
	CN3-2	P5D	CN3-2	
	CN3-3	RDP	CN3-3	
	CN3-4	SDN	CN3-4	
	CN3-5	SDP	CN3-5	
	CN3-6	RDN	CN3-6	
	CN3-7	LG	CN3-7	
	CN3-8	NC (-)	CN3-8	

3.4 Comparison of Peripheral Equipment

POINT
●Refer to "Part 8: Replacement of Optional Peripheral Equipment".

3.5 Comparison of Parameters

⚠CAUTION

- Never perform extreme adjustments and changes to the parameters, otherwise the operation may become unstable.
- If fixed values are written in the digits of a parameter, do not change these values.
- Do not change parameters for manufacturer setting.
- Do not enter any setting value other than those specified for each parameter.

POINT

- For the parameter converter function, refer to "Part 6: Common Reference Material".
- To enable a parameter whose abbreviation is preceded by *, turn the power OFF and then ON after setting the parameter.
- For details about parameter settings for replacement, refer to the "MR-J4-_A_ Servo Amplifier Instruction Manual".
- With MR-J4-_A_, the deceleration to a stop function is enabled by factory settings. To disable the deceleration to a stop function, set [Pr. PA04] to "0 _ _ _".

3.5.1 Setting requisite parameters upon replacement

The parameters shown in this section are a minimum number of parameters that need to be set for simultaneous replacement. Depending on the settings of the currently used amplifier, parameters other than these may need to be set.

(1) Parameters common to position control mode, speed control mode, and torque control mode

MR-J3-_A_		MR-J4-_A_		Precautions
No.	Name	No.	Name	
PA02	Regenerative option	PA02	Regenerative option	The setting value must be changed to use the regenerative option added for J4-A.
PA04	CN1-23 pin function selection			No corresponding parameter (Can substitute with PD23 to PD26, PD28.)
PA05	Number of command input pulses per revolution	PA05	Number of command input pulses per revolution	The setting value must be changed according to the encoder resolution.
PA06	Electronic gear numerator	PA06	Electronic gear numerator	The setting value must be changed according to PA21 (Electronic gear selection). When J3-A: PA05 = 0 → J4-A: PA21 = 2_ _ _ (Set the values of PA06 and PA07 for J3.) When J3-A: PA05 = other than 0 → J4-A: PA21 = 1_ _ _
PA07	Electronic gear denominator	PA07	Electronic gear denominator	
PA09	Auto tuning response	PA09	Auto tuning response	The setting value must be changed based on machine resonance frequency.
PB06	Load to motor inertia ratio	PB06	Load to motor inertia ratio	The unit system is different. (0.1 times → 0.01 times) Check the setting value.
PB07	Model loop gain	PB07	Model loop gain	The unit system is different. (rad/s → 0.1 rad/s)
PB08	Position loop gain	PB08	Position loop gain	The unit system is different. (rad/s → 0.1 rad/s)
PB29	Load to motor inertia ratio after gain switching	PB29	Load to motor inertia ratio after gain switching	The unit system is different. (0.1 times → 0.01 times) Check the setting value.
PB30	Position loop gain after gain switching	PB30	Position loop gain after gain switching	The unit system is different. (rad/s → 0.1 rad/s)

MR-J3-_A_		MR-J4-_A_		Precautions
No.	Name	No.	Name	
PC14	Analog monitor 1 output	PC14	Analog monitor 1 output	When the command pulse frequency is selected (±10 V/1 Mpulses/s → ±10 V/4 Mpulses/s)
PC15	Analog monitor 2 output	PC15	Analog monitor 2 output	When the command pulse frequency is selected (±10 V/1 Mpulses/s → ±10 V/4 Mpulses/s)
PC22	Restart after instantaneous power failure selection Encoder cable communication method selection	PC22	Encoder cable communication method selection	"Restart after instantaneous power failure selection" is not supported.
PC37	Analog speed command offset/ Analog speed limit offset	PC37	Analog speed command offset/ Analog speed limit offset	Depends on hardware. The setting values must be changed.
PC38	Analog torque command offset/ Analog torque limit offset	PC38	Analog torque command offset/ Analog torque limit offset	Depends on hardware. The setting values must be changed.
PC39	Analog monitor 1 offset	PC39	Analog monitor 1 offset	Depends on hardware. The setting values must be changed.
PC40	Analog monitor 2 offset	PC40	Analog monitor 2 offset	Depends on hardware. The setting values must be changed.
PD03	Input signal device selection 1 (CN1-15)	PD03	Input device selection 1L	
		PD04	Input device selection 1H	
PD04	Input signal device selection 2 (CN1-16)	PD05	Input device selection 2L	
		PD06	Input device selection 2H	
PD05	Input signal device selection 3 (CN1-17)	PD07	Input device selection 3L	
		PD08	Input device selection 3H	
PD06	Input signal device selection 4 (CN1-18)	PD09	Input device selection 4L	
		PD10	Input device selection 4H	
PD07	Input signal device selection 5 (CN1-19)	PD11	Input device selection 5L	
		PD12	Input device selection 5H	
PD08	Input signal device selection 6 (CN1-41)	PD13	Input device selection 6L	
		PD14	Input device selection 6H	
PD10	Input signal device selection 8 (CN1-43)	PD17	Input device selection 8L	
		PD18	Input device selection 8H	
PD11	Input signal device selection 9 (CN1-44)	PD19	Input device selection 9L	
		PD20	Input device selection 9H	
PD12	Input signal device selection 10 (CN1-45)	PD21	Input device selection 10L	
		PD22	Input device selection 10H	
PD13	Output signal device selection 1 (CN1-22)	PD23	Output device selection 1	The setting value 06 (DB) is added.
PD14	Output signal device selection 2 (CN1-23)	PD24	Output device selection 2	The setting value 06 (DB) is added.
PD15	Output signal device selection 3 (CN1-24)	PD25	Output device selection 3	The setting value 06 (DB) is added.
PD16	Output signal device selection 4 (CN1-25)	PD26	Output device selection 4	The setting value 06 (DB) is added.
PD18	Output signal device selection 6 (CN1-49)	PD28	Output device selection 6	The setting value 06 (DB) is added.
PD19	Input filter setting	PD29	Input filter setting	The filter setting value differs.
PD20	Function selection D-1	PD30	Function selection D-1	
PD22	Function selection D-3	PD32	Function selection D-3	
PD24	Function selection D-5	PD34	Function selection D-5	

3.5.2 Parameter comparison list

MR-J3-_A_ parameters					MR-J4-_A_ parameters				
No.	Abbreviation	Parameter name	Initial value	Customer setting value	No.	Abbreviation	Parameter name	Initial value	Customer setting value
PA01	*STY	Control mode	0000h		PA01	*STY	Operation mode	1000h	
PA02	*REG	Regenerative option	0000h		PA02	*REG	Regenerative option	0000h	
PA03	*ABS	Absolute position detection system	0000h		PA03	*ABS	Absolute position detection system	0000h	
PA04	*AOP1	Function selection A-1	0000h		PD23	*DO1	Output device selection 1	0004h	
					PD24	*DO2	Output device selection 2	000Ch	
					PD25	*DO3	Output device selection 3	0004h	
					PD26	*DO4	Output device selection 4	0007h	
					PD28	*DO6	Output device selection 6	0002h	
PA05	*FBP	Number of command input pulses per revolution	0		PA05	*FBP	Number of command input pulses per revolution	10000	
PA06	CMX	Electronic gear numerator (Command pulse multiplying factor numerator)	1		PA06	CMX	Electronic gear numerator (command pulse multiplication numerator)	1	
PA07	CDV	Electronic gear denominator (Command pulse multiplying factor denominator)	1		PA07	CDV	Electronic gear denominator (command pulse multiplication denominator)	1	
PA08	ATU	Auto tuning mode	0001h		PA08	ATU	Auto tuning mode	0001h	
PA09	RSP	Auto tuning response	12		PA09	RSP	Auto tuning response	16	
PA10	INP	In-position range	100		PA10	INP	In-position range	100	
PA11	TLP	Forward rotation torque limit	100.0		PA11	TLP	Forward rotation torque limit	100.0	
PA12	TLN	Reverse rotation torque limit	100.0		PA12	TLN	Reverse rotation torque limit	100.0	
PA13	*PLSS	Command pulse input form	0000h		PA13	*PLSS	Command pulse input form	0100h	
PA14	*POL	Rotation direction selection	0		PA14	*POL	Rotation direction selection	0	
PA15	*ENR	Encoder output pulses	4000		PA15	*ENR	Encoder output pulses	4000	
PA16		For manufacturer setting	0000h		PA16	*ENR2	Encoder output pulses 2	1	
PA17			0000h		PA17	*MSR	Servo motor series setting	0000h	
PA18			0000h		PA18	*MTY	Servo motor type setting	0000h	
PA19	*BLK	Parameter write inhibit	000Bh		PA19	*BLK	Parameter writing inhibit	00AAh	
PB01	FILT	Adaptive tuning mode (Adaptive filter II)	0000h		PB01	FILT	Adaptive tuning mode (adaptive filter II)	0000h	
PB02	VRFT	Vibration suppression control tuning mode (Advanced vibration suppression control)	0000h		PB02	VRFT	Vibration suppression control tuning mode (advanced vibration suppression control II)	0000h	
PB03	PST	Position command acceleration/deceleration time constant (Position smoothing)	0		PB03	PST	Position command acceleration/deceleration time constant (position smoothing)	0	
PB04	FFC	Feed forward gain	0		PB04	FFC	Feed forward gain	0	
PB05		For manufacturer setting	500		PB05		For manufacturer setting	500	
PB06	GD2	Ratio of load inertia moment to servo motor inertia moment	7.0		PB06	GD2	Load to motor inertia ratio/load to motor mass ratio	7.00	
PB07	PG1	Model loop gain	24		PB07	PG1	Model loop gain (Note)	15.0	
PB08	PG2	Position loop gain	37		PB08	PG2	Position loop gain (Note)	37.0	
PB09	VG2	Speed loop gain	823		PB09	VG2	Speed loop gain (Note)	823	
PB10	VIC	Speed integral compensation	33.7		PB10	VIC	Speed integral compensation (Note)	33.7	
PB11	VDC	Speed differential compensation	980		PB11	VDC	Speed differential compensation (Note)	980	
PB12		For manufacturer setting	0		PB12	OVA	Overshoot amount compensation	0	
PB13	NH1	Machine resonance suppression filter 1	4500		PB13	NH1	Machine resonance suppression filter 1	4500	
PB14	NHQ1	Notch shape selection 1	0000h		PB14	NHQ1	Notch shape selection 1	0000h	
PB15	NH2	Machine resonance suppression filter 2	4500		PB15	NH2	Machine resonance suppression filter 2	4500	
PB16	NHQ2	Notch shape selection 2	0000h		PB16	NHQ2	Notch shape selection 2	0000h	

Note. Parameters related to gain adjustment are different from those for the MR-J3_A_ servo amplifier. For gain adjustment, refer to "MR-J4_A_ Servo Amplifier Instruction Manual".

MR-J3-_A_ parameters					MR-J4-_A_ parameters				
No.	Abbreviation	Parameter name	Initial value	Customer setting value	No.	Abbreviation	Parameter name	Initial value	Customer setting value
PB17		Automatic setting parameter			PB17	NHF	Shaft resonance suppression filter	0000h	
PB18	LPF	Low-pass filter setting	3141		PB18	LPF	Low-pass filter setting	3141	
PB19	VRF1	Vibration suppression control vibration frequency setting	100.0		PB19	VRF11	Vibration suppression control 1 - Vibration frequency	100.0	
PB20	VRF2	Vibration suppression control resonance frequency setting	100.0		PB20	VRF12	Vibration suppression control 1 - Resonance frequency	100.0	
PB21		For manufacturer setting	0.00		PB21	VRF13	Vibration suppression control 1 - Vibration frequency damping	0.00	
PB22			0.00		PB22	VRF14	Vibration suppression control 1 - Resonance frequency damping	0.00	
PB23	VFBF	Low-pass filter selection	0000h		PB23	VFBF	Low-pass filter selection	0000h	
PB24	*MVS	Slight vibration suppression control selection	0000h		PB24	*MVS	Slight vibration suppression control	0000h	
PB25	*BOP1	Function selection B-1	0000h		PB25	*BOP1	Function selection B-1	0000h	
PB26	*CDP	Gain changing selection	0000h		PB26	*CDP	Gain switching function	0000h	
PB27	CDL	Gain changing condition	10		PB27	CDL	Gain switching condition	10	
PB28	CDT	Gain changing time constant	1		PB28	CDT	Gain switching time constant	1	
PB29	GD2B	Gain changing ratio of load inertia moment to servo motor inertia moment	7.0		PB29	GD2B	Load to motor inertia ratio/load to motor mass ratio after gain switching	7.00	
PB30	PG2B	Gain changing position loop gain	37		PB30	PG2B	Position loop gain after gain switching	0.0	
PB31	VG2B	Gain changing speed loop gain	823		PB31	VG2B	Speed loop gain after gain switching	0	
PB32	VICB	Gain changing speed integral compensation	33.7		PB32	VICB	Speed integral compensation after gain switching	0.0	
PB33	VRF1B	Gain changing vibration suppression control vibration frequency setting	100.0		PB33	VRF1B	Vibration suppression control 1 - Vibration frequency after gain switching	0.0	
PB34	VRF2B	Gain changing vibration suppression control resonance frequency setting	100.0		PB34	VRF2B	Vibration suppression control 1 - Resonance frequency after gain switching	0.0	
PB35		For manufacturer setting	0.00		PB35	VRF3B	Vibration suppression control 1 - Vibration frequency damping after gain switching	0.00	
PB36			0.00		PB36	VRF4B	Vibration suppression control 1 - Resonance frequency damping after gain switching	0.00	
PB37			100		PB37		For manufacturer setting	1600	
PB38			0.0		PB38			0.00	
PB39			0.0		PB39			0.00	
PB40			0.0		PB40			0.00	
PB41			1125		PB41			0000h	
PB42			1125		PB42			0000h	
PB43			0004h		PB43			0000h	
PB44			0000h		PB44			0.00	
PB45			0000h		PB45	CNHF	Command notch filter	0000h	
PC01	STA	Acceleration time constant	0		PC01	STA	Acceleration time constant	0	
PC02	STB	Deceleration time constant	0		PC02	STB	Deceleration time constant	0	
PC03	STC	S-pattern acceleration/ deceleration time constant	0		PC03	STC	S-pattern acceleration/ deceleration time constant	0	
PC04	TQC	Torque command time constant	0		PC04	TQC	Torque command time constant/ thrust command time constant	0	
PC05	SC1	Internal speed command 1	100		PC05	SC1	Internal speed command 1	100	
		Internal speed limit 1					Internal speed limit 1		
PC06	SC2	Internal speed command 2	500		PC06	SC2	Internal speed command 2	500	
		Internal speed limit 2					Internal speed limit 2		
PC07	SC3	Internal speed command 3	1000		PC07	SC3	Internal speed command 3	1000	
		Internal speed limit 3					Internal speed limit 3		
PC08	SC4	Internal speed command 4	200		PC08	SC4	Internal speed command 4	200	
		Internal speed limit 4					Internal speed limit 4		
PC09	SC5	Internal speed command 5	300		PC09	SC5	Internal speed command 5	300	
		Internal speed limit 5					Internal speed limit 5		

MR-J3-_A_ parameters					MR-J4-_A_ parameters				
No.	Abbreviation	Parameter name	Initial value	Customer setting value	No.	Abbreviation	Parameter name	Initial value	Customer setting value
PC10	SC6	Internal speed command 6	500		PC10	SC6	Internal speed command 6	500	
		Internal speed limit 6					Internal speed limit 6		
PC11	SC7	Internal speed command 7	800		PC11	SC7	Internal speed command 7	800	
		Internal speed limit 7					Internal speed limit 7		
PC12	VCM	Analog speed command maximum speed	0		PC12	VCM	Analog speed command - Maximum speed	0	
		Analog speed limit maximum speed					Analog speed limit - Maximum speed		
PC13	TLC	Analog torque command maximum output	100.0		PC13	TLC	Analog torque command maximum output	100.0	
PC14	MOD1	Analog monitor 1 output	0000h		PC14	MOD1	Analog monitor 1 output	0000h	
PC15	MOD2	Analog monitor 2 output	0001h		PC15	MOD2	Analog monitor 2 output	0001h	
PC16	MBR	Electromagnetic brake sequence output	100		PC16	MBR	Electromagnetic brake sequence output	0	
PC17	ZSP	Zero speed	50		PC17	ZSP	Zero speed	50	
PC18	*BPS	Alarm history clear	0000h		PC18	*BPS	Alarm history clear	0000h	
PC19	*ENRS	Encoder output pulses selection	0000h		PC19	*ENRS	Encoder output pulse selection	0000h	
PC20	*SNO	Station number setting	0		PC20	*SNO	Station No. setting	0	
PC21	*SOP	Absolute position detection system	0000h		PC21	*SOP	RS-422 communication function selection (RS232C communication is not available.)	0000h	
PC22	*COP1	Function selection C-1	0000h		PC22	*COP1	Function selection C-1	0000h	
PC23	*COP2	Function selection C-2	0000h		PC23	*COP2	Function selection C-2	0000h	
PC24	*COP3	Function selection C-3	0000h		PC24	*COP3	Function selection C-3	0000h	
PC25		For manufacturer setting	0000h		PC25		For manufacturer setting	0000h	
PC26	*COP5	Function selection C-5	0000h		PC26	*COP5	Function selection C-5	0000h	
PC27	*COP6	Function selection C-6	0000h		PC27	*COP6	Function selection C-6	0000h	
PC28		For manufacturer setting	0000h		PC28	*COP7	Function selection C-7	0000h	
PC29			0000h		PC29		For manufacturer setting	0000h	
PC30	STA2	Acceleration time constant 2	0		PC30	STA2	Acceleration time constant 2	0	
PC31	STB2	Deceleration time constant 2	0		PC31	STB2	Deceleration time constant 2	0	
PC32	CMX2	Command pulse multiplying factor numerator 2	1		PC32	CMX2	Command input pulse multiplication numerator 2	1	
PC33	CMX3	Command pulse multiplying factor numerator 3	1		PC33	CMX3	Command input pulse multiplication numerator 3	1	
PC34	CMX4	Command pulse multiplying factor numerator 4	1		PC34	CMX4	Command input pulse multiplication numerator 4	1	
PC35	TL2	Internal torque limit 2	100.0		PC35	TL2	Internal torque limit 2/internal thrust limit 2	100.0	
PC36	*DMD	Status display selection	0000h		PC36	*DMD	Status display selection	0000h	
PC37	VCO	Absolute position detection system	0		PC37	VCO	Analog speed command offset	The value differs depending on the servo amplifiers	
		Analog speed limit offset					Analog speed limit offset		
PC38	TPO	Analog torque command offset	0		PC38	TPO	Analog torque command offset	0	
		Analog torque limit offset					Analog torque limit offset		
PC39	MO1	Analog monitor 1 offset	0		PC39	MO1	Analog monitor 1 offset	0	
PC40	MO2	Analog monitor 2 offset	0		PC40	MO2	Analog monitor 2 offset	0	
PC41		For manufacturer setting	0		PC41		For manufacturer setting	0	
PC42			0		PC42			0	
PC43			0000h		PC43	ERZ	Error excessive alarm detection level	0000h	
PC44			0000h		PC44	*COP9	Function selection C-9	0000h	
PC45			0000h		PC45	*COPA	Function selection C-A	0000h	
PC46			0000h		PC46		For manufacturer setting	0	
PC47			0000h		PC47			0	
PC48			0000h		PC48			0	
PC49			0000h		PC49			0	
PC50			0000h		PC50			0000h	

MR-J3-_A_ parameters					MR-J4-_A_ parameters				
No.	Abbreviation	Parameter name	Initial value	Customer setting value	No.	Abbreviation	Parameter name	Initial value	Customer setting value
PD01	*DIA1	Input signal automatic ON selection 1	0000h		PD01	*DIA1	Input signal automatic on selection 1	0000h	
PD02		For manufacturer setting	0000h		PD02		For manufacturer setting	0000h	
PD03	*DI1	Input signal device selection 1 (CN1-15)	00020202h		PD03	*DI1L	Input device selection 1L	0202h	
					PD04	*DI1H	Input device selection 1H	0002h	
PD04	*DI2	Input signal device selection 2 (CN1-16)	00212100h		PD05	*DI2L	Input device selection 2L	2100h	
					PD06	*DI2H	Input device selection 2H	2021h	
PD05	*DI3	Input signal device selection 3 (CN1-17)	00070704h		PD07	*DI3L	Input device selection 3L	0704h	
					PD08	*DI3H	Input device selection 3H	0707h	
PD06	*DI4	Input signal device selection 4 (CN1-18)	00080805h		PD09	*DI4L	Input device selection 4L	0805h	
					PD10	*DI4H	Input device selection 4H	0808h	
PD07	*DI5	Input signal device selection 5 (CN1-19)	00030303h		PD11	*DI5L	Input device selection 5L	0303h	
					PD12	*DI5H	Input device selection 5H	3803h	
PD08	*DI6	Input signal device selection 6 (CN1-41)	00202006h		PD13	*DI6L	Input device selection 6L	2006h	
					PD14	*DI6H	Input device selection 6H	3920h	
PD09		For manufacturer setting	00000000h		PD15		For manufacturer setting	0000h	
					PD16			0000h	
PD10	*DI8	Input signal device selection 8 (CN1-43)	00000A0Ah		PD17	*DI8L	Input device selection 8L	0A0Ah	
					PD18	*DI8H	Input device selection 8H	0A00h	
PD11	*DI9	Input signal device selection 9 (CN1-44)	00000B0Bh		PD19	*DI9L	Input device selection 9L	0B0Bh	
					PD20	*DI9H	Input device selection 9H	0B00h	
PD12	*DI10	Input signal device selection 10 (CN1-45)	00232323h		PD21	*DI10L	Input device selection 10L	2323h	
					PD22	*DI10H	Input device selection 10H	2B23h	
PD13	*DO1	Output signal device selection 1 (CN1-22)	0004h		PD23	*DO1	Output device selection 1	0004h	
PD14	*DO2	Output signal device selection 2 (CN1-23)	000Ch		PD24	*DO2	Output device selection 2	000Ch	
PD15	*DO3	Output signal device selection 3 (CN1-24)	0004h		PD25	*DO3	Output device selection 3	0004h	
PD16	*DO4	Output signal device selection 4 (CN1-25)	0007h		PD26	*DO4	Output device selection 4	0007h	
PD17		For manufacturer setting	0003h		PD27		For manufacturer setting	0003h	
PD18	*DO6	Output signal device selection 6 (CN1-49)	0002h		PD28	*DO6	Output device selection 6	0002h	
PD19	*DIF	Input filter setting	0002h		PD29	*DIF	Input filter setting	0004h	
PD20	*DOP1	Function selection D-1	0000h		PD30	*DOP1	Function selection D-1	0000h	
PD21		For manufacturer setting	0000h		PD31	*DOP2	Function selection D-2	0000h	
PD22	*DOP3	Function selection D-3	0000h		PD32	*DOP3	Function selection D-3	0000h	
PD23		For manufacturer setting	0000h		PD33	*DOP4	Function selection D-4	0000h	
PD24	*DOP5	Function selection D-5	0000h		PD34	*DOP5	Function selection D-5	0000h	
PD25		For manufacturer setting	0000h		PD35		For manufacturer setting	0000h	
PD26			0000h		PD36			0000h	
PD27			0000h		PD37			0000h	
PD28			0000h		PD38			0	
PD29			0000h		PD39			0	
PD30			0000h		PD40			0	

3.5.3 Comparison of parameter details

POINT

●The symbols in the control mode column mean the following control modes.
P: Position control mode
S: Speed control mode
T: Torque control mode

●Differences between the MR-J3 servo amplifier and the MR-J4 servo amplifier are described in "Name and function".
"Same setting as MR-J3": The same setting as that for MR-J3 can be used.
(Some functions and models are added for MR-J4.)
"Same as MR-J3": The same setting as that for MR-J3 can be used.

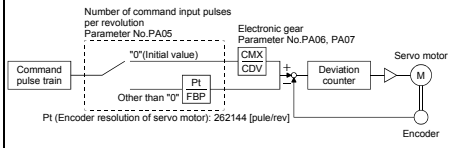
MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PA01	Control mode Turn off the power and then on again after setting the parameter to validate the parameter value. Set the control mode and control loop composition of the servo amplifier. 0 0 0 x: Selection of control mode 0: Position control mode 1: Position control mode and speed control mode 2: Speed control mode 3: Speed control mode and torque control mode 4: Torque control mode 5: Torque control mode and position control mode	0000h	PA01	Operation mode _ _ _ x: Control mode selection Select a control mode. 0: Position control mode 1: Position control mode and speed control mode 2: Speed control mode 3: Speed control mode and torque control mode 4: Torque control mode 5: Torque control mode and position control mode	0h	P S T
				_ _ x _: Operation mode selection 0: Standard control mode Setting other than above will trigger [AL. 37 Parameter error].	0h	P S T
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: For manufacturer setting	1h	

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PA02	Regenerative option Turn off the power and then on again after setting the parameter to validate the parameter value. Incorrect setting may cause the regenerative option to burn. If the regenerative option selected is not for use with the servo amplifier, [AL. 37 Parameter error] occurs. Set this parameter when using the regenerative option, brake unit, power regenerative converter, or power regenerative common converter. 0 0 x x: Selection of regenerative option 00: Regenerative option is not used ▪ For servo amplifier of 100 W, regenerative resistor is not used. ▪ For servo amplifier of 0.2 kW to 7 kW, built-in regenerative resistor is used. ▪ Supplied regenerative resistors or regenerative option is used with the servo amplifier of 11 kW to 22 kW. 01: FR-BU2-(H)/FR-RC-(H)/FR-CV-(H) 02: MR-RB032 03: MR-RB12 04: MR-RB32 05: MR-RB30 06: MR-RB50 (Cooling fanis required) 08: MR-RB31 09: MR-RB51 (Cooling fanis required) 80: MR-RB1H-4 81: MR-RB3M-4 (Cooling fanis required) 82: MR-RB3G-4 (Cooling fanis required) 83: MR-RB5G-4 (Cooling fanis required) 84: MR-RB34-4 (Cooling fanis required) 85: MR-RB54-4 (Cooling fanis required) FA: When the supplied regenerative resistor is cooled by the cooling fan to increase the ability with the servo amplifier of 11 kW to 22 kW.	0000h	PA02	Same setting as MR-J3 Regenerative option _ _ x x: Select the regenerative option. Incorrect setting may cause the regenerative option to burn. If a selected regenerative option is not for use with the servo amplifier, [AL. 37 Parameter error] occurs. 00: Regenerative option is not used. ▪ For the servo amplifier of 100 W, a regenerative resistor is not used. ▪ For the servo amplifier of 0.2 kW to 7 kW, the built-in regenerative resistor is used. ▪ The supplied regenerative resistor or a regenerative option is used with the servo amplifier of 11 kW to 22 kW. 01: FR-RC-(H)/FR-CV-(H)/FR-BU2-(H) When you use FR-RC-(H) or FR-CV-(H), select "Mode 2 (_ _ _ 1)" of "Undervoltage alarm detection mode selection" in [Pr. PC27]. 02: MR-RB032 03: MR-RB12 04: MR-RB32 05: MR-RB30 06: MR-RB50 (Cooling fan is required.) 08: MR-RB31 09: MR-RB51 (Cooling fan is required.) 0B: MR-RB3N 0C: MR-RB5N (Cooling fan is required.) 80: MR-RB1H-4 81: MR-RB3M-4 (Cooling fan is required.) 82: MR-RB3G-4 (Cooling fan is required.) 83: MR-RB5G-4 (Cooling fan is required.) 84: MR-RB34-4 (Cooling fan is required.) 85: MR-RB54-4 (Cooling fan is required.) 91: MR-RB3U-4 (Cooling fan is required.) 92: MR-RB5U-4 (Cooling fan is required.) FA: When the supplied regenerative resistor or a regenerative option used with the servo amplifier of 11 kW to 22 kW is cooled by a cooling fan to increase regenerative ability.	00h	P S T
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: For manufacturer setting	0h	

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PA03</td><td>Absolute position detection system
Turn off the power and then on again after setting the parameter to validate the parameter value.
Set this parameter when using the absolute position detection system in the position control mode.

0 0 0 x:
Selection of absolute position detection system
0: Used in incremental system
1: Used in absolute position detection system ABS transfer by DI0
2: Used in absolute position detection system ABS transfer by communication</td><td>0000h</td><td>PA03</td><td>Same setting as MR-J3
Absolute position detection system
_ _ _ x:
Absolute position detection system selection
Set this digit when using the absolute position detection system in the position control mode.
0: Disabled (incremental system)
1: Enabled (absolute position detection system by DIO)
2: Enabled (absolute position detection system by communication) (available for the software version A3 or later)</td><td>0h</td><td>P</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td>PA04</td><td>Function selection A-1
Turn off the power and then on again after setting the parameter to validate the parameter value.
Set this parameter when assigning the electromagnetic brake to the CN1-23 pin.

0 0 0 x:
CN1-23 pin function selection
0: Output device assigned with [Pr. PD14]
1: Electromagnetic brake interlock (MBR)</td><td>0000h</td><td>PD24</td><td>Output device selection 2
_ _ x x:
Device selection
Any output device can be assigned to the CN1-23 pin.
When "Enabled (absolute position detection system by DIO) (_ _ _ 1)" is selected in [Pr. PA03], the CN1-23 pin will become ABSB1 (ABS send data bit 1) only during ABS transfer mode.
Refer to table 2.1 in [Pr. PD23] for settings.
Table 2.1 Selectable output devices
<table><tr><th rowspan="2">Setting value</th><th colspan="3">Output device (Note)</th></tr><tr><th>P</th><th>S</th><th>T</th></tr><tr><td>_ _ 00</td><td>Always off</td><td>Always off</td><td>Always off</td></tr><tr><td>_ _ 02</td><td>RD</td><td>RD</td><td>RD</td></tr><tr><td>_ _ 03</td><td>ALM</td><td>ALM</td><td>ALM</td></tr><tr><td>_ _ 04</td><td>INP</td><td>SA</td><td>Always off</td></tr><tr><td>_ _ 05</td><td>MBR</td><td>MBR</td><td>MBR</td></tr><tr><td>_ _ 06</td><td>DB</td><td>DB</td><td>DB</td></tr><tr><td>_ _ 07</td><td>TLC</td><td>TLC</td><td>VLC</td></tr><tr><td>_ _ 08</td><td>WNG</td><td>WNG</td><td>WNG</td></tr><tr><td>_ _ 09</td><td>BWNG</td><td>BWNG</td><td>BWNG</td></tr><tr><td>_ _ 0A</td><td>Always off</td><td>SA</td><td>Always off</td></tr><tr><td>_ _ 0B</td><td>Always off</td><td>Always off</td><td>VLC</td></tr><tr><td>_ _ 0C</td><td>ZSP</td><td>ZSP</td><td>ZSP</td></tr><tr><td>_ _ 0D</td><td>MTTR</td><td>MTTR</td><td>MTTR</td></tr><tr><td>_ _ 0F</td><td>CDPS</td><td>Always off</td><td>Always off</td></tr><tr><td>_ _ 10</td><td>CLDS</td><td>Always off</td><td>Always off</td></tr><tr><td>_ _ 11</td><td>ABSV</td><td>Always off</td><td>Always off</td></tr></table>Note. P: Position control mode
S: Speed control mode
T: Torque control mode</td><td>0Ch</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
</table>

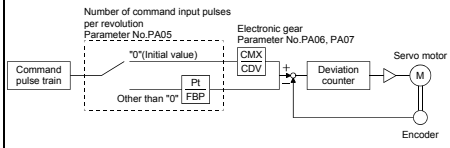
<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th>Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th><th></th></tr>
<tr><td>PA05</td><td>Number of command input pulses per revolution
Turn off the power and then on again after setting the parameter to validate the parameter value.
When "0" (initial value) is set in [Pr. PA05], the electronic gear ([Pr. PA06, PA07]) is made valid.
When the setting is other than "0", that value is used as the command input pulses necessary to rotate the servo motor one turn. At this time, the electronic gear is made invalid.
 

<table>
<tr><th>[Pr. PA05] setting</th><th>Description</th></tr>
<tr><td>0</td><td>Electronic gear ([Pr. PA06]/[Pr. PA07]) is made valid.</td></tr>
<tr><td>1000 to 50000</td><td>Number of command input pulses necessary to rotate the servo motor one turn [pulse]</td></tr>
</table></td><td>0</td><td>PA05</td><td>Number of command input pulses per revolution
The servo motor rotates based on set command input pulses.
To enable the parameter value, set "Electronic gear selection" to "Number of command input pulses per revolution (1 _ _ _)" of in [Pr. PA21].

Setting range: 1000 to 1000000</td><td>10000</td><td>P</td></tr>
<tr><td>PA06
PA07</td><td>Electronic gear numerator
(command pulse multiplying factor numerator)
Electronic gear denominator
(command pulse multiplying factor denominator)
Incorrect setting can lead to unexpected fast rotation, causing injury.

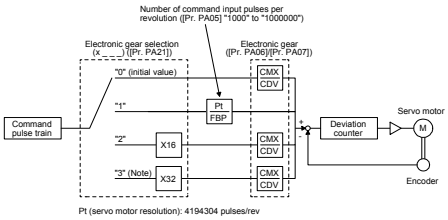
The electronic gear setting range is
$\frac{1}{10} < \frac{CMX}{CDV} < 2000$

If the set value is outside this range, noise may be generated during acceleration/ deceleration or operation may not be performed at the preset speed and/or acceleration/deceleration time constants.
Always set the electronic gear with servo off state to prevent unexpected operation due to improper setting.

Concept of electronic gear
The machine can be moved at any multiplication factor to input pulses.
 

$\frac{CMX}{CDV} = \frac{[Pr.\ PA06]}{[Pr.\ PA07]}$</td><td>1
1</td><td>PA06</td><td>Electronic gear numerator (command pulse multiplication numerator)
Set the numerator of the electronic gear.
To enable the parameter, select "Electronic gear (0 _ _ _)" or "J3 electronic gear setting value compatibility mode (2 _ _ _)" of "Electronic gear selection" in [Pr. PA21].
The following shows a standard of the setting range of the electronic gear.

$\frac{1}{10} < \frac{CMX}{CDV} < 4000$

If the set value is outside this range, noise may be generated during acceleration/deceleration or operation may not be performed at the preset speed and/or acceleration/deceleration time constants.
 

Note. This parameter is available with servo amplifiers with software version B3 or later.
Always set the electronic gear with servo-off state to prevent unexpected operation due to improper setting.

Setting range: 1 to 16777215</td><td>1</td><td>P</td></tr>
<tr><td></td><td></td><td></td><td>PA07</td><td>Electronic gear denominator (command pulse multiplication denominator)
Set the denominator of the electronic gear.
To enable the parameter, select "Electronic gear (0 _ _ _)" or "J3 electronic gear setting value compatibility mode (2 _ _ _)" of "Electronic gear selection" in [Pr. PA21].

Setting range: 1 to 16777215</td><td>1</td><td>P</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PA08
PA09</td><td>Auto tuning mode
Auto tuning response
Make gain adjustment using auto tuning.

Auto tuning mode [Pr. PA08]
Select the gain adjustment mode.
0 0 0 x:
Gain adjustment mode setting
0: Interpolation mode (Automatically set parameter No. [Pr. PB06/PB08/PB09/PB10])
1: Auto tuning mode 1 (Automatically set parameter No. [Pr. PB06/ PB07/PB08/PB09/PB10])
2: Auto tuning mode 2 (Automatically set parameter No. [Pr. PB07/PB08/PB09/PB10])
3: Manual mode

Note. The parameters have the following names.

<table>
<tr><th>No.</th><th>Name</th></tr>
<tr><td>PB06</td><td>Ratio of load inertia moment to servo motor inertia moment</td></tr>
<tr><td>PB07</td><td>Model loop gain</td></tr>
<tr><td>PB08</td><td>Position loop gain</td></tr>
<tr><td>PB09</td><td>Speed loop gain</td></tr>
<tr><td>PB10</td><td>Speed integral compensation</td></tr>
</table>

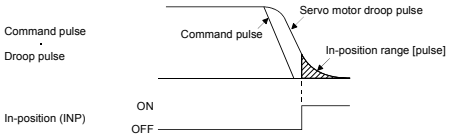
Auto tuning response [Pr. PA09]
If the machine hunts or generates large gear sound, decrease the set value. To improve performance, e.g. shorten the settling time, increase the set value.

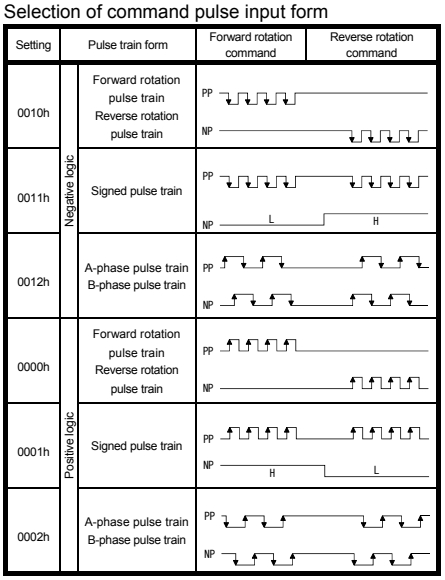
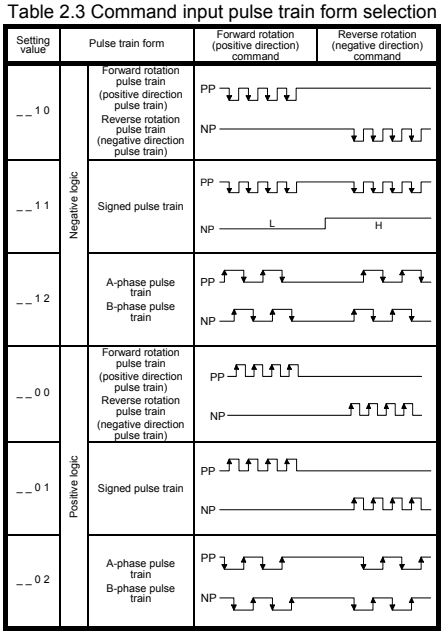
<table>
<tr><th>Setting</th><th>Response</th><th>Guideline for machine resonance frequency [Hz]</th></tr>
<tr><td>1</td><td rowspan="16">Low response
↑
↓
Middle response</td><td>10.0</td></tr>
<tr><td>2</td><td>11.3</td></tr>
<tr><td>3</td><td>12.7</td></tr>
<tr><td>4</td><td>14.3</td></tr>
<tr><td>5</td><td>16.1</td></tr>
<tr><td>6</td><td>18.1</td></tr>
<tr><td>7</td><td>20.4</td></tr>
<tr><td>8</td><td>23.0</td></tr>
<tr><td>9</td><td>25.9</td></tr>
<tr><td>10</td><td>29.2</td></tr>
<tr><td>11</td><td>32.9</td></tr>
<tr><td>12</td><td>37.0</td></tr>
<tr><td>13</td><td>41.7</td></tr>
<tr><td>14</td><td>47.0</td></tr>
<tr><td>15</td><td>52.9</td></tr>
<tr><td>16</td><td>59.6</td></tr>
</table>
<table>
<tr><th>Setting</th><th>Response</th><th>Guideline for machine resonance frequency [Hz]</th></tr>
<tr><td>17</td><td rowspan="16">Middle response
↑
↓
High response</td><td>67.1</td></tr>
<tr><td>18</td><td>75.6</td></tr>
<tr><td>19</td><td>85.2</td></tr>
<tr><td>20</td><td>95.9</td></tr>
<tr><td>21</td><td>108.0</td></tr>
<tr><td>22</td><td>121.7</td></tr>
<tr><td>23</td><td>137.1</td></tr>
<tr><td>24</td><td>154.4</td></tr>
<tr><td>25</td><td>173.9</td></tr>
<tr><td>26</td><td>195.9</td></tr>
<tr><td>27</td><td>220.6</td></tr>
<tr><td>28</td><td>248.5</td></tr>
<tr><td>29</td><td>279.9</td></tr>
<tr><td>30</td><td>315.3</td></tr>
<tr><td>31</td><td>355.1</td></tr>
<tr><td>32</td><td>400.0</td></tr>
</table></td><td>0001h
12</td><td>PA08</td><td>Same setting as MR-J3

Auto tuning mode
_ _ _ x:
Gain adjustment mode selection
Select the gain adjustment mode.
0: 2 gain adjustment mode 1 (interpolation mode)
1: Auto tuning mode 1
2: Auto tuning mode 2
3: Manual mode
4: 2 gain adjustment mode 2
Refer to table 2.2 for details.

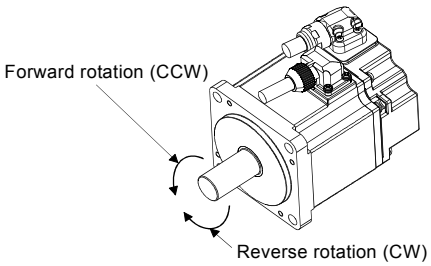
Table2.2 Gain adjustment mode selection
<table>
<tr><th>Setting value</th><th>Gain adjustment mode</th><th>Automatically adjusted parameter</th></tr>
<tr><td>_ _ _ 0</td><td>2 gain adjustment mode 1 (interpolation mode)</td><td>[Pr. PB06 Load to motor inertia ratio]
[Pr. PB08 Position loop gain]
[Pr. PB09 Speed loop gain]
[Pr. PB10 Speed integral compensation]</td></tr>
<tr><td>_ _ _ 1</td><td>Auto tuning mode 1</td><td>[Pr. PB06 Load to motor inertia ratio]
[Pr. PB07 Model loop gain]
[Pr. PB08 Position loop gain]
[Pr. PB09 Speed loop gain]
[Pr. PB10 Speed integral compensation]</td></tr>
<tr><td>_ _ _ 2</td><td>Auto tuning mode 2</td><td>[Pr. PB07 Model loop gain]
[Pr. PB08 Position loop gain]
[Pr. PB09 Speed loop gain]
[Pr. PB10 Speed integral compensation]</td></tr>
<tr><td>_ _ _ 3</td><td>Manual mode</td><td></td></tr>
<tr><td>_ _ _ 4</td><td>2 gain adjustment mode 2</td><td>[Pr. PB08 Position loop gain]
[Pr. PB09 Speed loop gain]
[Pr. PB10 Speed integral compensation]</td></tr>
</table></td><td>1h</td><td>P
S</td></tr>
<tr><td></td><td></td><td></td><td>_ _ x _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td>PA09</td><td>Auto tuning response
Set a response of the auto tuning.

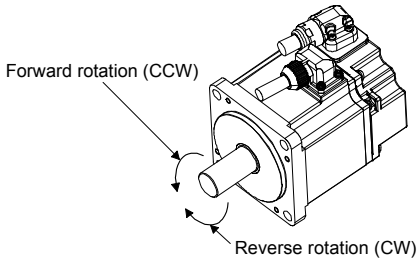
<table>
<tr><th rowspan="2">Setting value</th><th colspan="2">Machine characteristic</th></tr>
<tr><th>Response</th><th>Guideline for machine resonance frequency [Hz]</th></tr>
<tr><td>1</td><td rowspan="20">Low response
↑
↓
Middle response</td><td>2.7</td></tr>
<tr><td>2</td><td>3.6</td></tr>
<tr><td>3</td><td>4.9</td></tr>
<tr><td>4</td><td>6.6</td></tr>
<tr><td>5</td><td>10.0</td></tr>
<tr><td>6</td><td>11.3</td></tr>
<tr><td>7</td><td>12.7</td></tr>
<tr><td>8</td><td>14.3</td></tr>
<tr><td>9</td><td>16.1</td></tr>
<tr><td>10</td><td>18.1</td></tr>
<tr><td>11</td><td>20.4</td></tr>
<tr><td>12</td><td>23.0</td></tr>
<tr><td>13</td><td>25.9</td></tr>
<tr><td>14</td><td>29.2</td></tr>
<tr><td>15</td><td>32.9</td></tr>
<tr><td>16</td><td>37.0</td></tr>
<tr><td>17</td><td>41.7</td></tr>
<tr><td>18</td><td>47.0</td></tr>
<tr><td>19</td><td>52.9</td></tr>
<tr><td>20</td><td>59.6</td></tr>
</table>
<table>
<tr><th rowspan="2">Setting value</th><th colspan="2">Machine characteristic</th></tr>
<tr><th>Response</th><th>Guideline for machine resonance frequency [Hz]</th></tr>
<tr><td>21</td><td rowspan="20">Middle response
↑
↓
High response</td><td>67.1</td></tr>
<tr><td>22</td><td>75.6</td></tr>
<tr><td>23</td><td>85.2</td></tr>
<tr><td>24</td><td>95.9</td></tr>
<tr><td>25</td><td>108.0</td></tr>
<tr><td>26</td><td>121.7</td></tr>
<tr><td>27</td><td>137.1</td></tr>
<tr><td>28</td><td>154.4</td></tr>
<tr><td>29</td><td>173.9</td></tr>
<tr><td>30</td><td>195.9</td></tr>
<tr><td>31</td><td>220.6</td></tr>
<tr><td>32</td><td>248.5</td></tr>
<tr><td>33</td><td>279.9</td></tr>
<tr><td>34</td><td>315.3</td></tr>
<tr><td>35</td><td>355.1</td></tr>
<tr><td>36</td><td>400.0</td></tr>
<tr><td>37</td><td>446.6</td></tr>
<tr><td>38</td><td>501.2</td></tr>
<tr><td>39</td><td>571.5</td></tr>
<tr><td>40</td><td>642.7</td></tr>
</table>
Setting range: 1 to 40</td><td>16</td><td>P
S</td></tr>
</table>

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PA10	In-position range Set the range, where In-position (INP) is output, in the command pulse unit before calculation of the electronic gear. With the setting of [Pr. PC24], the range can be changed to the encoder output pulse unit.  	100	PA10	In-position range Set an in-position range per command pulse. To change it to the servo motor encoder pulse unit, set [Pr. PC24]. Setting range: 0 to 65535	100	P
PA11 PA12	Forward rotation torque limit Reverse rotation torque limit The torque generated by the servo motor can be limited. When torque is output with the analog monitor output, the smaller torque of the values in the [Pr. PA11] (forward rotation torque limit) and [Pr. PA12] (reverse rotation torque limit) is the maximum output voltage (8V). (1) Forward rotation torque limit [Pr. PA11] Set this parameter on the assumption that the maximum torque is 100 [%]. Set this parameter when limiting the torque of the servo motor in the CCW driving mode or CW regeneration mode. Set this parameter to "0.0" to generate no torque. (2) Reverse rotation torque limit [Pr. PA12] Set this parameter on the assumption that the maximum torque is 100 [%]. Set this parameter when limiting the torque of the servo motor in the CW driving mode or CCW regeneration mode. Set this parameter to "0.0" to generate no torque.	100.0 100.0	PA11	Same as MR-J3 Forward rotation torque limit You can limit the torque generated by the servo motor. When the torque is outputted with the analog monitor output, the setting of [Pr. PA11 Forward rotation torque limit] or [Pr. PA12 Reverse rotation torque limit], whichever is larger, will be the maximum output voltage (8 V). Set the parameter on the assumption that the maximum torque is 100.0 [%]. The parameter is for limiting the torque of the servo motor in the CCW power running or CW regeneration. No torque is generated when this parameter is set to "0.0". Setting range: 0.0 to 100.0	100.0	P S T
			PA12	Reverse rotation torque limit You can limit the torque generated by the servo motor. When the torque is outputted with the analog monitor output, the setting of [Pr. PA11 Forward rotation torque limit] or [Pr. PA12 Reverse rotation torque limit], whichever is larger, will be the maximum output voltage (8 V). Set the parameter on the assumption that the maximum torque is 100.0 [%]. The parameter is for limiting the torque of the servo motor in the CW power running or CCW regeneration. No torque is generated when this parameter is set to "0.0". Setting range: 0.0 to 100.0	100.0	P S T

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PA13	Command pulse input form Turn off the power and then on again after setting the parameter to validate the parameter value. Select the input form of the pulse train input signal. Command pulses may be input in any of three different forms, for which positive or negative logic can be chosen. Arrow ↑ or ↓ in the table indicates the timing of importing a pulse train. A- and B-phase pulse trains are imported after they have been multiplied by 4. Selection of command pulse input form  	0000h	PA13	Command pulse input form _ _ _ x: Command input pulse train form selection 0: Forward/reverse rotation pulse train 1: Signed pulse train 2: A-phase/B-phase pulse train (The servo amplifier imports input pulses after multiplying by four.) Refer to table 2.3 for settings.	0h	P
				_ _ x _: Pulse train logic selection 0: Positive logic 1: Negative logic Choose the right parameter to match the logic of the command pulse train received from a connected controller. Refer to Servo Amplifier Instruction Manual of MELSEC iQ-R series/MELSEC-Q series/MELSEC-L series/MELSEC-F series. Refer to table 2.3 for settings.	0h	P
				_ x _ _: Command input pulse train filter selection Selecting proper filter enables to enhance noise tolerance. 0: Command input pulse train is 4 Mpulses/s or less. 1: Command input pulse train is 1 Mpulse/s or less. 2: Command input pulse train is 500 kpulses/s or less. 3: Command input pulse train is 200 kpulses/s or less (available for the software version A5 or later) 1 Mpulse/s or lower commands are supported by "1". When inputting commands over 1 Mpulse/s and 4 Mpulses/s or lower, set "0". Incorrect setting may cause the following malfunctions. ▪ Setting a value higher than actual command will lower noise tolerance. ▪ Setting a value lower than actual command will cause a position mismatch.	1h	P
				x _ _ _: For manufacturer setting	0h	
				Table 2.3 Command input pulse train form selection  Arrows in the table indicate the timing of importing pulse trains. A-phase and B-phase pulse trains are imported after they have been multiplied by 4.		

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PA14</td><td>Rotation direction selection
Turn off the power and then on again after setting the parameter to validate the parameter value.

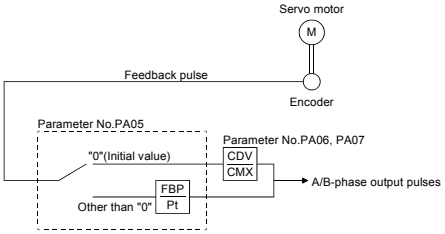
Select servo motor rotation direction relative to the input pulse train.
<table><tr><th rowspan="2">[Pr. PA14] setting</th><th colspan="2">Servo motor rotation direction</th></tr><tr><th>When forward rotation pulse is input</th><th>When reverse rotation pulse is input</th></tr><tr><td>0</td><td>CCW</td><td>CW</td></tr><tr><td>1</td><td>CW</td><td>CCW</td></tr></table>
  </td><td>0</td><td>PA14</td><td>Same as MR-J3

Rotation direction selection/travel direction selection
Select a servo motor rotation direction relative to the input pulse train.
<table><tr><th rowspan="2">Setting value</th><th colspan="2">Servo motor rotation direction</th></tr><tr><th>When forward rotation pulse is input</th><th>When reverse rotation pulse is input</th></tr><tr><td>0</td><td>CCW or positive direction</td><td>CW or negative direction</td></tr><tr><td>1</td><td>CW or negative direction</td><td>CCW or positive direction</td></tr></table>
The following shows the servo motor rotation directions.
 
Setting range: 0, 1</td><td>0</td><td>P</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PA15</td><td>Encoder output pulse
Turn off the power and then on again after setting the parameter to validate the parameter value.
Used to set the encoder pulses (A-phase, B-phase) output by the servo amplifier.
You can use parameter [Pr. PC19] to choose the output pulse setting or output division ratio setting.
The number of A/B-phase pulses actually output is 1/4 times greater than the preset number of pulses.
The maximum output frequency is 4.6 Mpulses/s (after multiplication by 4). Use this parameter within this range.

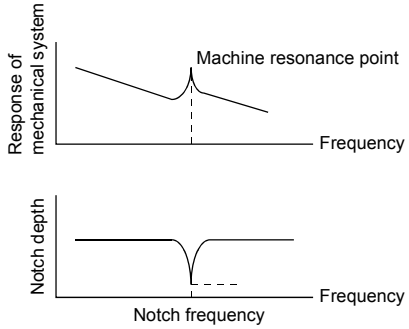
(1) For output pulse designation
Set "_ _ 0 _" (initial value) in [Pr. PC19].
Set the number of pulses per servo motor revolution.
Output pulse = set value [pulses/rev]
For instance, set "5600" to [Pr. PA15], the actually output A/B-phase pulses are as indicated below.
A/B-phase output pulses $= \frac{5600}{4} = 1400$ [pulse]

(2) For output division ratio setting
Set "0 0 1 0" in parameter [Pr. PC19]
The number of pulses per servo motor revolution is divided by the set value.
Output pulse $= \frac{\text{Resolution per servo motor revolution}}{\text{Set value}}$ [pulses/rev]

For instance, set "8" to [Pr. PA15], the actually A/B-phase pulses output are as indicated below.
A/B-phase output pulses $= \frac{262144}{8} \cdot \frac{1}{4} = 8192$ [pulses
(3) When outputting pulse train similar to command pulses
Set [Pr. PC19] to "_ _ 2 _". The feedback pulses from the servo motor encoder are processed and output as shown below. The feedback pulses can be output in the same pulse unit as the command pulses.
 
</td><td>4000</td><td>PA15</td><td>Set the encoder output pulses from the servo amplifier by using the number of output pulses per revolution, dividing ratio, or electronic gear ratio. (after multiplication by 4)
To set a numerator of the electronic gear, select "A-phase/B-phase pulse electronic gear setting (_ _ 3 _)" of "Encoder output pulse setting selection" in [Pr. PC19].
The maximum output frequency is 4.6 Mpps (after multiplication by 4). Use this parameter within this range.

Setting range: 1 to 4194304</td><td>4000</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td>PA16</td><td>Set a denominator of the electronic gear for the A/B-phase pulse output.
To set a denominator of the electronic gear, select "A-phase/B-phase pulse electronic gear setting (_ _ 3 _)" of "Encoder output pulse setting selection" in [Pr. PC19].

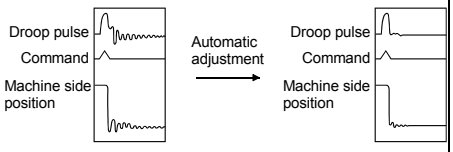
Setting range: 1 to 4194304</td><td>1</td><td>P
S
T</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th>Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th><th></th></tr>
<tr><td>PA19</td><td>Parameter write inhibit
<table>
<tr><th>[Pr. PA19] setting</th><th>Setting operation</th><th>Basic setting parameters [Pr. PA_ _]</th><th>Gain/Filter parameters [Pr. PB_ _]</th><th>Extension setting parameters [Pr. PC_ _]</th><th>I/O setting parameters [Pr. PD_ _]</th></tr>
<tr><td rowspan="2">0000h</td><td>Reference</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">000Bh (initial value)</td><td>Reference</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td>Writing</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td rowspan="2">000Ch</td><td>Reference</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>Writing</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td rowspan="2">100Bh</td><td>Reference</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>[Pr. PA19] only</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">100Ch</td><td>Reference</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>Writing</td><td>[Pr. PA19] only</td><td></td><td></td><td></td></tr>
</table>
O: Enabled</td><td>000Bh</td><td>PA19</td><td>Parameter writing inhibit
Select a reference range and writing range of the parameter.
Refer to table 2.4 for settings.
Table 2.4 [Pr. PA19] setting value and reading/writing range
<table>
<tr><th>PA19</th><th>Setting operation</th><th>PA</th><th>PB</th><th>PC</th><th>PD</th><th>PE</th><th>PF</th><th>PL</th></tr>
<tr><td rowspan="2">Other than below</td><td>Reading</td><td>○</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>○</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">000A</td><td>Reading</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">000B</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">000C</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">00AAh (initial value)</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td>Writing</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td rowspan="2">00AB</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>Writing</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td rowspan="2">100B</td><td>Reading</td><td>○</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">100C</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">10AA</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td>Writing</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">10AB</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>Writing</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td><td>00AAh</td><td>P
S
T</td></tr>
<tr><td>PB01</td><td>Adaptive tuning mode (adaptive filter II)
Select the setting method for filter tuning. Setting this parameter to "_ _ _ 1" (filter tuning mode) automatically changes the machine resonance suppression filter 1 [Pr. PB13], and notch shape selection 1 [Pr. PB14].
 

0 0 0 x:
Adaptive tuning mode selection
<table>
<tr><th>Setting</th><th>Adaptive tuning mode</th><th>Automatically set parameter</th></tr>
<tr><td>0</td><td>Filter OFF</td><td>(Note)</td></tr>
<tr><td>1</td><td>Filter tuning mode</td><td>[Pr. PB13]
[Pr. PB14]</td></tr>
<tr><td>2</td><td>Manual mode</td><td></td></tr>
</table>
Note. [Pr. PB13] and [Pr. PB14] are fixed to the initial values.

When this parameter is set to "_ _ _ 1" , the tuning is completed after positioning operation is done the predetermined number or times for the predetermined period of time, and the setting changes to "_ _ _ 2" . When the adaptive tuning is not necessary, the setting changes to "_ _ _ 0". When this parameter is set to "_ _ _ 0", the initial values are set to the machine resonance suppression filter 1 and notch shape selection 1. However, this does not occur when the servo off.</td><td>0000h</td><td>PB01</td><td>Same as MR-J3

Adaptive tuning mode (adaptive filter II)
_ _ _ x:
Filter tuning mode selection
Set the adaptive tuning.
Select the adjustment mode of the machine resonance suppression filter 1.
0: Disabled
1: Automatic setting (Do not use this in the torque control mode.)
2: Manual setting</td><td>0000h</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td>_ _ x _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td>x _ _ _:
Tuning accuracy selection
0: Standard
1: High accuracy
The frequency is estimated more accurately in the high accuracy mode compared to the standard mode. However, the tuning sound may be larger in the high accuracy mode.
This digit is available with servo amplifier with software version C5 or later.</td><td>0h</td><td>P
S
T</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB02</td><td>Vibration suppression control tuning mode (advanced vibration suppression control)
The vibration suppression is valid when the [Pr. PA08] (auto tuning mode) setting is "_ _ _ 2" or "_ _ _ 3".
When [Pr. PA08] is "_ _ _ 1", vibration suppression is always invalid.
Select the setting method for vibration suppression control tuning. Setting this parameter to "_ _ _ 1" (vibration suppression control tuning mode) automatically changes the vibration suppression control - vibration frequency([Pr. PB19]) and vibration suppression control - resonance frequency([Pr. PB20]) after positioning is done the predetermined number of times.
 

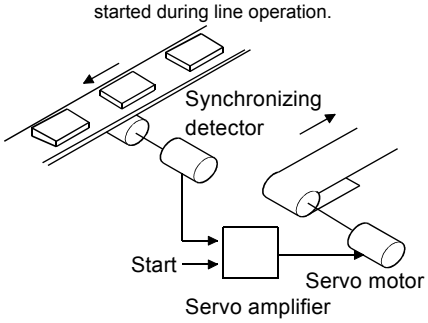
0 0 0 x:
Vibration suppression control tuning mode
<table><tr><th>Setting</th><th>Vibration suppression control tuning mode</th><th>Automatically set parameter</th></tr><tr><td>0</td><td>Vibration suppression control OFF</td><td>(Note)</td></tr><tr><td>1</td><td>Vibration suppression control tuning mode (Advanced vibration suppression control)</td><td>[Pr. PB19]
[Pr. PB20]</td></tr><tr><td>2</td><td>Manual mode</td><td></td></tr></table>Note. [Pr. PB19] and [Pr. PB20] are fixed to the initial values.

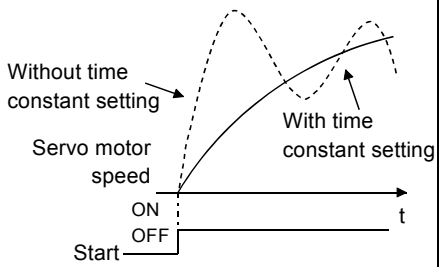
When this parameter is set to "_ _ _1", the tuning is completed after positioning operation is done the predetermined number or times for the predetermined period of time, and the setting changes to "_ _ _2". When the vibration suppression control tuning is not necessary, the setting changes to "_ _ _0". When this parameter is set to "_ _ _0", the initial values are set to the vibration suppression control - vibration frequency and vibration suppression control - resonance frequency. However, this does not occur when the servo off.</td><td>0000h</td><td>PB02</td><td>Vibration suppression control tuning mode (advanced vibration suppression control II)
_ _ _ x:
Vibration suppression control 1 tuning mode selection
Select the tuning mode of the vibration suppression control 1.
0: Disabled
1: Automatic setting
2: Manual setting

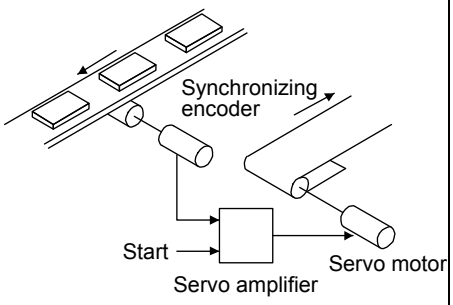
_ _ x _:
Vibration suppression control 2 tuning mode selection
Select the tuning mode of the vibration suppression control 2. To enable the setting of this digit, set "Vibration suppression mode selection" to "3 inertia mode (_ _ _ 1)" in [Pr. PA24].
0: Disabled
1: Automatic setting
2: Manual setting</td><td>0000h</td><td>P</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
</table>

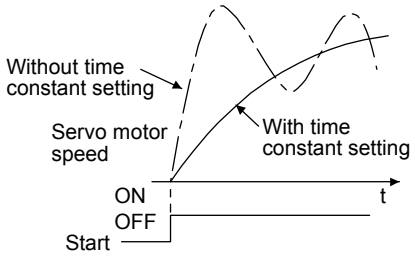
<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB03</td><td>Position command acceleration/deceleration time constant (position smoothing)
Used to set the time constant of a low-pass filter in response to the position command.
You can use [Pr. PB25] to choose the primary delay or linear acceleration/deceleration control system. When you choose linear acceleration/deceleration, the setting range is 0 to 10ms. Setting of longer than 10ms is recognized as 10ms.

POINT
●When you have chosen linear acceleration/deceleration, do not select control selection ([Pr. PA01]) and restart after instantaneous power failure ([Pr. PC22]). Doing so will cause the servo motor to make a sudden stop at the time of position control switching or restart.

(Example) When a command is given from a synchronizing detector, synchronous operation can be started smoothly if started during line operation.
 

 
</td><td>0</td><td>PB03</td><td>Same as MR-J3

Position command acceleration/ deceleration time constant (position smoothing)
Set the constant of a primary delay to the position command.
You can select a control method from "Primary delay" or "Linear acceleration/deceleration" in [Pr. PB25 Function selection B-1]. When the linear acceleration/deceleration is selected, the setting range is 0 ms to 10 ms. Setting of longer than 10 ms will be recognized as 10 ms.
When the linear acceleration/deceleration is selected, do not set the "Control mode selection" ([Pr. PA01]) to the setting other than "_ _ _ 0".
Doing so will cause the servo motor to make a sudden stop at the time of position control mode switching.
(Example) When a command is given from a synchronizing encoder, synchronous operation will start smoothly even if it starts during line operation.
 

Setting range: 0 to 65535</td><td>0</td><td>P</td></tr>
<tr><td>PB04</td><td>Feed forward gain
Set the feed forward gain. When the setting is 100%, the droop pulses during operation at constant speed are nearly zero. However, sudden acceleration/deceleration will increase the overshoot. As a guideline, when the feed forward gain setting is 100%, set 1s or longer as the acceleration time constant up to the rated speed.</td><td>0</td><td>PB04</td><td>Same setting as MR-J3

Feed forward gain
Set the feed forward gain.
When the setting is 100%, the droop pulses during operation at constant speed are nearly zero. When the super trace control is enabled, constant speed and uniform acceleration/deceleration droop pulses will be almost 0. However, sudden acceleration/deceleration will increase the overshoot. As a guideline, when the feed forward gain setting is 100%, set 1 s or more as the acceleration time constant up to the rated speed.

Setting range: 0 to 100</td><td>0</td><td>P</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB06</td><td>Ratio of load inertia moment to servo motor inertia moment
Used to set the ratio of the load inertia moment to the servo motor shaft inertia moment. When auto tuning mode 1 and interpolation mode is selected, the result of auto tuning is automatically used.
In this case, it varies between 0 and 100.0.</td><td>7.0</td><td>PB06</td><td>Load to motor inertia ratio/load to motor mass ratio
Set the load to motor inertia ratio or load to motor mass ratio.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the following table for details.
When the parameter is automatic setting, the value will vary between 0.00 and 100.00.
<table>
<tr><th>Pr. PA08</th><th>This parameter</th></tr>
<tr><td>_ _ _ 0 (2 gain adjustment mode 1 (interpolation mode))</td><td rowspan="2">Automatic setting</td></tr>
<tr><td>_ _ _ 1 (Auto tuning mode 1)</td></tr>
<tr><td>_ _ _ 2 (Auto tuning mode 2)</td><td rowspan="3">Manual setting</td></tr>
<tr><td>_ _ _ 3 (Manual mode)</td></tr>
<tr><td>_ _ _ 4 (2 gain adjustment mode 2)</td></tr>
</table>
Setting range: 0.00 to 300.00</td><td>7.00</td><td>P
S</td></tr>
<tr><td>PB07</td><td>Model loop gain
Set the response gain up to the target position.
Increase the gain to improve track ability in response to the command.
When auto turning mode 1 ▪ 2 is selected, the result of auto turning is automatically used.</td><td>24</td><td>PB07</td><td>Same setting as MR-J3
Model loop gain
Set the response gain up to the target position.
Increasing the setting value will also increase the response level to the position command but will be liable to generate vibration and noise.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting.
<table>
<tr><th>Pr. PA08</th><th>This parameter</th></tr>
<tr><td>_ _ _ 0 (2 gain adjustment mode 1 (interpolation mode))</td><td>Manual setting</td></tr>
<tr><td>_ _ _ 1 (Auto tuning mode 1)</td><td rowspan="2">Automatic setting</td></tr>
<tr><td>_ _ _ 2 (Auto tuning mode 2)</td></tr>
<tr><td>_ _ _ 3 (Manual mode)</td><td rowspan="2">Manual setting</td></tr>
<tr><td>_ _ _ 4 (2 gain adjustment mode 2)</td></tr>
</table>
Setting range: 1.0 to 2000.0</td><td>15.0</td><td>P</td></tr>
<tr><td>PB08</td><td>Position loop gain
Used to set the gain of the position loop.
Set this parameter to increase the position response to level load disturbance. Higher setting increases the response level but is liable to generate vibration and/or noise.
When auto tuning mode 1 ▪ 2 and interpolation mode is selected, the result of auto tuning is automatically used.</td><td>37</td><td>PB08</td><td>Same setting as MR-J3
Position loop gain
Set the gain of the position loop.
Set this parameter to increase the position response to level load disturbance.
Increasing the setting value will also increase the response level to the load disturbance but will be liable to generate vibration and noise.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the following table for details.
<table>
<tr><th>Pr. PA08</th><th>This parameter</th></tr>
<tr><td>_ _ _ 0 (2 gain adjustment mode 1 (interpolation mode))</td><td rowspan="3">Automatic setting</td></tr>
<tr><td>_ _ _ 1 (Auto tuning mode 1)</td></tr>
<tr><td>_ _ _ 2 (Auto tuning mode 2)</td></tr>
<tr><td>_ _ _ 3 (Manual mode)</td><td>Manual setting</td></tr>
<tr><td>_ _ _ 4 (2 gain adjustment mode 2)</td><td>Automatic setting</td></tr>
</table>
Setting range: 1.0 to 2000.0</td><td>37.0</td><td>P</td></tr>
<tr><td>PB09</td><td>Speed loop gain
Used to set the gain of the speed loop.
Set this parameter when vibration occurs on machines of low rigidity or large backlash.
Higher setting increases the response level but is liable to generate vibration and/or noise.
When auto tuning mode 1 ▪ 2, manual mode and interpolation mode is selected, the result of auto tuning is automatically used.
Note. The setting range of 50000 applies to the servo amplifier whose software version is A3 or later. The setting range of the servo amplifier whose software version is older than A3 is 20 to 20000. When the software version of Setup software (SETUP221E) is A3 or earlier, 20001 or more cannot be set. Use the display/operation section of the servo amplifier to set 20001 or more.</td><td>823</td><td>PB09</td><td>Same setting as MR-J3
Speed loop gain
Set the gain of the speed loop.
Set this parameter when vibration occurs on machines of low rigidity or large backlash.
Increasing the setting value will also increase the response level but will be liable to generate vibration and noise.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the table of [Pr. PB08] for details.

Setting range: 20 to 65535</td><td>823</td><td>P
S</td></tr>
</table>

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PB10	Speed integral compensation Used to set the integral time constant of the speed loop. Lower setting increases the response level but is liable to generate vibration and/or noise. When auto tuning mode 1 ▪ 2 and interpolation mode is selected, the result of auto tuning is automatically used.	33.7	PB10	Same setting as MR-J3 Speed integral compensation Set the integral time constant of the speed loop. Decreasing the setting value will increase the response level but will be liable to generate vibration and noise. The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the table of [Pr. PB08] for details. Setting range: 0.1 to 1000.0	33.7	P S
PB11	Speed differential compensation Used to set the differential compensation. Made valid when the proportion control (PC) is switched on.	980	PB11	Speed differential compensation Set the differential compensation. To enable the setting value, turn on PC (proportional control). Setting range: 0 to 1000	980	P S
PB12	For manufacturer setting	0	PB12	Overshoot amount compensation Set a viscous friction torque in percentage to the servo motor rated speed. When the response level is low or when the torque/thrust is limited, the efficiency of the parameter may be lower. Setting range: 0 to 100	0	P
PB13	Machine resonance suppression filter 1 Set the notch frequency of the machine resonance suppression filter 1. Setting [Pr. PB01] (Adaptive tuning mode (Adaptive filter II)) to "_ _ _1" automatically changes this parameter. When the [Pr. PB01] setting is "_ _ _0", the setting of this parameter is ignored.	4500	PB13	Machine resonance suppression filter 1 Machine resonance suppression filter 1 Set the notch frequency of the machine resonance suppression filter 1. When "Filter tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB01], this parameter will be adjusted automatically by adaptive tuning. When "Filter tuning mode selection" is set to "Manual setting (_ _ _ 2)" in [Pr. PB01], the setting value will be enabled. Setting range: 10 to 4500	4500	P S T

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PB14	Notch shape selection 1 Used to selection the machine resonance suppression filter 1. Setting [Pr. PB01] (Adaptive tuning mode (Adaptive filter II)) to "_ _ _1" automatically changes this parameter. When the [Pr. PB01] setting is "_ _ _0", the setting of this parameter is ignored.	0000h	PB14	Notch shape selection 1 Set the shape of the machine resonance suppression filter 1. When "Filter tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB01], this parameter will be adjusted automatically by adaptive tuning. Set manually for the manual setting.		
				_ _ _ x: For manufacturer setting	0h	
	0 0 x 0: Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB			_ _ x _: Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h	P S T
	0 x 0 0: Notch width selection 0: α = 2 1: α = 3 2: α = 4 3: α = 5			_ x _ _: Notch width selection 0: α = 2 1: α = 3 2: α = 4 3: α = 5	0h	P S T
				x _ _ _: For manufacturer setting	0h	
PB15	Machine resonance suppression filter 2 Set the notch frequency of the machine resonance suppression filter 2. Set [Pr. PB16] (notch shape selection 2) to "_ _ _ 1" to make this parameter valid.	4500	PB15	Same as MR-J3 Machine resonance suppression filter 2 Set the notch frequency of the machine resonance suppression filter 2. To enable the setting value, set "Machine resonance suppression filter 2 selection" to "Enabled (_ _ _ 1)" in [Pr. PB16]. Setting range: 10 to 4500	4500	P S T
PB16	Notch shape selection 2 Select the shape of the machine resonance suppression filter 2.	0000h	PB16	Same as MR-J3 Notch shape selection 2 Set the shape of the machine resonance suppression filter 2.		
	0 0 0 x: Machine resonance suppression filter 2 selection 0: Invalid 1: Valid			_ _ _ x: Machine resonance suppression filter 2 selection 0: Disabled 1: Enabled	0h	P S T
	0 0 x 0: Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB			_ _ x _: Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h	P S T
	0 x 0 0: Notch width selection 0: α = 2 1: α = 3 2: α = 4 3: α = 5			_ x _ _: Notch width selection 0: α = 2 1: α = 3 2: α = 4 3: α = 5	0h	P S T
				x _ _ _: For manufacturer setting	0h	

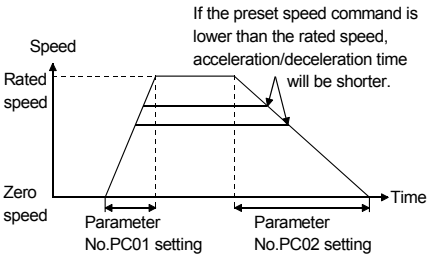
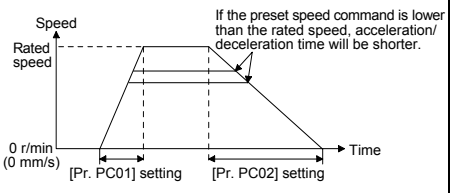
<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB17</td><td>Automatic setting parameter
The value of this parameter is set according to a set value of [Pr. PB06] (Ratio of load inertia moment to servo motor inertia moment).</td><td></td><td>PB17</td><td>Shaft resonance suppression filter
Set the shaft resonance suppression filter.
This is used to suppress a low-frequency machine vibration.
When "Shaft resonance suppression filter selection" is "Automatic setting (_ _ _ 0)" in [Pr. PB23], the value will be calculated automatically from the servo motor you use and load to motor inertia ratio. Set manually for "Manual setting (_ _ _ 1)".
When "Shaft resonance suppression filter selection" is "Disabled (_ _ _ 2)" in [Pr. PB23], the setting value of this parameter is disabled.
When "Machine resonance suppression filter 4 selection" is "Enabled (_ _ _ 1)" in [Pr. PB49], the shaft resonance suppression filter is not available.</td><td></td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x x:
Shaft resonance suppression filter setting frequency selection
Refer to table 2.5 for settings.
Set the value closest to the frequency you need.</td><td>00h</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _:
Notch depth selection
0: -40 dB
1: -14 dB
2: -8 dB
3: -4 dB</td><td>0h</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>Table 2.5 Shaft resonance suppression filter setting frequency selection
<table>
<tr><th>Setting value</th><th>Frequency [Hz]</th><th>Setting value</th><th>Frequency [Hz]</th></tr>
<tr><td>_ _ 0 0</td><td>Disabled</td><td>_ _ 1 0</td><td>562</td></tr>
<tr><td>_ _ 0 1</td><td>Disabled</td><td>_ _ 1 1</td><td>529</td></tr>
<tr><td>_ _ 0 2</td><td>4500</td><td>_ _ 1 2</td><td>500</td></tr>
<tr><td>_ _ 0 3</td><td>3000</td><td>_ _ 1 3</td><td>473</td></tr>
<tr><td>_ _ 0 4</td><td>2250</td><td>_ _ 1 4</td><td>450</td></tr>
<tr><td>_ _ 0 5</td><td>1800</td><td>_ _ 1 5</td><td>428</td></tr>
<tr><td>_ _ 0 6</td><td>1500</td><td>_ _ 1 6</td><td>409</td></tr>
<tr><td>_ _ 0 7</td><td>1285</td><td>_ _ 1 7</td><td>391</td></tr>
<tr><td>_ _ 0 8</td><td>1125</td><td>_ _ 1 8</td><td>375</td></tr>
<tr><td>_ _ 0 9</td><td>1000</td><td>_ _ 1 9</td><td>360</td></tr>
<tr><td>_ _ 0 A</td><td>900</td><td>_ _ 1 A</td><td>346</td></tr>
<tr><td>_ _ 0 B</td><td>818</td><td>_ _ 1 B</td><td>333</td></tr>
<tr><td>_ _ 0 C</td><td>750</td><td>_ _ 1 C</td><td>321</td></tr>
<tr><td>_ _ 0 D</td><td>692</td><td>_ _ 1 D</td><td>310</td></tr>
<tr><td>_ _ 0 E</td><td>642</td><td>_ _ 1 E</td><td>300</td></tr>
<tr><td>_ _ 0 F</td><td>600</td><td>_ _ 1 F</td><td>290</td></tr>
</table></td><td></td><td></td></tr>
</table>

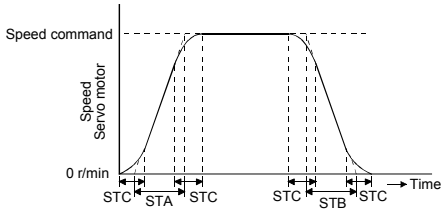
MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PB18	Low-pass filter setting Set the low-pass filter. Setting [Pr. PB23] (low-pass filter selection) to "_ _ 0 _" automatically changes this parameter. When [Pr. PB23] is set to "_ _ 1 _ ", this parameter can be set manually.	3141	PB18	Same as MR-J3 Low-pass filter setting Set the low-pass filter. The following shows a relation of a required parameter to this parameter. [Pr. PB23] / [Pr. PB18] _ _ 0_ (Initial value) / Automatic setting _ _ 1 _ / Setting value enabled _ _ 2 _ / Setting value disabled Setting is not necessary because this parameter is automatically set.	3141	P S
PB19	Vibration suppression control vibration frequency setting Set the vibration frequency for vibration suppression control to suppress low-frequency machine vibration, such as enclosure vibration. Setting [Pr. PB02] (vibration suppression control tuning mode) to "_ _ _ 1" automatically changes this parameter. When [Pr. PB02] is set to "_ _ _ 2", this parameter can be set manually.	100.0	PB19	Same as MR-J3 Vibration suppression control 1 - Vibration frequency Set the vibration frequency for vibration suppression control 1 to suppress low-frequency machine vibration. When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)". Setting range: 0.1 to 300.0	100.0	P
PB20	Vibration suppression control resonance frequency setting Set the resonance frequency for vibration suppression control to suppress low-frequency machine vibration, such as enclosure vibration. Setting [Pr. PB02] (vibration suppression control tuning mode) to "_ _ _ 1" automatically changes this parameter. When [Pr. PB02] is set to "_ _ _ 2", this parameter can be set manually.	PB20	PB20	Same as MR-J3 Vibration suppression control 1 - Resonance frequency Set the resonance frequency for vibration suppression control 1 to suppress low-frequency machine vibration. [When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)". Setting range: 0.1 to 300.0	100.0	P
PB21	For manufacturer setting Do not change this value by any means.	0.00	PB21	Vibration suppression control 1 - Vibration frequency damping Set a damping of the vibration frequency for vibration suppression control 1 to suppress low-frequency machine vibration. When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)". Setting range: 0.00 to 0.30	0.00	P
PB22	For manufacturer setting Do not change this value by any means.	0.00	PB22	Vibration suppression control 1 - Resonance frequency damping Set a damping of the resonance frequency for vibration suppression control 1 to suppress low-frequency machine vibration. When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)". Setting range: 0.00 to 0.30	0.00	P

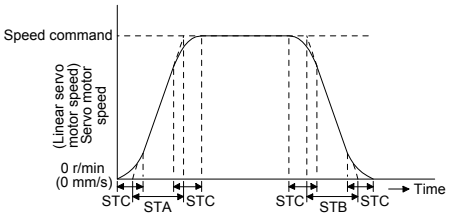
MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PB23	Low-pass filter selection Select the low-pass filter. 0 0 x 0: Low-pass filter selection 0: Automatic setting 1: Manual setting ([Pr. PB18] setting) When automatic setting has been selected, select the filter that has the band width close to the one calculated with $\frac{VG2 \cdot 10}{1 + GD2}$ [rad/s]	0000h	PB23	Same setting as MR-J3 Low-pass filter selection Shaft resonance suppression filter selection _ _ _ x: Select the shaft resonance suppression filter. 0: Automatic setting 1: Manual setting 2: Disabled When "Machine resonance suppression filter 4 selection" is set to "Enabled (_ _ _ 1)" in [Pr. PB49], the shaft resonance suppression filter is not available.	0h	P S T
				_ _ x _: Low-pass filter selection Select the low-pass filter. 0: Automatic setting 1: Manual setting 2: Disabled	0h	P S T
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: For manufacturer setting	0h	
PB24	Slight vibration suppression control selection Select the slight vibration suppression control. When [Pr. PA08] (auto tuning mode) is set to "_ _ _ 3", the slight vibration suppression control is made valid. 0 0 0 x: Slight vibration suppression control selection 0: Invalid 1: Valid	0000h	PB24	Same as MR-J3 Slight vibration suppression control Slight vibration suppression control selection _ _ _ x: Select the slight vibration suppression control. 0: Disabled 1: Enabled To enable the slight vibration suppression control, set "Gain adjustment mode selection" to "Manual mode (_ _ _ 3)" in [Pr. PA08]. Slight vibration suppression control cannot be used in the speed control mode.	0h	P
				_ _ x _: For manufacturer setting	0h	
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: For manufacturer setting	0h	
PB25	Function selection B-1 Select the control systems for position command acceleration/deceleration time constant ([Pr. PB03]). 0 0 x 0: Control of position command acceleration/ deceleration time constant 0: Primary delay 1: Linear acceleration/deceleration When linear acceleration/deceleration is selected, do not execute control switching after instantaneous power failure. The servo motor will make a sudden stop during the control switching or automatic restart.	0000h	PB25	Function selection B-1 _ _ _ x: Model adaptive control selection 0: Enabled (model adaptive control) 2: Disabled (PID control) This parameter is supported with software version B4 or later.	0h	P
				_ _ x _: Position acceleration/deceleration filter type selection Select the position acceleration/deceleration filter type. 0: Primary delay 1: Linear acceleration/deceleration When you select "Linear acceleration/deceleration", do not switch the control mode. Doing so will cause the servo motor to make a sudden stop at the time of control mode switching.	0h	P
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: For manufacturer setting	0h	

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PB26	Gain changing selection Select the gain changing condition.		PB26	Gain switching function Select the gain switching condition. Set conditions to enable the gain switching values set in [Pr. PB29] to [Pr. PB36] and [Pr. PB56] to [Pr. PB60].		
	0 0 0 x: Gain changing selection Under any of the following conditions, the gains change on the basis of the [Pr. PB29] to [Pr. PB34] settings 0: Invalid 1: Input device (Gain changing (CDP)) 2: Command frequency ([Pr. PB27] setting) 3: Droop pulse ([Pr. PB27] setting) 4: Servo motor speed ([Pr. PB27] setting)	0h		_ _ _ x: Gain switching selection 0: Disabled 1: Input device (gain switching (CDP)) 2: Command frequency 3: Droop pulses 4: Servo motor speed	0h	P S
	_ _ x _: Gain changing condition 0: Valid when the input device (gain changing (CDP)) is ON, or valid when the value is equal to or larger than the value set in [Pr. PB27] 1: Valid when the input device (gain changing (CDP)) is OFF, or valid when the value is equal to or smaller than the value set in [Pr. PB27]	0h		_ _ x _: Gain switching condition selection 0: Gain after switching is enabled with gain switching condition or more 1: Gain after switching is enabled with gain switching condition or less	0h	P S
	_ x _ _: For manufacturer setting Do not change this value by any means.	0h		_ x _ _: Gain switching time constant disabling condition selection 0: Switching time constant enabled 1: Switching time constant disabled 2: Return time constant disabled This parameter is used by servo amplifier with software version B4 or later.	0h	P S
	x _ _ _: For manufacturer setting Do not change this value by any means.	0h		x _ _ _: For manufacturer setting	0h	
PB27	Gain changing condition Used to set the value of gain changing condition (command frequency, droop pulses, servo motor speed) selected in [Pr. PB26].The set value unit changes with the changing condition item.	10	PB27	Same as MR-J3 Gain switching condition This is used to set the value of gain switching (command frequency, droop pulses, and servo motor speed) selected in [Pr. PB26]. The set value unit differs depending on the switching condition item. Setting range: 0 to 9999	10	P S
PB28	Gain changing time constant Used to set the time constant at which the gains will change in response to the conditions set in [Pr. PB26] and [Pr. PB27].	1	PB28	Same as MR-J3 Gain switching time constant This is used to set the time constant at which the gains will change in response to the conditions set in [Pr. PB26] and [Pr. PB27]. Setting range: 0 to 100	1	P S
PB29	Gain changing ratio of load inertia moment to servo motor inertia moment Used to set the ratio of load inertia moment to servo motor inertia moment when gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3).	7.0	PB29	Same as MR-J3 load to motor mass ratio after gain switching This is used to set the load to motor inertia ratio/load to motor mass ratio when gain switching is enabled. This parameter is enabled only when "Gain adjustment mode selection" is "Manual mode (_ _ _ 3)" in [Pr. PA08]. Setting range: 0.00 to 300.00 Unit: 1.0 time	7.00	P S
PB30	Gain changing position loop gain Set the position loop gain when the gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3).	37	PB30	Position loop gain after gain switching Set the position loop gain when the gain switching is enabled. When you set a value less than 1.0 rad/s, the value will be the same as [Pr. PB08]. This parameter is enabled only when "Gain adjustment mode selection" is "Manual mode (_ _ _ 3)" in [Pr. PA08]. Setting range: 0.0 to 2000.0	0.0	P

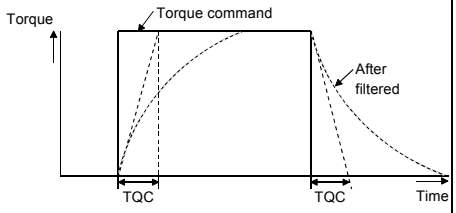
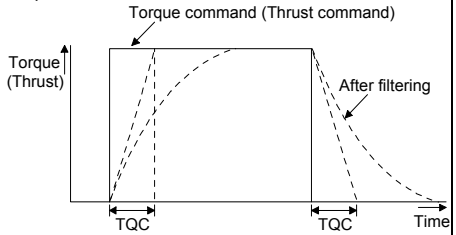
MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PB31	Gain changing speed loop gain Set the speed loop gain when the gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3). Note The setting range of 50000 applies to the servo amplifier whose software version is A3 or later. The setting range of the servo amplifier whose software version is older than A3 is 20 to 20000. When the software version of Setup software (SETUP221E) is A3 or earlier, 20001 or more cannot be set. Use the display/operation section of the servo amplifier to set 20001 or more.	823	PB31	Speed loop gain after gain switching Set the speed loop gain when the gain switching is enabled. When you set a value less than 20 rad/s, the value will be the same as [Pr. PB09]. This parameter is enabled only when "Gain adjustment mode selection" is "Manual mode (_ _ _ 3)" in [Pr. PA08]. Setting range: 0 to 65535	0	P S
PB32	Gain changing speed integral compensation Set the speed integral compensation when the gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3).	33.7	PB32	Speed integral compensation after gain switching Set the speed integral compensation when the gain changing is enabled. When you set a value less than 0.1 ms, the value will be the same as [Pr. PB10]. This parameter is enabled only when "Gain adjustment mode selection" is "Manual mode (_ _ _ 3)" in [Pr. PA08]. Setting range: 0.0 to 5000.0	0.0	P S
PB33	Gain changing vibration suppression control - vibration frequency setting Set the vibration frequency for vibration suppression control when the gain changing is valid. This parameter is made valid when the [Pr. PB02] setting is "_ _ _ 2" and the [Pr. PB26] setting is "_ _ _ 1". When using the vibration suppression control gain changing, always execute the changing after the servo motor has stopped.	100.0	PB33	Vibration suppression control 1 - Vibration frequency after gain switching Set the vibration frequency for vibration suppression control 1 when the gain switching is enabled. When you set a value less than 0.1 Hz, the value will be the same as [Pr. PB19]. This parameter will be enabled only when the following conditions are fulfilled. "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". "Gain switching selection" in [Pr. PB26] is "Input device (gain switching (CDP)) (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops. Setting range: 0.0 to 300.0	0.0	P
PB34	Gain changing vibration suppression control - resonance frequency setting Set the resonance frequency for vibration suppression control when the gain changing is valid. This parameter is made valid when the [Pr. PB02] setting is "_ _ _ 2" and the [Pr. PB26] setting is "_ _ _ 1". When using the vibration suppression control gain changing, always execute the changing after the servo motor has stopped.	100.0	PB34	Vibration suppression control 1 - Resonance frequency after gain switching Set the resonance frequency for vibration suppression control 1 when the gain switching is enabled. When you set a value less than 0.1 Hz, the value will be the same as [Pr. PB20]. This parameter will be enabled only when the following conditions are fulfilled. "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". "Gain switching selection" in [Pr. PB26] is "Input device (gain switching (CDP)) (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops. Setting range: 0.0 to 300.0	0.0	P

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PB35	For manufacturer setting Do not change this value by any means.	0.00	PB35	Vibration suppression control 1 - Vibration frequency damping after gain switching Set a damping of the vibration frequency for vibration suppression control 1 when the gain switching is enabled. This parameter will be enabled only when the following conditions are fulfilled. "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". "Gain switching selection" in [Pr. PB26] is "Input device (gain switching (CDP)) (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops. Setting range: 0.00 to 0.30	0.00	P
PB36	For manufacturer setting Do not change this value by any means.	0.00	PB36	Vibration suppression control 1 - Resonance frequency damping after gain switching Set a damping of the resonance frequency for vibration suppression control 1 when the gain switching is enabled. This parameter will be enabled only when the following conditions are fulfilled. "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". "Gain switching selection" in [Pr. PB26] is "Input device (gain switching (CDP)) (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops. Setting range: 0.00 to 0.30	0.00	P
PC01	Acceleration time constant Used to set the acceleration time required to reach the rated speed from 0r/min in response to the analog speed command and internal speed commands 1 to 7.  For example for the servo motor of 3000r/min rated speed, set 3000 (3s) to increase speed from 0r/min to 1000r/min in 1 second.	0	PC01	Same as MR-J3 Acceleration time constant Set the acceleration time required to reach the rated speed from 0 r/min or 0 mm/s for VC (Analog speed command) and [Pr. PC05 Internal speed command 1] to [Pr. PC11 Internal speed command 7].  For example for the servo motor of 3000 r/min rated speed, set 3000 (3 s) to increase the speed from 0 r/min to 1000 r/min in 1 second. Setting range: 0 to 50000	0	S T
PC02	Deceleration time constant Used to set the deceleration time required to reach 0r/min from the rated speed in response to the analog speed command and internal speed commands 1 to 7.	0	PC02	Same as MR-J3 Deceleration time constant Set the deceleration time required to reach 0 r/min or 0 mm/s from the rated speed for VC (Analog speed command) and [Pr. PC05 Internal speed command 1] to [Pr. PC11 Internal speed command 7]. Setting range: 0 to 50000	0	S T

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PC03</td><td>S-pattern acceleration/deceleration time constant
Used to smooth start/stop of the servo motor.
Set the time of the arc part for S-pattern acceleration/deceleration.
 
STA: Acceleration time constant [Pr. PC01]
STB: Deceleration time constant [Pr. PC02]
STC: S-pattern acceleration/deceleration time constant [Pr. PC03]

Long setting of STA (acceleration time constant) or STB (deceleration time constant) may produce an error in the time of the arc part for the setting of the S-pattern acceleration/deceleration time constant.
The upper limit value of the actual arc part time is limited by $\frac{2000000}{STA}$ for acceleration or by $\frac{2000000}{STB}$ for deceleration.
(Example) At the setting of STA=20000, STB=5000 and STC=200, the actual arc part times are as follows.
During acceleration: 100[ms] { Limited to 100[ms] since $\frac{2000000}{20000}$ = 100[ms]<200[ms]. }
During deceleration: 200[ms] { 200[ms] as set since $\frac{2000000}{5000}$ = 400[ms]>200[ms]. }</td><td>0</td><td>PC03</td><td>Same as MR-J3
S-pattern acceleration/deceleration time constant
Start/stop the servo motor or linear servo motor smoothly.
Set the time of the arc part for S-pattern acceleration/deceleration.
 
STA: Acceleration time constant ([Pr. PC01])
STB: Deceleration time constant ([Pr. PC02])
STC: S-pattern acceleration/deceleration time constant ([Pr. PC03])

Long setting of STA (acceleration time constant) or STB (deceleration time constant) may produce an error in the time of the arc part for the setting of the S-pattern acceleration/deceleration time constant.
The upper limit value of the actual arc part time is limited by
$\frac{2000000}{STA}$ for acceleration or by $\frac{2000000}{STB}$ for deceleration.
(Example) At the setting of STA 20000, STB 5000 and STC 200, the actual arc part times are as follows.
Acceleration: 100 ms
$\frac{2000000}{20000}$ = 100 [ms] < 200 [ms]
Therefore, it will be limited to 100 ms.
Deceleration: 200 ms
$\frac{2000000}{5000}$ = 400 [ms] > 200 [ms]
Therefore, it will be 200 ms as you set.

Setting range: 0 to 5000</td><td>0</td><td>S
T</td></tr>
<tr><td>PC04</td><td>Torque command time constant
Used to set the constant of a low-pass filter in response to the torque command.
 
TQC: Torque command time constant</td><td>0</td><td>PC04</td><td>Same as MR-J3
Torque command time constant
Set the constant of a primary delay filter to the torque command.
 
TQC: Torque
Setting range: 0 to 50000</td><td>0</td><td>T</td></tr>
</table>

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PC05	Internal speed command 1 Used to set speed 1 of internal speed commands.	100	PC05	Same as MR-J3 Internal speed command 1 Set the speed 1 of internal speed commands. Setting range: 0 to permissible instantaneous speed	100	S
	Internal speed limit 1 Used to set speed 1 of internal speed limits.			Internal speed limit 1 Set the speed 1 of internal speed limits. Setting range: 0 to permissible instantaneous speed		T
PC06	Internal speed command 2 Used to set speed 2 of internal speed commands.	500	PC06	Same as MR-J3 Internal speed command 2 Set the speed 2 of internal speed commands. Setting range: 0 to permissible instantaneous speed	500	S
	Internal speed limit 2 Used to set speed 2 of internal speed limits.			Internal speed limit 2 Set the speed 2 of internal speed limits. Setting range: 0 to permissible instantaneous speed		T
PC07	Internal speed command 3 Used to set speed 3 of internal speed commands.	1000	PC07	Same as MR-J3 Internal speed command 3 Set the speed 3 of internal speed commands. Setting range: 0 to permissible instantaneous speed	1000	S
	Internal speed limit 3 Used to set speed 3 of internal speed limits.			Internal speed limit 3 Set speed 3 of internal speed limits. Setting range: 0 to permissible instantaneous speed		T
PC08	Internal speed command 4 Used to set speed 4 of internal speed commands.	200	PC08	Same as MR-J3 Internal speed command 4 Set the speed 4 of internal speed commands. Setting range: 0 to permissible instantaneous speed	200	S
	Internal speed limit 4 Used to set speed 4 of internal speed limits.			Internal speed limit 4 Set the speed 4 of internal speed limits. Setting range: 0 to permissible instantaneous speed		T
PC09	Internal speed command 5 Used to set speed 5 of internal speed commands.	300	PC09	Same as MR-J3 Internal speed command 5 Set the speed 5 of internal speed commands. Setting range: 0 to permissible instantaneous speed	300	S
	Internal speed limit 5 Used to set speed 5 of internal speed limits.			Internal speed limit 5 Set the speed 5 of internal speed limits. Setting range: 0 to permissible instantaneous speed		T
PC10	Internal speed command 6 Used to set speed 6 of internal speed commands.	500	PC10	Same as MR-J3 Internal speed command 6 Set the speed 6 of internal speed commands. Setting range: 0 to permissible instantaneous speed	500	S
	Internal speed limit 6 Used to set speed 6 of internal speed limits.			Internal speed limit 6 Set the speed 6 of internal speed limits. Setting range: 0 to permissible instantaneous speed		T

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PC11</td><td>Internal speed command 7
Used to set speed 7 of internal speed commands.</td><td>800</td><td>PC11</td><td>Same as MR-J3
Internal speed command 7
Set the speed 7 of internal speed commands.
Setting range: 0 to permissible instantaneous speed</td><td>800</td><td>S</td></tr>
<tr><td></td><td>Internal speed limit 7
Used to set speed 7 of internal speed limits.</td><td></td><td></td><td>Internal speed limit 7
Set the speed 7 of internal speed limits.
Setting range: 0 to permissible instantaneous speed</td><td></td><td>T</td></tr>
<tr><td>PC12</td><td>Analog speed command maximum speed
Used to set the speed at the maximum input voltage (10 V) of the analog speed command (VC).
When "0" is set, the analog speed command maximum speed would be the rated speed of the servo motor connected.
The speed is as indicated below for motorless operation of test operation.
<table><tr><th colspan="2">Servo amplifier capacity</th><th>Servo motor speed [r/min]</th></tr><tr><td>100 V class</td><td>100 W to 400 W</td><td rowspan="2">3000</td></tr><tr><td rowspan="2">200 V class</td><td>100 W to 750 W</td></tr><tr><td>1 kW to 37 kW</td><td rowspan="2">2000</td></tr><tr><td>400 V class</td><td>600 W to 55 kW</td></tr></table></td><td>0</td><td>PC12</td><td>Same setting as MR-J3
Analog speed command - Maximum speed
Set the speed of servo motor at the maximum voltage (10 V) input to VC (Analog speed command).
When "0" is set, the rated speed of the connected servo motor is used.
When you input a command value of the permissible speed or more to VC, the value is clamped at the permissible speed.
Setting range: 0 to 50000</td><td>0</td><td>S</td></tr>
<tr><td></td><td>Analog speed limit maximum speed
Used to set the speed at the maximum input voltage (10 V) of the analog speed limit (VLA).
Set "0" to select the rated speed of the servo motor connected.</td><td></td><td></td><td>Analog speed limit - Maximum speed
Set the speed of servo motor at the maximum voltage (10 V) input to VLA (Analog speed limit).
When "0" is set, the rated speed of the connected servo motor is used.
When you input a limit value of the permissible speed or more to VLA, the value is clamped at the permissible speed.
Setting range: 0 to 50000</td><td></td><td>T</td></tr>
<tr><td>PC13</td><td>Analog torque command maximum output
Used to set the output torque at the analog torque command voltage (TC = ±8 V) of +8 V on the assumption that the maximum torque is 100 [%]. For example, set 50 to output (maximum torque × 50/100) at the TC of +8 V.</td><td>100.0</td><td>PC13</td><td>Same as MR-J3
Analog torque command maximum output
This is used to set the output torque at the analog torque (TC = ±8 V) of +8 V on the assumption that the maximum torque is 100.0%.
For example, set 50.0.
The maximum torque × $\frac{50.0}{100.0}$ is outputted.
If a value equal to or larger than the maximum torque is inputted to TC, the value will be clamped at the maximum torque.
Setting range: 0.0 to 1000.0</td><td>100.0</td><td>T</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PC14</td><td>Analog monitor 1 output
Used to selection the signal provided to the analog monitor 1 (MO1) output.

0 0 0 x:
Analog monitor 1 (MO1) output selection
<table><tr><th>Setting</th><th>Item</th></tr><tr><td>0</td><td>Servo motor speed (8 V/max. speed)</td></tr><tr><td>1</td><td>Torque (8 V/max. torque) (Note 2)</td></tr><tr><td>2</td><td>Servo motor speed (+8 V/max. speed)</td></tr><tr><td>3</td><td>Torque (+8 V/max. torque) (Note 2)</td></tr><tr><td>4</td><td>Current command (8 V/max. current command</td></tr><tr><td>5</td><td>Command pulse frequency (10 V/1Mpps)</td></tr><tr><td>6</td><td>Droop pulses (10 V/100 pulses) (Note 1)</td></tr><tr><td>7</td><td>Droop pulses (10 V/1000 pulses) (Note 1)</td></tr><tr><td>8</td><td>Droop pulses (10 V/10000 pulses) (Note 1)</td></tr><tr><td>9</td><td>Droop pulses (10 V/100000 pulses) (Note 1)</td></tr><tr><td>A</td><td>Feedback position (10 V/1 Mpulses) (Note 1)</td></tr><tr><td>B</td><td>Feedback position (10 V/10 Mpulses) (Note 1)</td></tr><tr><td>C</td><td>Feedback position (10 V/100 Mpulses) (Note 1)</td></tr><tr><td>D</td><td>Bus voltage (8 V/400 V) (Note 3)</td></tr></table>Note 1. Encoder pulse unit.
2. 8 V is outputted at the maximum torque. However, when [Pr. PA11] [Pr. PA12] are set to limit torque, 8 V is outputted at the torque highly limited.
3. For 400 V class servo amplifier, the bus voltage becomes +8 V/800 V.</td><td>0000h</td><td>PC14</td><td>Analog monitor 1 output
_ _ x x:
Analog monitor 1 output selection
Select a signal to output to MO1 (Analog monitor 1).
Refer to table 2.6 for settings.</td><td>00h</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>Table 2.6 Analog monitor setting value
(MR-J4-_A_(-RJ) 100 W or more)
<table><tr><th rowspan="2">Setting value</th><th rowspan="2">Item</th><th>Operation mode (Note 1)</th></tr><tr><th>Standard</th></tr><tr><td>_ _ 0 0</td><td>(Linear) servo motor speed (±8 V/max. speed)</td><td>○</td></tr><tr><td>_ _ 0 1</td><td>Torque or thrust (±8 V/max. torque or max. thrust) (Note 3)</td><td>○</td></tr><tr><td>_ _ 0 2</td><td>(Linear) servo motor speed (+8 V/max. speed)</td><td>○</td></tr><tr><td>_ _ 0 3</td><td>Torque or thrust (+8 V/max. torque or max. thrust) (Note 3)</td><td>○</td></tr><tr><td>_ _ 0 4</td><td>Current command (±8 V/max. current command)</td><td>○</td></tr><tr><td>_ _ 0 5</td><td>Command pulse frequency (±10 V/±4 Mpulses/s)</td><td>○</td></tr><tr><td>_ _ 0 6</td><td>Servo motor-side droop pulses (±10 V/100 pulses) (Note 2)</td><td>○</td></tr><tr><td>_ _ 0 7</td><td>Servo motor-side droop pulses (±10 V/1000 pulses) (Note 2)</td><td>○</td></tr><tr><td>_ _ 0 8</td><td>Servo motor-side droop pulses (±10 V/10000 pulses) (Note 2)</td><td>○</td></tr><tr><td>_ _ 0 9</td><td>Servo motor-side droop pulses (±10 V/100000 pulses) (Note 2)</td><td>○</td></tr><tr><td>_ _ 0 A</td><td>Feedback position (±10 V/1 Mpulse) (Note 2)</td><td>○</td></tr><tr><td>_ _ 0 B</td><td>Feedback position (±10 V/10 Mpulses) (Note 2)</td><td>○</td></tr><tr><td>_ _ 0 C</td><td>Feedback position (±10 V/100 Mpulses) (Note 2)</td><td>○</td></tr><tr><td>_ _ 0 D</td><td>Bus voltage (200 V class and 100 V class: +8 V/400 V, 400 V class: +8 V/800 V)</td><td>○</td></tr><tr><td>_ _ 0 E</td><td>Speed command 2 (±8 V/max. speed)</td><td>○</td></tr><tr><td>_ _ 1 0</td><td>Load-side droop pulses (±10 V/100 pulses) (Note 2)</td><td></td></tr><tr><td>_ _ 1 1</td><td>Load-side droop pulses (±10 V/1000 pulses) (Note 2)</td><td></td></tr><tr><td>_ _ 1 2</td><td>Load-side droop pulses (±10 V/10000 pulses) (Note 2)</td><td></td></tr><tr><td>_ _ 1 3</td><td>Load-side droop pulses (±10 V/100000 pulses) (Note 2)</td><td></td></tr><tr><td>_ _ 1 4</td><td>Load-side droop pulses (±10 V/1 Mpulse) (Note 2)</td><td></td></tr><tr><td>_ _ 1 5</td><td>Servo motor-side/load-side position deviation (±10 V/100000 pulses)</td><td></td></tr><tr><td>_ _ 1 6</td><td>Servo motor-side/load-side speed deviation (±8 V/max. speed)</td><td></td></tr><tr><td>_ _ 1 7</td><td>Internal temperature of encoder (±10 V/±128 °C)</td><td>○</td></tr></table>Note 1. Items with O are available for each operation mode.
Standard: Standard (semi closed loop system) use of the rotary servo motor
2. Encoder pulse unit
3. The larger value of [Pr. PA11] or [Pr. PA12] will be the maximum torque.</td><td></td><td></td></tr>
<tr><td>PC15</td><td>Analog monitor 2 output
Used to selection the signal provided to the analog monitor 2 (MO2) output.

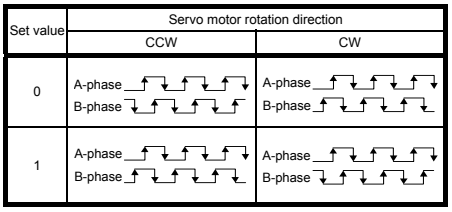
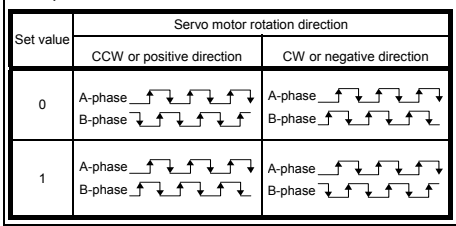
0 0 0 x:
Select the analog monitor 2 (MO2) output
The settings are the same as those of [Pr. PC14]</td><td>0001h</td><td>PC15</td><td>Analog monitor 2 output
Analog monitor 2 output selection
_ _ x x:
Select a signal to output to MO2 (Analog monitor 2).
Refer to [Pr. PC14] for settings.</td><td>01h</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td>PC16</td><td>Electromagnetic brake sequence output
Used to set the delay time (Tb) between electronic brake interlock (MBR) and the base drive circuit is shut-off.</td><td>100</td><td>PC16</td><td>Same as MR-J3
Analog monitor 2 output
Set the delay time between MBR (Electromagnetic brake interlock) and the base drive circuit is shut-off.

Setting range: 0 to 1000</td><td>0</td><td>P
S
T</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PC17</td><td>Zero speed
Used to set the output range of the zero speed detection (ZSP).
Zero speed detection (ZSP) has hysteresis width of 20r/min</td><td>50</td><td>PC17</td><td>Same as MR-J3
Zero speed
Set the output range of ZSP (Zero speed detection).
ZSP (Zero speed detection) has hysteresis of 20 r/min or 20 mm/s.

Setting range: 0 to 10000</td><td>50</td><td>P
S
T</td></tr>
<tr><td>PC18</td><td>Alarm history clear
Used to clear the alarm history.

0 0 0 x:
Alarm history clear
0: Invalid
1: Valid
When alarm history clear is made valid, the alarm history is cleared at next power-on.
After the alarm history is cleared, the setting is automatically made invalid (reset to 0).</td><td>0000h</td><td>PC18</td><td>Same as MR-J3
Alarm history clear
Alarm history clear selection
_ _ _ x:
Clear the alarm history.
0: Disabled
1: Enabled
When "Enabled" is set, the alarm history will be cleared at the next power-on. After the alarm history is cleared, the setting is automatically disabled.</td><td>0h</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td>PC19</td><td>Encoder output pulses selection
Use to select the, encoder output pulses direction and encoder output pulses setting.

0 0 0 x:
Encoder output pulses phase changing
Changes the phases of A/B-phase encoder output pulses.
 
</td><td>0000h</td><td>PC19</td><td>Same setting as MR-J3
Encoder output pulse selection
Encoder output pulse phase selection
_ _ _ x:
Select the encoder pulse direction.
0: A-phase 90° shift in CCW
1: A-phase 90° shift in CW
 
</td><td>0h</td><td>P
S
T</td></tr>
<tr><td></td><td>0 0 x 0:
Encoder output pulses setting selection
(refer to [Pr. PA15])
0: Output pulses setting
1: Division ratio setting
2: Ratio is automatically set to command pulse unit
Setting "2" makes the [Pr. PA15] (encoder output pulses) setting invalid.</td><td></td><td></td><td>Encoder output pulse setting selection
_ _ x _:
0: Output pulse setting
When "_ 1 0 _" is set to this parameter, [AL. 37 Parameter error] will occur.
1: Dividing ratio setting
2: The same output pulse setting as the command pulse
3: A-phase/B-phase pulse electronic gear setting
When you select "1", the setting of [Pr. PA16 Encoder output pulses 2] will be disabled. When you select "2", the settings of [Pr. PA15 Encoder output pulses] and [Pr. PA16 Encoder output pulses 2] will be disabled. When you select the setting, do not change the settings in [Pr. PA06] and [Pr. PA07] after the power-on.</td><td>0h</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Selection of the encoders for encoder output pulse
_ x _ _:
Select an encoder for servo amplifier output.
0: Servo motor encoder
1: Load-side encoder
When "_ 1 0 _" is set to this parameter, [AL. 37 Parameter error] will occur.
This is only for the fully closed loop system.</td><td>0h</td><td>P</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
</table>

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PC20	Station number setting Used to specify the station number for serial communication. Always set one station to one axis of servo amplifier. If one station number is set to two or more stations, normal communication cannot be made.	0	PC20	Same setting as MR-J3 Station No. setting Specify a station number of the servo amplifier for RS-422/RS-485 and USB communications. Always set one station to one axis of the servo amplifier. Setting one station number to two or more stations will disable a normal communication. Setting range: 0 to 31	0	P S T
PC21	Communication function selection Select the communication I/F and select the RS-422 communication conditions. 0 0 x 0: RS-422 communication baud rate selection 0: 9600 [bps] 1: 19200 [bps] 2: 38400 [bps] 3: 57600 [bps] 4: 115200 [bps]	0000h	PC21	RS-422 communication function selection Select the communication I/F and select the RS-422 communication conditions.		
				_ _ _ x: For manufacturer setting	0h	
				_ _ x _: RS-422 communication baud rate selection When using the parameter unit, set "1 _ _ _" in [Pr. PF34]. 0: 9600 [bps] 1: 19200 [bps] 2: 38400 [bps] 3: 57600 [bps] 4: 115200 [bps]	0h	P S T
	0 x 0 0: RS-422 communication response delay time 0: Invalid 1: Valid, reply sent after delay time of 800 μs or longer			_ x _ _: RS-422/RS-485 communication response delay time selection 0: Disabled 1: Enabled (responding after 800 μs or longer delay time)	0h	P S T
				x _ _ _: For manufacturer setting	0h	
PC22	Function selection C-1 Select the execution of automatic restart after instantaneous power failure selection, and encoder cable communication system selection. 0 0 0 x: Restart after instantaneous power failure selection If the power supply voltage has returned to normal after an undervoltage status caused by the reduction of the input power supply voltage in the speed control mode, the servo motor can be restarted by merely turning on the start signal without resetting the alarm. 0: Invalid ([AL.10 Undervoltage alarm] occurs.) 1: Valid	0000h	PC22	_ _ _ x: For manufacturer setting	0h	
				_ _ x _: For manufacturer setting	0h	
				_ x _ _: For manufacturer setting	0h	
	x 0 0 0: Encoder cable communication system selection 0: Two-wire type 1: Four-wire type The following encoder cables are four-wire type. MR-EKCBL30M-L MR-EKCBL30M-H MR-EKCBL40M-H MR-EKCBL50M-H Other encoder cables are two-wire type. Incorrect setting will result in an encoder error 1 (At power ON) (AL.16).			Function selection C-1 x _ _ _: Encoder cable communication method selection Select how to execute the encoder cable communication method. 0: Two-wire type 1: Four-wire type When using an encoder of A/B/Z-phase differential output method, set "0". If the setting is incorrect, [AL. 16 Encoder initial communication error 1] or [AL. 20 Encoder normal communication error 1] occurs.	0h	P S T

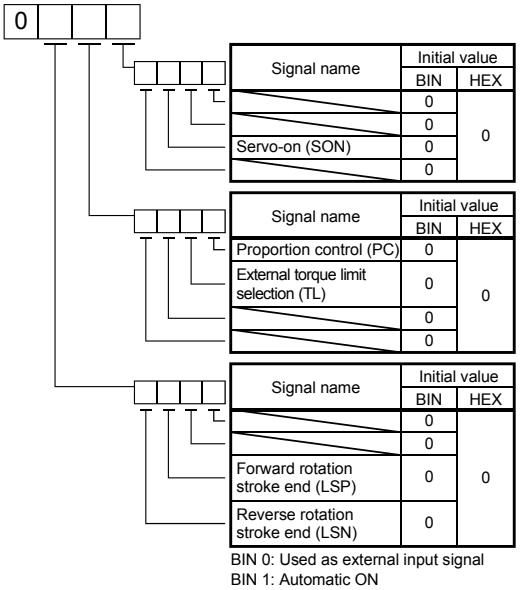
<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PC23</td><td>Function selection C-2
Select the servo lock at speed control mode stop, the VC-VLA voltage averaging, and the speed limit in torque control mode.
0 0 0 x:
Selection of servo lock at stop In the speed control mode, the servo motor shaft can be locked to prevent the shaft from being moved by the external force.
0: Valid (Servo-locked)
The operation to maintain the stop position is performed.
1: Invalid (Not servo-locked)
The stop position is not maintained.
The control to make the speed 0 r/min is performed.</td><td rowspan="4">0000h</td><td rowspan="4">PC23</td><td>Same as MR-J3
Function selection C-2
_ _ _ x:
Servo-lock selection at speed control stop
Select the servo-lock selection at speed control stop.
In the speed control mode, the servo motor shaft can be locked to prevent the shaft from being moved by an external force.
0: Enabled (servo-lock)
The operation to maintain the stop position is performed.
1: Disabled (no servo-lock)
The stop position is not maintained.
The control to make the speed 0 r/min or 0 mm/s is performed.</td><td>0h</td><td>S</td></tr>
<tr><td>0 x 0 0:
VC/VLA voltage averaging
Used to set the filtering time when the analog speed command (VC) voltage or analog speed limit (VLA) is imported.
Set 0 to vary the speed to voltage fluctuation in real time. Increase the set value to vary the speed slower to voltage fluctuation.
<table><tr><th>Set value</th><th>Filtering time [ms]</th></tr><tr><td>0</td><td>0</td></tr><tr><td>1</td><td>0.444</td></tr><tr><td>2</td><td>0.888</td></tr><tr><td>3</td><td>1.777</td></tr><tr><td>4</td><td>3.555</td></tr><tr><td>5</td><td>7.111</td></tr></table></td><td>_ _ x _ :
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td>x 0 0 0:
Selection of speed limit for torque control
0: Valid
1: Invalid
Do not use this function except when configuring a speed loop externally.
If the speed limit is invalid, the following parameters can be used.
[Pr. PB01] (Adaptive tuning mode (Adaptive filter))
[Pr. PB13] (machine resonance suppression filter 1)
[Pr. PB14] (notch shape selection 1)
[Pr. PB15] (machine resonance suppression filter 2)
[Pr. PB16] (notch shape selection 2)</td><td>_ x _ _:
VC/VLA voltage averaging selection
Select the VC/VLA voltage average.
Set the filtering time when VC (Analog speed command) or VLA (Analog speed limit) is imported.
Set 0 to vary the speed to voltage fluctuation in real time. Increase the set value to vary the speed slower to voltage fluctuation.
<table><tr><th>Setting value</th><th>Filtering time [ms]</th></tr><tr><td>0</td><td>0</td></tr><tr><td>1</td><td>0.444</td></tr><tr><td>2</td><td>0.888</td></tr><tr><td>3</td><td>1.777</td></tr><tr><td>4</td><td>3.555</td></tr><tr><td>5</td><td>7.111</td></tr></table></td><td>0h</td><td>S
T</td></tr>
<tr><td>x _ _ _:
Speed limit selection at torque control
Select the speed limit selection at torque control.
0: Enabled
1: Disabled
Do not use this function except when configuring an external speed loop.</td><td>0h</td><td>T</td></tr>
<tr><td>PC24</td><td>Function selection C-3
Select the unit of the in-position range
0 0 0 x:
In-position range unit selection
0: Command input pulse unit
1: Servo motor encoder pulse unit</td><td>0000h</td><td rowspan="4">PC24</td><td>Function selection C-3
In-position range unit selection
_ _ _ x:
Select a unit of in-position range.
0: Command input pulse unit
1: Servo motor encoder pulse unit</td><td>0h</td><td>P</td></tr>
<tr><td>_ _ x _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td>_ x _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td>x _ _ _:
Error excessive alarm/error excessive warning level unit selection
Select units for error excessive alarm level setting with [Pr. PC43] and for error excessive warning level setting with [Pr. PC73].
0: Per 1 rev or 1 mm
1: Per 0.1 rev or 0.1 mm
2: Per 0.01 rev or 0.01 mm
3: Per 0.001 rev or 0.001 mm</td><td>0h</td><td>P</td></tr>
</table>

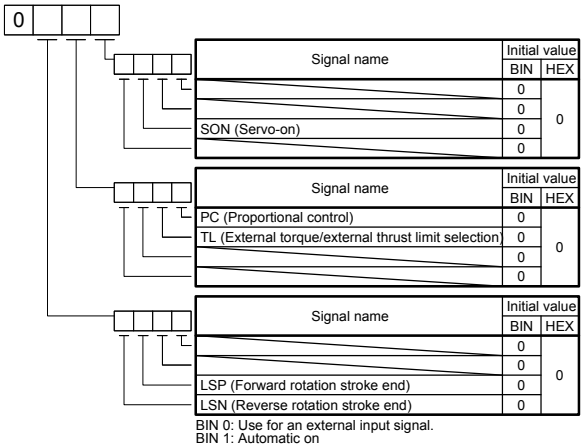
MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PC26	Function selection C-5 Select the [AL. 99 Stroke limit warning]. 0 0 0 x: [AL. 99 Stroke limit warning] selection 0: Valid 1: Invalid When this parameter is set to "1", AL. 99 will not occur if the forward rotation stroke end (LSP) or reverse rotation stroke end (LSN) turns OFF.	0000h	PC26	Same as MR-J3 Function selection C-5 _ _ _ x: [AL. 99 Stroke limit warning] selection Enable or disable [AL. 99 Stroke limit warning]. 0: Enabled 1: Disabled	0h	P S
				_ _ x _: For manufacturer setting	0h	
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: For manufacturer setting	0h	
PC27	Function selection C-6 Set this function if undervoltage alarm occurs because of distorted power supply voltage waveform when using power regenerative converter or power regenerative common converter. 0 0 0 x: Setting when undervoltage alarm occurs 0: Initial value (Waveform of power supply voltage is not distorted) 1: Set "1" if undervoltage alarm occurs because of distorted power supply voltage waveform when using power regenerative converter or power regenerative common converter.	0000h	PC27	Function selection C-6 _ _ _ x: [AL. 10 Undervoltage] detection method selection Set this parameter when [AL. 10 undervoltage] occurs due to power supply voltage distortion while using FR-RC-(H) or FR-CV-(H). 0: When [AL. 10] does not occur 1: When [AL. 10] occurs	0h	P S T
				_ _ x _: Main circuit power supply selection This digit is not available with MR-J4-_A_(-RJ) 100 W or more servo amplifiers.	0h	P S T
				_ x _ _: Undervoltage alarm selection Select the alarm and warning for when the bus voltage drops to the undervoltage alarm level. 0: [AL. 10] regardless of servo motor speed 1: [AL. E9] at servo motor speed 50 r/min (50 mm/s) or less, [AL. 10] at over 50 r/min (50 mm/s)	0h	P S T
				x _ _ _: For manufacturer setting	0h	
PC30	Acceleration time constant 2 This parameter is made valid when the acceleration/deceleration selection (STAB2) is turned ON. Used to set the acceleration time required to reach the rated speed from 0 r/min in response to the analog speed command and internal speed commands 1 to 7.	0	PC30	Same as MR-J3 Acceleration time constant 2 To enable the parameter, turn on STAB2 (Speed acceleration/deceleration selection). Set the acceleration time required to reach the rated speed from 0 r/min or 0 mm/s for VC (Analog speed command) and [Pr. PC05 Internal speed command 1] to [Pr. PC11 Internal speed command 7]. Setting range: 0 to 50000	0	S T
PC31	Deceleration time constant 2 This parameter is made valid when the acceleration/deceleration selection (STAB2) is turned ON. Used to set the deceleration time required to reach 0r/min from the rated speed in response to the analog speed command and internal speed commands 1 to 7.	0	PC31	Same as MR-J3 Deceleration time constant 2 To enable the parameter, turn on STAB2 (Speed acceleration/deceleration selection). Set the deceleration time required to reach 0 r/min or 0 mm/s from the rated speed for VC (Analog speed command) and [Pr. PC05 Internal speed command 1] to [Pr. PC11 Internal speed command 7]. Setting range: 0 to 50000	0	S T

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PC32	Command pulse multiplying factor numerator 2 Available when the [Pr. PA05] is set to "0".	1	PC32	Commanded pulse multiplication numerator 2 To enable the parameter, select "Electronic gear (0 _ _ _)" or "J3 electronic gear setting value compatibility mode (2 _ _ _)" of "Electronic gear selection" in [Pr. PA21]. Setting range: 1 to 16777215	1	P
PC33	Command pulse multiplying factor numerator 3 Available when the [Pr. PA05] is set to "0".	1	PC33	Commanded pulse multiplication numerator 3 To enable the parameter, select "Electronic gear (0 _ _ _)" or "J3 electronic gear setting value compatibility mode (2 _ _ _)" of "Electronic gear selection" in [Pr. PA21]. Setting range: 1 to 16777215	1	P
PC34	Command pulse multiplying factor numerator 4 Available when the [Pr. PA05] is set to "0".	1	PC34	Commanded pulse multiplication numerator 4 To enable the parameter, select "Electronic gear (0 _ _ _)" or "J3 electronic gear setting value compatibility mode (2 _ _ _)" of "Electronic gear selection" in [Pr. PA21]. Setting range: 1 to 16777215	1	P
PC35	Internal torque limit 2 Set this parameter to limit servo motor torque on the assumption that the maximum torque is 100 [%]. When 0 is set, torque is not produced. When torque is output in analog monitor output, this set value is the maximum output voltage (8 V).	100.0	PC35	Internal torque limit 2 Set the parameter on the assumption that the maximum torque is 100.0%. The parameter is for limiting the torque of the servo motor. No torque is generated when this parameter is set to "0.0". When TL1 (Internal torque limit selection) is turned on, Internal torque limits 1 and 2 are compared and the lower value will be enabled. Setting range: 0.0 to 100.0	100.0	P S T

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th>Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th><th></th></tr>
<tr><td>PC36</td><td>Status display selection
Select the status display to be provided at power-on.
0 0 0 x:
Selection of status display at power-on
0: Cumulative feedback pulse
1: Servo motor speed
2: Droop pulse
3: Cumulative command pulses
4: Command pulse frequency
5: Analog speed command voltage (Note 1)
6: Analog torque command voltage (Note 2)
7: Regenerative load ratio
8: Effective load ratio
9: Peak load ratio
A: Instantaneous torque
B: Within one-revolution position (1 pulse unit)
C: Within one-revolution position (100 pulses unit)
D: ABS counter
E: Load inertia moment ratio
F: Bus voltage
Note 1. In speed control mode. Analog speed limit voltage in torque control mode.
2. In torque control mode. Analog torque limit voltage in speed or position control mode.</td><td>0000h</td><td>PC36</td><td>Status display selection
_ _ x x:
Status display selection at power-on
Select a status display shown at power-on. Setting "21" to "27" will trigger [AL. 37] in the mode other than the positioning mode.
00: Cumulative feedback pulses
01: Servo motor speed
02: Droop pulses
03: Cumulative command pulses
04: Command pulse frequency
05: Analog speed command voltage (Note 1)
06: Analog torque command voltage (Note 2)
07: Regenerative load ratio
08: Effective load ratio
09: Peak load ratio
0A: Instantaneous torque
0B: Within one-revolution position/within virtual one-revolution position (1 pulse unit)
0C: Within one-revolution position/within virtual one-revolution position (1000 pulses unit)
0D: ABS counter/virtual ABS counter
0E: Load to motor inertia ratio/load to motor mass ratio
0F: Bus voltage
10: Internal temperature of encoder
11: Settling time
12: Oscillation detection frequency
13: Number of tough operations
14: Unit power consumption (increment of 1 W)
15: Unit power consumption (increment of 1 kW)
16: Unit total power consumption (increment of 1 Wh)
17: Unit total power consumption (increment of 100 kWh)
18: Load-side cumulative feedback pulses
19: Load-side droop pulses
1A: Load-side encoder information 1 (1 pulse unit)
1B: Load-side encoder information 1 (100000 pulses unit)
1C: Load-side encoder ABS counter
1D: Z-phase counter (1 pulse unit)
1E: Z-phase counter (100000 pulses unit)
1F: Electrical angle (1 pulse unit)
20: Electrical angle (100000 pulses unit)
Note 1. It is for the speed control mode. It will be the analog speed limit voltage in the torque control mode.
2. It is for the torque control mode. It will be the analog torque limit voltage in the speed control mode and position control mode.</td><td>00h</td><td>P
S
T</td></tr>
<tr><td></td><td>0 x 0 0:
Status display at power-on in corresponding control mode
<table><tr><th>Control mode</th><th>Status display at power-on</th></tr><tr><td>Position</td><td>Cumulative feedback pulses</td></tr><tr><td>Position/speed</td><td>Cumulative feedback pulses/servo motor speed</td></tr><tr><td>Speed</td><td>Servo motor speed</td></tr><tr><td>Speed/torque</td><td>Servo motor speed/analog torque command voltage</td></tr><tr><td>Torque</td><td>Analog torque command voltage</td></tr><tr><td>Torque/position</td><td>Analog torque command voltage/cumulative feedback pulses</td></tr></table>0: Depends on the control mode.
1: Depends on the first digit setting of this parameter.</td><td></td><td></td><td>_ x _ _:
Status display at power-on in corresponding control mode
0: Depends on the control mode
1: Depends on the last 2 digits settings of the parameter
<table><tr><th>Control mode</th><th>Status display at power-on</th></tr><tr><td>Position</td><td>Cumulative feedback pulses</td></tr><tr><td>Position/speed</td><td>Cumulative feedback pulses/servo motor speed</td></tr><tr><td>Speed</td><td>Servo motor speed</td></tr><tr><td>Speed/torque</td><td>Servo motor speed/analog torque command voltage</td></tr><tr><td>Torque</td><td>Analog torque (thrust) command voltage</td></tr><tr><td>Torque/position</td><td>Analog torque (thrust) command voltage/cumulative feedback pulses</td></tr></table></td><td>0h</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
</table>

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PC37	Analog speed command offset Used to set the offset voltage of the analog speed command (VC). For example, if CCW rotation is provided by switching on forward rotation start (ST1) with 0 V applied to VC, set a negative value. When automatic VC offset is used, the automatically offset value is set to this parameter. The initial value is the value provided by the automatic VC offset function before shipment at the VC-LG voltage of 0 V.	Depen-ding on servo amplifier	PC37	Same as MR-J3 Analog speed command offset Set the offset voltage of VC (Analog speed command). For example, if CCW rotation or positive direction travel is provided by switching on ST1 (Forward rotation start) while applying 0 V to VC, set a negative value. When automatic VC offset is used, the automatically offset value is set to this parameter. The initial value is provided before shipment by the automatic VC offset function on condition that the voltage between VC and LG is 0 V. Setting range: -9999 to 9999	The value differs depending on the servo amplifiers.	S
	Analog speed limit offset Used to set the offset voltage of the analog speed limit (VLA). For example, if CCW rotation is provided by switching on forward rotation selection (RS1) with 0 V applied to VLA, set a negative value. When automatic VC offset is used, the automatically offset value is set to this parameter. The initial value is the value provided by the automatic VC offset function before shipment at the VLA-LG voltage of 0 V.			Analog speed limit offset Set the offset voltage of VLA (Analog speed limit). For example, if CCW rotation or positive direction travel is provided by switching on RS1 (Forward rotation selection) while applying 0 V to VLA, set a negative value. When automatic VC offset is used, the automatically offset value is set to this parameter. The initial value is provided before shipment by the automatic VC offset function on condition that the voltage between VLA and LG is 0 V. Setting range: -9999 to 9999		T
PC38	Analog torque command offset Used to set the offset voltage of the analog torque command (TC).	0	PC38	Analog torque command offset Set the offset voltage of TC (Analog torque command). Setting range: -9999 to 9999 mV	0	T
	Analog torque limit offset Used to set the offset voltage of the analog torque limit (TLA).			Analog torque limit offset Set the offset voltage of TLA (Analog torque limit). Setting range: -9999 to 9999 mV		S
PC39	Analog monitor 1 offset Used to set the offset voltage of the analog monitor (MO1).	0	PC39	Same as MR-J3 Analog monitor 1 offset Set the offset voltage of MO1 (Analog monitor 1). Setting range: -9999 to 9999 mV	0	P S T
PC40	Analog monitor 2 offset Used to set the offset voltage of the analog monitor (MO2).	0	PC40	Same as MR-J3 Analog monitor 2 offset Set the offset voltage of MO2 (Analog monitor 2). Setting range: -9999 to 9999 mV	0	P S T
PC43	For manufacturer setting Do not change this value by any means.	0000h	PC43	Error excessive alarm level Set an error excessive alarm level. You can change the setting unit with "Error excessive alarm/error excessive warning level unit selection" in [Pr. PC24]. Set this per rev. for rotary servo motors. Setting "0" will be "3 rev", and setting over 200 rev will be clamped with 200 rev. Setting range: 0 to 1000	0	P

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th>Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th><th></th></tr>
<tr><td>PD01</td><td>Input signal automatic ON selection 1
Select the input devices to be automatically turned ON.</td><td>0000h</td><td>PD01</td><td>Same as MR-J3
Input signal automatic on selection 1
Select input devices to turn on them automatically.</td><td></td><td></td></tr>
<tr><td></td><td>_ _ _ x (HEX)</td><td>_ x _ _ (BIN): SON (Servo-on)
0: Disabled (Use for an external input signal.)
1: Enabled (automatic on)</td><td></td><td>_ _ _ x (HEX)</td><td>_ _ _ x (BIN): For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>_ _ x _ (BIN): For manufacturer setting</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>_ x _ _ (BIN): SON (Servo-on)
0: Disabled (Use for an external input signal.)
1: Enabled (automatic on)</td><td></td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>x _ _ _ (BIN): For manufacturer setting</td><td></td><td></td></tr>
<tr><td></td><td>_ _ x _ (HEX)</td><td>_ _ _ x (BIN): PC (Proportional control)
0: Disabled (Use for an external input signal.)
1: Enabled (automatic on)</td><td></td><td>_ _ x _ (HEX)</td><td>_ _ _ x (BIN): PC (Proportional control)
0: Disabled (Use for an external input signal.)
1: Enabled (automatic on)</td><td>0h</td><td>P
S</td></tr>
<tr><td></td><td></td><td>_ _ x _ (BIN): TL (External torque)
0: Disabled (Use for an external input signal.)
1: Enabled (automatic on)</td><td></td><td></td><td>_ _ x _ (BIN): TL (External torque)
0: Disabled (Use for an external input signal.)
1: Enabled (automatic on)</td><td></td><td>P
S</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>_ x _ _ (BIN): For manufacturer setting</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>x _ _ _ (BIN): For manufacturer setting</td><td></td><td></td></tr>
<tr><td></td><td>_ x _ _ (HEX)</td><td>_ x _ _ (BIN): LSP (Forward rotation stroke end)
0: Disabled (Use for an external input signal.)
1: Enabled (automatic on)</td><td></td><td>_ x _ _ (HEX)</td><td>_ _ _ x (BIN): For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>_ _ x _ (BIN): For manufacturer setting</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>_ x _ _ (BIN): LSP (Forward rotation stroke end)
0: Disabled (Use for an external input signal.)
1: Enabled (automatic on)</td><td></td><td>P
S</td></tr>
<tr><td></td><td></td><td>x _ _ _ (BIN): LSN (Reverse rotation stroke end)
0: Disabled (Use for an external input signal.)
1: Enabled (automatic on)</td><td></td><td></td><td>x _ _ _ (BIN): LSN (Reverse rotation stroke end)
0: Disabled (Use for an external input signal.)
1: Enabled (automatic on)</td><td></td><td>P
S</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _</td><td>For manufacturer setting</td><td></td><td></td></tr>
<tr><td></td><td colspan="2"> 

BIN 0: Used as external input signal
BIN 1: Automatic ON
For example, to turn ON SON, the setting is "0 0 0 4".</td><td></td><td></td><td colspan="3">Convert the setting value into hexadecimal as follows.
 

BIN 0: Use for an external input signal.
BIN 1: Automatic on</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th>Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th><th></th></tr>
<tr><td>PD03</td><td>Input signal device selection 1 (CN1-15)
Any input signal can be assigned to the CN1-15 pin. Note that the setting digits and the signal that can be assigned change depending on the control mode.

Select the input device of the CN1-15 pin.
0 0 _ _ _ _ x x
Position control
0 0 _ _ x x _ _
Speed control mode
0 0 x x _ _ _ _
Torque control mode

The devices that can be assigned in each control mode are those that have the symbols indicated in the following table. If any other device is set, it is invalid.
<table><tr><th rowspan="2">Setting</th><th colspan="3">Control modes (Note 1)</th></tr><tr><th>P</th><th>S</th><th>T</th></tr><tr><td>00</td><td></td><td></td><td></td></tr><tr><td>01</td><td colspan="3">For manufacturer setting (Note 2)</td></tr><tr><td>02</td><td>SON</td><td>SON</td><td>SON</td></tr><tr><td>03</td><td>RES</td><td>RES</td><td>RES</td></tr><tr><td>04</td><td>PC</td><td>PC</td><td></td></tr><tr><td>05</td><td>TL</td><td>TL</td><td></td></tr><tr><td>06</td><td>CR</td><td></td><td></td></tr><tr><td>07</td><td></td><td>ST1</td><td>RS2</td></tr><tr><td>08</td><td></td><td>ST2</td><td>RS1</td></tr><tr><td>09</td><td>TL1</td><td>TL1</td><td></td></tr><tr><td>0A</td><td>LSP</td><td>LSP</td><td></td></tr><tr><td>0B</td><td>LSN</td><td>LSN</td><td></td></tr><tr><td>0C</td><td colspan="3">For manufacturer setting (Note 2)</td></tr><tr><td>0D</td><td>CDP</td><td>CDP</td><td></td></tr><tr><td>0E to 1F</td><td colspan="3">For manufacturer setting (Note 2)</td></tr><tr><td>20</td><td></td><td>SP1</td><td>SP1</td></tr><tr><td>21</td><td></td><td>SP2</td><td>SP2</td></tr><tr><td>22</td><td></td><td>SP3</td><td>SP3</td></tr><tr><td>23</td><td>LOP</td><td>LOP</td><td>LOP</td></tr><tr><td>24</td><td>CM1</td><td></td><td></td></tr><tr><td>25</td><td>CM2</td><td></td><td></td></tr><tr><td>26</td><td></td><td>STAB2</td><td>STAB2</td></tr><tr><td>27 to 3F</td><td colspan="3">For manufacturer setting (Note 2)</td></tr></table>Note 1. P: Position control mode
S: Speed control mode
T: Torque control mode
2. For manufacturer setting. Never set this value.</td><td>0002
0202h</td><td>PD03</td><td>Input device selection 1L
Any input device can be assigned to the CN1-15 pin.
_ _ x x:
Position control mode - Device selection
Refer to table 2.7.</td><td>02h</td><td>P</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x x _ _:
Speed control mode - Device selection
Refer to table 2.7.

Table 2.7 Selectable input devices
<table><tr><th rowspan="2">Setting value</th><th colspan="3">Input device (Note 1)</th></tr><tr><th>P</th><th>S</th><th>T</th></tr><tr><td>02</td><td>SON</td><td>SON</td><td>SON</td></tr><tr><td>03</td><td>RES</td><td>RES</td><td>RES</td></tr><tr><td>04</td><td>PC</td><td>PC</td><td></td></tr><tr><td>05</td><td>TL</td><td>TL</td><td></td></tr><tr><td>06</td><td>CR</td><td></td><td></td></tr><tr><td>07</td><td></td><td>ST1</td><td>RS2</td></tr><tr><td>08</td><td></td><td>ST2</td><td>RS1</td></tr><tr><td>09</td><td>TL1</td><td>TL1</td><td></td></tr><tr><td>0A</td><td>LSP</td><td>LSP</td><td>LSP (Note 3)</td></tr><tr><td>0B</td><td>LSN</td><td>LSN</td><td>LSN (Note 3)</td></tr><tr><td>0D</td><td>CDP</td><td>CDP</td><td></td></tr><tr><td>0E</td><td>CLD</td><td></td><td></td></tr><tr><td>0F</td><td>MECR</td><td></td><td></td></tr><tr><td>20</td><td></td><td>SP1</td><td>SP1</td></tr><tr><td>21</td><td></td><td>SP2</td><td>SP2</td></tr><tr><td>22</td><td></td><td>SP3</td><td>SP3</td></tr><tr><td>23</td><td>LOP (Note 2)</td><td>LOP (Note 2)</td><td>LOP (Note 2)</td></tr><tr><td>24</td><td>CM1</td><td></td><td></td></tr><tr><td>25</td><td>CM2</td><td></td><td></td></tr><tr><td>26</td><td></td><td>STAB2</td><td>STAB2</td></tr></table>Note 1. P: Position control mode
S: Speed control mode
T: Torque control mode
The diagonal lines indicate manufacturer settings. Never change the setting.
2. When assigning LOP (Control switching), assign it to the same pin in all control modes.
3. In the torque control mode, this device cannot be used during normal operation. Also, when the magnetic pole detection in the torque control mode is completed, this signal will be disabled.</td><td>02h</td><td>S</td></tr>
<tr><td></td><td></td><td></td><td>PD04</td><td>Input device selection 1H
Any input device can be assigned to the CN1-15 pin.
_ _ x x:
Torque control mode - Device selection
Refer to table 2.7 in [Pr. PD03] for settings.</td><td>02h</td><td>T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x x _ _:
For manufacturer setting</td><td>02h</td><td></td></tr>
</table>

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PD04	Input signal device selection 2 (CN1-16) Any input signal can be assigned to the CN1-16 pin. The devices that can be assigned and the setting method are the same as in [Pr. PD03]. Select the input device of the CN1-16 pin. 0 0 _ _ _ _ x x Position control 0 0 _ _ x x _ _ Speed control mode 0 0 x x _ _ _ _ Torque control mode	0021 2100h	PD05	Input device selection 2L Any input device can be assigned to the CN1-16 pin.		
				_ _ x x: Position control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	00h	P
				x x _ _: Speed control mode - Device selection Refer to table 2.7 for settings.	21h	
			PD06	Input device selection 2H Any input device can be assigned to the CN1-16 pin.		
				_ _ x x: Torque control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	21h	T
				x x _ _: For manufacturer setting	20h	
PD05	Input signal device selection 3 (CN1-17) Any input signal can be assigned to the CN1-17 pin. The devices that can be assigned and the setting method are the same as in [Pr. PD03]. Select the input device of the CN1-17 pin. 0 0 _ _ _ _ x x Position control 0 0 _ _ x x _ _ Speed control mode 0 0 x x _ _ _ _ Torque control mode When "Valid (ABS transfer by DI0)" has been selected for the absolute position detection system in [Pr. PA03], the CN1-17 pin is set to the ABS transfer mode (ABSM).	0007 0704h	PD07	Input device selection 3L Any input device can be assigned to the CN1-17 pin. When "_ _ _ 1" is set in [Pr. PA03] and absolute position detection system by DIO is selected, the CN1-17 pin will become ABSM (ABS transfer mode).		
				_ _ x x: Position control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	04h	P
				x x _ _: Speed control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	07h	S
			PD08	Input device selection 3H Any input device can be assigned to the CN1-17 pin.		
				_ _ x x: Torque control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	07h	T
				x x _ _: For manufacturer setting	07h	

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PD06	Input signal device selection 4 (CN1-18) Any input signal can be assigned to the CN1-18 pin. The devices that can be assigned and the setting method are the same as in [Pr. PD03]. Select the input device of the CN1-18 pin. 0 0 _ _ _ _ x x Position control 0 0 _ _ x x _ _ Speed control mode 0 0 x x _ _ _ _ Torque control mode When "Valid (ABS transfer by DI0)" has been selected for the absolute position detection system in [Pr. PA03], the CN1-18 pin is set to the ABS transfer request (ABSR).	0008 0805h	PD09	Input device selection 4L When "_ _ _ 1" is set in [Pr. PA03] and absolute position detection system by DIO is selected, the CN1-18 pin will become ABSR (ABS transfer request).		
				_ _ x x: Position control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	05h	P
				x x _ _: Speed control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	08h	S
			PD10	Input device selection 4H Any input device can be assigned to the CN1-18 pin.		
				_ _ x x: Torque control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	08h	T
				x x _ _: For manufacturer setting	08h	
PD07	Input signal device selection 5 (CN1-19) Any input signal can be assigned to the CN1-19 pin. The devices that can be assigned and the setting method are the same as in [Pr. PD03]. Select the input device of the CN1-19 pin. 0 0 _ _ _ _ x x Position control 0 0 _ _ x x _ _ Speed control mode 0 0 x x _ _ _ _ Torque control mode	0003 0303h	PD11	Input device selection 5L Any input device can be assigned to the CN1-19 pin.		
				_ _ x x: Position control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	03h	P
				x x _ _: Speed control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	03h	S
			PD12	Input device selection 5H Any input device can be assigned to the CN1-19 pin.		
				_ _ x x: Torque control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	03h	T
				x x _ _: For manufacturer setting	03h	

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PD08	Input signal device selection 6 (CN1-41) Any input signal can be assigned to the CN1-41 pin. The devices that can be assigned and the setting method are the same as in [Pr. PD03]. Select the input device of the CN1-41 pin. 0 0 _ _ _ _ x x — Position control 0 0 _ _ x x _ _ — Speed control mode 0 0 x x _ _ _ _ — Torque control mode	0020 2006h	PD13	Input device selection 6L Any input device can be assigned to the CN1-41 pin.		
				_ _ x x: Position control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	06h	P
				x x _ _: Speed control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	20h	S
			PD14	Input device selection 6H Any input device can be assigned to the CN1-41 pin.		
				_ _ x x: Torque control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	20h	T
				x x _ _: For manufacturer setting	39h	
PD10	Input signal device selection 8 (CN1-43) Any input signal can be assigned to the CN1-43 pin. The devices that can be assigned and the setting method are the same as in [Pr. PD03] Select the input device of the CN1-43 pin. 0 0 _ _ _ _ x x — Position control 0 0 _ _ x x _ _ — Speed control mode 0 0 x x _ _ _ _ — Torque control mode	0000 0A0Ah	PD17	Input device selection 8L Any input device can be assigned to the CN1-43 pin.		
				_ _ x x: Position control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	0Ah	P
				x x _ _: Speed control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	0Ah	S
			PD18	Input device selection 8H Any input device can be assigned to the CN1-43 pin.		
				_ _ x x: Torque control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	00h	T
				x x _ _: For manufacturer setting	0Ah	

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PD11	Input signal device selection 9 (CN1-44) Any input signal can be assigned to the CN1-44 pin. The devices that can be assigned and the setting method are the same as in [Pr. PD03]. Select the input device of the CN1-44 pin. 0 0 _ _ _ _ x x — Position control 0 0 _ _ x x _ _ — Speed control mode 0 0 x x _ _ _ _ — Torque control mode	0000 0B0Bh	PD19	Input device selection 9L Any input device can be assigned to the CN1-44 pin.		
				_ _ x x: Position control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	0Bh	P
				x x _ _: Speed control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	0Bh	S
			PD20	Input device selection 9H Any input device can be assigned to the CN1-44 pin.		
				_ _ x x: Torque control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	00h	T
				x x _ _: For manufacturer setting	0Bh	
PD12	Input signal device selection 10 (CN1-45) Any input signal can be assigned to the CN1-45 pin. The devices that can be assigned and the setting method are the same as in [Pr. PD03]. Select the input device of the CN1-45 pin. 0 0 _ _ _ _ x x — Position control 0 0 _ _ x x _ _ — Speed control mode 0 0 x x _ _ _ _ — Torque control mode	0023 2323h	PD21	Input device selection 10L Any input device can be assigned to the CN1-45 pin.		
				_ _ x x: Position control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	23h	P
				x x _ _: Speed control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	23h	S
			PD22	Input device selection 10H Any input device can be assigned to the CN1-45 pin.		
				_ _ x x: Torque control mode - Device selection Refer to table 2.7 in [Pr. PD03] for settings.	23h	T
				x x _ _: For manufacturer setting	2Ah	

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th rowspan="2">Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PD13</td><td>Output signal device selection 1 (CN1-22)
Any output signal can be assigned to the CN1-22 pin.
In the initial setting, INP is assigned in the position control mode, and SA is assigned in the speed control mode.
Note that the device that can be assigned changes depending on the control mode.

0 0 x x:
Select the output device of the CN1-22 pin.

The devices that can be assigned in each control mode are those that have the symbols indicated in the following table. If any other device is set, it is invalid.

<table>
<tr><th rowspan="2">Setting</th><th colspan="3">Control modes (Note 1)</th></tr>
<tr><th>P</th><th>S</th><th>T</th></tr>
<tr><td>00</td><td>Always OFF</td><td>Always OFF</td><td>Always OFF</td></tr>
<tr><td>01</td><td colspan="3">For manufacturer setting (Note 2)</td></tr>
<tr><td>02</td><td>RD</td><td>RD</td><td>RD</td></tr>
<tr><td>03</td><td>ALM</td><td>ALM</td><td>ALM</td></tr>
<tr><td>04</td><td>INP</td><td>SA</td><td>Always OFF</td></tr>
<tr><td>05</td><td>MBR</td><td>MBR</td><td>MBR</td></tr>
<tr><td>06</td><td>DB</td><td>DB</td><td>DB</td></tr>
<tr><td>07</td><td>TLC</td><td>TLC</td><td>VLC</td></tr>
<tr><td>08</td><td>WNG</td><td>WNG</td><td>WNG</td></tr>
<tr><td>09</td><td>BWNG</td><td>BWNG</td><td>BWNG</td></tr>
<tr><td>0A</td><td>Always OFF</td><td>SA</td><td>SA</td></tr>
<tr><td>0B</td><td>Always OFF</td><td>Always OFF</td><td>VLC</td></tr>
<tr><td>0C</td><td>ZSP</td><td>ZSP</td><td>ZSP</td></tr>
<tr><td>0D</td><td colspan="3">For manufacturer setting (Note 2)</td></tr>
<tr><td>0E</td><td colspan="3">For manufacturer setting (Note 2)</td></tr>
<tr><td>0F</td><td>CDPS</td><td>Always OFF</td><td>Always OFF</td></tr>
<tr><td>10</td><td colspan="3">For manufacturer setting (Note 2)</td></tr>
<tr><td>11</td><td>ABSV</td><td>Always OFF</td><td>Always OFF</td></tr>
<tr><td>12 to 3F</td><td colspan="3">For manufacturer setting (Note 2)</td></tr>
</table>
Note 1. P: Position control mode
S: Speed control mode
T: Torque control mode
2. For manufacturer setting. Never set this value.

When "Valid (ABS transfer by DI0)" has been selected for the absolute position detection system in [Pr. PA03], the CN1-22 pin is set to the ABS transmission data bit 0 (ABSB0) in the ABS transfer mode only.</td><td>0004h</td><td>PD23</td><td>Output device selection 1
_ _ x x:
Device selection
Any output device can be assigned to the CN1-22 pin.
When "Enabled (absolute position detection system by DIO) (_ _ _ 1)" is selected in [Pr. PA03], the CN1-22 pin will become ABSB0 (ABS send data bit 0) only during ABS transfer mode.
Refer to table 2.8 for settings.
_ x _ _:
For manufacturer setting
x _ _ _:
For manufacturer setting

Table 2.8 Selectable output devices
<table>
<tr><th rowspan="2">Setting value</th><th colspan="3">Output device (Note)</th></tr>
<tr><th>P</th><th>S</th><th>T</th></tr>
<tr><td>_ _ 00</td><td>Always off</td><td>Always off</td><td>Always off</td></tr>
<tr><td>_ _ 02</td><td>RD</td><td>RD</td><td>RD</td></tr>
<tr><td>_ _ 03</td><td>ALM</td><td>ALM</td><td>ALM</td></tr>
<tr><td>_ _ 04</td><td>INP</td><td>SA</td><td>Always off</td></tr>
<tr><td>_ _ 05</td><td>MBR</td><td>MBR</td><td>MBR</td></tr>
<tr><td>_ _ 06</td><td>DB</td><td>DB</td><td>DB</td></tr>
<tr><td>_ _ 07</td><td>TLC</td><td>TLC</td><td>VLC</td></tr>
<tr><td>_ _ 08</td><td>WNG</td><td>WNG</td><td>WNG</td></tr>
<tr><td>_ _ 09</td><td>BWNG</td><td>BWNG</td><td>BWNG</td></tr>
<tr><td>_ _ 0A</td><td>Always off</td><td>SA</td><td>Always off</td></tr>
<tr><td>_ _ 0B</td><td>Always off</td><td>Always off</td><td>VLC</td></tr>
<tr><td>_ _ 0C</td><td>ZSP</td><td>ZSP</td><td>ZSP</td></tr>
<tr><td>_ _ 0D</td><td>MTTR</td><td>MTTR</td><td>MTTR</td></tr>
<tr><td>_ _ 0F</td><td>CDPS</td><td>Always off</td><td>Always off</td></tr>
<tr><td>_ _ 10</td><td>CLDS</td><td>Always off</td><td>Always off</td></tr>
<tr><td>_ _ 11</td><td>ABSV</td><td>Always off</td><td>Always off</td></tr>
</table>
Note. P: Position control mode
S: Speed control mode
T: Torque control mode</td><td>04h
0h
0h</td><td>P
S
T</td></tr>
</table>

MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PD14	Output signal device selection 2 (CN1-23) Any output signal can be assigned to the CN1-23 pin. In the initial setting, ZSP is assigned to the pin. The devices that can be assigned and the setting method are the same as in [Pr. PD13]. 0 0 x x: Select the output device of the CN1-23 pin. When "Valid (ABS transfer by DI0)" has been selected for the absolute position detection system in [Pr. PA13], the CN1-23 pin is set to the ABS transmission data bit 1 (ABSB1) in the ABS transfer mode only.	000Ch	PD24	Same as MR-J3 Output device selection 2 _ _ x x: Device selection Any output device can be assigned to the CN1-23 pin. When "Enabled (absolute position detection system by DIO) (_ _ _ 1)" is selected in [Pr. PA03], the CN1-23 pin will become ABSB1 (ABS send data bit 1) only during ABS transfer mode. Refer to table 2.8 in [Pr. PD23] for settings.	0Ch	P S T
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: For manufacturer setting	0h	
PD15	Output signal device selection 3 (CN1-24) Any output signal can be assigned to the CN1-24 pin. In the initial setting, INP is assigned in the position control mode, and SA is assigned in the speed control mode. The devices that can be assigned and the setting method are the same as in [Pr. PD13]. 0 0 x x: Select the output device of the CN1-24 pin.	0004h	PD25	Same setting as MR-J3 Output device selection 3 _ _ x x: Device selection Any output device can be assigned to the CN1-24 pin. Refer to table 2.8 in [Pr. PD23] for settings.	04h	P S T
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: For manufacturer setting	0h	
PD16	Output signal device selection 4 (CN1-25) Any output signal can be assigned to the CN1-25 pin. In the initial setting, TLC is assigned in the position control and speed control modes, and VLC is assigned in the torque control mode. The devices that can be assigned and the setting method are the same as in [Pr. PD13]. 0 0 x x: Select the output device of the CN1-25 pin. When "Valid (ABS transfer by DI0)" has been selected for the absolute position detection system in [Pr. PA03], the CN1-25 pin is set to the ABS transmission data ready (ABST) in the ABS transfer mode only.	0007h	PD26	Same setting as MR-J3 Output device selection 4 _ _ x x: Device selection Any output device can be assigned to the CN1-25 pin. When "Enabled (absolute position detection system by DIO) (_ _ _ 1)" is selected in [Pr. PA03], the CN1-25 pin will become ABST (ABS send data ready) only during ABS transfer mode. Refer to table 2.8 in [Pr. PD23] for settings.	07h	P S T
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: For manufacturer setting	0h	
PD18	Output signal device selection 6 (CN1-49) Any output signal can be assigned to the CN1-49 pin. In the initial setting, RD is assigned to the pin. The devices that can be assigned and the setting method are the same as in [Pr. PD13]. 0 0 x x: Select the output device of the CN1-49 pin.	0002h	PD28	Same setting as MR-J3 Output device selection 6 _ _ x x: Device selection Any output device can be assigned to the CN1-49 pin. Refer to table 2.8 in [Pr. PD23] for settings.	02h	P S T
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: For manufacturer setting	0h	

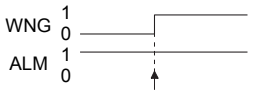
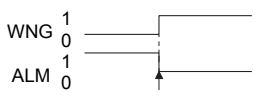
MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PD19	Input filter setting Select the input filter. 0 0 0 x: Input signal filter If external input signal causes chattering due to noise, etc., input filter is used to suppress it. 0: None 1: 1.777 [ms] 2: 3.555 [ms] 3: 5.333 [ms]	0002h	PD29	Input filter setting Select a filter for the input signal. _ _ _ x: Input signal filter selection If external input signal causes chattering due to noise, etc., input filter is used to suppress it. 0: None 1: 0.888 [ms] 2: 1.777 [ms] 3: 2.666 [ms] 4: 3.555 [ms] 5: 4.444 [ms] (available for the software version B3 or later) 6: 5.333 [ms] (available for the software version B3 or later)	4h	P S T
				_ _ x _: RES (Reset) dedicated filter selection 0: Disabled 1: Enabled (50 [ms])	0h	P S T
				_ x _ _: CR (Clear) dedicated filter selection 0: Disabled 1: Enabled (50 [ms])	0h	P S T
				x _ _ _: For manufacturer setting	0h	
PD20	Function selection D-1 Select the stop processing at forward rotation stroke end (LSP)/reverse rotation stroke end (LSN) OFF and the base circuit status at reset (RES) ON. 0 0 _ x: How to make a stop when forward rotation stroke end (LSP) reverse rotation stroke end (LSN) is valid. 0: Sudden stop 1: Slow stop	0000h	PD30	Function selection D-1 _ _ _ x: Stop method selection for LSP (Forward rotation stroke end) off and LSN (Reverse rotation stroke end) off Select a stop method for LSP (Forward rotation stroke end) off and LSN (Reverse rotation stroke end) off. Setting "2" or "3" will trigger [AL. 37] in the mode other than the positioning mode. 0: Quick stop 1: Slow stop	0h	P S
	0 0 x _ : Selection of base circuit status at reset (RES) ON 0: Base circuit switched off 1: Base circuit not switched off			_ _ x _: Base circuit status selection for RES (Reset) on 0: Base circuit shut-off 1: No base circuit shut-off	0h	P S T
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: Enabled/disabled selection for a thermistor of servo motor 0: Enabled 1: Disabled The setting in this digit will be disabled when using a servo motor without thermistor. This parameter is used by servo amplifier with software version A5 or later.	0h	P S T

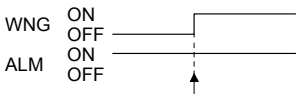
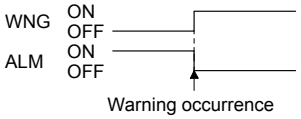
MR-J3-_A_			MR-J4-_A_			Control mode
No.	Name and function	Initial value	No.	Name and function	Initial value	
PD21	For manufacturer setting Do not change this value by any means.	0000h	PD31	Function selection D-2 _ _ _ x: For manufacturer setting	0h	
				_ _ x _: For manufacturer setting	0h	
				_ x _ _: INP (In-position) on condition selection Select a condition that INP (In-position) is turned on. 0: Droop pulses are within the in-position range. 1: The command pulse frequency is 0, and droop pulses are within the in-position range. When the position command is not inputted for about 1 ms, the command pulse frequency is decided as 0. This parameter is used by servo amplifier with software version B4 or later.	0h	P
				x _ _ _: For manufacturer setting	0h	
PD22	Function selection D-3 Set the clear (CR). 0 0 0 x: Clear (CR) selection 0: Droop pulses are cleared on the leading edge. 1: While on, droop pulses are always cleared.	0000h	PD32	Same setting as MR-J3 Function selection D-3 _ _ _ x: CR (Clear) selection Set CR (Clear). 0: Deleting droop pulses at the leading edge of turning on of CR 1: Continuous deleting of droop pulses while CR is on 2: Disabled (available for the software version B3 or later)	0h	P
				_ _ x _: For manufacturer setting	0h	
				_ x _ _: For manufacturer setting	0h	
				x _ _ _: For manufacturer setting	0h	
PD23	For manufacturer setting Do not change this value by any means.	0000h	PD33	_ _ _ x: For manufacturer setting	0h	
				_ _ x _: For manufacturer setting	0h	
				Function selection D-4 _ x _ _: Rotation direction selection for enabling torque limit Select a direction which enables internal torque limit 2 or external torque limit. 0: Both of "CCW or positive direction" and "CW or negative direction" are enabled. 1: Enabled with "CCW or positive direction" 2: Enabled with "CW or negative direction" This parameter setting is used with servo amplifier with software version B3 or later.	0h	P S T
				x _ _ _: For manufacturer setting	0h	

<table>
<tr><th colspan="3">MR-J3-_A_</th><th colspan="3">MR-J4-_A_</th><th>Control mode</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th><th></th></tr>
<tr><td>PD24</td><td>Function selection D-5

0 0 _ x:
Setting of alarm code output

Select the alarm code and warning (WNG) outputs.
<table><tr><th rowspan="2">Set value</th><th colspan="3">Connector pins of CN1</th></tr><tr><th>22</th><th>23</th><th>24</th></tr><tr><td>0</td><td colspan="3">Alarm code is not output</td></tr><tr><td>1</td><td colspan="3">Alarm code is output at alarm occurrence.</td></tr></table><table><tr><th colspan="3">Alarm code (Note)</th><th rowspan="2">Alarm display</th><th rowspan="2">Name</th></tr><tr><th>CN1-22</th><th>CN1-23</th><th>CN1-24</th></tr><tr><td>0</td><td>0</td><td>0</td><td>88888</td><td>Watchdog</td></tr><tr><td></td><td></td><td></td><td>AL.12</td><td>Memory error 1</td></tr><tr><td></td><td></td><td></td><td>AL.13</td><td>Clock error</td></tr><tr><td></td><td></td><td></td><td>AL.15</td><td>Memory error 2</td></tr><tr><td></td><td></td><td></td><td>AL.17</td><td>Board error</td></tr><tr><td></td><td></td><td></td><td>AL.19</td><td>Memory error 3</td></tr><tr><td></td><td></td><td></td><td>AL.37</td><td>Parameter error</td></tr><tr><td></td><td></td><td></td><td>AL.8A</td><td>Serial communication time-out error</td></tr><tr><td></td><td></td><td></td><td>AL.8E</td><td>Serial communication error</td></tr><tr><td>0</td><td>0</td><td>1</td><td>AL.30</td><td>Regenerative error</td></tr><tr><td></td><td></td><td></td><td>AL.33</td><td>Overvoltage</td></tr><tr><td>0</td><td>1</td><td>0</td><td>AL.10</td><td>Undervoltage</td></tr><tr><td>0</td><td>1</td><td>1</td><td>AL.45</td><td>Main circuit device overheat</td></tr><tr><td></td><td></td><td></td><td>AL.46</td><td>Servo motor overheat</td></tr><tr><td></td><td></td><td></td><td>AL.47</td><td>Cooling fan alarm</td></tr><tr><td></td><td></td><td></td><td>AL.50</td><td>Overload 1</td></tr><tr><td></td><td></td><td></td><td>AL.51</td><td>Overload 2</td></tr><tr><td>1</td><td>0</td><td>0</td><td>AL.24</td><td>Main circuit</td></tr><tr><td></td><td></td><td></td><td>AL.32</td><td>Overcurrent</td></tr><tr><td>1</td><td>0</td><td>1</td><td>AL.31</td><td>Overspeed</td></tr><tr><td></td><td></td><td></td><td>AL.35</td><td>Command pulse frequency error</td></tr><tr><td></td><td></td><td></td><td>AL.52</td><td>Error excessive</td></tr><tr><td>1</td><td>1</td><td>0</td><td>AL.16</td><td>Encoder error 1</td></tr><tr><td></td><td></td><td></td><td>AL.1A</td><td>Motor combination error</td></tr><tr><td></td><td></td><td></td><td>AL.20</td><td>Encoder error 2</td></tr><tr><td></td><td></td><td></td><td>AL.25</td><td>Absolute position erase</td></tr></table>Note 0: off
1: on
A parameter alarm [AL. 37 Parameter error] occurs if the alarm code output is selected with [Pr. PA03] set to "_ _ _ 1" and the DI0-based absolute position detection system selected.

0 0 x _:
Selection of output device at warning occurrence
Select the warning (WNG) and trouble (ALM) output status at warning occurrence.
<table><tr><th>Setting</th><th>Device status</th></tr><tr><td>0</td><td>  </td></tr><tr><td>1</td><td>  </td></tr></table>Note 0: off
1: on</td><td>0000h</td><td>PD34</td><td>Function selection D-5

_ _ _ x:
Alarm code output
Select output status of alarm codes.
Alarm codes are outputted to the pins CN1-22, CN1-23, and CN1-24.
0: Disabled
1: Enabled
When "Enabled (absolute position detection system by DIO) (_ _ _ 1)" is selected in [Pr. PA03] and when MBR (Electromagnetic brake interlock) or ALM (Malfunction) is assigned to the CN1-22 pin, CN1-23 pin, or CN1-24 pin, selecting alarm code output will generate [AL. Parameter error].
(The alarm code output is different from that for MR-J3. Check the MR-J4-_A_ Servo Amplifier Instruction Manual.)</td><td>0h</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _ :
Selection of output device at warning occurrence
Select ALM (Malfunction) output status at warning occurrence.
<table><tr><th>Setting value</th><th>Device status</th></tr><tr><td>0</td><td>  </td></tr><tr><td>1</td><td>  </td></tr></table></td><td>0h</td><td>P
S
T</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td><td></td></tr>
</table>

3.6 Important Points for Replacement

1. SUMMARY

This section describes the precautions for setting parameters for the replacement of MR-J3-_A_ with MR-J4-_A_

2. Precautions

We recommend that you use the parameter converter function (supported from version 1.12N or later) of MR Configurator2 for the replacement of MR-J3-_A_ with MR-J4-_A_. The following describes the parameters that are easily missed when the parameter setting is manually changed.

(1) Command input pulse train filter selection (_ x _ _) of [Pr. PA13 Command pulse input form]
As compared to MR-J3-_A_, the command input pulse train filter selection is added in [Pr.PA13] of MR-J4-_A_. Do not set "0h" for the command input pulse train filter selection when changing the command input pulse train form selection and pulse train logic selection. Setting "0h" for the command input pulse train filter selection enables the command input of up to 4 Mpulses/s but reduces the noise filter ability.

POINT
●Set "pulse train form" of the pulse output function correctly.

No./symbol/ name	Setting digit	Function	Initial value [unit]	Control mode (O:Enabled)		
				P	S	T
PA13 *PLSS Command pulse input form	_ _ _ x	Command input pulse train form selection 0: Forward/reverse rotation pulse train 1: Signed pulse train 2: A-phase/B-phase pulse train	0h	○		
	_ _ x _	Pulse train logic selection 0: Positive logic 1: Negative logic	0h	○		
	_ x _ _	Command input pulse train filter selection Selecting proper filter enables to enhance noise tolerance. 0: Command input pulse train is 4 Mpulses/s or less. 1: Command input pulse train is 1 Mpulse/s or less. 2: Command input pulse train is 500 kpulses/s or less. 3: Command input pulse train is 200 kpulses/s or less (available for the software version A5 or later) 1 Mpulse/s or lower commands are supported by "1". When inputting commands over 1 Mpulse/s and 4 Mpulses/s or lower, set "0".	1h	○		
	x _ _ _	For manufacturer setting	0h			

(2) [Pr. PC16 Electromagnetic brake sequence output]
MR-J3-_A_ and MR-J4-_A_ have different initial values for [Pr.PC16] (MR-J3-_A_: 100 ms, MR-J4-_A_: 0 ms). When MBR (Electromagnetic brake interlock) is assigned for [Pr. PD23] to [Pr. PD26] and [Pr. PD28], refer to the MR-J4-_A_ Servo Amplifier Instruction Manual and then set [Pr.PC16].

No./symbol/ name	Setting digit	Function	Initial value [unit]	Control mode (O: Enabled)		
				P	S	T
PC16 MBR Electromagnetic brake sequence output		Set the delay time between MBR (Electromagnetic brake interlock) and the base drive circuit is shut-off. Setting range: 0 to 1000	0 [ms]	○	○	○

(3) Input signal filter selection (_ _ _ x) of [Pr. PD29 Input filter setting]
MR-J3-_A_ and MR-J4-_A_ have different initial values for the input signal filter selection.

No./symbol/ name	Setting digit	Function	Initial value [unit]	Control mode (O:Enabled)		
				P	S	T
PD29 *DIF Input filter setting	Select a filter for the input signal.					
	_ _ _ x	Input signal filter selection If external input signal causes chattering due to noise, etc., input filter is used to suppress it.	4h	○	○	○
	_ _ x _	RES (Reset) dedicated filter selection 0: Disabled 1: Enabled (50 [ms])	0h	○	○	○
	_ x _ _	CR (Clear) dedicated filter selection 0: Disabled 1: Enabled (50 [ms])	0h	○	○	○
	x _ _ _	For manufacturer setting	0h			

Setting value	MR-J4-_A_	MR-J3-_A_
0	None	None
1	0.888 [ms]	1.777 [ms]
2	1.777 [ms]	3.555 [ms] (Initial value)
3	2.666 [ms]	5.333 [ms]
4	3.555 [ms] (Initial value)	

Part 3
Review on Replacement of MR-J3-_B_ with MR-J4-_B_

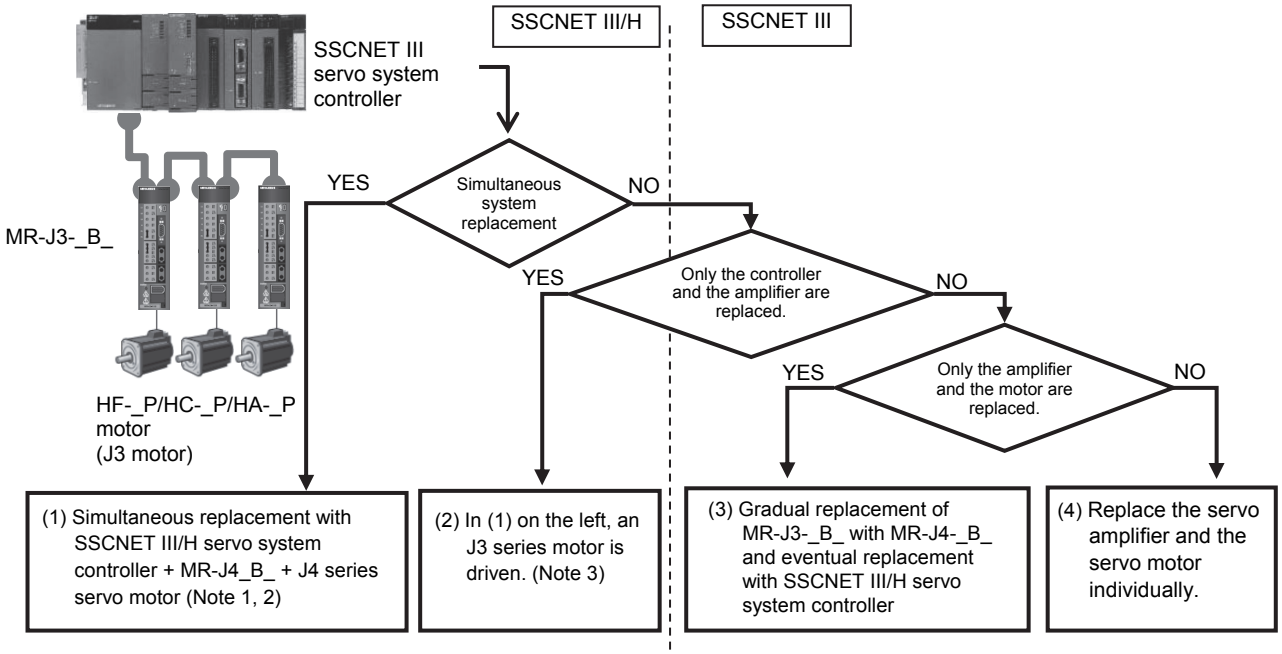
Part 3: Review on Replacement of MR-J3-_B_ with MR-J4-_B_

1. SUMMARY

This document describes the changes that are applied to when replacing a system using the MR-J3-_B_ with a system using the MR-J4-_B_.

2. CASE STUDY ON REPLACEMENT OF MR-J3-_B_

2.1 Review on Replacement Method

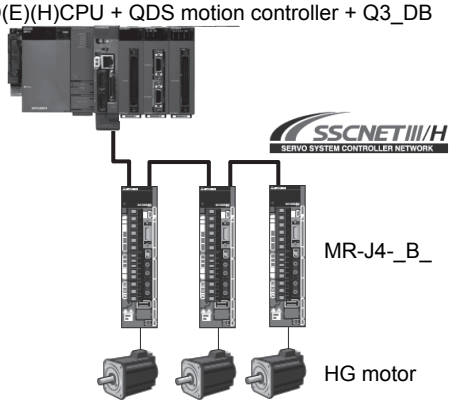
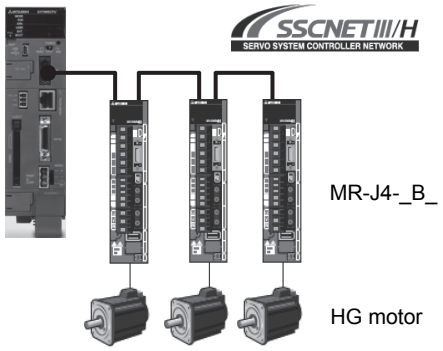


Note 1. Although heavier burdens including a longer construction period need to be borne, once replaced the system can be operated for a long period of time.
2. When designing a new system, apply simultaneous replacement at (1).
3. Replacing the system allows some J3 series servo motors to drive in MR-J4-_B_ (J4 mode) and MR-J4-_B_ (J3 compatibility mode). Check "Part 6: Common Reference Material" for target motors.

2.2 Replacement Method

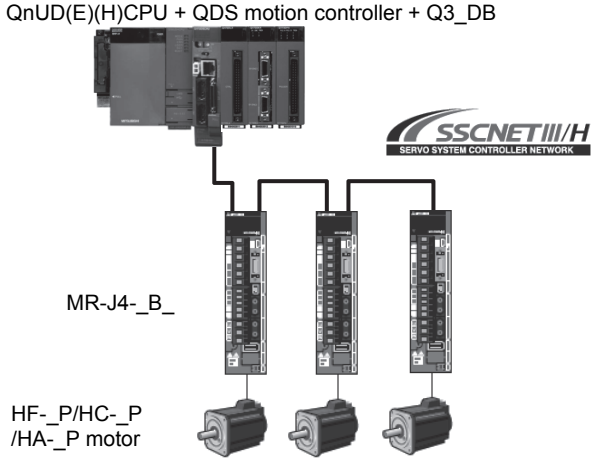
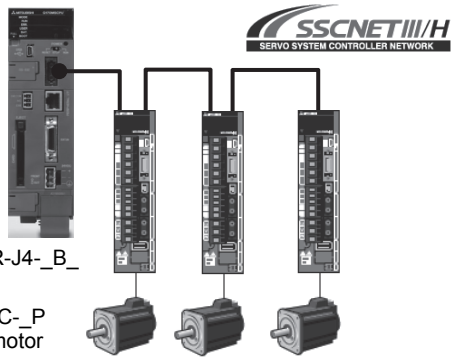
This section shows replacements using a QDS motion controller and an SSCNETIII/H stand-alone motion controller as examples.

(1) For simultaneous replacement

QDS motion controller + MR-J4-_B_ + HG motor	Stand-alone motion controller + MR-J4-_B_ + HG motor
QnUD(E)(H)CPU + QDS motion controller + Q3_DB  High-speed motion control and excellent extensibility can reduce cycle time.	SSCNET III/H stand-alone motion controller Q170MSCPU(-S1)  High performance equivalent to that of a QDS motion controller can be achieved at a lower cost.
"QDS motion controller" refers to the following model. ・Q172DSCPU ・Q173DSCPU	"Stand-alone motion controller" refers to the following model. ・Q170MSCPU(-S1)

(2) For replacement of only a controller and an amplifier

Replacing the system allows some J3 series servo motors to drive in MR-J4-_B_ (J4 mode).
For J3 series servo motors which are available with this, check "Part 6: Common Reference Material".

QDS motion controller + MR-J4-_B_ + HC-_FS/HA-_FS motor	Stand-alone motion controller + MR-J4-_B_ + HC-_FS/HA-_FS motor
QnUD(E)(H)CPU + QDS motion controller + Q3_DB  	SSCNET III/H stand-alone motion controller Q170MSCPU(-S1) 
"QDS motion controller" refers to the following model. ・Q172DSCPU ・Q173DSCPU	"Stand-alone motion controller" refers to the following model. ・Q170MSCPU(-S1)

Note. When designing a new system, please consider simultaneous replacement.

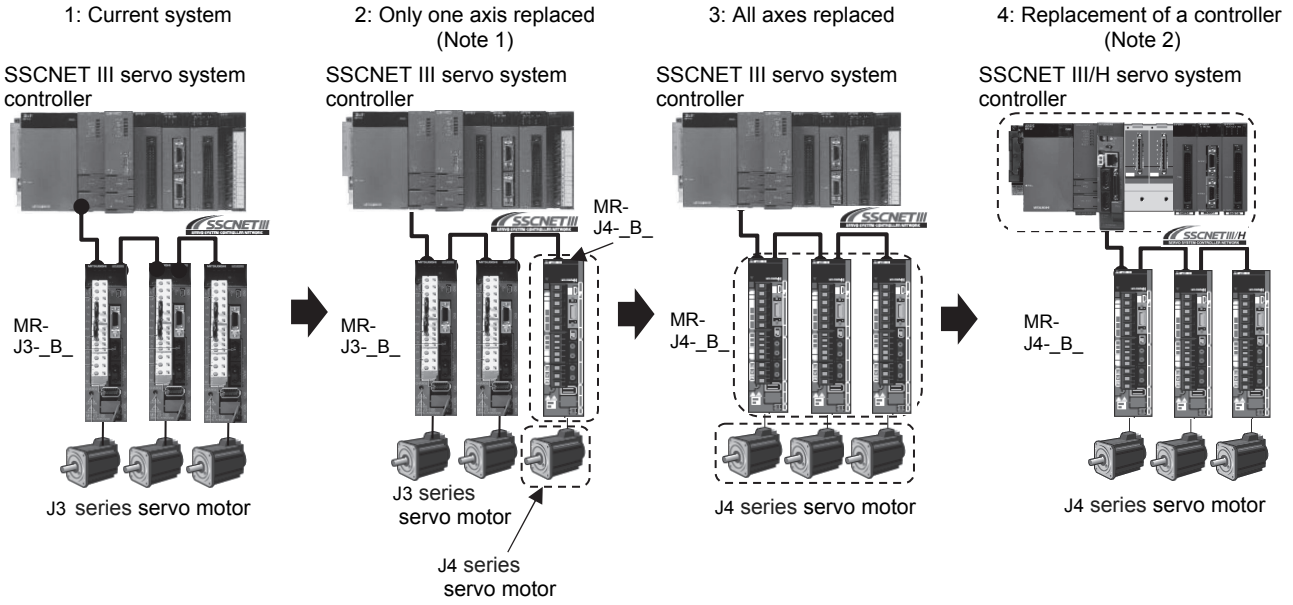
POINT

- MR-J3-_B_ cannot drive an HG motor. When the servo motor is replaced with an HG motor, simultaneous replacement with MR-J4-_B_ and an HG motor is necessary.
- When an "HC-_P motor" shown below is used, "simultaneous replacement with MR-J4-_B_ and an HG motor" is recommended. When an HG motor is adopted, the capacity of the servo amplifier needs to be changed. (Consider replacement, referring to "torque characteristics" described in "Part 7: Replacement of Motor".)
- The low inertia "HG-JR motor" is recommended for the replacement of "HC-LP motor".

  To use a servo motor other than the motors listed in following table, check the compatibility with the equipment because the motor inertia, etc. is different.

Existing device models		Replacement models for simultaneous replacement (example)	
Servo motor	Servo amplifier	Servo motor	Servo amplifier
HC-RP103(B)G5 1/_	MR-J3-200B(N)(-RT)	HG-SR102(B)G5 1/_	MR-J4-100B
HC-RP203(B)G5 1/_	MR-J3-350B	HG-SR202(B)G5 1/_	MR-J4-200B
HC-RP353(B)G5 1/_	MR-J3-500B	HG-SR352(B)G5 1/_	MR-J4-350B
HC-RP103(B)G7 1/_	MR-J3-200B(N)(-RT)	HG-SR102(B)G7 1/_	MR-J4-100B
HC-RP203(B)G7 1/_	MR-J3-350B	HG-SR202(B)G7 1/_	MR-J4-200B
HC-RP353(B)G7 1/_	MR-J3-500B	HG-SR352(B)G7 1/_	MR-J4-350B
HC-LP52(B)	MR-J3-60B	HG-JR73(B)	MR-J4-70B
HC-LP102(B)	MR-J3-100B	HG-JR153(B)	MR-J4-200B
HC-LP152(B)	MR-J3-200B(N)(-RT)	HG-JR353(B)	MR-J4-350B

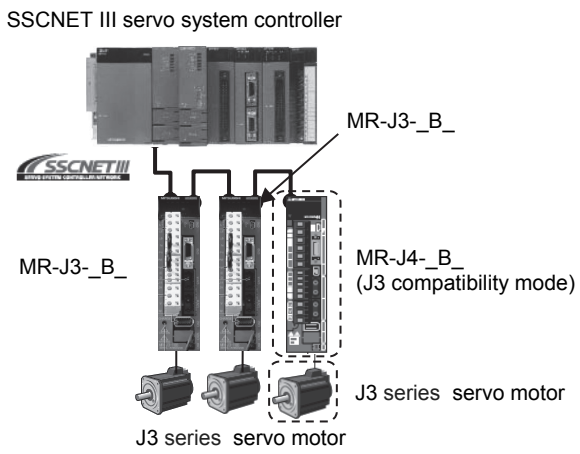
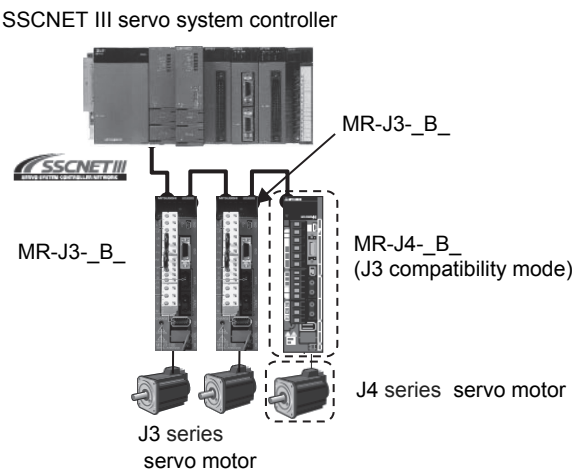
(3) Gradual replacement of MR-J3-_B_ with MR-J4-_B_



Note 1. The MR-J4-_B_ series has "J3 compatibility mode". MR-J4-_B_ and MR-J3-_B_ servo amplifiers can be used together. Optical fiber cables for the conventional SSCNET III can be used as they are.

2. Change the settings of the MR-J4-_B_ servo amplifier to "J4 mode" using the application software "MR-J4(W)-B mode selection" (*1). The servo amplifiers and servo motors can be used as they are.
   (*1): The application software is available with MR Configurator2 version 1.12 or later.

(4) For separate repair (Note)

Replacement of Servo amplifier (MR-J3-_B_)	Replacement of J3 series servo motor (HC/HA)
	
● J3 series servo motor driving with MR-J4-_B_ servo amplifiers (J3 compatibility mode) will be sequentially available. Check "Part 6: Common Reference Material" for target motors.	● The J4 series servo motor cannot be driven by the MR-J3-_B_ servo amplifier. Replace the existing servo amplifier and servo motor with MR-J4-_B_ servo amplifier (J3 compatibility mode) and J4 series servo motor simultaneously.

Note. Separate repair means replacement.

3. DIFFERENCES BETWEEN MR-J3-_B_ AND MR-J4-_B_

3.1 Function Comparison Table

POINT
●Functions with difference are shown with shading.

(1) 200 V Class

Item		MR-J3-_B_ series	MR-J4-_B_ series
1	Capacity range	0.1 kW to 22 kW/200 V	0.1 kW to 22 kW/200 V
2	Internal regenerative resistor	Built-in (0.2 kW to 7 kW) External (11kW to 22 kW)	Built-in (0.2 kW to 7 kW) External (11kW to 22 kW)
3	Dynamic brake	Built-in (0.1kW to 7kW) External (11kW to 22 kW)	Built-in (0.1kW to 7kW) External (11kW to 22 kW) **Coasting distance may differ. (Note)**
4	Control circuit power	1-phase 200 V AC to 230 V AC	1-phase 200 V AC to **240** V AC
5	Main circuit power	1-phase 200 V AC to 230 V AC (0.1 kW to 0.75 kW) 3-phase 200 V AC to 230 V AC (0.1 kW to 22 kW)	1-phase 200 V AC to **240** V AC (0.1 kW to **2 kW**) 3-phase 200 V AC to **240** V AC (0.1 kW to 22 kW)
6	24 V DC power	External supply required	External supply required
7	Auto Tuning	Real-time auto tuning: 32 steps Advanced gain search	Real-time auto tuning: **40 steps** **One-touch tuning**
8	Control mode	SSCNET III Interface (50 Mbps) ・Position control mode ・Speed control mode	**SSCNET III/H Interface (150 Mbps)** ・Position control mode ・Speed control mode ・**Torque control mode**
			< J3 compatibility mode > SSCNET III Interface (50 Mbps) ・Position control mode ・Speed control mode
9	The number of DIO points (excluding EM1)	DI: 3 points, DO: 3 points	DI: 3 points, DO: 3 points
10	Encoder pulse output	ABZ-phase (differential line driver)	ABZ-phase (differential line driver)
11	DIO interface	input/output: sink/source	input/output: sink/source
12	Analog input/output	(Output) 10-bit or equivalent × 2ch	(Output) 10-bit or equivalent × 2ch
13	Parameter setting method	Setup software (SETUP221E) MR Configurator2	MR Configurator2
14	Setup software communication function	USB	USB
15	Servo motor (Encoder resolution)	HF-_P series (18-bit ABS) HA-_P series (18-bit ABS)	HG series (**22**-bit ABS)
16	Motor maximum torque	HF-KP 350%	HG-KR 350%
		HF-MP 300%	HG-MR 300%
		HF-SP 300%	HG-SR 300%
		HF-JP 300%	HG-JR 300%
		HA-LP 250%	**HG-JR 300%**
17	LED display	7-segment 3-digit	7-segment 3-digit
18	Advanced vibration suppression control	Provided	Provided **(advanced vibration suppression control II)**
19	Adaptive filter II	Provided	Provided
20	Notch filter	Provided (2 pcs)	Provided (5 pcs)
21	Tough drive	Unprovided	**Provided**
22	Drive recorder	Unprovided	**Provided**
23	Forced stop	EM1 (DB stop)	**EM1 (DB stop)/ EM2 (deceleration to a stop)**

Note. For the coasting distance, refer to "1.2.3 Dynamic brake: coasting distance" in "Part 6: Common Reference Material".

(1) 400 V Class

Item		MR-J3-_B_ series	MR-J4-_B_ series
1	Capacity range	0.6 kW to 22 kW/400 V	0.6 kW to 22 kW/400 V
2	Internal regenerative resistor	Built-in (0.6 kW to 7 kW) External (11kW to 22 kW)	Built-in (0.6 kW to 7 kW) External (11kW to 22 kW)
3	Dynamic brake	Built-in (0.6 kW to 7 kW) External (11kW to 22 kW)	Built-in (0.6 kW to 7 kW) External (11kW to 22 kW) **Coasting distance may differ. (Note)**
4	Control circuit power	1-phase 380 V AC to 480 V AC	1-phase 380 V AC to 480 V AC
5	Main circuit power	3-phase 380 V AC to 480 V AC	3-phase 380 V AC to 480 V AC
6	24 V DC power	External supply required	External supply required
7	Auto Tuning	Real-time auto tuning: 32 steps Advanced gain search	Real-time auto tuning: **40 steps** **One-touch tuning**
8	Control mode	SSCNET III Interface (50 Mbps) ' Position control mode ' Speed control mode	**SSCNET III/H Interface (150 Mbps)** ' Position control mode ' Speed control mode ' **Torque control mode**
			< J3 compatibility mode > SSCNET III Interface (50 Mbps) ' Position control mode ' Speed control mode
9	The number of DIO points (excluding EM1)	DI: 3 points, DO: 3 points	DI: 3 points, DO: 3 points
10	Encoder pulse output	ABZ-phase (differential line driver)	ABZ-phase (differential line driver)
11	DIO interface	input/output: sink/source	input/output: sink/source
12	Analog input/output	(Output) 10-bit or equivalent × 2ch	(Output) 10-bit or equivalent × 2ch
13	Parameter setting method	Setup software (SETUP221E) MR Configurator2	MR Configurator2
14	Setup software communication function	USB	USB
15	Servo motor (Encoder resolution)	HF-_P series (18-bit ABS) HA-_P series (18-bit ABS)	HG series (**22**-bit ABS)
16	Motor maximum torque	HF-SP 300%	HG-SR 300%
		HF-JP 300%	HG-JR 300%
		HA-LP 250%	**HG-JR 300%**
17	LED display	7-segment 3-digit	7-segment 3-digit
18	Advanced vibration suppression control	Provided	Provided **(Advanced vibration suppression control II)**
19	Adaptive filter II	Provided	Provided

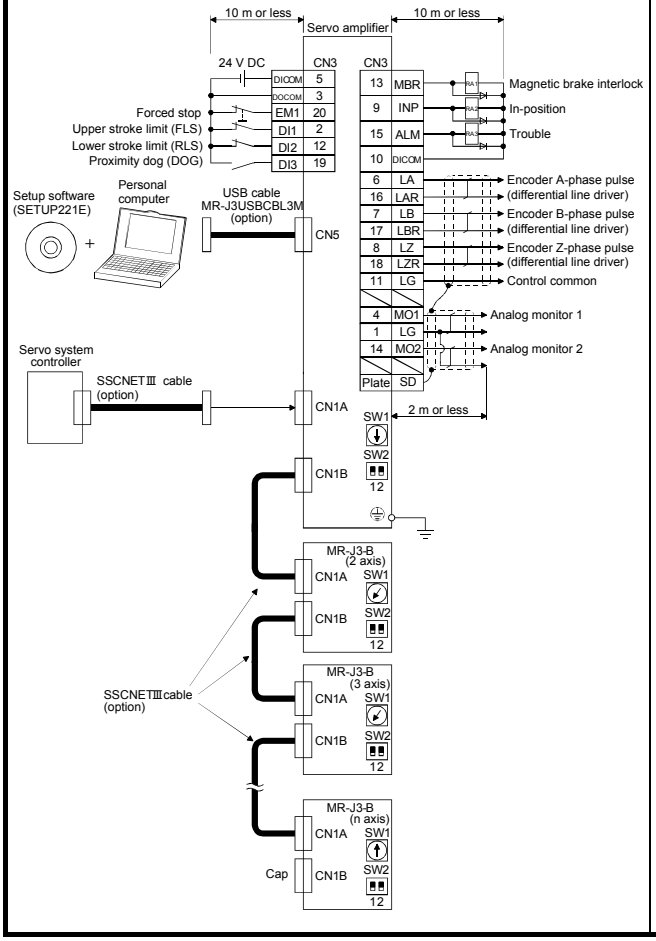
Note. For the coasting distance, refer to "1.2.3 Dynamic brake: coasting distance" in "Part 6: Common Reference Material".

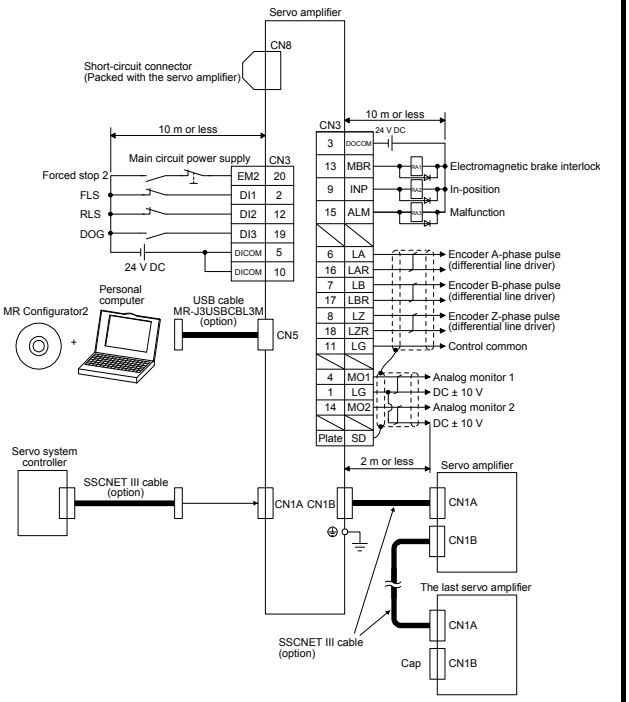
3.2 Comparison of Networks

POINT
●Refer to "Part 6: Common Reference Material".

3.3 Comparison of Standard Connection Diagrams

MR-J3-_B_	MR-J4-_B_
MR-J3-700B or less	

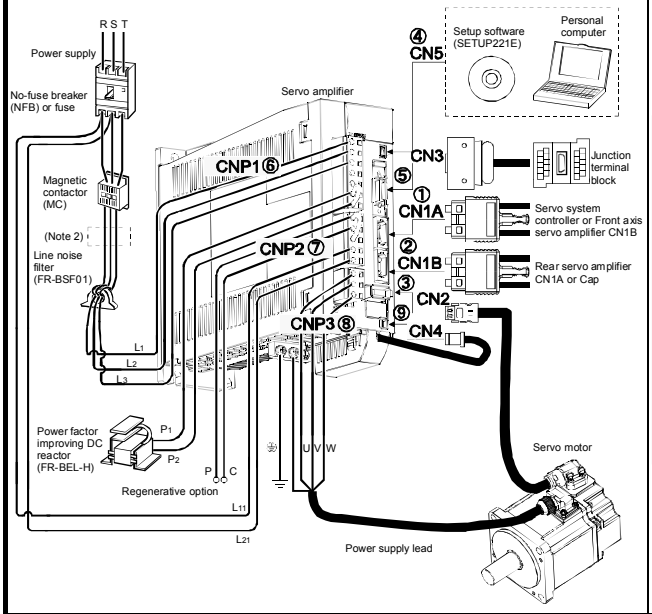
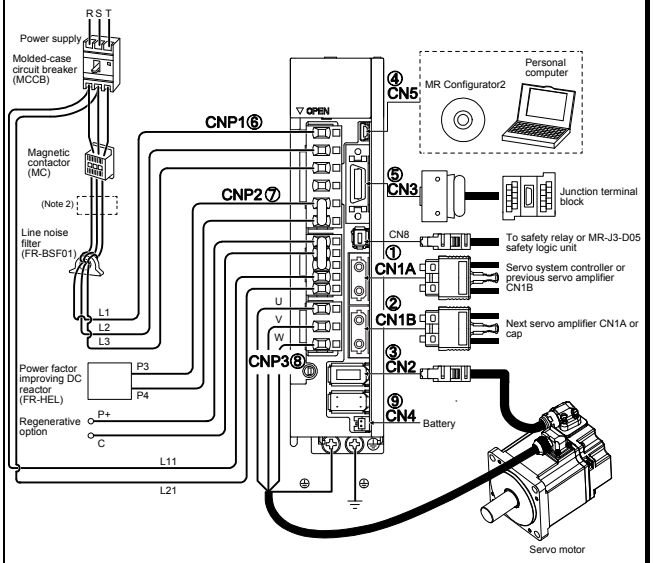




3.4 List of Corresponding Connectors and Terminal Blocks

An example of connections with the peripheral equipment is shown below. Refer to the respective Instruction Manuals for details on the signals.

(1) Comparison of connectors (7 kW or less)

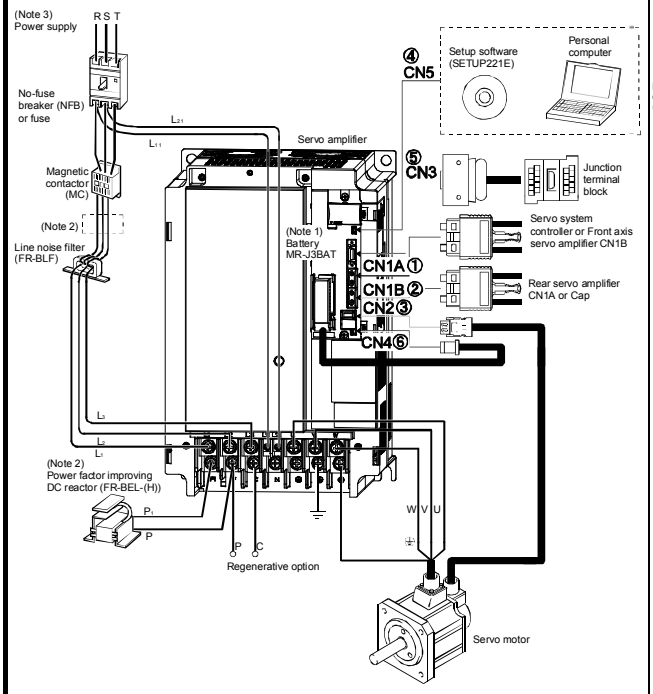
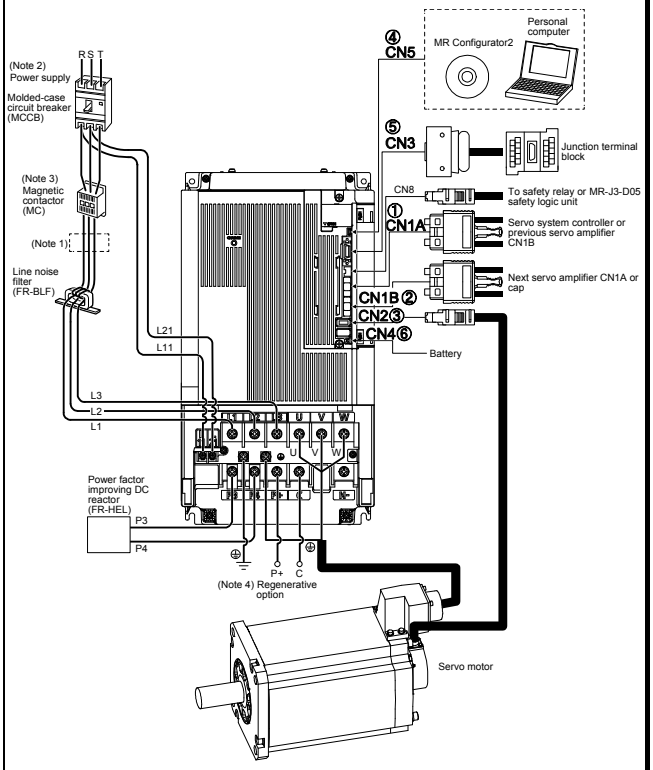
<table>
<tr><th>MR-J3-_B_</th><th>MR-J4-_B_</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Note 1. The above configuration example is applied to the MR-J3-200B or less capacities.
2. The power factor improving AC reactor can also be used. In this case, the power factor improving DC reactor cannot be used.</td><td>Note 1. The above configuration example is applied to the MR-J4-200B or less capacities.
2. The power factor improving AC reactor can also be used. In this case, the power factor improving DC reactor cannot be used.</td></tr>
</table>

(2) List of connector and terminal block correspondence (7 kW or less)

MR-J3-_B_				MR-J4-_B_		Precautions
No.	Connector name	Connector No.		No.	Connector name	Connector No.	
①	SSCNET III cable connector	CN1A	→	①	SSCNET III cable connector	CN1A	
②	SSCNET III cable connector	CN1B		②	SSCNET III cable connector	CN1B	
③	Encoder connector	CN2		③	Encoder connector	CN2	
④	USB communication connector	CN5		④	USB communication connector	CN5	
⑤	I/O signal connector	CN3		⑤	I/O signal connector	CN3	
⑥	Main circuit power connector	CNP1		⑥	Main circuit power connector	CNP1	Must switch to the power connector (enclosed with the amplifier).
⑦	Control circuit power connector	CNP2		⑦	Control circuit power connector	CNP2	
⑧	Servo motor power connector	CNP3		⑧	Servo motor power output connector	CNP3	
⑨	Battery connector	CN4		⑨	Battery connector	CN4	Prepare a new battery.

Note. When not using the STO function in MR-J4-_B_, attach a short-circuit connector supplied with a servo amplifier onto CN8 (STO input signal connector).
The configuration of the main circuit terminal block differs depending on capacity. Refer to "Part 6: Common Reference Material".

(3) Comparison of connectors (11 kW or more)

MR-J3-_B_	MR-J4-_B_
	
The above configuration example is for MR-J3-11KB or models with more capacity.	The above configuration example is for MR-J4-11KB or models with more capacity.
Note 1. The battery (option) is used for the absolute position detection system in the position control mode. 2. The power factor improving AC reactor can also be used. In this case, the power factor improving DC reactor cannot be used. When not using the power factor improving DC reactor, short P3 and P4. 3. Refer to the respective Instruction Manuals for the power supply specification.	Note 1. The power factor improving AC reactor can also be used. In this case, the power factor improving DC reactor cannot be used. When not using the power factor improving DC reactor, short P3 and P4. 2. For power supply specifications, refer to "MR-J4-_B_ Servo Amplifier Instruction Manual". 3. Depending on the main circuit voltage and operation pattern, bus voltage decreases, and that may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor. 4. When using the regenerative option, refer to Part 8 section 1.1 or 1.2.

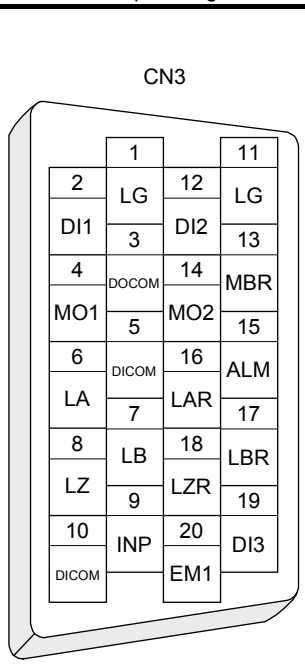
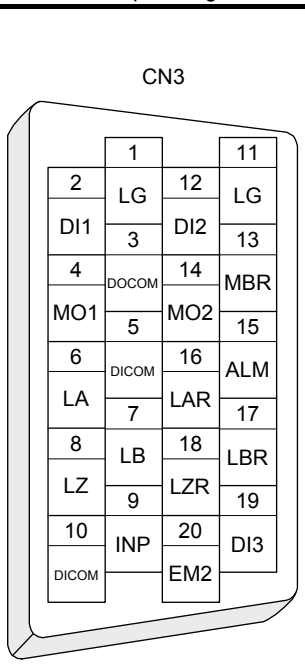
(4) List of connector and terminal block correspondence (11 kW or more)

MR-J3-_B_				MR-J4-_B_		Precautions
No.	Connector name	Connector No.		No.	Connector name	Connector No.	
①	SSCNET III cable connector	CN1A	→	①	SSCNET III cable connector	CN1A	
②	SSCNET III cable connector	CN1B		②	SSCNET III cable connector	CN1B	
③	Encoder connector	CN2		③	Encoder connector	CN2	
④	USB communication connector	CN5		④	USB communication connector	CN5	
⑤	I/O signal connector	CN3		⑤	I/O signal connector	CN3	
⑥	Battery connector	CN4		⑥	Battery connector	CN4	Prepare a new battery.

Note 1.When not using the STO function in MR-J4-_B_, attach a short-circuit connector supplied with a servo amplifier onto CN8 (STO input signal connector).
2.The configuration of the main circuit terminal block differs depending on capacity. Refer to "Part 6: Common Reference Material".

(5) Comparison of signals

Signals unique to MR-J4-_B_ are in parentheses.

MR-J3-_B_ < 7 kW or less >		Abbreviation	MR-J4-_B_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
	CN3-1	LG	CN3-1	
	CN3-2	DI1	CN3-2	
	CN3-3	DOCOM	CN3-3	
	CN3-4	MO1	CN3-4	
	CN3-5	DICOM	CN3-5	
	CN3-6	LA	CN3-6	
	CN3-7	LB	CN3-7	
	CN3-8	LZ	CN3-8	
	CN3-9	INP	CN3-9	
	CN3-10	DICOM	CN3-10	
	CN3-11	LG	CN3-11	
	CN3-12	DI2	CN3-12	
	CN3-13	MBR	CN3-13	
	CN3-14	MO2	CN3-14	
	CN3-15	ALM	CN3-15	
	CN3-16	LAR	CN3-16	
	CN3-17	LBR	CN3-17	
	CN3-18	LZR	CN3-18	
	CN3-19	DI3	CN3-19	
	CN3-20 (Note)	EM1	CN3-20	
		(EM2)		
	Plate	SD	Plate	

Note. The factory setting for MR-J4-_B_ is EM2.

3.5 Comparison of Peripheral Equipment

POINT

●Refer to "Part 8: Review on Replacement of Optional Peripheral Equipment".

3.6 Comparison of Parameters

⚠CAUTION

●Never perform extreme adjustments and changes to the parameters, otherwise the operation may become unstable.
●If fixed values are written in the digits of a parameter, do not change these values.
●Do not change parameters for manufacturer setting.
●Do not enter any setting value other than those specified for each parameter.

POINT

●For the parameter converter function, refer to "Part 6: Common Reference Material".
●The parameter whose symbol is preceded by * is enabled with the following conditions:
*: After setting the parameter, cycle the power or reset the controller.
**: After setting the parameter, cycle the power.
●For details about parameter settings for replacement, refer to the MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual to set parameters.
●Do not enter any setting value other than those specified for each parameter.

POINT

●With MR-J4-_B_, the deceleration to a stop function is enabled in the factory setting. To disable the deceleration to a stop function, set [Pr.PA04] to "0 _ _ _".
●In cases of 11 kW or more, the dynamic brake (DB) needs to be assigned to a device in [Pr.PD07] to [Pr. PD09].

3.6.1 Setting requisite parameters upon replacement

The parameters shown in this section are a minimum number of parameters that need to be set for simultaneous replacement. Depending on the settings of the currently used amplifier, parameters other than these may need to be set.

Parameter number	Name	Precautions
PA01	Control type selection	MR-J4 has servo motors whose initial settings are 350%. Refer to Part 7 "Review on Replacement of Motor" and check the operation.
PA02	Regenerative option selection	The setting value must be changed according to the option model.
PA04	Function selection A-1 Servo forced stop selection	Forced stop deceleration function selection To configure the same settings as for MR-J3-_B_, select "Forced stop deceleration function disabled (with EM1 used)".
PA08	Gain adjustment mode selection	The setting value needs to be changed according to the auto tuning mode.
PA09	Auto tuning response	Auto tuning response setting Enter this setting value for replacement, referring to "3.6.3 Comparison of parameter details". It is necessary to make gain adjustment again when replacing. For details on how to make gain adjustments, refer to Chapter 6 of the MRJ4-_B_ Servo Amplifier Instruction Manual. The setting value needs be changed based on the standard machine resonance frequency.
PA10	In-position range	The setting needs to be changed depending on the motor.
PA15	Encoder output pulse	Used to set the encoder pulses (A-phase and B-phase) output by the servo amplifier.
PA19	Parameter writing inhibit	Change the setting value as necessary.
PB06	Load to motor inertia ratio	The unit system is different. (0.1-fold→0.01-fold) Pay attention to setting value.
PB07	Model loop gain	The unit system is different. (rad/s→0.1 rad/s)
PB08	Position loop gain	The unit system is different. (rad/s→0.1 rad/s)
PB13	Machine resonance suppression filter 1	Change the setting value according to the frequency and depth.
PB14	Notch shape selection 1	
PB15	Machine resonance suppression filter 2	Change the setting value according to the frequency and depth.
PB16	Notch shape selection 2	
PB29	Load to motor inertia ratio after gain switching	The unit system is different. (0.1-fold→0.01-fold) Pay attention to setting value.
PB30	Position loop gain after gain switching	It is necessary to convert the ratio to a value to change the setting value.
PB31	Speed loop gain after gain switching	It is necessary to convert the ratio to a value to change the setting value.
PB32	Speed integral compensation after gain switching	It is necessary to convert the ratio to a value to change the setting value.
PC09	Analog monitor 1 output	The setting value must be changed according to monitor output data. "Maximum speed" and "Maximum torque" differ depending on the motor. Set according to the motor.
PC10	Analog monitor 2 output	
PC11	Analog monitor 1 offset	Depends on hardware. It is necessary to change the setting value.
PC12	Analog monitor 2 offset	Depends on hardware. It is necessary to change the setting value.

3.6.2 Parameter comparison list

MR-J3-_B_ parameters					MR-J4-_B_ parameters				
No.	Abbreviation	Parameter name	Initial value	Customer setting value	No.	Abbreviation	Parameter name	Initial value	Customer setting value
PA01	**STY	For manufacturer setting	0000h		PA01	**STY	Operation mode	1000h	
PA02	**REG	Regenerative option	0000h		PA02	**REG	Regenerative option	0000h	
PA03	*ABS	Absolute position detection system	0000h		PA03	*ABS	Absolute position detection system	0000h	
PA04	*AOP1	Function selection A-1	0000h		PA04	*AOP1	Function selection A-1	2000h	
PA05		For manufacturer setting	0		PA05		For manufacturer setting	10000	
PA06			1		PA06			1	
PA07			1		PA07			1	
PA08	ATU	Auto tuning mode	0001h		PA08	ATU	Auto tuning mode	0001h	
PA09	RSP	Auto tuning response	12		PA09	RSP	Auto tuning response	16	
PA10	INP	In-position range	100		PA10	INP	In-position range	1600	
PA11		For manufacturer setting	1000.0		PA11		For manufacturer setting	1000.0	
PA12			1000.0		PA12			1000.0	
PA13			0000h		PA13			0000h	
PA14	*POL	Rotation direction selection	0		PA14	*POL	Rotation direction selection/travel direction selection	0	
PA15	*ENR	Encoder output pulses	4000		PA15	*ENR	Encoder output pulses	4000	
PA16		For manufacturer setting	0		PA16	*ENR2	Encoder output pulses 2	1	
PA17			0000h		PA17	**MSR	Servo motor series setting	0000h	
PA18			0000h		PA18	**MTY	Servo motor type setting	0000h	
PA19	*BLK	Parameter write inhibit	000Bh		PA19	*BLK	Parameter writing inhibit	00ABh	
PB01	FILT	Adaptive tuning mode (adaptive filter II)	0000h		PB01	FILT	Adaptive tuning mode (adaptive filter II)	0000h	
PB02	VRFT	Vibration suppression control tuning mode (advanced vibration suppression control)	0000h		PB02	VRFT	Vibration suppression control tuning mode (advanced vibration suppression control II)	0000h	
PB03		For manufacturer setting	0		PB03	TFBGN	Torque feedback loop gain	18000	
PB04	FFC	Feed forward gain	0		PB04	FFC	Feed forward gain	0	
PB05		For manufacturer setting	500		PB05		For manufacturer setting	500	
PB06	GD2	Ratio of load inertia moment to servo motor inertia moment	7.0		PB06	GD2	Load to motor inertia ratio/load to motor mass ratio	7.00	
PB07	PG1	Model loop gain	24		PB07	PG1	Model loop gain	15.0	
PB08	PG2	Position loop gain	37		PB08	PG2	Position loop gain	37.0	
PB09	VG2	Speed loop gain	823		PB09	VG2	Speed loop gain	823	
PB10	VIC	Speed integral compensation	33.7		PB10	VIC	Speed integral compensation	33.7	
PB11	VDC	Speed differential compensation	980		PB11	VDC	Speed differential compensation	980	
PB12	OVA	Overshoot amount compensation	0		PB12	OVA	Overshoot amount compensation	0	
PB13	NH1	Machine resonance suppression filter 1	4500		PB13	NH1	Machine resonance suppression filter 1	4500	
PB14	NHQ1	Notch shape selection 1	0000h		PB14	NHQ1	Notch shape selection 1	0000h	
PB15	NH2	Machine resonance suppression filter 2	4500		PB15	NH2	Machine resonance suppression filter 2	4500	
PB16	NHQ2	Notch shape selection 2	0000h		PB16	NHQ2	Notch shape selection 2	0000h	
PB17		Automatic setting parameter			PB17	NHF	Shaft resonance suppression filter	0000h	
PB18	LPF	Low-pass filter setting	3141		PB18	LPF	Low-pass filter setting	3141	
PB19	VRF1	Vibration suppression control vibration frequency setting	100.0		PB19	VRF11	Vibration suppression control 1 - Vibration frequency	100.0	
PB20	VRF2	Vibration suppression control resonance frequency setting	100.0		PB20	VRF12	Vibration suppression control 1 - Resonance frequency	100.0	
PB21		For manufacturer setting	0.00		PB21	VRF13	Vibration suppression control 1 - Vibration frequency damping	0.00	
PB22			0.00		PB22	VRF14	Vibration suppression control 1 - Resonance frequency damping	0.00	
PB23	VFBF	Low-pass filter selection	0000h		PB23	VFBF	Low-pass filter selection	0000h	

MR-J3-_B_ parameters					MR-J4-_B_ parameters				
No.	Abbreviation	Parameter name	Initial value	Customer setting value	No.	Abbreviation	Parameter name	Initial value	Customer setting value
PB24	*MVS	Slight vibration suppression control selection	0000h		PB24	*MVS	Slight vibration suppression control	0000h	
PB25		For manufacturer setting	0000h		PB25	*BOP1	Function selection B-1	0000h	
PB26	*CDP	Gain changing selection	0000h		PB26	*CDP	Gain switching function	0000h	
PB27	CDL	Gain changing condition	10		PB27	CDL	Gain switching condition	10	
PB28	CDT	Gain changing time constant	1		PB28	CDT	Gain switching time constant	1	
PB29	GD2B	Gain changing ratio of load inertia moment to servo motor inertia moment	7.0		PB29	GD2B	Load to motor inertia ratio/load to motor mass ratio after gain switching	7.00	
PB30	PG2B	Gain changing position loop gain	37		PB30	PG2B	Position loop gain after gain switching	0.0	
PB31	VG2B	Gain changing speed loop gain	823		PB31	VG2B	Speed loop gain after gain switching	0	
PB32	VICB	Gain changing speed integral compensation	33.7		PB32	VICB	Speed integral compensation after gain switching	0.0	
PB33	VRF1B	Gain changing vibration suppression control vibration frequency setting	100.0		PB33	VRF11B	Vibration suppression control 1 - Vibration frequency after gain switching	0.0	
PB34	VRF2B	Gain changing vibration suppression control resonance frequency setting	100.0		PB34	VRF12B	Vibration suppression control 1 - Resonance frequency after gain switching	0.0	
PB35		For manufacturer setting	0.00		PB35	VRF13B	Vibration suppression control 1 - Vibration frequency damping after gain switching	0.00	
PB36			0.00		PB36	VRF14B	Vibration suppression control 1 - Resonance frequency damping after gain switching	0.00	
PB37			100		PB37		For manufacturer setting	1600	
PB38			0.0		PB38			0.00	
PB39			0.0		PB39			0.00	
PB40			0.0		PB40			0.00	
PB41			1125		PB41			0	
PB42			1125		PB42			0	
PB43			0004h		PB43			0000h	
PB44			0.0		PB44			0.00	
PB45	CNHF	Vibration suppression control filter 2	0000h		PB45	CNHF	Command notch filter	0000h	
PC01	ERZ	Error excessive alarm level	3		PC01	ERZ	Error excessive alarm level	0	
PC02	MBR	Electromagnetic brake sequence output	0		PC02	MBR	Electromagnetic brake sequence output	0	
PC03	*ENRS	Encoder output pulses selection	0000h		PC03	*ENRS	Encoder output pulse selection	0000h	
PC04	**COP1	Function selection C-1	0000h		PC04	**COP1	Function selection C-1	0000h	
PC05	**COP2	Function selection C-2	0000h		PC05	**COP2	Function selection C-2 Motor-less operation selection	0000h	
PC06	*COP3	Function selection C-3	0000h		PC06	*COP3	Function selection C-3 error excessive warning level unit selection	0000h	
PC07	ZSP	Zero speed	50		PC07	ZSP	Zero speed	50	
PC08		For manufacturer setting	0		PC08	OSL	Overspeed alarm detection level	0	
PC09	MOD1	Analog monitor 1 output	0000h		PC09	MOD1	Analog monitor 1 output	0000h	
PC10	MOD2	Analog monitor 2 output	0001h		PC10	MOD2	Analog monitor 2 output	0001h	
PC11	MO1	Analog monitor 1 offset	0		PC11	MO1	Analog monitor 1 offset	0	
PC12	MO2	Analog monitor 2 offset	0		PC12	MO2	Analog monitor 2 offset	0	
PC13	MOSDL	Analog monitor feedback position output standard data Low	0		PC13	MOSDL	Analog monitor - Feedback position output standard data - Low	0	
PC14	MOSDH	Analog monitor feedback position output standard data High	0		PC14	MOSDH	Analog monitor - Feedback position output standard data - High	0	
PC15		For manufacturer setting	0		PC15		For manufacturer setting	0	
PC16			0000h		PC16			0000h	
PC17	**COP4	Function selection C-4	0000h		PC17	**COP4	Function selection C-4	0000h	
PC18		For manufacturer setting	0000h		PC18	*COP5	Function selection C-5	0000h	
PC19			0000h		PC19		For manufacturer setting	0000h	
PC20	*COP7	Function selection C-7	0000h		PC20	*COP7	Overspeed alarm detection level	0000h	

MR-J3-_B_ parameters					MR-J4-_B_ parameters				
No.	Abbreviation	Parameter name	Initial value	Customer setting value	No.	Abbreviation	Parameter name	Initial value	Customer setting value
PC21	*BPS	Alarm history clear	0000h		PC21	*BPS	Alarm history clear	0000h	
PC22		For manufacturer setting	0000h		PC22		For manufacturer setting	0	
PC23			0000h		PC23			0000h	
PC24			0000h		PC24	RSBR	Forced stop deceleration time constant	100	
PC25			0000h		PC25		For manufacturer setting	0	
PC26			0000h		PC26	**COP8	Function selection C-8	0000h	
PC27			0000h		PC27	**COP9	Function selection C-9	0000h	
PC28			0000h		PC28		For manufacturer setting	0000h	
PC29			0000h		PC29	**COP8	Function selection C-B	0000h	
PC30			0000h		PC30		For manufacturer setting	0	
PC31			0000h		PC31	RSUP1	Vertical axis freefall prevention compensation amount	0	
PC32			0000h		PC32		For manufacturer setting	0000h	
PD01			0000h		PD01		For manufacturer setting	0000h	
PD02			0000h		PD02	*DIA2	Input signal automatic on selection 2	0000h	
PD03			0000h		PD03		For manufacturer setting	0020h	
PD04			0000h		PD04			0021h	
PD05			0000h		PD05			0022h	
PD06			0000h		PD06			0000h	
PD07	*DO1	Output signal device selection 1 (CN3-13)	0005h		PD07	*DO1	Output device selection 1	0005h	
PD08	*DO2	Output signal device selection 2 (CN3-9)	0004h		PD08	*DO2	Output device selection 2	0004h	
PD09	*DO3	Output signal device selection 3 (CN3-15)	0003h		PD09	*DO3	Output device selection 3	0003h	
PD10		For manufacturer setting	0000h		PD10		For manufacturer setting	0000h	
PD11			0004h		PD11	*DIF	Input filter setting (Note)	0004h	
PD12			0000h		PD12	*DOP1	Function selection D-1	0000h	
PD13			0000h		PD13	*DOP2	Function selection D-2	0000h	
PD14	*DOP3	Function selection D-3	0000h		PD14	*DOP3	Function selection D-3	0000h	
PD15	*IDCS	For manufacturer setting	0000h		PD15	*IDCS	Driver communication setting	0000h	
PD16	*MD1	Driver communication setting - Master - Transmit data selection 1	0000h		PD16	*MD1	Driver communication setting - Master - Transmit data selection 1	0000h	
PD17	*MD2	Driver communication setting - Master - Transmit data selection 2	0000h		PD17	*MD2	Driver communication setting - Master - Transmit data selection 2	0000h	
PD18		For manufacturer setting	0000h		PD18		For manufacturer setting	0000h	
PD19			0000h		PD19			0000h	
PD20	*SLA1	Driver communication setting - Slave - Master axis No. selection 1	0		PD20	*SLA1	Driver communication setting - Slave - Master axis No. selection 1	0	
PD21		For manufacturer setting	0		PD21		For manufacturer setting	0	
PD22			0		PD22			0	
PD23			0		PD23			0	
PD24			0000h		PD24			0000h	
PD25			0000h		PD25			0000h	
PD26			0000h		PD26			0000h	
PD27			0000h		PD27			0000h	
PD28			0000h		PD28			0000h	
PD29			0000h		PD29			0000h	
PD30	TLC	Master-slave operation - Torque command coefficient on slave	0000h		PD30	TLC	Master-slave operation - Torque command coefficient on slave	0	
PD31	VLC	Master-slave operation - Speed limit coefficient on slave	0000h		PD31	VLC	Master-slave operation - Speed limit coefficient on slave	0	
PD32	VLL	Master-slave operation - Speed limit adjusted value on slave	0000h		PD32	VLL	Master-slave operation - Speed limit adjusted value on slave	0	

Note Refer to the servo system controller instruction manual for the setting.

3.6.3 Comparison of parameter details

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PA01	Control mode Turn off the power and then on again after setting the parameter to validate the parameter value. This parameter is supported by a combination of a servo amplifier, whose software version is C4 or later (manufactured in January 2010 or later), and a HF-KP servo motor (manufactured in August 2009 or later). Check the software version using status display or Setup software (SETUP221E). When the 350% maximum torque setting of the HF-KP servo motor is enabled, set the torque limit value in the controller at 1000%. A HF-KP servo motor with a decelerator and servo motors except the HF-KP series do not support the 350 maximum torque setting. Making the 350 maximum torque setting valid when using these servo motors causes the [AL. 37 parameter error]. Set the control loop composition of the servo amplifier, and the maximum torque of the HFKP series servo motor. By making the high-response control valid in the control loop composition, response of the servo can be increased compared to the response under the standard control (factory setting).Moreover, the track ability for a command and the settling time in machines with high rigidity can be decreased. To further shorten the settling time using the auto tuning results of the high-response control, increase the setting of model loop gain ([Pr. PB07]) in the manual mode. By making the 350 maximum torque setting valid, the maximum torque of the HF-KP servo motor can be increased from 300 to 350. To operate at the maximum torque of 350, operate within the range of overload protection characteristic. If operated beyond the overload protection characteristic range, servo motor overheat (46), overload 1 (50), and overload 2 (51) may occur. 0 x 0 0: Control type selection 0: Standard control (350 maximum torque setting of HF-KP servo motor Invalid) 3: Standard control (350 maximum torque setting of HF-KP servo motor Valid) 4: High-response control valid (350 maximum torque setting of HF-KP servo motor Invalid) 5: High-response control valid (350 maximum torque setting of HF-KP servo motor Valid)	0000h	PA01	Operation mode Select an operation mode. _ _ _ x: For manufacturer setting	0h
				_ _ x _ : Operation mode selection 0: Standard control mode Setting other than above will result in [AL. 37 Parameter error].	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : Operation mode selection To change this digit, use an application software "MR-J4(W)-B mode selection". When you change it without the application, [AL. 3E Operation mode error] will occur. 0: J3 compatibility mode 1: J4 mode	1h

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PA02	Regenerative option This parameter value and switch power off once, then switch it on again to make that parameter setting valid. Wrong setting may cause the regenerative option to burn. If the regenerative option selected is not for use with the servo amplifier, [AL.37 parameter error] occurs. _ _ x x: Selection of regenerative option 00: Regenerative option is not used ・For servo amplifier of 100 W, regenerative resistor is not used. ・For servo amplifier of 0.2 kW to 7 kW, built-in regenerative resistor is used. ・Supplied regenerative resistors or regenerative option is used with the servo amplifier of 11 kW to 22 kW. 01: FR-BU2-(H)/FR-RC-(H)/FR-CV-(H) 02: MR-RB032 03: MR-RB12 04: MR-RB32 05: MR-RB30 06: MR-RB50 (Cooling fan is required) 08: MR-RB31 09: MR-RB51 (Cooling fan is required) 80: MR-RB1H-4 81: MR-RB3M-4 (Cooling fan is required) 82: MR-RB3G-4 (Cooling fan is required) 83: MR-RB5G-4 (Cooling fan is required) 84: MR-RB34-4 (Cooling fan is required) 85: MR-RB54-4 (Cooling fan is required) FA: When the supplied regenerative resistor is cooled by the cooling fan to increase the ability with the servo amplifier of 11kW to 22kW. Note. The setting is for the servo amplifier of 22 kW or less.	0000h	PA02	Same as MR-J3 Regenerative option Used to select the regenerative option. Incorrect setting may cause the regenerative option to burn. If a selected regenerative option is not for use with the servo amplifier, [AL. 37 Parameter error] occurs. _ _ x x: Regenerative option selection 00: Regenerative option is not used. ・For servo amplifier of 100 W, regenerative resistor is not used. ・For servo amplifier of 0.2 kW to 7 kW, built-in regenerative resistor is used. ・Supplied regenerative resistors or regenerative option is used with the servo amplifier of 11 kW to 22 kW. 01: FR-RC-(H)/FR-CV-(H)/FR-BU2-(H) When you use FR-RC-(H) or FR-CV-(H), "Mode 2 (_ _ _ 1)" of "Undervoltage alarm detection mode selection" in [Pr. PC20]. 02: MR-RB032 03: MR-RB12 04: MR-RB32 05: MR-RB30 06: MR-RB50 (Cooling fan is required.) 08: MR-RB31 09: MR-RB51 (Cooling fan is required.) 0B: MR-RB3N 0C: MR-RB5N (Cooling fan is required.) 80: MR-RB1H-4 81: MR-RB3M-4 (Cooling fan is required.) 82: MR-RB3G-4 (Cooling fan is required.) 83: MR-RB5G-4 (Cooling fan is required.) 84: MR-RB34-4 (Cooling fan is required.) 85: MR-RB54-4 (Cooling fan is required.) 91: MR-RB3U-4 (Cooling fan is required.) 92: MR-RB5U-4 (Cooling fan is required.) FA: When the supplied regenerative resistors or the regenerative option is cooled by the cooling fan to increase the ability with the servo amplifier of 11 kW to 22 kW.	00h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h

<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PA03</td><td>Absolute position detection system
This parameter is made valid when power is switched off, then on after setting, or when the controller reset has been performed.
This parameter cannot be used in the speed control mode.
Set this parameter when using the absolute position detection system in the position control mode.
0 0 0 x:
Selection of absolute position detection system
0: Used in incremental system
1: Used in absolute position detection system</td><td>0000h</td><td>PA03</td><td>Same as MR-J3
Absolute position detection system
Set this parameter when using the absolute position detection system.
The parameter is not available in the speed control mode and torque control mode.</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ _ x:
Absolute position detection system selection
0: Disabled (used in incremental system)
1: Enabled (used in absolute position detection system)</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td>PA04</td><td>Function selection A-1
This parameter is made valid when power is switched off, then on after setting, or when the controller reset has been performed.
The servo forced stop function is avoidable.

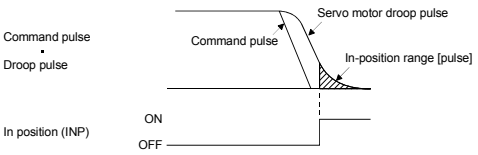
0 x 0 0:
Selection of servo forced stop
0: Valid (Forced stop (EM1) is used
1: Invalid (Forced stop (EM1) is not used.)

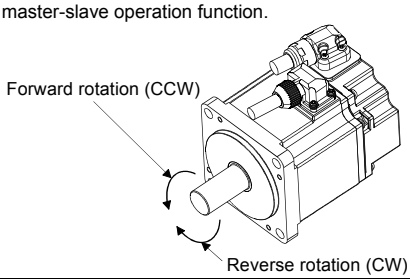
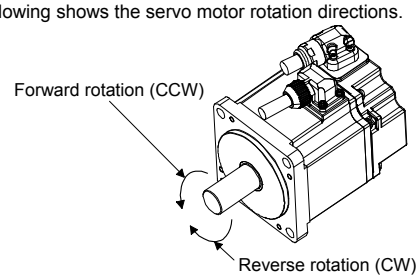
When not using the forced stop (EM1) of servo amplifier, set the selection of servo forced stop to Invalid (_ _1_). At this time, the forced stop (EM1) automatically turns on inside the servo amplifier.</td><td>0000h</td><td>PA04</td><td>Same setting as MR-J3
Function selection A-1
This is used to select the forced stop input and forced stop deceleration function.</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ _ x:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
Servo forced stop selection
0: Enabled (The forced stop input EM2 or EM1 is used.)
1: Disabled (The forced stop input EM2 and EM1 are not used.)
Refer to table 3.1 for details.</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
Forced stop deceleration function selection
0: Forced stop deceleration function disabled (EM1)
2: Forced stop deceleration function enabled (EM2)
Refer to table 3.1 for details.</td><td>2h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Table 3.1 Deceleration method
<table>
<tr><th rowspan="2">Setting value</th><th rowspan="2">EM2/EM1</th><th colspan="2">Deceleration method</th></tr>
<tr><th>EM2 or EM1 is off</th><th>Controller forced stop is enabled/Alarm occurred</th></tr>
<tr><td>0 0 _ _</td><td>EM1</td><td>MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.</td><td>MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.</td></tr>
<tr><td>2 0 _ _</td><td>EM2</td><td>MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.</td><td>MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.</td></tr>
<tr><td>0 1 _ _</td><td>Not using EM2 and EM1</td><td></td><td>MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.</td></tr>
<tr><td>2 1 _ _</td><td>Not using EM2 and EM1</td><td></td><td>MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.</td></tr>
</table></td><td></td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PA08</td><td>Auto tuning mode
This parameter cannot be used in the torque control mode.
Make gain adjustment using auto tuning.
Auto tuning mode [Pr. PA08]
Select the gain adjustment mode.

0 0 0 x:
Gain adjustment mode setting
0: Interpolation mode (Automatically set parameter No. (Note) [Pr. PB06/PB08/PB09/PB10])
1: Auto tuning mode 1 (Automatically set parameter No. (Note) [Pr. PB06/PB07/PB08/PB09/PB10])
2: Auto tuning mode 2 (Automatically set parameter No. [Pr. PB07/PB08/PB09/PB10])
3: Manual mode

Note. The parameters have the following names.
<table><tr><th>Parameter No.</th><th>Name</th></tr><tr><td>PB06</td><td>Ratio of load inertia moment to servo motor inertia moment</td></tr><tr><td>PB07</td><td>Model loop gain</td></tr><tr><td>PB08</td><td>Position loop gain</td></tr><tr><td>PB09</td><td>Speed loop gain</td></tr><tr><td>PB10</td><td>Speed integral compensation</td></tr></table></td><td>0001h</td><td>PA08</td><td>Same setting as MR-J3
Auto tuning response
Set a response of the auto tuning.
_ _ _ x:
Gain adjustment mode selection
0: 2 gain adjustment mode 1 (interpolation mode)
1: Auto tuning mode 1
2: Auto tuning mode 2
3: Manual mode
4: 2 gain adjustment mode 2
_ _ x _ :
For manufacturer setting
_ x _ _ :
For manufacturer setting
x _ _ _ :
For manufacturer setting</td><td>1h

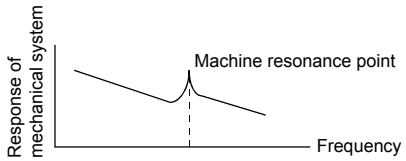
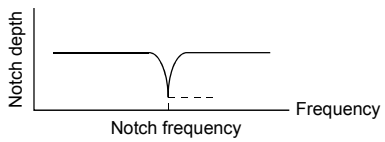
0h
0h
0h</td></tr>
<tr><td>PA09</td><td>Auto tuning response
If the machine hunts or generates large gear sound, decrease the set value. To improve performance, e.g. shorten the settling time, increase the set value.
<table><tr><th>Setting value</th><th>Response</th><th>Guideline for machine resonance frequency [Hz]</th></tr><tr><td>1</td><td>Low response</td><td>10.0</td></tr><tr><td>2</td><td></td><td>11.3</td></tr><tr><td>3</td><td></td><td>12.7</td></tr><tr><td>4</td><td></td><td>14.3</td></tr><tr><td>5</td><td></td><td>16.1</td></tr><tr><td>6</td><td></td><td>18.1</td></tr><tr><td>7</td><td></td><td>20.4</td></tr><tr><td>8</td><td></td><td>23.0</td></tr><tr><td>9</td><td></td><td>25.9</td></tr><tr><td>10</td><td></td><td>29.2</td></tr><tr><td>11</td><td></td><td>32.9</td></tr><tr><td>12</td><td></td><td>37.0</td></tr><tr><td>13</td><td></td><td>41.7</td></tr><tr><td>14</td><td></td><td>47.0</td></tr><tr><td>15</td><td></td><td>52.9</td></tr><tr><td>16</td><td>Middle response</td><td>59.6</td></tr></table><table><tr><th>Setting value</th><th>Response</th><th>Guideline for machine resonance frequency [Hz]</th></tr><tr><td>17</td><td>Middle response</td><td>67.1</td></tr><tr><td>18</td><td></td><td>75.6</td></tr><tr><td>19</td><td></td><td>85.2</td></tr><tr><td>20</td><td></td><td>95.9</td></tr><tr><td>21</td><td></td><td>108.0</td></tr><tr><td>22</td><td></td><td>121.7</td></tr><tr><td>23</td><td></td><td>137.1</td></tr><tr><td>24</td><td></td><td>154.4</td></tr><tr><td>25</td><td></td><td>173.9</td></tr><tr><td>26</td><td></td><td>195.9</td></tr><tr><td>27</td><td></td><td>220.6</td></tr><tr><td>28</td><td></td><td>248.5</td></tr><tr><td>29</td><td></td><td>279.9</td></tr><tr><td>30</td><td></td><td>315.3</td></tr><tr><td>31</td><td></td><td>355.1</td></tr><tr><td>32</td><td>High response</td><td>400.0</td></tr></table></td><td>12</td><td>PA09</td><td>Auto tuning response
Set a response of the auto tuning.
<table><tr><th rowspan="2">Setting value</th><th colspan="2">Machine characteristic</th></tr><tr><th>Response</th><th>Guideline for machine resonance frequency [Hz]</th></tr><tr><td>1</td><td>Low response</td><td>2.7</td></tr><tr><td>2</td><td></td><td>3.6</td></tr><tr><td>3</td><td></td><td>4.9</td></tr><tr><td>4</td><td></td><td>6.6</td></tr><tr><td>5</td><td></td><td>10.0</td></tr><tr><td>6</td><td></td><td>11.3</td></tr><tr><td>7</td><td></td><td>12.7</td></tr><tr><td>8</td><td></td><td>14.3</td></tr><tr><td>9</td><td></td><td>16.1</td></tr><tr><td>10</td><td></td><td>18.1</td></tr><tr><td>11</td><td></td><td>20.4</td></tr><tr><td>12</td><td></td><td>23.0</td></tr><tr><td>13</td><td></td><td>25.9</td></tr><tr><td>14</td><td></td><td>29.2</td></tr><tr><td>15</td><td></td><td>32.9</td></tr><tr><td>16</td><td></td><td>37.0</td></tr><tr><td>17</td><td></td><td>41.7</td></tr><tr><td>18</td><td></td><td>47.0</td></tr><tr><td>19</td><td></td><td>52.9</td></tr><tr><td>20</td><td>Middle response</td><td>59.6</td></tr></table><table><tr><th rowspan="2">Setting value</th><th colspan="2">Machine characteristic</th></tr><tr><th>Respoznse</th><th>Guideline for machine resonance frequency [Hz]</th></tr><tr><td>21</td><td>Middle response</td><td>67.1</td></tr><tr><td>22</td><td></td><td>75.6</td></tr><tr><td>23</td><td></td><td>85.2</td></tr><tr><td>24</td><td></td><td>95.9</td></tr><tr><td>25</td><td></td><td>108.0</td></tr><tr><td>26</td><td></td><td>121.7</td></tr><tr><td>27</td><td></td><td>137.1</td></tr><tr><td>28</td><td></td><td>154.4</td></tr><tr><td>29</td><td></td><td>173.9</td></tr><tr><td>30</td><td></td><td>195.9</td></tr><tr><td>31</td><td></td><td>220.6</td></tr><tr><td>32</td><td></td><td>248.5</td></tr><tr><td>33</td><td></td><td>279.9</td></tr><tr><td>34</td><td></td><td>315.3</td></tr><tr><td>35</td><td></td><td>355.1</td></tr><tr><td>36</td><td></td><td>400.0</td></tr><tr><td>37</td><td></td><td>446.6</td></tr><tr><td>38</td><td></td><td>501.2</td></tr><tr><td>39</td><td></td><td>571.5</td></tr><tr><td>40</td><td>High response</td><td>642.7</td></tr></table></td><td>16</td></tr>
<tr><td>PA10</td><td>In-position range
This parameter cannot be used in the speed control mode.
Set the range, where in position (INP) is output, in the command pulse unit.
  </td><td>100</td><td>PA10</td><td>In-position range
Set an in-position range per command pulse.</td><td>1600</td></tr>
</table>

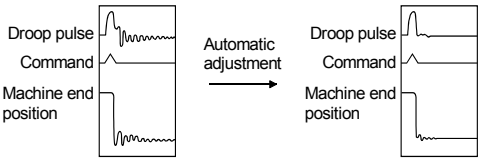
<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PA14</td><td>Rotation direction selection
This parameter is made valid when power is switched off, then on after setting, or when the controller reset has been performed.
Select servo motor rotation direction relative.
<table><tr><th rowspan="2">[Pr. PA14] setting</th><th colspan="2">Servo motor rotation direction (Note1)</th></tr><tr><th>When positioning address increases (Position control) Command speed in the positive direction (Speed control) Command torque in the positive direction (Torque control (Note2))</th><th>When positioning address decreases (Position control) Command speed in the negative direction (Speed control) Command torque in the negative direction (Torque control (Note2))</th></tr><tr><td>0</td><td>CCW</td><td>CW</td></tr><tr><td>1</td><td>CW</td><td>CCW</td></tr></table>Note 1. The torque generation direction for the torque control.
2. The torque generation direction can be set for the slave axis with this parameter by using the master-slave operation function.
  </td><td>0</td><td>PA14</td><td>Rotation direction selection/travel direction selection
This is used to select a rotation direction or travel direction.
For the setting for the master-slave operation function, refer to "Part 6 section 6.2".
<table><tr><th rowspan="2">Setting value</th><th colspan="2">Servo motor rotation direction</th></tr><tr><th>Positioning address increase</th><th>Positioning address decrease</th></tr><tr><td>0</td><td>CCW or positive direction</td><td>CW or negative direction</td></tr><tr><td>1</td><td>CW or negative direction</td><td>CCW or positive direction</td></tr></table>The following shows the servo motor rotation directions.
  </td><td>0</td></tr>
<tr><td>PA15</td><td>Encoder output pulse
This parameter is made valid when power is switched off, then on after setting, or when the controller reset has been performed.
Used to set the encoder pulses (A-phase, B-phase) output by the servo amplifier. Set the value 4 times greater than the A-phase or B-phase pulses.
You can use [Pr. PC03] to choose the output pulse setting or output division ratio setting.
The number of A/B-phase pulses actually output is 1/4 times greater than the preset number of pulses.
The maximum output frequency is 4.6 Mpulses/s (after multiplication by 4). Use this parameter within this range.

For output pulse designation
Set "_ _ 0 _" (initial value) in [Pr. PC03]
Set the number of pulses per servo motor revolution.
Output pulse set value [pulses/rev]
For instance, set "5600" to [Pr. PA15], the actually output A/B-phase pulses are as indicated below.
A·B-phase output pulses $= \frac{5600}{4} = 1400$[pulse]

For output division ratio setting
Set "_ _ 1 _" in [Pr. PC03]
The number of pulses per servo motor revolution is divided by the set value.
Output pulse $= \frac{\text{Resolution per servo motor revolution}}{\text{Set value}}$ [pulses/rev]

For instance, set "8" to [Pr. PA15], the actually output A/B-phase pulses are as indicated below.
A·B-phase output pulses $= \frac{262144}{8} \cdot \frac{1}{4} = 8192$ [pulse]</td><td>4000</td><td>PA15</td><td>Encoder output pulses
Set the encoder output pulses from the servo amplifier by using the number of output pulses per revolution, dividing ratio, or electronic gear ratio. (after multiplication by 4)
To set a numerator of the electronic gear, select "A-phase/B-phase pulse electronic gear setting (_ _ 3 _)" of "Encoder output pulse setting selection" in [Pr. PC03].
The maximum output frequency is 4.6 Mpulses/s. Set the parameter within this range.</td><td>4000</td></tr>
<tr><td></td><td></td><td></td><td>PA16</td><td>Encoder output pulses 2
Set a denominator of the electronic gear for the A/B-phase pulse output. To set a denominator of the electronic gear, select "A-phase/B-phase pulse electronic gear setting (_ _ 3 _)" of "Encoder output pulse setting selection" in [Pr. PC03].</td><td>1</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PA19</td><td>Parameter write inhibit
<table><tr><th>[Pr. PA19] setting</th><th>Setting operation</th><th>Basic setting [Pr. PA_ _]</th><th>Gain/filter [Pr. PB_ _]</th><th>Extension setting [Pr. PC_ _]</th><th>I/O setting [Pr. PD_ _]</th></tr><tr><td rowspan="2">0000h</td><td>Reference</td><td>O</td><td></td><td></td><td></td></tr><tr><td>Write</td><td>O</td><td></td><td></td><td></td></tr><tr><td rowspan="2">000Bh (initial value)</td><td>Reference</td><td>O</td><td>O</td><td>O</td><td></td></tr><tr><td>Write</td><td>O</td><td>O</td><td>O</td><td></td></tr><tr><td rowspan="2">000Ch</td><td>Reference</td><td>O</td><td>O</td><td>O</td><td>O</td></tr><tr><td>Write</td><td>O</td><td>O</td><td>O</td><td>O</td></tr><tr><td rowspan="2">100Bh</td><td>Reference</td><td>O</td><td></td><td></td><td></td></tr><tr><td>Write</td><td>[Pr. PA19] only</td><td></td><td></td><td></td></tr><tr><td rowspan="2">100Ch</td><td>Reference</td><td>O</td><td>O</td><td>O</td><td>O</td></tr><tr><td>Write</td><td>[Pr. PA19] only</td><td></td><td></td><td></td></tr></table>O: Enabled</td><td>000Bh</td><td>PA19</td><td>Parameter writing inhibit
Select a reference range and writing range of the parameter.
See the table below for the setting value.
[Pr. PA19] setting value and reading/writing range<table><tr><th>PA19</th><th>Setting operation</th><th>PA</th><th>PB</th><th>PC</th><th>PD</th><th>PE</th><th>PF</th><th>PL</th></tr><tr><td rowspan="2">Other than below</td><td>Reading</td><td>O</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Writing</td><td>O</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="2">000Ah</td><td>Reading</td><td>19 only</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Writing</td><td>19 only</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="2">000Bh</td><td>Reading</td><td>O</td><td>O</td><td>O</td><td></td><td></td><td></td><td></td></tr><tr><td>Writing</td><td>O</td><td>O</td><td>O</td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="2">000Ch</td><td>Reading</td><td>O</td><td>O</td><td>O</td><td>O</td><td></td><td></td><td></td></tr><tr><td>Writing</td><td>O</td><td>O</td><td>O</td><td>O</td><td></td><td></td><td></td></tr><tr><td rowspan="2">000Fh</td><td>Reading</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td></td><td>O</td></tr><tr><td>Writing</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td></td><td>O</td></tr><tr><td rowspan="2">00AAh</td><td>Reading</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td></td></tr><tr><td>Writing</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td></td></tr><tr><td rowspan="2">00ABh (initial value)</td><td>Reading</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr><tr><td>Writing</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr><tr><td rowspan="2">100Bh</td><td>Reading</td><td>O</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Writing</td><td>19 only</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="2">100Ch</td><td>Reading</td><td>O</td><td>O</td><td>O</td><td>O</td><td></td><td></td><td></td></tr><tr><td>Writing</td><td>19 only</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="2">100Fh</td><td>Reading</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td></td><td>O</td></tr><tr><td>Writing</td><td>19 only</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="2">10AAh</td><td>Reading</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td></td></tr><tr><td>Writing</td><td>19 only</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="2">10ABh</td><td>Reading</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr><tr><td>Writing</td><td>19 only</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>O: Enabled</td><td>00ABh</td></tr>
<tr><td>PB01</td><td>Adaptive tuning mode (adaptive filter II)
Select the setting method for filter tuning. Setting this parameter to " _ _ _ 1" (filter tuning mode 1) automatically changes the machine resonance suppression filter 1 [Pr. PB13] and notch shape selection [Pr. PB14].
 
 
0 0 0 x:
Filter tuning mode selection
0: Filter OFF ([Pr. PB13/PB14] are fixed to the initial values.)
1: Filter tuning mode (Automatically set parameter: [Pr. PB13/PB14])
2: Manual mode
When this parameter is set to "_ _ _ 1", the tuning is completed after positioning is done the predetermined number or times for the predetermined period of time, and the setting changes to " _ _ 2 _". When the filter tuning is not necessary, the setting changes to "_ _ _ 0". When this parameter is set to "_ _ _ 0", the initial values are set to the machine resonance suppression filter 1 and notch shape selection. However, this does not occur when the servo off.</td><td>0000h</td><td>PB01</td><td>Adaptive tuning mode (adaptive filter II)
Set the adaptive tuning.</td><td></td></tr>
<tr><td></td><td></td><td></td><td>_ _ _ x:
Filter tuning mode selection
Select the adjustment mode of the machine resonance suppression filter 1.
0: Disabled
1: Automatic setting
2: Manual setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td>_ _ x _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td>_ x _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td>x _ _ _ :
uning accuracy selection
0: Standard
1: High accuracy
The frequency is estimated more accurately in the high accuracy mode compared to the standard mode. However, the tuning sound may be larger in the high accuracy mode.
This digit is available with servo amplifier with software version C5 or later.</td><td>0h</td></tr>
</table>

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB02	Vibration suppression control tuning mode (advanced vibration suppression control) This parameter cannot be used in the speed control mode. The vibration suppression is valid when the [Pr. PA08] (auto tuning) setting is "_ _ _ 2" or "_ _ _ 3". When PA08 is [Pr. PA08] is "_ _ _ 1", vibration suppression is always invalid. Select the setting method for vibration suppression control tuning. Setting this parameter to "_ _ _ 1" (vibration suppression control tuning mode) automatically changes the vibration suppression control vibration frequency ([Pr. PB19]) and vibration suppression control resonance frequency ([Pr. PB20]) after positioning is done the predetermined number of times.  0 0 0 x: Vibration suppression control tuning mode 0: Vibration suppression control OFF (Automatically set parameter (Note)) 1: Vibration suppression control tuning mode (Advanced vibration suppression control) (Automatically set parameter: [Pr.PB19/PB20]) 2: Manual mode Note [Pr. PB19/PB20] are fixed to the initial values. When this parameter is set to "_ _ _ 1", the tuning is completed after positioning is done the predetermined number or times for the predetermined period of time, and the setting changes to "_ _ _ 2". When the vibration suppression control tuning is not necessary, the setting changes to "_ _ _ 0". When this parameter is set to "_ _ _ 0", the initial values are set to the vibration suppression control vibration frequency and vibration suppression control resonance frequency. However, this does not occur when the servo off.	0000h	PB02	Vibration suppression control tuning mode (advanced vibration suppression control II) This is used to set the vibration suppression control tuning.	
				_ _ _ x: Vibration suppression control 1 tuning mode selection Select the tuning mode of the vibration suppression control 1. 0: Disabled 1: Automatic setting 2: Manual setting	0h
				_ _ x _ : Vibration suppression control 2 tuning mode selection Select the tuning mode of the vibration suppression control 2. To enable the digit, select "3 inertia mode (_ _ _ 1)" of "Vibration suppression mode selection" in [Pr. PA24 Function selection A-4]. 0: Disabled 1: Automatic setting 2: Manual setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PB03	For manufacturer setting Do not change this value by any means.	0	PB03	Torque feedback loop gain This is used to set a torque feedback loop gain in the continuous operation to torque control mode. Decreasing the setting value will also decrease a collision load during continuous operation to torque control mode. Setting a value less than 6 rad/s will be 6 rad/s.	18000
PB04	Feed forward gain This parameter cannot be used in the speed control mode. Set the feed forward gain. When the setting is 100%, the droop pulses during operation at constant speed are nearly zero. However, sudden acceleration/deceleration will increase the overshoot. As a guideline, when the feed forward gain setting is 100%, set 1 s or more as the acceleration/deceleration time constant up to the rated speed.	0	PB04	Same as MR-J3 Feed forward gain Set the feed forward gain. When the setting is 100%, the droop pulses during operation at constant speed are nearly zero. When the super trace control is enabled, constant speed and uniform acceleration/deceleration droop pulses will be almost 0. However, sudden acceleration/deceleration will increase the overshoot. As a guideline, when the feed forward gain setting is 100%, set 1 s or more as the acceleration time constant up to the rated speed.	0

<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB06</td><td>Load to motor inertia ratio
Used to set the ratio of the load inertia moment to the servo motor shaft inertia moment. When auto tuning mode 1 and interpolation mode is selected, the result of auto tuning is automatically used.
When [Pr. PA08] is set to "_ _ _ 2" or "_ _ _ 3", this parameter can be set manually.</td><td>7.0</td><td>PB06</td><td>Same setting as MR-J3
Load to motor inertia ratio/load to motor mass ratio
This is used to set the load to motor inertia ratio or load to motor mass ratio. Setting a value considerably different from the actual load moment of inertia or load mass may cause an unexpected operation such as an overshoot.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the following table for details. When the parameter is automatic setting, the value will vary between 0.00 and 100.00.
<table><tr><th>Pr. PA08</th><th>This parameter</th></tr><tr><td>_ _ _ 0 (2 gain adjustment mode 1 (interpolation mode))</td><td rowspan="2">Automatic setting</td></tr><tr><td>_ _ _ 1 (Auto tuning mode 1)</td></tr><tr><td>_ _ _ 2 (Auto tuning mode 2)</td><td rowspan="3">Manual setting</td></tr><tr><td>_ _ _ 3 (Manual mode)</td></tr><tr><td>_ _ _ 4 (2 gain adjustment mode 2)</td></tr></table></td><td>7.00</td></tr>
<tr><td>PB07</td><td>Model loop gain
Set the response gain up to the target position.
Increase the gain to improve track ability in response to the command.
When auto turning mode 1・2 is selected, the result of auto turning is automatically used.
When [Pr. PA08] is set to "_ _ _ 0" or "_ _ _ 3", this parameter can be set manually.</td><td>24</td><td>PB07</td><td>Same setting as MR-J3
Model loop gain
Set the response gain up to the target position.
Increasing the setting value will also increase the response level to the position command but will be liable to generate vibration and noise.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the following table for details.
<table><tr><th>Pr. PA08</th><th>This parameter</th></tr><tr><td>_ _ _ 0 (2 gain adjustment mode 1 (interpolation mode))</td><td>Manual setting</td></tr><tr><td>_ _ _ 1 (Auto tuning mode 1)</td><td rowspan="2">Automatic setting</td></tr><tr><td>_ _ _ 2 (Auto tuning mode 2)</td></tr><tr><td>_ _ _ 3 (Manual mode)</td><td rowspan="2">Manual setting</td></tr><tr><td>_ _ _ 4 (2 gain adjustment mode 2)</td></tr></table></td><td>15.0</td></tr>
<tr><td>PB08</td><td>Position loop gain
This parameter cannot be used in the speed control mode.
Used to set the gain of the position loop.
Set this parameter to increase the position response to level load disturbance. Higher setting increases the response level but is liable to generate vibration and/or noise.
When auto tuning mode 1・2 and interpolation mode is selected, the result of auto tuning is automatically used.
When [Pr. PA08] is set to "_ _ _ 3", this parameter can be set manually.</td><td>37</td><td>PB08</td><td>Same as MR-J3
Position loop gain
This is used to set the gain of the position loop.
Set this parameter to increase the position response to level load disturbance.
Increasing the setting value will also increase the response level to the load disturbance but will be liable to generate vibration and noise.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the following table for details.
<table><tr><th>Pr. PA08</th><th>This parameter</th></tr><tr><td>_ _ _ 0 (2 gain adjustment mode 1 (interpolation mode))</td><td rowspan="3">Automatic setting</td></tr><tr><td>_ _ _ 1 (Auto tuning mode 1)</td></tr><tr><td>_ _ _ 2 (Auto tuning mode 2)</td></tr><tr><td>_ _ _ 3 (Manual mode)</td><td>Manual setting</td></tr><tr><td>_ _ _ 4 (2 gain adjustment mode 2)</td><td>Automatic setting</td></tr></table></td><td>37.0</td></tr>
</table>

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB09	Speed loop gain Used to set the gain of the speed loop. Set this parameter when vibration occurs on machines of low rigidity or large backlash. Higher setting increases the response level but is liable to generate vibration and/or noise. When auto tuning mode 1・2, and interpolation mode is selected, the result of auto tuning is automatically used. When [Pr. PA08] is set to " _ _ _ 3", this parameter can be set manually.	823	PB09	Same as MR-J3 Speed loop gain This is used to set the gain of the speed loop. Set this parameter when vibration occurs on machines of low rigidity or large backlash. Increasing the setting value will also increase the response level but will be liable to generate vibration and noise. The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the table of [Pr. PB08] for details.	823
PB10	Speed integral compensation Used to set the integral time constant of the speed loop. Lower setting increases the response level but is liable to generate vibration and/or noise. When auto tuning mode 1・2 and interpolation mode is selected, the result of auto tuning is automatically used. When [Pr. PA08] is set to " _ _ _ 3", this parameter can be set manually.	33.7	PB10	Same as MR-J3 Speed integral compensation This is used to set the integral time constant of the speed loop. Decreasing the setting value will increase the response level but will be liable to generate vibration and noise. The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the table of [Pr. PB08] for details.	33.7
PB11	Speed differential compensation Used to set the differential compensation. When [Pr. PB24] is set to "_ _ 3 _", this parameter is made valid. When [Pr. PB24] is set to " _ _ 0 _", this parameter is made valid by instructions of controller.	980	PB11	Same as MR-J3 Speed differential compensation This is used to set the differential compensation. To enable the parameter, select "Continuous PID control enabled (_ _ 3 _)" of "PI-PID switching control selection" in [Pr. PB24].	980
PB12	Overshoot amount compensation This parameter is supported by the servo amplifiers whose software versions are C4 or later. Check the software version using Setup software (SETUP221E). Used to suppress overshoot during position control. Overshoot can be suppressed in machines with high friction. Set a control ratio against the friction torque in percentage unit. When [Pr. PA01] is set to "_ 4 _ _" or "_ 5 _ _" and [Pr. PB12] is set to "0", the control ratio against the friction torque is fixed at 5% in the servo amplifier.	0	PB12	Same as MR-J3 Overshoot amount compensation This is used to set a viscous friction torque or thrust to rated torque in percentage unit at servo motor rated speed rated speed. When the response level is low or when the torque/thrust is limited, the efficiency of the parameter may be lower.	0
PB13	Machine resonance suppression filter 1 Set the notch frequency of the machine resonance suppression filter 1. Setting [Pr. PB01] (adaptive tuning mode (adaptive filter II)) to "_ _ _ 1" automatically changes this parameter. When the [Pr. PB01] setting is " _ _ _ 0", the setting of this parameter is ignored.	4500	PB13	Same as MR-J3 Machine resonance suppression filter 1 Set the notch frequency of the machine resonance suppression filter 1. When "Filter tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB01], this parameter will be adjusted automatically. When "Filter tuning mode selection" is set to "Manual setting (_ _ _ 2)" in [Pr. PB01], the setting value will be enabled.	4500

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB14	Notch shape selection 1 Used to selection the machine resonance suppression filter 1. 0 _ x 0: Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0000h	PB14	Same as MR-J3 Notch shape selection 1 Set the shape of the machine resonance suppression filter 1. When "Filter tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB01], this parameter will be adjusted automatically. Set manually for the manual setting.	
				_ _ _ x: For manufacturer setting	0h
	0 x _ 0: Notch width selection 0: α = 2 1: α = 3 2: α = 4 3: α = 5 Setting [Pr. PB01] (adaptive tuning mode (adaptive filter II)) to "_ _ _ 1" automatically changes this parameter. When the [Pr. PB01] setting is "_ _ _ 0", the setting of this parameter is ignored.			_ _ x _ : Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h
				_ x _ _ : Notch width selection 0: α = 2 1: α = 3 2: α = 4 3: α = 5	0h
				x _ _ _ : For manufacturer setting	0h
PB15	Machine resonance suppression filter 2 Set the notch frequency of the machine resonance suppression filter 2. Set [Pr. PB16] (notch shape selection 2) to "_ _ _ 1" to make this parameter valid.	4500	PB15	Same as MR-J3 Machine resonance suppression filter 2 Set the notch frequency of the machine resonance suppression filter 2. To enable the setting value, select "Enabled (_ _ _ 1)" of "Machine resonance suppression filter 2 selection" in [Pr. PB16].	4500
PB16	Notch shape selection 2 Select the shape of the machine resonance suppression filter 2. 0 _ _ x: Machine resonance suppression filter 2 selection 0: Invalid 1: Valid	0000h	PB16	Same as MR-J3 Notch shape selection 2 Set the shape of the machine resonance suppression filter 2.	
				_ _ _ x: Machine resonance suppression filter 2 selection 0: Disabled 1: Enabled	0h
	0 _ x _ : Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB			_ _ x _ : Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h
	0 x _ _ : Notch width 0: α = 2 1: α = 3 2: α = 4 3: α = 5			_ x _ _ : Notch width selection 0: α = 2 1: α = 3 2: α = 4 3: α = 5	0h
				x _ _ _ : For manufacturer setting	0h

<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB17</td><td>Automatic setting parameter
The value of this parameter is set according to a set value of [Pr. PB06] (Load to motor inertia ratio)</td><td></td><td>PB17</td><td>Shaft resonance suppression filter
This is used for setting the shaft resonance suppression filter.
This is used to suppress a low-frequency machine vibration.
When you select "Automatic setting (_ _ _ 0)" of "Shaft resonance suppression filter selection" in [Pr. PB23], the value will be calculated automatically from the servo motor you use and load to motor inertia ratio. When "Manual setting (_ _ _ 1)" is selected, the setting written to the parameter is used.
When "Shaft resonance suppression filter selection" is "Disabled (_ _ _ 2)" in [Pr. PB23], the setting value of this parameter will be disabled.
When you select "Enabled (_ _ _ 1)" of "Machine resonance suppression filter 4 selection" in [Pr. PB49], the shaft resonance suppression filter is not available.</td><td></td></tr>
<tr><td></td><td></td><td></td><td>_ _ x x:
Shaft resonance suppression filter setting frequency selection
This is used for setting the shaft resonance suppression filter.
Refer to table 3.2 for settings.
Set the value closest to the frequency you need.</td><td>00h</td></tr>
<tr><td></td><td></td><td></td><td>_ x _ _ :
Notch depth selection
0: -40 dB
1: -14 dB
2: -8 dB
3: -4 dB</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td>Table 3.2 Shaft resonance suppression filter setting frequency selection
<table>
<tr><th>Setting value</th><th>Frequency [Hz]</th><th>Setting value</th><th>Frequency [Hz]</th></tr>
<tr><td>_ _ 0 0</td><td>Disabled</td><td>_ _ 1 0</td><td>562</td></tr>
<tr><td>_ _ 0 1</td><td>Disabled</td><td>_ _ 1 1</td><td>529</td></tr>
<tr><td>_ _ 0 2</td><td>4500</td><td>_ _ 1 2</td><td>500</td></tr>
<tr><td>_ _ 0 3</td><td>3000</td><td>_ _ 1 3</td><td>473</td></tr>
<tr><td>_ _ 0 4</td><td>2250</td><td>_ _ 1 4</td><td>450</td></tr>
<tr><td>_ _ 0 5</td><td>1800</td><td>_ _ 1 5</td><td>428</td></tr>
<tr><td>_ _ 0 6</td><td>1500</td><td>_ _ 1 6</td><td>409</td></tr>
<tr><td>_ _ 0 7</td><td>1285</td><td>_ _ 1 7</td><td>391</td></tr>
<tr><td>_ _ 0 8</td><td>1125</td><td>_ _ 1 8</td><td>375</td></tr>
<tr><td>_ _ 0 9</td><td>1000</td><td>_ _ 1 9</td><td>360</td></tr>
<tr><td>_ _ 0 A</td><td>900</td><td>_ _ 1 A</td><td>346</td></tr>
<tr><td>_ _ 0 B</td><td>818</td><td>_ _ 1 B</td><td>333</td></tr>
<tr><td>_ _ 0 C</td><td>750</td><td>_ _ 1 C</td><td>321</td></tr>
<tr><td>_ _ 0 D</td><td>692</td><td>_ _ 1 D</td><td>310</td></tr>
<tr><td>_ _ 0 E</td><td>642</td><td>_ _ 1 E</td><td>300</td></tr>
<tr><td>_ _ 0 F</td><td>600</td><td>_ _ 1 F</td><td>290</td></tr>
</table></td><td></td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB18</td><td>Low-pass filter setting
Set the low-pass filter.
Setting [Pr. PB023] (low-pass filter selection) to "_ _ 0 _" automatically changes this parameter.
When [Pr. PB023] is set to "_ _ 1 _", this parameter can be set manually.</td><td>3141</td><td>PB18</td><td>Same setting as MR-J3
Low-pass filter setting
Set the low-pass filter.
The following shows a relation of a required parameter to this parameter.<table><tr><th>[Pr. PB23]</th><th>[Pr. PB18]</th></tr><tr><td>_ _ 0 _ (Initial value)</td><td>Automatic setting</td></tr><tr><td>_ _ 1 _</td><td>Setting value enabled</td></tr><tr><td>_ _ 2 _</td><td>Setting value disabled</td></tr></table></td><td>3141</td></tr>
<tr><td>PB19</td><td>Vibration suppression control vibration frequency setting
This parameter cannot be used in the speed control mode.
Set the vibration frequency for vibration suppression control to suppress low-frequency machine vibration, such as enclosure vibration.
Setting [Pr. PB02] (vibration suppression control tuning mode) to "_ _ _ 1"automatically changes this parameter.
When [Pr. PB02] is set to "_ _ _ 2", this parameter can be set manually.</td><td>100.0</td><td>PB19</td><td>Same as MR-J3
Vibration suppression control 1 - Vibration frequency
Set the vibration frequency for vibration suppression control 1 to suppress low-frequency machine vibration.
When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)".</td><td>100.0</td></tr>
<tr><td>PB20</td><td>Vibration suppression control resonance frequency setting
This parameter cannot be used in the speed control mode.
Set the resonance frequency for vibration suppression control to suppress low frequency machine vibration, such as enclosure vibration.
Setting [Pr. PB02] (vibration suppression control tuning mode) to "_ _ _ 1" automatically changes this parameter.
When parameter No.PB02 is set to "_ _ _ 2", this parameter can be set manually.</td><td>100.0</td><td>PB20</td><td>Same as MR-J3
Vibration suppression control 1 - Resonance frequency
Set the resonance frequency for vibration suppression control 1 to suppress low-frequency machine vibration.
When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)".</td><td>100.0</td></tr>
<tr><td>PB21</td><td>For manufacturer setting
Do not change this value by any means.</td><td>0.00</td><td>PB21</td><td>Vibration suppression control 1 - Vibration frequency damping
Set a damping of the vibration frequency for vibration suppression control 1 to suppress low-frequency machine vibration.
When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)".</td><td>0.00</td></tr>
<tr><td>PB22</td><td>For manufacturer setting
Do not change this value by any means.</td><td>0.00</td><td>PB22</td><td>Vibration suppression control 1 - Resonance frequency damping
Set a damping of the resonance frequency for vibration suppression control 1 to suppress low-frequency machine vibration.
When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)".</td><td>0.00</td></tr>
</table>

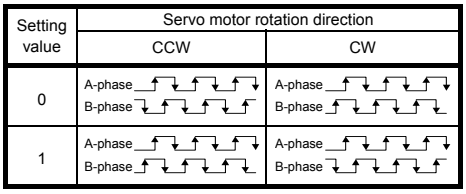
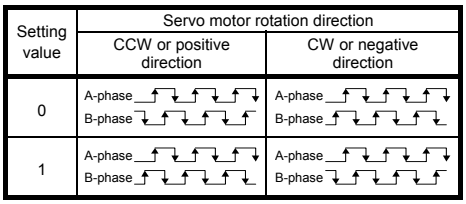
MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB23	Low-pass filter selection Select the low-pass filter. 0 0 x 0: Low-pass filter selection 0: Automatic setting 1: Manual setting ([Pr. PB18] setting) When automatic setting has been selected, select the filter that has the band width close to the one calculated with $\frac{VG2 \cdot 10}{1 + GD2}$ [rad/s]	0000h	PB23	Same setting as MR-J3 Low-pass filter selection Select the shaft resonance suppression filter and low-pass filter.	
				_ _ _ x: Shaft resonance suppression filter selection 0: Automatic setting 1: Manual setting 2: Disabled When you select "Enabled (_ _ _ 1)" of "Machine resonance suppression filter 4 selection" in [Pr. PB49], the shaft resonance suppression filter is not available.	0h
				_ _ x _ : Low-pass filter selection 0: Automatic setting 1: Manual setting 2: Disabled	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PB24	Slight vibration suppression control selection Select the slight vibration suppression control and PI-PID change. When [Pr. PA08] (auto tuning mode) is set to "_ _ _ 3", the slight vibration suppression control is made valid. (Slight vibration suppression control cannot be used in the speed control mode.) 0 0 _ x: Slight vibration suppression control selection 0: Invalid 1: Valid 0 0 x _ : PI-PID control switch over selection 0: PI control is valid. (Switching to PID control is possible with instructions of controller.) 3: PID control is always valid.	0000h	PB24	Same as MR-J3 Slight vibration suppression control Select the slight vibration suppression control and PI-PID switching control.	
				_ _ _ x: Slight vibration suppression control selection 0: Disabled 1: Enabled To enable the slight vibration suppression control, select "Manual mode (_ _ _ 3)" of "Gain adjustment mode selection" in [Pr. PA08]. Slight vibration suppression control cannot be used in the speed control mode.	0h
				_ _ x _ : PI-PID switching control selection 0: PI control enabled (Switching to PID control is possible with commands of servo system controller.) 3: Continuous PID control enabled If the servo motor at a stop is rotated even one pulse due to any external factor, it generates torque to compensate for a position shift. When the servo motor shaft is to be locked mechanically after positioning completion (stop), enabling PID control and completing positioning simultaneously will suppress the unnecessary torque generated to compensate for a position shift.	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB25	For manufacturer setting Do not change this value by any means.	0000h	PB25	Function selection B-1 Select enabled/disabled of model adaptive control. This parameter is supported with software version B4 or later.	
				_ _ _ x: Model adaptive control selection 0: Enabled (model adaptive control) 2: Disabled (PID control)	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PB26	Gain changing selection Select the gain changing condition.	0000h	PB26	Same setting as MR-J3 Gain switching function Select the gain switching condition. Set conditions to enable the gain switching values set in [Pr. PB29] to [Pr. PB36] and [Pr. PB56] to [Pr. PB60].	
	0 0 _ x: Gain changing selection Under any of the following conditions, the gains change on the basis of the [Pr. PB29 to PB34] settings. 0: Invalid 1: Control instructions from a controller. 2: Command frequency ([Pr. PB27] setting) 3: Droop pulse value ([Pr. PB27] setting) 4: Servo motor speed ([Pr. PB27] setting)			_ _ _ x: Gain switching selection 0: Disabled 1: Control command from controller is enabled 2: Command frequency 3: Droop pulses 4: Servo motor speed	0h
	0 0 x _ : Gain changing condition 0: Valid when the control instruction from a controller is ON Valid at equal to or more than the value set in [Pr. PB27] 1: Valid when the control instruction from a controller is OFF Valid at equal to or less than the value set in [Pr. PB27]			_ _ x _ : Gain switching condition selection 0: Gain after switching is enabled with gain switching condition or more 1: Gain after switching is enabled with gain switching condition or less	0h
				_ x _ _ : Gain switching time constant disabling condition selection 0: Switching time constant enabled 1: Switching time constant disabled 2: Return time constant disabled This parameter is used by servo amplifier with software version B4 or later.	0h
				x _ _ _ : For manufacturer setting	0h
PB27	Gain changing condition Used to set the value of gain changing condition (command frequency, droop pulses, servo motor speed) selected in [Pr. PB26]. The set value unit changes with the changing condition item.	10	PB27	Same setting as MR-J3 Gain switching condition This is used to set the value of gain switching (command frequency, droop pulses, and servo motor speed) selected in [Pr. PB26]. The set value unit differs depending on the switching condition item.	10
PB28	Gain changing time constant Used to set the time constant at which the gains will change in response to the conditions set in [Pr. PB26 and PB27].	1	PB28	Same setting as MR-J3 Gain switching time constant This is used to set the time constant at which the gains will change in response to the conditions set in [Pr. PB26] and [Pr. PB27].	1

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB29	Gain changing load to motor inertia ratio Used to set the load to motor inertia ratio when gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3).	7.0	PB29	Same as MR-J3 Load to motor inertia ratio/load to motor mass ratio after gain switching This is used to set the load to motor inertia ratio/load to motor mass ratio when gain switching is enabled. This parameter is enabled only when you select "Manual mode (_ _ _ 3)" of "Gain adjustment mode selection" in [Pr. PA08].	7.00
PB30	Gain changing position loop gain This parameter cannot be used in the speed control mode. Set the position loop gain when the gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3).	37	PB30	Position loop gain after gain switching Set the position loop gain when the gain switching is enabled. When you set a value less than 1.0 rad/s, the value will be the same as [Pr. PB08]. This parameter is enabled only when you select "Manual mode (_ _ _ 3)" of "Gain adjustment mode selection" in [Pr. PA08].	0.0
PB31	Gain changing speed loop gain Set the speed loop gain when the gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3).	823	PB31	Speed loop gain after gain switching Set the speed loop gain when the gain switching is enabled. When you set a value less than 20 rad/s, the value will be the same as [Pr. PB09]. This parameter is enabled only when you select "Manual mode (_ _ _ 3)" of "Gain adjustment mode selection" in [Pr. PA08].	0
PB32	Gain changing speed integral compensation Set the speed integral compensation when the gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3)	33.7	PB32	Speed integral compensation after gain switching Set the speed integral compensation when the gain changing is enabled. When you set a value less than 0.1 ms, the value will be the same as [Pr. PB10]. This parameter is enabled only when you select "Manual mode (_ _ _ 3)" of "Gain adjustment mode selection" in [Pr. PA08].	0.0
PB33	Gain changing vibration suppression control vibration frequency setting This parameter cannot be used in the speed control mode. Set the vibration frequency for vibration suppression control when the gain changing is valid. This parameter is made valid when the [Pr. PB02] setting is "_ _ _ 2"and the [Pr. PB26] setting is " _ _ _ 1". When using the vibration suppression control gain changing, always execute the changing after the servo motor has stopped.	100.0	PB33	Vibration suppression control 1 - Vibration frequency after gain switching Set the vibration frequency for vibration suppression control 1 when the gain switching is enabled. When you set a value less than 0.1 Hz, the value will be the same as [Pr. PB19]. This parameter will be enabled only when the following conditions are fulfilled. ▪ "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". ▪ "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". ▪ "Gain switching selection" in [Pr. PB26] is "Control command from controller is enabled (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops.	0.0

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB34	Gain changing vibration suppression control resonance frequency setting This parameter cannot be used in the speed control mode. Set the resonance frequency for vibration suppression control when the gain changing is valid. This parameter is made valid when the [Pr. PB02] setting is "_ _ _ 2" and the [Pr. PB26] setting is "_ _ _ 1". When using the vibration suppression control gain changing, always execute the changing after the servo motor has stopped.	100.0	PB34	Vibration suppression control 1 - Resonance frequency after gain switching Set the resonance frequency for vibration suppression control 1 when the gain switching is enabled. When you set a value less than 0.1 Hz, the value will be the same as [Pr. PB20]. This parameter will be enabled only when the following conditions are fulfilled. ▪ "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". ▪ "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". ▪ "Gain switching selection" in [Pr. PB26] is "Control command from controller is enabled (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops.	0.0
PB35	For manufacturer setting Do not change this value by any means.	0.00	PB35	Vibration suppression control 1 - Vibration frequency damping after gain switching Set a damping of the vibration frequency for vibration suppression control 1 when the gain switching is enabled. This parameter will be enabled only when the following conditions are fulfilled. ▪ "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". ▪ "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". ▪ "Gain switching selection" in [Pr. PB26] is "Control command from controller is enabled (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops.	0.00
PB36	For manufacturer setting Do not change this value by any means.	0.00	PB36	Vibration suppression control 1 - Resonance frequency damping after gain switching Set a damping of the resonance frequency for vibration suppression control 1 when the gain switching is enabled. This parameter will be enabled only when the following conditions are fulfilled. ▪ "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". ▪ "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". ▪ "Gain switching selection" in [Pr. PB26] is "Control command from controller is enabled (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops.	0.00

<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB45</td><td>Vibration suppression control filter 2
Used to set the vibration suppression control filter 2.
By setting this parameter, machine end vibration, such as workpiece end vibration and base shake, can be suppressed.</td><td>0000h</td><td>PB45</td><td>Same as MR-J3
Command notch filter
Set the command notch filter.</td><td></td></tr>
<tr><td></td><td>0 0 x x:
Vibration suppression control filter 2 setting frequency selection (Note 1)
<table><tr><th>Setting value</th><th>Frequency [Hz]</th></tr><tr><td>0</td><td>Invalid</td></tr><tr><td>1</td><td>2250</td></tr><tr><td>to</td><td>to</td></tr><tr><td>5F</td><td>4.5</td></tr></table></td><td></td><td></td><td>_ _ x x:
Command notch filter setting frequency selection
Refer to table 3.3 for the relation of setting values to frequency.</td><td>00h</td></tr>
<tr><td></td><td>0 x 0 0:
Notch depth selection (Note 1)
<table><tr><th>Setting value</th><th>Depth</th></tr><tr><td>0</td><td>-40dB</td></tr><tr><td>to</td><td>to</td></tr><tr><td>F</td><td>-0.6dB</td></tr></table></td><td></td><td></td><td>_ x _ _ :
Notch depth selection
Refer to table 3.4 for details.</td><td>0h</td></tr>
<tr><td></td><td>Note 1. This parameter is supported by the servo amplifiers whose software versions are C4 or later.
Check the software version using Setup software (SETUP221E).</td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Table 3.3 Command notch filter setting frequency selection
<table><tr><th>Setting value</th><th>Frequency [Hz]</th><th>Setting value</th><th>Frequency [Hz]</th><th>Setting value</th><th>Frequency [Hz]</th></tr><tr><td>_ _ 0 0</td><td>Disabled</td><td>_ _ 2 0</td><td>70</td><td>_ _ 4 0</td><td>17.6</td></tr><tr><td>_ _ 0 1</td><td>2250</td><td>_ _ 2 1</td><td>66</td><td>_ _ 4 1</td><td>16.5</td></tr><tr><td>_ _ 0 2</td><td>1125</td><td>_ _ 2 2</td><td>62</td><td>_ _ 4 2</td><td>15.6</td></tr><tr><td>_ _ 0 3</td><td>750</td><td>_ _ 2 3</td><td>59</td><td>_ _ 4 3</td><td>14.8</td></tr><tr><td>_ _ 0 4</td><td>562</td><td>_ _ 2 4</td><td>56</td><td>_ _ 4 4</td><td>14.1</td></tr><tr><td>_ _ 0 5</td><td>450</td><td>_ _ 2 5</td><td>53</td><td>_ _ 4 5</td><td>13.4</td></tr><tr><td>_ _ 0 6</td><td>375</td><td>_ _ 2 6</td><td>51</td><td>_ _ 4 6</td><td>12.8</td></tr><tr><td>_ _ 0 7</td><td>321</td><td>_ _ 2 7</td><td>48</td><td>_ _ 4 7</td><td>12.2</td></tr><tr><td>_ _ 0 8</td><td>281</td><td>_ _ 2 8</td><td>46</td><td>_ _ 4 8</td><td>11.7</td></tr><tr><td>_ _ 0 9</td><td>250</td><td>_ _ 2 9</td><td>45</td><td>_ _ 4 9</td><td>11.3</td></tr><tr><td>_ _ 0 A</td><td>225</td><td>_ _ 2 A</td><td>43</td><td>_ _ 4 A</td><td>10.8</td></tr><tr><td>_ _ 0 B</td><td>204</td><td>_ _ 2 B</td><td>41</td><td>_ _ 4 B</td><td>10.4</td></tr><tr><td>_ _ 0 C</td><td>187</td><td>_ _ 2 C</td><td>40</td><td>_ _ 4 C</td><td>10</td></tr><tr><td>_ _ 0 D</td><td>173</td><td>_ _ 2 D</td><td>38</td><td>_ _ 4 D</td><td>9.7</td></tr><tr><td>_ _ 0 E</td><td>160</td><td>_ _ 2 E</td><td>37</td><td>_ _ 4 E</td><td>9.4</td></tr><tr><td>_ _ 0 F</td><td>150</td><td>_ _ 2 F</td><td>36</td><td>_ _ 4 F</td><td>9.1</td></tr><tr><td>_ _ 1 0</td><td>140</td><td>_ _ 3 0</td><td>35.2</td><td>_ _ 5 0</td><td>8.8</td></tr><tr><td>_ _ 1 1</td><td>132</td><td>_ _ 3 1</td><td>33.1</td><td>_ _ 5 1</td><td>8.3</td></tr><tr><td>_ _ 1 2</td><td>125</td><td>_ _ 3 2</td><td>31.3</td><td>_ _ 5 2</td><td>7.8</td></tr><tr><td>_ _ 1 3</td><td>118</td><td>_ _ 3 3</td><td>29.6</td><td>_ _ 5 3</td><td>7.4</td></tr><tr><td>_ _ 1 4</td><td>112</td><td>_ _ 3 4</td><td>28.1</td><td>_ _ 5 4</td><td>7.0</td></tr><tr><td>_ _ 1 5</td><td>107</td><td>_ _ 3 5</td><td>26.8</td><td>_ _ 5 5</td><td>6.7</td></tr><tr><td>_ _ 1 6</td><td>102</td><td>_ _ 3 6</td><td>25.6</td><td>_ _ 5 6</td><td>6.4</td></tr><tr><td>_ _ 1 7</td><td>97</td><td>_ _ 3 7</td><td>24.5</td><td>_ _ 5 7</td><td>6.1</td></tr><tr><td>_ _ 1 8</td><td>93</td><td>_ _ 3 8</td><td>23.4</td><td>_ _ 5 8</td><td>5.9</td></tr><tr><td>_ _ 1 9</td><td>90</td><td>_ _ 3 9</td><td>22.5</td><td>_ _ 5 9</td><td>5.6</td></tr><tr><td>_ _ 1 A</td><td>86</td><td>_ _ 3 A</td><td>21.6</td><td>_ _ 5 A</td><td>5.4</td></tr><tr><td>_ _ 1 B</td><td>83</td><td>_ _ 3 B</td><td>20.8</td><td>_ _ 5 B</td><td>5.2</td></tr><tr><td>_ _ 1 C</td><td>80</td><td>_ _ 3 C</td><td>20.1</td><td>_ _ 5 C</td><td>5.0</td></tr><tr><td>_ _ 1 D</td><td>77</td><td>_ _ 3 D</td><td>19.4</td><td>_ _ 5 D</td><td>4.9</td></tr><tr><td>_ _ 1 E</td><td>75</td><td>_ _ 3 E</td><td>18.8</td><td>_ _ 5 E</td><td>4.7</td></tr><tr><td>_ _ 1 F</td><td>72</td><td>_ _ 3 F</td><td>18.2</td><td>_ _ 5 F</td><td>4.5</td></tr></table>
Table 3.4 Notch depth selection
<table><tr><th>Setting value</th><th>Depth [dB]</th><th>Setting value</th><th>Depth [dB]</th></tr><tr><td>_ 0 _ _</td><td>-40.0</td><td>_ 8 _ _</td><td>-6.0</td></tr><tr><td>_ 1 _ _</td><td>-24.1</td><td>_ 9 _ _</td><td>-5.0</td></tr><tr><td>_ 2 _ _</td><td>-18.1</td><td>_ A _ _</td><td>-4.1</td></tr><tr><td>_ 3 _ _</td><td>-14.5</td><td>_ B _ _</td><td>-3.3</td></tr><tr><td>_ 4 _ _</td><td>-12.0</td><td>_ C _ _</td><td>-2.5</td></tr><tr><td>_ 5 _ _</td><td>-10.1</td><td>_ D _ _</td><td>-1.8</td></tr><tr><td>_ 6 _ _</td><td>-8.5</td><td>_ E _ _</td><td>-1.2</td></tr><tr><td>_ 7 _ _</td><td>-7.2</td><td>_ F _ _</td><td>-0.6</td></tr></table></td><td></td></tr>
</table>

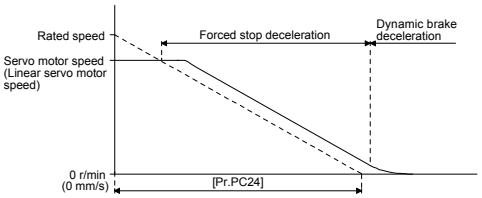
<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PC01</td><td>Error excessive alarm level
This parameter cannot be used in the speed control mode or in the torque control mode.
Set error excessive alarm level with rotation amount of servo motor.
Note 1. Setting can be changed in [Pr. PC06].
2. For a servo amplifier with software version of B2 or later, reactivating the power supply to enable the setting value is not necessary. For a servo amplifier with software version of earlier than B2, reactivating the power supply is required to enable the setting value.
Check the software version using Setup software (SETUP221E).</td><td>3</td><td>PC01</td><td>Error excessive alarm level
Set an error excessive alarm level.
Set this per rev. for rotary servo motors and direct drive motors. Setting "0" will be 3 rev. Setting over 200 rev will be clamped with 200 rev.</td><td>0</td></tr>
<tr><td>PC02</td><td>Electromagnetic brake sequence output
Used to set the delay time (Tb) between electronic brake interlock (MBR) and the base drive circuit is shut-off.</td><td>0</td><td>PC02</td><td>Same as MR-J3
Electromagnetic brake sequence output
This is used to set the delay time between MBR (Electromagnetic brake interlock) and the base drive circuit is shut-off.</td><td>0</td></tr>
<tr><td rowspan="3">PC03</td><td>Encoder output pulse selection
Use to select the, encoder output pulse direction and encoder output pulse setting.</td><td rowspan="3">0000h</td><td rowspan="3">PC03</td><td>Same setting as MR-J3
Encoder output pulse selection
This is used to select the encoder pulse direction and encoder output pulse setting.</td><td></td></tr>
<tr><td>0 0 _ x:
Encoder output pulse phase changing
Changes the phases of A, B-phase encoder pulses output.
 
</td><td>_ _ _ x:
Encoder output pulse phase selection
0: Increasing A-phase 90° in CCW or positive direction
1: Increasing A-phase 90° in CW or negative direction
 
</td><td>0h</td></tr>
<tr><td>0 0 x _:
Encoder output pulse setting selection
0: Output pulse designation
1: Division ratio setting</td><td>_ _ x _ :
Encoder output pulse setting selection
0: Output pulse setting
When "_ 1 0 _" is set to this parameter, [AL. 37 Parameter error] will occur.
1: Division ratio setting
3: A-phase/B-phase pulse electronic gear setting
4: A/B-phase pulse through output setting</td><td>0h</td></tr>
<tr><td></td><td>_ x _ _ :
Selection of the encoders for encoder output pulse
This is used for selecting an encoder for servo amplifier output.
0: Servo motor encoder
1: Load-side encoder
When "_ 1 0 _" is set to this parameter, [AL. 37 Parameter error] will occur.</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
</table>

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PC04	Function selection C-1 Select the encoder cable communication system selection. x 0 0 0: Encoder cable communication system selection 0: Two-wire type 1: Four-wire type Incorrect setting will result in an [AL.16 encoder alarm 1].	0000h	PC04	Same as MR-J3 Function selection C-1 Select the encoder cable communication method selection.	
				_ _ _ x: For manufacturer setting	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : Encoder cable communication method selection 0: Two-wire type 1: Four-wire type When using an encoder of A/B/Z-phase differential output method, set "0". Incorrect setting will result in [AL. 16 Encoder initial communication error 1]. or [AL. 20 Encoder initial communication error 1] will occur.	0h
PC05	Function selection C-2 Motor-less operation select. 0 0 0 x: Motor-less operation select. 0: Valid 1: Invalid	0000h	PC05	Same setting as MR-J3 Function selection C-2 Set the motor-less operation.	
				_ _ _ x: Motor-less operation selection 0: Disabled 1: Enabled	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : [AL. 9B Error excessive warning] selection 0: [AL. 9B Error excessive warning] disabled 1: [AL. 9B Error excessive warning] enabled The setting of this digit is used by servo amplifier with software version B4 or later.	0h
PC06	Function selection C-3 This parameter cannot be used in the speed control mode or in the torque control mode. Select the error excessive alarm level setting for [Pr. PC01] x 0 0 0: Error excessive alarm level setting selection 0: 1 [rev] unit 1: 0.1 [rev] unit 2: 0.01 [rev] unit 3: 0.001 [rev] unit This parameter is available to software version B1 or later. Check the software version using Setup software (SETUP221E).	0000h	PC06	Same as MR-J3 Function selection C-3 Select units for error excessive alarm level setting with [Pr. PC01]. The parameter is not available in the speed control mode and torque control mode.	
				_ _ _ x: For manufacturer setting	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : Error excessive alarm/error excessive warning level unit selection 0: Per 1 rev or 1 mm 1: Per 0.1 rev or 0.1 mm 2: Per 0.01 rev or 0.01 mm 3: Per 0.001 rev or 0.001 mm	0h

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PC07	Zero speed Used to set the output range of the zero speed detection (ZSP). Zero speed detection (ZSP) has hysteresis width of 20r/min	50	PC07	Same as MR-J3 Zero speed Used to set the output range of ZSP (Zero speed detection). ZSP (Zero speed detection) has hysteresis of 20 r/min or 20 mm/s.	50
PC08	For manufacturer setting Do not change this value by any means.	0	PC08	Overspeed alarm detection level This is used to set an overspeed alarm detection level. When you set a value more than "servo motor maximum speed × 120%" the set value will be clamped. When you set "0", the value of "servo motor maximum speed × 120%" will be set.	0
PC09	Analog monitor 1 output Used to selection the signal provided to the analog monitor 1 (MO1) output. 0 0 0 x: Analog monitor 1 (MO1) output selection 0: Servo motor speed (± 8 V/max. speed) 1: Torque (±8 V/max. torque) 2: Servo motor speed (+8 V/max. speed) 3: Torque (+8 V/max. torque) 4: Current command (±8 V/max. current command) 5: Speed command (±8 V/max. current command) 6: Droop pulses (±10 V/100 pulses) 7: Droop pulses (±10 V/1000 pulses) 8: Droop pulses (±10 V/10000 pulses) 9: Droop pulses (±10 V/100000 pulses) A: Feedback position (±10 V/1 Mpulse) B: Feedback position (±10 V/10 Mpulses) C: Feedback position (±10 V/100 Mpulses) D: Bus voltage (+8 V/400 V) E: Speed command 2 (±8 V/max. current command)	0000h	PC09	Analog monitor 1 output Select a signal to output to MO1 (Analog monitor 1).	
				_ _ x x: Analog monitor 1 output selection 0 0: servo motor speed (±8 V/max. speed) 0 1: Torque (±8 V/max. torque) 0 2: servo motor speed (+8 V/max. speed) 0 3: Torque (+8 V/max. torque) 0 4: Current command (±8 V/max. current command) 0 5: Speed command (±8 V/max. speed) 0 6: Servo motor-side droop pulses (±10 V/100 pulses) (Note) 0 7: Servo motor-side droop pulses (±10 V/1000 pulses) (Note) 0 8: Servo motor-side droop pulses (±10 V/10000 pulses) (Note) 0 9: Servo motor-side droop pulses (±10 V/100000 pulses) (Note) 0 A: Feedback position (±10 V/1 Mpulse) (Note) 0 B: Feedback position (±10 V/10 Mpulses) (Note) 0 C: Feedback position (±10 V/100 Mpulses) (Note) 0 D: Bus voltage (200 V class and 100 V class: +8 V/400 V, 400 V class: +8 V/800 V) 0 E: Speed command 2 (±8 V/max. speed) 1 0: Load-side droop pulses (±10 V/100 pulses) (Note) 1 1: Load-side droop pulses (±10 V/1000 pulses) (Note) 1 2: Load-side droop pulses (±10 V/10000 pulses) (Note) 1 3: Load-side droop pulses (±10 V/100000 pulses) (Note) 1 4: Load-side droop pulses (±10 V/1 Mpulse) (Note) 1 5: Servo motor-side/load-side position deviation (±10 V/100000 pulses) 1 6: Servo motor-side/load-side speed deviation (±8 V/max. speed) 1 7: Internal temperature of encoder (±10 V/±128 ˚C) Note. Encoder pulse unit	00h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PC10	Analog monitor 2 output Used to selection the signal provided to the analog monitor 2 (MO2) output. 0 0 0 x: Select the analog monitor 2 (MO2) output The settings are the same as those of [Pr. PC09].	0001h	PC10	Analog monitor 2 output Select a signal to output to Analog monitor 2 (MO2).	
				_ _ x x: Analog monitor 2 output selection Refer to [Pr. PC09] for settings.	01h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PC11	Analog monitor 1 offset Used to set the offset voltage of the analog monitor 1 (MO1) output.	0	PC11	Same as MR-J3 Analog monitor 1 offset This is used to set the offset voltage of Analog monitor 1 (MO1).	0
PC12	Analog monitor 2 offset Used to set the offset voltage of the analog monitor 2 (MO2) output.	0	PC12	Same as MR-J3 Analog monitor 2 offset This is used to set the offset voltage of Analog monitor 2 (MO2).	0
PC13	Analog monitor feedback position output standard data Low Used to set the standard position of feedback output with analog monitor 1 (M01) or 2 (M02). For this parameter, the lower-order four digits of standard position in decimal numbers are set.	0	PC13	Same as MR-J3 Analog monitor - Feedback position output standard data - Low Set a monitor output standard position (lower 4 digits) for the feedback position for when selecting "Feedback position" for Analog monitor 1 (MO1) and Analog monitor 2 (MO2). Monitor output standard position = [Pr. PC14] setting × 10000 + [Pr. PC13] setting	0
PC14	Analog monitor feedback position output standard data High Used to set the standard position of feedback output with analog monitor 1 (M01) or 2 (M02). For this parameter, the higher-order four digits of standard position in decimal numbers are set.	0	PC14	Same as MR-J3 Analog monitor - Feedback position output standard data - High Set a monitor output standard position (higher 4 digits) for the feedback position for when selecting "Feedback position" for Analog monitor 1 (MO1) and Analog monitor 2 (MO2). Monitor output standard position = [Pr. PC14] setting × 10000 + [Pr. PC13] setting	0
PC17	Function Selection C-4 This parameter cannot be used in the speed control mode or in the torque control mode. Home position setting condition in the absolute position detection system can be selected. 0 0 0 x: Selection of home position setting condition 0: Need to pass motor Z-phase after the power supply is switched on. 1: Not need to pass motor Z-phase after the power supply is switched on.	0000h	PC17	Same setting as MR-J3 Function selection C-4 This is used to select a home position setting condition.	
				_ _ _ x: Selection of home position setting condition 0: Need to pass servo motor Z-phase after power on 1: Not need to pass servo motor Z-phase after power on	0h
				_ _ x _ : When the rotary motor is used, the setting need not be changed.	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PC18	For manufacturer setting Do not change this value by any means.	0000h	PC18	Function selection C-5 This is used to select an occurring condition of [AL. E9 Main circuit off warning].	
				_ _ _ x: For manufacturer setting	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : [AL. E9 Main circuit off warning] selection 0: Detection with ready-on and servo-on command 1: Detection with servo-on command	0h

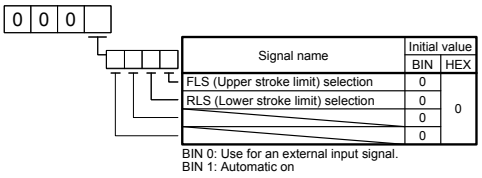
MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PC20	Function Selection C-7 Set this function if undervoltage alarm occurs because of distorted power supply voltage waveform when using power regenerative converter or power regeneration common converter. 0 0 0 x: Setting when undervoltage alarm occurs 0: Initial value (Waveform of power supply voltage is not distorted) 1: Set "1" if undervoltage alarm occurs because of distorted power supply voltage waveform when using power regenerative converter or power regeneration common converter.	0000h	PC20	Function selection C-7 This is used to select an undervoltage alarm detection method.	
				_ _ _ x: [AL. 10 Undervoltage] detection method selection This is set when FR-RC-(H) or FR-CV-(H) is used and if [AL. 10 undervoltage] occurs due to distorted power supply voltage waveform. 0: [AL. 10] not occurrence 1: [AL. 10] occurrence	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : Undervoltage alarm selection Select the alarm and warning for when the bus voltage drops to the undervoltage alarm level. 0: [AL. 10] regardless of servo motor speed 1: [AL. E9] at servo motor speed 50 r/min (50 mm/s) or less, [AL. 10] at over 50 r/min (50 mm/s)	0h
				x _ _ _ : For manufacturer setting	0h
PC21	Alarm history clear Used to clear the alarm history. 0 0 0 x: Alarm history clear 0: Invalid 1: Valid When alarm history clear is made valid, the alarm history is cleared at next power-on. After the alarm history is cleared, the setting is automatically made invalid (reset to 0).	0000h	PC21	Same as MR-J3 Alarm history clear Used to clear the alarm history.	
				_ _ _ x: Alarm history clear selection 0: Disabled 1: Enabled When "Enabled" is set, the alarm history will be cleared at the next power-on. After the alarm history is cleared, the setting is automatically disabled.	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PC24	For manufacturer setting Do not change this value by any means.	0000h	PC24	Forced stop deceleration time constant This is used to set deceleration time constant when you use the forced stop deceleration function. Set the time per ms from the rated speed to 0 r/min or 0 mm/s. Setting "0" will be 100 ms.  [Precautions] ▪ If the servo motor torque thrust is saturated at the maximum torque during forced stop deceleration because the set time is too short, the time to stop will be longer than the set time constant. ▪ [AL. 50 Overload alarm 1] or [AL. 51 Overload alarm 2] may occur during forced stop deceleration, depending on the set value. ▪ After an alarm that leads to a forced stop deceleration, if an alarm that does not lead to a forced stop deceleration occurs or if the control circuit power supply is cut, dynamic braking will start regardless of the deceleration time constant setting. ▪ Set a longer time than deceleration time at quick stop of the controller. If a shorter time is set, [AL. 52 Error excessive] may occur.	100
PC29	For manufacturer setting Do not change this value by any means.	0000h	PC29	Function selection C-B This is used to select the POL reflection at torque control.	
				_ _ _ x: For manufacturer setting	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : POL reflection selection at torque control 0: Enabled 1: Disabled	0h
PC31	For manufacturer setting Do not change this value by any means.	0000h	PC31	Vertical axis freefall prevention compensation amount Set the compensation amount of the vertical axis freefall prevention function. Set it per servo motor rotation amount travel distance. When a positive value is set, compensation is performed to the address increasing direction. When a negative value is set, compensation is performed to the address decreasing direction. The vertical axis freefall prevention function is performed when all of the following conditions are met. 1) Position control mode 2) The value of the parameter is other than "0". 3) The forced stop deceleration function is enabled. 4) Alarm occurs or EM2 turns off when the servo motor speed is zero speed or less. 5) MBR (Electromagnetic brake interlock) was enabled in [Pr. PD07] to [Pr. PD09], and the base circuit shut-off delay time was set in [Pr. PC02].	0

<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th colspan="2">Name and function</th><th>Initial value</th></tr>
<tr><td>PD02</td><td>For manufacturer setting
Do not change this value by any means.</td><td>0000h</td><td>PD02</td><td colspan="2">Input signal automatic on selection 2</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ _ x
(HEX)</td><td>_ _ _ x:
FLS (Upper stroke limit) selection
0: Disabled
1: Enabled

_ _ x _ :
RLS (Lower stroke limit) selection
0: Disabled
1: Enabled

_ x _ _ :
For manufacturer setting

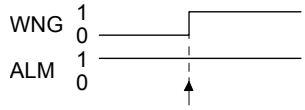
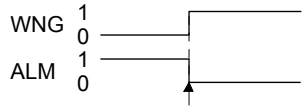
x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _
(HEX)</td><td>For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _
(HEX)</td><td>For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _
(HEX)</td><td>For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td colspan="2">Convert the setting value into hexadecimal as follows.
 
</td><td></td></tr>
</table>

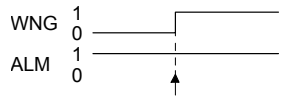
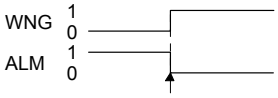
MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PD07	Output signal device selection 1 (CN3-13) Any input signal can be assigned to the CN3-13 pin. As the initial value, MBR is assigned to the pin. 0 0 x x: Select the output device of the CN3-13 pin. 00: Always OFF 01: For manufacturer setting (Note 3) 02: RD 03: ALM 04: INP (Note1, 4) 05: MBR 06: DB 07: TLC (Note 4) 08: WNG 09: BWNG 0A: SA (Note 2) 0B: VLC (Note 5) 0C: ZSP 0D: For manufacturer setting (Note 3) 0E: For manufacturer setting (Note 3) 0F: CDPS 10: For manufacturer setting (Note 3) 11: ABSV (Note 1) 12 to1F: For manufacturer setting (Note 3) 20 to 3F: For manufacturer setting (Note 3) Note 1. It becomes always OFF in the speed control mode. 2. It becomes always OFF in the position control mode or in the torque control mode. 3. For manufacturer setting Never change this setting. 4. It becomes always OFF in the torque control mode. 5. It becomes always OFF in the position control mode or in the speed control mode.	0005h	PD07	Same setting as MR-J3 Output device selection 1 You can assign any output device to the CN3-13 pin.	
				_ _ x x: Device selection 0 0: Always off 0 2: RD (Ready) 0 3: ALM (Malfunction) 0 4: INP (In-position) 0 5: MBR (Electromagnetic brake interlock) 0 6: DB (Dynamic brake interlock) 0 7: TLC (Limiting torque) 0 8: WNG (Warning) 0 9: BWNG (Battery warning) 0 A: SA (Speed reached) 0 C: ZSP (Zero speed detection) 0 F: CDPS (Variable gain selection) 1 1: ABSV (Absolute position undetermined) 1 7: MTTR (During tough drive)	05h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PD08	Output signal device selection 2 (CN3-9) Any input signal can be assigned to the CN3-9 pin. As the initial value, INP is assigned to the pin. The devices that can be assigned and the setting method are the same as in [Pr. PD07]. 0 0 x x: Select the output device of the CN3-9 pin.	0004h	PD08	Same setting as MR-J3 Output device selection 2 You can assign any output device to the CN3-9 pin. INP (In-position) is assigned as the initial value. The devices that can be assigned and the setting method are the same as in [Pr. PD07].	
				_ _ x x: Device selection Refer to [Pr. PD07] for settings.	04h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PD09	Output signal device selection 3 (CN3-15) Any input signal can be assigned to the CN3-15 pin. As the initial value, ALM is assigned to the pin. The devices that can be assigned and the setting method are the same as in [Pr. PD07]. 0 0 x x: Select the output device of the CN3-15 pin.	0003h	PD09	Same setting as MR-J3 Output device selection 3 You can assign any output device to the CN3-15 pin. ALM (Malfunction) is assigned as the initial value. The devices that can be assigned and the setting method are the same as in [Pr. PD07].	
				_ _ x x: Device selection Refer to [Pr. PD07] for settings.	03h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PD11	For manufacturer setting Do not change this value by any means.	0004h	PD11	Input filter setting Select the input filter.	
				_ _ _ x: Input signal filter selection Refer to the servo system controller instruction manual for the setting. If external input signal causes chattering due to noise, etc., input filter is used to suppress it. 0: None 1: 0.888 [ms] 2: 1.777 [ms] 3: 2.666 [ms] 4: 3.555 [ms]	4h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PD12	For manufacturer setting Do not change this value by any means.	0000h	PD12	Function selection D-1	
				_ _ _ x : For manufacturer setting	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : Servo motor thermistor enabled/disabled selection 0: Enabled 1: Disabled For servo motors without thermistor, the setting will be disabled. This parameter setting is used with servo amplifier with software version A5 or later.	0h

<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PD13</td><td>For manufacturer setting
Do not change this value by any means.</td><td>0000h</td><td>PD13</td><td>Function selection D-2
Select the INP (In-position) on condition.
This parameter is supported with software version B4 or later.</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ _ x:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
INP (In-position) on condition selection
Select a condition that INP (In-position) is turned on.
0: Droop pulses are within the in-position range.
1: The command pulse frequency is 0, and droop pulses are within the in-position range.
When the position command is not inputted for about 1 ms, the command pulse frequency is decided as 0.</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td>PD14</td><td>Function selection D-3
Set the ALM output signal at warning occurrence.

0 0 x 0:
Selection of output device at warning occurrence
Select the warning (WNG) and trouble (ALM) output status at warning occurrence.

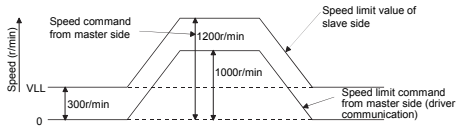
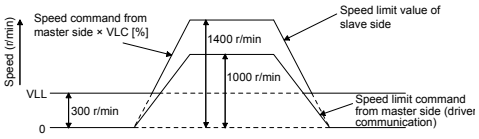
Output of Servo amplifier
<table><tr><th>Setting</th><th>Device status (Note)</th></tr><tr><td>0</td><td>  </td></tr><tr><td>1</td><td>  </td></tr></table>Note. 0: off
1: on</td><td>0000h</td><td>PD14</td><td>Same setting as MR-J3
Function selection D-3
_ _ _ x:
For manufacturer setting
_ _ x _ :
Selection of output device at warning occurrence
Select WNG (Warning) and ALM (Malfunction) output status at warning occurrence.

Servo amplifier output
<table><tr><th>Setting</th><th>Device status (Note1)</th></tr><tr><td>0</td><td>  </td></tr><tr><td>1</td><td>  </td></tr></table>Note1. 0: Off
1: On
2. Although ALM is turned off upon occurrence of the warning, the forced stop deceleration is performed.
_ x _ _ :
For manufacturer setting
x _ _ _ :
For manufacturer setting</td><td>0000h</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3-_B_</th><th colspan="3">MR-J4-_B_</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PD15</td><td>Driver communication setting
This parameter setting is used with servo amplifier with software version C1 or later. Check the software version using Setup software (SETUP221E).
This parameter is used to select master/slave axis for the driver communication.</td><td>0000h</td><td>PD15</td><td>Same setting as MR-J3
Driver communication setting
This parameter is used to select master/slave axis for the driver communication.
This is available only when the forced stop deceleration function is disabled. When the forced stop deceleration function is enabled, [AL. 37] will occur.
This parameter setting is used with servo amplifier with software version A8 or later.</td><td></td></tr>
<tr><td></td><td>0 0 _ x:
Master axis operation selection
0: Disabled (not using master-slave operation function)
1: Enabled (this servo amplifier: master axis)</td><td></td><td></td><td>_ _ _ x:
Master axis operation selection
Setting "1" other than in standard control mode will trigger [AL. 37].
0: Disabled (not using master-slave operation function)
1: Enabled (this servo amplifier: master axis)</td><td>0h</td></tr>
<tr><td></td><td>0 0 x _ :
Slave axis operation selection
0: Disabled (not using master-slave operation function)
1: Enabled (this servo amplifier: slave axis)
<table><tr><th colspan="2">Master-slave operation function</th><th>Setting value</th></tr><tr><td>Not used</td><td></td><td>0000</td></tr><tr><td rowspan="2">Used</td><td>Master</td><td>0001</td></tr><tr><td>Slave</td><td>0010</td></tr></table></td><td></td><td></td><td>_ _ x _:
Slave axis operation selection
Setting "1" other than in standard control mode will trigger [AL. 37].
0: Disabled (not using master-slave operation function)
1: Enabled (this servo amplifier: slave axis)</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td><table><tr><th colspan="2">Master-slave operation function</th><th>Setting value</th></tr><tr><td>Not used</td><td></td><td>0000</td></tr><tr><td rowspan="2">Used</td><td>Master</td><td>0001</td></tr><tr><td>Slave</td><td>0010</td></tr></table></td><td></td></tr>
<tr><td>PD16</td><td>Driver communication setting - Master - Transmit data selection 1
This parameter setting is used with servo amplifier with software version C1 or later. Check the software version using Setup software (SETUP221E).
This parameter is used to select transmit data from master axis to slave axis.
When setting this amplifier as master axis ([Pr. PD15] = "0001"), select "0038 (torque command)" with this parameter.

0 0 x x:
Transmission data selection
00: Disabled
38: Torque command</td><td>0000h</td><td>PD16</td><td>Same setting as MR-J3
Driver communication setting - Master - Transmit data selection 1
This parameter is used to select transmit data from master axis to slave axis.
When setting this amplifier as master axis ([Pr. PD15] is "_ _ 0 1".), select "_ _ 3 8 (torque command)" with this parameter.
This parameter setting is used with servo amplifier with software version A8 or later.</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x x:
Transmission data selection
00: Disabled
38: Torque command</td><td>00h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
</table>

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PD17	Driver communication setting - Master - Transmit data selection 2 This parameter setting is used with servo amplifier with software version C1 or later. Check the software version using Setup software (SETUP221E). This parameter is used to select transmit data from master axis to slave axis. When setting this amplifier as master axis ([Pr. PD15] = "0001"), select "003A (speed limit command)" with this parameter. 0 0 x x: Transmission data selection 00: Disabled 3A: speed limit command	0000h	PD17	Driver communication setting - Master - Transmit data selection 2 This parameter is used to select transmit data from master axis to slave axis. When setting this amplifier as master axis ([Pr. PD15] is "_ _ 0 1".), select "_ _ 3 A (speed limit command)" with this parameter. This parameter setting is used with servo amplifier with software version A8 or later.	
				_ _ x x: Transmission data selection 00: Disabled 3A: speed limit command	00h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PD20	Driver communication setting - Slave - Master axis No. selection 1 This parameter setting is used with servo amplifier with software version C1 or later. Check the software version using Setup software (SETUP221E). Select a master axis when this amplifier is slave axis. When setting this amplifier as slave axis ([Pr. PD15] = "0010"), set the axis No. of the servo amplifier of master. Refer to MR-J4-_B_ Servo Amplifier Instruction Manual for details of axis Nos.	0	PD20	Driver communication setting - Slave - Master axis No. selection 1 Select a master axis when this amplifier is slave axis. When setting this amplifier as slave axis ([Pr. PD15] is "_ _ 1 0".), set the axis No. of the servo amplifier of master. Setting "0" disables this parameter. This parameter setting is used with servo amplifier with software version A8 or later.	0
PD30	Master-slave operation - Torque command coefficient on slave This parameter setting is used with servo amplifier with software version C1 or later. Check the software version using Setup software (SETUP221E). This parameter is used to set an internal torque command coefficient to torque command value received from master axis. This parameter is enabled when this amplifier is set as slave axis ([Pr. PD15] = "0010"). Convert a decimal value to a hexadecimal value for input. The maximum value is 500. Setting over 500 will be 500. Setting 100 [%] (0064h in hexadecimal) means multiplication of one. The torque ratio will be 100 (master) to 100 (slave). Setting 90 [%] (005Ah in hexadecimal) means multiplication of 0.9. The torque ratio will be 100 (master) to 90 (slave).	0000h	PD30	Master-slave operation - Torque command coefficient on slave This parameter is used to set an internal torque command coefficient to torque command value received from master axis. This parameter is enabled when this amplifier is set as slave axis ([Pr. PD15] is "_ _ 1 0".). The maximum value is 500. Setting over 500 will be 500. Setting 100 [%] means multiplication of one. The torque ratio will be 100 (master) to 100 (slave). Setting 90 [%] means multiplication of 0.9. The torque ratio will be 100 (master) to 90 (slave). This parameter setting is used with servo amplifier with software version A8 or later.	0

MR-J3-_B_			MR-J4-_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PD31	Master-slave operation - Speed limit coefficient on slave This parameter setting is used with servo amplifier with software version C1 or later. Check the software version using Setup software (SETUP221E). This parameter is used to set an internal speed limit value coefficient to speed limit command value received from master axis. This parameter is enabled when this amplifier is set as slave axis ([Pr. PD15] = "0010"). Convert a decimal value to a hexadecimal value for input. The maximum value is 500. Setting over 500 will be 500. Setting 100 [%] (0064h in hexadecimal) means multiplication of one. Setting example: [Pr. PD31 (VLC)] = 0078h (120%), [Pr. PD32 (VLL)] = 012Ch (300 r/min), and master side acceleration/deceleration at 1000 [r/min] 	0000h	PD31	Master-slave operation - Speed limit coefficient on slave This parameter is used to set an internal speed limit value coefficient to speed limit command value received from master axis. This parameter is enabled when this amplifier is set as slave axis ([Pr. PD15] is "_ _ 1 0".). The maximum value is 500. Setting over 500 will be 500. Setting 100 [%] means multiplication of one. Setting example: [Pr. PD31 (VLC)] = 140 [%], [Pr. PD32 (VLL)] = 300 [r/min], and master side acceleration/deceleration at 1000 [r/min]  This parameter setting is used with servo amplifier with software version A8 or later.	0
PD32	Master-slave operation - Speed limit adjusted value on slave This parameter setting is used with servo amplifier with software version C1 or later. Check the software version using Setup software (SETUP221E). This parameter is used to set a minimum value for internal speed limit value. This parameter is enabled when this amplifier is set as slave axis ([Pr. PD15] = "0010"). Convert a decimal value to a hexadecimal value for input. The speed limit value will not be this setting value or lower. This parameter ensures torque control range at low speed driving (avoid area likely to reach speed limit). Set 100 to 500 [r/min] normally as a reference. Refer to [Pr. PD31] for the setting example.	0000h	PD32	Master-slave operation - Speed limit adjusted value on slave This parameter is used to set a minimum value for internal speed limit value. This parameter is enabled when this amplifier is set as slave axis ([Pr. PD15] is "_ _ 1 0".). The speed limit value will not be this setting value or lower. This parameter ensures torque control range at low speed driving (avoid area likely to reach speed limit). Set 100 to 500 [r/min] normally as a reference. Refer to [Pr. PD31] for the setting example. This parameter setting is used with servo amplifier with software version A8 or later.	0

4. APPLICATION OF FUNCTIONS

POINT

●Refer to "Part 6 Common Reference Material" for the application of functions.

・J3 compatibility mode

MR-J4-_B_(-RJ) servo amplifiers have two operation mode: "J4 mode" is for using all functions with full performance and "J3 compatibility mode" for using the conventional MR-J3-_B_ servo amplifiers.

MEMO

Part 4
Review on Replacement of MR-J3W-_B with MR-J4W2-_B

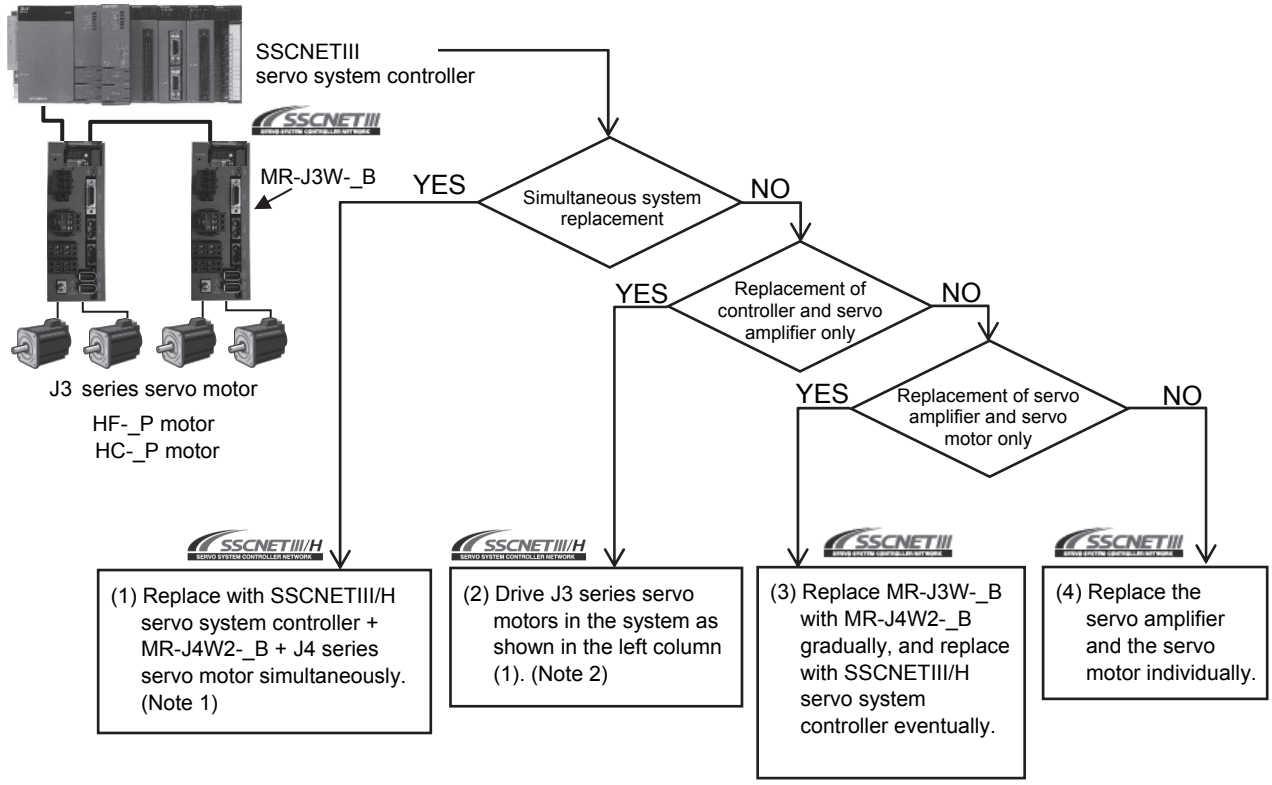
Part 4: Replacement of MR-J3W-_B with MR-J4W2-_B

1. SUMMARY

This section describes the changes to be made when a system using MR-J3W-_B is replaced with a system using MR-J4W2-_B.

2. CASE STUDY ON REPLACEMENT OF MR-J3W-_B

2.1 Review on Replacement Method



Note 1. Although heavier burdens including a longer construction period need to be borne, once replaced the system can be operated for a long period of time.
2. Replacing the system, you can drive some J3 series servo motors with MR-J4W2-_B (J4 mode) and MR-J4W2-_B (J3 compatibility mode). Refer to "Part 6 Common Reference Material" for the applicable motor.

2.2 Servo Amplifier Replacement Model

The following shows the target models (MR-J3W series) and replacement models (MR-J4W2-_B servo amplifier).

Servo amplifier model
MR-J3W-22B
MR-J3W-44B
MR-J3W-77B
MR-J3W-1010B
MR-J3W-0303BN6

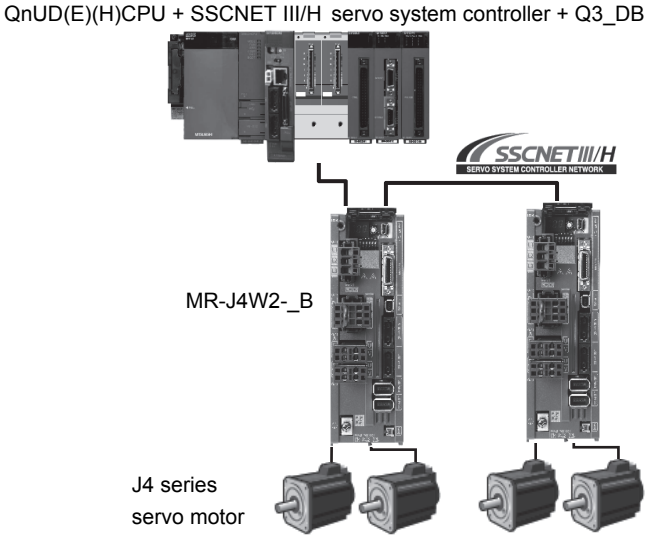
→

Servo amplifier model
MR-J4W2-22B
MR-J4W2-44B
MR-J4W2-77B
MR-J4W2-1010B
MR-J4W2-0303B6

2.3 Replacement Method

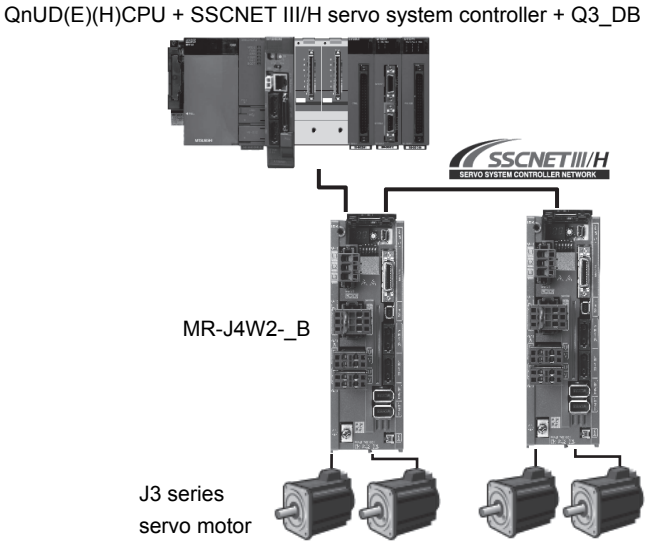
This section shows replacements using a QDS motion controller and an SSCNETIII/H stand-alone motion controller as examples.

(1) For simultaneous replacement
SSCNET III/H servo system controller (Note1) + MR-J4W2-_B + J4 series servo motor



High-speed motion control and excellent extensibility can reduce cycle time

(2) For replacement of controller and amplifier only
SSCNET III/H servo system controller (Note1) + MR-J4W2-_B



Note 1. The SSCNETIII/H servo system controller indicates QDS Motion (Q172DSCPU/Q173DSCPU) or Q simple Motion (QD77MS2/4/16).
2. Replacing the system, you can drive some J3 series servo motors with MR-J4W2-_B (J4 mode) and MR-J4W2-_B (J3 compatibility mode). Refer to "Part 6 Common Reference Material" for the applicable motor.

(3) Gradual replacement of MR-J3W-_B with MR-J4W2-_B

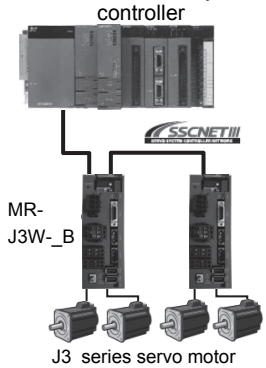
POINT

- MR-J3W-_B cannot drive an HG motor. When the servo motor is replaced with an HG motor, simultaneous replacement with MR-J4W2-_B and HG motor is necessary.
- Replacing the system, you can drive some J3 series servo motors with MR-J4W2-_B (J4 mode) and MR-J4W2-_B(J3 compatibility mode). Refer to "Part 6 Common Reference Material" for the applicable motor.
- When an "HC-_P motor" shown below is used, "simultaneous replacement with MR-J4W2-_B and an HG motor" is recommended. When an HG motor is adopted, the capacity of the servo amplifier needs to be changed. (Consider replacement, referring to "torque characteristics" described in "Part 7: Replacement of Motor".)
- The low inertia "HG-JR motor" is recommended for the replacement of "HC-LP motor". To use a servo motor other than the motors listed in following table, check the compatibility with the equipment because the motor inertia, etc. is different.

Existing device models		Replacement models for simultaneous replacement (example)	
Servo motor	Servo amplifier	Servo motor	Servo amplifier
HC-LP102(B)	MR-J3W-1010B	HG-JR153(B)	Replace with the MR-J4-200B.

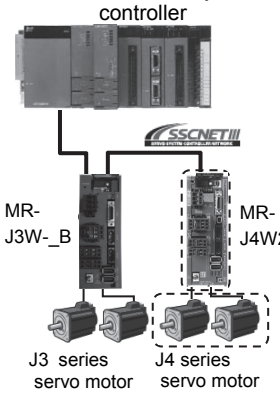
1: Current system

SSCNETIII servo system controller



2: Only one axis replaced

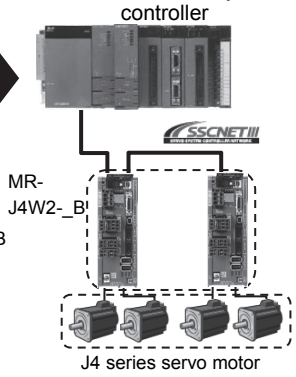
SSCNETIII servo system controller



- The MR-J4W2-_B series has the J3 compatibility mode (Note 1). The MR-J4W2-_B series and the MR-J3W-_B series can be used together.
- Optical fiber cables for the conventional SSCNETIII can be used as they are.

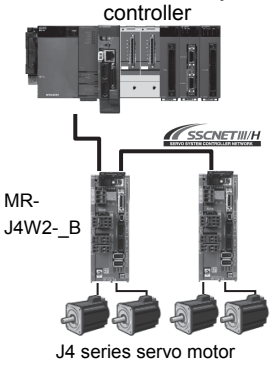
3: All axes replaced

SSCNETIII servo system controller



4: Controller update

SSCNETIII/H servo system controller



- Change the settings of the MR-J4W2-_B to J4 mode using the application software "MR-J4(W)-B mode selection" (Note 2). The servo amplifiers and servo motors can be used as they are.

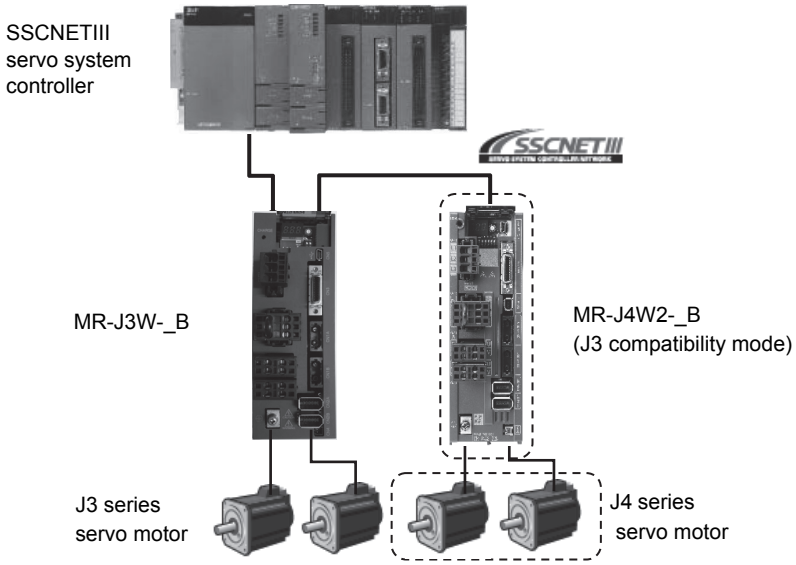
Note 1. Replacing the system, you can drive some J3 series servo motors with MR-J4W2-_B (J4 mode) and MR-J4W2-_B (J3 compatibility mode). Refer to "Part 6 Common Reference Material" for the applicable motor.

2. The application software is available with MR Configurator2 version 1.12N or later.

(4) Separate repair

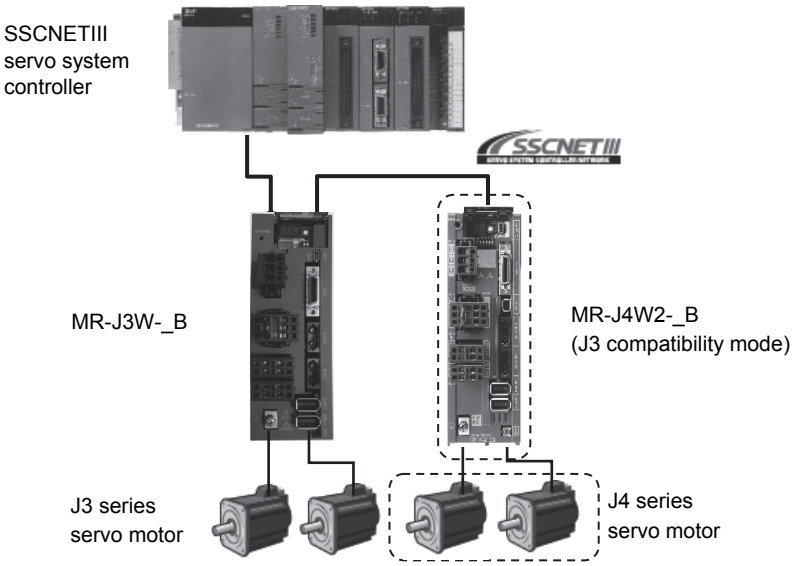
(a) Replacement of servo amplifier

Replacing the system, you can drive some J3 series servo motors with MR-J4W2-_B (J4 mode) and MR-J4W2-_B(J3 compatibility mode). Refer to "Part 6 Common Reference Material" for the applicable motor.



(b) Replacement of servo motor

The J4 series servo motors cannot be driven by MR-J3W-_B. Replace the existing servo amplifiers and servo motors with MR-J4W2-_B servo amplifiers (J3 compatibility mode) and J4 series servo motors simultaneously.



3. DIFFERENCES BETWEEN MR-J3W-_B AND MR-J4W2-_B

3.1 Function Comparison Table

POINT
●Functions with difference are shown with shading.

(1) MR-J3W-_B/MR-J4W2-_B 200 V class

Item		MR-J3W-_B series		MR-J4W2-_B servo amplifier	
1	Capacity range	MR-J3W-22B	200 W (A axis)/200 W (B axis)	MR-J4W2-22B	200 W (A axis)/200 W (B axis)
		MR-J3W-44B	400 W (A axis)/400 W (B axis)	MR-J4W2-44B	400 W (A axis)/400 W (B axis)
		MR-J3W-77B	750 W (A axis)/750 W (B axis)	MR-J4W2-77B	750 W (A axis)/750 W (B axis)
		MR-J3W-1010B	1 kW (A axis)/1 kW (B axis)	MR-J4W2-1010B	1 kW (A axis)/1 kW (B axis)
2	Internal regenerative resistor	Built-in MR-J3W-22B/-44B 10 W MR-J3W-77B/-1010B 100 W		Built-in MR-J4W2-22B/-44B 20 W MR-J4W2-77B/-1010B 100 W	
3	Dynamic brake	Built-in		Built-in **Coasting distance may differ. (Note)**	
4	Control circuit power	1-phase AC 200 ～ 230 V		1-phase AC 200 ～ **240** V	
5	Main circuit power	1-phase AC 200 ～ 230 V (MR-J3W-22B/-44B only) 3-phase AC 200 ～ 230 V		1-phase AC 200 ～ **240** V (MR-J4W2-22B/-44B/**-77B** only) 3-phase AC 200 ～ **240** V	
6	Interface power supply	External supply required (24 V DC)		External supply required (24 V DC)	
7	Auto Tuning	Real-time auto tuning: 32 steps Advanced gain search		Real-time auto tuning: **40 steps** **One-touch tuning**	
8	Control mode	SSCNET III Interface (50 Mbps) ・Position control mode ・Speed control mode		**SSCNET III/H Interface (150 Mbps)** ・Position control mode ・Speed control mode ・**Torque control mode**	
				< J3 compatibility mode > SSCNET III Interface (50 Mbps) ・Position control mode ・Speed control mode	
9	The number of DIO points (excluding EM1)	DI: 6 points, DO: 4 points		DI: 6 points, DO: 4 points	
10	Encoder pulse output	A/B-phase pulse (differential line driver) × 2 axes		A/B-phase pulse (differential line driver) × 2 axes	
11	DIO interface	input/output: sink/source		input/output: sink/source	
12	Analog input/output	10-bit or equivalent × 2ch		Analog monitors (MO1 and MO2) are not supported. When using MO1 and MO2, please consider replacing the servo amplifier with two MR-J4 single-axis servo amplifiers.	
13	Parameter setting method	Setup software (SETUP221E) MR Configurator2		MR Configurator2	
14	Setup software communication function	USB		USB	
15	Servo motor (Encoder resolution)	HF-_P series (18-bit ABS) HA-_P series (18-bit ABS)		HG series (**22**-bit ABS)	
16	Motor maximum torque	HF-KP 350%		HG-KR 350%	
		HF-MP 300%		HG-MR 300%	
		HF-SP 300%		HG-SR 300%	
		HC-UP 300%		HG-UR 300%	
		HF-JP 300% (When HF-JP53 and MR-J3W-1010B are used together: 400%)		HG-JR 300% (When HG-JR53 and MR-J4W2-1010B are used together: 400%)	
		HC-LP 300%			
17	LED display	7-segment 3-digit		7-segment 3-digit	
18	Advanced vibration suppression control	Provided		Provided **(Advanced vibration suppression control II)**	
19	Adaptive filter II	Provided		Provided	
20	Notch filter	Provided (2 pcs)		Provided (5 pcs)	
21	Tough drive	Unprovided		**Provided**	
22	Drive recorder	Unprovided		**Provided**	
23	Forced stop	EM1 (DB stop)		**EM1 (DB stop)/ EM2 (deceleration to a stop)**	

Note. For the coasting distance, refer to "1.2.3 Dynamic brake: coasting distance" in "Part 6 Common Reference Material".

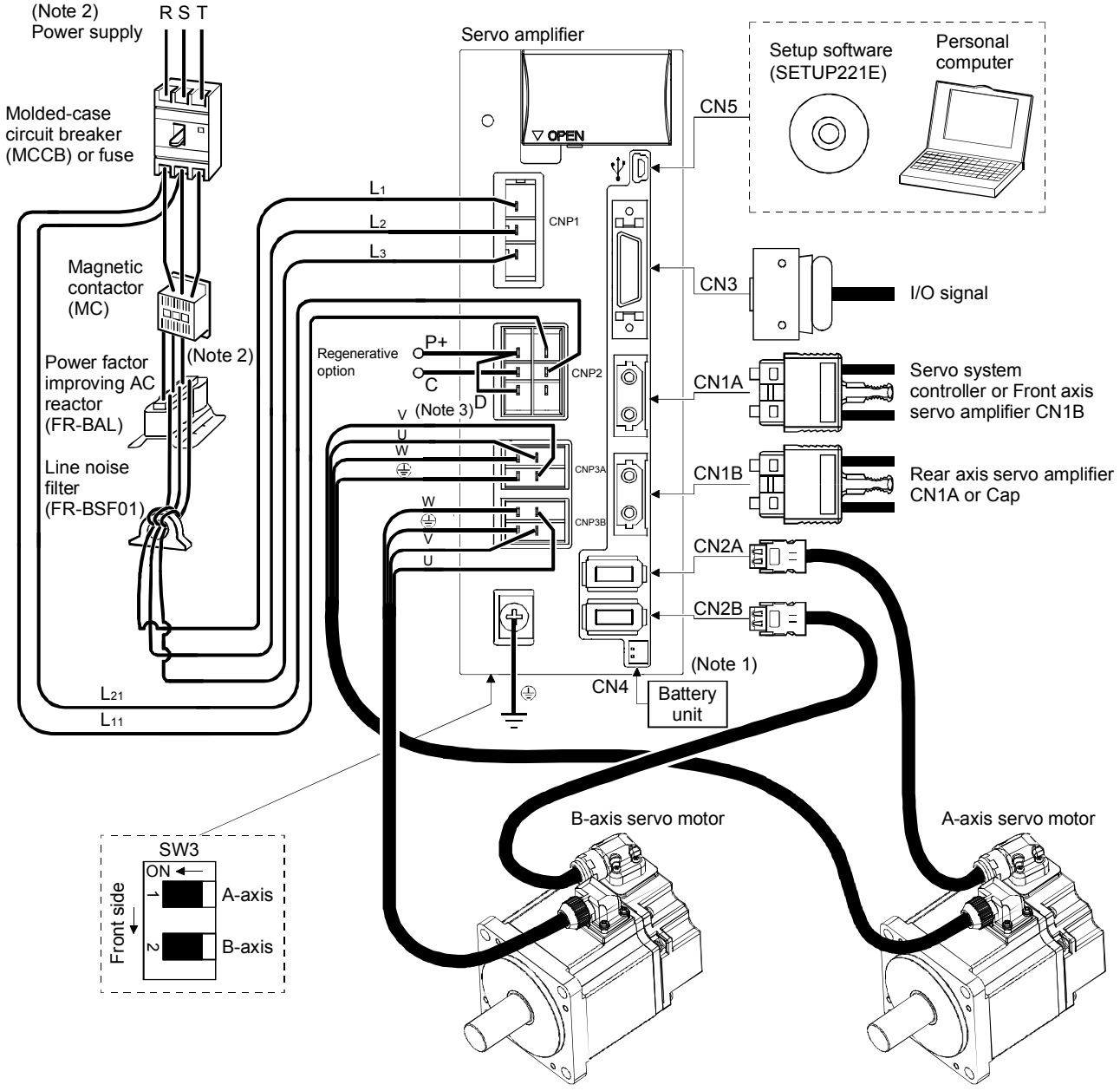
(2) MR-J3W-0303BN6/MR-J4W2-0303B6 48 V DC class /24 V DC class

Item		MR-J3W-0303BN6 servo amplifier	MR-J4W2-0303B6 servo amplifier
1	Capacity range	30 W (A-axis)/30 W (B-axis)	30 W (A-axis)/30 W (B-axis)
2	Internal regenerative resistor	Built-in 1.3 W	Built-in 1.3 W
3	Dynamic brake	Built-in (Electronic type)	Built-in (Electronic type) **Coasting distance may differ. (Note)**
4	Control circuit power	24 V DC	24 V DC
5	Main circuit power	48 V DC/24 V DC	48 V DC/24 V DC
6	Interface power supply	External supply required (24 V DC)	External supply required (24 V DC)
7	Auto Tuning	Real-time auto tuning: 32 steps Advanced gain search	Real-time auto tuning: **40 steps** **One-touch tuning**
8	Control mode	SSCNET III Interface (50 Mbps) ・ Position control mode ・ Speed control mode	**SSCNET III/H Interface (150 Mbps)** ・ Position control mode ・ Speed control mode ・ **Torque control mode**
			< J3 compatibility mode > SSCNET III Interface (50 Mbps) ・ Position control mode ・ Speed control mode
9	The number of DIO points (excluding EM1)	DI: 6 points, DO: 4 points	DI: 6 points, DO: 4 points
10	Encoder pulse output	A/B-phase pulse (differential line driver) × 2 axes	A/B-phase pulse (differential line driver) × 2 axes
11	DIO interface	input/output: sink/source	input/output: sink/source
12	Analog monitor output	10-bit or equivalent × 2ch	10-bit or equivalent × 2ch
13	Parameter setting method	Setup software (SETUP221E) MR Configurator2	MR Configurator2
14	Setup software communication function	USB	USB
15	Servo motor (Encoder resolution)	HG-AK series (18-bit ABS)	HG-AK series (18-bit ABS)
16	LED display	7-segment 3-digit	7-segment 3-digit
17	Advanced vibration suppression control	Provided	Provided **(Advanced vibration suppression control II)**
18	Adaptive filter II	Provided	Provided
19	Notch filter	Provided (2 pcs)	Provided (**5** pcs)
20	Tough drive	Unprovided	**Provided (The instantaneous power failure tough drive is unavailable.)**
21	Drive recorder	Unprovided	**Provided**
22	Forced stop	EM1 (DB stop)	**EM1 (DB stop)/ EM2 (deceleration to a stop)**
23	DIN rail mounting	unattachable	**attachable**

Note. For the coasting distance, refer to "1.2.3 Dynamic brake: coasting distance" in "Part 6: Common Reference Material".

3.2 Configuration including auxiliary equipment

(1) MR-J3W-_B

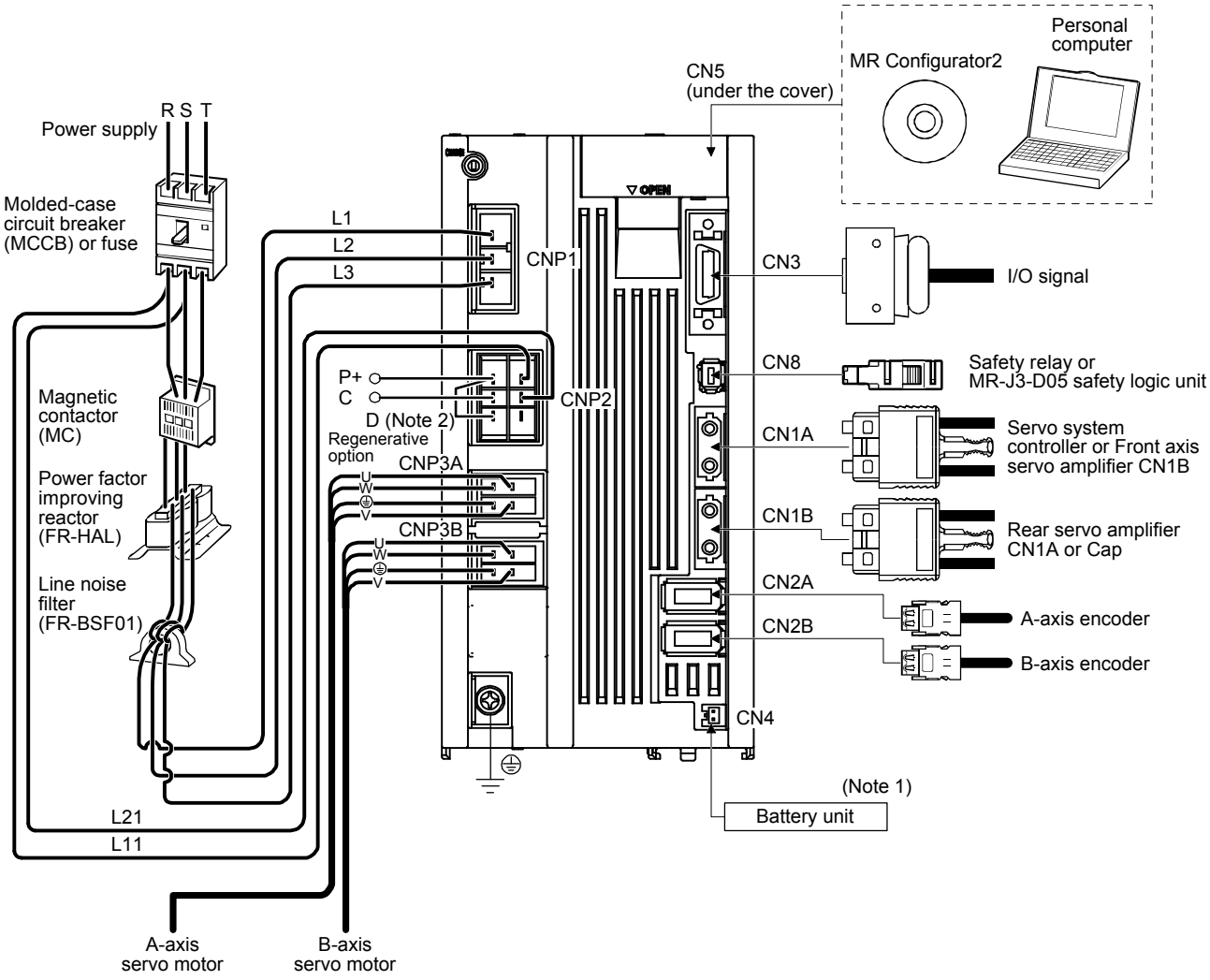


Note 1. A battery unit consists of one MR-BTCASE battery case and eight MR-BAT batteries. Use the battery unit in the absolute position detection system of the position control mode.

2. For 1-phase 200V to 230VAC, connect the power supply to L_1 · L_2 and leave L_3 open. Refer to section 3.1 for the power supply specification.

3. Make sure to connect the P+ terminal to the D terminal. When using the regenerative option, Refer to the Instruction Manuals.

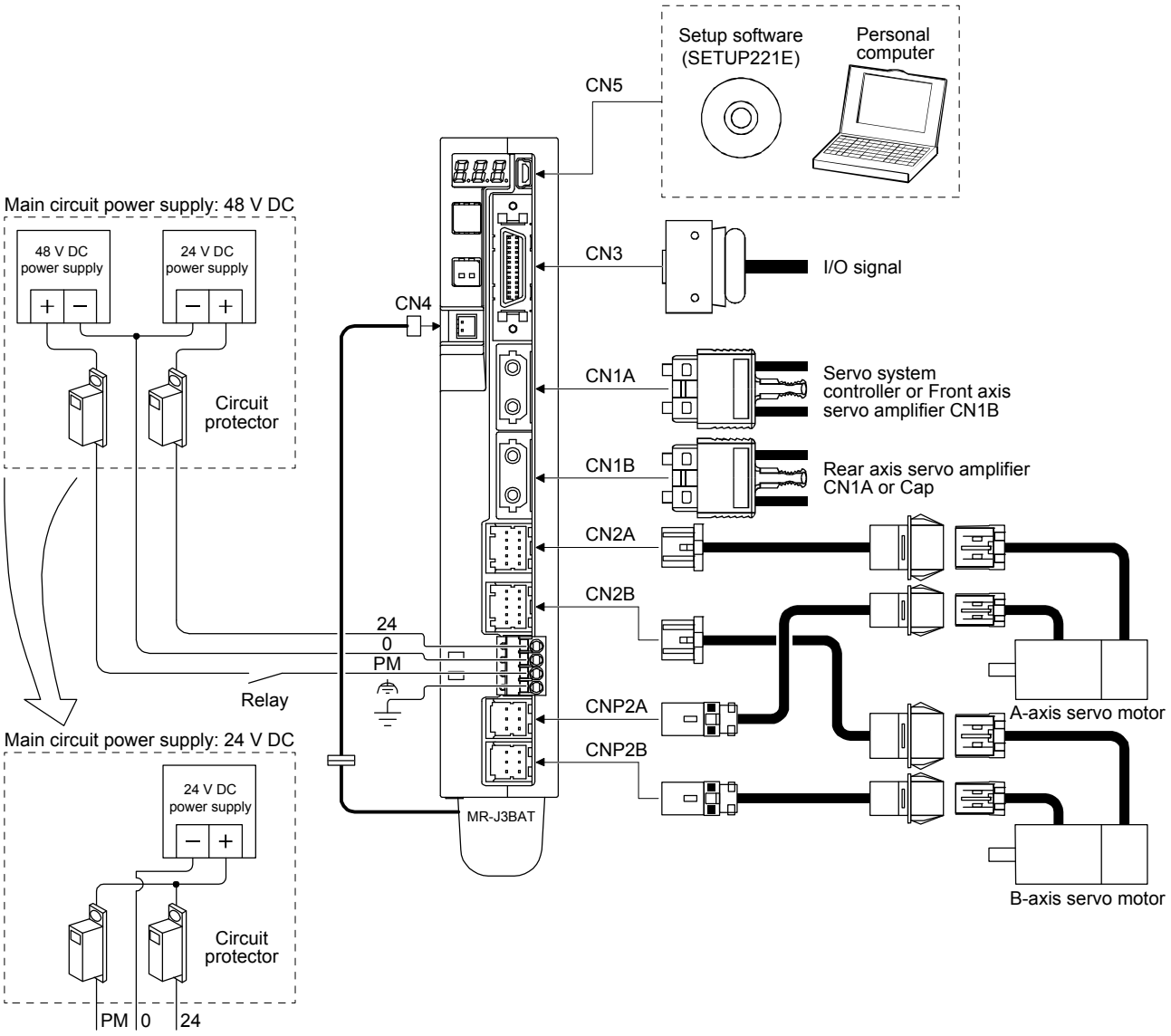
(2) MR-J4W2-_B



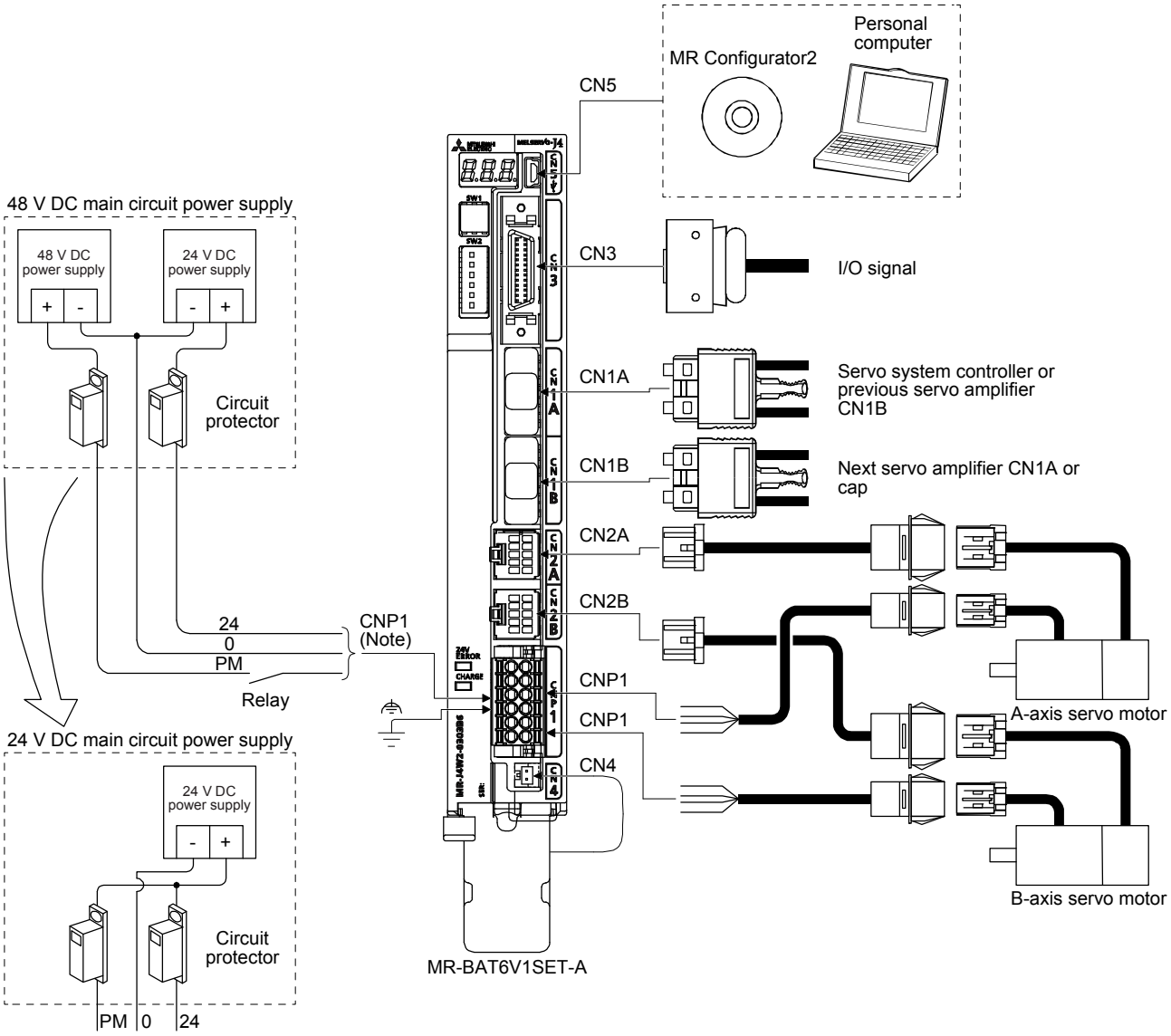
Note 1. The battery unit consists of an MR-BT6VCASE battery case and five MR-BAT6V1 batteries. The battery unit is used in the absolute position detection system. For details, refer to "MR-J4W2-_B/MR-J4W3-_B/MR-J4W2-0303B6 servo amplifier instruction manual".

2. Always connect P+ and D. When using the regenerative option, Refer to the Instruction Manuals.

(3) MR-J3W-0303BN6



(4) MR-J4W2-0303B6



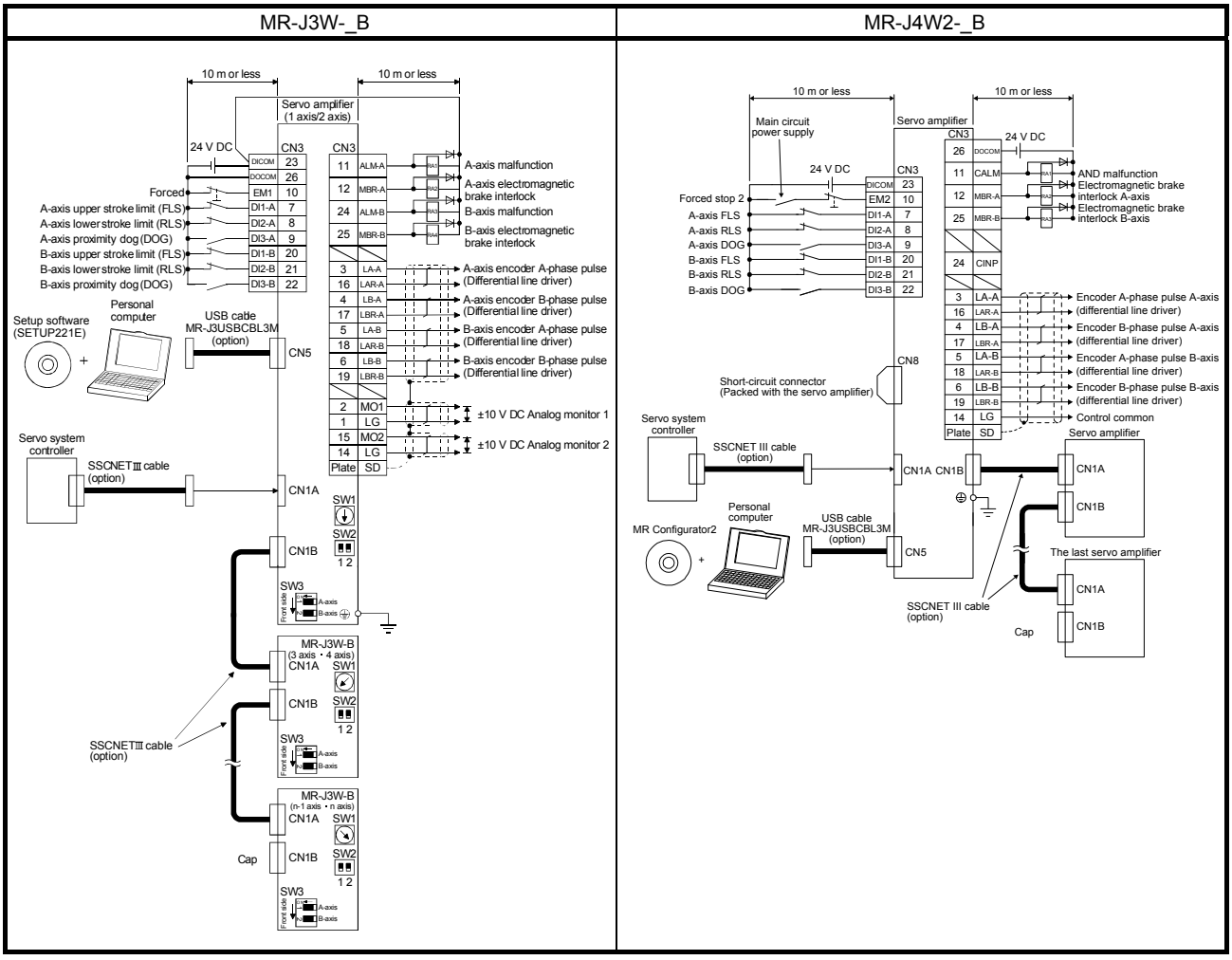
Note. For details, refer to "MR-J4W2-_B/MR-J4W3-_B/MR-J4W2-0303B6 servo amplifier instruction manual".

3.3 Comparison of Networks

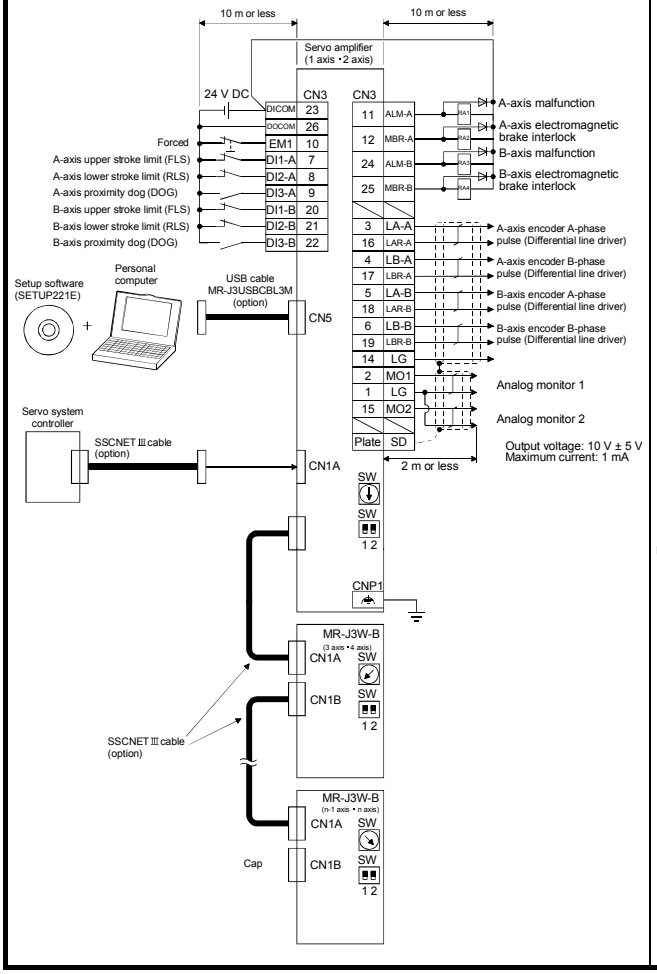
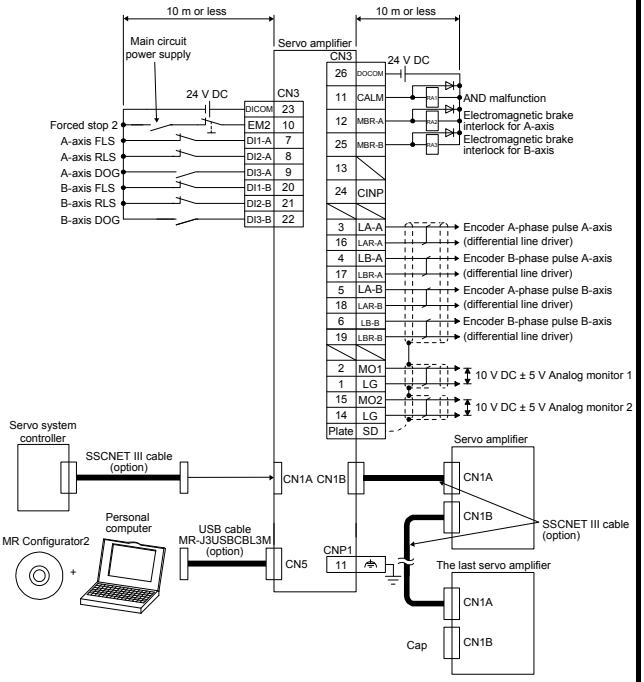
POINT
●Refer to "Part 6: Common Reference Material".

3.4 Comparison of Standard Connection Diagrams

(1) MR-J3W-_B/MR-J4W2-_B 200 V class



(2) MR-J3W-0303BN6/MR-J4W2-0303B6 48 V DC/24 V DC class

MR-J3W-0303BN6	MR-J4W2-0303B6
	

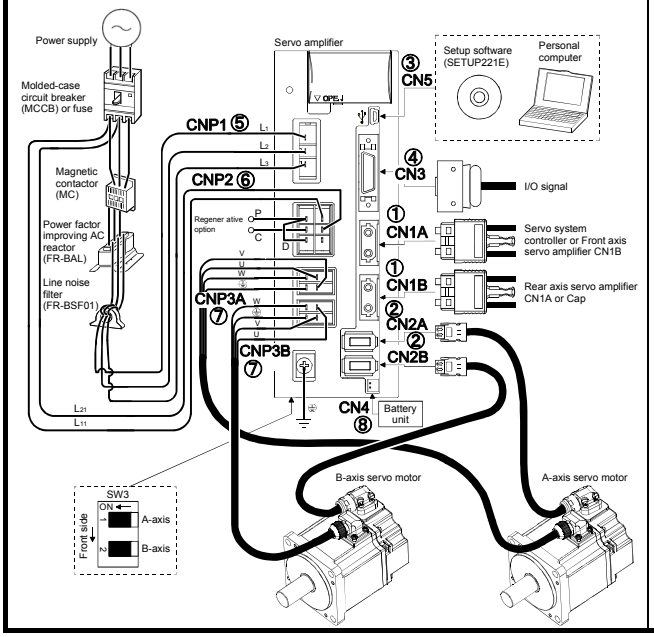
3.5 List of Corresponding Connectors and Terminal Blocks

An example of connections with the peripheral equipment is shown below. Refer to the respective Instruction Manuals for details on the signals.

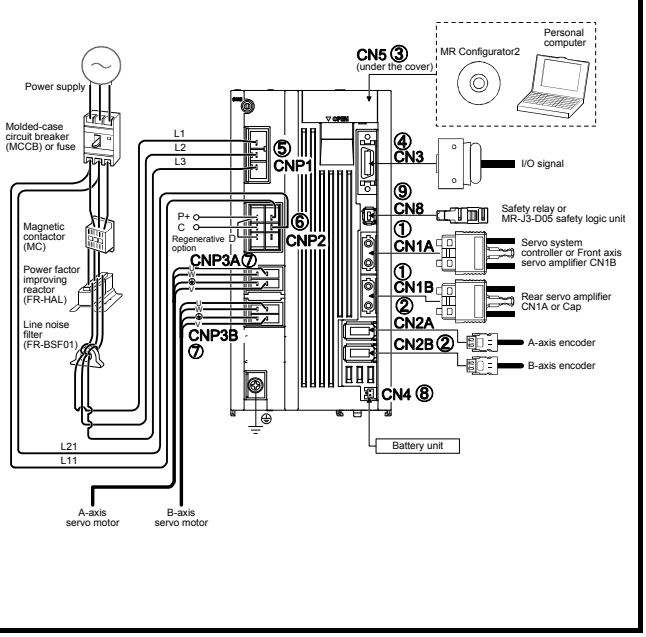
3.5.1 200 V class

(1) Comparison of connectors

MR-J3W-_B



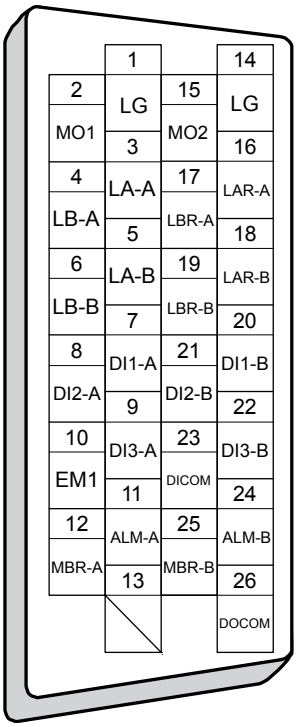
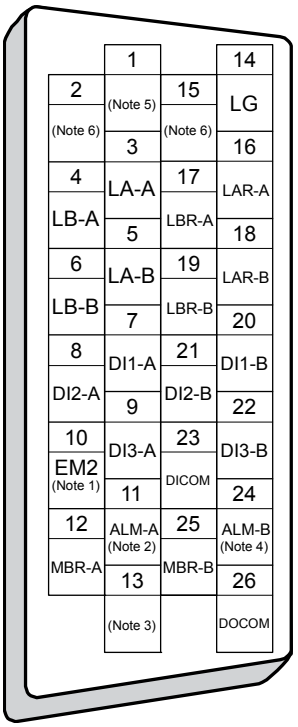
MR-J4W2-_B



(2) List of connector and terminal block correspondence

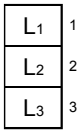
MR-J3W-_B				MR-J4W2-_B			Precautions
No.	Connector name	Connector No.		No.	Connector name	Connector No.	
①	Communication connector	CN1A CN1B		①	Communication connector	CN1A CN1B	MR-J3W cables can be used as they are.
②	encoder connector	CN2A CN2B		②	encoder connector	CN2A CN2B	
③	USB communication connector	CN5		③	USB communication connector	CN5	
④	I/O signal connector	CN3	→	④	I/O signal connector	CN3	A new cable needs to be prepared. Refer to (3) of this section for details. Analog monitors (MO1 and MO2) are not supported. When using MO1 and MO2, please consider replacing the servo amplifier with two MR-J4 single-axis servo amplifiers.
⑤	Main circuit power connector	CNP1		⑤	Main circuit power connector	CNP1	Replace the existing connectors with the ones supplied with the servo amplifier.
⑥	Control circuit power connector	CNP2		⑥	Control circuit power connector	CNP2	
⑦	Servo motor power connector	CNP3A CNP3B		⑦	Servo motor power connector	CNP3A CNP3B	
⑧	Battery connector	CN4		⑧	Battery connector	CN4	A new battery needs to be prepared. For details, refer to "MR-J4W2-_B Servo Amplifier Instruction Manual".
⑨	STO input signal connector			⑨	STO input signal connector	CN8	When not using the STO in MR-J4W2, attach the short-circuit connector supplied with the servo amplifier to CN8.

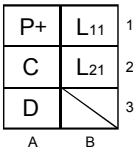
(3) Comparison of signals

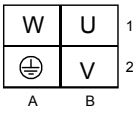
MR-J3W-_B		Abbreviation	MR-J4W2-_B	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
CN3 	CN3-1	LG (Note 5)	CN3-1	CN3 
	CN3-2	MO1 (Note 6)	CN3-2	
	CN3-3	LA-A	CN3-3	
	CN3-4	LB-A	CN3-4	
	CN3-5	LA-B	CN3-5	
	CN3-6	LB-B	CN3-6	
	CN3-7	DI1-A	CN3-7	
	CN3-8	DI2-A	CN3-8	
	CN3-9	DI3-A	CN3-9	
	CN3-10	EM1 (Note 1)	CN3-10	
	CN3-11	ALM-A (Note 2)	CN3-11	
	CN3-12	MBR-A	CN3-12	
	CN3-13	(Note 3)	CN3-13	
	CN3-14	LG	CN3-14	
	CN3-15	MO2 (Note 6)	CN3-15	
	CN3-16	LAR-A	CN3-16	
	CN3-17	LBR-A	CN3-17	
	CN3-18	LAR-B	CN3-18	
	CN3-19	LBR-B	CN3-19	
	CN3-20	DI1-B	CN3-20	
	CN3-21	DI2-B	CN3-21	
	CN3-22	DI3-B	CN3-22	
	CN3-23	DICOM	CN3-23	
	CN3-24	ALM-B (Note 4)	CN3-24	
	CN3-25	MBR-B	CN3-25	
	CN3-26	DOCOM	CN3-26	

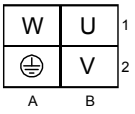
Note 1. In the initial setting, EM2 is assigned to the CN3-10 pin. Set [Pr. PA04] to "0 0 _ _" when assigning EM1.
2. In the initial setting, CALM is assigned to the CN3-11 pin. Set [Pr. PD09] to "_ _ 0 3" when assigning ALM-A.
3. In the initial setting, MBR-C is assigned to the CN3-13 pin. Set [Pr.PD07] to "_ _ 0 0" when assigning Always off.
4. In the initial setting, CINP is assigned to the CN3-24 pin. Set [Pr. PD08] to "_ _ 0 3" when assigning ALM-B.
5. Because the MR-J4W2-_B servo amplifiers do not support analog monitors (MO1 and MO2), LG for MO1 or MO2 is not assigned. Use CN3-14 for the control common of the encoder output pulses.
   DI1-C is assigned to the CN3-1 pin. Because the signal is for MR-J4W3-_B servo amplifier, it does not function for the MR-J4W2-_B servo amplifier (Always off).
6. MR-J4W2-_B servo amplifier does not support analog monitors (MO1 and MO2). DI2-C is assigned to the CN3-2 pin, and DI3-C is assigned to the CN3-15 pin. Because the signal is for MR-J4W3-_B servo amplifier, it does not function for the MR-J4W2-_B servo amplifier (Always off).

(4) Main circuit terminal block

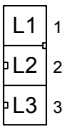
<table>
<tr><th>MR-J3W-22B/MR-J3W-44B</th><th>MR-J4W2-22B/MR-J4W2-44B</th></tr>
<tr><td>
CNP1


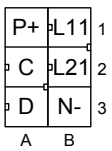
CNP2


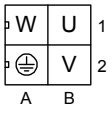
CNP3A


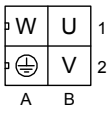
CNP3B


PE (⏚)

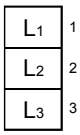

Screw Size: M4
Tightening torque: 1.2 [N•m]
</td><td>
CNP1


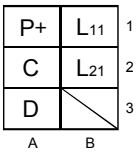
CNP2


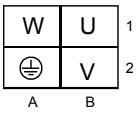
CNP3A


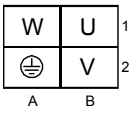
CNP3B


PE

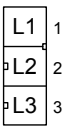

Screw Size: M4
Tightening torque: 1.2 [N•m]
</td></tr>
<tr><th>MR-J3W-77B/MR-J3W-1010B</th><th>MR-J4W2-77B/MR-J4W2-1010B</th></tr>
<tr><td>
CNP1


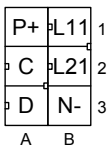
CNP2


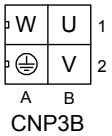
CNP3A


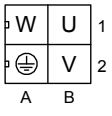
CNP3B


PE (⏚)


Screw Size: M4
Tightening torque: 1.2 [N•m]
</td><td>
CNP1


CNP2


CNP3A


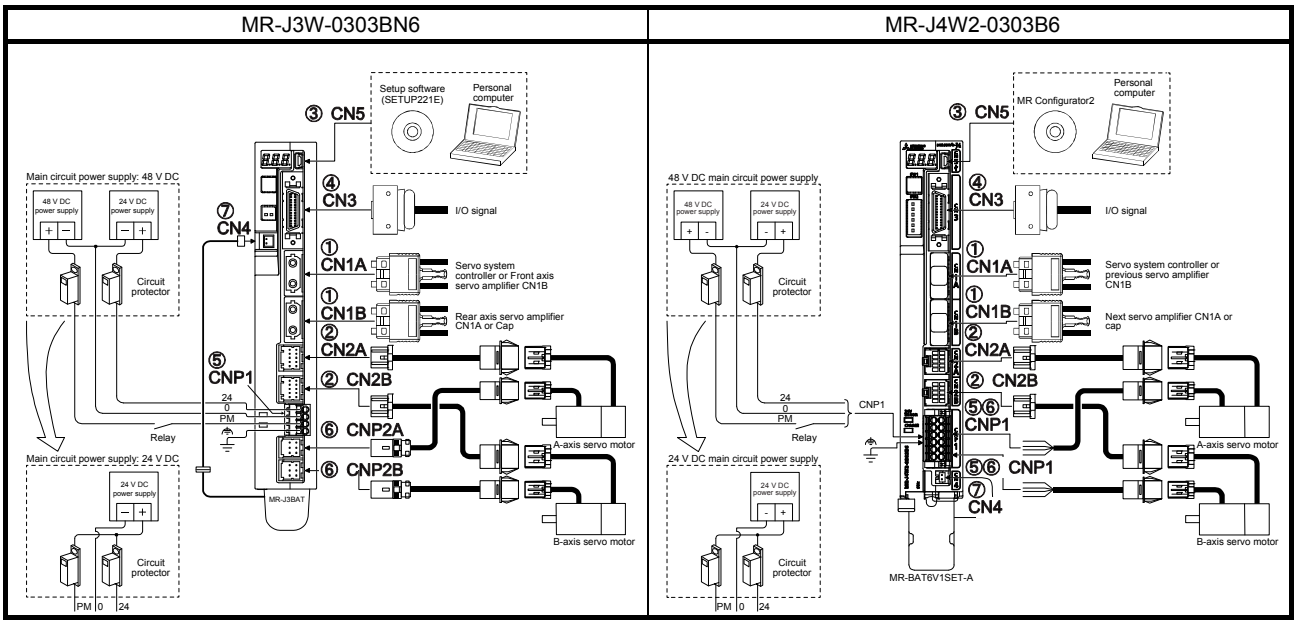
CNP3B


PE


Screw Size: M4
Tightening torque: 1.2 [N•m]
</td></tr>
</table>

3.5.2 48 V DC/24 V DC class

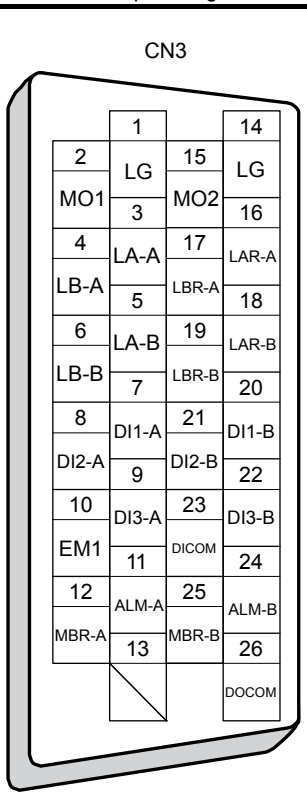
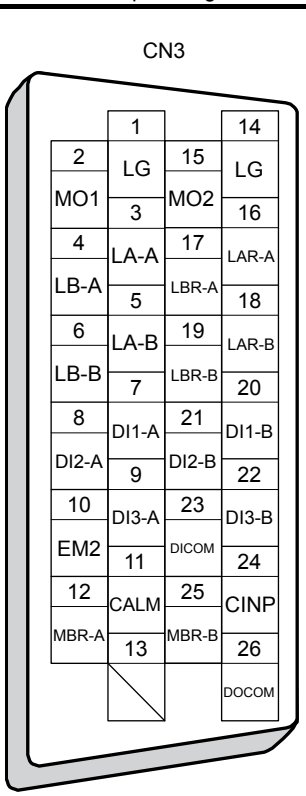
(1) Comparison of connectors



(2) List of connector and terminal block correspondence

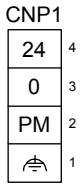
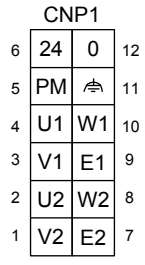
MR-J3W-0303BN6				MR-J4W2-0303B6			Precautions
No.	Connector name	Connector No.		No.	Connector name	Connector No.	
①	Communication connector	CN1A CN1B	→	①	Communication connector	CN1A CN1B	MR-J3W cables can be used as they are.
②	Encoder connector	CN2A CN2B		②	Encoder connector	CN2A CN2B	
③	USB communication connector	CN5		③	USB communication connector	CN5	
④	I/O signal connector	CN3		④	I/O signal connector	CN3	MR-J3W cables can be used as they are. Refer to (3) in this section for the connector pin assignment.
⑤	Main circuit power supply connector	CNP1		⑤	Main circuit power supply connector	CNP1	Replace the existing connectors with the ones supplied with the servo amplifier.
⑥	Servo motor power connector	CNP2A CNP2B		⑥	Servo motor power connector		Replace the existing connectors with the ones supplied with the servo amplifier. They are different from the cables and connector of MR-J3W.
⑦	Battery connector	CN4		⑦	Battery connector	CN4	A new battery needs to be prepared. For details, refer to "MR-J4W2-_B Servo Amplifier Instruction Manual".

(3) Comparison of signals

MR-J3W-0303BN6		Signal abbreviation	MR-J4W2-0303B6	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
	CN3-1	LG	CN3-1	
	CN3-2	MO1	CN3-2	
	CN3-3	LA-A	CN3-3	
	CN3-4	LB-A	CN3-4	
	CN3-5	LA-B	CN3-5	
	CN3-6	LB-B	CN3-6	
	CN3-7	DI1-A	CN3-7	
	CN3-8	DI2-A	CN3-8	
	CN3-9	DI3-A	CN3-9	
	CN3-10	EM1 (Note 1)	CN3-10	
	CN3-11	ALM-A (Note 2)	CN3-11	
	CN3-12	MBR-A	CN3-12	
	CN3-13	(Note 3)	CN3-13	
	CN3-14	LG	CN3-14	
	CN3-15	MO2	CN3-15	
	CN3-16	LAR-A	CN3-16	
	CN3-17	LBR-A	CN3-17	
	CN3-18	LAR-B	CN3-18	
	CN3-19	LBR-B	CN3-19	
	CN3-20	DI1-B	CN3-20	
	CN3-21	DI2-B	CN3-21	
	CN3-22	DI3-B	CN3-22	
	CN3-23	DICOM	CN3-23	
	CN3-24	ALM-B (Note 4)	CN3-24	
	CN3-25	MBR-B	CN3-25	
	CN3-26	DOCOM	CN3-26	

Note 1. As the initial value, EM2 is assigned to the CN3-10 pin. Set [Pr. PA04] to "0 0 _ _" to assign EM1.
2. As the initial value, CALM is assigned to the CN3-11 pin. Set [Pr. PD09] to "_ _ 0 3" to assign ALM-A.
3. As the initial value, MBR-C is assigned to the CN3-13 pin. Set [Pr. PD07] to "_ _ 0 0" to assign Always off.
4. As the initial value, CINP is assigned to the CN3-24 pin. Set [Pr. PD08] to "_ _ 0 3" to assign ALM-B.

(4) Main circuit terminal block

MR-J3W-0303BN6	MR-J4W2-0303B6
 Screw size: M5 Tightening torque: 1.87 [N•m]	 Screw size: M5 Tightening torque: 1.87 [N•m]

3.6 Comparison of Peripheral Equipment

POINT
●Refer to "Part 8: Replacement of Optional Peripheral Equipment".

3.7 Comparison of Parameters

⚠CAUTION
- ●Never perform extreme adjustments and changes to the parameters, otherwisethe operation may become unstable.
- ●If fixed values are written in the digits of a parameter, do not change these values.
- ●Do not change parameters for manufacturer setting.
- ●Do not enter any setting value other than those specified for each parameter.

POINT
- ●For the parameter converter function, refer to "Part 6: Common Reference Material".
- ●For details about parameter settings for replacement, Refer to "MR-J4W2-_B Servo Amplifier Instruction Manual".
- ●Do not enter any setting value other than those specified for each parameter.

POINT
- ●With MR-J4-_B_ the deceleration to a stop function is enabled by factory settings. To disable the deceleration to a stop function, set [Pr.PA04] to "0 _ _ _ ".

3.7.1 Setting requisite parameters upon replacement

The parameters shown in this section are a minimum number of parameters that need to be set for simultaneous replacement. Depending on the settings of the currently used amplifier, parameters other than these may need to be set.

Parameter No.	Name	Precautions
PA01	Control type selection	MR-J4W2-_B has servo motors whose initial settings are 350%. Refer to Part 7: "Review on Replacement of Motor" and check the operation.
PA02	Regenerative option selection	The setting value must be changed according to the option model.
PA04	Function selection A-1 Servo forced stop selection	Forced stop deceleration function selection To configure the same settings as for MR-J3W-_B, select "Forced stop deceleration function disabled (with EM1 used)".
PA08	Gain adjustment mode selection	The setting value needs to be changed according to the auto tuning mode.
PA09	Auto tuning response	Auto tuning response setting Enter this setting value for replacement, referring to "3.7.3 Comparison of parameter details". It is necessary to make gain adjustment again when replacing. For details on how to make gain adjustments, refer to Chapter 6 of the MR-J4W2-_B Servo Amplifier Instruction Manual. The setting value needs be changed based on the standard machine resonance frequency.
PA10	In-position range	The setting needs to be changed depending on the motor.
PA15	Encoder output pulse	Used to set the encoder pulses (A-phase and B-phase) output by the servo amplifier.
PA19	Parameter writing inhibit	Change the setting value as necessary.
PB06	Load to motor inertia ratio	The unit system is different. (0.1-fold→0.01-fold) Pay attention to setting value.
PB07	Model loop gain	The unit system is different. (rad/s→0.1 rad/s)
PB08	Position loop gain	The unit system is different. (rad/s→0.1 rad/s)
PB13	Machine resonance suppression filter 1	Change the setting value according to the frequency and depth.
PB14	Notch shape selection 1	
PB15	Machine resonance suppression filter 2	Change the setting value according to the frequency and depth.
PB16	Notch shape selection 2	
PB29	Load to motor inertia ratio after gain switching	The unit system is different. (0.1-fold→0.01-fold) Pay attention to setting value.
PB30	Position loop gain after gain switching	It is necessary to convert the ratio to a value to change the setting value.
PB31	Speed loop gain after gain switching	It is necessary to convert the ratio to a value to change the setting value.
PB32	Speed integral compensation after gain switching	It is necessary to convert the ratio to a value to change the setting value.
PC05	Function selection C-2	Select a voltage to be connected to the main circuit power supply with an MR-J4W2-0303B6 servo amplifier. [Pr. PC05]: "_ 0 _ _" 48 V DC (Initial value) "_ 1 _ _" 24 V DC The setting of this digit in the J3 compatibility mode is the same as the MR-J3W-0303BN6 servo amplifier. Set it with [Pr. Po04]. [Pr. Po04]: "0 _ _ _" 48 V DC (Initial value) "1 _ _ _" 24 V DC The characteristics of the servo motor vary depending on whether the voltage of the main circuit is 48 V DC or 24 V DC.
PC09	Analog monitor 1 output	Analog monitors (MO1/MO2) support MR-J4W2-0303B6 only. When MO1/MO2 are used with 200 V of MR-J3W-_B, please consider replacing the amplifier with 2 MR-J4 single-axis amplifiers.
PC10	Analog monitor 2 output	
PC11	Analog monitor 1 offset	
PC12	Analog monitor 2 offset	

3.7.2 Parameter comparison list

POINT

- The parameter whose symbol preceded by * can be validated with the following conditions.
  * : Turn off the power and then on again, or reset the controller after setting the parameter.
  **: Turn off the power and then on again after setting the parameter.
- How to set parameters
  Each: Set parameters for each axis of A and B.
  Common: Set parameters for common axis of A and B. Be sure to set the same value to all axes.
- The same values are set as default for all axes.
- Setting an out of range value to each parameter will trigger [AL. 37 Parameter error].

MR-J3W-_B parameters						MR-J4W2-_B parameters					
No.	Symbol	Parameter name	Setting	Factory setting	Customer setting value	No.	Symbol	Parameter name	Setting	Factory setting	Customer setting value
PA01	**STY	Control mode	Each axis	0000h		PA01	**STY	Operation mode	Each axis	1000h	
PA02	**REG	Regenerative option	Common	0000h		PA02	**REG	Regenerative option	Common	0000h	
PA03	*ABS	Absolute position detection system	Each axis	0000h		PA03	*ABS	Absolute position detection system	Each axis	0000h	
PA04	*AOP1	Function selection A-1	Common	0000h		PA04	*AOP1	Function selection A-1	Common	2000h	
PA05		This parameter is not used. Do not change the value.		0		PA05		For manufacturer setting		10000	
PA06				1		PA06				1	
PA07				1		PA07				1	
PA08	ATU	Auto tuning mode	Each axis	0001h		PA08	ATU	Auto tuning mode	Each axis	0001h	
PA09	RSP	Auto tuning response	Each axis	12		PA09	RSP	Auto tuning response	Each axis	16	
PA10	INP	In-position range	Each axis	100		PA10	INP	In-position range	Each axis	1600	
PA11		This parameter is not used. Do not change the value.		1000.0		PA11		For manufacturer setting		1000.0	
PA12				1000.0		PA12				1000.0	
PA13				0000h		PA13				0000h	
PA14	*POL	Rotation direction selection	Each axis	0		PA14	*POL	Rotation direction selection/travel direction selection	Each axis	0	
PA15	*ENR	Encoder output pulses	Each axis	4000		PA15	*ENR	Encoder output pulses	Each axis	4000	
PA16	*ENR2	Encoder output pulses 2	Each axis	0		PA16	*ENR2	Encoder output pulses 2	Each axis	1	
PA17		This parameter is not used. Do not change the value.		0000h		PA17		For manufacturer setting		0000h	
PA18				0000h		PA18				0000h	
PA19	*BLK	Parameter write inhibit	Each axis	000Bh		PA19	*BLK	Parameter writing inhibit	Each axis	00ABh	
PB01	FILT	Adaptive tuning mode (Adaptive filter II)	Each axis	0000h		PB01	FILT	Adaptive tuning mode (adaptive filter II)	Each axis	0000h	
PB02	VRFT	Vibration suppression control tuning mode (advanced vibration suppression control)	Each axis	0000h		PB02	VRFT	Vibration suppression control tuning mode (advanced vibration suppression control II)	Each axis	0000h	
PB03		This parameter is not used. Do not change the value.		0		PB03	TFBGN	Torque feedback loop gain	Each axis	18000	
PB04	FFC	Feed forward gain	Each axis	0		PB04	FFC	Feed forward gain	Each axis	0	

MR-J3W-_B parameters						MR-J4W2-_B parameters					
No.	Symbol	Parameter name	Setting	Factory setting	Customer setting value	No.	Symbol	Parameter name	Setting	Factory setting	Customer setting value
PB05		This parameter is not used. Do not change the value.		500		PB05		For manufacturer setting		500	
PB06	GD2	Load to motor inertia moment ratio	Each axis	7.0		PB06	GD2	Load to motor inertia ratio/load to motor mass ratio	Each axis	7.00	
PB07	PG1	Model loop gain	Each axis	24		PB07	PG1	Model loop gain	Each axis	15.0	
PB08	PG2	Position loop gain	Each axis	37		PB08	PG2	Position loop gain	Each axis	37.0	
PB09	VG2	Speed loop gain	Each axis	823		PB09	VG2	Speed loop gain	Each axis	823	
PB10	VIC	Speed integral compensation	Each axis	33.7		PB10	VIC	Speed integral compensation	Each axis	33.7	
PB11	VDC	Speed differential compensation	Each axis	980		PB11	VDC	Speed differential compensation	Each axis	980	
PB12		This parameter is not used. Do not change the value.		0		PB12	OVA	Overshoot amount compensation	Each axis	0	
PB13	NH1	Machine resonance suppression filter 1	Each axis	4500		PB13	NH1	Machine resonance suppression filter 1	Each axis	4500	
PB14	NHQ1	Notch shape selection 1	Each axis	0000h		PB14	NHQ1	Notch shape selection 1	Each axis	0000h	
PB15	NH2	Machine resonance suppression filter 2	Each axis	4500		PB15	NH2	Machine resonance suppression filter 2	Each axis	4500	
PB16	NHQ2	Notch shape selection 2	Each axis	0000h		PB16	NHQ2	Notch shape selection 2	Each axis	0000h	
PB17		Automatic setting parameter				PB17	NHF	Shaft resonance suppression filter	Each axis	0000h	
PB18	LPF	Low-pass filter setting	Each axis	3141		PB18	LPF	Low-pass filter setting	Each axis	3141	
PB19	VRF1	Vibration suppression control vibration frequency setting	Each axis	100.0		PB19	VRF11	Vibration suppression control 1 - Vibration frequency	Each axis	100.0	
PB20	VRF2	Vibration suppression control resonance frequency setting	Each axis	100.0		PB20	VRF12	Vibration suppression control 1 - Resonance frequency	Each axis	100.0	
PB21		This parameter is not used. Do not change the value.		0.00		PB21	VRF13	Vibration suppression control 1 - Vibration frequency damping	Each axis	0.00	
PB22				0.00		PB22	VRF14	Vibration suppression control 1 - Resonance frequency damping	Each axis	0.00	
PB23	VFBF	Low-pass filter selection	Each axis	0000h		PB23	VFBF	Low-pass filter selection	Each axis	0000h	
PB24	*MVS	Slight vibration suppression control selection	Each axis	0000h		PB24	∗MVS	Slight vibration suppression control	Each axis	0000h	
PB25		This parameter is not used. Do not change the value.		0000h		PB25	∗BOP1	Function selection B-1	Each axis	0000h	
PB26	*CDP	Gain changing selection	Each axis	0000h		PB26	∗CDP	Gain switching function	Each axis	0000h	
PB27	CDL	Gain changing condition	Each axis	10		PB27	CDL	Gain switching condition	Each axis	10	
PB28	CDT	Gain changing time constant	Each axis	1		PB28	CDT	Gain switching time constant	Each axis	1	
PB29	GD2B	Gain changing load to motor inertia moment ratio	Each axis	7.0		PB29	GD2B	Load to motor inertia ratio/load to motor mass ratio after gain switching	Each axis	7.00	
PB30	PG2B	Gain changing position loop gain	Each axis	37		PB30	PG2B	Position loop gain after gain switching	Each axis	0.0	
PB31	VG2B	Gain changing speed loop gain	Each axis	823		PB31	VG2B	Speed loop gain after gain switching	Each axis	0	
PB32	VICB	Gain changing speed integral compensation	Each axis	33.7		PB32	VICB	Speed integral compensation after gain switching	Each axis	0.0	

MR-J3W-_B parameters						MR-J4W2-_B parameters					
No.	Symbol	Parameter name	Setting	Factory setting	Customer setting value	No.	Symbol	Parameter name	Setting	Factory setting	Customer setting value
PB33	VRF1B	Gain changing vibration suppression control vibration frequency setting	Each axis	100.0		PB33	VRF11B	Vibration suppression control 1 - Vibration frequency after gain switching	Each axis	0.0	
PB34	VRF2B	Gain changing vibration suppression control resonance frequency setting	Each axis	100.0		PB34	VRF12B	Vibration suppression control 1 - Resonance frequency after gain switching	Each axis	0.0	
PB35		This parameter is not used. Do not change the value.		0.00		PB35	VRF13B	Vibration suppression control 1 - Resonance frequency after gain switching	Each axis	0.0	
PB36				0.00		PB36	VRF14B	Vibration suppression control 1 - Vibration frequency damping after gain switching	Each axis	0.0	
PB37				100		PB37		For manufacturer setting		1600	
PB38				0.0		PB38				0.00	
PB39				0.0		PB39				0.00	
PB40				0.0		PB40				0.00	
PB41				1125		PB41				0	
PB42				1125		PB42				0	
PB43				0004h		PB43				0000h	
PB44				0.0		PB44				0.00	
PB45				0000h		PB45	CNHF	Command notch filter	Each axis	0000h	
PC01	ERZ	Error excessive alarm level	Each axis	0		PC01	ERZ	Error excessive alarm level	Each axis	0	
PC02	MBR	Electromagnetic brake sequence output	Each axis	0		PC02	MBR	Electromagnetic brake sequence output	Each axis	0	
PC03	*ENRS	Encoder output pulses selection	Each axis	0010h		PC03	*ENRS	Encoder output pulse selection	Each axis	0000h	
PC04	**COP1	Function selection C-1	Each axis	0000h		PC04	**COP1	Function selection C-1	Each axis	0000h	
PC05	**COP2	Function selection C-2	Each axis	0000h		PC05	**COP2	Function selection C-2	Each axis	0000h	
PC06	*COP3	Function selection C-3	Each axis	0000h		PC06	*COP3	Function selection C-3	Each axis	0000h	
PC07	ZSP	Zero speed	Each axis	50		PC07	ZSP	Zero speed	Each axis	50	
PC08		This parameter is not used. Do not change the value.		0		PC08	OSL	Overspeed alarm detection level	Each axis	0	
PC09	MOD1	Analog monitor 1 output	Common	0000h		PC09	MOD1	Analog monitor 1 output	Common	0000h	
PC10	MOD2	Analog monitor 2 output	Common	0001h		PC10	MOD2	Analog monitor 2 output	Common	0001h	
PC11	MO1	Analog monitor 1 offset	Common	0		PC11	MO1	Analog monitor 1 offset	Common	0	
PC12	MO2	Analog monitor 2 offset	Common	0		PC12	MO2	Analog monitor 2 offset	Common	0	
PC13		This parameter is not used. Do not change the value.		0		PC13	MOSDL	Analog monitor - Feedback position output standard data - Low	Each axis	0	
PC14				0		PC14	MOSDH	Analog monitor - Feedback position output standard data - High	Each axis	0	
PC15	SNO	Station number selection	Common	0		PC15		For manufacturer setting		0	
PC16		This parameter is not used. Do not change the value.		0000h		PC16				0000h	
PC17	**COP4	Function selection C-4	Each axis	0000h		PC17	**COP4	Function selection C-4	Each axis	0000h	
PC18		This parameter is not used. Do not change the value.		0000h		PC18	*COP5	Function selection C-5	Common	0000h	
PC19				0000h		PC19		For manufacturer setting		0000h	
PC20				0000h		PC20	*COP7	Function selection C-7	Common	0000h	
PC21	*BPS	Alarm history clear	Each axis	0000h		PC21	*BPS	Alarm history clear	Each axis	0000h	

MR-J3W-_B parameters						MR-J4W2-_B parameters					
No.	Symbol	Parameter name	Setting	Factory setting	Customer setting value	No.	Symbol	Parameter name	Setting	Factory setting	Customer setting value
PC22		This parameter is not used. Do not change the value.		0000h		PC22		For manufacturer setting		0	
PC23				0000h		PC23				0000h	
PC24				0000h		PC24	RSBR	Forced stop deceleration time constant	Each axis	100	
PC25				0000h		PC25		For manufacturer setting		0	
PC26				0000h		PC26				0000h	
PC27				0000h		PC27	**COP9	Function selection C-9	Each axis	0000h	
PC28				0000h		PC28		For manufacturer setting		0000h	
PC29				0000h		PC29	*COPB	Function selection C-B	Each axis	0000h	
PC30				0000h		PC30		For manufacturer setting		0	
PC31				0000h		PC31	RSUP1	Vertical axis freefall prevention compensation amount	Each axis	0	
PC32				0000h		PC32		For manufacturer setting		0000h	
PD01				0000h		PD01		For manufacturer setting		0000h	
PD02				0000h		PD02	*DIA2	Input signal automatic on selection 2	Each axis	0000h	
PD03				0020h		PD03		For manufacturer setting		0020h	
PD04				0021h		PD04				0021h	
PD05				0022h		PD05				0022h	
PD06				0000h		PD06				0000h	
PD07	*D01	Output signal device selection 1 (CN3-12 for A-axis and CN3-25 for B-axis)	Each axis	0005h		PD07	*DO1	Output device selection 1	Each axis	0005h	
PD08		This parameter is not used. Do not change the value.		0004h		PD08	*DO2	Output device selection 2	Common	0004h	
PD09	*D03	Output signal device selection 3 (CN3-11 for A-axis and CN3-24 for B-axis)	Each axis	0003h		PD09	*DO3	Output device selection 3	Common	0003h	
PD10		This parameter is not used. Do not change the value.		0000h		PD10		For manufacturer setting		0000h	
PD11				0004h		PD11	*DIF	Input filter setting (Note)	Common	0004h	
PD12				0000h		PD12	*DOP1	Function selection D-1	Each axis	0000h	
PD13				0000h		PD13		For manufacturer setting		0000h	
PD14	*DOP3	Function selection D-3	Each axis	0000h		PD14	*DOP3	Function selection D-3	Each axis	0000h	
PD15		This parameter is not used. Do not change the value.		0000h		PD15		For manufacturer setting		0000h	
PD16				0000h		PD16				0000h	
PD17				0000h		PD17				0000h	
PD18				0000h		PD18				0000h	
PD19				0000h		PD19				0000h	
PD20				0		PD20				0	
PD21				0		PD21				0	
PD22				0		PD22				0	
PD23				0		PD23				0	
PD24				0000h		PD24				0000h	
PD25				0000h		PD25				0000h	
PD26				0000h		PD26				0000h	
PD27				0000h		PD27				0000h	
PD28				0000h		PD28				0000h	
PD29				0000h		PD29				0000h	
PD30				0000h		PD30				0	
PD31				0000h		PD31				0	
PD32				0000h		PD32				0	

Note. Refer to the servo system controller instruction manual for the setting.

3.7.3 Comparison of parameter details

POINT

●"x" in the "Setting digit" columns means which digit to set a value.

MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PA01	Control mode Turn off the power and then on again after setting the parameter to validate the parameter value. Select the control mode. This parameter is set as "_ _ 0_" in the initial setting. 0 0 x 0: Control mode selection 0: Rotary servo motor	0000h	PA01	Operation mode Select an operation mode. _ _ _ x: For manufacturer setting	0h
				_ _ x _: Operation mode selection 0: Standard control mode Setting other than above will result in [AL. 37 Parameter error]. For MR-J4W2-0303B6 servo amplifiers, this digit cannot be used other than the initial value.	0h
				_ x _ _ For manufacturer setting	0h
				x _ _ _ Compatibility mode selection To change this digit, use an application software "MR-J4(W)-B mode selection". When you change it without the application, [AL. 3E Operation mode error] will occur. Set the digit as common setting. 0: J3 compatibility mode 1: J4 mode	1h
PA02	Regenerative option Turn off the power and then on again after setting the parameter to validate the parameter value. Wrong setting may cause the regenerative option to burn. If the regenerative option selected is not for use with the servo amplifier, [AL. 37 Parameter error] occurs. The MR-RB3B can be used with the servo amplifier whose software version is B3 or later. Set this parameter when using the regenerative option. For MR-J4W2-0303BN6 servo amplifiers, this digit cannot be used other than the initial value. _ _ x x: Selection of regenerative option 00: Regenerative option is not used (built-in regenerative resistor is used) 0D: MR-RB14 0E: MR-RB34 10: MR-RB3B	0000h	PA02	Regenerative option Select a regenerative option. Incorrect setting may cause the regenerative option to burn. If a selected regenerative option is not for use with the servo amplifier, [AL. 37 Parameter error] occurs. For MR-J4W2-0303B6 servo amplifiers, this digit cannot be used other than the initial value. _ _ x x: Regenerative option selection 00: Regenerative option is not used. (Built-in regenerative resistor is used.) 0B: MR-RB3N 0D: MR-RB14 0E: MR-RB34	00h
				_ x _ _ For manufacturer setting	0h
				x _ _ _ For manufacturer setting	0h
PA03	Absolute position detection system Turn off the power and then on again, or reset the controller after setting the parameter to validate the parameter value. This parameter cannot be used in the speed control mode. Set this parameter when using the absolute position detection system in the position control mode. 0 0 0 x: Selection of absolute position detection system 0: Used in incremental system 1: Used in absolute position detection system	0000h	PA03	Absolute position detection system Set this parameter when using the absolute position detection system. The parameter is not available in the speed control mode and torque control mode.	
				_ _ _ x: Absolute position detection system selection 0: Disabled (used in incremental system) 1: Enabled (used in absolute position detection system)	0h
				_ _ x _: For manufacturer setting	0h
				_ x _ _: For manufacturer setting	0h
				x _ _ _: For manufacturer setting	0h

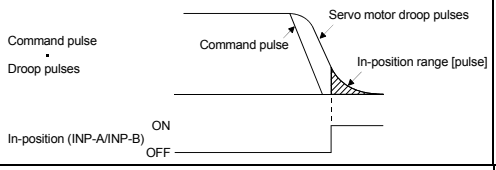
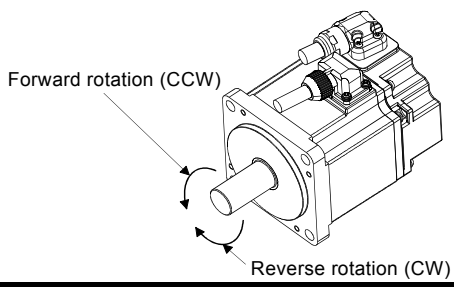
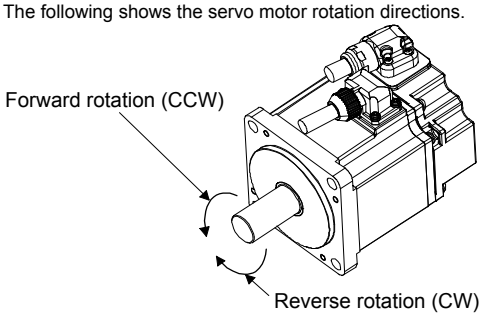
<table>
<tr><th colspan="3">MR-J3W-_B</th><th colspan="3">MR-J4W2-_B</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PA04</td><td>Function selection A-1
Turn off the power and then on again, or reset the controller after setting the
parameter to validate the parameter value.
The servo forced stop function is avoidable.

0 x 0 0:
Selection of servo forced stop
0: Valid (Forced stop (EM1) is used.)
1: Invalid (Forced stop (EM1) is not used.)

When not using the forced stop (EM1) of servo amplifier, set the selection of servo forced stop to Invalid (_ 1 _ _) . At this time, the forced stop (EM1) automatically turns on inside the servo amplifier.</td><td>0000h</td><td>PA04</td><td>Function selection A-1
Select a forced stop input and forced stop deceleration function.</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ _ x:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
Servo forced stop selection
0: Enabled (The forced stop input EM2 or EM1 is used.)
1: Disabled (The forced stop input EM2 and EM1 are not used.)
Refer to table 4.1 for details.</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
Forced stop deceleration function selection
0: Forced stop deceleration function disabled (EM1)
2: Forced stop deceleration function enabled (EM2)
Refer to table 4.1 for details.</td><td>2h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Table 4.1 Deceleration method
<table><tr><th rowspan="2">Setting value</th><th rowspan="2">EM2/EM1</th><th colspan="2">Deceleration method</th></tr><tr><th>EM2 or EM1 is off</th><th>Alarm occurred</th></tr><tr><td>0 0 _ _</td><td>EM1</td><td>MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.</td><td>MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.</td></tr><tr><td>2 0 _ _</td><td>EM2</td><td>MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.</td><td>MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.</td></tr><tr><td>0 1 _ _</td><td>Not using EM2 and EM1</td><td></td><td>MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.</td></tr><tr><td>2 1 _ _</td><td>Not using EM2 and EM1</td><td></td><td>MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.</td></tr></table></td><td></td></tr>
<tr><td>PA08</td><td>Auto tuning mode
This parameter cannot be used in the torque control mode.
Make gain adjustment using auto tuning.
Auto tuning mode ([Pr. PA08])
Select the gain adjustment mode.

0 0 0 x:
Gain adjustment mode setting
0: Interpolation mode (Automatically set parameter No. PB06/PB08/PB09/PB10])
1: Auto tuning mode 1 (Automatically set parameter No. [Pr. PB06/ PB07/PB08/PB09/PB10])
2: Auto tuning mode 2 (Automatically set parameter No. [Pr. PB07/ PB08/PB09/PB10])
3: Manual mode

The parameters have the following names.
<table><tr><th>Parameter No.</th><th>Name</th></tr><tr><td>PB06</td><td>Load to motor inertia moment ratio</td></tr><tr><td>PB07</td><td>Model loop gain</td></tr><tr><td>PB08</td><td>Position loop gain</td></tr><tr><td>PB09</td><td>Speed loop gain</td></tr><tr><td>PB10</td><td>Speed integral compensation</td></tr></table></td><td>0001h</td><td>PA08</td><td>Auto tuning mode
Select a gain adjustment mode.</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ _ x:
Gain adjustment mode selection
0: 2 gain adjustment mode 1 (interpolation mode)
1: Auto tuning mode 1
2: Auto tuning mode 2
3: Manual mode
4: 2 gain adjustment mode 2
Refer to table 4.2 for details.
Table 4.2 Gain adjustment mode selection
<table><tr><th>Setting value</th><th>Gain adjustment mode</th><th>Automatically adjusted parameter</th></tr><tr><td>_ _ _ 0</td><td>2 gain adjustment mode 1 (interpolation mode)</td><td>[Pr. PB06 Load to motor inertia ratio/load to motor mass ratio]
[Pr. PB08 Position loop gain]
[Pr. PB09 Speed loop gain]
[Pr. PB10 Speed integral compensation]</td></tr><tr><td>_ _ _ 1</td><td>Auto tuning mode 1</td><td>[Pr. PB06 Load to motor inertia ratio/load to motor mass ratio]
[Pr. PB07 Model loop gain]
[Pr. PB08 Position loop gain]
[Pr. PB09 Speed loop gain]
[Pr. PB10 Speed integral compensation]</td></tr><tr><td>_ _ _ 2</td><td>Auto tuning mode 2</td><td>[Pr. PB07 Model loop gain]
[Pr. PB08 Position loop gain]
[Pr. PB09 Speed loop gain]
[Pr. PB10 Speed integral compensation]</td></tr><tr><td>_ _ _ 3</td><td>Manual mode</td><td></td></tr><tr><td>_ _ _ 4</td><td>2 gain adjustment mode 2</td><td>[Pr. PB08 Position loop gain]
[Pr. PB09 Speed loop gain]
[Pr. PB10 Speed integral compensation]</td></tr></table></td><td>1h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3W-_B</th><th colspan="3">MR-J4W2-_B</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PA09</td><td>Auto tuning response
If the machine hunts or generates large gear sound, decrease the set value. To improve performance, e.g. shorten the settling time, increase the set value.
<table><tr><th>Setting value</th><th>Response</th><th>Guideline for machine resonance frequency [Hz]</th></tr><tr><td>1</td><td>Low response</td><td>10.0</td></tr><tr><td>2</td><td rowspan="15">↑
↓</td><td>11.3</td></tr><tr><td>3</td><td>12.7</td></tr><tr><td>4</td><td>14.3</td></tr><tr><td>5</td><td>16.1</td></tr><tr><td>6</td><td>18.1</td></tr><tr><td>7</td><td>20.4</td></tr><tr><td>8</td><td>23.0</td></tr><tr><td>9</td><td>25.9</td></tr><tr><td>10</td><td>29.2</td></tr><tr><td>11</td><td>32.9</td></tr><tr><td>12</td><td>37.0</td></tr><tr><td>13</td><td>41.7</td></tr><tr><td>14</td><td>47.0</td></tr><tr><td>15</td><td>52.9</td></tr><tr><td>16</td><td>Middle response</td><td>59.6</td></tr></table><table><tr><th>Setting value</th><th>Response</th><th>Guideline for machine resonance frequency [Hz]</th></tr><tr><td>17</td><td>Middle response</td><td>67.1</td></tr><tr><td>18</td><td rowspan="15">↑
↓</td><td>75.6</td></tr><tr><td>19</td><td>85.2</td></tr><tr><td>20</td><td>95.9</td></tr><tr><td>21</td><td>108.0</td></tr><tr><td>22</td><td>121.7</td></tr><tr><td>23</td><td>137.1</td></tr><tr><td>24</td><td>154.4</td></tr><tr><td>25</td><td>173.9</td></tr><tr><td>26</td><td>195.9</td></tr><tr><td>27</td><td>220.6</td></tr><tr><td>28</td><td>248.5</td></tr><tr><td>29</td><td>279.9</td></tr><tr><td>30</td><td>315.3</td></tr><tr><td>31</td><td>355.1</td></tr><tr><td>32</td><td>High response</td><td>400.0</td></tr></table></td><td>12</td><td>PA09</td><td>Auto tuning response
Set a response of the auto tuning.
<table><tr><th rowspan="2">Setting value</th><th colspan="2">Machine characteristic</th></tr><tr><th>Response</th><th>Guideline for machine resonance frequency [Hz]</th></tr><tr><td>1</td><td>Low response</td><td>2.7</td></tr><tr><td>2</td><td rowspan="19">↑
↓</td><td>3.6</td></tr><tr><td>3</td><td>4.9</td></tr><tr><td>4</td><td>6.6</td></tr><tr><td>5</td><td>10.0</td></tr><tr><td>6</td><td>11.3</td></tr><tr><td>7</td><td>12.7</td></tr><tr><td>8</td><td>14.3</td></tr><tr><td>9</td><td>16.1</td></tr><tr><td>10</td><td>18.1</td></tr><tr><td>11</td><td>20.4</td></tr><tr><td>12</td><td>23.0</td></tr><tr><td>13</td><td>25.9</td></tr><tr><td>14</td><td>29.2</td></tr><tr><td>15</td><td>32.9</td></tr><tr><td>16</td><td>37.0</td></tr><tr><td>17</td><td>41.7</td></tr><tr><td>18</td><td>47.0</td></tr><tr><td>19</td><td>52.9</td></tr><tr><td>20</td><td>Middle response</td><td>59.6</td></tr></table><table><tr><th rowspan="2">Setting value</th><th colspan="2">Machine characteristic</th></tr><tr><th>Respozns e</th><th>Guideline for machine resonance frequency [Hz]</th></tr><tr><td>21</td><td>Middle response</td><td>67.1</td></tr><tr><td>22</td><td rowspan="19">↑
↓</td><td>75.6</td></tr><tr><td>23</td><td>85.2</td></tr><tr><td>24</td><td>95.9</td></tr><tr><td>25</td><td>108.0</td></tr><tr><td>26</td><td>121.7</td></tr><tr><td>27</td><td>137.1</td></tr><tr><td>28</td><td>154.4</td></tr><tr><td>29</td><td>173.9</td></tr><tr><td>30</td><td>195.9</td></tr><tr><td>31</td><td>220.6</td></tr><tr><td>32</td><td>248.5</td></tr><tr><td>33</td><td>279.9</td></tr><tr><td>34</td><td>315.3</td></tr><tr><td>35</td><td>355.1</td></tr><tr><td>36</td><td>400.0</td></tr><tr><td>37</td><td>446.6</td></tr><tr><td>38</td><td>501.2</td></tr><tr><td>39</td><td>571.5</td></tr><tr><td>40</td><td>High response</td><td>642.7</td></tr></table></td><td>16</td></tr>
<tr><td>PA10</td><td>In-position range
This parameter cannot be used in the speed control mode and the torque control mode.
Set the range, where in-position (INP-A/INP-B) is output, in the command pulse unit.
  </td><td>100</td><td>PA10</td><td>In-position range
Set an in-position range per command pulse.</td><td>1600</td></tr>
<tr><td>PA14</td><td>Rotation direction selection
Turn off the power and then on again, or reset the controller after setting the parameter to validate the parameter value.
Select servo motor rotation direction relative.
<table><tr><th rowspan="2">[Pr. PA14] setting</th><th colspan="2">Servo motor rotation direction (Note)</th></tr><tr><th>When positioning address increases (Position control)
Command speed in the positive direction (Speed control)
Command torque in the positive direction (Torque control)</th><th>When positioning address decreases (Position control)
Command speed in the negative direction (Speed control)
Command torque in the negative direction (Torque control)</th></tr><tr><td>0</td><td>CCW</td><td>CW</td></tr><tr><td>1</td><td>CW</td><td>CCW</td></tr></table>Note. Torque generation direction for the torque control
  </td><td>0</td><td>PA14</td><td>Rotation direction selection/travel direction selection
Select a rotation direction or travel direction.
<table><tr><th rowspan="2">Setting value</th><th colspan="2">Servo motor rotation direction</th></tr><tr><th>Positioning address increase</th><th>Positioning address decrease</th></tr><tr><td>0</td><td>CCW or positive direction</td><td>CW or negative direction</td></tr><tr><td>1</td><td>CW or negative direction</td><td>CCW or positive direction</td></tr></table>The following shows the servo motor rotation directions.
  </td><td>0</td></tr>
</table>

MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PA15	Encoder output pulses Encoder output pulses 2 Turn off the power and then on again, or reset the controller after setting the parameter to validate the parameter value. Used to set the encoder pulses (A/B-phase) output by the servo amplifier. Set the value 4 times greater than the A-phase or B-phase pulses. You can use [Pr. PC03] to choose the output pulse setting or output division ratio setting. The number of A/B-phase pulses actually output is 1/4 times greater than the preset number of pulses. The maximum output frequency is 4.6 Mpulses/s (after multiplication by 4). Use this parameter within this range. (1) For output pulse designation Set "_ _ 0_" in [Pr. PC03]. Set the number of pulses per servo motor revolution. Output pulse = set value [pulse/rev] For instance, set "5600" to [Pr. PA15], the actually output A/B-phase pulses are as indicated below. $\text{A/B-phase output pulses} = \frac{5600}{4} = 1400$ [pulse] (2) For output division ratio setting Set "_ _ 1_" in [Pr. PC03]. The number of pulses per servo motor revolution is divided by the set value. $\text{Output pulse} = \frac{\text{Resolution per servo motor revolution}}{\text{Set value}}$ [pulses/rev] For instance, set "8" to [Pr. PA15], the actually output A/B-phase pulses are as indicated below. $\text{A/B-phase output pulses} = \frac{262144}{8} \cdot \frac{1}{4} = 8192$ [pulse]	4000	PA15	Encoder output pulses Set the encoder output pulses from the servo amplifier by using the number of output pulses per revolution, dividing ratio, or electronic gear ratio. (after multiplication by 4) Set a numerator of the electronic gear, for when selecting "A-phase/B-phase pulse electronic gear setting (_ _ 3 _)" of "Encoder output pulse setting selection" in [Pr. PC03]. The maximum output frequency is 4.6 Mpulses/s. Set the parameter within this range.	4000
PA16	(3) A/B-phase pulse electronic gear setting This parameter is made valid when [Pr. PC03] is set to "_ _ 3_". Set the encoder pulses (A/B-phase) output by the servo amplifier. Set the encoder pulses output by the servo amplifier by [Pr. PA15] and [Pr. PA16]. Travel distance [pulse] of the linear encoder is multiplied by the set value. $\text{Output pulse} = \text{Travel distance of linear encoder} \times \frac{\text{[Pr. PA15]}}{\text{[Pr. PA16]}}$ [pulse] The number of A/B-phase pulses actually output is 1/4 times greater than the preset number of pulses. Also, the maximum output frequency is 4.6 Mpulses/s (after multiplication by 4). Use this parameter within the range. When the set value is "0 (factory setting)", it is internally treated as "1".	0	PA16	Encoder output pulses 2 Set a denominator of the electronic gear for the A/B-phase pulse output. Set a denominator of the electronic gear, for when selecting "A-phase/B-phase pulse electronic gear setting (_ _ 3 _)" of "Encoder output pulse setting selection" in [Pr. PC03].	1

<table>
<tr><th colspan="3">MR-J3W-_B</th><th colspan="3">MR-J4W2-_B</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PA19</td><td>Parameter write inhibit
Turn off the power and then on again, or reset the controller after setting the parameter to validate the parameter value. In the factory setting, this servo amplifier allows changes to the basic setting parameter, gain/filter parameter and extension setting parameter settings. With the setting of [Pr. PA19], write can be disabled to prevent accidental changes.
The following table indicates the parameters which are enabled for reference and write by the setting of [Pr. PA19]. Operation can be performed for the parameters marked ○.
<table>
<tr><th>[Pr. PA19] setting</th><th>Setting operation</th><th>Basic setting [Pr. PA _ _]</th><th>Gain/filter [Pr. PB_ _]</th><th>Extension setting [Pr. PC_ _]</th><th>I/O setting [Pr. PD_ _]</th><th>Special setting [Pr. PS_ _] (Note)</th><th>Option setting [Pr. Po_ _]</th></tr>
<tr><td rowspan="2">0000h</td><td>Reference</td><td>○</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Write</td><td>○</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">000Bh (factory setting)</td><td>Reference</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td>Write</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">000Ch</td><td>Reference</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td></td></tr>
<tr><td>Write</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td></td></tr>
<tr><td rowspan="2">000Dh</td><td>Reference</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td>Write</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td rowspan="2">000Eh</td><td>Reference</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>Write</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td rowspan="2">100Bh</td><td>Reference</td><td>○</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Write</td><td>[Pr. PA19] only</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">100Ch</td><td>Reference</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td></td></tr>
<tr><td>Write</td><td>[Pr. PA19] only</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">100Dh</td><td>Reference</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td>Write</td><td>[Pr. PA19] only</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">100Eh</td><td>Reference</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>Write</td><td>[Pr. PA19] only</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
Note. Do not use this parameter when using a rotary servo motor.</td><td>000Bh</td><td>PA19</td><td>Parameter writing inhibit
Select a reference range and writing range of the parameter.
Refer to the following table for settings.
Setting parameters ([Pr. PL_ _]) cannot be used with MR-J4W2-0303B6 servo amplifiers.
[Pr. PA19] setting value and reading/writing range
<table>
<tr><th>PA19</th><th>Setting operation</th><th>PA</th><th>PB</th><th>PC</th><th>PD</th><th>PE</th><th>PF</th><th>PL</th></tr>
<tr><td rowspan="2">Other than below</td><td>Reading</td><td>○</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>○</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">000Ah</td><td>Reading</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">000Bh</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">000Ch</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">000Fh</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td>○</td></tr>
<tr><td>Writing</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td>○</td></tr>
<tr><td rowspan="2">00AAh</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td>Writing</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td rowspan="2">00ABh (initial value)</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>Writing</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td rowspan="2">100Bh</td><td>Reading</td><td>○</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">100Ch</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td></td><td></td></tr>
<tr><td>Writing</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">100Fh</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td><td>○</td></tr>
<tr><td>Writing</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">10AAh</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td></td></tr>
<tr><td>Writing</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">10ABh</td><td>Reading</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td><td>○</td></tr>
<tr><td>Writing</td><td>Only 19</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td><td>00ABh</td></tr>
<tr><td>PB01</td><td>Adaptive tuning mode (Adaptive filter II)
Used to set the mode for the machine resonance suppression filter 1.
0 0 0 x:
Filter tuning mode
0: Invalid
1: Cannot be set
2: Manual setting
If "_ _ _ 1" is set for this parameter, it is automatically rewritten as "_ _ _0"</td><td>0000h</td><td>PB01</td><td>Adaptive tuning mode (adaptive filter II)
Set the adaptive tuning.
All axes cannot be simultaneously enabled for this function. Set for each axis to use.</td><td></td></tr>
<tr><td></td><td></td><td></td><td>_ _ _ x:
Filter tuning mode selection
Select the adjustment mode of the machine resonance suppression filter 1.
0: Disabled
1: Automatic setting
2: Manual setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td>_ _ x _:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td>x _ _ _:
Tuning accuracy selection
0: Standard
1: High accuracy
The frequency is estimated more accurately in the high accuracy mode compared to the standard mode. However, the tuning sound may be larger in the high accuracy mode.
This digit is available with servo amplifier with software version C5 or later.</td><td>0h</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3W-_B</th><th colspan="3">MR-J4W2-_B</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB02</td><td>Vibration suppression control tuning mode (advanced vibration suppression control)
Used to set the tuning mode for the vibration suppression control.
0 0 0 x:
Vibration suppression control tuning mode
0: Invalid
1: Cannot be set
2: Manual setting
If "_ _ _ 1" is set for this parameter, it is automatically rewritten as "_ _ _0".</td><td>0000h</td><td>PB02</td><td>Vibration suppression control tuning mode (advanced vibration suppression control II)
This is used to set the vibration suppression control tuning.
All axes cannot be simultaneously enabled for this function. Set for each axis to use.</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ _ x:
Vibration suppression control 1 tuning mode selection
Select the tuning mode of the vibration suppression control 1.
0: Disabled
1: Automatic setting
2: Manual setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _ :
Vibration suppression control 2 tuning mode selection
Select the tuning mode of the vibration suppression control 2. To enable the digit, select "3 inertia mode (_ _ _ 1)" of "Vibration suppression mode selection" in [Pr. PA24 Function selection A-4].
0: Disabled
1: Automatic setting
2: Manual setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td>PB03</td><td>This parameter is not used. Do not change the value.</td><td>0</td><td>PB03</td><td>Torque feedback loop gain
Set a torque feedback loop gain in the continuous operation to torque control mode.
Decreasing the setting value will also decrease a collision load during continuous operation to torque control mode.
Setting a value less than 6 rad/s will be 6 rad/s.</td><td>18000</td></tr>
<tr><td>PB04</td><td>Feed forward gain
This parameter cannot be used in the speed control mode.
Set the feed forward gain. When the setting is 100%, the droop pulses during operation at constant speed are nearly zero. However, sudden acceleration/deceleration will increase the overshoot. As a guideline, when the feed forward gain setting is 100%, set 1s or more as the acceleration time constant up to the rated speed.</td><td>0</td><td>PB04</td><td>Feed forward gain
Set the feed forward gain.
When the setting is 100%, the droop pulses during operation at constant speed are nearly zero. However, sudden acceleration/deceleration will increase the overshoot. As a guideline, when the feed forward gain setting is 100%, set 1 s or more as the acceleration time constant up to the rated speed.</td><td>0</td></tr>
<tr><td>PB06</td><td>Load to motor inertia moment ratio
Used to set the ratio of the load inertia moment to the servo motor shaft inertia moment. When auto tuning mode 1 and interpolation mode is selected, the result of auto tuning is automatically used.
In this case, it varies between 0 and 100.0.
When [Pr. PA08] is set to "_ _ _ 2" or "_ _ _ 3" , this parameter can be set manually.</td><td>7.0</td><td>PB06</td><td>Load to motor inertia ratio/load to motor mass ratio
Set a load to motor inertia ratio or load to motor mass ratio. Setting a value considerably different from the actual load moment of inertia or load mass may cause an unexpected operation such as an overshoot.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the following table for details. When the parameter is automatic setting, the value will vary between 0.00 and 100.00.
<table><tr><th>Pr. PA08</th><th>This parameter</th></tr><tr><td>_ _ _ 0 (2 gain adjustment mode 1 (interpolation mode))</td><td rowspan="2">Automatic setting</td></tr><tr><td>_ _ _ 1 (Auto tuning mode 1)</td></tr><tr><td>_ _ _ 2 (Auto tuning mode 2)</td><td rowspan="3">Manual setting</td></tr><tr><td>_ _ _ 3 (Manual mode)</td></tr><tr><td>_ _ _ 4 (2 gain adjustment mode 2)</td></tr></table></td><td>7.00</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3W-_B</th><th colspan="3">MR-J4W2-_B</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB07</td><td>Model loop gain
Set the response gain up to the target position.
Increase the gain to improve track ability in response to the command.
When auto turning mode 1, 2 is selected, the result of auto turning is automatically used.
When [Pr. PA08] is set to "_ _ _ 0" or "_ _ _ 3" , this parameter can be set manually.</td><td>24</td><td>PB07</td><td>Model loop gain
Set the response gain up to the target position.
Increasing the setting value will also increase the response level to the position command but will be liable to generate vibration and noise.
For the vibration suppression control tuning mode, the setting range of [Pr. PB07] is limited. Refer to "MR-J4W2-_B servo amplifier instruction manual" for details.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the following table for details.<table><tr><th>Pr. PA08</th><th>This parameter</th></tr><tr><td>_ _ _ 0 (2 gain adjustment mode 1 (interpolation mode))</td><td>Manual setting</td></tr><tr><td>_ _ _ 1 (Auto tuning mode 1)</td><td rowspan="2">Automatic setting</td></tr><tr><td>_ _ _ 2 (Auto tuning mode 2)</td></tr><tr><td>_ _ _ 3 (Manual mode)</td><td rowspan="2">Manual setting</td></tr><tr><td>_ _ _ 4 (2 gain adjustment mode 2)</td></tr></table></td><td>15.0</td></tr>
<tr><td>PB08</td><td>Position loop gain
This parameter cannot be used in the speed control mode.
Used to set the gain of the position loop.
Set this parameter to increase the position response to level load disturbance. Higher setting increases the response level but is liable to generate vibration and/or noise.
When auto tuning mode 1, 2 and interpolation mode is selected, the result of auto tuning is automatically used.
When [Pr. PA08] is set to " _ _ _ 3", this parameter can be set manually.</td><td>37</td><td>PB08</td><td>Position loop gain
Set a gain of the position loop.
Set this parameter to increase the position response to level load disturbance.
Increasing the setting value will also increase the response level to the load disturbance but will be liable to generate vibration and noise.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the following table for details.<table><tr><th>Pr. PA08</th><th>This parameter</th></tr><tr><td>_ _ _ 0 (2 gain adjustment mode 1 (interpolation mode))</td><td rowspan="3">Automatic setting</td></tr><tr><td>_ _ _ 1 (Auto tuning mode 1)</td></tr><tr><td>_ _ _ 2 (Auto tuning mode 2)</td></tr><tr><td>_ _ _ 3 (Manual mode)</td><td>Manual setting</td></tr><tr><td>_ _ _ 4 (2 gain adjustment mode 2)</td><td>Automatic setting</td></tr></table></td><td>37.0</td></tr>
<tr><td>PB09</td><td>Speed loop gain
Set this parameter when vibration occurs on machines of low rigidity or large backlash.
Higher setting increases the response level but is liable to generate vibration and/or noise.
When auto tuning mode 1, 2 and interpolation mode is selected, the result of auto tuning is automatically used.
When [Pr. PA08] is set to " _ _ _ 3", this parameter can be set manually.</td><td>823</td><td>PB09</td><td>Speed loop gain
Set a gain of the speed loop.
Set this parameter when vibration occurs on machines of low rigidity or large backlash. Increasing the setting value will also increase the response level but will be liable to generate vibration and noise.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the table of [Pr. PB08] for details.</td><td>823</td></tr>
<tr><td>PB10</td><td>Speed integral compensation
Used to set the integral time constant of the speed loop.
Lower setting increases the response level but is liable to generate vibration and/or noise.
When auto tuning mode 1, 2 and interpolation mode is selected, the result of auto tuning is automatically used.
When [Pr. PA08] is set to " _ _ _ 3", this parameter can be set manually.</td><td>33.7</td><td>PB10</td><td>Speed integral compensation
Set an integral time constant of the speed loop.
Decreasing the setting value will increase the response level but will be liable to generate vibration and noise.
The setting of the parameter will be the automatic setting or manual setting depending on the [Pr. PA08] setting. Refer to the table of [Pr. PB08] for details.</td><td>33.7</td></tr>
<tr><td>PB11</td><td>Speed differential compensation
Used to set the differential compensation.
When [Pr. PB24] is set to "_ _ 3_" , this parameter is made valid. When [Pr. PB24] is set to "_ _ 0_", this parameter is made valid by instructions of controller.</td><td>980</td><td>PB11</td><td>Speed differential compensation
Set a differential compensation.
To enable the parameter, select "Continuous PID control enabled (_ _ 3 _)" of "PI-PID switching control selection" in [Pr. PB24].</td><td>980</td></tr>
</table>

MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB12	This parameter is not used. Do not change the value.		PB12	Overshoot amount compensation Set a viscous friction torque or thrust to rated torque in percentage unit at servo motor rated speed. When the response level is low or when the torque/thrust is limited, the efficiency of the parameter may be lower.	0
PB13	Machine resonance suppression filter 1 Set the notch frequency of the machine resonance suppression filter 1. When the [Pr. PB01] setting is "_ _ _ 0" , the setting of this parameter is ignored. If a value exceeding "3000" is set for this parameter, it is automatically rewritten as "3000".	4500	PB13	Machine resonance suppression filter 1 Set the notch frequency of the machine resonance suppression filter 1. When "Filter tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB01], this parameter will be adjusted automatically by adaptive tuning. When "Filter tuning mode selection" is set to "Manual setting (_ _ _ 2)" in [Pr. PB01], the setting value will be enabled.	4500
PB14	Notch shape selection 1 Select the shape of the machine resonance suppression filter 1. 0 _ x 0: Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0000h	PB14	Notch shape selection 1 Set the shape of the machine resonance suppression filter 1. When "Filter tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB01], this parameter will be adjusted automatically by adaptive tuning. To enable the setting value, select the manual setting.	
				_ _ _ x: For manufacturer setting	0h
	0 x _ 0: Notch width 0: α = 2 1: α = 3 2: α = 4 3: α = 5 When the [Pr. PB01] setting is "_ _ _ 0" , the setting of this parameter is ignored.			_ _ x _ : Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h
				_ x _ _ : Notch width selection 0: α = 2 1: α = 3 2: α = 4 3: α = 5	0h
				x _ _ _ : For manufacturer setting	0h
PB15	Machine resonance suppression filter 2 Set the notch frequency of the machine resonance suppression filter 2. Set [Pr. PB16] (notch shape selection 2) to "_ _ _ 1" to make this parameter valid. If a value exceeding "3000" is set for this parameter, it is automatically rewritten as "3000".	4500	PB15	Machine resonance suppression filter 2 Set the notch frequency of the machine resonance suppression filter 2. To enable the setting value, select "Enabled (_ _ _ 1)" of "Machine resonance suppression filter 2 selection" in [Pr. PB16].	4500
PB16	Notch shape selection 2 Select the shape of the machine resonance suppression filter 2. 0 _ _ x: Machine resonance suppression filter 2 selection 0: Invalid 1: Valid	0000h	PB16	Notch shape selection 2 Set the shape of the machine resonance suppression filter 2.	
				_ _ _ x: Machine resonance suppression filter 2 selection 0: Disabled 1: Enabled	0h
	0 _ x _ : Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB			_ _ x _ : Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h
	0 x _ _ : Notch width 0: α = 2 1: α = 3 2: α = 4 3: α = 5			_ x _ _ : Notch width selection 0: α = 2 1: α = 3 2: α = 4 3: α = 5	0h
				x _ _ _ : For manufacturer setting	0h

<table>
<tr><th colspan="3">MR-J3W-_B</th><th colspan="3">MR-J4W2-_B</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB17</td><td>Automatic setting parameter
The value of this parameter is set according to a set value of [Pr. PB06] (Load to motor inertia moment ratio).</td><td></td><td>PB17</td><td>Shaft resonance suppression filter
Set a shaft resonance suppression filter.
When you select "Automatic setting (_ _ _ 0)" of "Shaft resonance suppression filter selection" in [Pr. PB23], the value will be calculated automatically from the servo motor you use and load to motor inertia ratio. When "Manual setting (_ _ _ 1)" is selected, the setting written to the parameter is used.
When "Shaft resonance suppression filter selection" is "Disabled (_ _ _ 2)" in [Pr. PB23], the setting value of this parameter will be disabled.
When you select "Enabled (_ _ _ 1)" of "Machine resonance suppression filter 4 selection" in [Pr. PB49], the shaft resonance suppression filter is not available.</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x x:
Shaft resonance suppression filter setting frequency selection.This is used for setting the shaft resonance suppression filter.Refer to table 4.3 for settings.
Set the value closest to the frequency you need.</td><td>00h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
Notch depth selection
0: -40 dB
1: -14 dB
2: -8 dB
3: -4 dB</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Table 4.3 Shaft resonance suppression filter setting frequency selection
<table>
<tr><th>Setting value</th><th>Frequency [Hz]</th><th>Setting value</th><th>Frequency [Hz]</th></tr>
<tr><td>_ _ 0 0</td><td>Disabled</td><td>_ _ 1 0</td><td>562</td></tr>
<tr><td>_ _ 0 1</td><td>Disabled</td><td>_ _ 1 1</td><td>529</td></tr>
<tr><td>_ _ 0 2</td><td>4500</td><td>_ _ 1 2</td><td>500</td></tr>
<tr><td>_ _ 0 3</td><td>3000</td><td>_ _ 1 3</td><td>473</td></tr>
<tr><td>_ _ 0 4</td><td>2250</td><td>_ _ 1 4</td><td>450</td></tr>
<tr><td>_ _ 0 5</td><td>1800</td><td>_ _ 1 5</td><td>428</td></tr>
<tr><td>_ _ 0 6</td><td>1500</td><td>_ _ 1 6</td><td>409</td></tr>
<tr><td>_ _ 0 7</td><td>1285</td><td>_ _ 1 7</td><td>391</td></tr>
<tr><td>_ _ 0 8</td><td>1125</td><td>_ _ 1 8</td><td>375</td></tr>
<tr><td>_ _ 0 9</td><td>1000</td><td>_ _ 1 9</td><td>360</td></tr>
<tr><td>_ _ 0 A</td><td>900</td><td>_ _ 1 A</td><td>346</td></tr>
<tr><td>_ _ 0 B</td><td>818</td><td>_ _ 1 B</td><td>333</td></tr>
<tr><td>_ _ 0 C</td><td>750</td><td>_ _ 1 C</td><td>321</td></tr>
<tr><td>_ _ 0 D</td><td>692</td><td>_ _ 1 D</td><td>310</td></tr>
<tr><td>_ _ 0 E</td><td>642</td><td>_ _ 1 E</td><td>300</td></tr>
<tr><td>_ _ 0 F</td><td>600</td><td>_ _ 1 F</td><td>290</td></tr>
</table></td><td></td></tr>
<tr><td>PB18</td><td>Low-pass filter setting
Set the low-pass filter.
Setting [Pr. PB023] (low-pass filter selection) to "_ _ 0 _" automatically changes this parameter.
When [Pr. PB023] is set to "_ _ 1 _" , this parameter can be set manually.</td><td>3141</td><td>PB18</td><td>Low-pass filter setting
Set the low-pass filter.
The following shows a relation of a required parameter to this parameter.
<table>
<tr><th>[Pr. PB23]</th><th>[Pr. PB18]</th></tr>
<tr><td>_ _ 0 _ (Initial value)</td><td>Automatic setting</td></tr>
<tr><td>_ _ 1 _</td><td>Setting value enabled</td></tr>
<tr><td>_ _ 2 _</td><td>Setting value disabled</td></tr>
</table></td><td>3141</td></tr>
</table>

MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB19	Vibration suppression control vibration frequency setting This parameter cannot be used in the speed control mode. Set the vibration frequency for vibration suppression control to suppress low-frequency machine vibration, such as enclosure vibration. When [Pr. PB02] is set to "_ _ _ 2" , this parameter can be set manually.	100.0	PB19	Vibration suppression control 1 - Vibration frequency Set the vibration frequency for vibration suppression control 1 to suppress low-frequency machine vibration. When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. When "Manual setting (_ _ _ 2)" is selected, the setting written to the parameter is used. The setting range of this parameter varies, depending on the value in [Pr. PB07]. If a value out of the range is set, the vibration suppression control will be disabled.	100.0
PB20	Vibration suppression control resonance frequency setting This parameter cannot be used in the speed control mode. Set the resonance frequency for vibration suppression control to suppress low-frequency machine vibration, such as enclosure vibration. When [Pr. PB02] is set to "_ _ _ 2" , this parameter can be set manually.	100.0	PB20	Vibration suppression control 1 - Resonance frequency Set the resonance frequency for vibration suppression control 1 to suppress low-frequency machine vibration. When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. When "Manual setting (_ _ _ 2)" is selected, the setting written to the parameter is used. The setting range of this parameter varies, depending on the value in [Pr. PB07]. If a value out of the range is set, the vibration suppression control will be disabled.	100.0
PB21	This parameter is not used. Do not change the value.	0.00	PB21	Vibration suppression control 1 - Vibration frequency damping Set a damping of the vibration frequency for vibration suppression control 1 to suppress low-frequency machine vibration. When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. When "Manual setting (_ _ _ 2)" is selected, the setting written to the parameter is used.	0.00
PB22	This parameter is not used. Do not change the value.	0.00	PB22	Vibration suppression control 1 - Resonance frequency damping Set a damping of the resonance frequency for vibration suppression control 1 to suppress low-frequency machine vibration. When "Vibration suppression control 1 tuning mode selection" is set to "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. When "Manual setting (_ _ _ 2)" is selected, the setting written to the parameter is used.	0.00
PB23	Low-pass filter selection Select the low-pass filter. 0 0 x 0: Low-pass filter selection 0: Automatic setting 1: Manual setting ([Pr. PB18] setting) When automatic setting has been selected, select the filter that has the band width close to the one calculated with $\frac{VG2 \cdot 10}{1+GD2}$ [rad/s]	0000h	PB23	Low-pass filter selection Select the shaft resonance suppression filter and low-pass filter.	
				_ _ _ x: Shaft resonance suppression filter selection 0: Automatic setting 1: Manual setting 2: Disabled When you select "Enabled (_ _ _ 1)" of "Machine resonance suppression filter 4 selection" in [Pr. PB49], the shaft resonance suppression filter is not available.	0h
				_ _ x _ : Low-pass filter selection 0: Automatic setting 1: Manual setting 2: Disabled	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h

MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB24	Slight vibration suppression control selection Select the slight vibration suppression control and PI-PID change. When [Pr. PA08] (Auto tuning mode) is set to "_ _ _ 3", the slight vibration suppression control is enabled. (Slight vibration suppression control cannot be used in the speed control mode.) 0 0 _ x: Slight vibration suppression control selection 0: Invalid 1: Valid	0000h	PB24	Slight vibration suppression control Select the slight vibration suppression control and PI-PID switching control.	
				_ _ _ x: Slight vibration suppression control selection 0: Disabled 1: Enabled To enable the slight vibration suppression control, select "Manual mode (_ _ _ 3)" of "Gain adjustment mode selection" in [Pr. PA08]. Slight vibration suppression control cannot be used in the speed control mode.	0h
	0 0 x _ : PI-PID control switch over selection 0: PI control is valid. (Switching to PID control is possible with instructions of controller.) 3: PID control is always valid.			_ _ x _ : PI-PID switching control selection 0: PI control enabled (Switching to PID control is possible with commands of servo system controller.) 3: Continuous PID control enabled If the servo motor at a stop is rotated even for a pulse due to any external factor, it generates torque to compensate for a position shift. When the servo motor shaft is to be locked mechanically after positioning completion (stop), enabling PID control and completing positioning simultaneously will suppress the unnecessary torque generated to compensate for a position shift.	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PB25	This parameter is not used. Do not change the value.	0000h	PB25	Function selection B-1 Select enabled/disabled of model adaptive control. This parameter is used by servo amplifier with software version B4 or later.	
				_ _ _ x: Model adaptive control selection 0: Enabled (model adaptive control) 2: Disabled (PID control)	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h

MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB26	Gain changing selection Select the gain changing condition.	0000h	PB26	Gain switching function Select the gain switching condition. Set conditions to enable the gain switching values set in [Pr. PB29] to [Pr. PB36] and [Pr. PB56] to [Pr. PB60].	
	0 0 _ x: Gain changing selection Under any of the following conditions, the gains change on the basis of the [Pr. PB29 to PB34] settings. 0: Invalid 1: Control instructions from a controller. 2: Command frequency ([Pr. PB27] setting) 3: Droop pulses value ([Pr. PB27] setting) 4: Servo motor speed ([Pr. PB27] setting)			_ _ _ x: Gain switching selection 0: Disabled 1: Control command from controller is enabled 2: Command frequency 3: Droop pulses 4: Servo motor speed/linear servo motor speed	0h
	0 0 x _ : Gain changing condition 0: Valid when the control instruction from a controller is ON Valid at equal to or more than the value set in [Pr. PB27] 1: Valid when the control instruction from a controller is OFF Valid at equal to or less than the value set in [Pr. PB27]			_ _ x _ : Gain switching condition selection 0: Gain after switching is enabled with gain switching condition or more 1: Gain after switching is enabled with gain switching condition or less	0h
				_ x _ _ : Gain switching time constant disabling condition selection 0: Switching time constant enabled 1: Switching time constant disabled 2: Return time constant disabled This digit is available with servo amplifier with software version B4 or later.	0h
				x _ _ _ : For manufacturer setting	0h
PB27	Gain changing condition Used to set the value of gain changing condition (command frequency, droop pulses, servo motor speed) selected in [Pr. PB26]. The set value unit changes with the changing condition item.	10	PB27	Gain switching condition Set a value of gain switching (command frequency, droop pulses, and servo motor speed/linear servo motor speed) selected in [Pr. PB26]. The set value unit differs depending on the switching condition item.	10
PB28	Gain changing time constant Used to set the time constant at which the gains will change in response to the conditions set in [Pr. PB26] and [Pr. PB27].	1	PB28	Gain switching time constant Set the time constant until the gains switch in response to the conditions set in [Pr. PB26] and [Pr. PB27].	1
PB29	Gain changing load to motor inertia moment ratio Used to set the load to motor inertia moment ratio when gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3).	7.0	PB29	Load to motor inertia ratio/load to motor mass ratio after gain switching Set a load to motor inertia ratio/load to motor mass ratio for when gain switching is enabled. This parameter is enabled only when you select "Manual mode (_ _ _ 3)" of "Gain adjustment mode selection" in [Pr. PA08].	7.00
PB30	Gain changing position loop gain This parameter cannot be used in the speed control mode. Set the position loop gain when the gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3).	37	PB30	Position loop gain after gain switching Set the position loop gain when the gain switching is enabled. When you set a value less than 1.0 rad/s, the value will be the same as [Pr. PB08]. This parameter is enabled only when you select "Manual mode (_ _ _ 3)" of "Gain adjustment mode selection" in [Pr. PA08].	0.0
PB31	Gain changing speed loop gain Set the speed loop gain when the gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3).	823	PB31	Speed loop gain after gain switching Set the speed loop gain when the gain switching is enabled. When you set a value less than 20 rad/s, the value will be the same as [Pr. PB09]. This parameter is enabled only when you select "Manual mode (_ _ _ 3)" of "Gain adjustment mode selection" in [Pr. PA08].	0

MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PB32	Gain changing speed integral compensation Set the speed integral compensation when the gain changing is valid. This parameter is made valid when the auto tuning is invalid ([Pr. PA08]: _ _ _ 3).	33.7	PB32	Speed integral compensation after gain switching Set the speed integral compensation when the gain changing is enabled. When you set a value less than 0.1 ms, the value will be the same as [Pr. PB10]. This parameter is enabled only when you select "Manual mode (_ _ _ 3)" of "Gain adjustment mode selection" in [Pr. PA08].	0.0
PB33	Gain changing vibration suppression control vibration frequency setting This parameter cannot be used in the speed control mode. Set the vibration frequency for vibration suppression control when the gain changing is valid. This parameter is made valid when the [Pr. PB02] setting is "_ _ _ 2" and the [Pr. PB26] setting is " _ _ _ 1". When using the vibration suppression control gain changing, always execute the changing after the servo motor has stopped.	100.0	PB33	Vibration suppression control 1 - Vibration frequency after gain switching Set the vibration frequency of the vibration suppression control 1 for when the gain switching is enabled. When you set a value less than 0.1 Hz, the value will be the same as [Pr. PB19]. This parameter is enabled only when the following conditions are fulfilled. ▪ "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". ▪ "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". ▪ "Gain switching selection" in [Pr. PB26] is "Control command from controller is enabled (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops.	0.0
PB34	Gain changing vibration suppression control resonance frequency setting This parameter cannot be used in the speed control mode. Set the resonance frequency for vibration suppression control when the gain changing is valid. This parameter is made valid when the [Pr. PB02] setting is "_ _ _ 2" and the [Pr. PB26] setting is "_ _ _ 1". When using the vibration suppression control gain changing, always execute the changing after the servo motor has stopped.	100.0	PB34	Vibration suppression control 1 - Resonance frequency after gain switching Set the resonance frequency for vibration suppression control 1 when the gain switching is enabled. When you set a value less than 0.1 Hz, the value will be the same as [Pr. PB20]. This parameter will be enabled only when the following conditions are fulfilled. ▪ "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". ▪ "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". ▪ "Gain switching selection" in [Pr. PB26] is "Control command from controller is enabled (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops.	0.0
PB35	This parameter is not used. Do not change the value.	0.00	PB35	Vibration suppression control 1 - Vibration frequency damping after gain switching Set a damping of the vibration frequency for vibration suppression control 1 when the gain switching is enabled. This parameter will be enabled only when the following conditions are fulfilled. ▪ "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". ▪ "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". ▪ "Gain switching selection" in [Pr. PB26] is "Control command from controller is enabled (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops.	0.00
PB36	This parameter is not used. Do not change the value.	0.00	PB36	Vibration suppression control 1 - Resonance frequency damping after gain switching Set a damping of the resonance frequency for vibration suppression control 1 when the gain switching is enabled. This parameter will be enabled only when the following conditions are fulfilled. ▪ "Gain adjustment mode selection" in [Pr. PA08] is "Manual mode (_ _ _ 3)". ▪ "Vibration suppression control 1 tuning mode selection" in [Pr. PB02] is "Manual setting (_ _ _ 2)". ▪ "Gain switching selection" in [Pr. PB26] is "Control command from controller is enabled (_ _ _ 1)". Switching during driving may cause a shock. Be sure to switch them after the servo motor stops.	0.00

<table>
<tr><th colspan="3">MR-J3W-_B</th><th colspan="3">MR-J4W2-_B</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PB45</td><td>This parameter is not used. Do not change the value.</td><td>0000h</td><td>PB45</td><td>Command notch filter
Set the command notch filter.</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x x:
Command notch filter setting frequency selection
Refer to table 4.4 for the relation of setting values to frequency.</td><td>00h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
Notch depth selection
Refer to table 4.5 for details.</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Table 4.4 Command notch filter setting frequency selection
<table>
<tr><th>Setting value</th><th>Frequency [Hz]</th><th>Setting value</th><th>Frequency [Hz]</th><th>Setting value</th><th>Frequency [Hz]</th></tr>
<tr><td>_ _ 0 0</td><td>Disabled</td><td>_ _ 2 0</td><td>70</td><td>_ _ 4 0</td><td>17.6</td></tr>
<tr><td>_ _ 0 1</td><td>2250</td><td>_ _ 2 1</td><td>66</td><td>_ _ 4 1</td><td>16.5</td></tr>
<tr><td>_ _ 0 2</td><td>1125</td><td>_ _ 2 2</td><td>62</td><td>_ _ 4 2</td><td>15.6</td></tr>
<tr><td>_ _ 0 3</td><td>750</td><td>_ _ 2 3</td><td>59</td><td>_ _ 4 3</td><td>14.8</td></tr>
<tr><td>_ _ 0 4</td><td>562</td><td>_ _ 2 4</td><td>56</td><td>_ _ 4 4</td><td>14.1</td></tr>
<tr><td>_ _ 0 5</td><td>450</td><td>_ _ 2 5</td><td>53</td><td>_ _ 4 5</td><td>13.4</td></tr>
<tr><td>_ _ 0 6</td><td>375</td><td>_ _ 2 6</td><td>51</td><td>_ _ 4 6</td><td>12.8</td></tr>
<tr><td>_ _ 0 7</td><td>321</td><td>_ _ 2 7</td><td>48</td><td>_ _ 4 7</td><td>12.2</td></tr>
<tr><td>_ _ 0 8</td><td>281</td><td>_ _ 2 8</td><td>46</td><td>_ _ 4 8</td><td>11.7</td></tr>
<tr><td>_ _ 0 9</td><td>250</td><td>_ _ 2 9</td><td>45</td><td>_ _ 4 9</td><td>11.3</td></tr>
<tr><td>_ _ 0 A</td><td>225</td><td>_ _ 2 A</td><td>43</td><td>_ _ 4 A</td><td>10.8</td></tr>
<tr><td>_ _ 0 B</td><td>204</td><td>_ _ 2 B</td><td>41</td><td>_ _ 4 B</td><td>10.4</td></tr>
<tr><td>_ _ 0 C</td><td>187</td><td>_ _ 2 C</td><td>40</td><td>_ _ 4 C</td><td>10</td></tr>
<tr><td>_ _ 0 D</td><td>173</td><td>_ _ 2 D</td><td>38</td><td>_ _ 4 D</td><td>9.7</td></tr>
<tr><td>_ _ 0 E</td><td>160</td><td>_ _ 2 E</td><td>37</td><td>_ _ 4 E</td><td>9.4</td></tr>
<tr><td>_ _ 0 F</td><td>150</td><td>_ _ 2 F</td><td>36</td><td>_ _ 4 F</td><td>9.1</td></tr>
<tr><td>_ _ 1 0</td><td>140</td><td>_ _ 3 0</td><td>35.2</td><td>_ _ 5 0</td><td>8.8</td></tr>
<tr><td>_ _ 1 1</td><td>132</td><td>_ _ 3 1</td><td>33.1</td><td>_ _ 5 1</td><td>8.3</td></tr>
<tr><td>_ _ 1 2</td><td>125</td><td>_ _ 3 2</td><td>31.3</td><td>_ _ 5 2</td><td>7.8</td></tr>
<tr><td>_ _ 1 3</td><td>118</td><td>_ _ 3 3</td><td>29.6</td><td>_ _ 5 3</td><td>7.4</td></tr>
<tr><td>_ _ 1 4</td><td>112</td><td>_ _ 3 4</td><td>28.1</td><td>_ _ 5 4</td><td>7.0</td></tr>
<tr><td>_ _ 1 5</td><td>107</td><td>_ _ 3 5</td><td>26.8</td><td>_ _ 5 5</td><td>6.7</td></tr>
<tr><td>_ _ 1 6</td><td>102</td><td>_ _ 3 6</td><td>25.6</td><td>_ _ 5 6</td><td>6.4</td></tr>
<tr><td>_ _ 1 7</td><td>97</td><td>_ _ 3 7</td><td>24.5</td><td>_ _ 5 7</td><td>6.1</td></tr>
<tr><td>_ _ 1 8</td><td>93</td><td>_ _ 3 8</td><td>23.4</td><td>_ _ 5 8</td><td>5.9</td></tr>
<tr><td>_ _ 1 9</td><td>90</td><td>_ _ 3 9</td><td>22.5</td><td>_ _ 5 9</td><td>5.6</td></tr>
<tr><td>_ _ 1 A</td><td>86</td><td>_ _ 3 A</td><td>21.6</td><td>_ _ 5 A</td><td>5.4</td></tr>
<tr><td>_ _ 1 B</td><td>83</td><td>_ _ 3 B</td><td>20.8</td><td>_ _ 5 B</td><td>5.2</td></tr>
<tr><td>_ _ 1 C</td><td>80</td><td>_ _ 3 C</td><td>20.1</td><td>_ _ 5 C</td><td>5.0</td></tr>
<tr><td>_ _ 1 D</td><td>77</td><td>_ _ 3 D</td><td>19.4</td><td>_ _ 5 D</td><td>4.9</td></tr>
<tr><td>_ _ 1 E</td><td>75</td><td>_ _ 3 E</td><td>18.8</td><td>_ _ 5 E</td><td>4.7</td></tr>
<tr><td>_ _ 1 F</td><td>72</td><td>_ _ 3 F</td><td>18.2</td><td>_ _ 5 F</td><td>4.5</td></tr>
</table>
Table 4.5 Notch depth selection
<table>
<tr><th>Setting value</th><th>Depth [dB]</th><th>Setting value</th><th>Depth [dB]</th></tr>
<tr><td>_ 0 _ _</td><td>-40.0</td><td>_ 8 _ _</td><td>-6.0</td></tr>
<tr><td>_ 1 _ _</td><td>-24.1</td><td>_ 9 _ _</td><td>-5.0</td></tr>
<tr><td>_ 2 _ _</td><td>-18.1</td><td>_ A _ _</td><td>-4.1</td></tr>
<tr><td>_ 3 _ _</td><td>-14.5</td><td>_ B _ _</td><td>-3.3</td></tr>
<tr><td>_ 4 _ _</td><td>-12.0</td><td>_ C _ _</td><td>-2.5</td></tr>
<tr><td>_ 5 _ _</td><td>-10.1</td><td>_ D _ _</td><td>-1.8</td></tr>
<tr><td>_ 6 _ _</td><td>-8.5</td><td>_ E _ _</td><td>-1.2</td></tr>
<tr><td>_ 7 _ _</td><td>-7.2</td><td>_ F _ _</td><td>-0.6</td></tr>
</table></td><td></td></tr>
<tr><td>PC01</td><td>Error excessive alarm level
This parameter cannot be used in the speed control mode and the torque control mode.
Used to set the error excessive alarm level with rotation amount of servo motor.
When "0" is set in this parameter, the alarm level is three rotations. When a value other than "0" is set, the alarm level is the rotation number of the set value. However, the alarm level stays at 200 rotations even if a value exceeding "200" is set.
Note. Setting can be changed in [Pr. PC06].</td><td>0</td><td>PC01</td><td>Error excessive alarm level
Set an error excessive alarm level.
Set this per rev. for rotary servo motors and direct drive motors. Setting "0" will be 3 rev. Setting over 200 rev will be clamped with 200 rev.

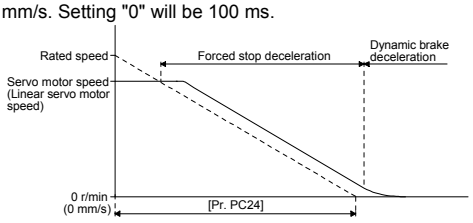
Note. Setting can be changed in [Pr. PC06].</td><td>0</td></tr>
</table>

<table>
<tr><th colspan="3">MR-J3W-_B</th><th colspan="3">MR-J4W2-_B</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PC02</td><td>Electromagnetic brake sequence output
Used to set the delay time (Tb) between electronic brake interlock (MBR-A/MBR-B) and the base drive circuit is shut-off.</td><td>0</td><td>PC02</td><td>Electromagnetic brake sequence output
Set a delay time between MBR (Electromagnetic brake interlock) and the base drive circuit is shut-off.</td><td>0</td></tr>
<tr><td rowspan="4">PC03</td><td>Encoder output pulse selection
Use to select the encoder output pulse direction and encoder output pulse setting.</td><td rowspan="4">0010h</td><td rowspan="4">PC03</td><td>Encoder output pulse selection
Select an encoder pulse direction and encoder output pulse setting.</td><td></td></tr>
<tr><td>0 0 _ x:
Encoder output pulse phase changing
Changes the phases of A/B-phase encoder pulses output .
<table><tr><th rowspan="2">Setting value</th><th colspan="2">Servo motor rotation direction</th></tr><tr><th>CCW</th><th>CW</th></tr><tr><td>0</td><td>A-phase
B-phase</td><td>A-phase
B-phase</td></tr><tr><td>1</td><td>A-phase
B-phase</td><td>A-phase
B-phase</td></tr></table></td><td>_ _ _ x:
Encoder output pulse phase selection
0: Increasing A-phase 90° in CCW or positive direction
1: Increasing A-phase 90° in CW or negative direction
<table><tr><th rowspan="2">Setting value</th><th colspan="2">Servo motor rotation direction</th></tr><tr><th>CCW or positive direction</th><th>CW or negative direction</th></tr><tr><td>0</td><td>A-phase
B-phase</td><td>A-phase
B-phase</td></tr><tr><td>1</td><td>A-phase
B-phase</td><td>A-phase
B-phase</td></tr></table></td><td>0h</td></tr>
<tr><td>0 0 x _:
Encoder output pulse setting selection
0: Output pulse designation
1: Division ratio setting
3: A/B-phase pulse elecrtonic gear setting (Set with the electronic gear [Pr. PA15] and [Pr. PA16])</td><td>_ _ x _ :
Encoder output pulse setting selection
0: Output pulse setting
When "_ 1 0 _" is set to this parameter, [AL. 37 Parameter error] will occur.
1: Division ratio setting
3: A/B-phase pulse electronic gear setting</td><td>0h</td></tr>
<tr><td>_ x _ _ :
Selection of the encoders for encoder output pulse
Select an encoder used the encoder output pulses which the servo amplifier outputs.
0: Servo motor encoder
1: Load-side encoder
When "_ 1 0 _" is set to this parameter, [AL. 37 Parameter error] will occur.</td><td>0h</td></tr>
<tr><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td>PC04</td><td>Function selection C-1
Select the encoder cable communication system selection.
x 0 0 0:
Encoder cable communication system selection
0: Two-wire type
1: Four-wire type
Incorrect setting will result in an encoder alarm 1 (16.3).
Refer to "MR-J3W-0303BN6 MR-J3W-_B Servo Amplifier Instruction Manual" for the communication method of the encoder cable.</td><td>0000h</td><td>PC04</td><td>Function selection C-1
Select the encoder cable communication method selection.</td><td></td></tr>
<tr><td></td><td></td><td></td><td>_ _ _ x:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td>_ _ x _:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td>x _ _ _:
Encoder cable communication method selection
0: Two-wire type
1: Four-wire type
Incorrect setting will result in [AL. 16 Encoder initial communication error 1]. or [AL. 20 Encoder initial communication error 1] will occur. Setting "1" will trigger [AL. 37] while "Fully closed loop control mode (_ _ 1 _)" is selected in [Pr. PA01].
For MR-J4W2-0303B6 servo amplifiers, this digit cannot be used other than the initial value.</td><td>0h</td></tr>
</table>

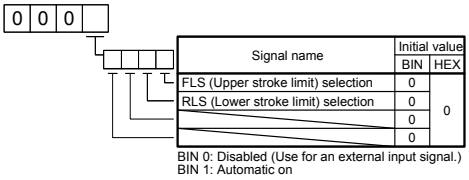
MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PC05	Function selection C-2 Motor-less operation select. 0 0 0 x: Motor-less operation select. 0: Valid 1: Invalid	0000h	PC05	Function selection C-2 Set the motor-less operation, servo motor main circuit power supply, and [AL. 9B Error excessive warning].	
				_ _ _ x: Motor-less operation selection 0: Disabled 1: Enabled	0h
				_ _ x _: For manufacturer setting	0h
				_ x _ _: Main circuit power supply selection Select a voltage to be connected to the main circuit power supply with an MR-J4W2-0303B6 servo amplifier. 0: 48 V DC 1: 24 V DC When using 24 V DC for the main circuit power supply, set "1" to this digit. The setting of this digit in the J3 compatibility mode is the same as the MR-J3W-0303BN6 servo amplifier. Set it with [Pr. Po04]. For details, refer to "MR-J3W-0303BN6 MR-J3W-_B Servo Amplifier Instruction Manual". This digit is not available with MR-J4W_-_B 200 W or more servo amplifiers. The characteristics of the servo motor vary depending on whether 48 V DC or 24 V DC is used. For details, refer to "Servo Motor Instruction Manual (Vol. 3)".	0h
				x _ _ _: [AL. 9B Error excessive warning] selection 0: [AL. 9B Error excessive warning] is disabled. 1: [AL. 9B Error excessive warning] is enabled. The setting of this digit is used by servo amplifier with software version B4 or later.	0h
PC06	Function selection C-3 The parameter is not available in the speed control mode and torque control mode. Select the error excessive alarm level setting for [Pr. PC01]. x 0 0 0: Error excessive alarm level setting selection 0: 1 [rev] unit 1: 0.1 [rev] unit 2: 0.01 [rev] unit 3: 0.001[rev] unit	0000h	PC06	Function selection C-3 Select units for error excessive alarm level setting with [Pr. PC01] and for error excessive warning level setting with [Pr. PC38]. The parameter is not available in the speed control mode and torque control mode.	
				_ _ _ x: For manufacturer setting	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : Error excessive alarm/error excessive warning level unit selection 0: Per rev or mm 1: Per 0.1 rev or 0.1 mm 2: Per 0.01 rev or 0.01 mm 3: Per 0.001 rev or 0.001 mm	0h
PC07	Zero speed Used to set the output range of the zero speed (ZSP-A/ZSP-B). Zero speed (ZSP-A/ZSP-B) detection has hysteresis width of 20r/min.	50	PC07	Zero speed Set an output range of ZSP (Zero speed detection). ZSP (Zero speed detection) has hysteresis of 20 r/min or 20 mm/s.	50
PC08	This parameter is not used. Do not change the value.	0	PC08	Overspeed alarm detection level Set an overspeed alarm detection level. When you set a value more than "(linear) servo motor maximum speed × 120%", the set value will be clamped. When you set "0", the value of "(linear) servo motor maximum speed × 120%" will be set.	0

MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PC09	Analog monitor 1 output Used to selection the signal provided to the analog monitor 1 (MO1) output.	0000h	PC09	Analog monitor 1 output Select a signal to output to MO1 (Analog monitor 1). Refer to "MR-J4W_-_B servo amplifier instruction manual" for detection point of output selection. The parameter is available with MR-J4W2-0303B6 servo amplifiers. _ _ x x: For manufacturer setting 00: Servo motor speed (10 V ± 4 V/max. speed) 01: Torque (10 V ± 4 V/max. torque) 02: Servo motor speed (10 V + 4 V/max. speed) 03: Torque (10 V + 4 V/max. torque) 04: Current command (10 V ± 4 V/max. current command) 05: Speed command (10 V ± 4 V/max. speed) 06: Servo motor-side droop pulses (10 V ± 5 V/100 pulses) (Note) 07: Servo motor-side droop pulses (10 V ± 5 V/1000 pulses) (Note) 08: Servo motor-side droop pulses (10 V ± 5 V/10000 pulses) (Note) 09: Servo motor-side droop pulses (10 V ± 5 V/100000 pulses) (Note) 0A: Feedback position (10 V ± 5 V/1 Mpulse) (Note) 0B: Feedback position (10 V ± 5 V/10 Mpulses) (Note) 0C: Feedback position (10 V ± 5 V/100 Mpulses) (Note) 0D: Bus voltage (10 V + 5 V/100 V) 0E: Speed command 2 (10 V ± 4 V/max. speed) 17: Internal temperature of encoder (10 V ± 5 V/±128 °C) Note. Encoder pulse unit	00h
	_ 0 0 x: Analog monitor 1 (MO1) output selection 0: Servo motor speed (±8 V/max. speed) 1: Torque (±8 V/max. torque) 2: Servo motor speed (+8 V/max. speed) 3: Torque (+8 V /max. torque) 4: Current command (8V/max. current command) 5: Speed command (8V/max. current command) 6: Droop pulses (10V/100 pulses) 7: Droop pulses (10V/1000 pulses) 8: Droop pulses (10V/10000 pulses) 9: Droop pulses (10V/100000 pulses) D: Bus voltage (8V/400V) E: Speed command 2 (8V/max. current command) In the case of MR-J3W-0303BN6 is as follows. 0: Servo motor speed (10 V ± 4 V/max. speed) 1: Torque (10 V ± 4 V/max. torque) 2: Servo motor speed (10 V + 4 V/max. speed) 3: Torque (10 V + 4 V/max. torque) 4: Current command (10 V ± 4 V/max. current command) 5: Speed command (10 V ± 4 V/max. speed) 6: Droop pulses (10 V ± 5 V/100 pulses) 7: Droop pulses (10 V ± 5 V/1000 pulses) 8: Droop pulses (10 V ± 5 V/10000 pulses) 9: Droop pulses (10 V ± 5 V/100000 pulses) D: Bus voltage (10 V + 5 V/400 V) E: Speed command 2 (10 V ± 4 V/max. speed)				
	x 0 0 _: Analog monitor 1 (MO1) output axis selection 0: A-axis 1: B-axis			_ x _ _ : For manufacturer setting	0h
				x _ _ _ : Analog monitor 1 output axis selection Select an output axis of Analog monitor 1. 0: A-axis 1: B-axis	0h
PC10	Analog monitor 2 output Used to selection the signal provided to the analog monitor 2 (MO2) output. _ 0 0 x: Analog monitor 2 (MO2) output selection The settings are the same as those of [Pr. PC09].	0001h	PC10	Analog monitor 2 output Select a signal to output to MO2 (Analog monitor 2). Refer to "MR-J4W_-_B servo amplifier instruction manual" for detection point of output selection. The parameter is available with MR-J4W2-0303B6 servo amplifiers. _ _ x x: Analog monitor 2 output selection Refer to [Pr. PC09] for settings.	01h
	X 0 0 _: Analog monitor 2 (MO2) output axis selection The settings are the same as those of [Pr. PC09].			_ x _ _: For manufacturer setting	0h
				x _ _ _: Analog monitor 2 output axis selection The settings are the same as those of [Pr. PC09].	0h
PC11	Analog monitor 1 offset Used to set the offset voltage of the analog monitor 1 (MO1) output.	0	PC11	Analog monitor 1 offset Set the offset voltage of MO1 (Analog monitor 1). The parameter is available with MR-J4W2-0303B6 servo amplifiers.	0

MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PC12	Analog monitor 2 offset Used to set the offset voltage of the analog monitor 2 (MO2) output.	0	PC12	Analog monitor 2 offset Set the offset voltage of MO2 (Analog monitor 2). The parameter is available with MR-J4W2-0303B6 servo amplifiers.	0
PC13	This parameter is not used. Do not change this value by any means.	0	PC13	Analog monitor - Feedback position output standard data - Low Set a monitor output standard position (lower 4 digits) for the feedback position for when selecting "Feedback position" for MO1 (Analog monitor 1) and MO2 (Analogmonitor 2). Monitor output standard position = [Pr. PC14] setting × 10000 + [Pr. PC13] setting The parameter is available with MR-J4W2-0303B6 servo amplifiers.	0
PC14	This parameter is not used. Do not change this value by any means.	0	PC14	Analog monitor - Feedback position output standard data - High Set a monitor output standard position (higher 4 digits) for the feedback position for when selecting "Feedback position" for MO1 (Analog monitor 1) and MO2 (Analogmonitor 2). Monitor output standard position = [Pr. PC14] setting × 10000 + [Pr. PC13] setting The parameter is available with MR-J4W2-0303B6 servo amplifiers.	0
PC15	Station number selection Used to select the axis to communicate with (SETUP221E). 0: A-axis 1: B-axis	0000h	PC15	For manufacturer setting	0
PC17	Function Selection C-4 This parameter cannot be used in the speed control mode and the torque control mode. This is used to select a home position setting condition. 0 0 0 x: Selection of home position setting condition 0: Need to pass motor Z-phase after the power supply is switched on. 1: Not need to pass motor Z-phase after the power supply is switched on.	0000h	PC17	Function selection C-4 Select a home position setting condition.	
				_ _ _ x: Selection of home position setting condition 0: Need to pass servo motor Z-phase after power on 1: Not need to pass servo motor Z-phase after power on	0h
				_ _ x _ : When a rotary servo motor is used, the setting does not need to be changed.	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PC18	This parameter is not used. Do not change the value.	0000h	PC18	Function selection C-5 Select an occurring condition of [AL. E9 Main circuit off warning].	
				_ _ _ x: For manufacturer setting	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : [AL. E9 Main circuit off warning] selection 0: Detection with ready-on and servo-on command 1: Detection with servo-on command	0h

MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PC20	This parameter is not used. Do not change the value.	0000h	PC20	Function selection C-7 Select the detection method of [AL. 10 Undervoltage].	
				_ _ _ x: For manufacturer setting	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : Undervoltage alarm selection Select the alarm/alarm and warning for when the bus voltage drops to the undervoltage alarm level. 0: [AL. 10] regardless of servo motor speed 1: [AL. E9] at servo motor speed 50 r/min (50 mm/s) or less, [AL. 10] at over 50 r/min (50 mm/s)	0h
				x _ _ _ : For manufacturer setting	0h
PC21	Alarm history clear Used to clear the alarm history. 0 0 0 x: Alarm history clear 0: Invalid 1: Valid When alarm history clear is made valid, the alarm history is cleared at next power-on. After the alarm history is cleared, the setting is automatically made invalid (reset to 0).	0000h	PC21	Alarm history clear Used to clear the alarm history.	
				_ _ _ x: Alarm history clear selection 0: Disabled 1: Enabled When "Enabled" is set, the alarm history will be cleared at the next power-on. Once the alarm history is cleared, the setting becomes disabled automatically.	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : For manufacturer setting	0h
PC24	This parameter is not used. Do not change the value.	0000h	PC24	Forced stop deceleration time constant Set a deceleration time constant when you use the forced stop deceleration function. Set the time per ms from the rated speed to 0 r/min or 0 mm/s. Setting "0" will be 100 ms.  [Precautions] ・If the servo motor torque is saturated at the maximum torque during forced stop deceleration because the set time is too short, the time to stop will be longer than the set time constant. ・[AL. 50 Overload alarm 1] or [AL. 51 Overload alarm 2] may occur during forced stop deceleration, depending on the set value. ・After an alarm that leads to a forced stop deceleration, if an alarm that does not lead to a forced stop deceleration occurs or if the control circuit power supply is cut, dynamic braking will start regardless of the deceleration time constant setting. ・Set a longer time than deceleration time of the controller. If a shorter time is set, [AL. 52 Error excessive] may occur.	100

MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PC27	This parameter is not used. Do not change the value.	0000h	PC27	Function selection C-9 This parameter is not available with MR-J4W2-0303B6 servo amplifiers.	
				_ _ _ x: Selection of encoder pulse count polarity 0: Encoder pulse increasing direction in the servo motor CCW or positive direction 1: Encoder pulse decreasing direction in the servo motor CCW or positive direction	0h
				_ _ x _: For manufacturer setting	0h
				_ x _ _: For manufacturer setting	0h
				x _ _ _: For manufacturer setting	0h
PC29	This parameter is not used. Do not change the value.	0000h	PC29	Function selection C-B Select the POL reflection at torque control.	
				_ _ _ x: For manufacturer setting	0h
				_ _ x _ : For manufacturer setting	0h
				_ x _ _ : For manufacturer setting	0h
				x _ _ _ : POL reflection selection at torque control 0: Enabled 1: Disabled	0h
PC31	This parameter is not used. Do not change the value.	0000h	PC31	Vertical axis freefall prevention compensation amount Set the compensation amount of the vertical axis freefall prevention function. Set it per servo motor rotation amount. When a positive value is set, compensation is performed to the address increasing direction. When a negative value is set, compensation is performed to the address decreasing direction. The vertical axis freefall prevention function is performed when all of the following conditions are met. 1) Position control mode 2) The value of the parameter is other than "0". 3) The forced stop deceleration function is enabled. 4) Alarm occurs or EM2 turns off when the (linear) servo motor speed is zero speed or less. 5) MBR (Electromagnetic brake interlock) was enabled in [Pr. PD07] to [Pr. PD09], and the base circuit shut-off delay time was set in [Pr. PC02].	0

<table>
<tr><th colspan="3">MR-J3W-_B</th><th colspan="3">MR-J4W2-_B</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PD02</td><td>This parameter is not used. Do not change the value.</td><td>0000h</td><td>PD02</td><td>Input signal automatic on selection 2</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ _ x (HEX)
_ _ _ x:
FLS (Upper stroke limit) selection
0: Disabled
1: Enabled
_ _ x _ :
RLS (Lower stroke limit) selection
0: Disabled
1: Enabled
_ x _ _ :
For manufacturer setting
x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _ (HEX)
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ (HEX)
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ (HEX)
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Convert the setting value into hexadecimal as follows.
 
</td><td></td></tr>
<tr><td>PD07</td><td>Output signal device selection 1 (CN3-12 for A-axis and CN3-25 for B-axis)
Any input signal can be assigned to the CN3-12 pin for A-axis and CN3-25 pin for B-axis. In the factory setting, MBR-A/MBR-B is assigned.

0 0 x x:
Select the output device of the CN3-12 pin for Aaxis and CN3-25 pin for B-axis.

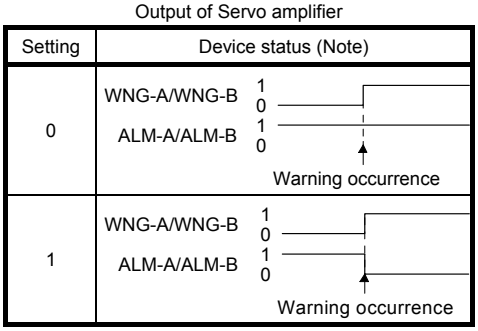
The devices that can be assigned in each control mode are those that have the symbols indicated in the following table.

<table>
<tr><th>Setting</th><th>Device</th></tr>
<tr><td>00</td><td>Always OFF</td></tr>
<tr><td>01</td><td>For manufacturer setting (Note 3)</td></tr>
<tr><td>02</td><td>RD-A/RD-B</td></tr>
<tr><td>03</td><td>ALM-A/ALM-B</td></tr>
<tr><td>04</td><td>INP-A/INP-B (Note 1, 4)</td></tr>
<tr><td>05</td><td>MBR-A/MBR-B</td></tr>
<tr><td>06</td><td>For manufacturer setting (Note 3)</td></tr>
<tr><td>07</td><td>TLC-A/TLC-B (Note 4)</td></tr>
<tr><td>08</td><td>WNG-A/WNG-B</td></tr>
<tr><td>09</td><td>BWNG-A/BWNG-B</td></tr>
<tr><td>0A</td><td>SA-A/SA-B (Note 2)</td></tr>
<tr><td>0B</td><td>VLC-A/VLC-B (Note 5)</td></tr>
<tr><td>0C</td><td>ZSP-A/ZSP-B</td></tr>
<tr><td>0D</td><td>For manufacturer setting (Note 3)</td></tr>
<tr><td>0E</td><td>For manufacturer setting (Note 3)</td></tr>
<tr><td>0F</td><td>CDPS-A/CDPS-B</td></tr>
<tr><td>10</td><td>For manufacturer setting (Note 3)</td></tr>
<tr><td>11</td><td>ABSV-A/ABSV-B (Note 1)</td></tr>
<tr><td>12 to 1F</td><td>For manufacturer setting (Note 3)</td></tr>
<tr><td>20 to 3F</td><td>For manufacturer setting (Note 3)</td></tr>
</table>
Note 1. Always off in the speed loop mode.
2. Always off in the position control mode and the torque loop mode.
3. For manufacturer setting. Never change this setting.
4. Always off in the torque loop mode.
5. Always off in the position control mode and the torque loop mode.</td><td>0005h</td><td>PD07</td><td>Output device selection 1
You can assign any output device to pins CN3-12 and CN3-25. In the initial setting, the following devices are assigned to the pins.
CN3-12 pin: MBR-A (Electromagnetic brake interlock for A-axis)
CN3-25 pin: MBR-B (Electromagnetic brake interlock for B-axis)</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x x:
Device selection
Refer to table 4.6 for settings.</td><td>05h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _:
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Table4.6 Selectable output devices
<table>
<tr><th>Setting value</th><th>Output device</th></tr>
<tr><td>_ _ 0 0</td><td>Always off</td></tr>
<tr><td>_ _ 0 2</td><td>RD (Ready)</td></tr>
<tr><td>_ _ 0 3</td><td>ALM (Malfunction)</td></tr>
<tr><td>_ _ 0 4</td><td>INP (In-position)</td></tr>
<tr><td>_ _ 0 5</td><td>MBR (Electromagnetic brake interlock)</td></tr>
<tr><td>_ _ 0 7</td><td>TLC (Limiting torque)</td></tr>
<tr><td>_ _ 0 8</td><td>WNG (Warning)</td></tr>
<tr><td>_ _ 0 9</td><td>BWNG (Battery warning)</td></tr>
<tr><td>_ _ 0 A</td><td>SA (Speed reached)</td></tr>
<tr><td>_ _ 0 C</td><td>ZSP (Zero speed detection)</td></tr>
<tr><td>_ _ 0 F</td><td>CDPS (Variable gain selection)</td></tr>
<tr><td>_ _ 1 0</td><td>CLDS (During fully closed loop control)</td></tr>
<tr><td>_ _ 1 1</td><td>ABSV (Absolute position undetermined)</td></tr>
<tr><td>_ _ 1 7</td><td>MTTR (During tough drive)</td></tr>
</table></td><td></td></tr>
</table>

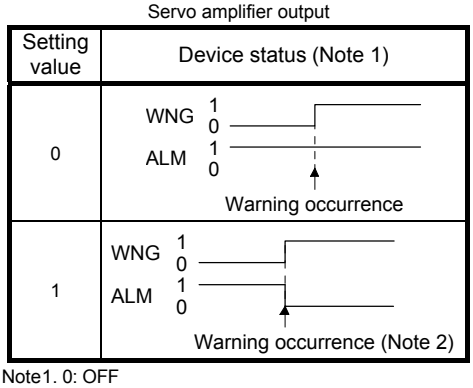
MR-J3W-_B			MR-J4W2-_B		
No.	Name and function	Initial value	No.	Name and function	Initial value
PD08	This parameter is not used. Do not change the value.	0004h	PD08	Output device selection 2 You can assign any output device to the CN3-24 pin for each axis. CINP (AND in-position) is assigned to the all axes in the initial setting. The devices that can be assigned and the setting method are the same as in [Pr. PD07].	
				_ _ x x: Device selection Refer to table 4.6 in [Pr. PD07] for settings.	04h
				_ x _ _: All-axis output condition selection 0: AND output When all axes of A and B meet a condition, the device will be enabled (on or off). 1: OR output When all axes of A or B meet a condition, the device will be enabled (on or off). The digit will be enabled when "All axes (0 _ _ _)" is selected.	0h
				x _ _ _: Output axis selection 0: All axes 1: A-axis 2: B-axis	0h
PD09	Output signal device selection 3 (CN3-11 for A-axis and CN3-24 for B-axis) Any input signal can be assigned to the CN3-11 pin for A-axis and CN3-24 pin for B-axis. In the factory setting, ALM-A/ALM-B is assigned. The devices that can be assigned and the setting method are the same as in [Pr. PD07]. 0 0 x x: Select the output device of the CN3-11 pin for Aaxis and CN3-24 pin for B-axis.	0003h	PD09	Output device selection 3 You can assign any output device to the CN3-11 pin for each axis. CALM (AND malfunction) is assigned to the all axes in the initial setting. The devices that can be assigned and the setting method are the same as in [Pr. PD07].	
				_ _ x x: Device selection Refer to table 4.6 in [Pr. PD07] for settings.	03h
				_ x _ _: All-axis output condition selection 0: AND output When all axes of A and B meet a condition, the device will be enabled (on or off). 1: OR output When each axis of A or B meet a condition, the device will be enabled (on or off). The digit will be enabled when "All axes (0 _ _ _)" is selected.	0h
				x _ _ _: Output axis selection 0: All axes 1: A-axis 2: B-axis	0h

<table>
<tr><th colspan="3">MR-J3W-_B</th><th colspan="3">MR-J4W2-_B</th></tr>
<tr><th>No.</th><th>Name and function</th><th>Initial value</th><th>No.</th><th>Name and function</th><th>Initial value</th></tr>
<tr><td>PD11</td><td>This parameter is not used. Do not change the value.</td><td>0004h</td><td>PD11</td><td>Input filter setting
Select the input filter.</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ _ x:
Input signal filter selection
Refer to the servo system controller instruction manual for the setting.
If external input signal causes chattering due to noise, etc., input filter is used to suppress it.
0: None
1: 0.888 [ms]
2: 1.777 [ms]
3: 2.666 [ms]
4: 3.555 [ms]</td><td>4h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td>PD12</td><td>This parameter is not used. Do not change the value.</td><td>0000h</td><td>PD12</td><td>Function selection D-1</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ _ x :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
Servo motor or linear servo motor thermistor enabled/disabled selection (Supported by servo amplifiers with software version A5 or later.)
0: Enabled
1: Disabled
For servo motors or linear servo motor without thermistor, the setting will be disabled.</td><td>0h</td></tr>
<tr><td>PD14</td><td>Function selection D-3
Set the ALM-A/ALM-B output signal at warning occurrence.

0 0 x 0:
Selection of output device at warning occurrence
Select the warning (WNG-A/WNG-B) and malfunction (ALM-A/ALM-B) output status at warning occurrence.

Output of Servo amplifier
 

Note. 0: OFF
1: ON</td><td>0000h</td><td>PD14</td><td>Function selection D-3</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ _ x :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ _ x _ :
Selection of output device at warning occurrence
Select WNG (Warning) and ALM (Malfunction) output status at warning occurrence.

Servo amplifier output
 

Note1. 0: OFF
1: ON
2. Although ALM is turned off upon occurrence of the warning, the forced stop deceleration is performed.</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>_ x _ _ :
For manufacturer setting</td><td>0h</td></tr>
<tr><td></td><td></td><td></td><td></td><td>x _ _ _ :
For manufacturer setting</td><td>0h</td></tr>
</table>

4. APPLICATION OF FUNCTIONS

POINT

●Refer to "Part 6 Common Reference Material" for the application of functions.
- J3 compatibility mode
  MR-J4W2-_B servo amplifiers have two operation mode: "J4 mode" is for using all functions with full performance and "J3 compatibility mode" for using the conventional MR-J3-_B_ servo amplifiers.

MEMO

Part 5
Review on Replacement of MR-J3-DU_ with MR-J4-DU_

Part 5: Review on Replacement of MR-J3-DU_ with MR-J4-DU_

1. SUMMARY

The following explains the changes when the large capacity of 200 V (30 kW to 37 kW)/400 V (30 kW to 55 kW) of MELSERVO-J3 is replaced with MR-J4-DU_.

2. FUNCTIONS AND CONFIGURATION

2.1 Differences between MR-J3-DU_ and MR-J4-DU_

Item	MR-J3-DU_		MR-J4-DU_		Compatibility (Note)	Reference material/items
Converter unit	200 V class	MR-J3-CR55K	200 V class	MR-CR55K	○	2.2 Combinations of the converter units, drive unit and servo motors.
	400 V class	MR-J3-CR55K4	400 V class	MR-CR55K4		
Drive Unit	200 V class	MR-J3-DU30K_ MR-J3-DU37K_	200 V class	MR-J4-DU30K_ MR-J4-DU37K_	○	
	400 V class	MR-J3-DU30K_4 MR-J3-DU37K_4 MR-J3-DU45K_4 MR-J3-DU55K_4	400 V class	MR-J4-DU30K_4 MR-J4-DU37K_4 MR-J4-DU45K_4 MR-J4-DU55K_4		
Installation	A heat sink is attached outside the cabinet.		A heat sink is attached outside the cabinet.		○	3 Installation
Protection coordination connector	The termination connector is required (MR-J3-TM).		The termination connector is not required.		-	
Power consumption display	Not available		Available (Use converter unit [Pr. PA08] and [Pr. PA15] to set this value.)		-	
SEMI-F47 function selection	Not available		Available (Use converter unit [Pr. PA17] and [Pr. PA18], and drive unit [Pr. PA20] and [Pr. PF25] to set this value.)		-	
Regenerative resistor	Some regenerative options cannot be used for MR-J4.				-	7.5 Regenerative option
Dynamic brakes	Some dynamic brakes cannot be used for MR-J4.				-	7.6 External dynamic brake

Note. ○: Compatible

2.2 Combination of converter unit, drive unit, and servo motor

POINT

●MR-J3-_A_/MR-J3-_B_ cannot drive an HG motor. When the servo motor is replaced with an HG motor, simultaneous replacement withMR-J4-_A_/MR-J4-_B_ and an HG motor is necessary.

●When an "HA-LP motor " shown below is used, simultaneous replacement with "MR-J4-_A_/MR-J4-_B_ + HG motor is recommended. When an HG motor is adopted, the capacity of the servo amplifier needs to be changed. (Consider replacement, referring to "2.7 Comparison of Servo Motor Torque Characteristics" described in "Part 7: Review on Replacement of Motor".)

Existing device models		Replacement models for simultaneous replacement (example)	
Servo motor	Servo amplifier	Servo motor	Servo amplifier
HA-LP25K14	MR-J3-DU30K_4	HG-JR25K14	MR-J4-22K_4
		HG-JR25K14R-S_ (Note)	
HA-LP30K2(4)	MR-J3-DU30K_(4)	HG-JR22K1M(4)	MR-J4-22K_(4)
		HG-JR22K1M(4)R-S_ (Note)	
HA-LP37K2(4)	MR-J3-DU37K_(4)	HG-JR30K1M(4)	MR-J4-DU30K_(4)
		HG-JR30K1M(4)R-S_ (Note)	
HA-LP45K24	MR-J3-DU45K_4	HG-JR37K1M4	MR-J4-DU37K_4
		HG-JR37K1M4R-S_ (Note)	
HA-LP55K24	MR-J3-DU55K_4	HG-JR45K1M4	MR-J4-DU45K_4
		HG-JR45K1M4R-S_ (Note)	

Note. Only flanges and shaft ends have compatibility in mounting.
Please contact your local sales office regarding the motor model and its delivery, since it is developed upon receipt of order.

(1) MR-J3 series

(a) 200 V class

Converter unit	Servo amplifier	Servo motor HA-LP_		
		1000 r/min	1500 r/min	2000 r/min
MR-J3-CR55K	MR-J3-DU30K_	30K1	30K1M	30K2
	MR-J3-DU37K_	37K1	37K1M	37K2

(b) 400 V class

Converter unit	Servo amplifier	Servo motor HA-LP_		
		1000 r/min	1500 r/min	2000 r/min
MR-J3-CR55K4	MR-J3-DU30K_4	25K14 30K14	30K1M4	30K24
	MR-J3-DU37K_4	37K14	37K1M4	37K24
	MR-J3-DU45K_4		45K1M4	45K24
	MR-J3-DU55K_4		50K1M4	55K24

(2) MR-J4 series

(a) 200 V class

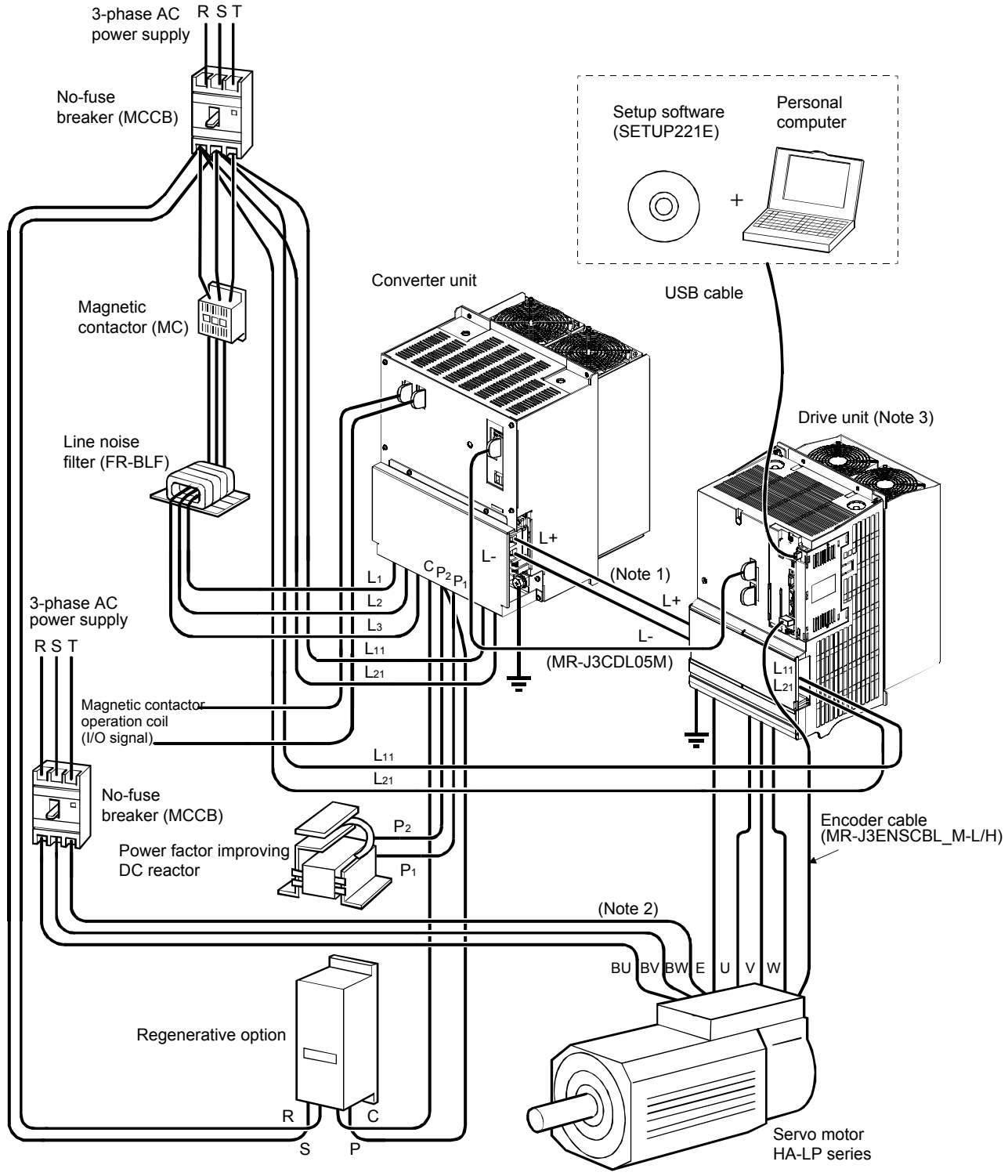
Converter unit	Drive unit	Servo motor	
		HG-JR_	
		1000 r/min series	1500 r/min series
MR-CR55K	MR-J4-DU30K_	30K1	30K1M
	MR-J4-DU37K_	37K1	37K1M

(b) 400 V class

Converter unit	Drive unit	Servo motor	
		HG-JR_	
		1000 r/min series	1500 r/min series
MR-CR55K4	MR-J4-DU30K_4	30K14	30K1M4
	MR-J4-DU37K_4	37K14	37K1M4
	MR-J4-DU45K_4		45K1M4
	MR-J4-DU55K_4		55K1M4

2.3 Configuration including peripheral equipment

(1) MR-J3-DU_



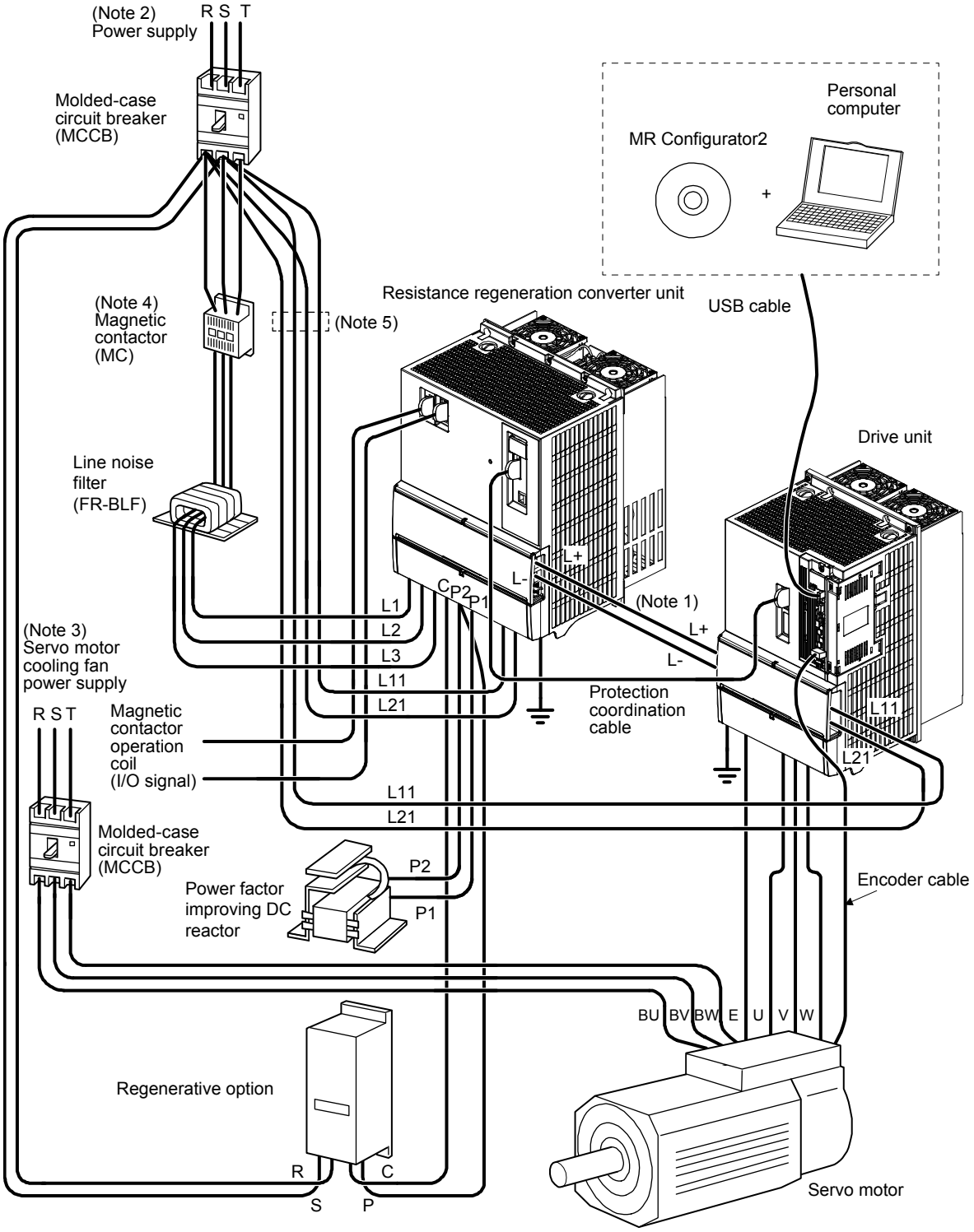
Note 1. The L+ and L- connection conductors used to connect a converter unit to a drive unit are standard accessories. The converter unit is attached to the drive unit actually. (Refer to Section 3 in this part.)

2. The power supply of the servo motor cooling fan differs depending on the capacity of a servo motor. Refer to Instruction Manuals

3. For MR-J3-DU30KB4 or MR-J3-DU37KB4.

(2) MR-J4-DU_

The diagram shows MR-J4-DU30KB4 and MR-J4-DU37KB4. The interface connection of MR-J4-DU_ is the same as that of MR-J4-_. Refer to each servo amplifier instruction manual.



Note 1. The bus bars on L+ and L- for connecting the resistance regeneration converter unit to the drive unit are standard accessories. In the actual connection, the resistance regeneration converter unit is closely mounted to the drive unit.

2. For the power supply specifications, refer to "Part 6: Common Reference Material".
3. For specifications of the cooling fan power supply, refer to "Servo Motor Instruction Manual (Vol. 3)".
4. An bus voltage may drop, depending on the main circuit voltage and operation pattern, causing a dynamic brake deceleration during a forced stop deceleration. When dynamic brake deceleration is not required, delay the time to turn off the magnetic contactor.
5. If the wire used for L11 and L21 is thinner than the wire used for L1, L2, and L3, use a molded-case circuit breaker. (Refer to Section 7.3 in this part.)

3. INSTALLATION

When using heat generating equipment such as the regenerative option, install them with full consideration of heat generation so that the converter unit and drive unit is not affected.
Install the converter unit and drive unit on a perpendicular wall in the correct vertical direction.

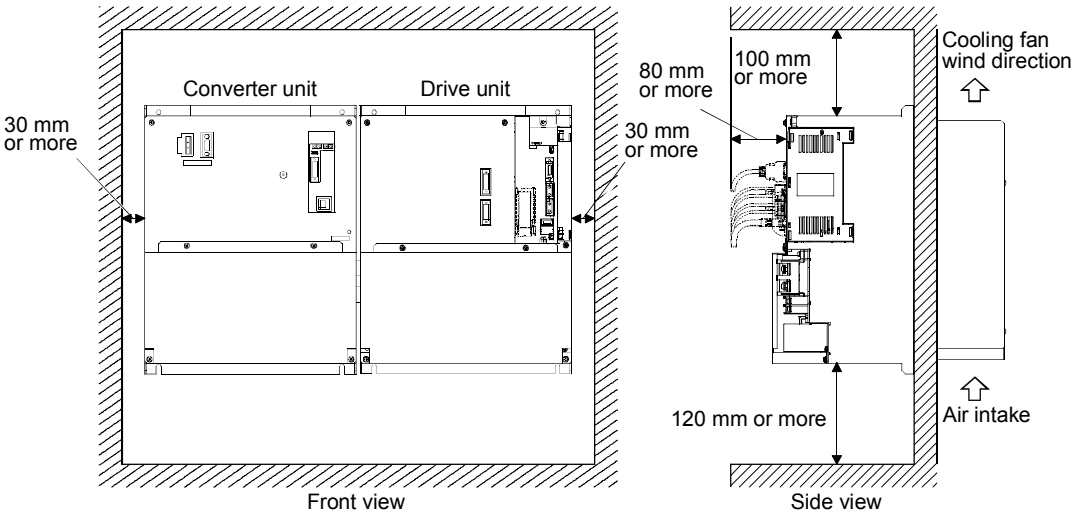
3.1 Installation direction and clearances

⚠CAUTION
- The equipment must be installed in the specified direction. Otherwise, it may cause a malfunction.
- Maintain specified clearances between the converter unit/drive unit and the inner surfaces of a control cabinet or other equipment. Otherwise, it may cause a malfunction.

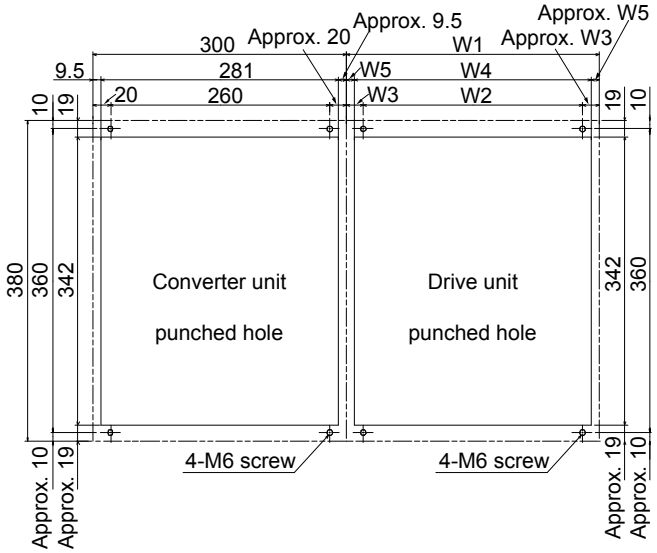
(1) MR-J3-DU_

(a) Installation

POINT
- Make sure to connect a drive unit to the right side of a converter unit as shown in the diagram.



(b) Mounting dimensional diagram



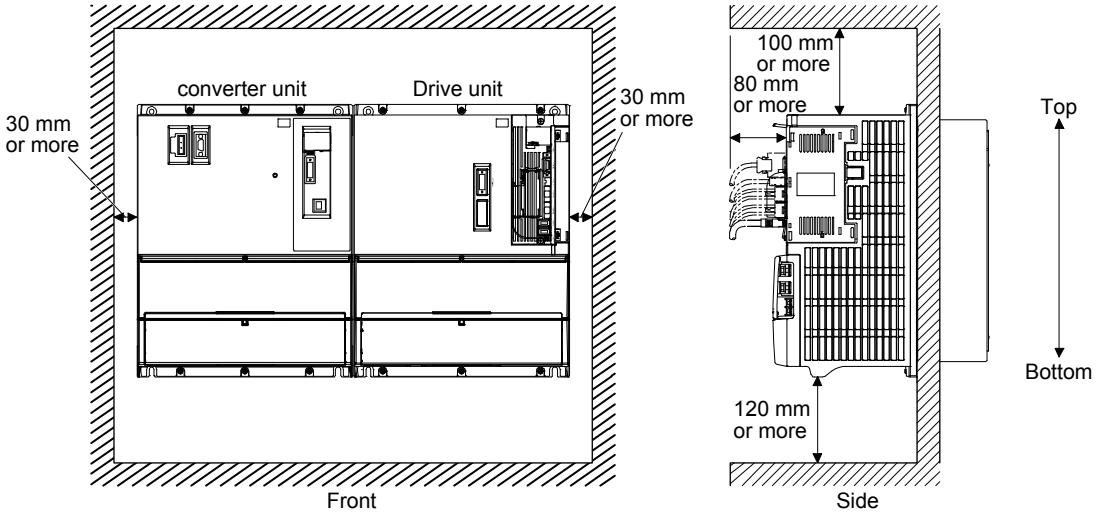
[Unit: mm]

Drive unit model	Dimensions					
	W1	W2	W3	W4	W5	A
MR-J3-DU30K_ MR-J3-DU37K_ MR-J3-DU45K_4 MR-J3-DU55K_4	300	260	20	281	9.5	M6
MR-J3-DU30K_4 MR-J3-DU37K_4	240	120	60	222	9	M5

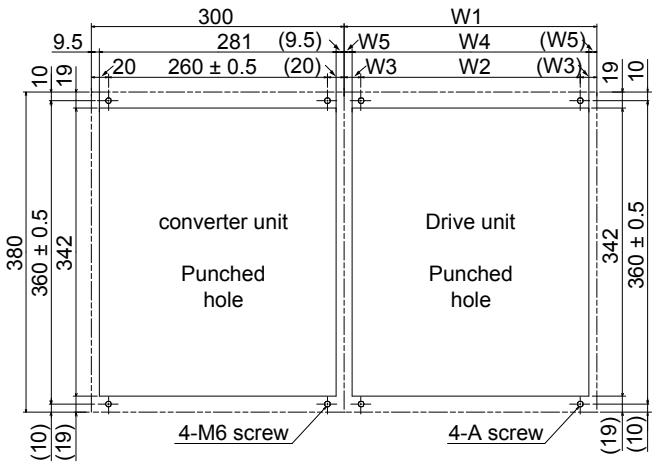
(2) MR-J4-DU_

(a) Installation

POINT
●Make sure to connect a drive unit to the right side of a converter unit as shown in the diagram.



(b) Mounting hole process drawing



Converter unit Drive unit	Variable dimensions [mm]					Screw size
	W1	W2	W3	W4	W5	A
MR-J4-DU30K_ MR-J4-DU37K_ MR-J4-DU45K_4 MR-J4-DU55K_4	300	260 ± 0.5	20	281	9.5	M6
MR-J4-DU30K_4 MR-J4-DU37K_4	240	120 ± 0.5	60	222	9	M5

3.2 Magnetic contactor control connector (CNP1)

> ⚠CAUTION ●Always connect the magnetic contactor wiring connector to the converter unit. If the connector is not connected, an electric shock may occur since CNP1-1 and L11 are always conducting.

By enabling magnetic contactor drive output, the main circuit power supply can be shut off automatically when an alarm occurs in the converter unit or the drive unit.
To enable magnetic contactor drive output, set [Pr. PA02] of the converter unit to "_ _ _ 1" (initial value).

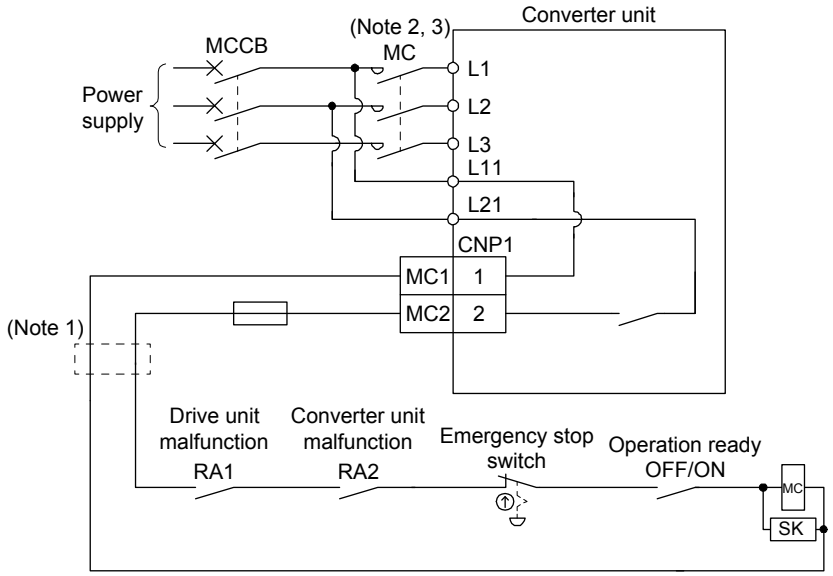
[Pr. PA02]

0	0	0	1

Magnetic contactor drive output selection
0: Disabled
1: Enabled

(1) When magnetic contactor drive output is enabled
To control the magnetic contactor, connect the magnetic contactor control connector (CNP1) to the coil of the magnetic contactor.

Internal connection diagram of CNP1



Note 1. A step-down transformer is required when coil voltage of the magnetic contactor is 200 V class, and the converter unit and the drive unit are 400 V class.
2. The bus voltage decreases depending on the main circuit voltage and operation pattern, which may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, delay the time to turn off the magnetic contactor.
3. When the voltage between L11 and L21 drops due to an instantaneous power failure and others, the magnetic contactor is turned off.

When the converter unit receives a start command from the drive unit, CNP1-2 and L21 are shorted, and the control circuit power is supplied to the magnetic contactor. When the control circuit power is supplied, the magnetic contactor is turned on, and the main circuit power is supplied to the converter unit.
In the following cases, CNP1-2 and L21 in the converter unit are opened, and the main circuit power supply is automatically shut off.

(a) An alarm has occurred in the converter unit.

(b) An alarm has occurred in the drive unit.

(c) The EM1 (forced stop) of the converter unit was turned off.

(d) [AL. 95 STO warning] has occurred in the drive unit (J4 series).

(2) When magnetic contactor drive output is disabled
The main circuit power supply is not automatically shut off even when an alarm occurs in the resistance regeneration converter unit or the drive unit. Therefore, configure an external circuit to shut off the main circuit power supply when detecting an alarm.

4. SIGNALS AND WIRING

4.1 Comparison of standard connection diagrams

⚠WARNING	●Insulate the connections of the power supply terminals. Otherwise, an electric shock may occur.

⚠CAUTION	●Be sure to connect a magnetic contactor between the power supply and the main circuit power supply (L1/L2/L3) of the power regeneration converter unit, in order to configure a circuit that shuts off the power supply by the magnetic contactor. If the magnetic contactor is not connected, a large current keeps flowing and may cause a fire when the power regeneration converter unit or the drive unit malfunctions. ●Use ALM (Malfunction) to shut the power off. Not doing so may cause a fire when the power regeneration converter unit malfunctions and causes the AC reactor to overheat. ●Connect the wires to the correct phase terminals (U/V/W) of the servo amplifier and servo motor. Not doing so may cause unexpected operation. ●Do not connect the servo motor directly to the 3-phase 200 V power supply or the 3-phase 400 V power supply. Otherwise a malfunction may be caused. ●During power-on, do not open or close the motor power line. Otherwise, a malfunction or faulty may occur.

POINT
●When using an external dynamic brake, refer to the Servo Amplifier Instruction Manual.

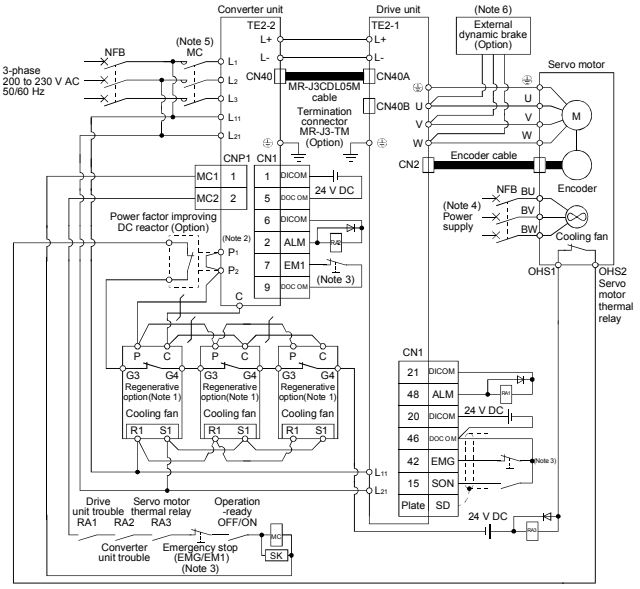
4.1.1 When magnetic contactor drive output is enabled (factory setting)

POINT
●The converter unit controls the magnetic contactor. ●Connect the converter unit and the drive unit with MR-J3CDL05M protection coordination cable. (For MR-J3-DU_, always connect a terminal connector (MR-J3-TM) as well.) ●Always turn on or off the control circuit power supplies of the converter unit and the drive unit simultaneously.

(1) 200 V class

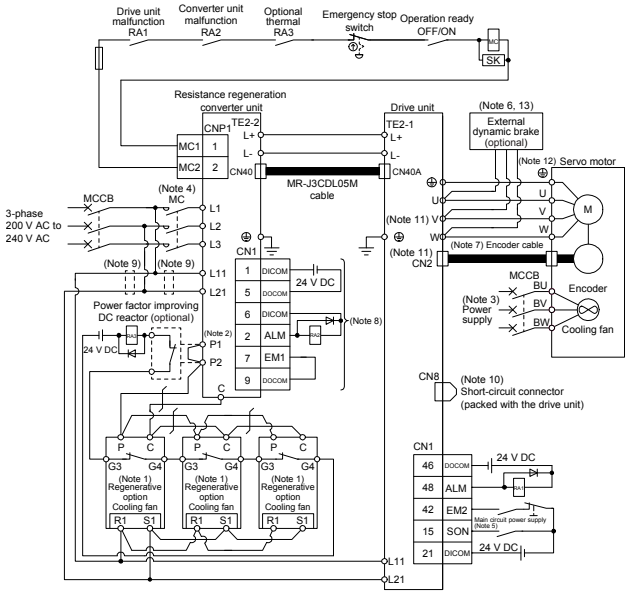
(a) MR-J3-DU_A/MR-J4-DU_A

MR-J3-DU_A



Note 1. For the MR-RB137. For the MR-RB137, three units are used as one set (permissible wattage: 3900W).
2. When using the Power factor improving DC reactor, disconnect the short bar across P1 and P2.
3. Make up a sequence that will concurrently turn off the Emergency stop (EMG) of the drive unit and the Forced stop (EM1) of the converter unit, and shut off the main circuit power supply by the external sequence.
4. For specifications of cooling fan power supply, refer to "MR-J3-_A_ Servo amplifier instruction manual"
5. Be sure to use a magnetic contactor with an operation delay time of 80ms or less. The operation delay time is the time interval between current being applied to the coil until closure of contacts.
6. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an emergency stop and such conditions. Ensure the safety in the entire system.

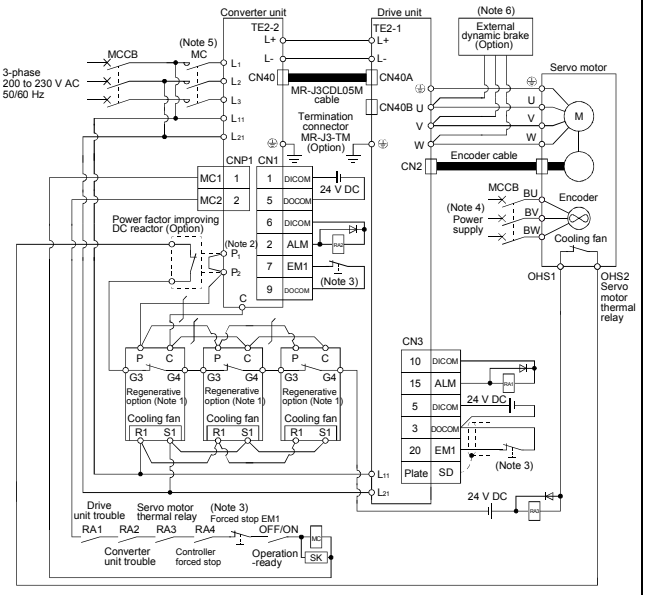
MR-J4-DU_A



Note 1. This is for MR-RB137. For the MR-RB137, three units are used as one set (permissible regenerative power: 3900 W).
2. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part 8: section 7.3" for details.
3. For specifications of the cooling fan power supply, refer to "Servo Motor Instruction Manual (Vol. 3)".
4. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. The bus voltage decreases depending on the main circuit voltage and operation pattern, which may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.
5. To prevent an unexpected restart of the drive unit, configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off.
6. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an alarm occurrence for which the servo motor does not decelerate to stop. Ensure the safety in the entire equipment. For alarms for which the servo motor does not decelerate to stop and for wiring of the external dynamic brake, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".
7. For the encoder cable, use of the option cable is recommended. For selecting cables, refer to "Servo Motor Instruction Manual (Vol. 3)".
8. This diagram shows sink I/O interface. For source I/O interface, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".
9. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.)
10. When not using the STO function, attach the short-circuit connector supplied with the drive unit.
11. Do not connect a servo motor of the wrong axis to U, V, W, or CN2 of the drive unit. Otherwise, a malfunction may occur.
12. For connecting servo motor power wires, refer to "Servo Motor Instruction Manual (Vol. 3)".
13. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB. Failure to do so will cause the drive unit to become servo-off when an instantaneous power failure occurs.

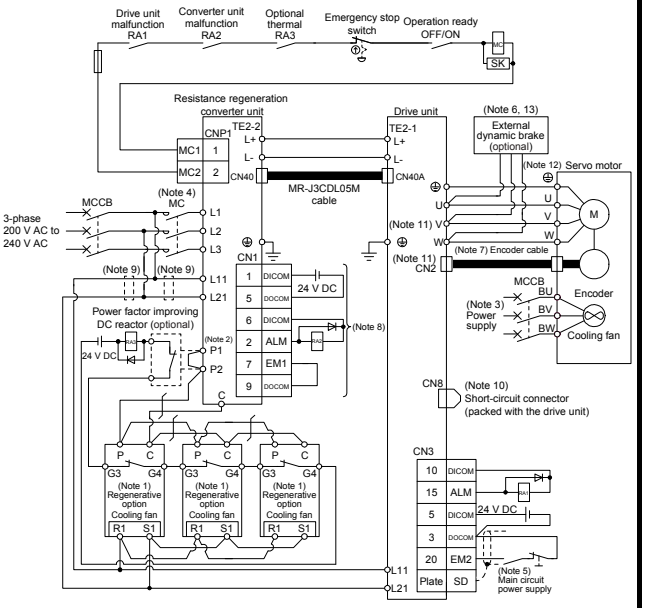
(b) MR-J3-DU_B/MR-J4-DU_B

MR-J3-DU_B



Note 1. For the MR-RB137. For the MR-RB137, three units are used as one set (permissible wattage: 3900W).
2. When using the Power factor improving DC reactor, disconnect the short bar across P1 and P2.
3. Make up a sequence that will concurrently turn off the Emergency stop (EMG) of the drive unit and the Forced stop (EM1) of the converter unit, and shut off the main circuit power supply by the external sequence.
4. For specifications of cooling fan power supply, refer to "MR-J3-_A_ Servo amplifier instruction manual"
5. Be sure to use a magnetic contactor with an operation delay time of 80ms or less. The operation delay time is the time interval between current being applied to the coil until closure of contacts.
6. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an emergency stop and such conditions. Ensure the safety in the entire system.

MR-J4-DU_B

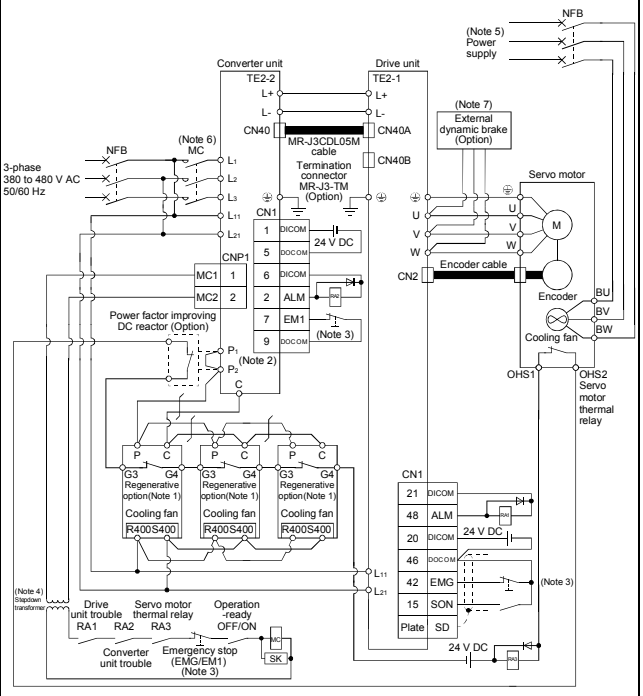


Note 1. This is for MR-RB137. For the MR-RB137, three units are used as one set (permissible regenerative power: 3900 W).
2. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part 8: section 7.3" for details.
3. For specifications of the cooling fan power supply, refer to "Servo Motor Instruction Manual (Vol. 3)".
4. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. The bus voltage decreases depending on the main circuit voltage and operation pattern, which may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.
5. To prevent an unexpected restart of the drive unit, configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off.
6. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an alarm occurrence for which the servo motor does not decelerate to stop. Ensure the safety in the entire equipment. For alarms for which the servo motor does not decelerate to stop and for wiring of the external dynamic brake, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".
7. For the encoder cable, use of the option cable is recommended. For selecting cables, refer to "Servo Motor Instruction Manual (Vol. 3)".
8. This diagram shows sink I/O interface. For source I/O interface, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".
9. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.)
10. When not using the STO function, attach the short-circuit connector supplied with the drive unit.
11. Do not connect a servo motor of the wrong axis to U, V, W, or CN2 of the drive unit. Otherwise, a malfunction may occur.
12. For connecting servo motor power wires, refer to "Servo Motor Instruction Manual (Vol. 3)".
13. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB. Failure to do so will cause the drive unit to become servo-off when an instantaneous power failure occurs.

(2) 400 V class

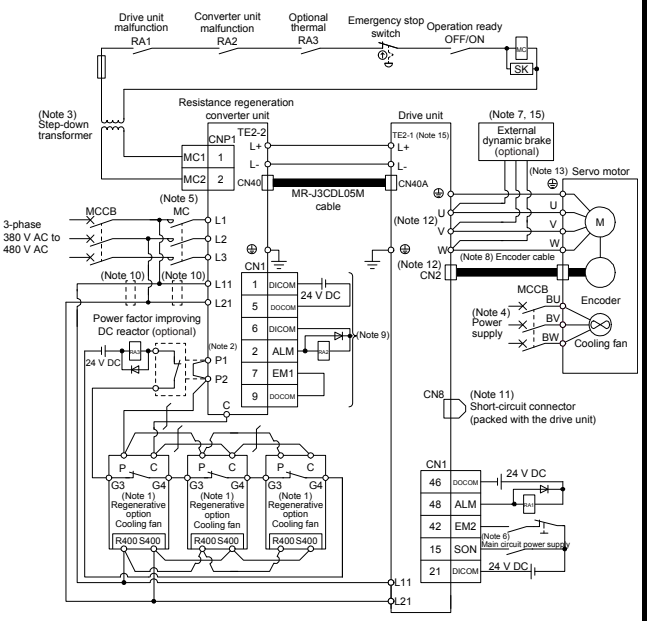
(a) MR-J3-DU_A4/MR-J4-DU_A4

MR-J3-DU_A4



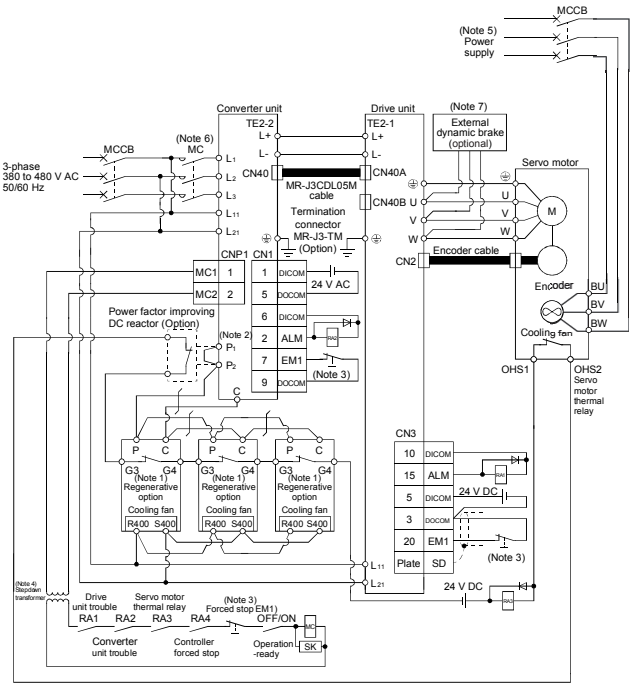
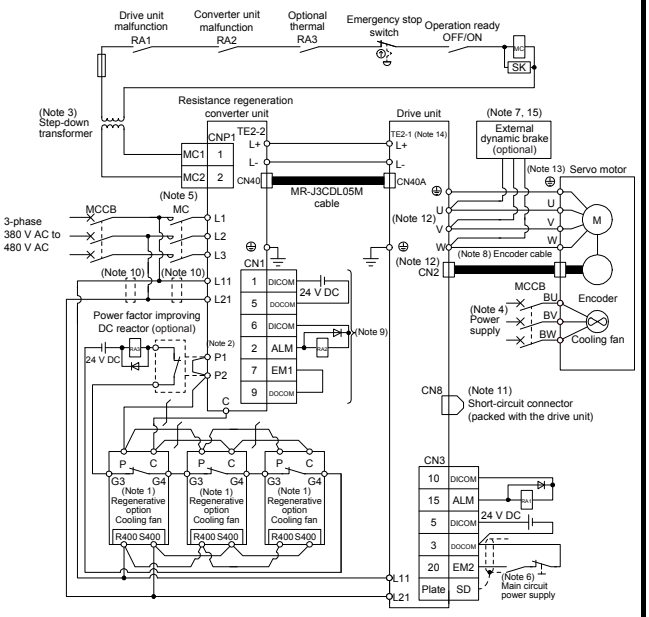
Note 1. For the MR-RB138-4. For the MR-RB138-4, three units are used as one set (permissible wattage: 3900W).
2. When using the Power factor improving DC reactor, disconnect the short bar across P1 and P2.
3. Make up a sequence that will concurrently turn off the Emergency stop (EMG) of the drive unit and the Forced stop (EM1) of the converter unit, and shut off the main circuit power supply by the external sequence.
4. Stepdown transformer is required for coil voltage of magnetic contactor more than 200V class.
5. For specifications of cooling fan power supply, refer to "MR-J3-_A_ Servo amplifier instruction manual".
6. Be sure to use a magnetic contactor with an operation delay time of 80ms or less. The operation delay time is the time interval between current being applied to the coil until closure of contacts.
7. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an emergency stop and such conditions. Ensure the safety in the entire system.

MR-J4-DU_A4



Note 1. This is for MR-RB13V-4. For the MR-RB13V-4, three units are used as one set (permissible regenerative power: 3900 W).
2. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part 8: section 7.3" for details.
3. A step-down transformer is required when the coil voltage of the magnetic contactor is 200 V class.
4. For specifications of the cooling fan power supply, refer to "Servo Motor Instruction Manual (Vol. 3)".
5. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. The bus voltage decreases depending on the main circuit voltage and operation pattern, which may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.
6. To prevent an unexpected restart of the drive unit, configure a circuit to turn off EM2 in the drive unit when the main circuitpower is turned off.
7. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an alarm occurrence for which the servo motor does not decelerate to stop. Ensure the safety in the entire equipment. For alarms for which the servo motor does not decelerate to stop and for wiring of the external dynamic brake, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".
8. For the encoder cable, use of the option cable is recommended. For selecting cables, refer to "Servo Motor Instruction Manual (Vol. 3)".
9. This diagram shows sink I/O interface. For source I/O interface, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".
10. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.)
11. When not using the STO function, attach the short-circuit connector supplied with the drive unit.
12. Do not connect the servo motor of a wrong axis to U, V, W, or CN2 of the drive unit. Otherwise, a malfunction may occur.
13. For connecting servo motor power wires, refer to "Servo Motor Instruction Manual (Vol. 3)".
14. For the MR-J4-DU30K_4(-RJ) and MR-J4-DU37K_4(-RJ), the terminal block is TE2.
15. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB. Failure to do so will cause the drive unit to become servo-off when an instantaneous power failure occurs.

(b) MR-J3-DU_B4/MR-J4-DU_B4

MR-J3-DU_B4	MR-J4-DU_B4
	
Note 1. For the MR-RB138-4. For the MR-RB138-4, three units are used as one set (permissible wattage: 3900W). 2. When using the Power factor improving DC reactor, disconnect the short bar across P1 and P2. 3. Make up a sequence that will concurrently turn off the Emergency stop (EM1) of the drive unit and the Forced stop (EM1) of the converter unit, and shut off the main circuit power supply by the external sequence. 4. Stepdown transformer is required for coil voltage of magnetic contactor more than 200V class. 5. For specifications of cooling fan power supply, refer to "MR-J3-_A_ Servo amplifier instruction manual". 6. Be sure to use a magnetic contactor with an operation delay time of 80ms or less. The operation delay time is the time interval between current being applied to the coil until closure of contacts. 7. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an emergency stop and such conditions. Ensure the safety in the entire system.	Note 1. This is for MR-RB13V-4. For the MR-RB13V-4, three units are used as one set (permissible regenerative power: 3900 W). 2. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part 8: section 7.4" for details. 3. A step-down transformer is required when the coil voltage of the magnetic contactor is 200 V class. 4. For specifications of the cooling fan power supply, refer to "Servo Motor Instruction Manual (Vol. 3)". 5. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. The bus voltage decreases depending on the main circuit voltage and operation pattern, which may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor. 6. To prevent an unexpected restart of the drive unit, configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off. 7. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an alarm occurrence for which the servo motor does not decelerate to stop. Ensure the safety in the entire equipment. For alarms for which the servo motor does not decelerate to stop and for wiring of the external dynamic brake, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual". 8. For the encoder cable, use of the option cable is recommended. For selecting cables, refer to "Servo Motor Instruction Manual (Vol. 3)". 9. This diagram shows sink I/O interface. For source I/O interface, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual". 10. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.) 11. When not using the STO function, attach the short-circuit connector supplied with the drive unit. 12. Do not connect the servo motor of a wrong axis to U, V, W, or CN2 of the drive unit. Otherwise, a malfunction may occur. 13. For connecting servo motor power wires, refer to "Servo Motor Instruction Manual (Vol. 3)". 14. For the MR-J4-DU30K_4(-RJ) and MR-J4-DU37K_4(-RJ), the terminal block is TE2. 15. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB. Failure to do so will cause the drive unit to become servo-off when an instantaneous power failure occurs.

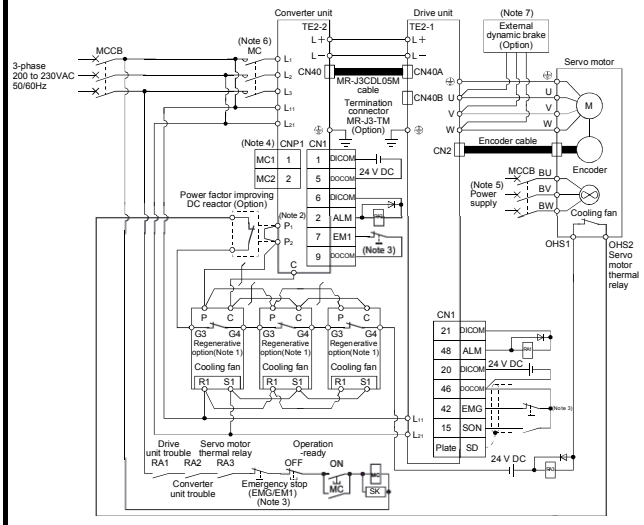
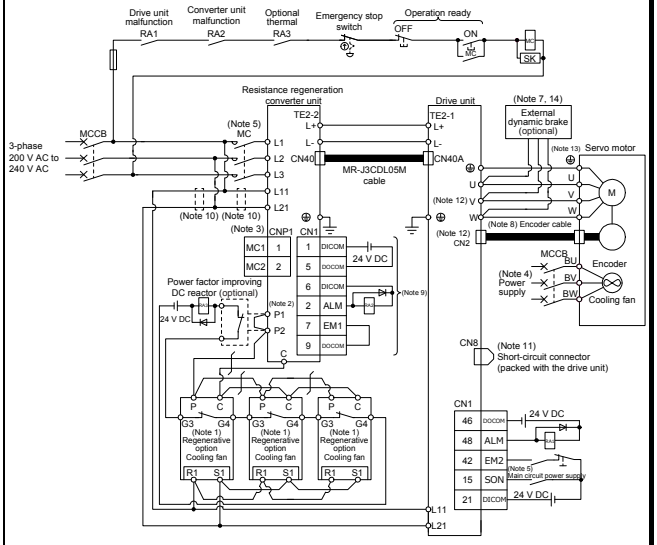
4.1.2 When magnetic contactor control connector (CNP1) is made invalid

POINT

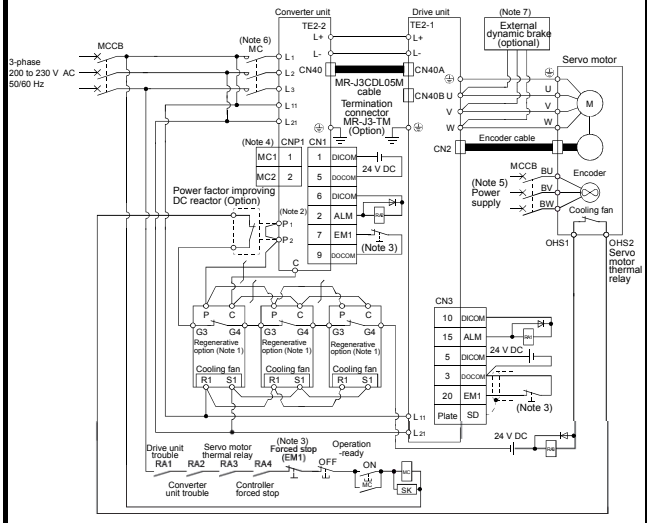
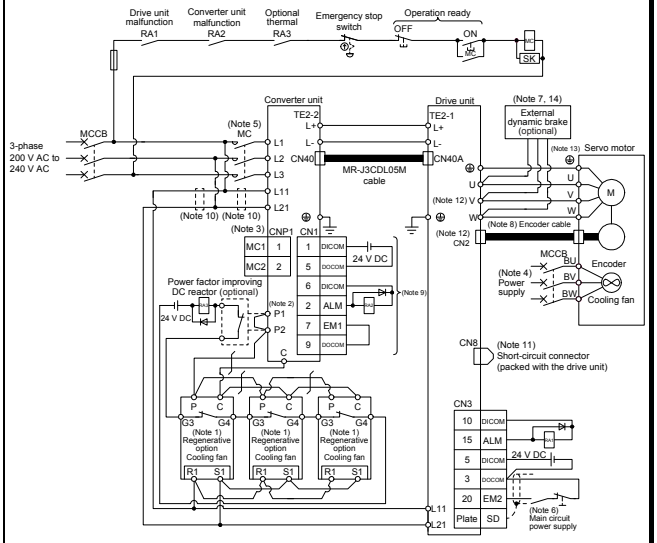
- When making CNP1 invalid, set "0000" in [Pr. PA02]. (Refer to Part: 5).
- Always connect a protection coordination cable (MR-J3CDL05M). (For MR-J3-DU_, always connect a terminal connector (MR-J3-TM) as well.) When they are not connected properly, the servo-on may not be turned on.
- Always turn on or off the control circuit power supplies of the converter unit and the drive unit simultaneously.

(1) 200 V class

(a) MR-J3-DU_A/MR-J4-DU_A

MR-J3-DU_A	MR-J4-DU_A
	
Note 1. For the MR-RB137. For the MR-RB137, three units are used as one set (permissible wattage: 3900W). 2. When using the Power factor improving DC reactor, disconnect the short bar across P1 and P2. 3. Make up a sequence that will concurrently turn off the Emergency stop (EMG) of the drive unit and the Forced stop (EM1) of the converter unit, and shut off the main circuit power supply by the external sequence. 4. Keep the wiring connector for the magnetic contactor connected to CNP1 of the converter unit. Unconnected status may cause an electric shock. 5. For specifications of cooling fan power supply, refer to "MR-J3-_A_ Servo amplifier instruction manual". 6. 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 between current being applied to the coil until closure of contacts. 7. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an emergency stop and such conditions. Ensure the safety in the entire system.	Note 1. This is for MR-RB137. For the MR-RB137, three units are used as one set (permissible regenerative power: 3900 W). 2. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part 8: section 7.3" for details. 3. Always connect the magnetic contactor wiring connector to CNP1 of the resistance regeneration converter unit. If the connector is not connected, Aan electric shock may occur. 4. For specifications of the cooling fan power supply, refer to "Servo Motor Instruction Manual (Vol. 3)". 5. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. The bus voltage decreases depending on the main circuit voltage and operation pattern, which may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor. 6. To prevent an unexpected restart of the drive unit, configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off. 7. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an alarm occurrence for which the servo motor does not decelerate to stop. Ensure the safety in the entire equipment. For alarms for which the servo motor does not decelerate to stop and for wiring of the external dynamic brake, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual". 8. For the encoder cable, use of the option cable is recommended. For selecting cables, refer to "Servo Motor Instruction Manual (Vol. 3)". 9. This diagram shows sink I/O interface. For source I/O interface, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual". 10. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.) 11. When not using the STO function, attach the short-circuit connector supplied with the drive unit. 12. Do not connect the servo motor of a wrong axis to U, V, W, or CN2 of the drive unit. Otherwise, a malfunction may occur. 13. For connecting servo motor power wires, refer to "Servo Motor Instruction Manual (Vol. 3)". 14. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB. Failure to do so will cause the drive unit to become servo-off when an instantaneous power failure occurs.

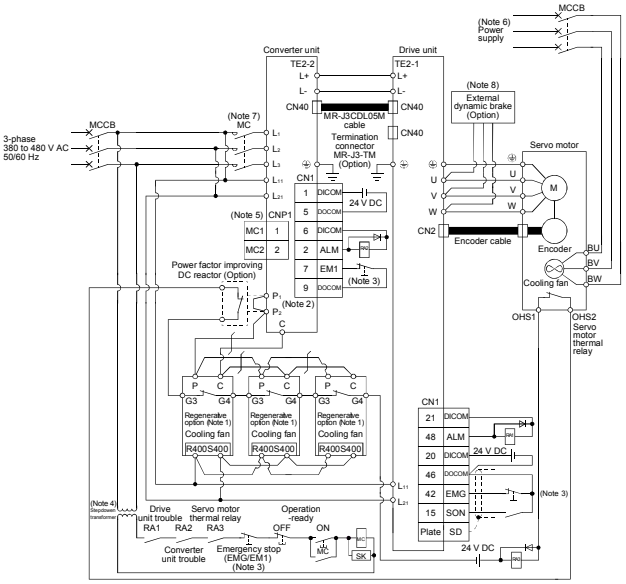
(b) MR-J3-DU_B/MR-J4-DU_B

MR-J3-DU_B	MR-J4-DU_B
	
Note 1. For the MR-RB137. For the MR-RB137, three units are used as one set (permissible wattage: 3900 W). 2. When using the Power factor improving DC reactor, disconnect the short bar across P1 and P2. 3. Make up a sequence that turns off the drive unit forced stop (EM1) and the converter unit forced stop (EM1) at the same time. 4. Keep the wiring connector for the magnetic contactor connected to CNP1 of the converter unit. Unconnected status may cause an electric shock. 5. For specifications of the cooling fan power supply, refer to "Servo Motor Instruction Manual (Vol. 3)". 6. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. 7. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an alarm occurrence for which the servo motor does not decelerate to stop.	Note 1. This is for MR-RB137. For the MR-RB137, three units are used as one set (permissible regenerative power: 3900 W). 2. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part: 8 section 7.3" for details. 3. Always connect the magnetic contactor wiring connector to CNP1 of the converter unit. If the connector is not connected, an electric shock may occur. 4. For specifications of the cooling fan power supply, refer to "Servo Motor Instruction Manual (Vol. 3)". 5. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. The bus voltage decreases depending on the main circuit voltage and operation pattern, which may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor. 6. To prevent an unexpected restart of the drive unit, configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off. 7. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an alarm occurrence for which the servo motor does not decelerate to stop. Ensure the safety in the entire equipment. For alarms for which the servo motor does not decelerate to stop, refer to chapter 6. For wiring of the external dynamic brake, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual". 8. For the encoder cable, use of the option cable is recommended. For selecting cables, refer to "Servo Motor Instruction Manual (Vol. 3)". 9. This diagram shows sink I/O interface. For source I/O interface, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual". 10. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.) 11. When not using the STO function, attach the short-circuit connector supplied with the drive unit. 12. Do not connect the servo motor of a wrong axis to U, V, W, or CN2 of the drive unit. Otherwise, a malfunction may occur. 13. For connecting servo motor power wires, refer to "Servo Motor Instruction Manual (Vol. 3)". 14. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB. Failure to do so will cause the drive unit to become servo-off when an instantaneous power failure occurs.

(2) 400 V class

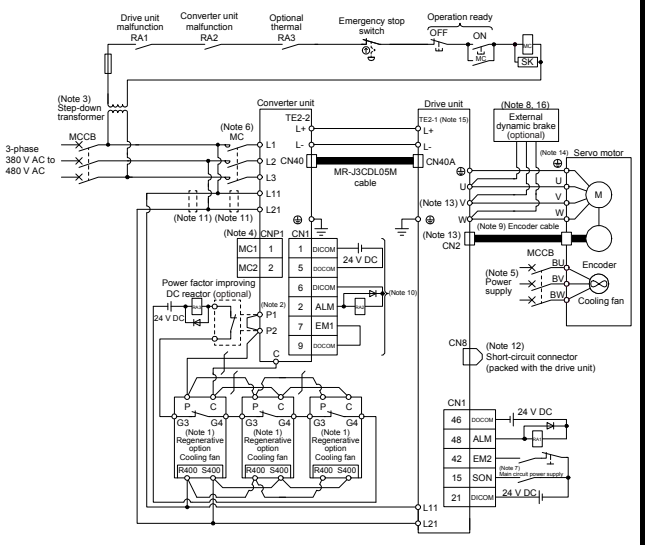
(a) MR-J3-DU_A4/MR-J4-DU_A4

MR-J3-DU_A4



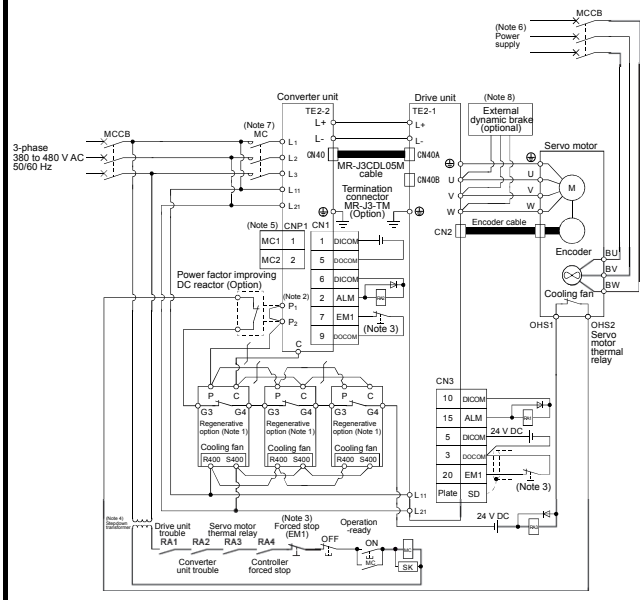
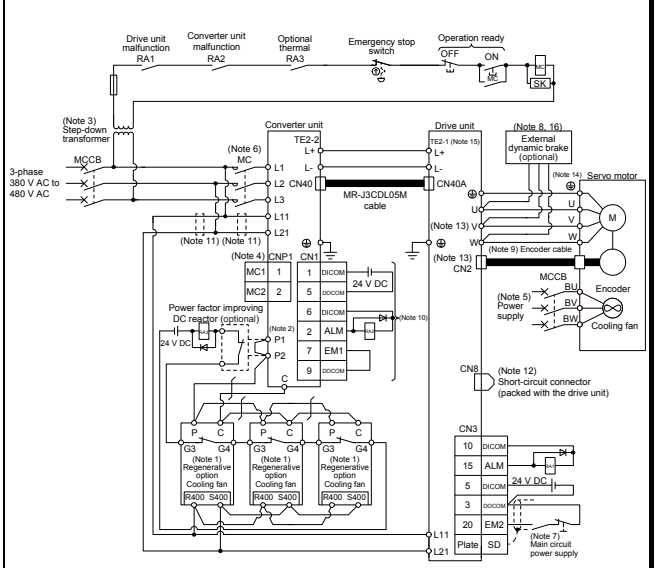
Note 1. For the MR-RB138-4. For the MR-RB138-4, three units are used as one set (permissible wattage: 3900W).
2. When using the Power factor improving DC reactor, disconnect the short bar across P1 and P2.
3. Make up a sequence that will concurrently turn off the Emergency stop (EMG) of the drive unit and the Forced stop (EM1) of the converter unit, and shut off the main circuit power supply by the external sequence.
4. Stepdown transformer is required for coil voltage of magnetic contactor more than 200V class.
5. Keep the wiring connector for the magnetic contactor connected to CNP1 of the converter unit. Unconnected status may cause an electric shock.
6. For specifications of cooling fan power supply, refer to "MR-J3-_A_ Servo amplifier instruction manual".
7. 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 between current being applied to the coil until closure of contacts.
8. Use an external dynamic brake for the drive unit. Failure to do so will but cause an accident because the servo motor does not stop immediately coasts at an emergency stop and such conditions. Ensure the safety in the entire system.

MR-J4-DU_A4



Note 1. This is for MR-RB13V-4. For the MR-RB13V-4, three units are used as one set (permissible regenerative power: 3900 W).
2. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part: 8 section 7.4" for details.
3. A step-down transformer is required when the coil voltage of the magnetic contactor is 200 V class.
4. Always connect the magnetic contactor wiring connector to CNP1 of the converter unit. If the connector is not connected, an electric shock may occur.
5. For specifications of the cooling fan power supply, refer to "Servo Motor Instruction Manual (Vol. 3)".
6. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. The bus voltage decreases depending on the main circuit voltage and operation pattern, which may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.
7. To prevent an unexpected restart of the drive unit, configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off.
8. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an alarm occurrence for which the servo motor does not decelerate to stop. Ensure the safety in the entire equipment. For alarms for which the servo motor does not decelerate to stop, refer to chapter 6. For wiring of the external dynamic brake, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".
9. For the encoder cable, use of the option cable is recommended. For selecting cables, refer to "Servo Motor Instruction Manual (Vol. 3)".
10. This diagram shows sink I/O interface. For source I/O interface, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".
11. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.)
12. When not using the STO function, attach the short-circuit connector supplied with the drive unit.
13. Do not connect the servo motor of a wrong axis to U, V, W, or CN2 of the drive unit. Otherwise, a malfunction may occur.
14. For connecting servo motor power wires, refer to "Servo Motor Instruction Manual (Vol. 3)".
15. For the MR-J4-DU30K_4(-RJ) and MR-J4-DU37K_4(-RJ), the terminal block is TE2.
16. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB. Failure to do so will cause the drive unit to become servo-off when an instantaneous power failure occurs.

(b) MR-J3-DU_B4/MR-J4-DU_B4

MR-J3-DU_B4	MR-J4-DU_B4
	
Note 1. For the MR-RB138-4. For the MR-RB138-4, three units are used as one set (permissible wattage: 3900W). 2. When using the Power factor improving DC reactor, disconnect the short bar across P1 and P2. 3. Make up a sequence that turns off the drive unit forced stop (EM1) and the converter unit forced stop (EM1) at the same time. 4. Stepdown transformer is required for coil voltage of magnetic contactor more than 200 V class. 5. Keep the wiring connector for the magnetic contactor connected to CNP1 of the converter unit. Unconnected status may cause an electric shock. 6. For specifications of cooling fan power supply, refer to "MR-J3-_B_ Servo amplifier instruction manual". 7. 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 between current being applied to the coil until closure of contacts. 8. Use an external dynamic brake for the drive unit. Failure to do so will but cause an accident because the servo motor does not stop immediately coasts at an emergency stop and such conditions. Ensure the safety in the entire system.	Note 1. This is for MR-RB13V-4. For the MR-RB13V-4, three units are used as one set (permissible regenerative power: 3900 W). 2. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part: 8 section 7.4" for details. 3. A step-down transformer is required when the coil voltage of the magnetic contactor is 200 V class. 4. Always connect the magnetic contactor wiring connector to CNP1 of the converter unit. If the connector is not connected, an electric shock may occur. 5. For specifications of the cooling fan power supply, refer to "Servo Motor Instruction Manual (Vol. 3)". 6. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. The bus voltage decreases depending on the main circuit voltage and operation pattern, which may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor. 7. To prevent an unexpected restart of the drive unit, configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off. 8. Use an external dynamic brake for the drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an alarm occurrence for which the servo motor does not decelerate to stop. Ensure the safety in the entire equipment. For alarms for which the servo motor does not decelerate to stop, refer to chapter 6. For wiring of the external dynamic brake, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual". 9. For the encoder cable, use of the option cable is recommended. For selecting cables, refer to "Servo Motor Instruction Manual (Vol. 3)". 10. This diagram shows sink I/O interface. For source I/O interface, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual". 11. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.) 12. When not using the STO function, attach the short-circuit connector supplied with the drive unit. 13. Do not connect the servo motor of a wrong axis to U, V, W, or CN2 of the drive unit. Otherwise, a malfunction may occur. 14. For connecting servo motor power wires, refer to "Servo Motor Instruction Manual (Vol. 3)". 15. For the MR-J4-DU30K_4(-RJ) and MR-J4-DU37K_4(-RJ), the terminal block is TE2. 16. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB. Failure to do so will cause the drive unit to become servo-off when an instantaneous power failure occurs.

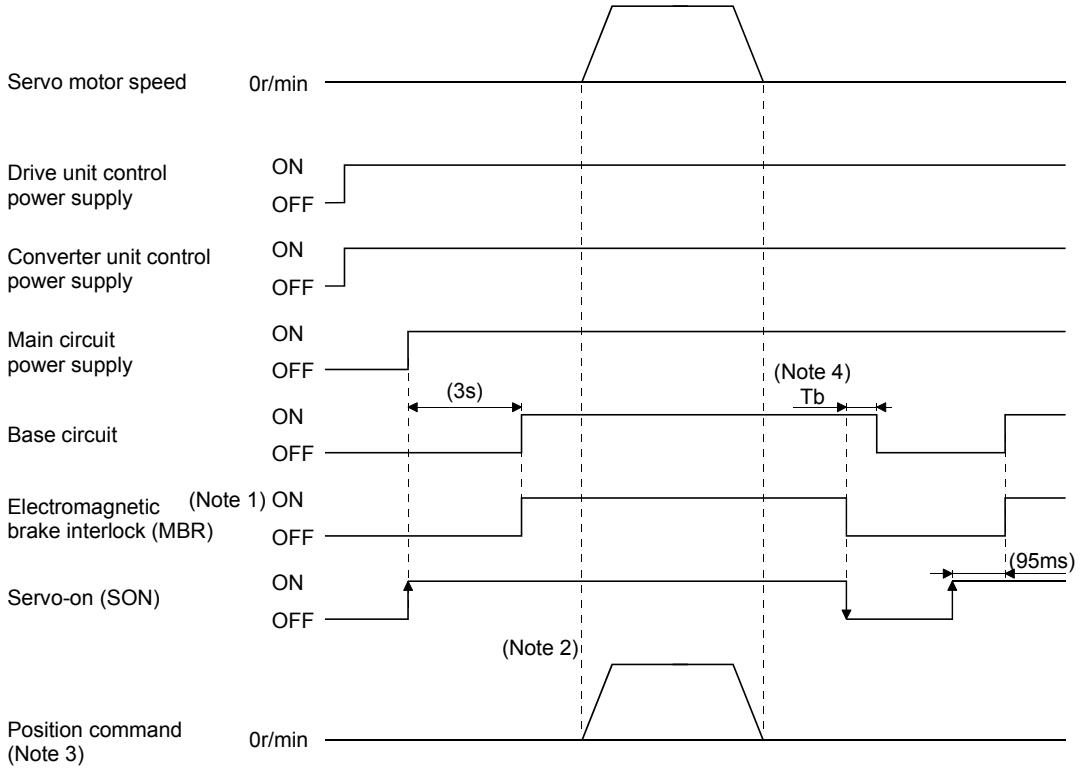
4.2 Power-on sequence

(1) MR-J3-DU_ A

(a) Power-on procedure

1) Make sure to wire the power supply as shown in above section 4.1 using the magnetic contactor with the main circuit power supply (3-phase: L1, L2, L3). Configure up an external sequence to switch off the magnetic contactor as soon as an alarm occurs.

2) In the case where control function of the magnetic contactor for the converter unit is enabled, turn on control circuit power supply (L11 and L21) for the converter unit and the drive unit at the same time. After the converter unit and the drive unit are activated, main circuit power supply automatically turns on. When controlling the magnetic contactor by the external sequence, turn on the control circuit power supply (L11 and L21) for the converter unit and the drive unit concurrently with the main circuit power supply or before switching on the main circuit power supply. However, by switching on the main circuit power supply, the warning disappears and the drive unit will operate properly.



Note 1. When setting up an electromagnetic brake at customer's side, make up a sequence which will operate the electromagnetic brake as follow using the electromagnetic brake interlock (MBR).
ON: Electromagnetic brake is not activated.
OFF: Electromagnetic brake is activated
2. Give a position command after the external electromagnetic brake is released.
3. For the position control mode.
4. "Tb" is a delay time from when the electromagnetic brake interlock (MBR) is turned off until when the base circuit is shut off at servo off. Set Tb using [Pr. PC16].

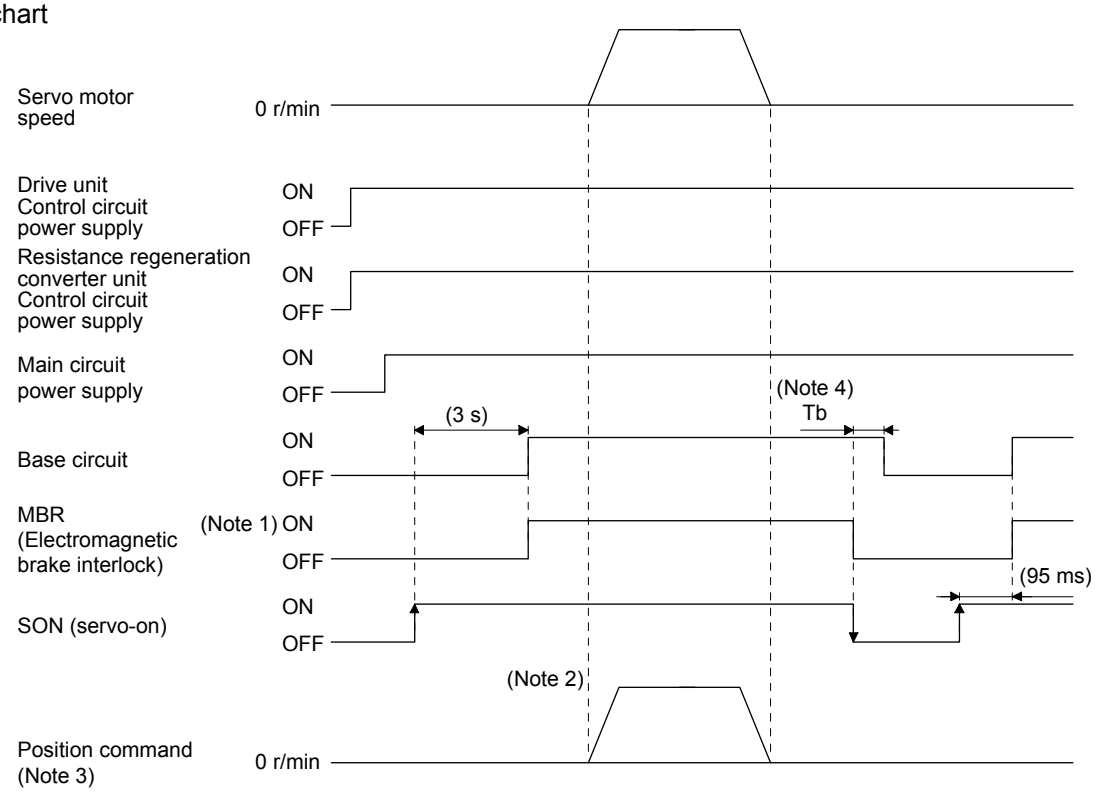
(2) MR-J4-DU_A_

(a) Power-on procedure

1) Always use a magnetic contactor for the main circuit power supply wiring (L1/L2/L3) as shown in above section 4.1. Configure an external sequence to switch off the magnetic contactor as soon as an alarm occurs.

2) When enabling magnetic contactor drive output, turn on the control circuit power supplies (L11/L21) of the resistance regeneration converter unit and the drive unit simultaneously. The main circuit power supply is automatically turned on after the resistance regeneration converter unit and drive unit are started.
When using an external sequence to control the magnetic contactor, turn on the control circuit power supplies (L11/ L21) of the resistance regeneration converter unit and drive unit simultaneously with the main circuit power supply or before turning on the main circuit power supply. If the main circuit power supply is not on, the display shows the corresponding warning. However, by switching on the main circuit power supply, the warning disappears and the drive unit will operate properly.

(b) Timing chart



Note 1. When setting up an electromagnetic brake at customer's side, make up a sequence which will operate the electromagnetic brake as follow using MBR.
ON: Electromagnetic brake is not activated.
OFF: Electromagnetic brake is activated.
2. Give a position command after the external electromagnetic brake is released.
3. This is in position control mode.
4. In [Pr. PC16 Electromagnetic brake sequence output], set a delay time (Tb) from MBR off to base circuit shut-off at a servo-off.

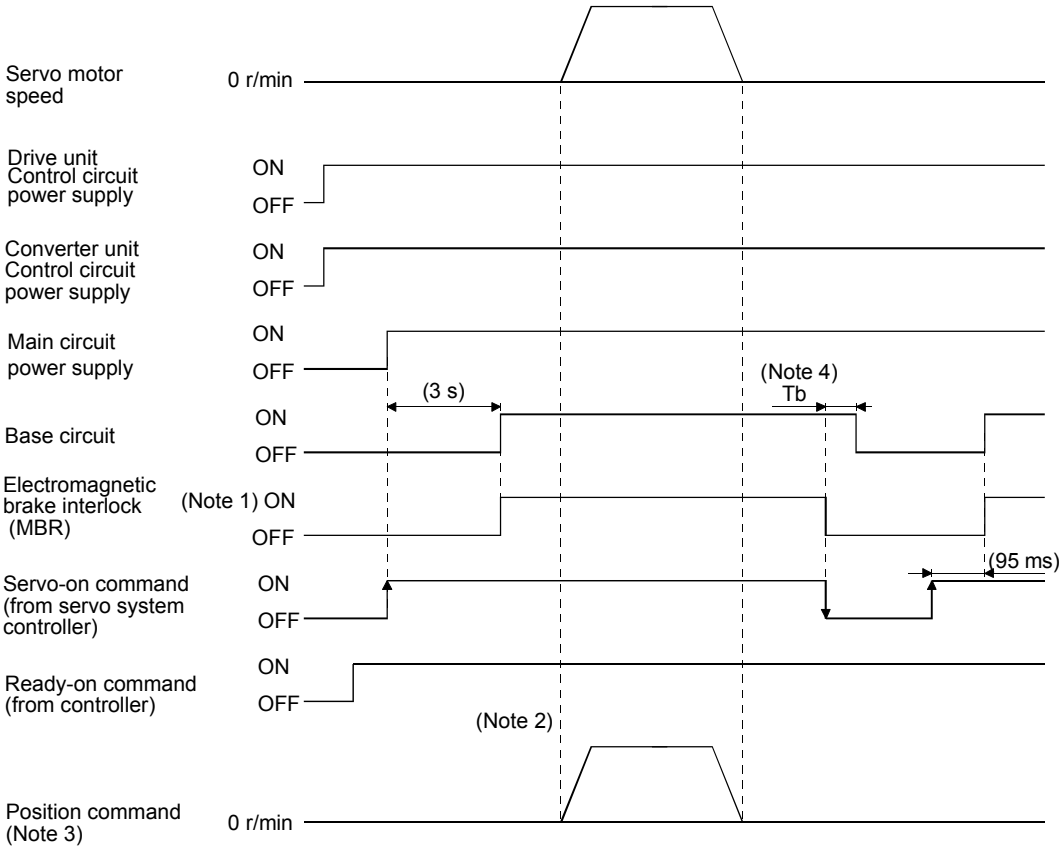
(3) MR-J3-DU_B

(a) Power-on procedure

1) Always wire the power supply as shown in above section 4.1 using the magnetic contactor with the main circuit power supply (3-phase: L1, L2, L3). Configure up an external sequence to switch off the magnetic contactor as soon as an alarm occurs.

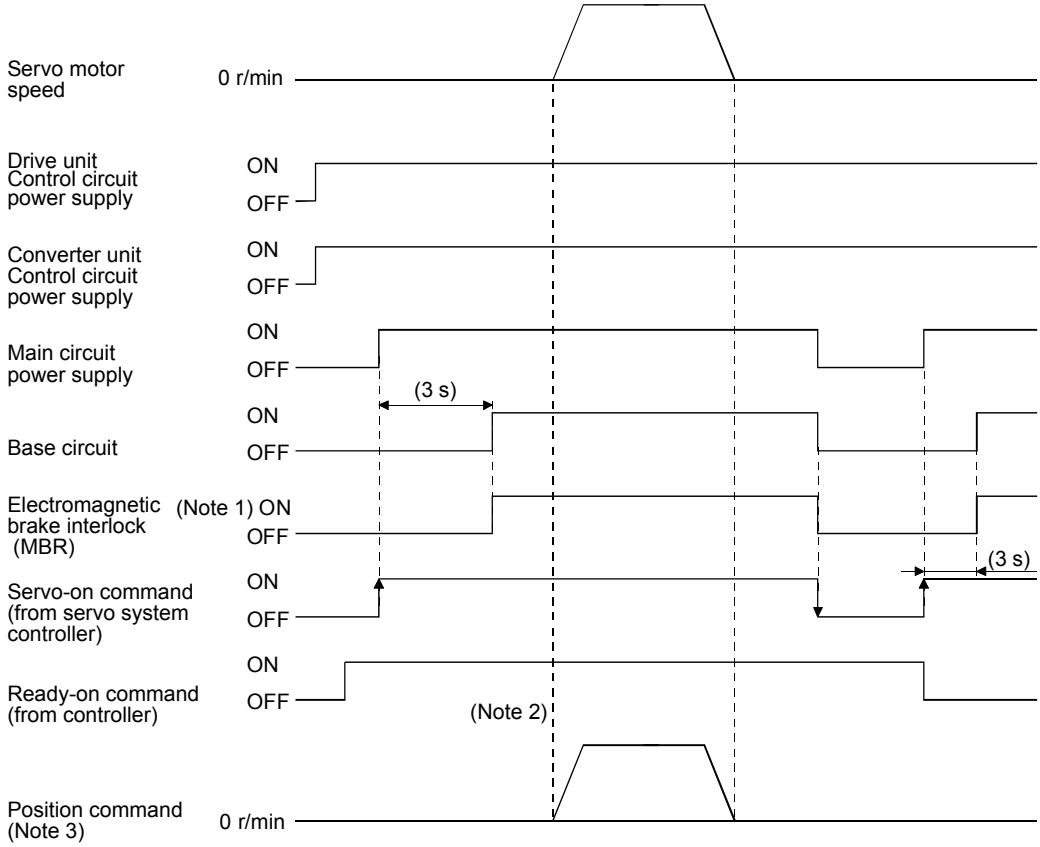
2) Switch on the control circuit power supply L11, L21 simultaneously with the main circuit power supply or before switching on the main circuit power supply. If the main circuit power supply is not on, the display shows the corresponding warning. However, by switching on the main circuit power supply, the warning disappears and the drive unit will operate properly.

a) When control function of magnetic contactor is enabled and the status remains at ready on
The main circuit power is not shut off with servo off.



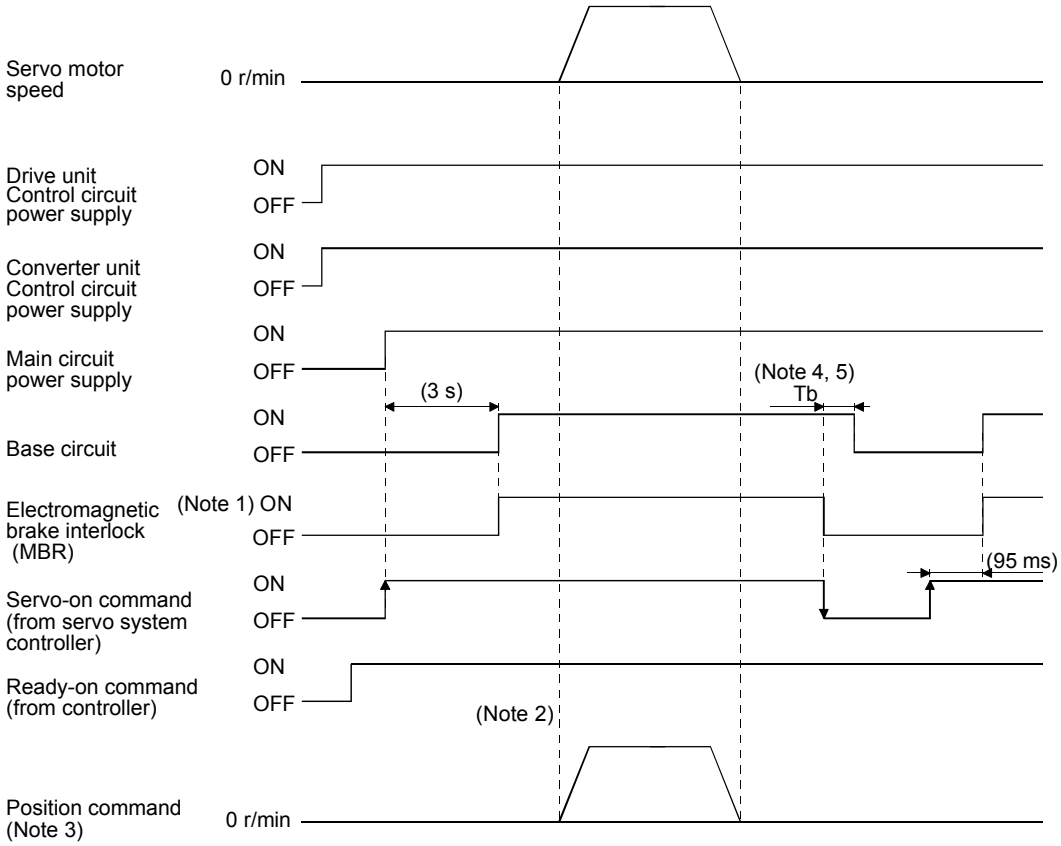
Note 1. When setting up an electromagnetic brake at customer's side, make up a sequence which will operate the electromagnetic brake as follow using the electromagnetic brake interlock (MBR).
ON: Electromagnetic brake is not activated.
OFF: Electromagnetic brake is activated
2. Give a position command after the external electromagnetic brake is released.
3. For the position control mode.
4. "Tb" is a delay time from when the electromagnetic brake interlock (MBR) is turned off until when the base circuit is shut off at servo off. Set Tb using [Pr. PC02].

b) When control function of magnetic contactor is enabled and the status returns to ready-off
The magnetic contactor of the converter unit turns off with servo-off, and the main circuit power supply shuts off.



Note 1. When setting up an electromagnetic brake at customer's side, make up a sequence which will operate the electromagnetic brake as follow using the electromagnetic brake interlock (MBR).
ON: Electromagnetic brake is not activated.
OFF: Electromagnetic brake is activated
2. Give a position command after the external electromagnetic brake is released.
3. For the position control mode.

c) When using an external sequence to control the magnetic contactor
When an alarm occurs, turn off the magnetic contactor using the external sequence, and shut off the main circuit power supply.



Note 1. When setting up an electromagnetic brake at customer's side, make up a sequence which will operate the electromagnetic brake as follow using the electromagnetic brake interlock (MBR).
ON: Electromagnetic brake is not activated.
OFF: Electromagnetic brake is activated
2. Give a position command after the external electromagnetic brake is released.
3. For the position control mode.
4. "Tb" is a delay time from when the electromagnetic brake interlock (MBR) is turned off until when the base circuit is shut off at servo off. Set Tb using [Pr. PC02].
5. The base circuit remains ready-on status at servo-off. When the status is ready-off, the base circuit and the servo-on command turn off at the same time. (Tb = 0)

(4) MR-J4-DU_B_

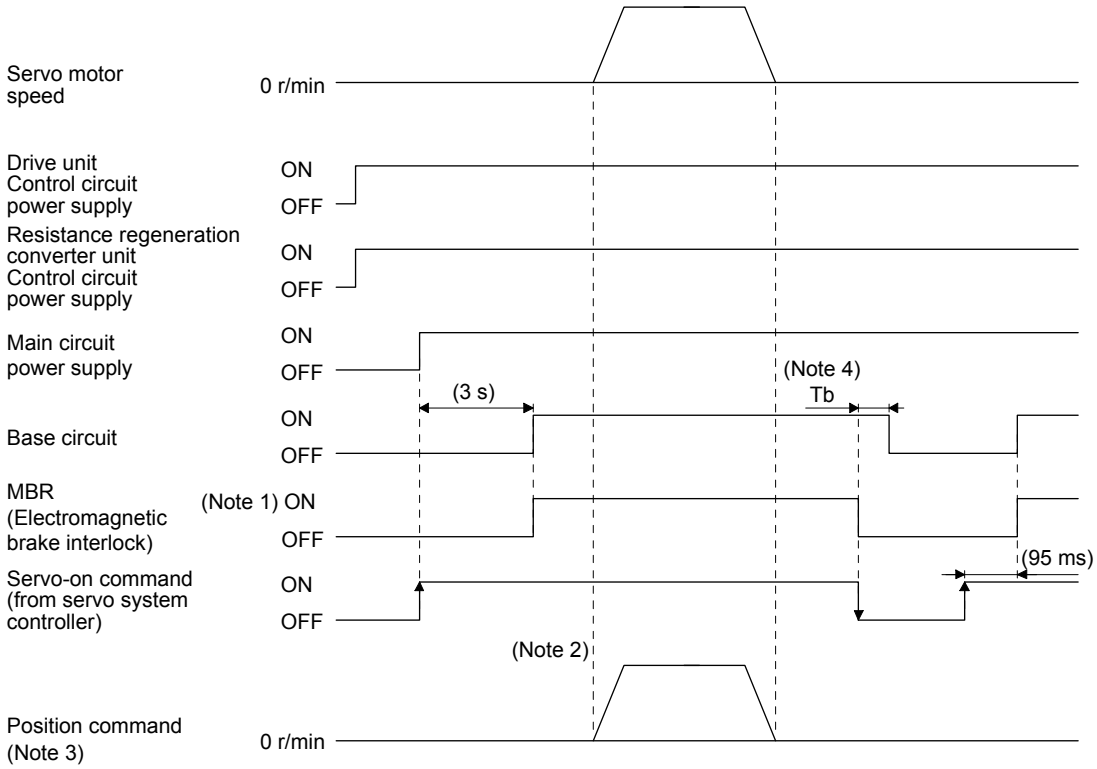
(a) Power-on procedure

1) Always use a magnetic contactor for the main circuit power supply wiring (L1/L2/L3) as shownin above section 4.1. Configure an external sequence to switch off the magnetic contactor as soon as an alarm occurs.

2) Turn on the control circuit power supplies (L11/L21) of the converter unit and drive unit simultaneously with the main circuit power supply or before turning on the main circuit power supply. If the main circuit power supply is not on, the display shows the corresponding warning. However, by switching on the main circuit power supply, the warning disappears and the drive unit will operate properly.

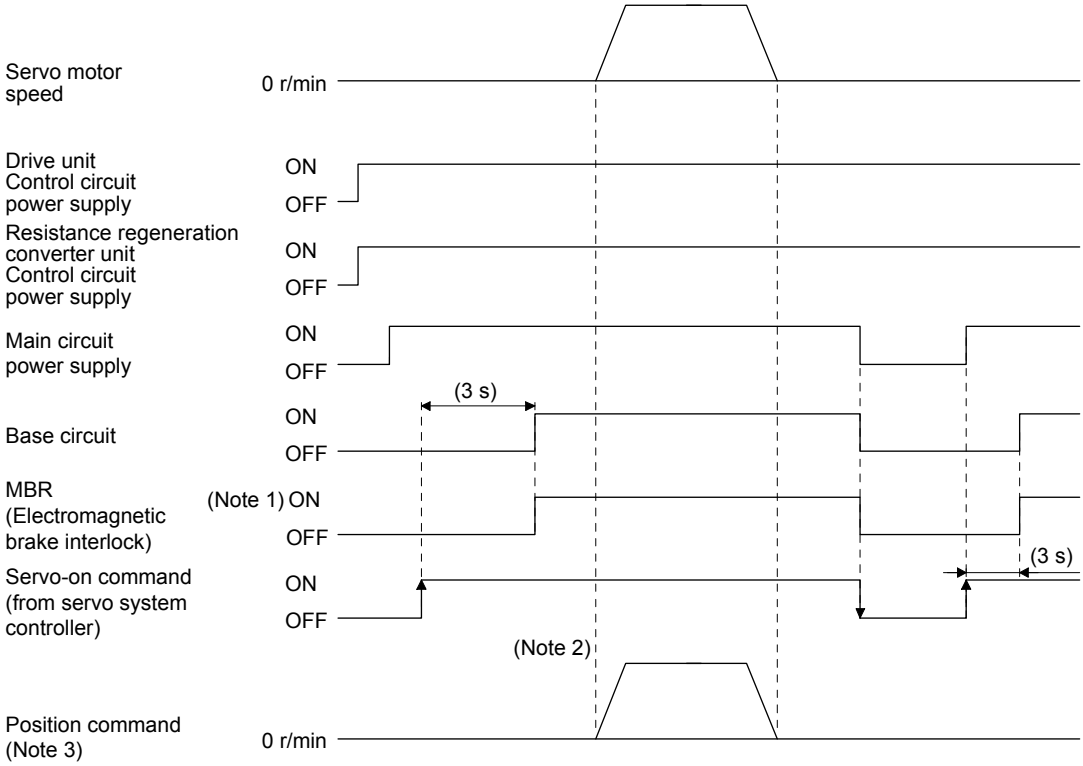
(b) Timing chart

1) When magnetic contactor drive output is enabled and the status remains at ready-on
The main circuit power is not shut off with servo-off.



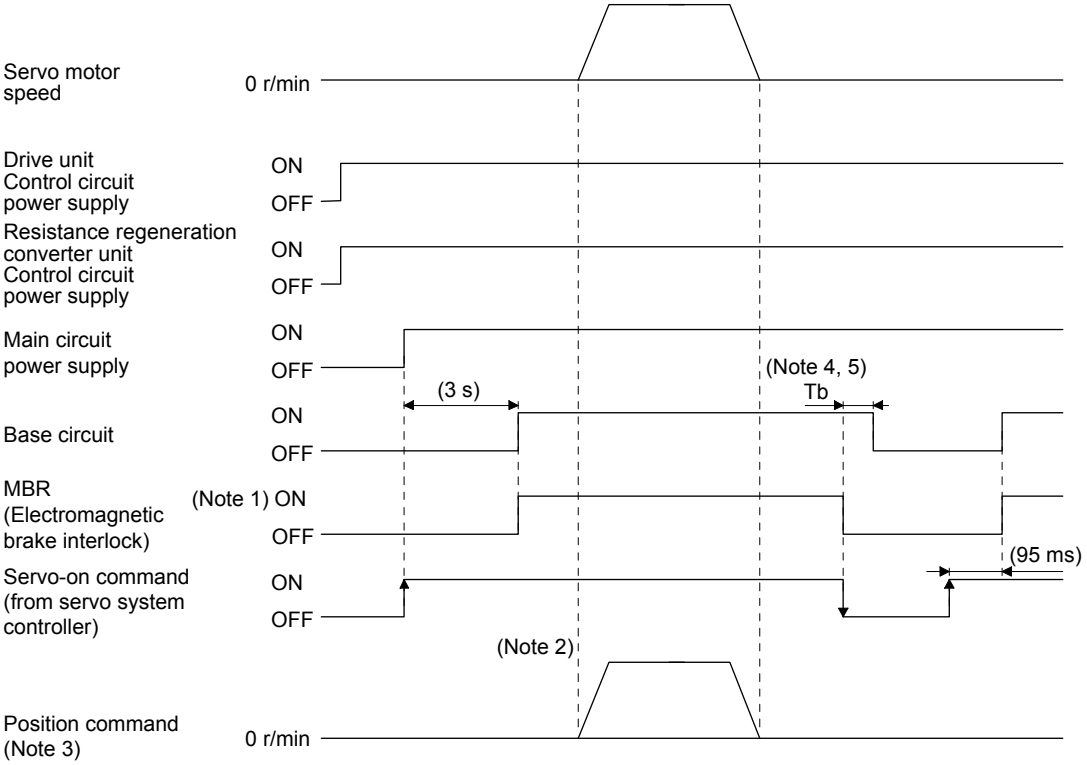
Note 1. When setting up an electromagnetic brake at customer's side, make up a sequence which will operate the electromagnetic brake as follow using MBR.
ON: Electromagnetic brake is not activated.
OFF: Electromagnetic brake is activated.
2. Give a position command after the external electromagnetic brake is released.
3. This is in position control mode.
4. In [Pr. PC02 Electromagnetic brake sequence output], set a delay time (Tb) from MBR off to base circuit shut-off at a servo-off.

2) When magnetic contactor drive output is enabled and the status returns to ready-off
The magnetic contactor of the resistance regeneration converter unit is turned off with ready-off, and the main circuit power supply is shut off.



Note 1. When setting up an electromagnetic brake at customer's side, make up a sequence which will operate the electromagnetic brake as follow using MBR.
ON: Electromagnetic brake is not activated.
OFF: Electromagnetic brake is activated.
2. Give a position command after the external electromagnetic brake is released.
3. This is in position control mode.

3) When magnetic contactor drive output is disabled
When an alarm occurs, turn off the magnetic contactor using the external sequence, and shut off the main circuit power supply.



Note 1. When setting up an electromagnetic brake at customer's side, make up a sequence which will operate the electromagnetic brake as follow using MBR.
ON: Electromagnetic brake is not activated.
OFF: Electromagnetic brake is activated.
2. Give a position command after the external electromagnetic brake is released.
3. This is in position control mode.
4. In [Pr. PC02 Electromagnetic brake sequence output], set a delay time (Tb) from MBR off to base circuit shut-off at a servo-off.
5. The base circuit remains ready-on status at servo-off. When the status is ready-off, the base circuit and the servo-on command turn off at the same time. (Tb = 0)

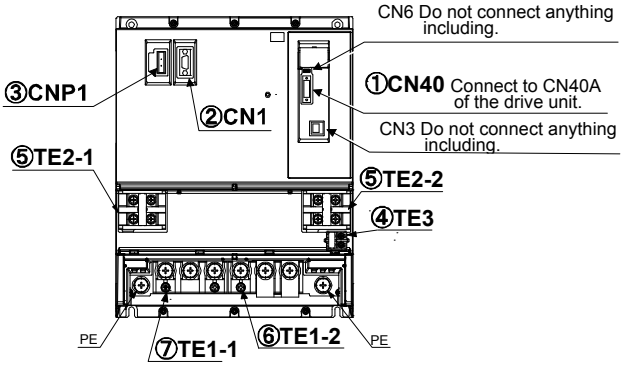
4.3 List of corresponding connectors and terminal blocks

(1) Converter unit

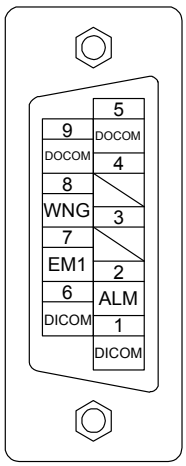
(a) Connector comparison table

For details on signals, refer to each servo amplifier instruction manual.

MR-J3-CR55K/MR-J3-CR55K4

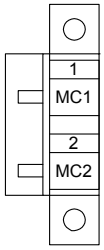


CN1



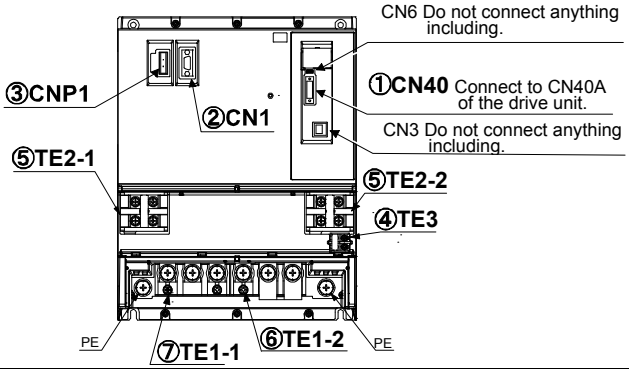
Connector pin No.	Signal abbreviation
CN1-1	DICOM
CN1-2	ALM
CN1-3	
CN1-4	
CN1-5	DOCOM
CN1-6	DICOM
CN1-7	EM1
CN1-8	WNG
CN1-9	DOCOM

CNP1

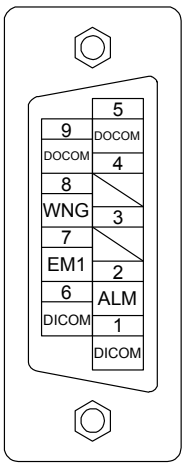


Connector pin No.	Signal abbreviation
CNP1-1	MC1
CNP1-2	MC2

MR-CR55K/MR-CR55K4

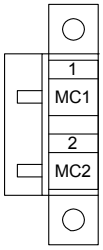


CN1



Connector pin No.	Signal abbreviation
CN1-1	DICOM
CN1-2	ALM
CN1-3	
CN1-4	
CN1-5	DOCOM
CN1-6	DICOM
CN1-7	EM1
CN1-8	WNG
CN1-9	DOCOM

CNP1



Connector pin No.	Signal abbreviation
CNP1-1	MC1
CNP1-2	MC2

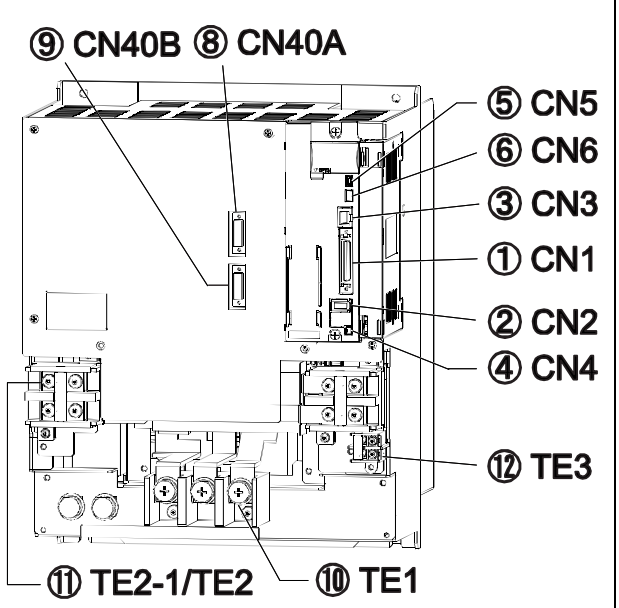
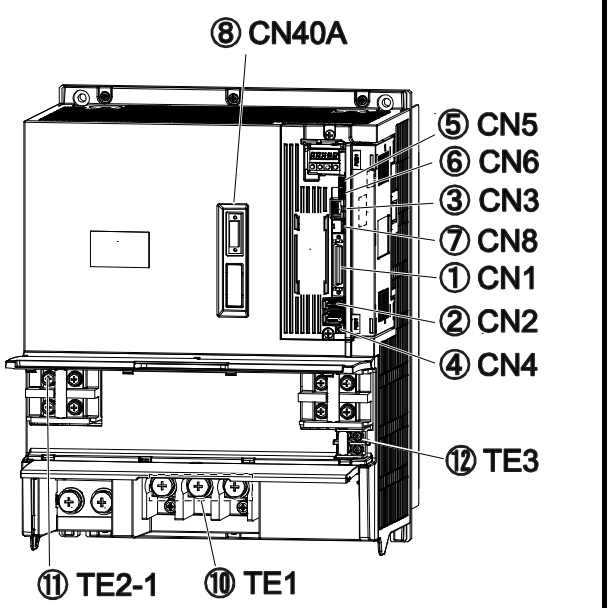
(b) List of corresponding connectors and terminal blocks

MR-J3-CR55K/MR-J3-CR55K4				MR-CR55K/MR-CR55K4		
No.	Connector name	Connector No.	→	No.	Connector name	Connector No.
①	Protection coordination connector	CN40		①	Protection coordination connector	CN40
②	I/O signal connector	CN1		②	I/O signal connector	CN1
③	Magnetic contactor control connector	CNP1		③	Magnetic contactor wiring connector	CNP1
④	Control circuit terminal block	TE3		④	Control circuit terminal	TE3
⑤	L+/L- terminal	TE2-1		⑤	L+/L- terminal	TE2-1
		TE2-2				TE2-2
⑥	Regenerative option/Power factor improving DC reactor	TE1-2		⑥	Regenerative option/Power factor improving DC reactor	TE1-2
⑦	Main circuit terminal block	TE1-1		⑦	Main circuit terminal block	TE1-1

(2) Drive unit (General-Purpose interface)

(a) Connector comparison table

For details on signals, refer to each servo amplifier instruction manual.

MR-J3-DU_A_	MR-J4-DU_A_
	

(b) List of corresponding connectors and terminal blocks

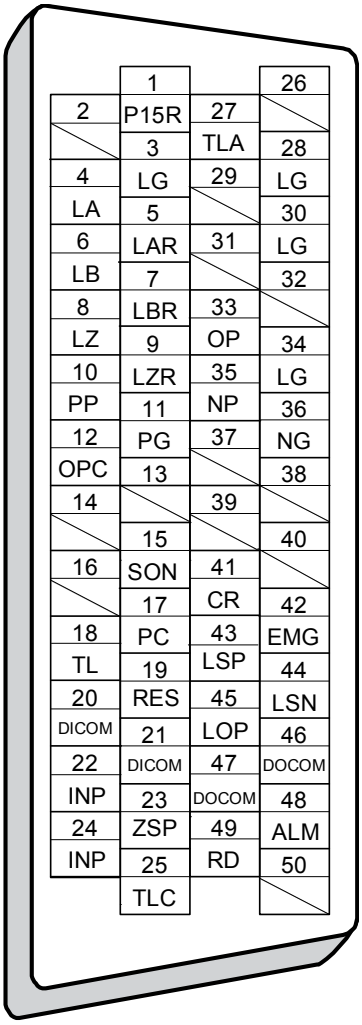
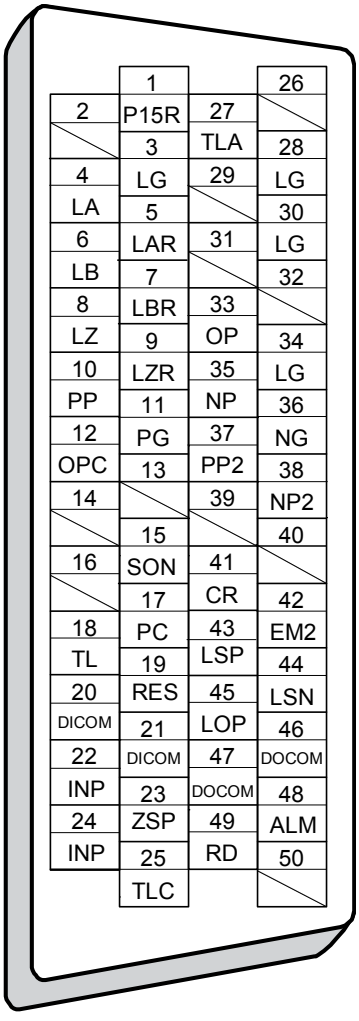
MR-J3-DU_A_				MR-J4-DU_A_			Precautions
No.	Connector name	Connector No.		No.	Connector name	Connector No.	
①	I/O signal connector	CN1		①	I/O signal connector	CN1	
②	Encoder connector	CN2		②	Encoder connector	CN2	When connected to an HG-JR motor, the encoder cable needs to be changed.
③	RS-422 communication connector	CN3		③	RS-422 communication connector	CN3	
④	Battery connector	CN4		④	Battery connector	CN4	Use the dedicated battery of each series.
⑤	USB communication connector	CN5		⑤	USB communication connector	CN5	
⑥	Analog monitor connector	CN6		⑥	Analog monitor connector	CN6	
⑦			→	⑦	STO input signal connector	CN8	When not using the STO function, attach the short-circuit connector supplied with the drive unit to CN8 (STO I/O signal connector).
⑧	Converter unit connectors	CN40A		⑧	Protection coordination connector	CN40A	
⑨	Converter unit connectors	CN40B		⑨			
⑩	Motor power supply terminals	TE1		⑩	Servo motor power output terminal	TE1	The structure of the main circuit terminal block varies depending on the capacity. Refer to "Part 6 Common Reference Material".
⑪	L+ L- terminals	TE2-1/TE2		⑪	L+/L- terminal	TE2-1	
⑫	Control circuit terminal L11/L21	TE3		⑫	Control circuit terminal L11/L21	TE3	

(c) Comparison of signals

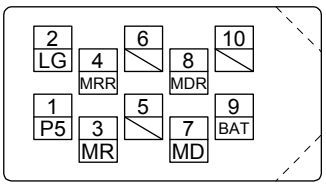
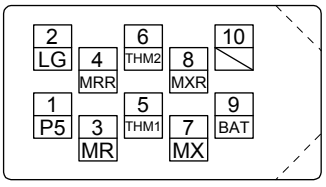
Signal abbreviations in parentheses are for MR-J4-DU_A_.

1) CN1

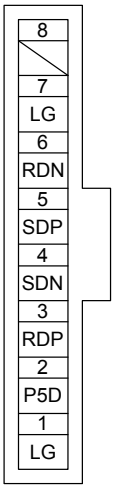
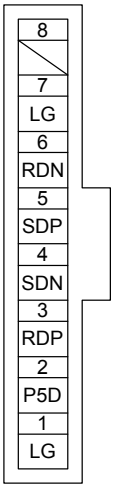
This is the signal symbol in the positioning mode. For other signal names, refer to the instruction manual.

MR-J3-_A_		Signal	MR-J4-_A_	
Connector pin assignment	Connector pin No.	abbreviation	Connector pin No.	Connector pin assignment
	CN1-1	P15R	CN1-1	
	CN1-2		CN1-2	
	CN1-3	LG	CN1-3	
	CN1-4	LA	CN1-4	
	CN1-5	LAR	CN1-5	
	CN1-6	LB	CN1-6	
	CN1-7	LBR	CN1-7	
	CN1-8	LZ	CN1-8	
	CN1-9	LZR	CN1-9	
	CN1-10	PP	CN1-10	
	CN1-11	PG	CN1-11	
	CN1-12	OPC	CN1-12	
	CN1-13		CN1-13	
	CN1-14		CN1-14	
	CN1-15	SON	CN1-15	
	CN1-16		CN1-16	
	CN1-17	PC	CN1-17	
	CN1-18	TL	CN1-18	
	CN1-19	RES	CN1-19	
	CN1-20	DICOM	CN1-20	
	CN1-21	DICOM	CN1-21	
	CN1-22	INP	CN1-22	
	CN1-23	ZSP	CN1-23	
	CN1-24	INP	CN1-24	
	CN1-25	TLC	CN1-25	
	CN1-26		CN1-26	
	CN1-27	TLA	CN1-27	
	CN1-28	LG	CN1-28	
	CN1-29		CN1-29	
	CN1-30	LG	CN1-30	
	CN1-31		CN1-31	
	CN1-32		CN1-32	
	CN1-33	OP	CN1-33	
	CN1-34	LG	CN1-34	
	CN1-35	NP	CN1-35	
	CN1-36	NG	CN1-36	
	CN1-37	(PP2)	CN1-37	
	CN1-38	(NP2)	CN1-38	
	CN1-39		CN1-39	
	CN1-40		CN1-40	
	CN1-41	CR	CN1-41	
	CN1-42	EMG (EM2)	CN1-42	
	CN1-43	LSP	CN1-43	
	CN1-44	LSN	CN1-44	
	CN1-45	LOP	CN1-45	
	CN1-46	DOCOM	CN1-46	
	CN1-47	DOCOM	CN1-47	
	CN1-48	ALM	CN1-48	
	CN1-49	RD	CN1-49	
	CN1-50		CN1-50	

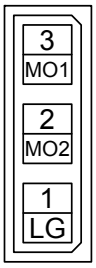
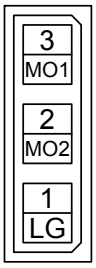
2) CN2

MR-J3-DU_A_		Signal abbreviation	MR-J4-DU_A_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
	CN2-1	P5	CN2-1	
	CN2-2	LG	CN2-2	
	CN2-3	MR	CN2-3	
	CN2-4	MRR	CN2-4	
	CN2-5	(THM1)	CN2-5	
	CN2-6	(THM2)	CN2-6	
	CN2-7	MD	CN2-7	
		(MX)		
	CN2-8	MDR	CN2-8	
		(MXR)		
	CN2-9	BAT	CN2-9	
	CN2-10		CN2-10	

3) CN3

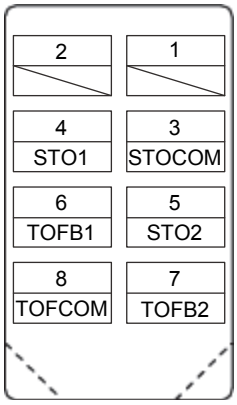
MR-J3-DU_A_		Signal abbreviation	MR-J4-DU_A_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
	CN3-1	LG	CN3-1	
	CN3-2	P5D	CN3-2	
	CN3-3	RDP	CN3-3	
	CN3-4	SDN	CN3-4	
	CN3-5	SDP	CN3-5	
	CN3-6	RDN	CN3-6	
	CN3-7	LG	CN3-7	
	CN3-8	TRE	CN3-8	

4) CN6

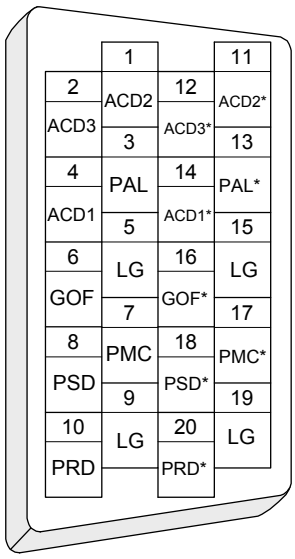
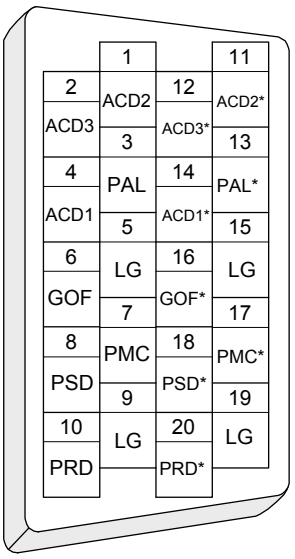
MR-J3-DU_A_		Signal abbreviation	MR-J4-DU_A_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
	CN6-3	MO1	CN6-3	
	CN6-2	MO2	CN6-2	
	CN6-1	LG	CN6-1	

5) CN8

When not using the STO function, attach the short-circuit connector supplied with the drive unit to CN8 (STO I/O signal connector).

MR-J3-DU_A_		Signal abbreviation	MR-J4-DU_A_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
			CN8-1	
			CN8-2	
		STOCOM	CN8-3	
		STO1	CN8-4	
		STO2	CN8-5	
		TOFB1	CN8-6	
		TOFB2	CN8-7	
		TOFCOM	CN8-8	

6) CN40A

MR-J3-DU_A_		Signal abbreviation	MR-J4-DU_A_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
	CN40A-1	ACD2	CN40A-1	
	CN40A-2	ACD3	CN40A-2	
	CN40A-3	PAL	CN40A-3	
	CN40A-4	ACD1	CN40A-4	
	CN40A-5	LG	CN40A-5	
	CN40A-6	GOF	CN40A-6	
	CN40A-7	PMC	CN40A-7	
	CN40A-8	PSD	CN40A-8	
	CN40A-9	LG	CN40A-9	
	CN40A-10	PRD	CN40A-10	
	CN40A-11	ACD2*	CN40A-11	
	CN40A-12	ACD3*	CN40A-12	
	CN40A-13	PAL*	CN40A-13	
	CN40A-14	ACD1*	CN40A-14	
	CN40A-15	LG	CN40A-15	
	CN40A-16	GOF*	CN40A-16	
	CN40A-17	PMC*	CN40A-17	
	CN40A-18	PSD*	CN40A-18	
	CN40A-19	LG	CN40A-19	
	CN40A-20	PRD*	CN40A-20	

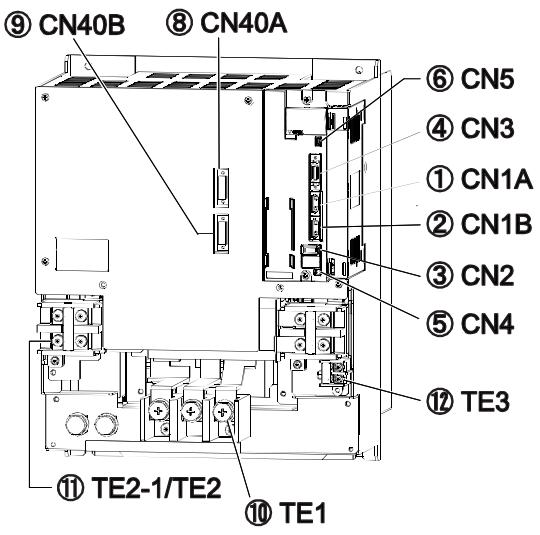
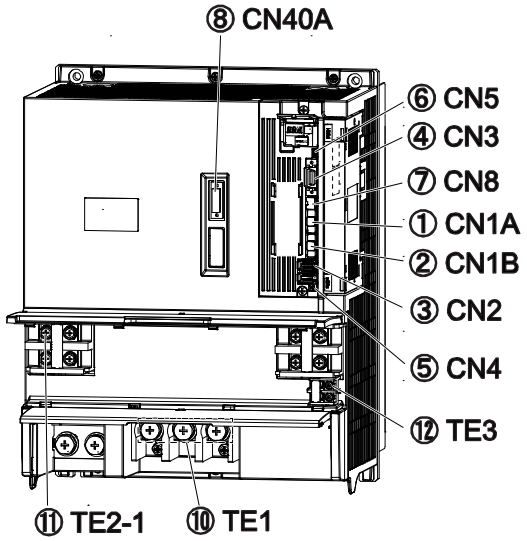
7) CN40B

When MR-J4-DU_A is used, the terminal connector (MR-J3-TM) does not need to be connected to CN40B. (This product does not have a connector for the terminal connector.)

(3) Drive unit (SSCNET interface)

(a) Connector comparison table

For details on signals, refer to each servo amplifier instruction manual.

MR-J3-DU_B_	MR-J4-DU_B_
	

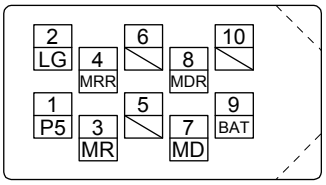
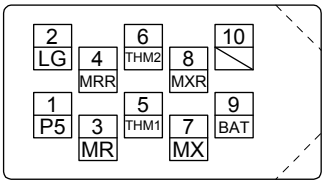
(b) List of connector and terminal block correspondence

MR-J3-DU_B_				MR-J4-DU_B_		Precautions
No.	Connector name	Connector No.		No.	Connector name	Connector No.	
①	SSCNET cable connector	CN1A		①	SSCNET cable connector	CN1A	
②	SSCNET cable connector	CN1B		②	SSCNET cable connector	CN1B	
③	Encoder connector	CN2		③	Encoder connector	CN2	
④	I/O signal connector	CN3		④	I/O signal connector	CN3	When connected to an HG-JR motor, the encoder cable needs to be changed.
⑤	Battery connector	CN4		⑤	Battery connector	CN4	Use the dedicated battery of each series.
⑥	USB communication connector	CN5		⑥	USB communication connector	CN5	
⑦			→	⑦	STO input signal connector	CN8	When not using the STO function, attach the short-circuit connector supplied with the drive unit to CN8 (STO I/O signal connector).
⑧	Converter unit connectors	CN40A		⑧	Protection coordination connector	CN40A	
⑨	Converter unit connectors	CN40B		⑨			
⑩	Motor power supply terminals	TE1		⑩	Servo motor power output terminal	TE1	The structure of the main circuit terminal block varies depending on the capacity. Refer to "Part 6 Common Reference Material"
⑪	L+ L- terminals	TE2-1/TE2		⑪	L+ L- terminal	TE2-1	
⑫	Control circuit terminal L11/L21	TE3		⑫	Control circuit terminal L11/L21	TE3	

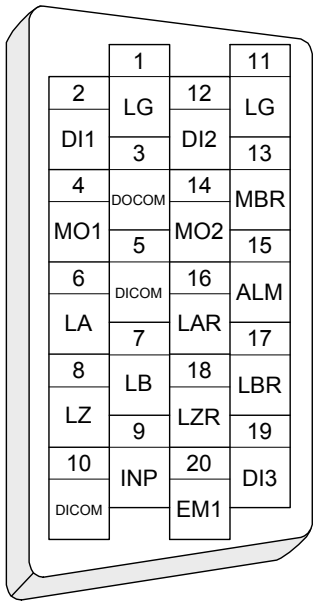
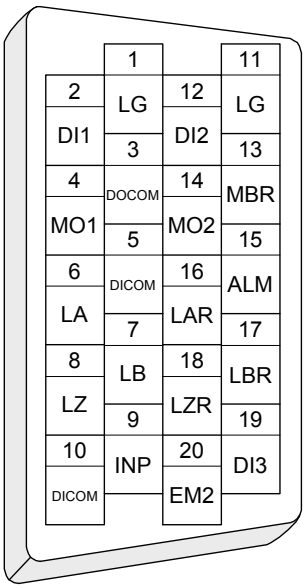
(c) Comparison of signals

Signal abbreviations in parentheses are for MR-J4-DU_B_.

1) CN2

MR-J3-DU_B_		Signal abbreviation	MR-J4-DU_B_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
	CN2-1	P5	CN2-1	
	CN2-2	LG	CN2-2	
	CN2-3	MR	CN2-3	
	CN2-4	MRR	CN2-4	
	CN2-5	(THM1)	CN2-5	
	CN2-6	(THM2)	CN2-6	
	CN2-7	MD	CN2-7	
		(MX)		
	CN2-8	MDR	CN2-8	
		(MXR)		
	CN2-9	BAT	CN2-9	
	CN2-10		CN2-10	

2) CN3

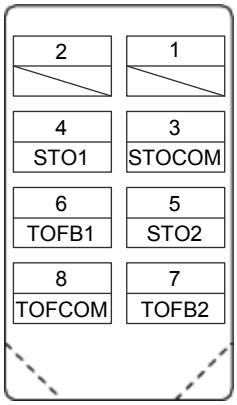
MR-J3-DU_B_		Signal abbreviation	MR-J4-DU_B_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
	CN3-1	LG	CN3-1	
	CN3-2	DI1	CN3-2	
	CN3-3	DOCOM	CN3-3	
	CN3-4	MO1	CN3-4	
	CN3-5	DICOM	CN3-5	
	CN3-6	LA	CN3-6	
	CN3-7	LB	CN3-7	
	CN3-8	LZ	CN3-8	
	CN3-9	INP	CN3-9 (Note 1)	
	CN3-10	DICOM	CN3-10	
	CN3-11	LG	CN3-11	
	CN3-12	DI2	CN3-12	
	CN3-13	MBR	CN3-13 (Note 1)	
	CN3-14	MO2	CN3-14	
	CN3-15	ALM	CN3-15 (Note 1)	
	CN3-16	LAR	CN3-16	
	CN3-17	LBR	CN3-17	
	CN3-18	LZR	CN3-18	
	CN3-19	DI3	CN3-19	
	CN3-20	EM1 (EM2)	CN3-20 (Note 2)	

Note 1. Set with [Pr. PD07] to [PD09] for use.

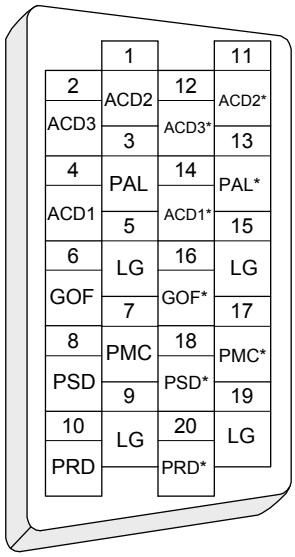
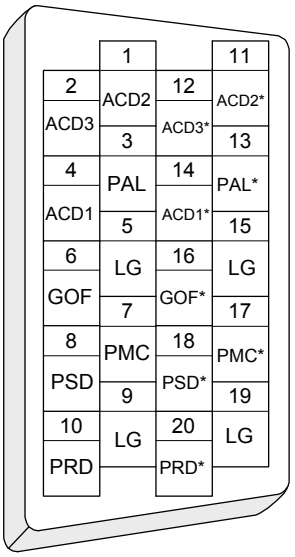
2. The factory setting for MR-J4-_B_ is EM2.

3) CN8

When not using the STO function, attach the short-circuit connector supplied with the drive unit to CN8 (STO I/O signal connector).

MR-J3-DU_B_		Signal abbreviation	MR-J4-DU_B_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
			CN8-1	
			CN8-2	
		STOCOM	CN8-3	
		STO1	CN8-4	
		STO2	CN8-5	
		TOFB1	CN8-6	
		TOFB2	CN8-7	
		TOFCOM	CN8-8	

4) CN40A

MR-J3-DU_B_		Signal abbreviation	MR-J4-DU_B_	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
	CN40A-1	ACD2	CN40A-1	
	CN40A-2	ACD3	CN40A-2	
	CN40A-3	PAL	CN40A-3	
	CN40A-4	ACD1	CN40A-4	
	CN40A-5	LG	CN40A-5	
	CN40A-6	GOF	CN40A-6	
	CN40A-7	PMC	CN40A-7	
	CN40A-8	PSD	CN40A-8	
	CN40A-9	LG	CN40A-9	
	CN40A-10	PRD	CN40A-10	
	CN40A-11	ACD2*	CN40A-11	
	CN40A-12	ACD3*	CN40A-12	
	CN40A-13	PAL*	CN40A-13	
	CN40A-14	ACD1*	CN40A-14	
	CN40A-15	LG	CN40A-15	
	CN40A-16	GOF*	CN40A-16	
	CN40A-17	PMC*	CN40A-17	
	CN40A-18	PSD*	CN40A-18	
	CN40A-19	LG	CN40A-19	
	CN40A-20	PRD*	CN40A-20	

5) CN40B

When MR-J4-DU_B is used, the terminal connector (MR-J3-TM) does not need to be connected to CN40B. (This product does not have a connector for the terminal connector.)

5. PARAMETER

⚠CAUTION

- Never make a drastic adjustment or change to the parameter values as doing so will make the operation unstable.
- Do not change the parameter settings as described below. Doing so may cause an unexpected condition, such as failing to start up the drive unit.
  - Changing the values of the parameters for manufacturer setting
  - Setting a value out of the range
  - Changing the fixed values in the digits of a parameter

POINT

- For the parameter converter function, refer to "Part 6: Common Reference Material".
- To enable a parameter whose abbreviation is preceded by *, turn the power OFF and then ON after setting the parameter.
- For details about parameter settings for replacement, refer to the MR-J4-_A_/MR-J4-_ B_ Servo Amplifier Instruction Manual.
- With the drive unit, the deceleration to a stop function is enabled in the factory setting. To disable the deceleration to a stop function, set [Pr. PA04] to "0 _ _ _".

5.1 Converter unit

5.1.1 Converter unit parameter comparison list

MR-J3-CR55K/MR-J3-CR55K4					MR-CR55K/MR-CR55K4				
No.	Abbreviation	Parameter name	Initial value	Customer setting value	No.	Abbreviation	Parameter name	Initial value	Customer setting value
PA01	*REG	Regenerative option	0000h		PA01	*REG	Regenerative option	0000h	
PA02	*MCC	Magnetic contactor drive output selection	0001h		PA02	*MCC	Magnetic contactor drive output selection	0001h	
PA03		For manufacturer setting	0001h		PA03		For manufacturer setting	0001h	
PA04			0		PA04			0	
PA05			100		PA05			100	
PA06			0		PA06			0	
PA07			100		PA07			100	
PA08	*DMD	Status display selection	0000h		PA08	*DMD	Status display selection	0000h	
PA09	*BPS	Alarm history clear	0000h		PA09	*BPS	Alarm history clear	0000h	
PA10		For manufacturer setting	0		PA10		For manufacturer setting	0	
PA11			0000h		PA11			0000h	
PA12	*DIF	Input filter setting	0002h		PA12	*DIF	Input filter setting	0002h	
PA13		For manufacturer setting	0000h		PA13		For manufacturer setting	0000h	
PA14			0000h		PA14			0000h	
PA15			0000h		PA15	AOP3	Function selection A-3	0000h	
PA16			0000h		PA16		For manufacturer setting	0000h	
PA17			0000h		PA17	*AOP5	Function selection A-5	0001h	
PA18			0000h		PA18	CVAT	SEMI-F47 function - Instantaneous power failure detection time	200	
PA19			0000h		PA19		For manufacturer setting	0000h	

5.1.2 Converter unit comparison of parameter details

POINT

●Set a value to each "x" in the "Setting digit" columns.

MR-J3-CR55K/MR-J3-CR55K4			MR-CR55K/MR-CR55K4		
No.	Name and function	Initial value	No.	Name and function	Initial value
PA01	Regenerative option Used to select the regenerative option 0 0 x x: Select the regenerative option 00: No used 01: MR-RB139 02: MR-RB137 (3 pcs.) 11: MR-RB136-4 12: MR-RB138-4 (3 pcs.) "01" and "02" are the set values for the MR-J3-CR55K only, and "11" and "12" are those for the MR-J3-CR55K4 only. Incorrect setting will trigger [AL. 37 Parameter error].	0000h	PA01	Regenerative option Select a regenerative option. _ _ x x: Incorrect setting will trigger [AL. 37 Parameter error]. 00: Regenerative option is not used When using the FR-BU2-(H) brake unit, select the value. 01: MR-RB139 02: MR-RB137 (3 pcs.) 13: MR-RB137-4 14: MR-RB13V-4 (3 pcs.)	00h
				_ x _ _: For manufacturer setting	0h
				x _ _ _: For manufacturer setting	0h
PA02	Magnetic contactor drive output selection Used to select the output of the magnetic contactor drive power supply. 0 0 0 x: Used to select the output of the magnetic contactor drive power supply. 0: Disabled 1: Enabled	0001h	PA02	Magnetic contactor drive output selection Select the magnetic contactor drive output. _ _ _ x 0: Disabled 1: Enabled	1h
				_ _ x _: For manufacturer setting	0h
				_ x _ _: For manufacturer setting	0h
				x _ _ _: For manufacturer setting	0h
PA08	Status display selection Select a status display shown at power-on. 0 0 0 x: Status display of converter unit display section at power-on. 0: Status 1: Bus voltage 2: Effective load ratio 3: Peak load ratio 4: Regenerative load ratio	0000h	PA08	Status display selection _ _ _ x: Select a status display shown at power-on. 0: Status 1: Bus voltage 2: Effective load ratio 3: Peak load ratio 4: Regenerative load ratio 5: Unit power consumption 1 6: Unit total power consumption 1 7: Unit total power consumption 2	0h
				_ _ x _: For manufacturer setting	0h
				_ x _ _: For manufacturer setting	0h
				x _ _ _: For manufacturer setting	0h

MR-J3-CR55K/MR-J3-CR55K4			MR-CR55K/MR-CR55K4		
No.	Name and function	Initial value	No.	Name and function	Initial value
PA09	Alarm history clear Used to clear the alarm history. 0 0 0 x: Alarm history clear 0: Invalid 1: Valid When alarm history clear is made valid, the alarm history is cleared at next power-on. After the alarm history is cleared, the setting is automatically made invalid (reset to 0).	0000h	PA09	Alarm history clear Used to clear the alarm history. _ _ _ x: 0: Disabled 1: Enabled When you select "Enabled", the alarm history will be cleared at next power-on. After the alarm history is cleared, the setting is automatically disabled.	0h
				_ _ x _: For manufacturer setting	0h
				_ x _ _: For manufacturer setting	0h
				x _ _ _: For manufacturer setting	0h
PA12	Input filter setting Select the input filter. 0 0 0 x: Input signal filter If external input signal causes chattering due to noise, etc., input filter is used to suppress it. 0: None 1: 1.777 [ms] 2: 3.555 [ms] 3: 5.333 [ms]	0002h	PA12	Input filter setting Select the input filter. _ _ _ x: If external input signal causes chattering due to noise, etc., input filter is used to suppress it. 0: None 1: 1.777 [ms] 2: 3.555 [ms] 3: 5.333 [ms]	2h
				_ _ x _: For manufacturer setting	0h
				_ x _ _: For manufacturer setting	0h
				x _ _ _: For manufacturer setting	0h
PA15	For manufacturer setting Do not change this value by any means.	0000h	PA15	Function selection A-3 _ _ _ x: Selection of unit power consumption display unit 0: increment of 1 kW 1: increment of 0.1 kW	0h
				_ _ x _: For manufacturer setting	0h
				_ x _ _: For manufacturer setting	0h
				x _ _ _: For manufacturer setting	0h

MR-J3-CR55K/MR-J3-CR55K4			MR-CR55K/MR-CR55K4		
No.	Name and function	Initial value	No.	Name and function	Initial value
PA17	For manufacturer setting Do not change this value by any means.	0000h	PA17	Function selection A-5 The [Pr. PA17 SEMI-F47 function selection] and [Pr. PA18 SEMI-F47 function - Instantaneous power failure detection time] settings of the converter unit must be the same as [Pr. PA20 SEMI-F47 function selection] and [Pr. PF25 SEMI-F47 function - Instantaneous power failure detection time] settings of the drive unit. _ _ _ x: [AL. 10 Undervoltage] detection method selection Set this parameter when [AL. 10] occurs due to distorted power supply voltage waveform. 0: [AL. 10] not occurrence 1: [AL. 10] occurrence	1h
				_ _ x _: SEMI-F47 function selection 0: Disabled 1: Enabled Selecting "1" enables to avoid triggering [AL. 10 Undervoltage] using the electrical energy charged in the capacitor in case that an instantaneous power failure occurs during operation. In [Pr. PA18 SEMI-F47 function - Instantaneous power failure detection time], set the time until the occurrence of [AL. 10 Undervoltage].	0h
				_ x _ _: For manufacturer setting	0h
				x _ _ _: For manufacturer setting	0h
PA18	For manufacturer setting Do not change this value by any means.	0000h	PA18	SEMI-F47 function - Instanta-neous power failure detection time The [Pr. PA17 SEMI-F47 function selection] and [Pr. PA18 SEMI-F47 function - Instantaneous power failure detection time] settings of the converter unit must be the same as [Pr. PA20 SEMI-F47 function selection] and [Pr. PF25 SEMI-F47 function - Instantaneous power failure detection time] settings of the drive unit. Set the time until the occurrence of [AL. 10 Undervoltage]. To disable the parameter setting value, select "Disabled (_ _ 0 _)" of "SEMI-F47 function selection" in [Pr. PA17]. Setting range: 30 to 200	200 [ms]

5.2 Drive unit

POINT

●Manufacturer setting parameters are not described here.
●Set a value to each "x" in the "Setting digit" columns.
●An incorrect setting may cause the regenerative option to burn out.
●When a regenerative option that is not available to use on a servo amplifier is selected, a [AL.37 parameter error] occurs.
●For a drive unit of 30 kW or more, be sure to set this parameter to "_ _ 0 0" since selecting the regenerative option and brake unit is carried out by [Pr. PA01] of the MR-J3-CR55K(4) converter unit.

5.2.1 Drive unit comparison of parameter details

(1) General-Purpose interface 200 V/400 V class
Here are described settings of drive unit specific parameters. Settings of the other parameters are the same as MR-J4-_A_(-RJ). Refer to "Part 2: section 3.5".

MR-J3-DU-_A_			MR-J4-DU_A_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PA02	Regenerative option Set this parameter when using the regenerative option, brake unit, power regenerative converter, or power regenerative common converter. 0 0 x x: Selection of regenerative option 00: Regenerative option is not used, or when you use a regenerative option, set the regenerative option with the converter unit. When using the drive unit with the resistance regeneration converter unit, set this value regardless of whether or not the regenerative option and brake unit are used.)	0000h	PA02	Regenerative option _ _ x x: Select a regenerative option. For the drive unit, select the regenerative option with the converter unit. Selecting other than "_ _ 0 0" or "_ _ 0 1" will trigger [AL. 37 Parameter error]. 00: Regenerative option is not used, or when you use a regenerative option, set the regenerative option with the converter unit. When using the drive unit with the resistance regeneration converter unit, set this value regardless of whether or not the regenerative option and brake unit are used.)	00h
				_ x _ _: For manufacturer setting	0h
				x _ _ _: For manufacturer setting	0h

(2) SSCNET interface 200 V/400 V class

POINT

●When you connect the amplifier to a servo system controller, servo parameter values of the servo system controller will be written to each parameter.

●Setting may not be made to some parameters and their ranges depending on the servo system controller model, drive unit software version, and MR Configurator2 software version. For details, refer to the servo system controller user's manual.

Here are described settings of drive unit specific parameters. Settings of the other parameters are the same as MR-J4-_B_. Refer to "Part 3: section 3.6".

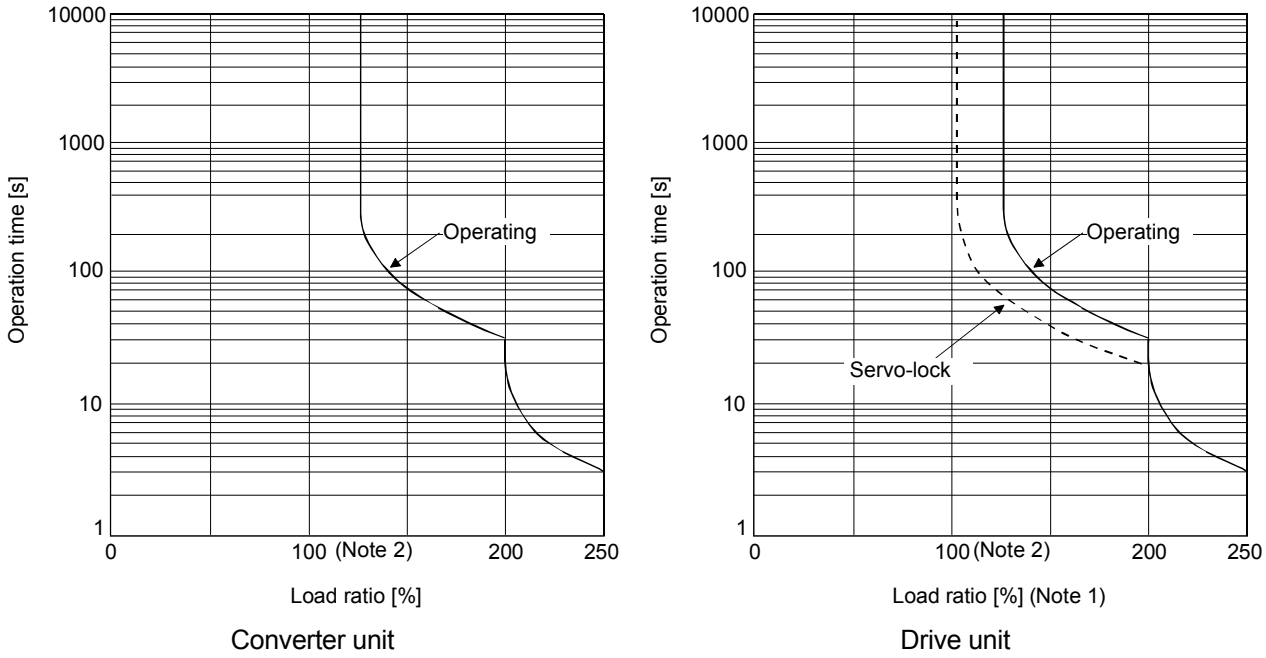
MR-J3-DU-_B_			MR-J4-DU_B_		
No.	Name and function	Initial value	No.	Name and function	Initial value
PA02	Regenerative option Set this parameter when using the regenerative option, brake unit, power regeneration converter, or power regeneration common converter. 0 0 x x: Selection of regenerative option 00: Regenerative option is not used, or when you use a regenerative option, set the regenerative option with the converter unit. When using the drive unit with the resistance regeneration converter unit, set this value regardless of whether or not the regenerative option and brake unit are used.)	0000h	PA02	Regenerative option Select a regenerative option. For the drive unit, select the regenerative option with the converter unit. Selecting other than "_ _ 0 0" or "_ _ 0 1" will trigger [AL. 37 Parameter error]. _ _ x x: Regenerative option selection 00: Regenerative option is not used, or when you use a regenerative option, set the regenerative option with the converter unit. When using the drive unit with the resistance regeneration converter unit, set this value regardless of whether or not the regenerative option and brake unit are used.)	0h
				_ x _ _: Converter unit selection 0: MR-CR_ 7: MR-CV_ Setting a value other than "0" or "7" will trigger [AL. 37].	0h
				x _ _ _: Enable or disable the protection coordination mode. 0: Protection coordination mode enabled 4: Protection coordination mode disabled (stand-alone drive) Set "4" for the drive unit which is not connected to the MR-CV_ with the protection coordination cable. To disable the protection coordination mode, set "Protection coordination mode function between converter and drive unit selection" of [Pr. PF03] to "Enabled (_ 1 _ _)", and then this parameter to "Protection coordination mode disabled (4 _ _ _)".	0h

6. CHARACTERISTICS

6.1 Overload protection characteristics

An electronic thermal relay is built in the converter unit and drive unit to protect the servo motor, converter unit and drive unit from overloads.
[AL. 50 Overload 1] occurs if overload operation performed is above the electronic thermal protection curve shown in fig. 5.1, 5.2 and 5.3. [AL. 51 Overload 2] occurs if the maximum current is applied continuously for several seconds due to machine collision, etc. Use the equipment on the left-side area of the graph.
For the system where the unbalanced torque occurs, such as a vertical axis system, the unbalanced torque of the machine should be kept at 70% or lower of the motor's rated torque.
The MR-J3-DU_ and MR-J4-DU_ servo amplifiers have servo motor overload protective function.

(1) For the MR-J3-DU_



Note 1. If operation that generates torque more than 100% of the rating is performed with an abnormally high frequency in a servo motor stop status (servo-lock status) or in a 30 r/min or less low-speed operation status, the drive unit may malfunction regardless of the electronic thermal protection.
2. Load ratio 100% indicates the rated output of each converter unit and drive unit. Refer to "MR-J3-_A_ /MR-J3-_B_Servo amplifier instruction manual"

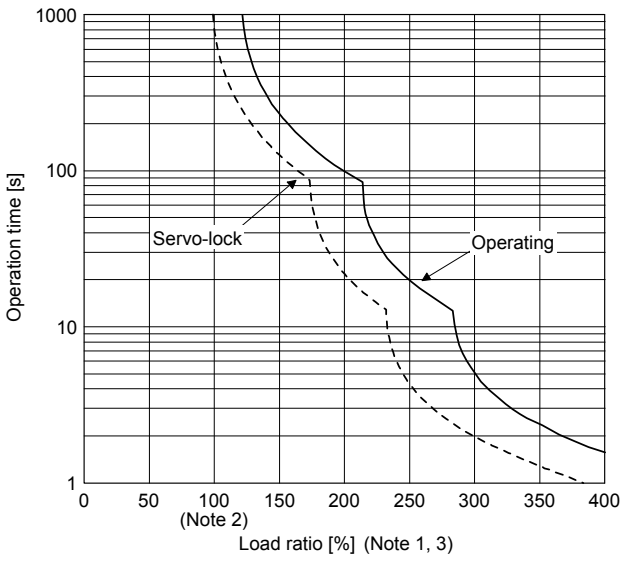
Fig. 5.1 Overload protection characteristics

(2) For the MR-J4-DU_

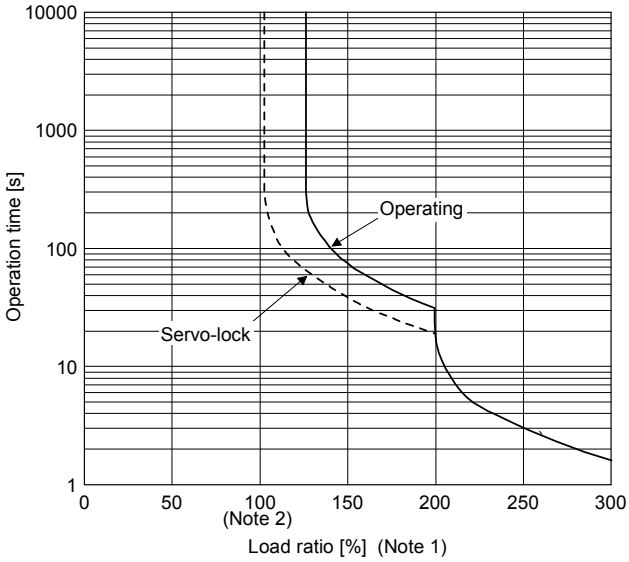
The following table shows combinations of each servo motor and graph of overload protection characteristics.

Rotary servo motor		Graph
HG-SR	HG-JR	
702 7024	503 703 701M 5034 7034	Characteristics A
	11K1M 903 9034 12K14 11K1M4 15K1M4 37K14 12K1 37K1 15K1M 801 15K1 20K1 25K1 30K1 22K1M 30K1M 37K1M 8014 15K14 20K14 25K14 30K14 22K1M4 30K1M4 37K1M4 45K1M4	Characteristics B
	601 6014 701M4	Characteristics A
	55K1M4	Characteristics B

The following graphs show overload protection characteristics.



Characteristics A



Characteristics B

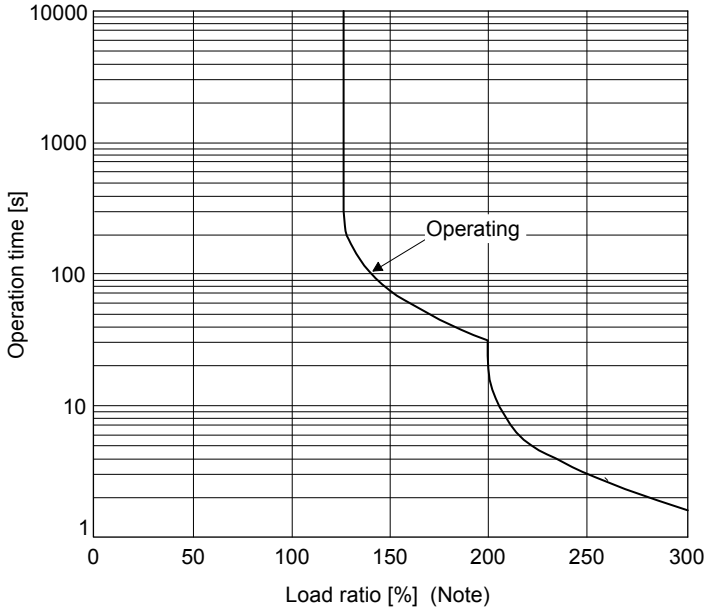
Note 1. If operation that generates torque more than 100% of the rating is performed with an abnormally high frequency in a servo motor stop status (servo-lock status) or in a 50 r/min or less low-speed operation status, the drive unit may malfunction regardless of the electronic thermal protection.

2. Load ratio 100% indicates the rated output of the drive unit. Refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".

3. The operation time at the load ratio of 300% to 400% applies when the maximum torque is increased to 400% of rated torque. For the combination of a servo amplifier and servo motor with which the maximum torque can be increased, refer to “Part 1: 3.3.2 (3) Servo amplifier and servo motor combination for the MR-J4 series”.

Fig. 5.2 Overload protection characteristics.

(3) For the MR-CR_ converter unit



Note. Load ratio 100% indicates the rated output of the resistance regeneration converter unit. Refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".

Fig. 5.3 Overload protection characteristics

6.2 Power supply capacity and generated loss

(1) Generated heat of the converter unit/drive unit

Table 5.1 and 5.2 indicates the generated loss and power supply capacity under rated load per combination of the resistance regeneration converter unit and drive unit. When the servo motors are run at less than the rated speed, the power supply equipment capacity is lower than the value in the table but the heat generated does not change.

Since the servo motor requires 2 times to 2.5 times greater instantaneous power for acceleration, use the power supply which ensures that the voltage lies within the permissible voltage fluctuation at the main circuit power supply terminals (L1/L2/L3) of the resistance regeneration converter unit. The power supply equipment capacity changes with the power supply impedance. The actually generated heat falls within the ranges at rated output and at servo-off according to the frequencies of use during operation. When designing an enclosed cabinet, use the values in the table, considering the worst operating conditions. The generated heat in table 5.1 and 5.2 does not include heat produced during regeneration.

(a) MR-J3-DU_

Table 5.1 Power supply capacity and generated heat per servo amplifier at rated output

Converter unit	Drive unit	Servo motor	Power supply capacity [kVA]		Drive unit-generated heart [W] (Note)			Area required for heat dissipation [m^2]
			Power factor improving DC reactor is not used	Power factor improving DC reactor is used	At rated torque	At rated output [Generated heat in the cabinet when cooled outside the cabinet]	At zero torque	
MR-J3-CR55K	MR-J3-DU30KB	HA-LP30K1 HA-LP30K1M HA-LP30K2	48	40	1550 (1100 + 450)	470	60 (30 + 30)	31.0
	MR-J3-DU37KB	HA-LP37K1 HA-LP37K1M HA-LP37K2	59	49	1830 (1280 + 550)	550		36.6
MR-J3-CR55K4	MR-J3-DU30KB4	HA-LP25K14	40	35	1080 (850 + 230)	330		21.6
		HA-LP30K14 HA-LP30K1M4 HA-LP30K24	48	40	1290 (1010 + 280)	390		25.8
	MR-J3-DU37KB4	HA-LP37K14 HA-LP37K1M4 HA-LP37K24	59	49	1542 (1200 + 342)	470		30.8
	MR-J3-DU45KB4	HA-LP45K1M4 HA-LP45K24	71	59	1810 (1370 + 440)	550		36.2
	MR-J3-DU55KB4	HA-LP50K1M4	80	67	2120 (1650 + 470)	640		42.4
		HA-LP55K24	87	72	2150 (1650 + 500)	650		43.0

Note. The heat generated by the drive unit is indicated in the left term within the parentheses, and the heat generated by the converter unit in the right term.

(b) MR-J4-DU_

Table 5.2 Power supply capacity and generated heat per servo motor at rated output

Converter unit	Drive unit	Servo motor	Power supply capacity [kVA]		Drive unit-generated heat [W] (Note)			Area required for heat dissipation [m^2]
			Power factor improving DC reactor is not used	Power factor improving DC reactor is used	At rated output	At rated output [Generated heat in the cabinet when cooled outside the cabinet]	With servo-off	
MR-CR55K	MR-J4-DU30K_	HG-JR30K1 HG-JR30K1M	48	40	1350 (900 + 450)	470	60 (30 + 30)	27.0
	MR-J4-DU37K_	HG-JR37K1 HG-JR37K1M	59	49	1550 (1000 + 550)	550		31.0
MR-CR55K4	MR-J4-DU30K_4	HG-JR30K14 HG-JR30K1M4	48	40	1070 (790 + 280)	390		21.4
	MR-J4-DU37K_4	HG-JR37K14 HG-JR37K1M4	59	49	1252 (910 + 342)	470		25.1
	MR-J4-DU45K_4	HG-JR45K1M4	71	59	1580 (1110 + 470)	550		31.6
	MR-J4-DU55K_4	HG-JR55K1M4	87	72	1940 (1440 + 500)	650		38.8

6.3 Inrush currents at power-on of main circuit/control circuit

POINT
●The inrush current values can change depending on frequency of turning on/off the power and ambient temperature.

Since large inrush currents flow in the power supplies, always use molded-case circuit breakers and magnetic contactors. (Refer to section 7.3.)
When circuit protectors are used, it is recommended that the inertia delay type, which is not tripped by an inrush current, be used.

(1) MR-J3 series

The following table indicates the inrush currents (reference data) that will flow when the maximum permissible voltage (200 V class: 253 VAC, 400 V class: 528 VAC) is applied at the power supply capacity of 2500 kVA and the wiring length of 1 m.

Converter unit	Drive unit	Inrush currents (A_{0-P})	
		Main circuit power supply ($L_1/L_2/L_3$)	Control circuit power supply (L_{11}/L_{21})
MR-J3-CR55K	MR-J3-DU30K_	163 A (Attenuated to approx. 20 A in 180 ms)	18 A (Attenuated to approx. 0 A in 100 ms)
	MR-J3-DU37K_		
MR-J3-CR55K4	MR-J3-DU30K_4	339 A (Attenuated to approx. 20 A in 70 ms)	19 A (Attenuated to approx. 0 A in 60 ms)
	MR-J3-DU37K_4		
	MR-J3-DU45K_4		
	MR-J3-DU55K_4		

(2) MR-J4 series

The following table indicates the inrush currents (reference data) that will flow when the maximum permissible voltage (200 V class: 240 VAC, 400 V class: 480 VAC) is applied at the power supply capacity of 2500 kVA and the wiring length of 1 m.

Converter unit	Drive unit	Inrush currents (A_{0-P})	
		Main circuit power supply (L1/L2/L3)	Control circuit power supply (L11/L21)
MR-CR55K	MR-J4-DU30K_	154 A (Attenuated to approx. 20 A in 150 ms)	31 A (attenuated to approx. 2 A in 60 ms)
	MR-J4-DU37K_		
MR-CR55K4	MR-J4-DU30K_4	305 A (attenuated to approx. 20 A in 70 ms)	27 A (attenuated to approx. 2 A in 45 ms)
	MR-J4-DU37K_4		
	MR-J4-DU45K_4		
	MR-J4-DU55K_4		

7. OPTIONS AND PERIPHERAL EQUIPMENT

7.1 Comparison table of cable option combinations

Cable option combinations

<table>
<tr><th>Application</th><th>MR-J3-DU_</th><th>MR-J4-DU_</th><th>Note</th></tr>
<tr><td>Protection coordination cable</td><td colspan="2">MR-J3CDL05M</td><td>Compatible</td></tr>
<tr><td>Connector sets</td><td colspan="2">MR-J2CN1-A</td><td>Compatible</td></tr>
<tr><td>Terminal connector</td><td>MR-J3-TM</td><td></td><td>Not required</td></tr>
<tr><td>Magnetic contactor wiring connector</td><td colspan="2" rowspan="2">(Note)</td><td>Socket: GFKC 2.5/2-STF-7.62 (Compatible)</td></tr>
<tr><td>Digital I/O connector</td><td>Connector: 17JE23090-02(D8A)K11-CG (Compatible)</td></tr>
<tr><td>Encoder cable</td><td>MR-J3ENSCBL_M-_
Cable length:
2 m/5 m/10 m/20 m/30 m</td><td>MR-ENECBL_M-H-MTH
Cable length:
2 m/5 m/10 m/20 m/30 m/40 m/50 m</td><td>When connected to an HG-JR motor, the encoder cable needs to be changed.</td></tr>
<tr><td>Encoder Connector sets</td><td>MR-J3SCNS</td><td>MR-ENECNS</td><td>When connected to an HG-JR motor, the encoder cable needs to be changed.</td></tr>
<tr><td>Connector sets</td><td colspan="2">MR-J3CN1</td><td>Compatible</td></tr>
<tr><td rowspan="3">SSCNETⅢcable</td><td colspan="2">MR-J3BUS_M
Cable length: 0.15 to 3 m</td><td rowspan="3">Compatible</td></tr>
<tr><td colspan="2">MR-J3BUS_M-A
Cable length: 5 to 20 m</td></tr>
<tr><td colspan="2">MR-J3BUS_M-B
Cable length: 30 to 50 m</td></tr>
<tr><td>USB cable</td><td colspan="2">MR-J3USBCBL3M</td><td></td></tr>
<tr><td>Connector sets</td><td colspan="2">MR-CCN1</td><td></td></tr>
<tr><td>STO cable</td><td></td><td>MR-D05UDL3M-B</td><td>When not using the STO function, attach the short-circuit connector supplied with the drive unit to CN8 (STO I/O signal connector).</td></tr>
<tr><td>battery for junction battery cable</td><td>MR-J3BTCBL03M</td><td>MR-BT6VCBL03M</td><td>Use the dedicated battery of each series.</td></tr>
<tr><td>Monitor cable</td><td colspan="2">MR-J3CN6CBL1M</td><td>Compatible</td></tr>
<tr><td>RS-422/RS-232C conversion cable</td><td colspan="2">DSV-CABV</td><td>Compatible</td></tr>
</table>

Note. Packed with a converter unit

7.1.1 MR-J3CDL05M (0.5 m) Protection coordination cable

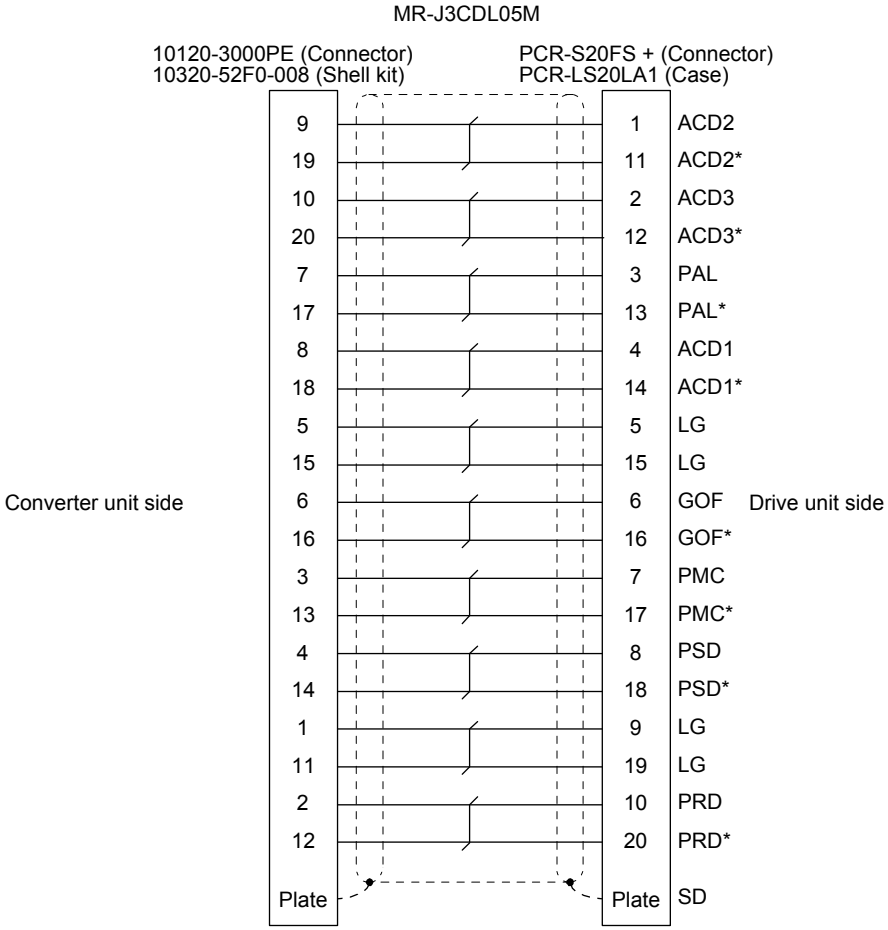
⚠CAUTION ●Connect protection coordination cables correctly if they are fabricated.Otherwise, the system may perform unexpected operation.

POINT

●MR-J3CDL05M is for the MR-CR_ converter unit.
MR-J3CDL05M cannot be used with the MR-CV_ power regeneration converter unit.

(1) Applications of the protection coordination cable
The cable is used to connect a converter unit to a drive unit.

(2) Internal wiring diagram

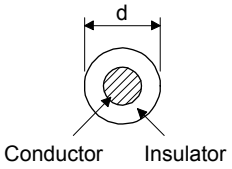


(3) When fabricating a cable

Prepare MR-J2CN1-A connector set, the recommended wires, and fabricate the cable according to the wiring diagram in (2) in this section.

Model	Length [m]	Core size [mm²]	Number of cores	Characteristics of one core			Cable OD [mm] (Note 2)	Wire model
				Structure [Wires/mm]	Conductor resistance [Ω/km]	Insulator OD d [mm] (Note 1)		
MR-J3CDL05M	0.5	0.08	20 (10 pairs)	7/0.127	222 or less	0.38	6.1	UL 20276 AWG#28 10pair (cream)

Note 1. The following shows the detail of d.



2. Standard OD. Maximum OD is about 10% greater.

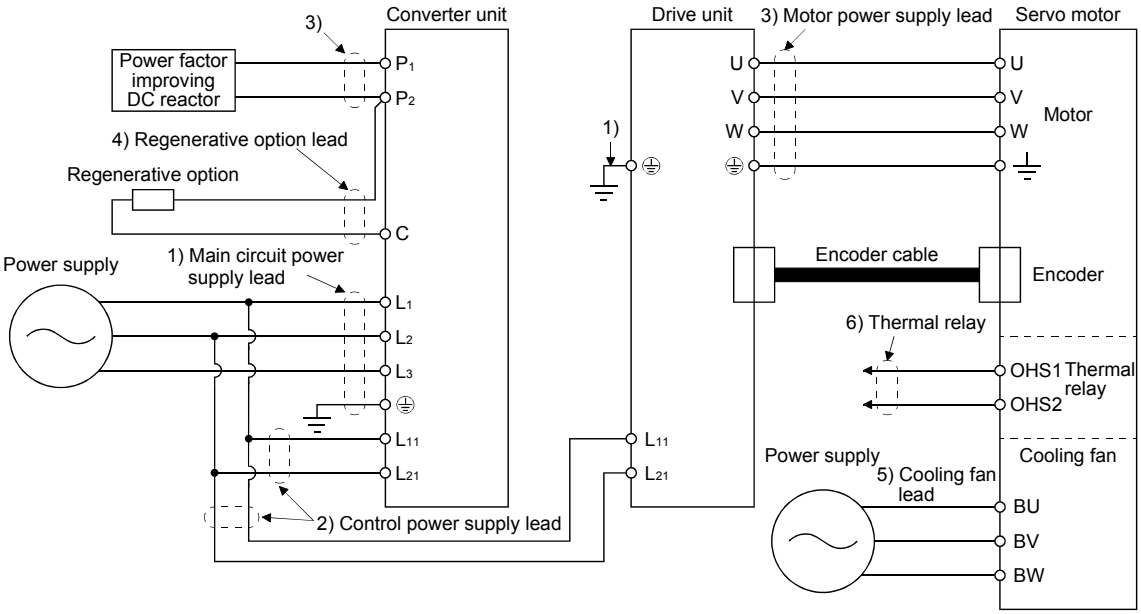
7.2 Selection example of wires

POINT

- To comply with the IEC/EN/UL/CSA standard, use the wires refer to "MR-J3-_A_/MR-J3-_B_ Servo amplifier instruction manual" and "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".To comply with other standards, use a wire that is complied with each standard.
- Selection conditions of wire size are as follows.
  Construction condition: Single wire set in midair
  Wire length: 30 m or less (J3 series)
  50 m or less (J4 series)

7.2.1 MR-J3 series, power supply wire size

For the power supply wire, use a 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wire). The following diagram shows the wires used for wiring. Use the wires or equivalent given in this section.



(1) When using the 600V Grade heat-resistant polyvinyl chloride insulated wire (HIV wire)
Selection example of wire size when using HIV wires is indicated below.

Wire size selection example 2 (HIV wire)

Converter unit	Drive unit (Note 2)	Wires [mm²] (Note 1, 3)					
		1) $L_1/L_2/L_3/⏚$	2) L_{11}/L_{21}	3) $U/V/W/P_1/P_2/⏚$	4) P_2/C	5) BU/BV/BW	6) OHS1/OHS2
MR-J3-CR55K	MR-J3-DU30K_	38 (AWG2): c	2 (AWG14)	60 (AWG2/0): d	5.5 (AWG10): a	2 (AWG14)	1.25 (AWG16)
	MR-J3-DU37K_	60 (AWG2/0): d		60 (AWG2/0): d			
MR-J3-CR55K4	MR-J3-DU30K_4	22 (AWG4): b		22 (AWG4): e		1.25 (AWG16)	
	MR-J3-DU37K_4	22 (AWG4): b		22 (AWG4): e			
	MR-J3-DU45K_4	38 (AWG2): c		38 (AWG2): c			
	MR-J3-DU55K_4	38 (AWG2): c		38 (AWG2): c			

Note 1. Alphabets in the table indicate crimping tools. For crimp terminals and applicable tools, refer to (2) in this section.
2. To connect these models to a terminal block, be sure to use the screws that come with the terminal block.
3. Wires are selected based on the highest rated current among combining servo motors.

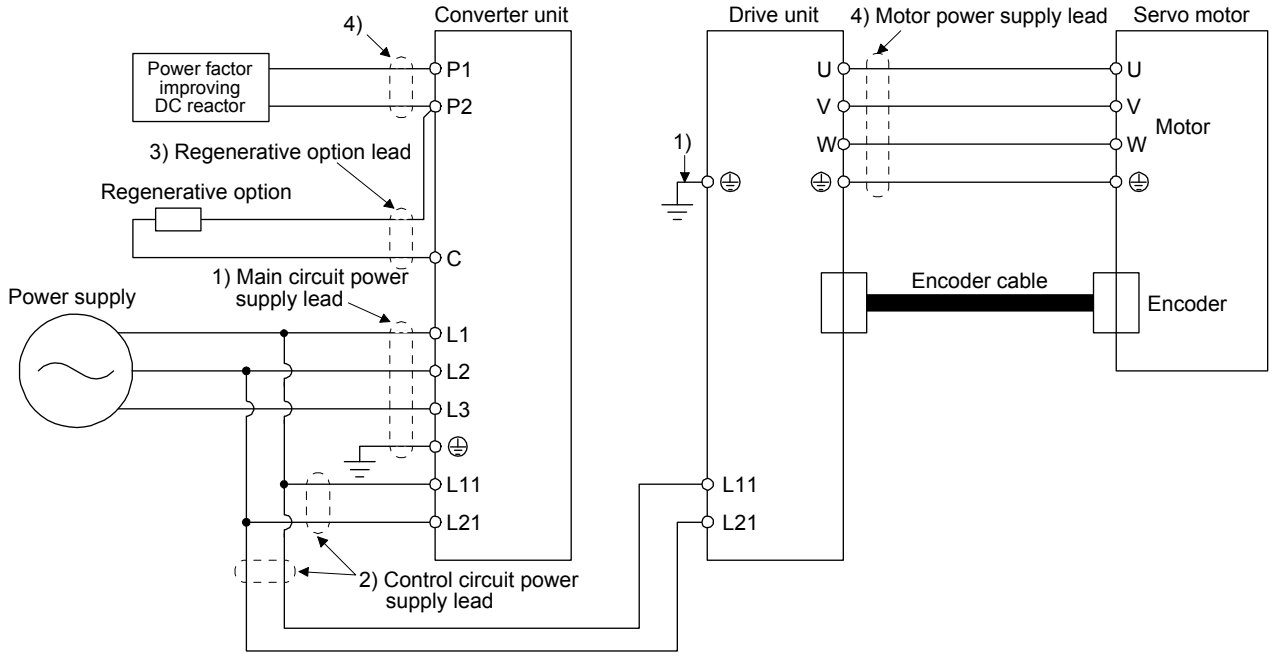
(2) Selection example of crimp terminals
The following shows the selection example of crimp terminals for terminal blocks of the drive unit and converter unit when you use wires mentioned in (1) in this section.

Symbol	Drive unit/converter unit-side crimp terminal				
	Crimp terminal (Note 2)	Applicable tool			Manufacturer
		Body	Head	Dice	
a	FVD5.5-10	YNT-1210S			JST (J.S.T. Mfg. Co., Ltd.)
b	FVD22-10	YF-1 E-4	YNE-38	DH-123 DH-113	
c (Note 1)	R38-10	YPT-60-21		TD-124 TD-112	
		YF-1 E-4	YET-60-1		
d (Note 1)	R60-10	YPT-60-21		TD-125 TD-113	
		YF-1 E-4	YET-60-1		
e	FVD22-8	YF-1 E-4	YNE-38	DH-123 DH-113	
f (Note 1)	R38-8	YPT-60-21		TD-124 TD-112	
		YF-1 E-4	YET-60-1		

Note 1. Coat the crimping part with an insulation tube.
2. Some crimp terminals may not be mounted. Make sure to use the recommended crimp terminal or one equivalent to it.

7.2.2 MR-J4 series, power supply wire size

The following diagram shows the wires used for wiring. Use the wires given in this section or equivalent.



(1) Example of selecting the wire sizes

Use the 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wire) for wiring. The following shows the wire size selection example.

Wire size selection example (HIV wire)

Recommended wire

Converter unit (Note 2)	Drive unit (Note 2)	Wire [mm^2] (Note 1, 3)			
		1) L1/L2/L3/⏚	2) L11/L21	3) P2/C	4) U/V/W P1/P2/⏚
MR-CR55K	MR-J4-DU30K_	38 (AWG2): c	1.25 to 2 (AWG 16 ～ 14): g (Note 4)	5.5 (AWG10): a	60 (AWG2/0): d
	MR-J4-DU37K_	60 (AWG2/0): d			60 (AWG2/0): d
MR-CR55K4	MR-J4-DU30K_4	22 (AWG4): e			22 (AWG4): e
	MR-J4-DU37K_4	22 (AWG4): e			38 (AWG 2): f
	MR-J4-DU45K_4	38 (AWG2): c			38 (AWG2): c
	MR-J4-DU55K_4	38 (AWG2): c			38 (AWG2): c

Note 1. Alphabets in the table indicate crimping tools. For crimp terminals and applicable tools, refer to (2) in this section.

2. To connect these models to a terminal block, be sure to use the screws that come with the terminal block.

3. Wires are selected based on the highest rated current among combining servo motors.

4. Be sure to use the size of 2 mm^2 when corresponding to the IEC/EN/UL/CSA standard.

(2) Selection example of crimp terminals

The following shows the selection example of crimp terminals for terminal blocks of the drive unit and converter unit when you use wires mentioned in (1) in this section.

Symbol	Drive unit/converter unit-side crimp terminal				
	Crimp terminal (Note 2)	Applicable tool			Manufacturer
		Body	Head	Dice	
a	FVD5.5-10	YNT-1210S			JST (J.S.T. Mfg. Co., Ltd.)
b	FVD22-10	YF-1 E-4	YNE-38	DH-123 DH-113	
c (Note 1)	R38-10	YPT-60-21		TD-124 TD-112	
		YF-1 E-4	YET-60-1		
d (Note 1)	R60-10	YPT-60-21		TD-125 TD-113	
		YF-1 E-4	YET-60-1		
e	FVD22-8	YF-1 E-4	YNE-38	DH-123 DH-113	
f (Note 1)	R38-8	YPT-60-21		TD-124 TD-112	
		YF-1 E-4	YET-60-1		
g	FVD2-4	YNT-1614			

Note 1. Coat the crimping part with an insulation tube.
2. Installation of a crimp terminal may be impossible depending on the size, so make sure to use the recommended crimp terminal or one equivalent to it.

7.3 Selection of Molded-case circuit breakers, fuses, magnetic contactors (example)

⚠CAUTION

- To prevent the converter unit and the drive unit from smoke and a fire, select a molded-case circuit breaker which shuts off with high speed.
- Always use one molded-case circuit breaker and one magnetic contactor with one converter unit.
- Since recommended products vary between MR-J3-DU and MR-J4-DU_, use the recommended products of MR-J4-DU_.

7.3.1 MR-J3-DU_ Molded-case circuit breakers, fuses, magnetic contactors (recommended)

(1) For main circuit power supply

When using a fuse instead of the molded-case circuit breaker, use the one having the specifications given in this section.

Converter unit	Drive unit	Molded-case circuit breaker			Fuse			Magnetic contactor (Note)
		Frame, rated current		Voltage AC [V]	Class	Current [A]	Voltage AC [V]	
		Power factor improving DC reactor is not used	Power factor improving DC reactor is used					
MR-J3-CR55K	MR-J3-DU30K_	400 A frame 250 A	225 A frame 225 A	240	T	500	300	S-N150
	MR-J3-DU37K_	400 A frame 300 A	400 A frame 300 A			600		S-N180
MR-J3-CR55K4	MR-J3-DU30K_4	225 A frame 125 A	225 A frame 125 A	600Y/347		250	600	S-N95
	MR-J3-DU37K_4	225 A frame 150 A	225 A frame 150 A			300		S-N125
	MR-J3-DU45K_4	225 A frame 175 A	225 A frame 175 A			400		S-N150
	MR-J3-DU55K_4	400 A frame 225 A	225 A frame 225 A			450		S-N180

Note. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less.

7.3.2 MR-J4-DU_ Molded-case circuit breakers, fuses, magnetic contactors (recommended)

(1) For main circuit power supply

When using a fuse instead of the molded-case circuit breaker, use the one having the specifications given in this section.

Converter unit	Drive unit	Molded-case circuit breaker (Note 1)			Fuse			Magnetic contactor (Note 2)
		Frame, rated current		Voltage AC [V]	Class	Current [A]	Voltage AC [V]	
		Power factor improving DC reactor is not used	Power factor improving DC reactor is used					
MR-CR55K	MR-J4-DU30K_	225 A frame 175 A	225 A frame 150 A	240	T	300	300	S-N150
	MR-J4-DU37K_	225 A frame 225 A	225 A frame 175 A			400		S-N180
MR-CR55K4	MR-J4-DU30K_4	100 A frame 100 A	100 A frame 80 A	480	T	175	600	S-N65
	MR-J4-DU37K_4	125 A frame 125 A	100 A frame 100 A			200		S-N80
	MR-J4-DU45K_4	225 A frame 150 A	125 A frame 125 A			300		S-N95
	MR-J4-DU55K_4	225 A frame 175 A	225 A frame 150 A			300		S-N150

Note 1. For compliance with the IEC/EN/UL/CSA standard, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".

2. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less.

(2) For control circuit power supply

When the wiring for the control circuit power supply (L11/L21) is thinner than that for the main circuit power supply (L1/L2/L3), install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit.

(a) Converter unit

Converter unit	Molded-case circuit breaker (Note)		Fuse (Class T)		Fuse (Class K5)	
	Frame, rated current	Voltage AC [V]	Current [A]	Voltage AC [V]	Current [A]	Voltage AC [V]
MR-CR55K	30 A frame 5 A	240	1	300	1	250
MR-CR55K4	30 A frame 5 A	480	1	600	1	600

Note. When having the converter unit comply with the IEC/EN/UL/CSA standard, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".

(b) Drive unit

Drive unit	Molded-case circuit breaker (Note)		Fuse (Class T)		Fuse (Class K5)	
	Frame, rated current	Voltage AC [V]	Current [A]	Voltage AC [V]	Current [A]	Voltage AC [V]
MR-J4-DU30K_	30 A frame 5 A	240	1	300	1	250
MR-J4-DU37K_						
MR-J4-DU30K_4	30 A frame 5 A	480	1	600	1	600
MR-J4-DU37K_4						
MR-J4-DU45K_4						
MR-J4-DU55K_4						

Note. When having the drive unit comply with the IEC/EN/UL/CSA standard, refer to "MR-CV_/MR-CR55K_/MR-J4-DU_(-RJ) instruction manual".

7.4 FR-BU2-(H) brake unit

POINT

- EM2 of the drive unit is the signal having the same contents as EM1 of the drive unit in torque control mode. (J4 series)
- Use a 200 V class brake unit and a resistor unit with a 200 V class converter unit, and a 400 V class brake unit and a resistor unit with a 400 V class converter unit. Combination of different voltage class units cannot be used.
- When a brake unit and a resistor unit are installed horizontally or diagonally, the heat dissipation effect diminishes. Install them on a flat surface vertically.
- The temperature of the resistor unit case will be higher than the ambient temperature by 100 ˚C or over. Keep cables and flammable materials away from the case.
- Ambient temperature condition of the brake unit is between -10 °C and 50 °C. Note that the condition is different from the ambient temperature condition of the converter unit (between 0 °C and 55 °C).
- Configure the circuit to shut down the power-supply with the alarm output of the brake unit and the resistor unit under abnormal condition.
- Use the brake unit with a combination indicated in section 7.4.1.
- Brake unit and regenerative options (Regenerative resistor) cannot be used simultaneously.
- When using the brake unit, set the parameters as follows.

Parameter	Setting value
[Pr. PA01] of the resistance regeneration converter unit	_ _ 0 0 (Initial value)
MR-J3-DU_ drive unit of the [Pr. PA02]	_ _ 0 0 (Initial value)
MR-J4-DU_ drive unit of the [Pr. PA02]	_ _ 0 1

Connect the brake unit to the bus of the converter unit (L+ and L- of TE2-1) for use. As compared to the MR-RB regenerative option, the brake unit can return larger power. Use the brake unit when the regenerative option cannot provide sufficient regenerative capability.
When using the brake unit, always refer to "FR-BU2 Brake Unit Instruction Manual".

7.4.1 Selection

Use a combination of converter unit, brake unit and resistor unit listed below.

Brake unit		Resistor unit	Number of connected units	Permissible continuous power [kW]	Resultant resistance [Ω]	Converter unit
200 V class	FR-BU2-55K	FR-BR-55K	2 (parallel)	7.82	1	MR-J3-CR55K
		MT-BR5-55K	2 (parallel)	11.0	1	MR-CR55K
400 V class	FR-BU2-H55K	FR-BR-H55K	2 (parallel)	7.82	4	MR-J3-CR55K4
	FR-BU2-H75K	MT-BR5-H75K	2 (parallel)	15.0	3.25	MR-CR55K4

7.4.2 Brake unit parameter setting

Normally, changing the FR-BU2-(H) parameter is not required. Whether a parameter can be changed or not is listed below.

Parameter		Change possible/ impossible	Remark
No.	Name		
0	Brake mode switchover	Impossible	Do not change the parameter.
1	Monitor display data selection	Possible	Refer to "FR-BU2 Brake Unit Instruction Manual".
2	Input terminal function selection 1	Impossible	Do not change the parameter.
3	Input terminal function selection 2		
77	Parameter write selection		
78	Cumulative energization time carrying-over times		
CLr	Parameter clear		
ECL	Alarm history clear		
C1	For manufacturer setting		

7.4.3 Connection example

POINT

●Connecting PR terminal of the brake unit to L+ terminal of the resistance regeneration converter unit results in a brake unit malfunction. Always connect the PR terminal of the brake unit to the PR terminal of the resistor unit.

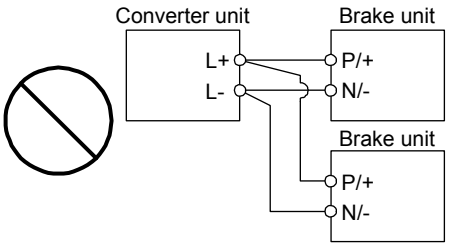
(1) Combination with FR-BR-(H) resistor unit

POINT

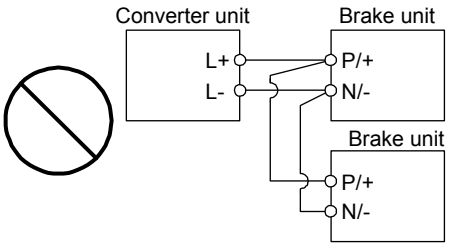
●To use brake units with a parallel connection, use two sets of FR-BU2-(H) brake unit. Combination with other brake unit results in alarm occurrence or malfunction.

●Always connect the terminals for master/slave (MSG to MSG, SD to SD) between the two brake units.

●Do not connect as follows.

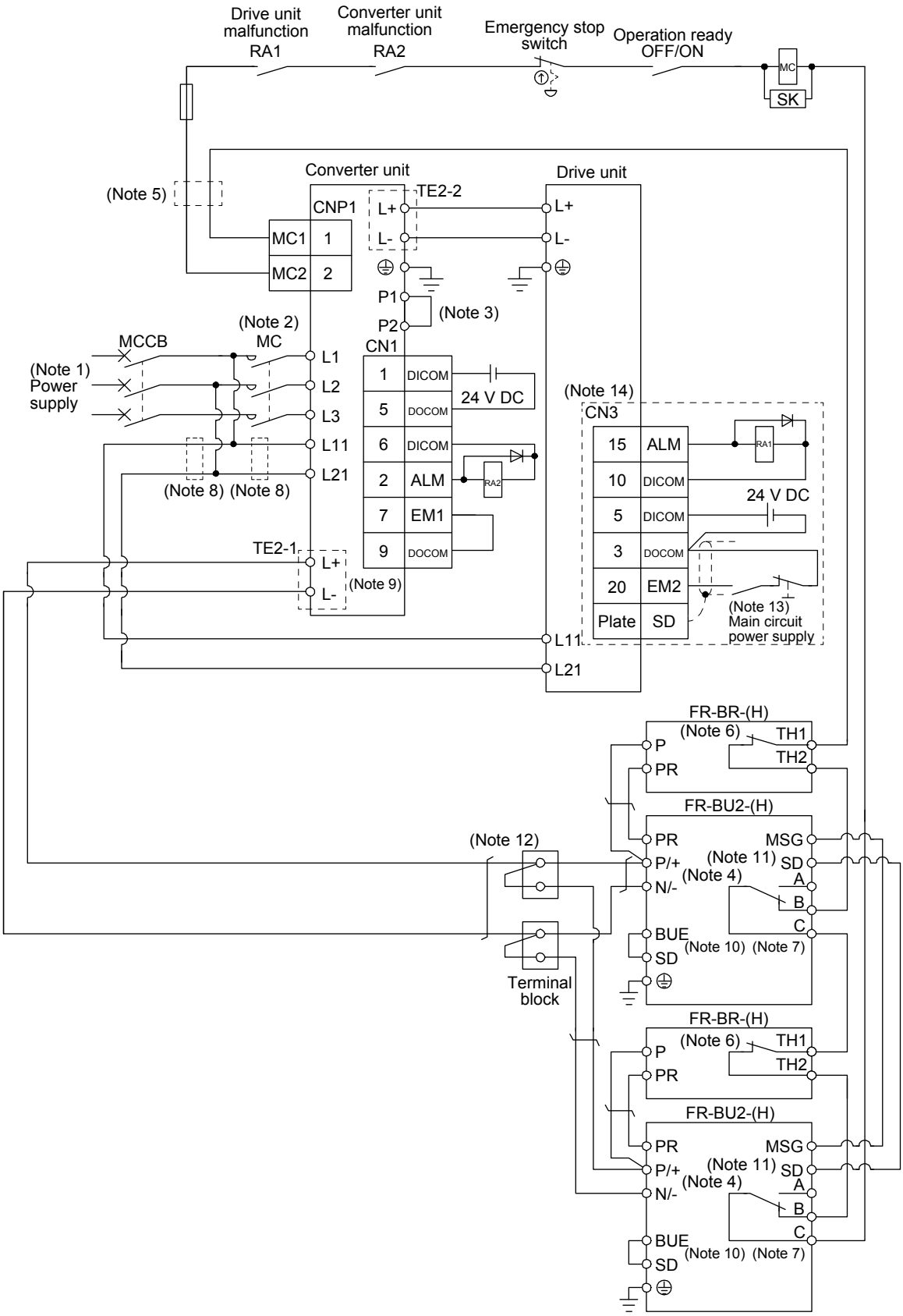


Connecting two cables to L+ and L- terminals



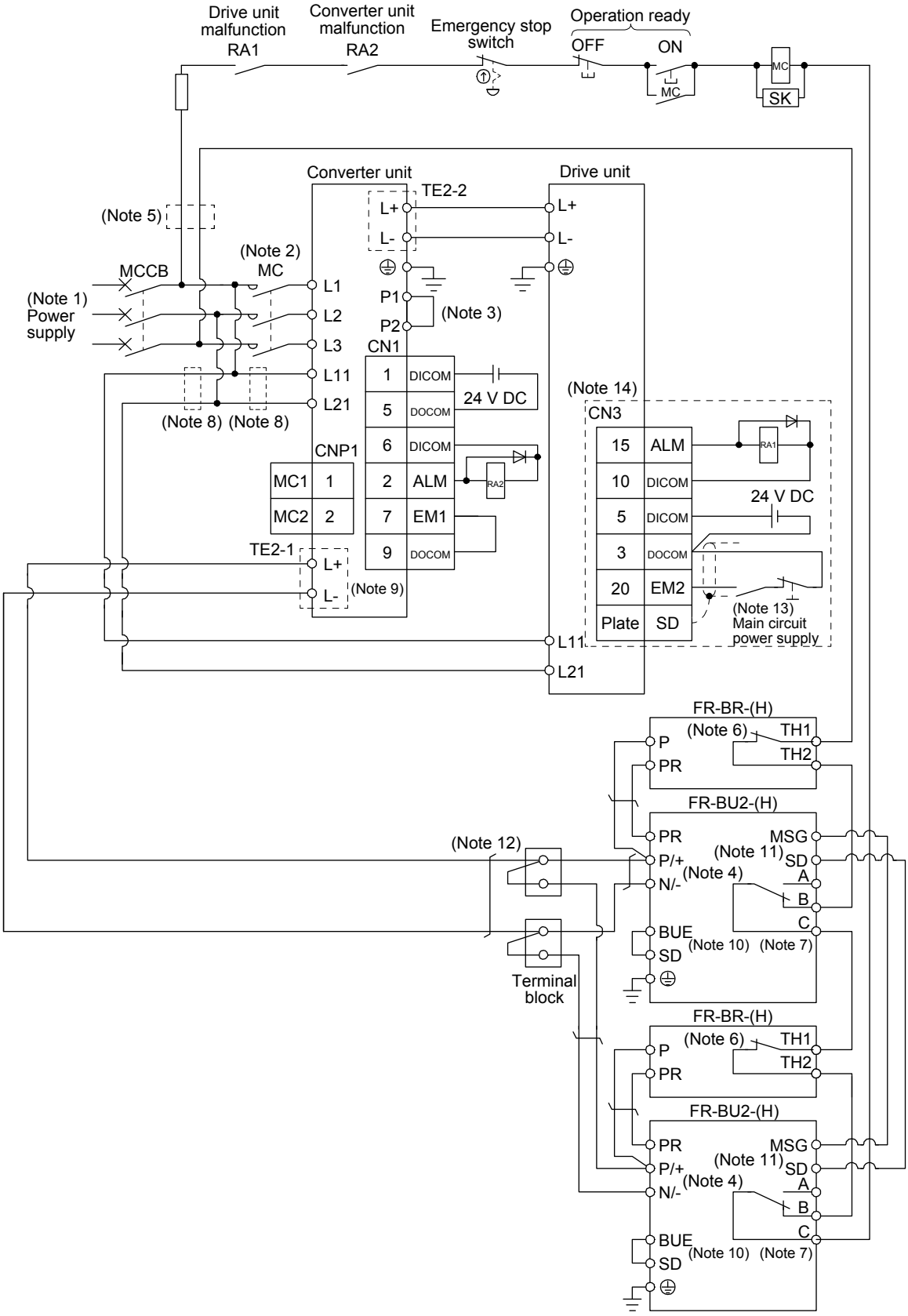
Passing wiring

(a) When magnetic contactor drive output is enabled



Note
1. For the power supply specifications, refer to "Part 6: Common Reference Material".
2. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. Depending on the main circuit voltage and operation pattern, bus voltage decreases, and that may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.
3. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part 8: Chapter 7" for details.
4. Connect P/+ and N/- terminals of the brake unit to a correct destination. Incorrect connection destination results in the resistance regeneration converter unit and brake unit malfunction.
5. For 400 V class, a step-down transformer is required.
6. Contact rating: 1b contact, 110 V AC, 5 A/220 V AC, 3 A
   Normal condition: TH1-TH2 is conducting. Abnormal condition: TH1-TH2 is not conducting.
7. Contact rating: 230 V AC, 0.3 A/30 V DC, 0.3 A
   Normal condition: B-C is conducting./A-C is not conducting. Abnormal condition: B-C is not conducting./A-C is conducting.
8. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.)
9. Do not connect more than one cable to each L+ and L- terminals of TE2-1 of the resistance regeneration converter unit.
10. Always connect BUE and SD terminals. (factory-wired)
11. Connect MSG and SD terminals of the brake unit to a correct destination. Incorrect connection destination results in the converter unit and brake unit malfunction.
12. For connecting L+ and L- terminals of TE2-1 of the converter unit to the terminal block, use the cable indicated in (4) in this section.
13. Configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off to prevent an unexpected restart of the drive unit.
14. The wiring is for MR-J4-DU_B_(-RJ). The connection for the interface of MR-J4-DU_(-RJ) is the same as in the case of MR-J4-_(-RJ). Refer to each servo amplifier instruction manual.

(b) When magnetic contactor drive output is disabled

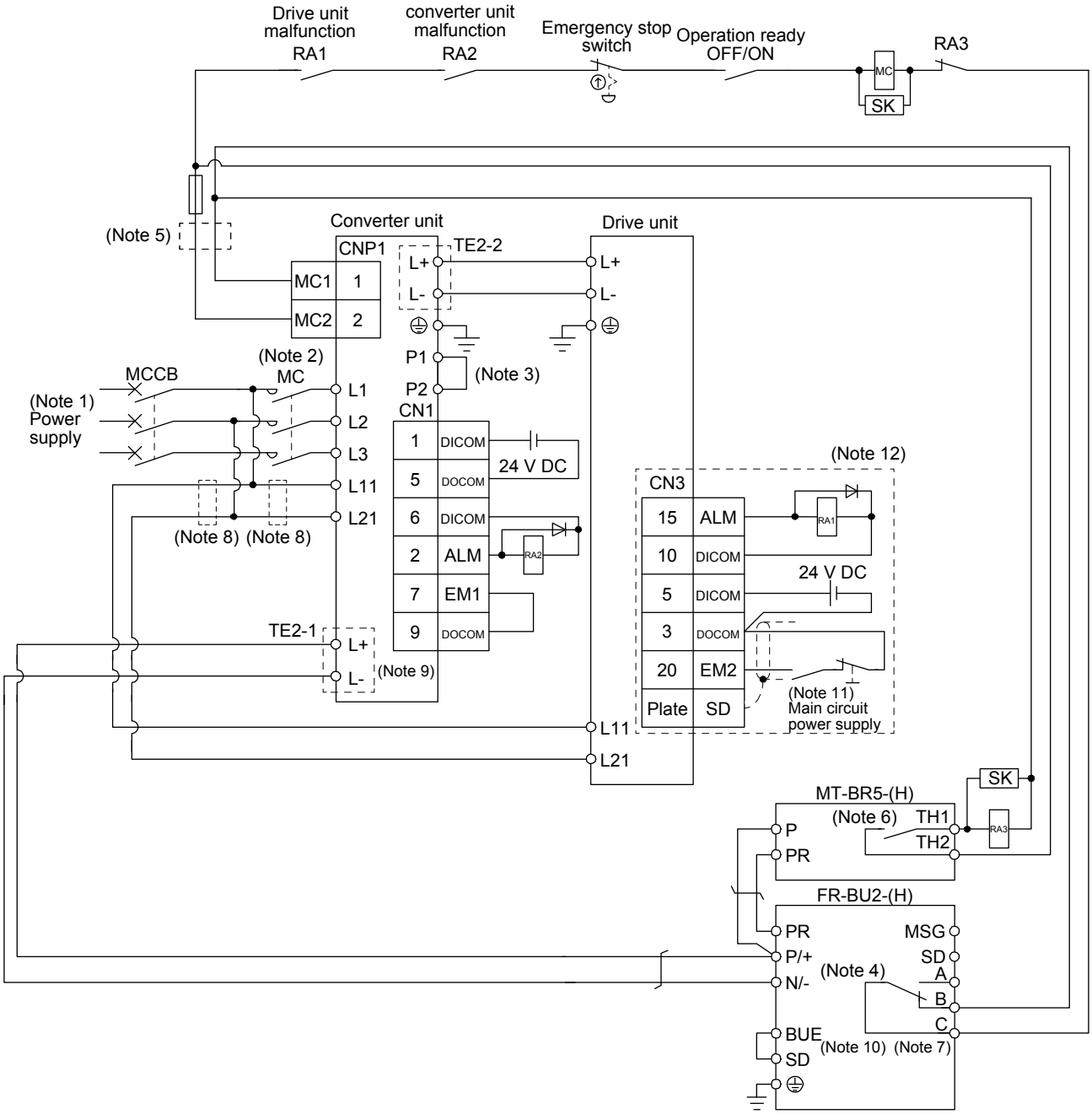


Note
1. For the power supply specifications, refer to "Part 6: Common Reference Material".
2. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. Depending on the main circuit voltage and operation pattern, bus voltage decreases, and that may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.
3. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part 8: Chapter 7" for details.
4. Connect P/+ and N/- terminals of the brake unit to a correct destination. Incorrect connection destination results in the converter unit and brake unit malfunction.
5. For 400 V class, a step-down transformer is required.
6. Contact rating: 1b contact, 110 V AC, 5 A/220 V AC, 3 A
   Normal condition: TH1-TH2 is conducting. Abnormal condition: TH1-TH2 is not conducting.
7. Contact rating: 230 V AC, 0.3 A/30 V DC, 0.3 A
   Normal condition: B-C is conducting./A-C is not conducting. Abnormal condition: B-C is not conducting./A-C is conducting.
8. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.)
9. Do not connect more than one cable to each L+ and L- terminals of TE2-1 of the resistance regeneration converter unit.
10. Always connect BUE and SD terminals. (factory-wired)
11. Connect MSG and SD terminals of the brake unit to a correct destination. Incorrect connection destination results in the converter unit and brake unit malfunction.
12. For connecting L+ and L- terminals of TE2-1 of the resistance regeneration converter unit to the terminal block, use the cable indicated in (4) in this section.
13. Configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off to prevent an unexpected restart of the drive unit.
14. The wiring is for MR-J4-DU_B_(-RJ). The connection for the interface of MR-J4-DU_(-RJ) is the same as in the case of MR-J4-_(-RJ). Refer to each servo amplifier instruction manual.

(2) Combination with MT-BR5-(H) resistor unit

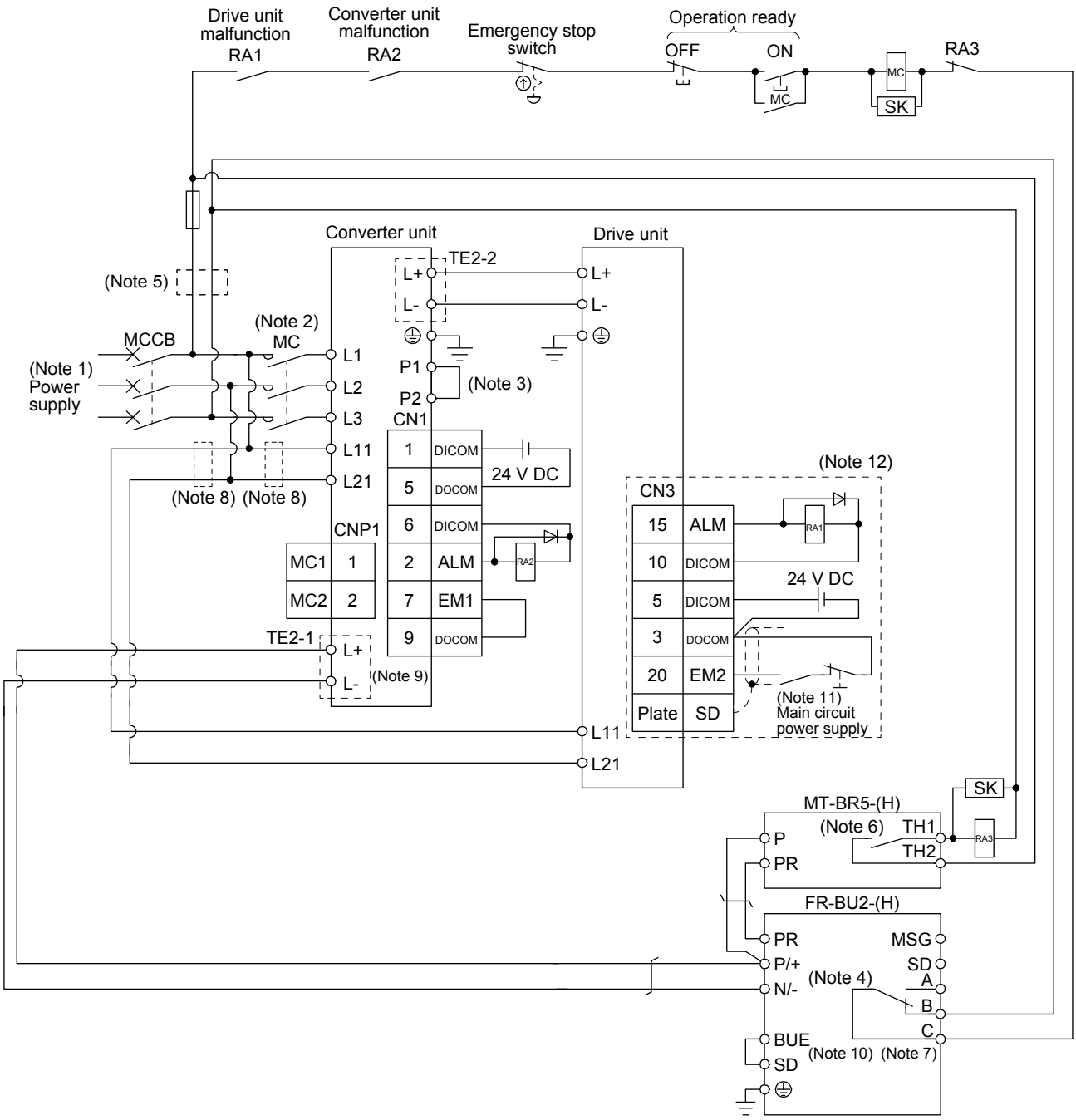
(a) When connecting a brake unit to a converter unit

1) When magnetic contactor drive output is enabled



Note
1. For the power supply specifications, refer to "Part 6: Common Reference Material".
2. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. Depending on the main circuit voltage and operation pattern, bus voltage decreases, and that may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.
3. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part 8: Chapter 7" for details.
4. Connect P/+ and N/- terminals of the brake unit to a correct destination. Incorrect connection destination results in the converter unit and brake unit malfunction.
5. For 400 V class, a step-down transformer is required.
6. Contact rating: 1a contact, 110 V AC, 5 A/220 V AC, 3 A
   Normal condition: TH1-TH2 is not conducting. Abnormal condition: TH1-TH2 is conducting.
7. Contact rating: 230 V AC, 0.3 A/30 V DC, 0.3 A
   Normal condition: B-C is conducting./A-C is not conducting. Abnormal condition: B-C is not conducting./A-C is conducting.
8. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.)
9. Do not connect more than one cable to each L+ and L- terminals of TE2-1 of the converter unit.
10. Always connect BUE and SD terminals. (factory-wired)
11. Configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off to prevent an unexpected restart of the drive unit.
12. The wiring is for MR-J4-DU_B_(-RJ). The connection for the interface of MR-J4-DU_(-RJ) is the same as in the case of MR-J4-_(-RJ). Refer to each servo amplifier instruction manual.

2) When magnetic contactor drive output is disabled

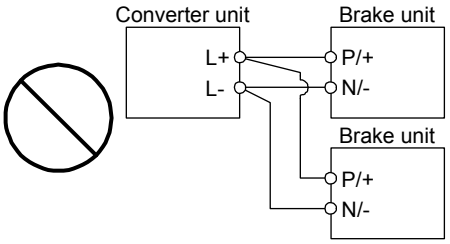


Note
1. For the power supply specifications, refer to "Part 6: Common Reference Material".
2. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. Depending on the main circuit voltage and operation pattern, bus voltage decreases, and that may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.
3. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part 8: Chapter 7" for details.
4. Connect P/+ and N/- terminals of the brake unit to a correct destination. Incorrect connection destination results in the converter unit and brake unit malfunction.
5. For 400 V class, a step-down transformer is required.
6. Contact rating: 1a contact, 110 V AC, 5 A/220 V AC, 3 A
   Normal condition: TH1-TH2 is not conducting. Abnormal condition: TH1-TH2 is conducting.
7. Contact rating: 230 V AC, 0.3 A/30 V DC, 0.3 A
   Normal condition: B-C is conducting./A-C is not conducting. Abnormal condition: B-C is not conducting./A-C is conducting.
8. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.)
9. Do not connect more than one cable to each L+ and L- terminals of TE2-1 of the converter unit.
10. Always connect BUE and SD terminals. (factory-wired)
11. Configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off to prevent an unexpected restart of the drive unit.
12. The wiring is for MR-J4-DU_B_(-RJ). The connection for the interface of MR-J4-DU_(-RJ) is the same as in the case of MR-J4-_(-RJ). Refer to each servo amplifier instruction manual.

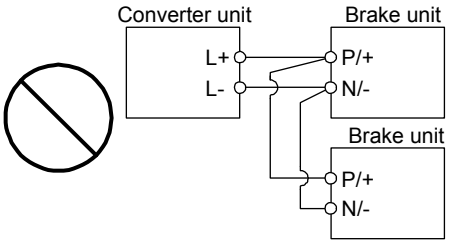
(b) When connecting two brake units to a resistance regeneration converter unit

POINT

- To use brake units with a parallel connection, use two sets of FR-BU2-(H) brake unit. Combination with other brake unit results in alarm occurrence or malfunction.
- Always connect the terminals for master/slave (MSG to MSG, SD to SD) between the two brake units.
- Do not connect as follows.

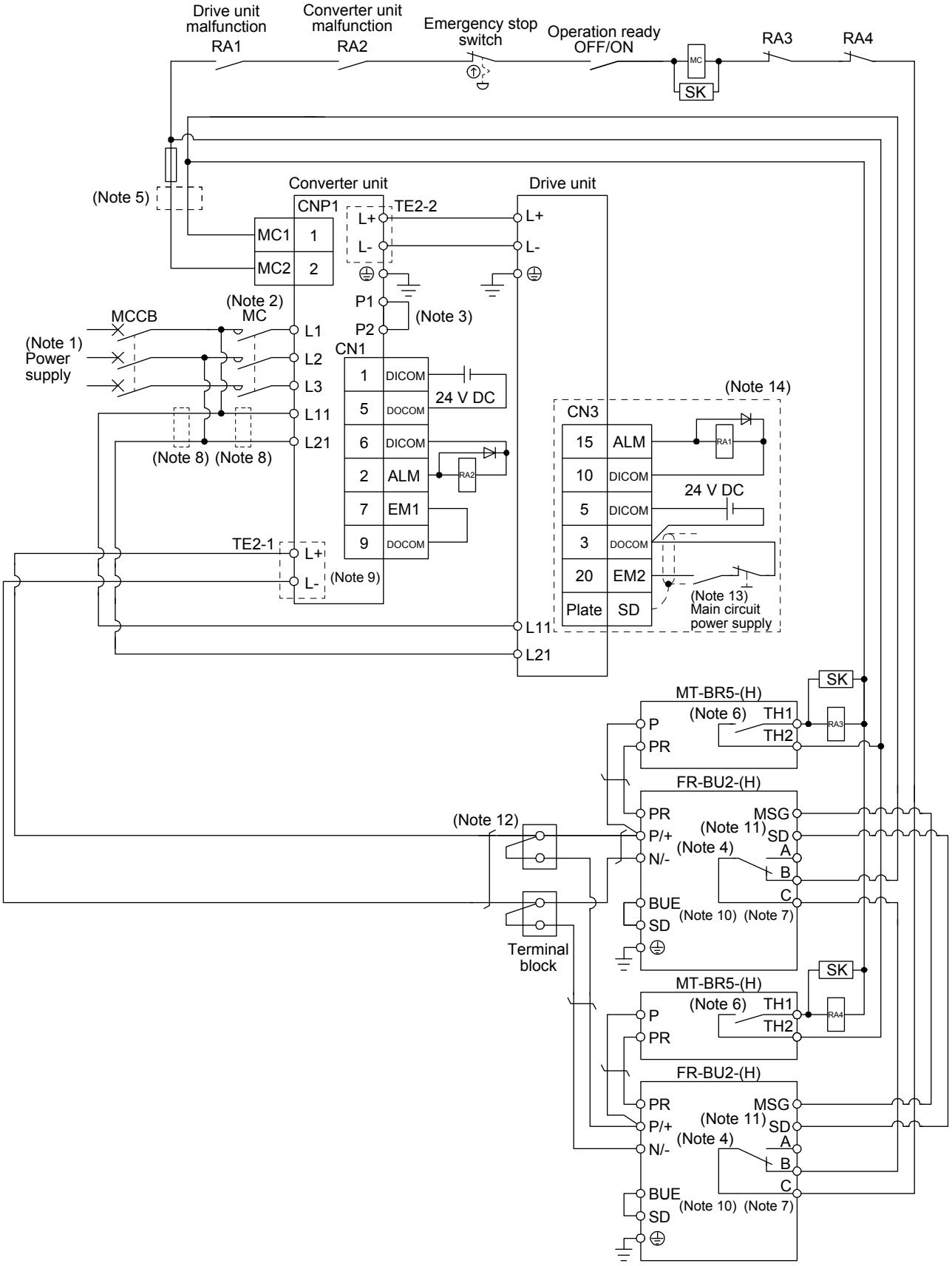


Connecting two cables to L+ and L- terminals



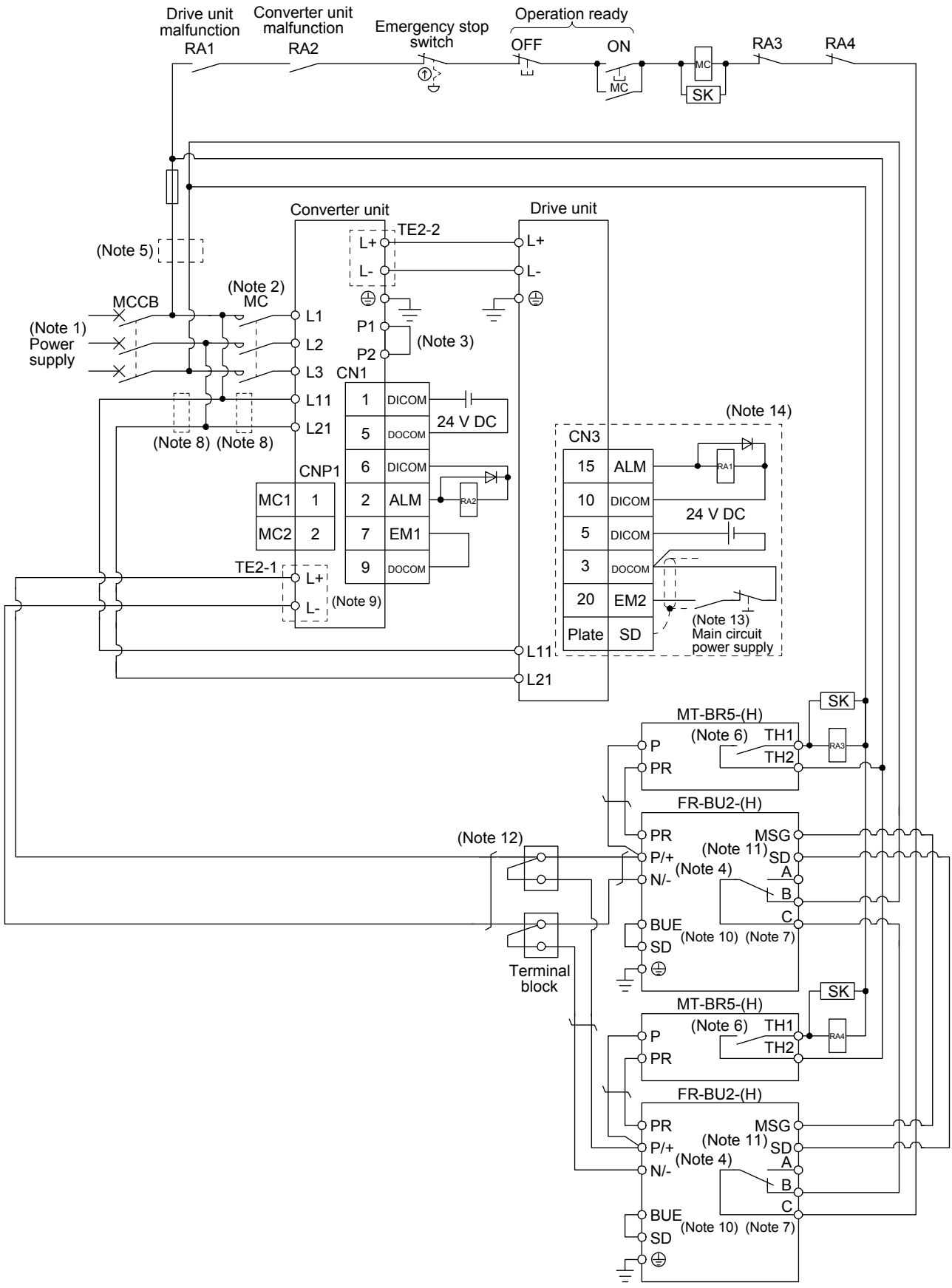
Passing wiring

1) When magnetic contactor drive output is enabled



Note
1. For the power supply specifications, refer to "Part 6: Common Reference Material".
2. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. Depending on the main circuit voltage and operation pattern, bus voltage decreases, and that may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.
3. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part 8: Chapter 7" for details.
4. Connect P/+ and N/- terminals of the brake unit to a correct destination. Incorrect connection destination results in the converter unit and brake unit malfunction.
5. For 400 V class, a step-down transformer is required.
6. Contact rating: 1a contact, 110 V AC, 5 A/220 V AC, 3 A
   Normal condition: TH1-TH2 is not conducting. Abnormal condition: TH1-TH2 is conducting.
7. Contact rating: 230 V AC, 0.3 A/30 V DC, 0.3 A
   Normal condition: B-C is conducting./A-C is not conducting. Abnormal condition: B-C is not conducting./A-C is conducting.
8. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.)
9. Do not connect more than one cable to each L+ and L- terminals of TE2-1 of the converter unit.
10. Always connect BUE and SD terminals. (factory-wired)
11. Connect MSG and SD terminals of the brake unit to a correct destination. Incorrect connection destination results in the converter unit and brake unit malfunction.
12. For connecting L+ and L- terminals of the converter unit to the terminal block, use the cable indicated in (4) in this section.
13. Configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off to prevent an unexpected restart of the drive unit.
14. The wiring is for MR-J4-DU_B_(-RJ). The connection for the interface of MR-J4-DU_(-RJ) is the same as in the case of MR-J4-_(-RJ). Refer to each servo amplifier instruction manual.

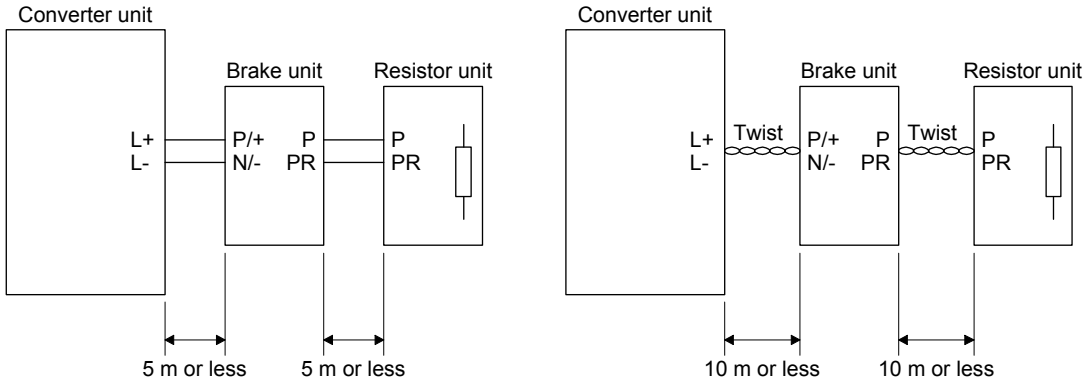
2) When magnetic contactor drive output is disabled



Note
1. For the power supply specifications, refer to "Part 6: Common Reference Material".
2. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. Depending on the main circuit voltage and operation pattern, bus voltage decreases, and that may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.
3. P1 and P2 are connected by default. When using the power factor improving DC reactor, connect P1 and P2 after removing the short bar across them. Refer to "Part 8: Chapter 7" for details.
4. Connect P/+ and N/- terminals of the brake unit to a correct destination. Incorrect connection destination results in the converter unit and brake unit malfunction.
5. For 400 V class, a step-down transformer is required.
6. Contact rating: 1a contact, 110 V AC, 5 A/220 V AC, 3 A
   Normal condition: TH1-TH2 is not conducting. Abnormal condition: TH1-TH2 is conducting.
7. Contact rating: 230 V AC, 0.3 A/30 V DC, 0.3 A
   Normal condition: B-C is conducting./A-C is not conducting. Abnormal condition: B-C is not conducting./A-C is conducting.
8. Install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit. (Refer to section 7.3.)
9. Do not connect more than one cable to each L+ and L- terminals of TE2-1 of the converter unit.
10. Always connect BUE and SD terminals. (factory-wired)
11. Connect MSG and SD terminals of the brake unit to a correct destination. Incorrect connection destination results in the converter unit and brake unit malfunction.
12. For connecting L+ and L- terminals of the converter unit to the terminal block, use the cable indicated in (4) in this section.
13. Configure a circuit to turn off EM2 in the drive unit when the main circuit power is turned off to prevent an unexpected restart of the drive unit.
14. The wiring is for MR-J4-DU_B_(-RJ). The connection for the interface of MR-J4-DU_(-RJ) is the same as in the case of MR-J4-_(-RJ). Refer to each servo amplifier instruction manual.

(3) Connection instructions

Keep the wires between the converter unit and the brake unit, and between the resistor unit and the brake unit as short as possible. For wires longer than 5 m, twist the wires five times or more per meter. The wires should not exceed 10 m even when the wires are twisted. If wires exceeding 5 m without twisted or exceeding 10 m with or without twisted are used, the brake unit may malfunction.

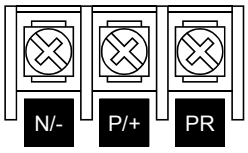


(4) Wires

(a) Wires for the brake unit

For the brake unit, HIV wire (600 V Grade heat-resistant polyvinyl chloride insulated wire) is recommended.

1) Main circuit terminal

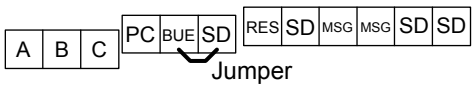


Terminal block

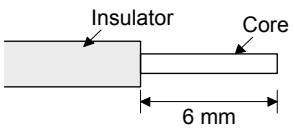
Brake unit		Main circuit terminal screw size	Crimp terminal N/-, P/+, PR, ⏚	Tightening torque [N•m]	Wire size N/-, P/+, PR, ⏚	
					HIV wire [mm²]	AWG
200 V class	FR-BU2-55K	M6	14-6	4.4	14	6
400 V class	FR-BU2-H55K	M5	5.5-5	2.5	5.5	10
	FR-BU2-H75K	M6	14-6	4.4	14	6

2) Control circuit terminal

> POINT
>
> ●Under tightening can cause a cable disconnection or malfunction. Over tightening can cause a short circuit or malfunction due to damage to the screw or the brake unit.



Terminal block



Wire the stripped cable after twisting to prevent the cable from becoming loose. In addition, do not solder it.

Screw size: M3

Tightening torque: 0.5 N•m to 0.6 N•m

Wire size: 0.3 mm^2 to 0.75 mm^2

Screw driver: Small flat-blade screwdriver

(Tip thickness: 0.4 mm/Tip width 2.5 mm)

(b) Cables for connecting the converter unit and a distribution terminal block when connecting two sets of the brake unit

Brake unit		Wire size	
		HIV wire [mm^2]	AWG
200 V class	FR-BU2-55K	38	2
400 V class	FR-BU2-H55K	14	6
	FR-BU2-H75K	38	2

(5) Crimp terminals for L+ and L- terminals of TE2-1 of converter unit

(a) Recommended crimp terminals

POINT

●Some crimp terminals may not be mounted depending on their sizes. Make sure to use the recommended ones or equivalent ones.

Converter unit		Brake unit	Number of connected units	Crimp terminal (Manufacturer)	Applicable tool (Note 1)
200 V class	MR-CR55K	FR-BU2-55K	2	38-S6 (JST (J.S.T. Mfg. Co., Ltd.)) (Note 2) R38-6S (NICHIFU (NICHIFU CO., LTD.)) (Note 2)	a
400 V class	MR-CR55K4	FR-BU2-H55K	2	FVD14-6 (JST (J.S.T. Mfg. Co., Ltd.))	b
		FR-BU2-H75K	2	38-S6 (JST (J.S.T. Mfg. Co., Ltd.)) (Note 2) R38-6S (NICHIFU (NICHIFU CO., LTD.)) (Note 2)	a

Note 1. Symbols in the applicable tool field indicate applicable tools in (5) (b) in this section.
2. Coat the crimping part with an insulation tube.

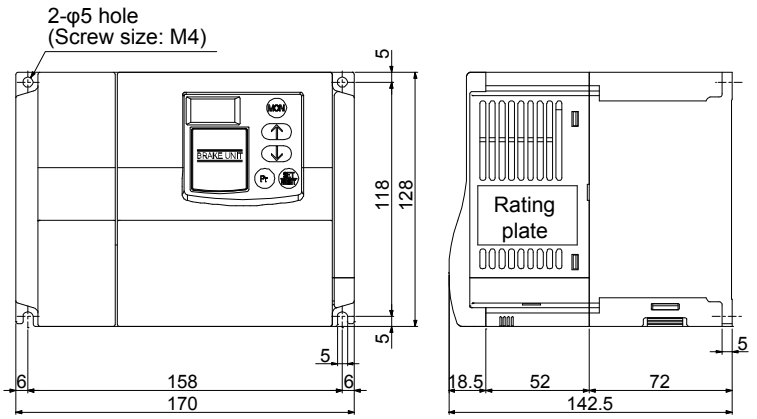
(b) Applicable tool

Symbol	Resistance regeneration converter unit-side crimp terminal				
	Crimp terminal	Applicable tool			Manufacturer
		Body	Head	Dice	
a	38-S6	YPT-60-21		TD-124 TD-112	JST (J.S.T. Mfg. Co., Ltd.)
		YF-1 E-4	YET-60-1		
	R38-6S	NOP60 NOM60			NICHIFU (NICHIFU CO., LTD.)
b	FDV14-6	YF-1 E-4	YNE-38	DH-112 DH-122	JST (J.S.T. Mfg. Co., Ltd.)

7.4.4 Dimensions

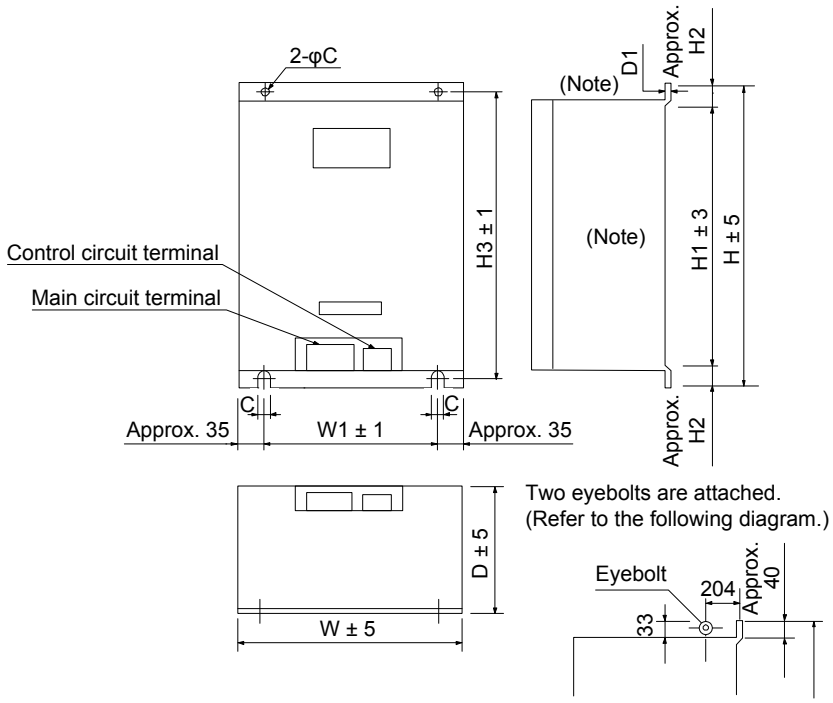
(1) FR-BU2-(H) brake unit
FR-BU2-55K/FR-BU2-H55K/FR-BU2-H75K

[Unit: mm]



(2) FR-BR-(H) resistor unit

[Unit: mm]

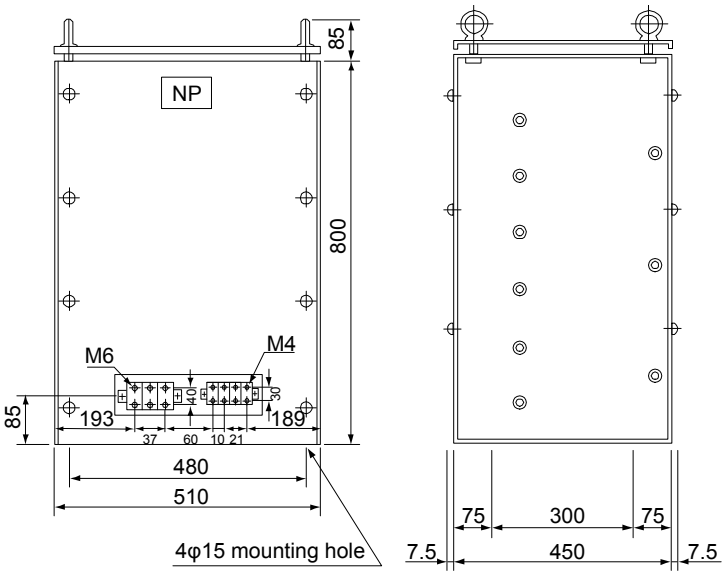


Note. Ventilation ports are provided on both sides and the top. The bottom is open.

Resistor unit		W	W1	H	H1	H2	H3	D	D1	C	Approximate mass [kg]
200 V class	FR-BR-55K	480	410	700	620	40	670	450	3.2	12	70
400 V class	FR-BR-H55K	480	410	700	620	20	670	450	3.2	12	70

(3) MT-BR5-(H) resistor unit

[Unit: mm]



Resistor unit		Resistance	Approximate mass [kg]
200 V class	MT-BR5-55K	2.0 Ω	50
400 V class	MT-BR5-H75K	6.5 Ω	70

7.5 Regenerative option

> **⚠CAUTION** ●Do not use the converter unit and drive unit with the regenerative options other than the combinations specified below. Otherwise, it may cause a fire.

7.5.1 Combination and regenerative power

(1) MR-J3 series

The regenerative power values in the table are the regenerative power of the resistor and are not the rated power.

Converter unit	Drive unit	Regenerative power [W]			
		MR-RB139 (1.3 Ω)	MR-RB137 Three MR-RB137 (1.3 Ω) in parallel (Note 1)	MR-RB136-4 (5 Ω)	MR-RB138-4 Three MR-RB138-4 (5 Ω) in parallel (Note 2)
MR-J3-CR55K	MR-J3-DU30K_	1300	3900		
	MR-J3-DU37K_				
MR-J3-CR55K4	MR-J3-DU30K_4			1300	3900
	MR-J3-DU37K_4				
	MR-J3-DU45K_4				
	MR-J3-DU55K_4				

Note 1. The composite resistor value of three options is 1.3 Ω. The resistor value of one option is 4 Ω.
2. The composite resistor value of three options is 5 Ω. The resistor value of one option is 15 Ω.

(2) MR-J4 series

The regenerative power values in the table are the regenerative power of the resistor and are not the rated power.

The combinations of the regenerative option which differ from those for the J3 series are shown with the gray background.

Converter unit	Drive unit	Regenerative power [W]			
		MR-RB139 (1.3 Ω)	Three MR-RB137 (1.3 Ω) in parallel (Note 1)	MR-RB137-4 (4 Ω)	Three MR-RB13V-4 (4 Ω) in parallel (Note 2)
MR-CR55K	MR-J4-DU30K_	1300	3900		
	MR-J4-DU37K_				
MR-CR55K4	MR-J4-DU30K_4			1300	3900
	MR-J4-DU37K_4				
	MR-J4-DU45K_4				
	MR-J4-DU55K_4				

Note 1. The resultant resistance of three options is 1.3 Ω.
2. The resultant resistance of three options is 4 Ω.

7.6 External dynamic brake

⚠CAUTION	●Use an external dynamic brake for this drive unit. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at an alarm occurrence for which the servo motor does not decelerate to stop. Ensure the safety in the entire equipment. For alarms for which the servo motor does not decelerate to stop, refer to chapter 6. ●The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB. Doing so will cause the drive unit to become servo-off when an instantaneous power failure occurs.

POINT

●For drive units, EM2 has the same function as EM1 in the torque control mode.
●Configure a sequence which switches off the magnetic contactor of the external dynamic brake after (or as soon as) SON (Servo-on) has been turned off at a power failure or a malfunction.
●For the external braking time taken when the dynamic brake is operated, refer to each servo amplifier instruction manual.
●The external dynamic brake is rated for a short duration. Do not use it very frequently.
●The specifications of the input power supply for external dynamic brake are the same as those of the converter unit control circuit power supply.
●When an alarm, [AL. E6 Servo forced stop warning], or [AL. E7 Controller forced stop warning] occurs, or the power is turned off, the external dynamic brake will operate. Do not use external dynamic brake to stop in a normal operation as it is the function to stop in emergency.
●For a machine operating at the recommended load to motor inertia ratio or less, the estimated number of usage times of the external dynamic brake is 1000 times while the machine decelerates from the rated speed to a stop once in 10 minutes.
●Be sure to enable EM1 (Forced stop 1) after servo motor stops when using EM1 frequently in other than emergency.

7.6.1 MR-J3 series

The dynamic brake is designed to bring the servo motor to a sudden stop when a power failure occurs or the protective circuit is activated. When using the
external dynamic brake, assign the dynamic brake interlock (DB) to any of CN3-9, CN3-13, and CN3-15 pins in [Pr. PD07 to PD09].

Converter unit	Drive unit	Dynamic brake
MR-J3-CR55K	MR-J3-DU30K_	DBU-37K
	MR-J3-DU37K_	
MR-J3-CR55K4	MR-J3-DU30K_4	DBU-55K-4
	MR-J3-DU37K_4	
	MR-J3-DU45K_4	
	MR-J3-DU55K_4	

7.6.2 MR-J4 series

The external dynamic brake is designed to bring the servo motor to a sudden stop when a power failure occurs or the protective circuit is activated. For MR-J4-DU_A_ drive unit, assign DB to any of CN1-22 to CN1-25, CN1-49, CN1-13 and CN1-14 pins in [Pr. PD23] to [Pr. PD26], [Pr. PD28] and [Pr. PD47]. For MR-J4-DU_B_ drive unit, assign DB to any of CN3-9, CN3-13, and CN3-15 pins in [Pr. PD07] to [Pr. PD09].

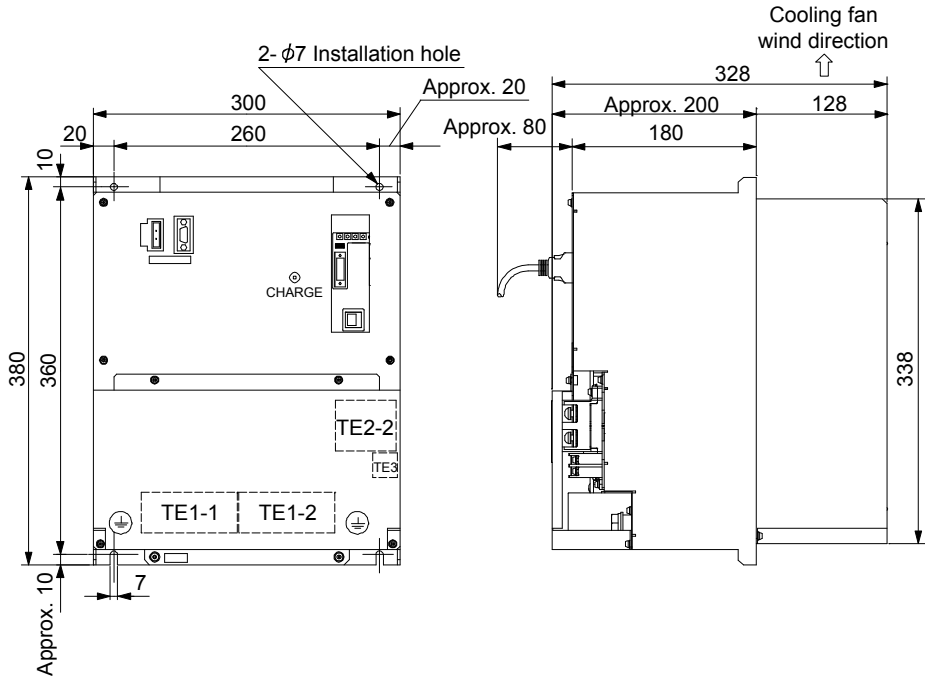
Converter unit	Drive unit	External dynamic brake
MR-CR-55K	MR-J4-DU30K_	DBU-37K-R1
	MR-J4-DU37K_	
MR-CR55K4	MR-J4-DU30K_4	DBU-55K-4-R5
	MR-J4-DU37K_4	
	MR-J4-DU45K_4	
	MR-J4-DU55K_4	

7.7 Dimensions

7.7.1 MR-J3 series

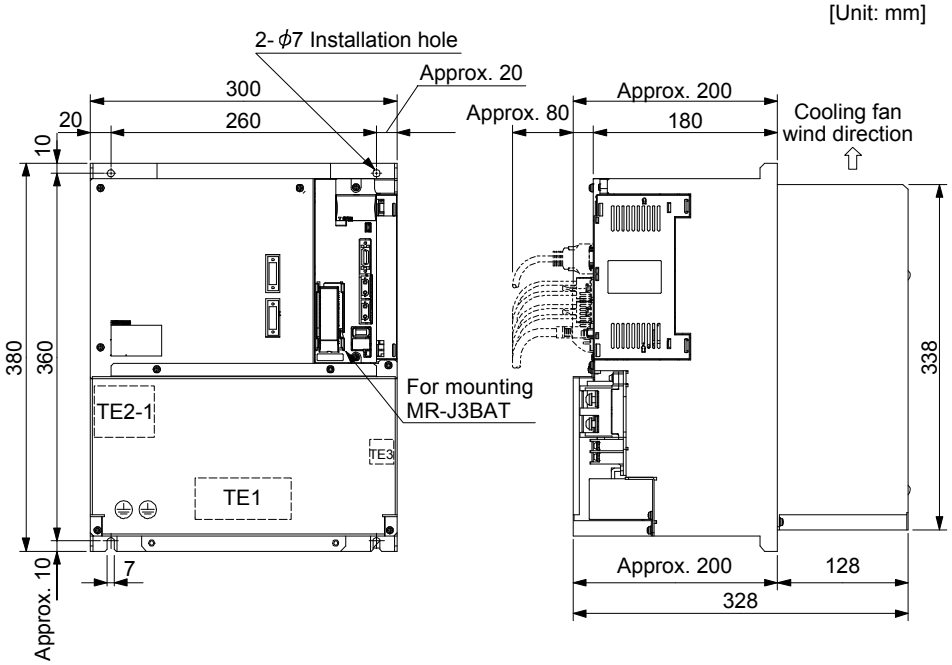
(1) MR-J3-CR55K_

[Unit: mm]



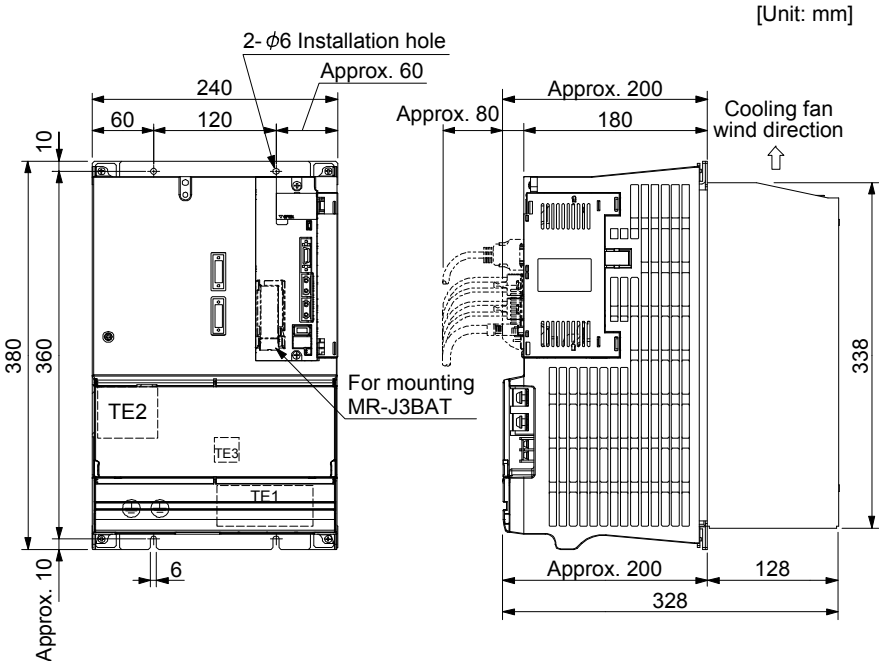
(2) MR-J3-DU30K_/MR-J3-DU37K_/MR-J3-DU45K_4/MR-J3-DU55K_4

[Unit: mm]



(3) MR-J3-DU30K_4/MR-J3-DU37K_4

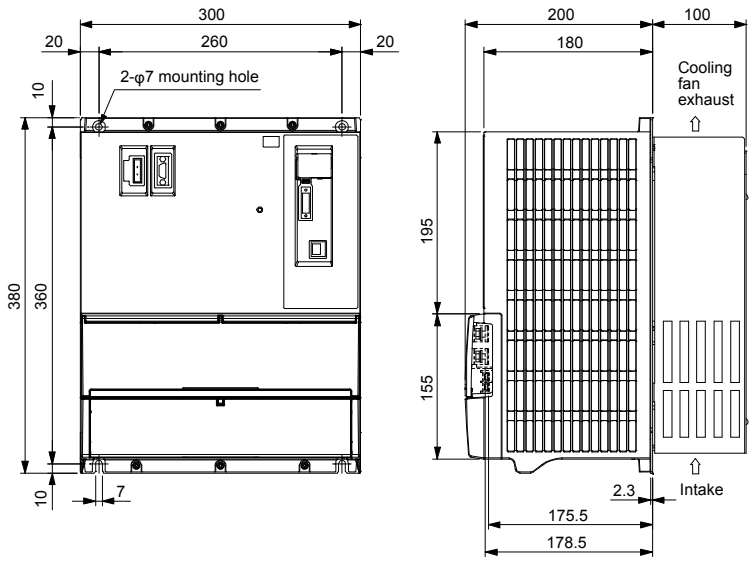
[Unit: mm]



7.7.2 MR-J4 series

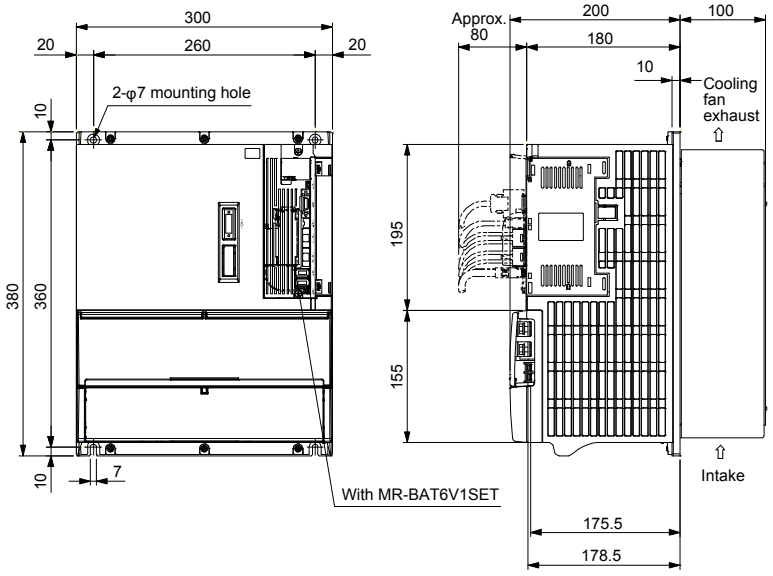
(1) MR-CR-55K_

[Unit: mm]



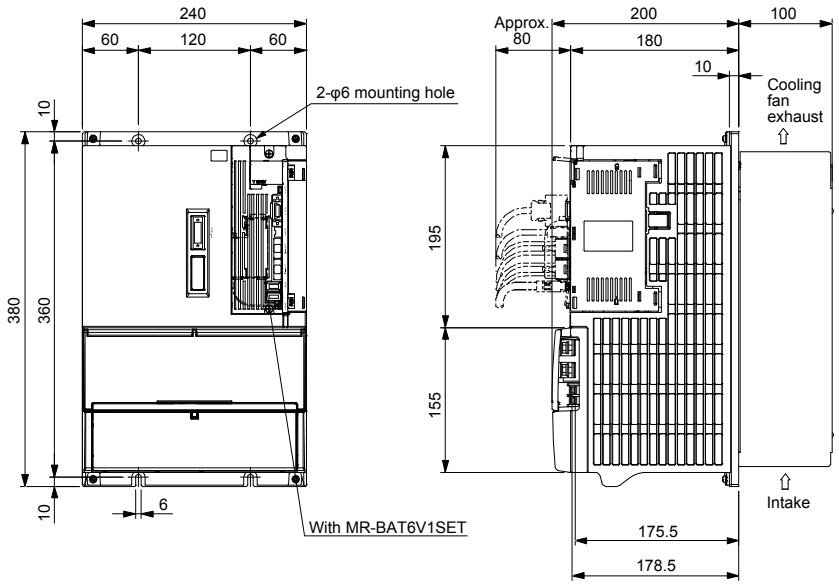
(2) MR-J4-DU30K_/MR-J4-DU37K_/MR-J4-DU45K_4/MR-J4-DU55K_4

[Unit: mm]



(3) MR-J4-DU30K_4/MR-J4-DU37K_4

[Unit: mm]



MEMO

Part 6
Common Reference Material

Part 6: Common Reference Material

1. SPECIFICATION DIFFERENCES

1.1 Detailed Specification/Function Differences

POINT

●Functions with difference are shown witph shading.

(1) Comparison of MR-J3 series and MR-J4 series (General-purpose interface/SSCNET interface)

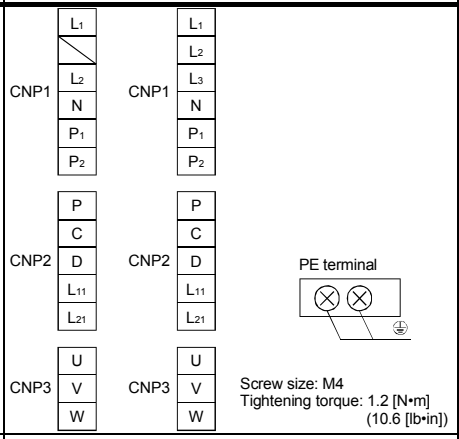
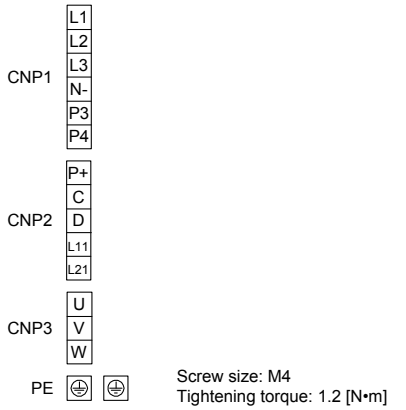
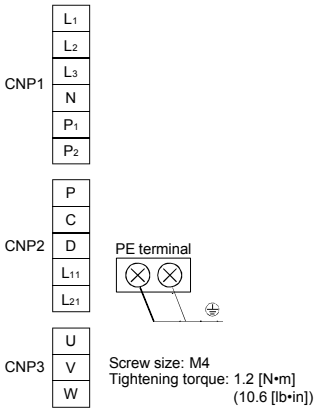
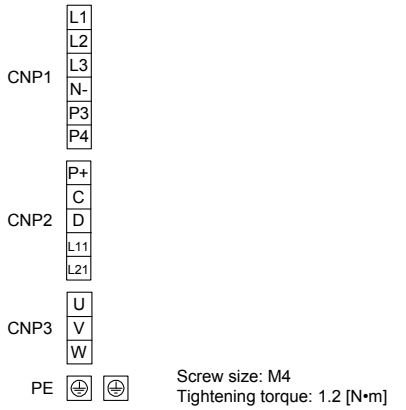
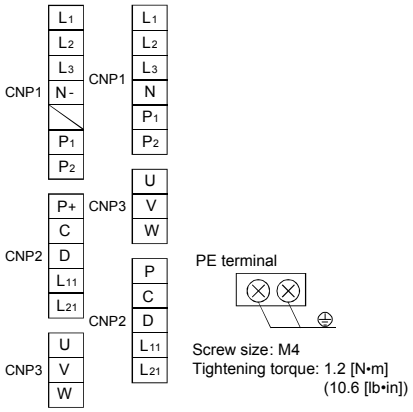
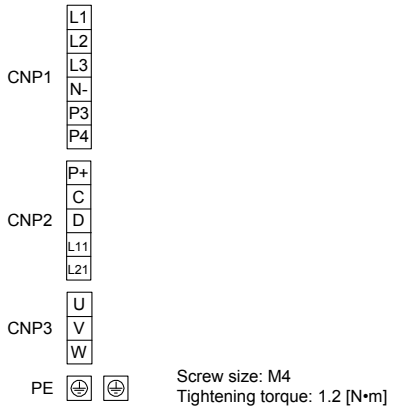
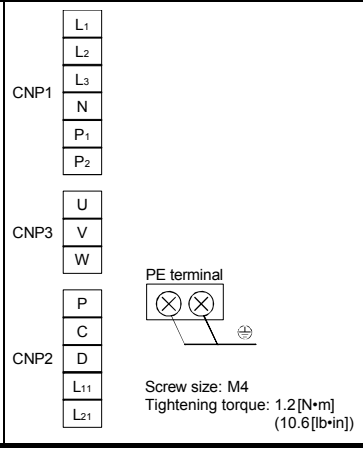
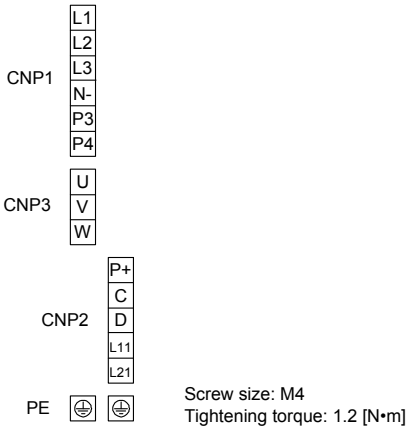
Item		MR-J3 series	MR-J4 series
1	Capacity range	(100 V class) 0.1 kW to 0.4 kW (200 V class) 0.1 kW to 37 kW (400 V class) 0.6 kW to 55 kW	(100 V class) 0.1 kW to 0.4 kW (200 V class) 0.1 kW to 37 kW (400 V class) 0.6 kW to 55 kW
2	Regenerative resistor	Built-in (0.2 kW to 7 kW) External (11 kW to 55 kW)	Built-in (0.2 kW to 7 kW) External (11 kW to 55 kW)
3	Dynamic brake	Built-in (0.1 kW to 7 kW) External (11 kW to 55 kW)	Built-in (0.1 kW to 7 kW) External (11 kW to 55 kW) **Coasting distance is different. (Note1)**
4	Control circuit power	(100 V class) 1-phase 100V AC to 120V AC (200 V class) 1-phase 200V AC to 230V AC (400 V class) 1-phase 380V AC to 480V AC	(100 V class) 1-phase 100V AC to 120V AC (200 V class) 1-phase 200V AC to **240V AC** (400 V class) 1-phase 380V AC to 480V AC
5	Main circuit power	(100 V class) 1-phase 100V AC to 120V AC (200 V class) 1-phase 230V AC 3-phase 200V AC to 230V AC (0.1 kW to 750 W) 3-phase 200V AC to 230V AC (0.1 kW to 37 kW) (400 V class) 3-phase 380V AC to 480V AC	(100 V class) 1-phase 100V AC to 120V AC (200 V class) 1-phase 200V AC to **240V AC** (0.1 kW to **2 kW**) 3-phase 200V AC to **240V AC** (0.1 kW to 37 kW) (400 V class) 3-phase 380V AC to 480V AC
6	24 V DC power	External supply required	External supply required
7	Auto tuning	Real-time auto tuning: 32 steps Advanced gain search	Real-time auto tuning: **40 steps** **One-touch tuning**
8	Control mode	General-Purpose Interface ・Position control mode (pulse command) ・Speed control mode (analog command) ・Torque control mode (analog command) SSCNET III Interface (50 Mbps) ・Position control mode ・Speed control mode	General-Purpose Interface ・Position control mode (pulse command) ・Speed control mode (analog command) ・Torque control mode (analog command) **SSCNET III**/H Interface **(150 Mbps)** ・Position control mode ・Speed control mode ・**Torque control mode** **< J3 compatibility mode >** SSCNET III/H Interface (50 Mbps) ・Position control mode ・Speed control mode
9	Maximum input pulses (General-Purpose Interface)	Differential pulse: 1 Mpulse/s Command pulse: Sink	Differential pulse: **4** Mpulses/s Command pulse: Sink
10	The number of DIO points (excluding EM1)	General-Purpose Interface DI: 9 points, DO: 6 points SSCNET III Interface DI: 3 points, DO: 3 points	General-Purpose Interface DI: 9 points, DO: 6 points SSCNET III/H Interface DI: 3 points, DO: 3 points
11	Encoder pulse output	ABZ-phase (differential line driver) General-Purpose Interface Z-phase (open collector)	ABZ-phase (differential line driver) General-Purpose Interface Z-phase (open collector)
12	DIO interface	input/output: sink/source	input/output: sink/source
13	Analog input/output	General-Purpose Interface (Input) 2ch 10-bit torque, 14-bit speed or equivalent (Output) 10-bit or equivalent × 2ch SSCNET III Interface (Output) 10-bit or equivalent × 2ch	General-Purpose Interface (Input) 2ch 10-bit torque, 14-bit speed or equivalent (Output) 10-bit or equivalent × 2ch SSCNET III/H Interface (Output) 10-bit or equivalent × 2ch

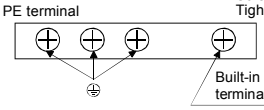
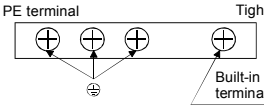
Item		MR-J3 series	MR-J4 series
14	Number of internal speed commands (General-Purpose Interface)	7 points	7 points
15	Parameter setting method	Setup software (SETUP221E) MR Configurator2 Push button (General-Purpose Interface)	MR Configurator2 Push button (General-Purpose Interface)
16	Setup software communication function	USB	USB
17	Servo motor (Encoder resolution)	HF-_P series (18-bit ABS) HA-_P series (18-bit ABS)	HG series (**22**-bit ABS)
18	Motor maximum torque	HF-KP 350%	HG-KR 350%
		HF-MP 300%	HG-MR 300%
		HF-SP 300%	HG-SR 300%
		HF-JP 300%	HG-JR 300%
		HA-LP 250%	**HG-JR 300%**
19	Button (General-Purpose Interface)	4 buttons	4 buttons
20	LED display	General-Purpose Interface ・7-segment 5-digit SSCNET III Interface ・7-segment 3-digit	General-Purpose Interface ・7-segment 5-digit SSCNET III/H Interface ・7-segment 3-digit
21	Advanced vibration suppression control	Provided	Provided **(Advanced vibration suppression control II)**
22	Adaptive filter II	Provided	Provided
23	Notch filter	Provided (2 pcs)	Provided (**5** pcs)
24	Tough drive	Unprovided	**Provided**
25	Drive recorder	Unprovided	**Provided**
26	Forced stop	EM1 (DB stop)	**EM1 (DB stop)/EM2 (deceleration to a stop)**

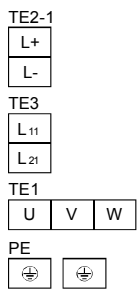
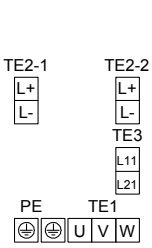
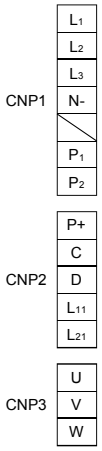
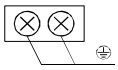
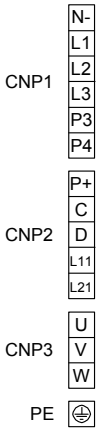
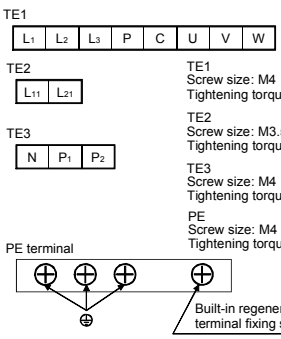
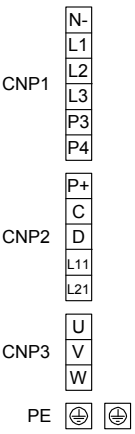
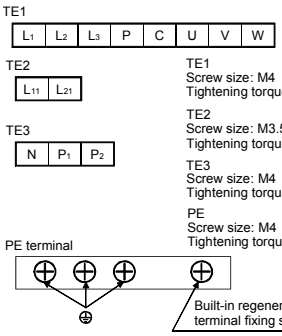
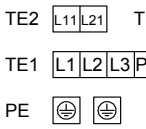
Note 1. For the coasting distance, refer to section "1.2.3 Dynamic brake: coasting distance".
2. For the comparison of Networks, refer to section "1.4 comparison of Networks".

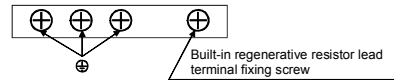
1.2 Servo amplifier

1.2.1 Main circuit terminal block

Series	Main circuit terminal block	Series	Main circuit terminal block
MR-J3-10_ to MR-J3-60_		MR-J4-10_ to MR-J4-60_	
MR-J3-70_, MR-J3-100_		MR-J4-70_, MR-J4-100_	
MR-J3-200_N, /-200_(-RT)		MR-J4-200_	
MR-J3-350_		MR-J4-350_	

<table>
<tr><th>Series</th><th>Main circuit terminal block</th><th>Series</th><th>Main circuit terminal block</th></tr>
<tr><td>MR-J3-500_</td><td>
TE1
<table><tr><td>L1</td><td>L2</td><td>L3</td><td>P</td><td>C</td><td>U</td><td>V</td><td>W</td></tr></table>
TE2
<table><tr><td>L11</td><td>L21</td></tr></table>
TE3
<table><tr><td>N</td><td>P1</td><td>P2</td></tr></table>
PE terminal

TE1
Screw size: M4
Tightening torque: 1.2 [N•m] (10.6 [lb•in])
TE2
Screw size: M3.5 (Note)
Tightening torque: 0.8 [N•m] (7.08 [lb•in])
TE3
Screw size: M4
Tightening torque: 1.2 [N•m] (10.6 [lb•in])
PE
Screw size: M4
Tightening torque: 1.2 [N•m] (10.6 [lb•in])
Built-in regenerative resistor lead terminal fixing screw
</td><td>MR-J4-500_</td><td>
TE2 L11 L21 — TE2 Screw size: M3.5 Tightening torque: 0.8 [N•m]
TE1 L1 L2 L3 N- — TE1 Screw size: M4 Tightening torque: 1.2 [N•m]
TE3 P3 P4 P+ C — TE3 Screw size: M4 Tightening torque: 1.2 [N•m]
TE4 D U V W — TE4 Screw size: M4 Tightening torque: 1.2 [N•m]
PE — PE Screw size: M4 Tightening torque: 1.2 [N•m]
</td></tr>
<tr><td>MR-J3-700_</td><td>
TE1
<table><tr><td>L1</td><td>L2</td><td>L3</td><td>P</td><td>C</td><td>U</td><td>V</td><td>W</td></tr></table>
TE2
<table><tr><td>L11</td><td>L21</td></tr></table>
TE3
<table><tr><td>N</td><td>P1</td><td>P2</td></tr></table>
PE terminal

TE1
Screw size: M4
Tightening torque: 1.2 [N•m] (10.6 [lb•in])
TE2
Screw size: M3.5 (Note)
Tightening torque: 0.8 [N•m] (7.08 [lb•in])
TE3
Screw size: M4
Tightening torque: 1.2 [N•m] (10.6 [lb•in])
PE
Screw size: M4
Tightening torque: 1.2 [N•m] (10.6 [lb•in])
Built-in regenerative resistor lead terminal fixing screw
</td><td>MR-J4-700_</td><td>
TE3 N- P3 P4
TE1 L1 L2 L3 P+ C U V W — TE2 L11 L21
PE — TE3 Screw size: M4 Tightening torque: 1.2 [N•m]
TE1 Screw size: M4 Tightening torque: 1.2 [N•m]
TE2 Screw size: M3.5 Tightening torque: 0.8 [N•m]
PE Screw size: M4 Tightening torque: 1.2 [N•m]
</td></tr>
<tr><td>MR-J3-11K_
(-LR)
MR-J3-15K_
(-LR)</td><td>
TE
<table><tr><td>L1</td><td>L2</td><td>L3</td><td>L11</td><td>L21</td><td>U</td><td>V</td><td>W</td></tr><tr><td>P1</td><td>P</td><td>C</td><td colspan="2">N</td><td>⏚</td><td>⏚</td><td>⏚</td></tr></table>
<table>
<tr><th colspan="2"></th><th>L1/L2/L3/U/V/W/P1/P/C/N/⏚</th><th>L11/L21</th></tr>
<tr><td>MR-J3-11K_(4)</td><td>Screw size</td><td>M6</td><td>M4</td></tr>
<tr><td>MR-J3-15K_(4)</td><td>Tightening torque [(lb:in)] [N•m]</td><td>3.0</td><td>1.2</td></tr>
<tr><td rowspan="2">MR-J3-22K_(4)</td><td>Screw size</td><td>M8</td><td>M4</td></tr>
<tr><td>Tightening torque [(lb:in)] [N•m]</td><td>6.0</td><td>1.2</td></tr>
</table>
</td><td>MR-J4-11K_
MR-J4-15K_</td><td>
TE1-1 L1 L2 L3 U V W
TE1-2 P3 P4 P+ C N- — TE2 L11 L21
PE — TE1-1 Screw size: M6 Tightening torque: 3.0 [N•m]
TE1-2 Screw size: M6 Tightening torque: 3.0 [N•m]
TE2 Screw size: M4 Tightening torque: 1.2 [N•m]
PE Screw size: M6 Tightening torque: 3.0 [N•m]
</td></tr>
<tr><td>MR-J3-22K_</td><td>
TE
<table><tr><td>L1</td><td>L2</td><td>L3</td><td>L11</td><td>L21</td><td>U</td><td>V</td><td>W</td></tr><tr><td>P1</td><td>P</td><td>C</td><td colspan="2">N</td><td>⏚</td><td>⏚</td><td>⏚</td></tr></table>
<table>
<tr><th colspan="2"></th><th>L1/L2/L3/U/V/W/P1/P/C/N/⏚</th><th>L11/L21</th></tr>
<tr><td>MR-J3-11K_(4)</td><td>Screw size</td><td>M6</td><td>M4</td></tr>
<tr><td>MR-J3-15K_(4)</td><td>Tightening torque [(lb:in)] [N•m]</td><td>3.0</td><td>1.2</td></tr>
<tr><td rowspan="2">MR-J3-22K_(4)</td><td>Screw size</td><td>M8</td><td>M4</td></tr>
<tr><td>Tightening torque [(lb:in)] [N•m]</td><td>6.0</td><td>1.2</td></tr>
</table>
</td><td>MR-J4-22K_</td><td>
TE1-1 L1 L2 L3 U V W
TE1-2 P3 P4 P+ C N-
PE — TE2 L11 L21
TE1-1 Screw size: M8 Tightening torque: 6.0 [N•m
TE1-2 Screw size: M8 Tightening torque: 6.0 [N•m
TE2 Screw size: M4 Tightening torque: 1.2 [N•m
PE Screw size: M8 Tightening torque: 6.0 [N•m
</td></tr>
</table>

Series	Main circuit terminal block	Series	Main circuit terminal block
MR-J3-DU30K_ MR-J3-DU37K_ MR-J3-DU45K_4 MR-J3-DU55K_4	 TE2-1 Screw size: M6 Tightening torque: 3.0 [N•m] (26.6 [lb•in]) TE3 Screw size: M4 Tightening torque: 1.2 [N•m] (10.6 [lb•in]) TE1 Screw size: M10 Tightening torque: 10.0 [N•m] (88.5 [lb•in]) PE Screw size: M10 Tightening torque: 10.0 [N•m] (88.5 [lb•in])	MR-J4-DU30K_ MR-J4-DU37K_ MR-J4-DU45K_4 MR-J4-DU55K_4	 TE1 Screw size: M10 Tightening torque: 12.0 [N•m] TE2-1 Screw size: M6 Tightening torque: 3.0 [N•m] TE2-2 Screw size: M6 Tightening torque: 3.0 [N•m] TE3 Screw size: M4 Tightening torque: 1.2 [N•m] PE Screw size: M10 Tightening torque: 12.0 [N•m]
MR-J3-60_4 to MR-J3-200_4	 PE terminal  Screw size: M4 Tightening torque: 1.2 [N•m] (10.6 [lb•in])	MR-J4-60_4 to MR-J4-200_4	 Screw size: M4 Tightening torque: 1.2 [N•m]
MR-J3-350_4	 TE1 Screw size: M4 Tightening torque: 1.2 [N•m] (10.6 [lb•in]) TE2 Screw size: M3.5 (Note) Tightening torque: 0.8 [N•m] (7.08 [lb•in]) TE3 Screw size: M4 Tightening torque: 1.2 [N•m] (10.6 [lb•in]) PE Screw size: M4 Tightening torque: 1.2 [N•m] (10.6 [lb•in])	MR-J4-350_4	 Screw size: M4 Tightening torque: 1.2 [N•m]
MR-J3-500_4	 TE1 Screw size: M4 Tightening torque: 1.2 [N•m] (10.6 [lb•in]) TE2 Screw size: M3.5 (Note) Tightening torque: 0.8 [N•m] (7.08 [lb•in]) TE3 Screw size: M4 Tightening torque: 1.2 [N•m] (10.6 [lb•in]) PE Screw size: M4 Tightening torque: 1.2 [N•m] (10.6 [lb•in])	MR-J4-500_4	 TE2 Screw size: M3.5 Tightening torque: 0.8 [N•m] TE3 Screw size: M4 Tightening torque: 1.2 [N•m] TE1 Screw size: M4 Tightening torque: 1.2 [N•m] PE Screw size: M4 Tightening torque: 1.2 [N•m]

<table>
<tr><th>Series</th><th>Main circuit terminal block</th><th>Series</th><th>Main circuit terminal block</th></tr>
<tr><td>MR-J3-700_4</td><td>
TE1
<table><tr><td>L1</td><td>L2</td><td>L3</td><td>P</td><td>C</td><td>U</td><td>V</td><td>W</td></tr></table>
TE2
<table><tr><td>L11</td><td>L21</td></tr></table>
TE3
<table><tr><td>N</td><td>P1</td><td>P2</td></tr></table>
TE1
Screw size: M4
Tightening torque: 1.2 [N•m] (10.6 [lb•in])
TE2
Screw size: M3.5 (Note)
Tightening torque: 0.8 [N•m] (7.08 [lb•in])
TE3
Screw size: M4
Tightening torque: 1.2 [N•m] (10.6 [lb•in])
PE
Screw size: M4
Tightening torque: 1.2 [N•m] (10.6 [lb•in])
PE terminal


</td><td>MR-J4-700_4</td><td>
TE3 N- P3 P4
TE1 L1 L2 L3 P+ C U V W TE2 L11 L21
PE ⏚ ⏚
TE3 Screw size: M4
Tightening torque: 1.2 [N•m]
TE1 Screw size: M4
Tightening torque: 1.2 [N•m]
TE2 Screw size: M3.5
Tightening torque: 0.8 [N•m]
PE Screw size: M4
Tightening torque: 1.2 [N•m]
</td></tr>
<tr><td>MR-J3-11K_4
(-LR),
MR-J3-15K_4
(-LR)</td><td>
TE
<table><tr><td>L1</td><td>L2</td><td>L3</td><td>L11</td><td>L21</td><td>U</td><td>V</td><td>W</td></tr><tr><td>P1</td><td>P</td><td>C</td><td colspan="2">N</td><td>⏚</td><td>⏚</td><td>⏚</td></tr></table>
<table><tr><td colspan="2"></td><td>L1/L2/L3/U/V/W/P1/P/C/N/⏚</td><td>L11/L21</td></tr><tr><td>MR-J3-11K_(4)</td><td>Screw size</td><td>M6</td><td>M4</td></tr><tr><td>MR-J3-15K_(4)</td><td>Tightening torque [(lb:in)] [N•m]</td><td>3.0</td><td>1.2</td></tr><tr><td rowspan="2">MR-J3-22K_(4)</td><td>Screw size</td><td>M8</td><td>M4</td></tr><tr><td>Tightening torque [(lb:in)] [N•m]</td><td>6.0</td><td>1.2</td></tr></table>
</td><td>MR-J4-11K_4,
MR-J4-15K_4</td><td>
TE1-1 L1 L2 L3 U V W
TE1-2 P3 P4 P+ C N- TE2 L11 L21
PE ⏚ ⏚
TE1-1 Screw size: M6
Tightening torque: 3.0 [N•m]
TE1-2 Screw size: M6
Tightening torque: 3.0 [N•m]
TE2 Screw size: M4
Tightening torque: 1.2 [N•m]
PE Screw size: M6
Tightening torque: 3.0 [N•m]
</td></tr>
<tr><td>MR-J3-22K_4</td><td>
TE
<table><tr><td>L1</td><td>L2</td><td>L3</td><td>L11</td><td>L21</td><td>U</td><td>V</td><td>W</td></tr><tr><td>P1</td><td>P</td><td>C</td><td colspan="2">N</td><td>⏚</td><td>⏚</td><td>⏚</td></tr></table>
<table><tr><td colspan="2"></td><td>L1/L2/L3/U/V/W/P1/P/C/N/⏚</td><td>L11/L21</td></tr><tr><td>MR-J3-11K_(4)</td><td>Screw size</td><td>M6</td><td>M4</td></tr><tr><td>MR-J3-15K_(4)</td><td>Tightening torque [(lb:in)] [N•m]</td><td>3.0</td><td>1.2</td></tr><tr><td rowspan="2">MR-J3-22K_(4)</td><td>Screw size</td><td>M8</td><td>M4</td></tr><tr><td>Tightening torque [(lb:in)] [N•m]</td><td>6.0</td><td>1.2</td></tr></table>
</td><td>MR-J4-22K_4</td><td>
TE1-1 L1 L2 L3 U V W
TE1-2 P3 P4 P+ C N-
PE ⏚ ⏚ TE2 L11 L21
TE1-1 Screw size: M8
Tightening torque: 6.0 [N•m]
TE1-2 Screw size: M8
Tightening torque: 6.0 [N•m]
TE2 Screw size: M4
Tightening torque: 1.2 [N•m]
PE Screw size: M8
Tightening torque: 6.0 [N•m]
</td></tr>
<tr><td>MR-J3-DU30K_4
MR-J3-DU37K_4</td><td>
TE2
<table><tr><td>L+</td></tr><tr><td>L-</td></tr></table>
TE3
<table><tr><td>L11</td></tr><tr><td>L21</td></tr></table>
TE1
<table><tr><td>U</td><td>V</td><td>W</td></tr></table>
PE
⏚ ⏚
TE2
Screw size M6
Tightening torque: 3.0 [N•m] (26.6 [lb•in])
TE3
Screw size M4
Tightening torque: 1.2 [N•m] (10.6 [lb•in])
TE1
Screw size M8
Tightening torque: 6.0 [N•m] (53.1 [lb•in])
PE
Screw size M8
Tightening torque: 6.0 [N•m] (53.1 [lb•in])
</td><td>MR-J4-DU30K_4
MR-J4-DU37K_4</td><td>
TE2 L+ L-
TE3 L11 L21
PE ⏚ ⏚ TE1 U V W
TE1 Screw size: M8
Tightening torque: 6.0 [N•m]
TE2 Screw size: M6
Tightening torque: 3.0 [N•m]
TE3 Screw size: M4
Tightening torque: 1.2 [N•m]
PE Screw size: M8
Tightening torque: 6.0 [N•m]
</td></tr>
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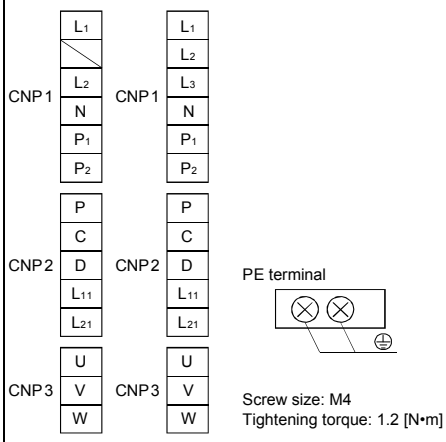
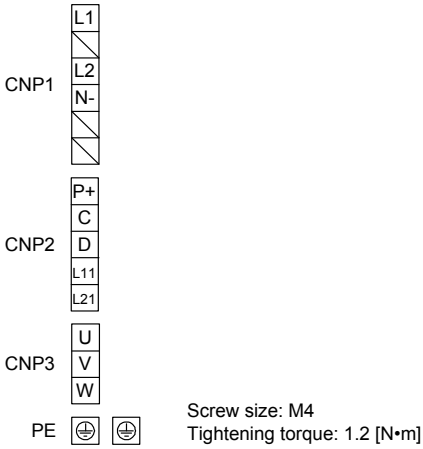
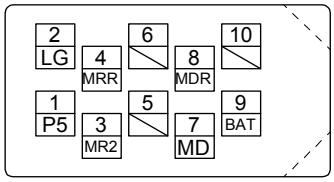
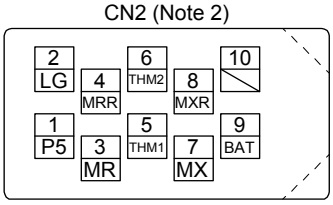
Series	Main circuit terminal block	Series	Main circuit terminal block
MR-J3-10_1 to MR-J3-40_1		MR-J4-10_1 to MR-J4-40_1	

Note Screw size is M3.5 for the control circuit terminal block (TE2) of the servo amplifier manufactured in April 2007 or later. Screw size is M3 for the control terminal block (TE2) of the servo amplifier manufactured in March 2007 or earlier.

1.2.2 Comparison of encoder signals (CN2)

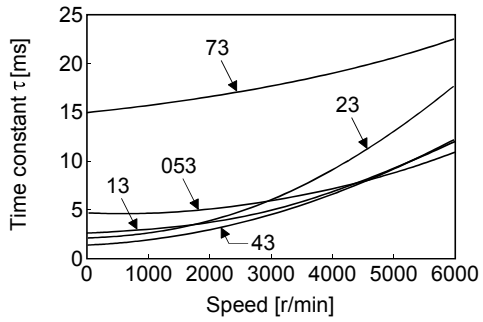
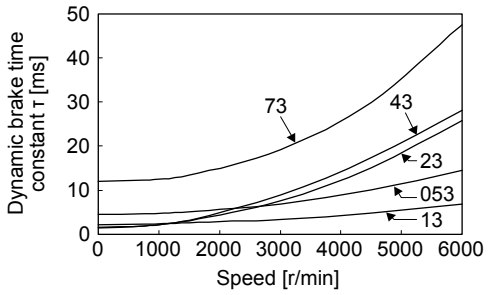
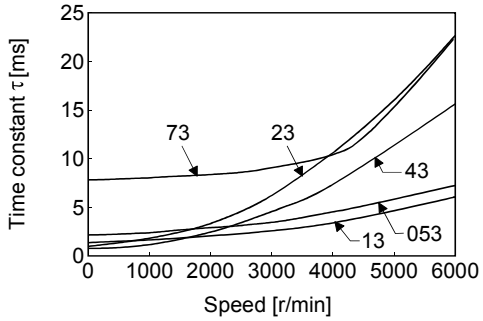
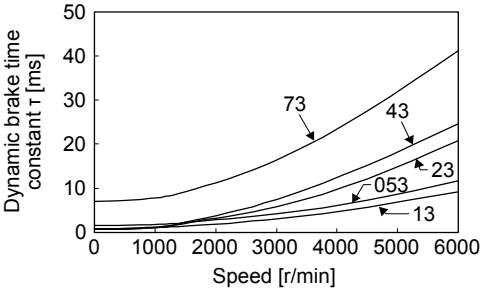
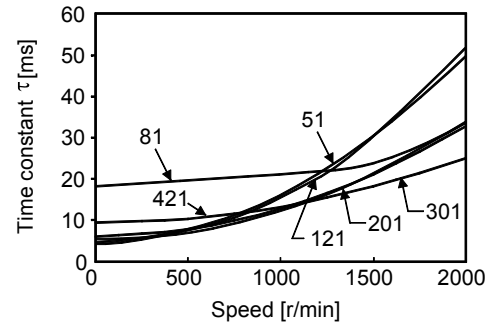
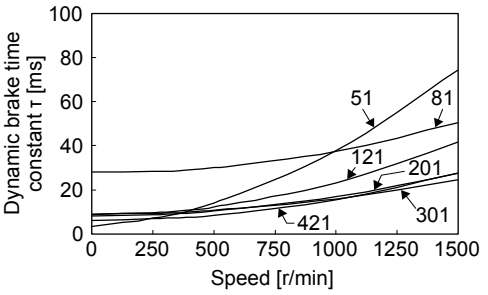
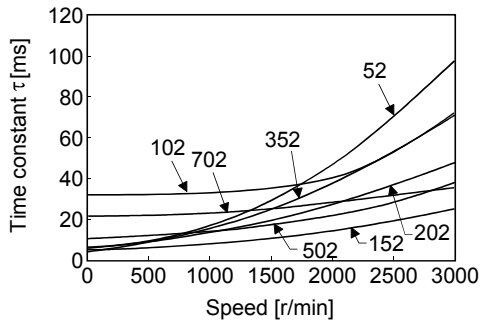
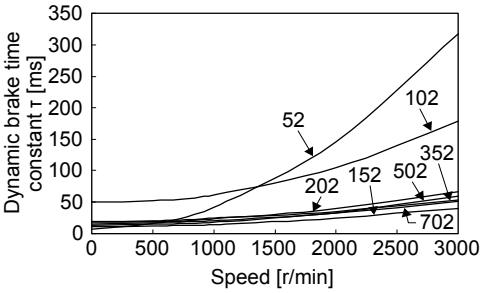
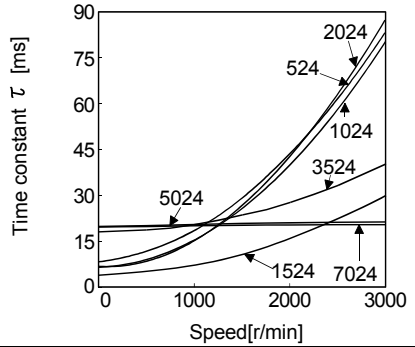
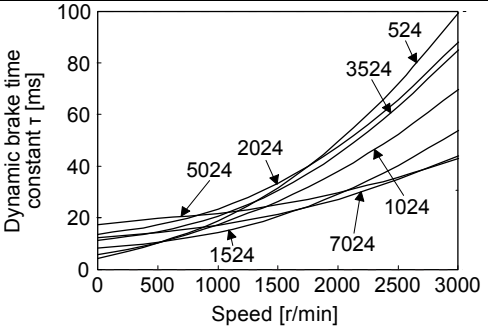
MR-J3/J3W series		Signal symbol (Note 1)	MR-J4 series	
Connector pin assignment	Connector pin No.		Connector pin No.	Connector pin assignment
CN2  	CN2-2	LG	CN2-2	CN2 (Note 2) 
	CN2-7	MD (MX)	CN2-7	
	CN2-3	MR	CN2-3	
	CN2-9	BAT	CN2-9	
	CN2-8	MDR (MXR)	CN2-8	
	CN2-4	MRR	CN2-4	
	CN2-1	P5	CN2-1	

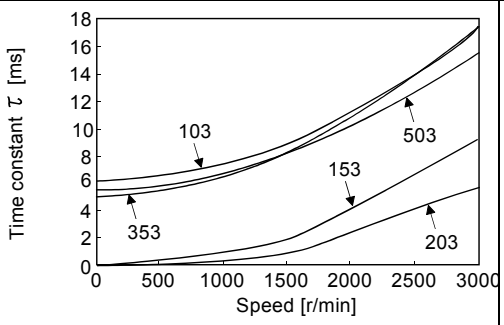
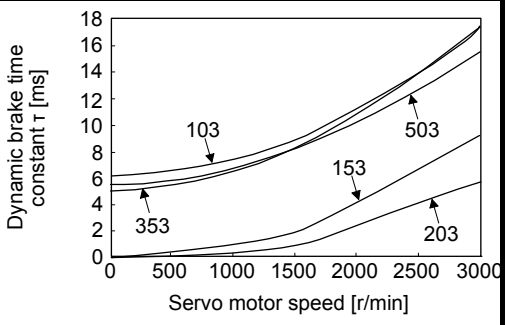
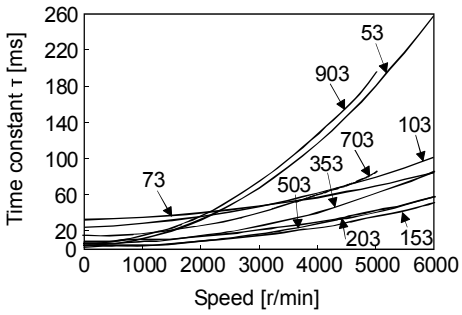
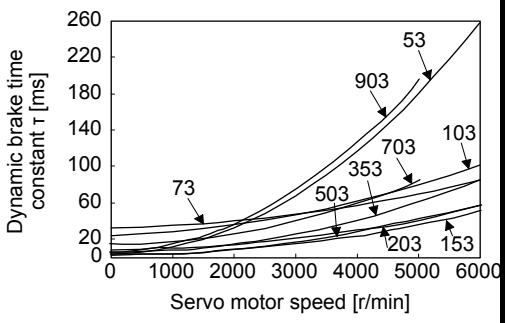
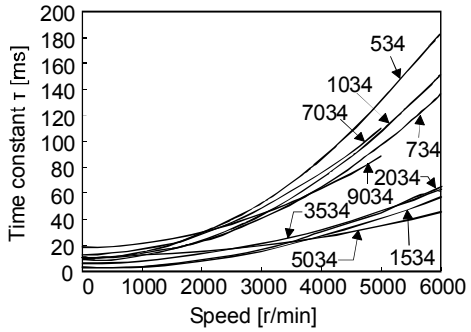
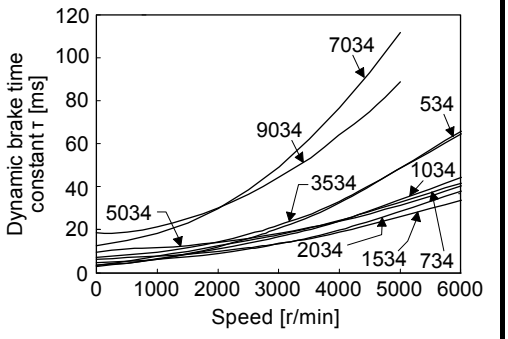
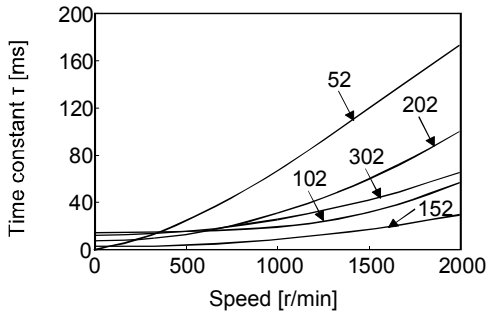
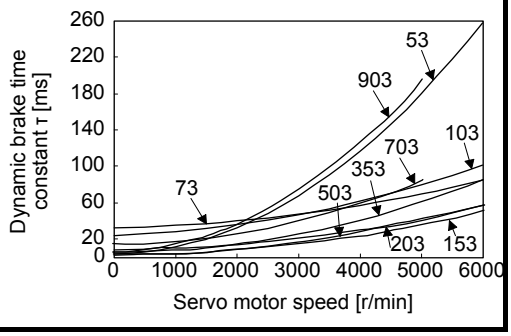
Note 1. Signal abbreviations in parentheses are for MR-J4 series.
2. THM1 and THM2 depend on the motor used. Refer to "Part 7 Review on Replacement of Motor".

1.2.3 Dynamic brake: coasting distance

(1) Dynamic brake time constant

(a) Replacement of MR-J3 Series with MR-J4 Series

Series	MR-J3 Series	Series	MR-J4 Series
HF-KP		HG-KR	
HF-MP		HG-MR	
HF-SP 1000 r/min		HG-SR 1000 r/min	
HF-SP 2000 r/min		HG-SR 2000 r/min	
HF-SP 400 V 2000 r/min		HG-SR 400 V 2000 r/min	

Series	MR-J3 Series	Series	MR-J4 Series
HC-RP		HG-RR	
HF-JP 200 V		HG-JR 200 V	
HF-JP 400 V		HG-JR 400 V	
HC-LP 2000 r/min		HG-JR 3000 r/min	

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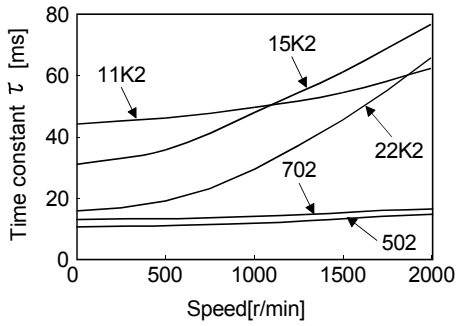
200 V</td><td> 
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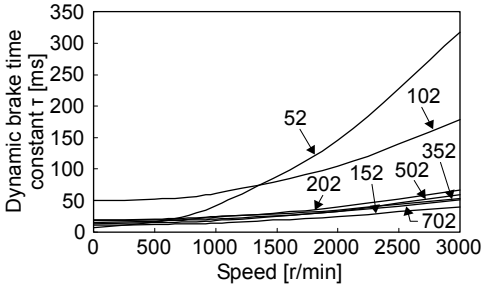
200 V</td><td> 
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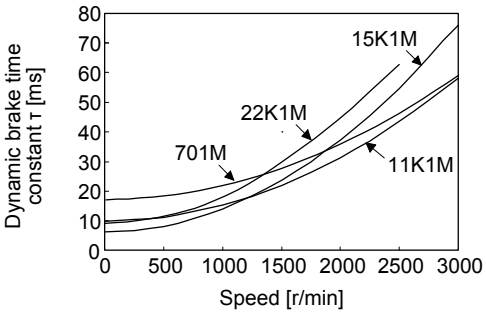
1500 r/min</td><td> 
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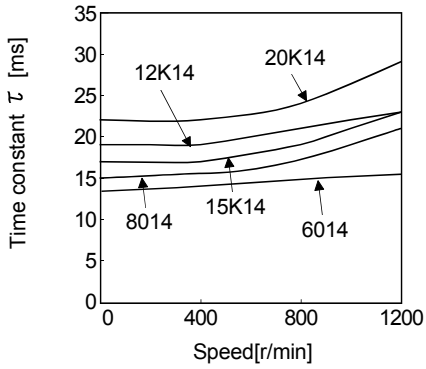
1500 r/min</td><td> 
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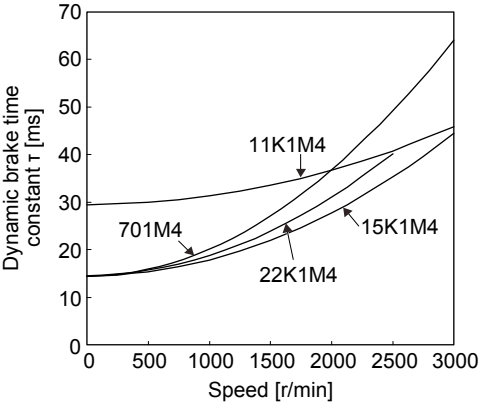
1500 r/min</td><td rowspan="2"> 
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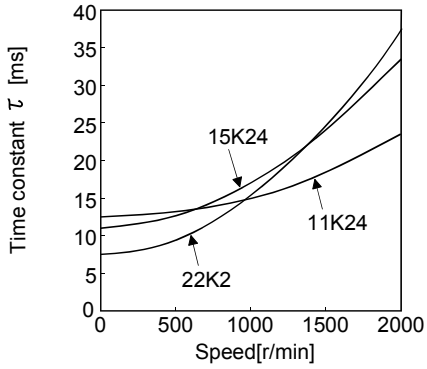
2000 r/min</td><td> 
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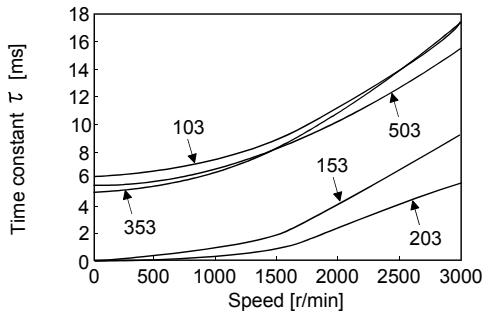
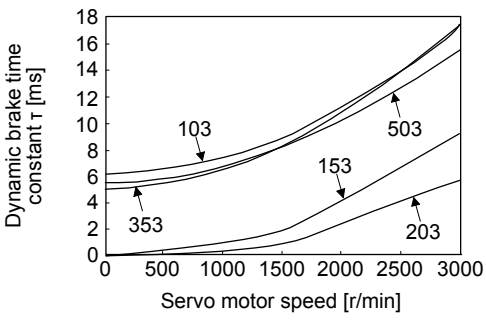
<tr><td>HC-RP</td><td> 
</td><td>HG-RR</td><td> 
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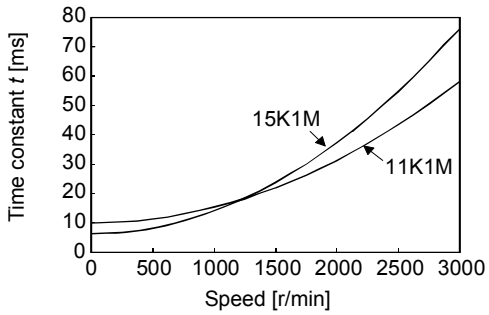
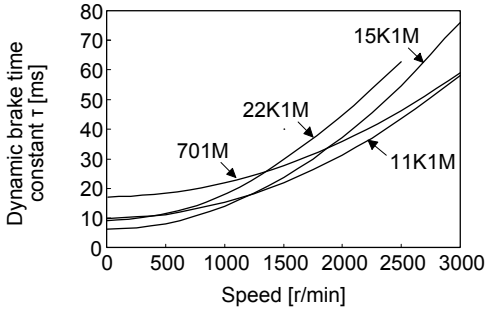
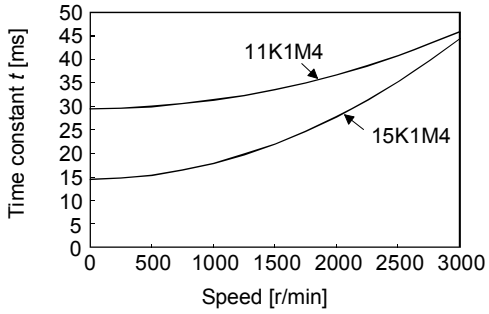
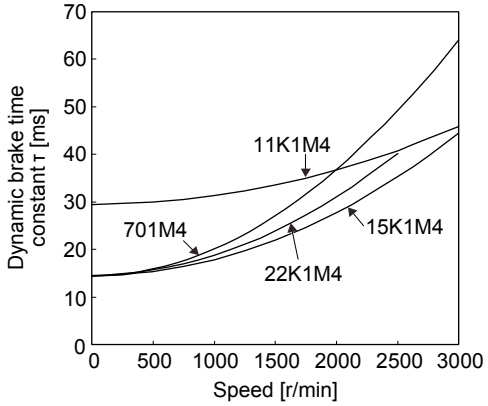
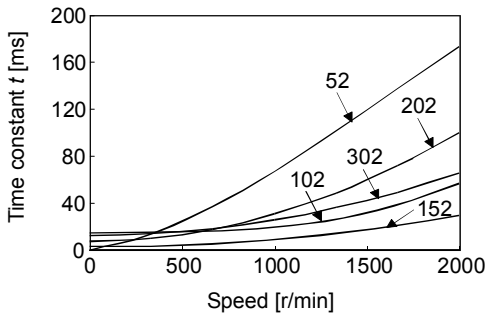
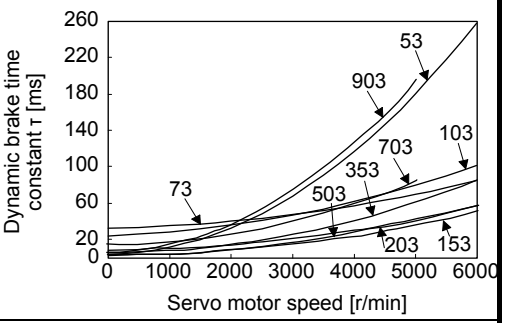
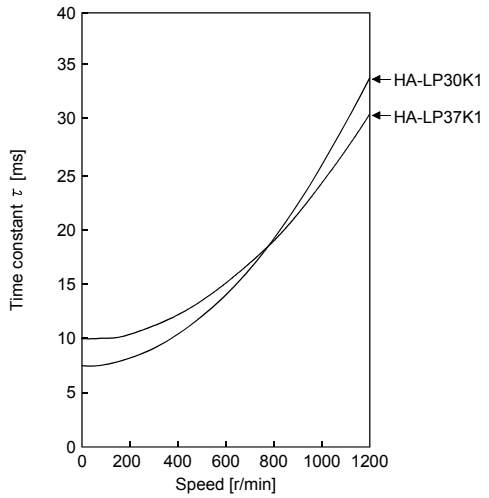
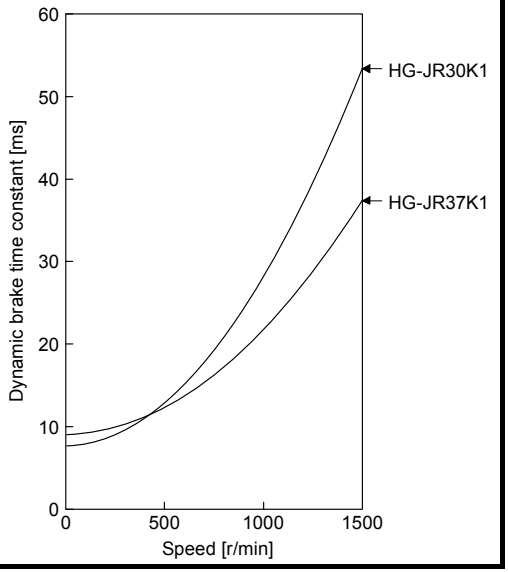
Series	MR-J3 Series	Series	MR-J4 Series
HF-JP 200 V		HG-JR 200 V	
HF-JP 400 V		HG-JR 400 V	
HC-LP 2000 r/min		HG-JR 3000 r/min	
HA-LP 200 V 1000 r/min		HG-JR 200 V 1000 r/min	

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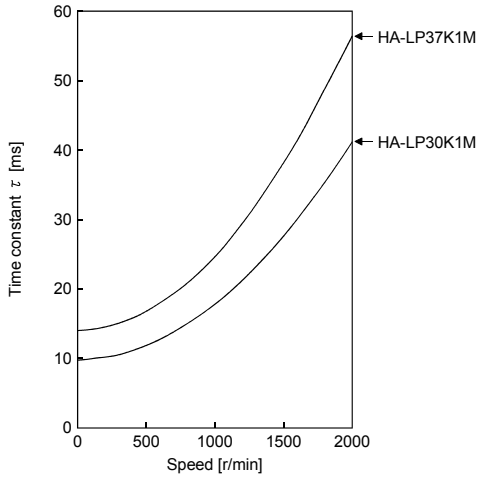
1500 r/min</td><td> 
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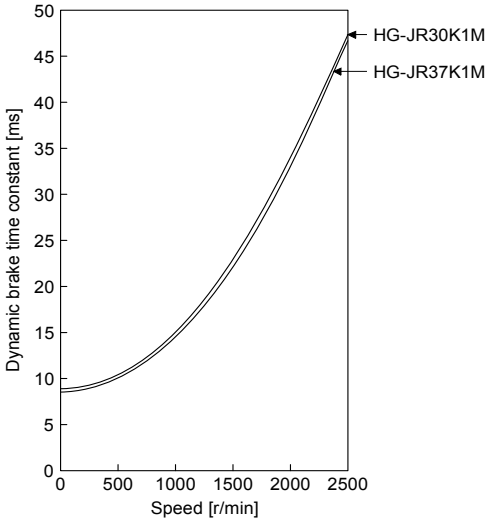
1500 r/min</td><td rowspan="2"> 
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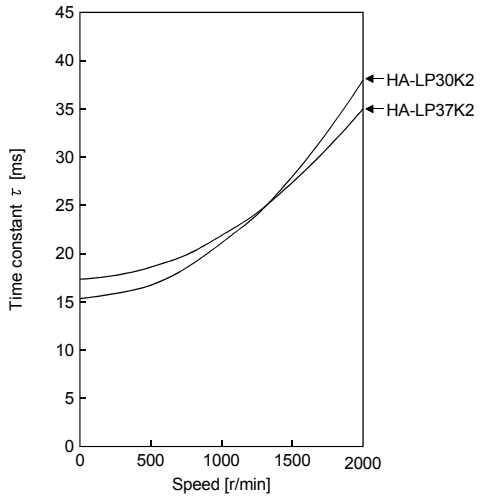
2000 r/min</td><td> 
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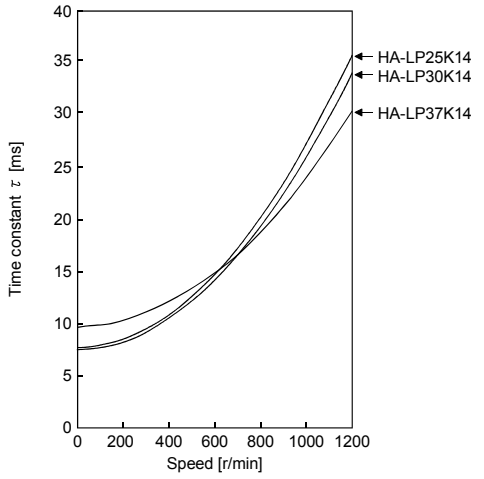
1000 r/min</td><td> 
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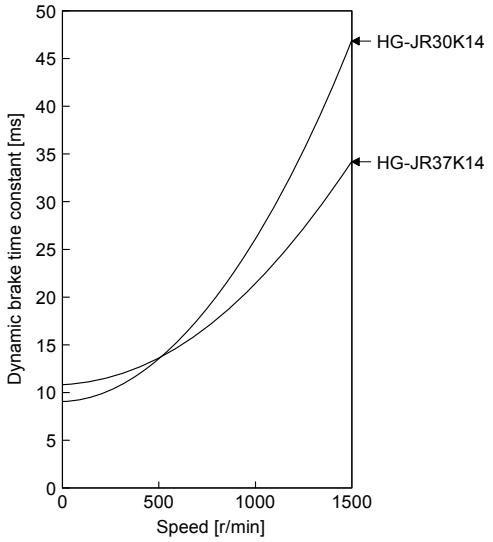
1000 r/min</td><td> 
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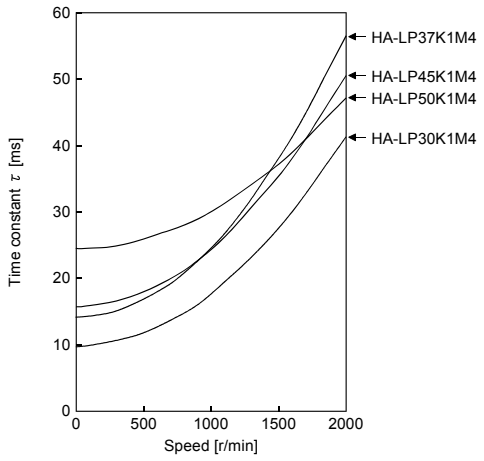
1500 r/min</td><td> 
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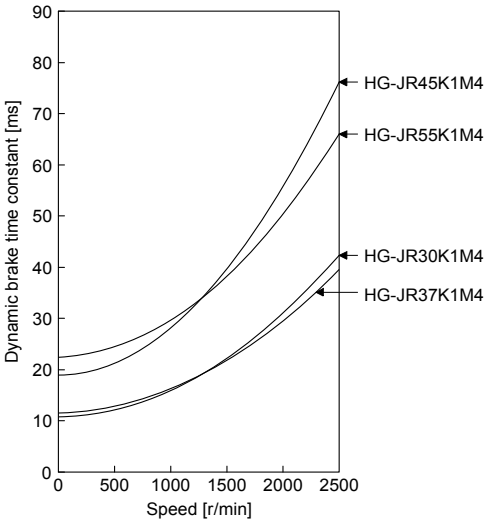
1500 r/min</td><td rowspan="2"> 
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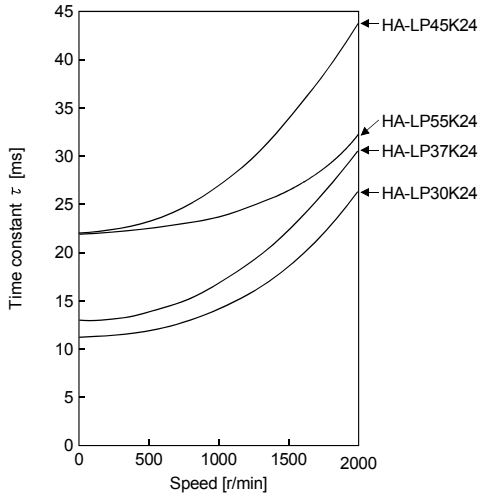
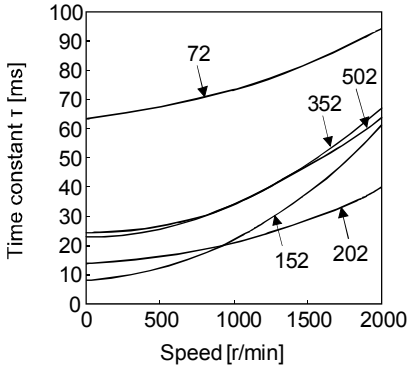
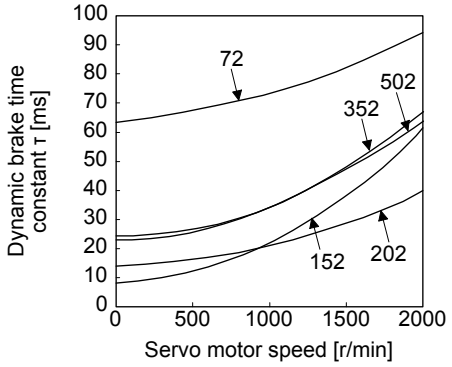
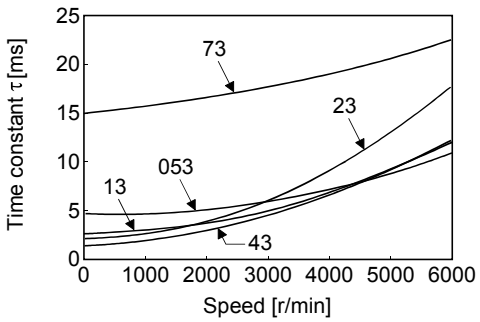
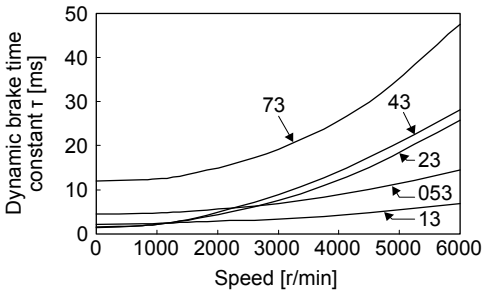
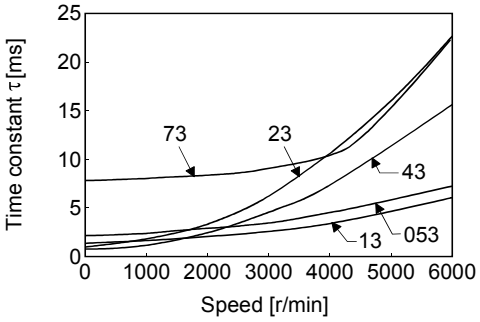
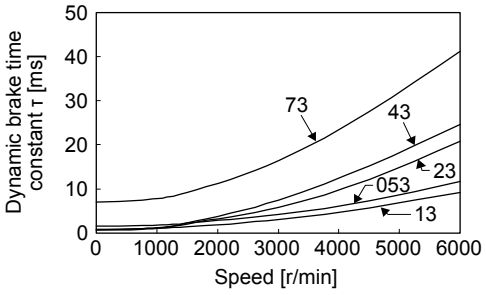
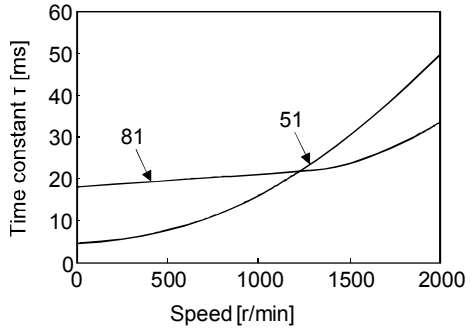
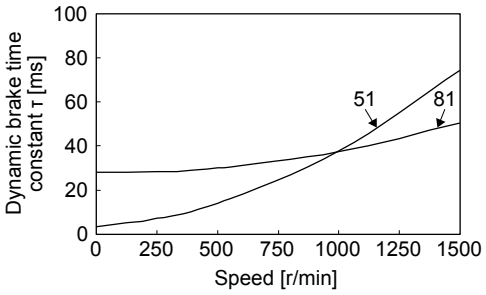
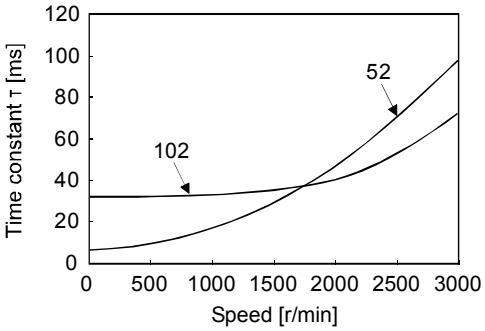
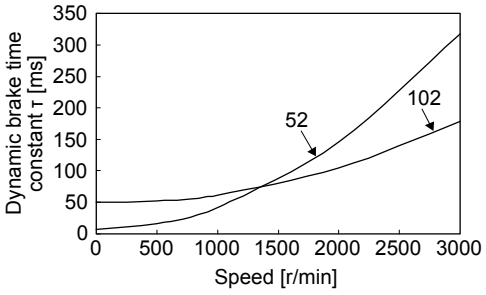
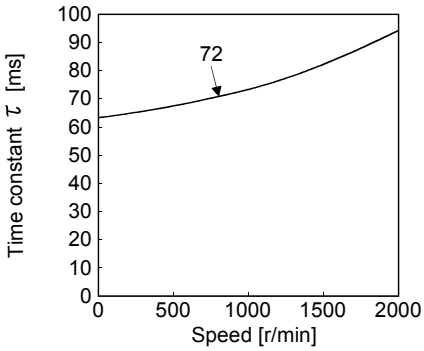
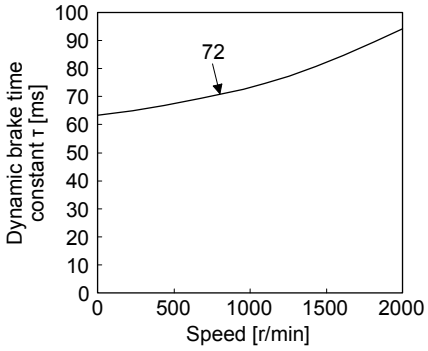
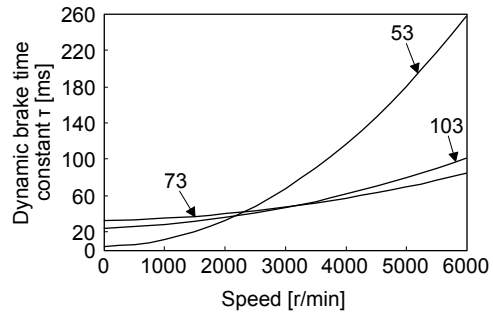
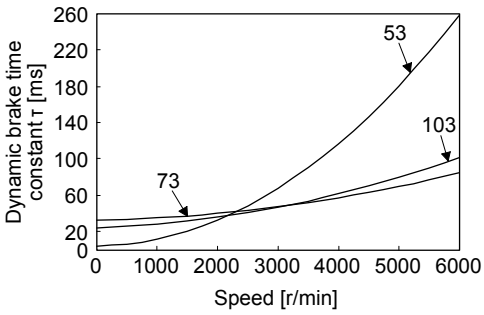
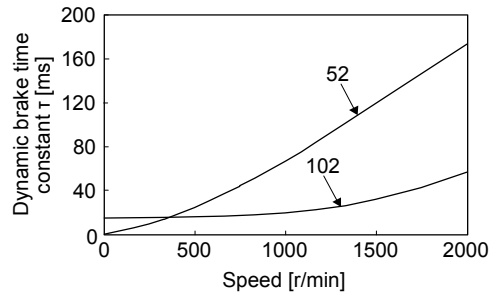
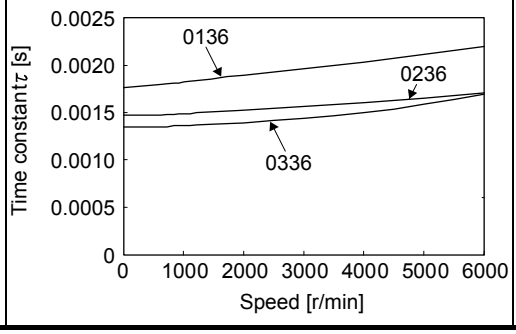
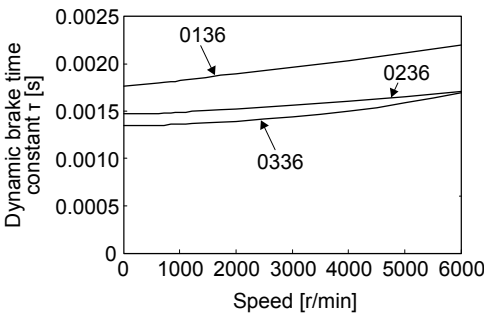
<tr><td>HA-LP
400 V
2000 r/min</td><td> 
</td></tr>
<tr><td>HC-UP</td><td> 
</td><td>HG-UR</td><td> 
</td></tr>
</table>

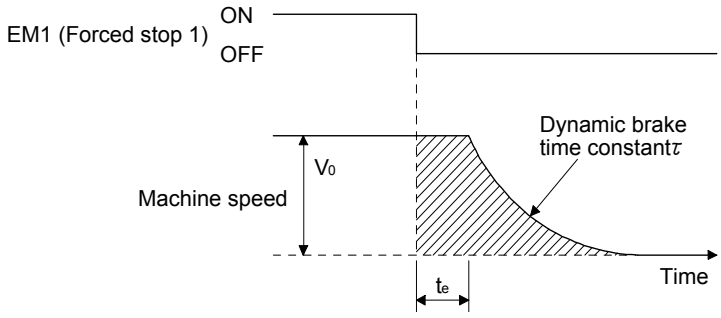
(b) Replacement of MR-J3W series with MR-J4W2-_B servo amplifier

Series	MR-J3W Series	Series	MR-J4W2-_B
HF-KP		HG-KR	
HF-MP		HG-MR	
HF-SP 1000 r/min		HG-SR 1000 r/min	
HF-SP 2000 r/min		HG-SR 2000 r/min	
HC-UP series		HG-UR series	

<table>
<tr><th>Series</th><th>MR-J3W Series</th><th>Series</th><th>MR-J4W2-_B</th></tr>
<tr><td>HF-JP
3000 r/min</td><td> 
</td><td rowspan="2">HG-JR
3000
r/min</td><td rowspan="2"> 
</td></tr>
<tr><td>HC-LP
series</td><td> 
</td></tr>
<tr><td>HG-AK
series</td><td> 
</td><td>HG-AK
series</td><td> 
</td></tr>
</table>

(2) Calculation of coasting distance

The figure shows the pattern in which the servo motor comes to a stop when the dynamic brake is operated. Use equation 5.1 to calculate an approximate coasting distance to a stop. The dynamic brake time constant τ varies with the servo motor and machine operation speeds. (Refer to (1) of this section.) A working part generally has a friction force. Therefore, actual coasting distance will be shorter than a maximum coasting distance calculated with the following equation.



Dynamic Brake Operation Diagram

$$L_{max} = \frac{V_0}{60} \bullet \left\{ t_e + \tau \left(1 + \frac{J_L}{J_M} \right) \right\} \quad \cdots\cdots (5.1)$$

L_{max} : Maximum coasting distance ·····[mm]
V_0 : Machine's fast feed speed ····· [mm/min]
J_M : Moment of inertia of the servo motor ····· [× 10^{-4} kg • m^2]
J_L : Load moment of inertia converted into equivalent value on servo motor shaft ····· [× 10^{-4} kg • m^2]
τ : Dynamic brake time constant ····· [s]
t_e : Delay time of control section ····· [s]
For 7 kW or lower servo, there is internal relay delay time of about 10 ms. For 11 kW to 55 kW servo, there is delay caused by magnetic contactor built into the external dynamic brake (about 50 ms) and delay caused by the external relay.
For MR-J3W-0303BN6 and MR-J4W2-0303B6 the processing delay time about 3.5 ms

(3) Electronic dynamic brake

The electronic dynamic brake operates in the initial state for HG series servo motors with a 600 W or smaller capacity.

The time constant "τ" for the electronic dynamic brake will be shorter than that for normal dynamic brake. Therefore, coasting distance will be shorter than in normal dynamic brake.

Series	Servo motor
HG-KR	HG-KR053, HG-KR13, HG-KR23, HG-KR43
HG-MR	HG-MR053, HG-MR13, HG-MR23, HG-MR43
HG-SR	HG-SR51, HG-SR52
HG-AK	HG-AK0136, HG-AK0236, HG-AK0336

(a) Parameter settings (for MR-J4-_A_series)

<table>
<tr><th>No.</th><th>Abbrevia-tion</th><th>Name and function</th><th>Initial value [unit]</th><th>Setting range</th></tr>
<tr><td>PF09</td><td>*FOP5</td><td>Function selection F-5
<table>
<tr><th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr>
<tr><td>_ _ _ x</td><td>Electronic dynamic brake selection.
0: Automatic (effective only for specific servo motors)
2: Disabled
Refer to the following table for the specified servo motors.
<table>
<tr><th>Series</th><th>Servo motor</th></tr>
<tr><td>HG-KR</td><td>HG-KR053/HG-KR13/HG-KR23/HG-KR43</td></tr>
<tr><td>HG-MR</td><td>HG-MR053/HG-MR13/HG-MR23/HG-MR43</td></tr>
<tr><td>HG-SR</td><td>HG-SR51/HG-SR52</td></tr>
</table></td><td>0h</td></tr>
</table></td><td>Refer to the "Name and function" column.</td><td></td></tr>
<tr><td>PF15</td><td>DBT</td><td>Electronic Dynamic Brake Operating Time
Set an operating time for the electronic dynamic brake. (Note)</td><td>2000 [ms]</td><td>0 to 10000</td></tr>
</table>

(b) Parameter settings (for MR-J4-_B_series/MR-J4W2-_B servo amplifier)

<table>
<tr><th>No.</th><th>Abbrevia-tion</th><th>Name and function</th><th>Initial value [unit]</th><th>Setting range</th></tr>
<tr><td>PF06</td><td>*FOP5</td><td>Function selection F-5
<table>
<tr><th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr>
<tr><td>_ _ _ x</td><td>Electronic dynamic brake selection.
0: Automatic (effective only for specific servo motors)
2: Disabled
Refer to the following table for the specified servo motors.
<table>
<tr><th>Series</th><th>Servo motor</th></tr>
<tr><td>HG-KR</td><td>HG-KR053/HG-KR13/HG-KR23/HG-KR43</td></tr>
<tr><td>HG-MR</td><td>HG-MR053/HG-MR13/HG-MR23/HG-MR43</td></tr>
<tr><td>HG-SR</td><td>HG-SR51/HG-SR52</td></tr>
<tr><td>HG-AK</td><td>HG-AK0136/HG-AK0236/HG-AK0336</td></tr>
</table></td><td>0h</td></tr>
</table></td><td>Refer to the "Name and function" column.</td><td></td></tr>
<tr><td>PF12</td><td>DBT</td><td>Electronic Dynamic Brake Operating Time
Set an operating time for the electronic dynamic brake. (Note)</td><td>2000 [ms]</td><td>0 to 10000</td></tr>
</table>

Note. When the electronic dynamic brake is released during operation, the servo system cannot be switched on until the PF12 operating time is over.

1.2.4 Forced stop deceleration function selection

(1) Parameter setting

(a) For MR-J4-_A_series

POINT
●With MR-J4-A_, the deceleration to a stop function is enabled by the factory setting. To disable the deceleration to a stop function, set [Pr. PA04] to "0 _ _ _".

<table>
<tr><th>No.</th><th>Abbre-viation</th><th>Name and function</th><th>Initial value [unit]</th><th>Setting range</th></tr>
<tr><td>PA04</td><td>*AOP1</td><td>Function selection A-1
This is used to select the forced stop input and forced stop deceleration function.

<table>
<tr><th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr>
<tr><td>_ _ _ x</td><td rowspan="3">For manufacturer setting</td><td>0h</td></tr>
<tr><td>_ _ x _</td><td>0h</td></tr>
<tr><td>_ x _ _</td><td>0h</td></tr>
<tr><td>x _ _ _</td><td>Forced stop deceleration function selection
0: Forced stop deceleration function disabled (EM1)
2: Forced stop deceleration function enabled (EM2)
Refer to the following table for details.</td><td>2h</td></tr>
</table>

<table>
<tr><th rowspan="2">Setting value</th><th rowspan="2">EM2/EM1 selection</th><th colspan="2">Deceleration method</th></tr>
<tr><th>EM2 or EM1 is off</th><th>Alarm occurred</th></tr>
<tr><td>0 _ _ _</td><td>EM1</td><td>MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.</td><td>MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.</td></tr>
<tr><td>2 _ _ _</td><td>EM2</td><td>MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.</td><td>MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.</td></tr>
</table>
</td><td>Refer to the "Name and function" column.</td><td></td></tr>
</table>

(b) For MR-J4-_B_series/MR-J4W2-_B servo amplifier

POINT
●With MR-J4-_B_ and MR-J4W2-_B the deceleration to a stop function is enabled in the factory setting. To disable the deceleration to a stop function, set [Pr. PA04] to "0 _ _ _".

<table>
<tr><th>No.</th><th>Abbre-viation</th><th>Name and function</th><th>Initial value [unit]</th><th>Setting range</th></tr>
<tr><td>PA04</td><td>*AOP1</td><td>Function selection A-1
This is used to select the forced stop input and forced stop deceleration function.

<table>
<tr><th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr>
<tr><td>_ _ _ x</td><td rowspan="2">For manufacturer setting</td><td>0h</td></tr>
<tr><td>_ _ x _</td><td>0h</td></tr>
<tr><td>_ x _ _</td><td>Servo forced stop selection
0: Enabled (The forced stop input EM2 or EM1 is used.)
1: Disabled (The forced stop input EM2 and EM1 are not used.)
Refer to the following table for details.</td><td>0h</td></tr>
<tr><td>x _ _ _</td><td>Forced stop deceleration function selection
0: Forced stop deceleration function disabled (EM1)
2: Forced stop deceleration function enabled (EM2)
Refer to the following table for details.</td><td>2h</td></tr>
</table>

<table>
<tr><th rowspan="2">Setting value</th><th rowspan="2">EM2/EM1 selection</th><th colspan="2">Deceleration method</th></tr>
<tr><th>EM2 or EM1 is off</th><th>Alarm occurred</th></tr>
<tr><td>0 0 _ _</td><td>EM1</td><td>MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.</td><td>MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.</td></tr>
<tr><td>2 0 _ _</td><td>EM2</td><td>MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.</td><td>MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.</td></tr>
<tr><td>0 1 _ _</td><td>Not using EM2 or EM1</td><td></td><td>MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.</td></tr>
<tr><td>2 1 _ _</td><td>Not using EM2 or EM1</td><td></td><td>MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.</td></tr>
</table>
</td><td>Refer to the "Name and function" column</td><td></td></tr>
</table>

1.2.5 Servo setup software: Setup software (SETUP221E) => MR Configurator2

Item	MR-J3 series	→	MR-J4 series
Servo setup software	Setup software Model: MRZJW3-SETUP221E	→	MR Configurator2 Model: SW1DNC-MRC2-E

(1) MR Configurator2 (SW1DNC-MRC2-E) specification

Item	Description
Project	Create/read/save/delete project, system setting, and print
Parameter	Parameter setting, amplifier axis name setting, parameter converter (Note 1)
Positioning data	Point table, program, indirect addressing
Monitor	Display all, I/O monitor, graph, and ABS data display
Diagnostics	Alarm display, alarm onset data display, drive recorder, display of the reason for no rotation, system configuration, life diagnosis, machine diagnosis
Test operation	Jog operation (Note 1), positioning operation, motor-less operation, DO forced output, and program operation, test operation event information, single-step feed (Note 2)
Adjustment	One-touch tuning, tuning, and machine analyzer
Others	Servo assistant, parameter setting range update, help display, connection to MITSUBISHI ELECTRIC FA Global Website

Note 1. This function is available only in standard control mode.
2. SW1DNC-MRC2-E supports only MR-J4_A_-RJ.

(2) System configuration

For servo setup software components, refer to the MR-J4-_A_ Servo Amplifier Instruction Manual, MR-J4-_B_ Servo Amplifier Instruction Manual or MR-J4W2_-B Servo Amplifier Instruction Manual.

1.2.6 Servo amplifier initializing time

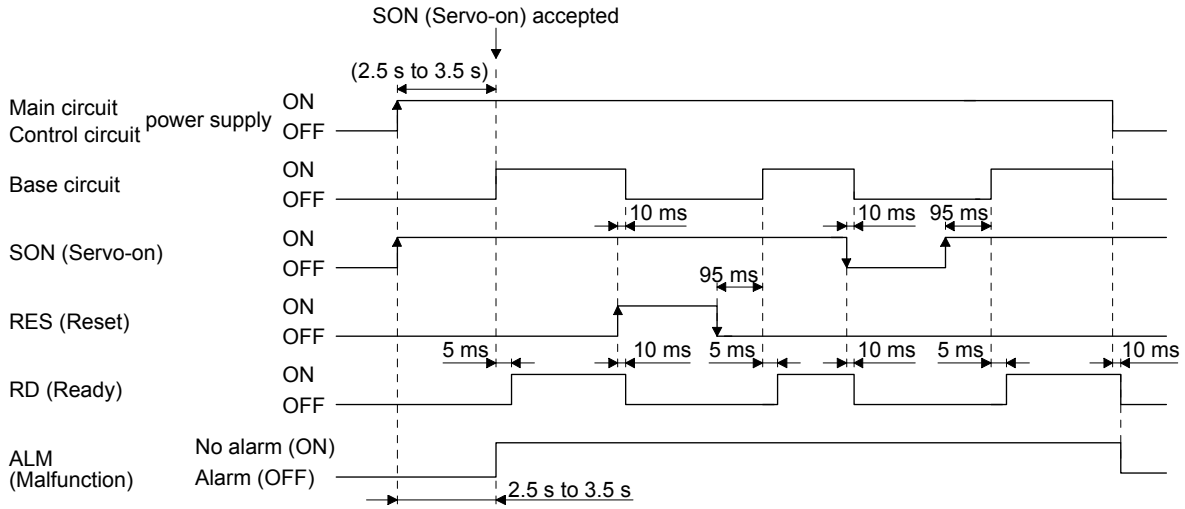
This section explains the initializing time of the servo amplifier (the time taken between power-on and servo-on reception). The initializing time is 2 s at maximum for the MR-J3-_A_servo amplifier, and 3 s at maximum for the MR-J3-_B_/MR-J3W-_B servo amplifier, but 3.5 s at maximum for the MR-J4-_A_/MR-J4-_B_/MR-J4W2-_B servo amplifier. Note the initializing time difference upon replacement.

<Points to note upon replacement>

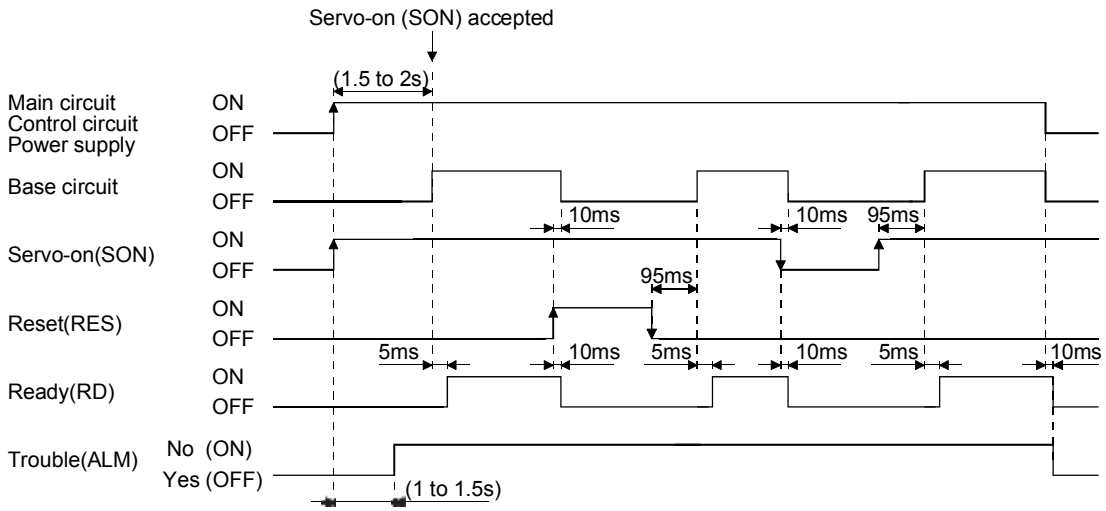
(1) When using the electromagnetic brake to prevent a drop in a vertical lift application or the like with an external timer to adjust the brake release time, the lift may drop due to a longer servo-lock time. Adjust the brake release time as necessary or use MBR (electromagnetic brake interlock signal).

(2) A longer servo-on time at power-on may cause a delay in the motor starting time after power-up. Please take note.

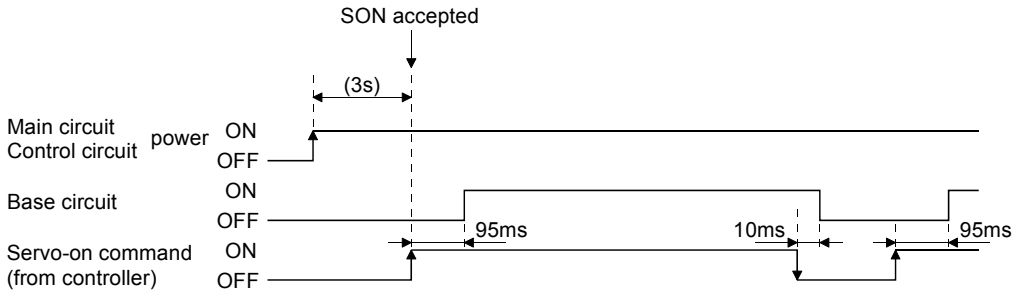
(1) MR-J4-_A_/MR-J4-_B_series servo amplifier/MR-J4W2-_B servo amplifier
The initializing time is 2.5 to 3.5 s.



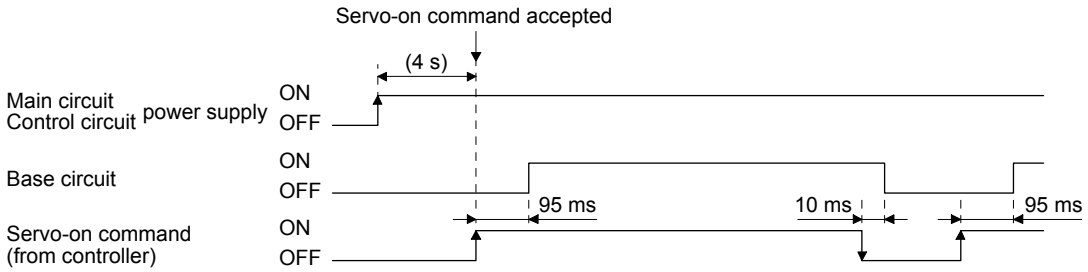
(2) MR-J3-_A_series servo amplifier
The initializing time is 1.5 to 2 s.



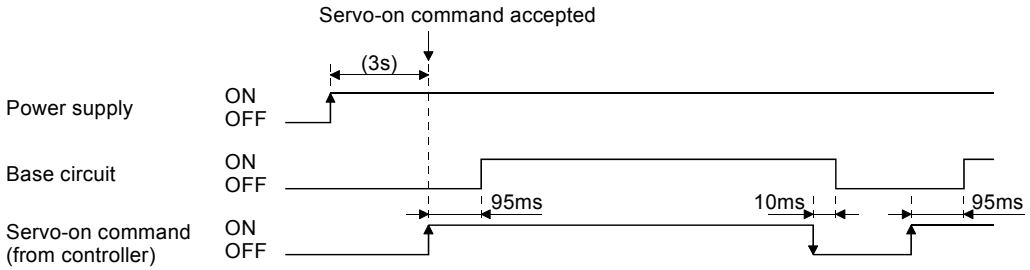
(3) MR-J3-_B_/MR-J3W-_B series servo amplifier
The initializing time is 3 s.



(4) MR-J4W2-0303B6 servo amplifier



(5) MR-J3W-0303BN6 servo amplifier

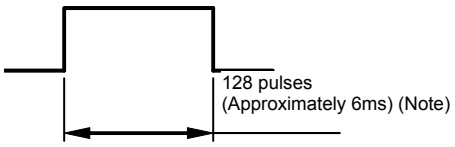
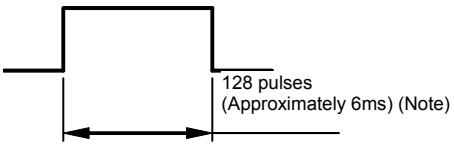
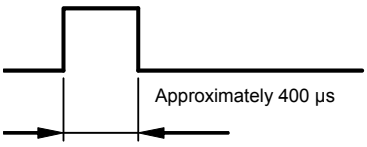
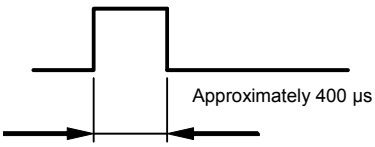


1.2.7 The pulse width of the encoder Z-Phase pulse

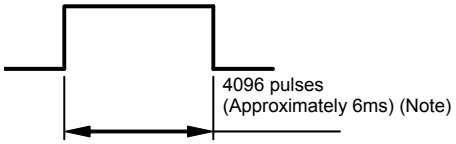
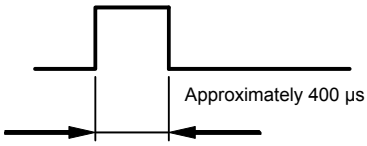
< Precautions >

Always reset the home position upon replacement.

< Amplifier replacement >

	MR-J3/MR-J3W series	MR-J4 series
At low speed	256/262144 pulses (Example: At 10 r/min) 	256/262144 pulses (Example: At 10 r/min) 
At high speed	Approximately 400 μs fixed 	Approximately 400 μs fixed 

< Simultaneous replacement >

	HG-KR/HG-MR/HG-SR motor
At low speed	4096/4194304 pulses (Example: At 10 r/min) 
At high speed	Approximately 400 μs fixed 

Note This is the pulse width when the motor rotates at 10 r/min. The pulse width changes depending on rotational frequency.

1.3 Overload protection characteristics

POINT

- "Overload protection characteristics" may be different due to the replacement of the servo amplifier and the servo motor. Check "overload protection characteristics" of each model before considering replacement.
- If operation that generates torque more than 100% of the rating is performed with an abnormally high frequency in a servo motor stop status (servo-lock status) or in a 50 r/min or less (the other motors: 30 r/min or less) low-speed operation status, the servo amplifier may malfunction regardless of the electronic thermal protection.
- When MR-J4 series is driven with motors before replacement, the "overload protection characteristics" is the same as MR-J3 series.

An electronic thermal is built in the servo amplifier to protect the servo motor, servo amplifier and servo motor power wires from overloads.
[AL. 50 Overload 1] occurs if overload operation performed is above the electronic thermal protection curve shown in fig. 10.1 [AL. 51 Overload 2] occurs if the maximum current is applied continuously for several seconds due to machine collision, etc. Use the equipment on the left-hand side area of the continuous or broken line in the graph.
For the system where the unbalanced torque occurs, such as a vertical axis system, the unbalanced torque of the machine should be kept at 70% or less of the rated torque.
This servo amplifier has solid-state servo motor overload protection.

(1) MR-J4 servo amplifier/MR-J3 servo amplifier

MR-J4 servo amplifier

Rotary servo motor						Graph of overload protection characteristics
HG-KR	HG-MR	HG-SR	HG-UR	HG-RR	HG-JR	
053 13	053 13		72			Characteristics a
23 43 73	23 43 73	51 81 52 102			53 (Note) 73 103	Characteristics b
		121 201 152 202 301 352	152 202	103 153 203	73 (Note) 103 (Note) 153 (Note) 203 (Note) 353	Characteristics c
		421 502 702	352 502	353 503	353 (Note) 601 701M 503 (Note) 703	Characteristics d
					801 12K1 15K1 20K1 25K1 11K1M 15K1M 22K1M 903	Characteristics e
		524 1024			534 (Note) 734 1034	Characteristics b
		1524 2024 3524			734 (Note) 1034 (Note) 1534 (Note) 2034 (Note) 3534	Characteristics c
		5024 7024			3534 (Note) 6014 701M4 5034 (Note) 7034	Characteristics d
					8014 12K14 15K14 20K14 25K14 11K1M4 15K1M4 22K1M4 9034	Characteristics e

Note. The combination is for increasing the maximum torque of the servo motor to 400%.

Servo amplifiers supporting the 400% maximum torque setting (Note)	Servo motor (Note) HG-JR_
MR-J4-100_(-RJ)	53
MR-J4-200_(-RJ)	73
	103
MR-J4-350_(-RJ)	153
	203
MR-J4-500_(-RJ)	353
MR-J4-700_(-RJ)	503

Servo amplifiers supporting the 400% maximum torque setting (Note)	Servo motor (Note) HG-JR_
MR-J4-100_4(-RJ)	534
MR-J4-200_4(-RJ)	734
	1034
MR-J4-350_4(-RJ)	1534
	2034
MR-J4-500_4(-RJ)	3534
MR-J4-700_4(-RJ)	5034

Note. This is available with servo amplifiers with software version C8 or later. The combination increases the rated torque and the maximum torque.

MR-J3 servo amplifier

Rotary servo motor								Graph of overload protection characteristics
HF-KP	HF-MP	HF-SP	HC-UP	HF-RP	HC-LP	HA-LP	HF-JP	
053 13	053 13							Characteristics a
23 43 73	23 43 73	51 81 52 102	72		52 102		53 73 103	Characteristics b
		121 201 152 202 301 352	152 202	103 153 203	152 202		153 203 353	Characteristics c
		421 502 702	352 502	353 503	302	502 601 701M 702	503 703	Characteristics d
						801 11K1M 11K2 15K1 15K1M 15K2 20K1 22K1M 22K2 25K1	903 11K1M (Note) 15K1M (Note)	Characteristics e
		524 1024					534 734 1034	Characteristics b
		1524 2024 3524					1534 2034 3534	Characteristics c
		5024 7024				6014 701M4	5034 7034	Characteristics d
						8014 11K1M4 11K24 12K14 15K14 15K1M4 15K24 20K14 22K1M4 22K24	9034 11K1M4 (Note) 15K1M4 (Note)	Characteristics e

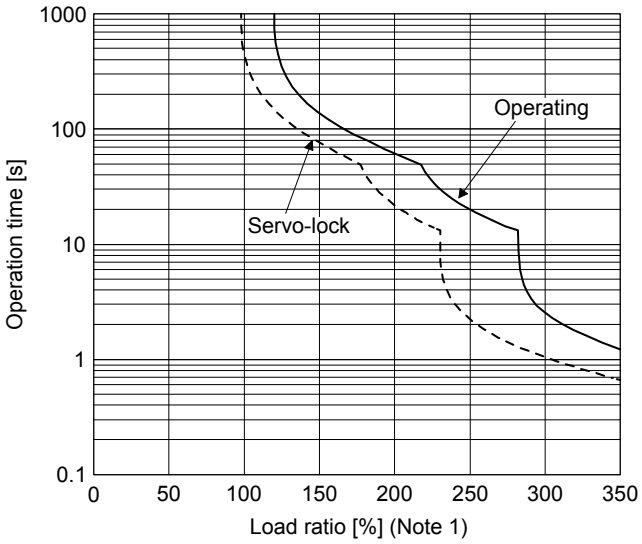
Note. Model names of servo amplifiers supporting these servo motors have "-LR" at the end.

Servo amplifiers supporting the 400% maximum torque setting (Note)	Servo motor (Note)
	HF-JP
MR-J3-100_	53
MR-J3-200_N	73
	103
MR-J3-350_	153
	203
MR-J3-500_	353
MR-J3-700_	503

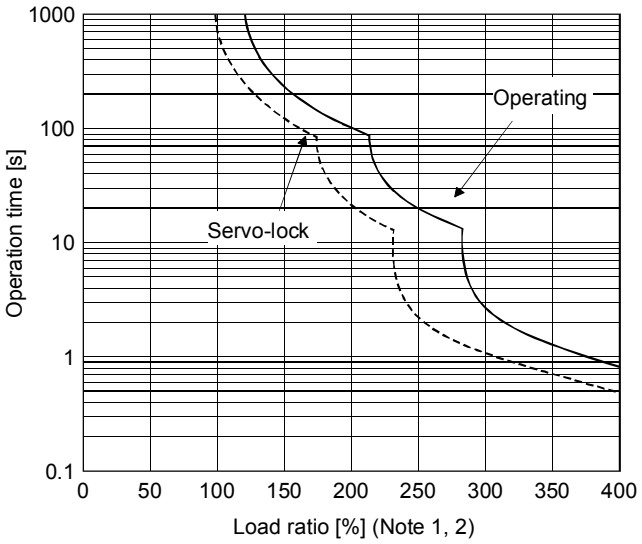
Servo amplifiers supporting the 400% maximum torque setting (Note)	Servo motor (Note)
	HF-JP
MR-J3-100_4	534
MR-J3-200_4	734
	1034
MR-J3-350_4	1534
	2034
MR-J3-500_4	3534
MR-J3-700_4	5034

Note. The maximum torque of 400% is achieved when servo amplifiers manufactured in August 2009 or later (with software version C4 or later) are used in combination with HF-JP servo motors manufactured in April 2010 or later.

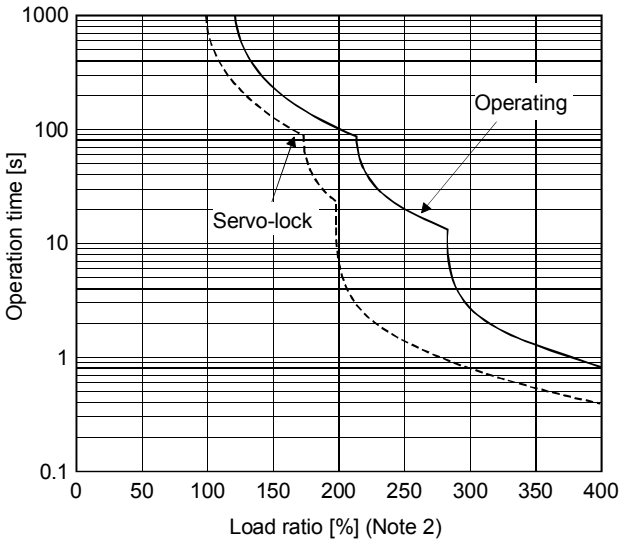
The following graphs show overload protection characteristics.



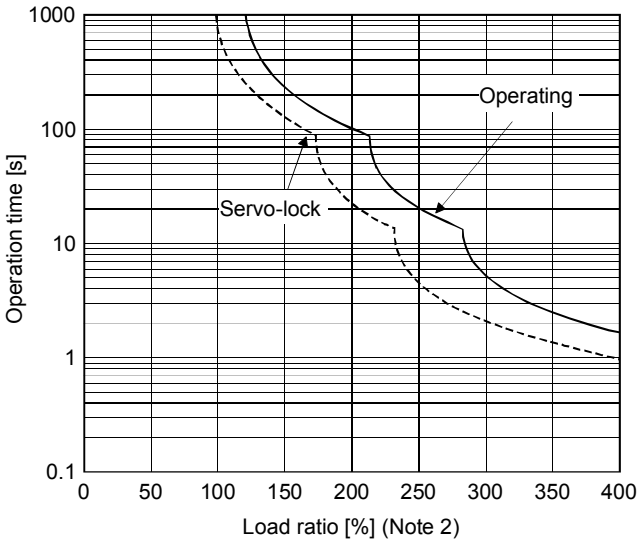
Characteristics a



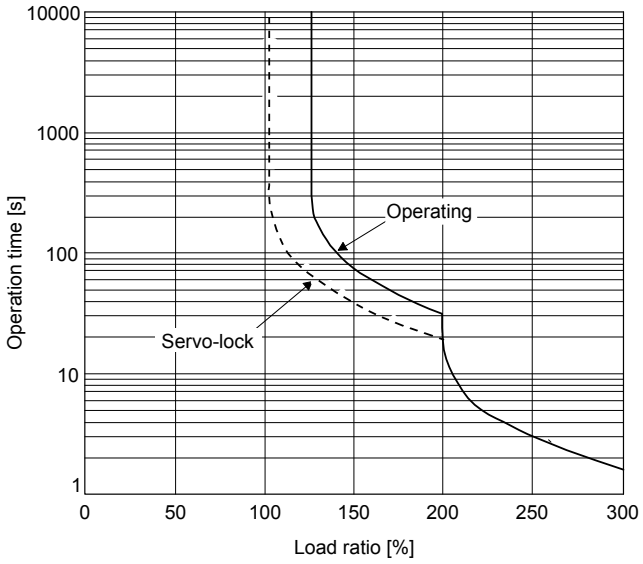
Characteristics b



Characteristics c



Characteristics d



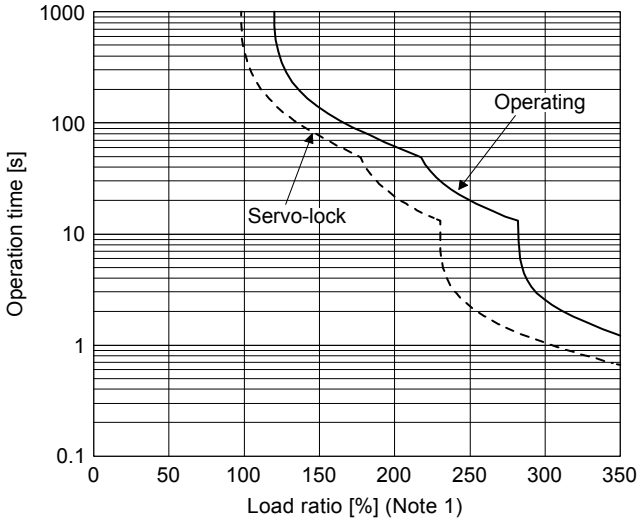
Characteristics e

Note 1. The operation time at the load ratio of 300% to 350% applies when the maximum torque of HG-KR servo motor and HF-KP servo motor is increased to 350% of rated torque.

2. The operation time at the load ratio of 300% to 400% applies when the maximum torque of HG-JR servo motor and HF-JP servo motor is increased to 400% of rated torque.

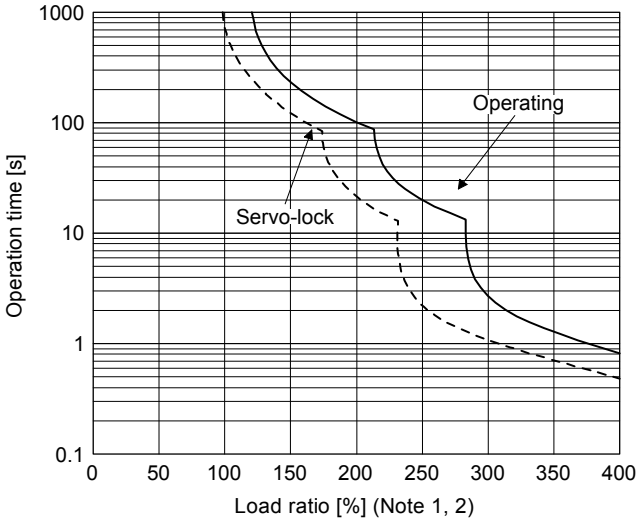
(2) MR-J4W2-_B servo amplifier/MR-J3W series

The following graphs show overload protection characteristics.



HG-KR053/HG-KR13
HG-MR053/HG-MR13

HF-KP053/HF-KP13
HF-MP053/HF-MP13

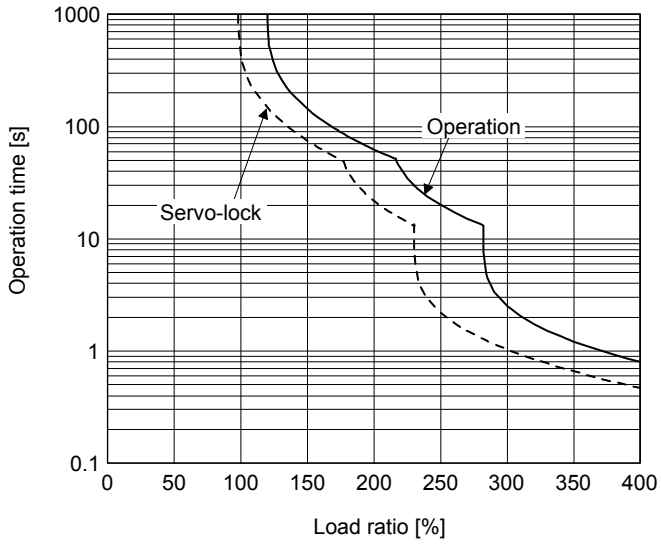


HG-KR23/HG-KR43/HG-KR73
HG-MR23/HG-MR43/HG-MR73
HG-SR51/HG-SR81/HG-SR52/HG-SR102
HG-UR72
HG-JR53/HG-JR73/HG-JR103
HF-KP23/HF-KP43/HF-KP73
HF-MP23/HF-MP43/HF-MP73
HF-SP51/HF-SP81/HF-SP52/HF-SP102
HC-UP72
HC-LP52/HC-LP102
HF-JP53/HF-JP73/HF-JP103

Note 1. The load ratio ranging from 300% to 350% applies to the HG-KR series servo motor.
2. The operation time at the load ratio of 350% to 400% applies when the maximum torque of HG-JR53 servo motor and HF-JP servo motor is increased to 400% of rated torque.

(3) MR-J4W2-0303B6/MR-J3W-0303BN6 servo amplifier

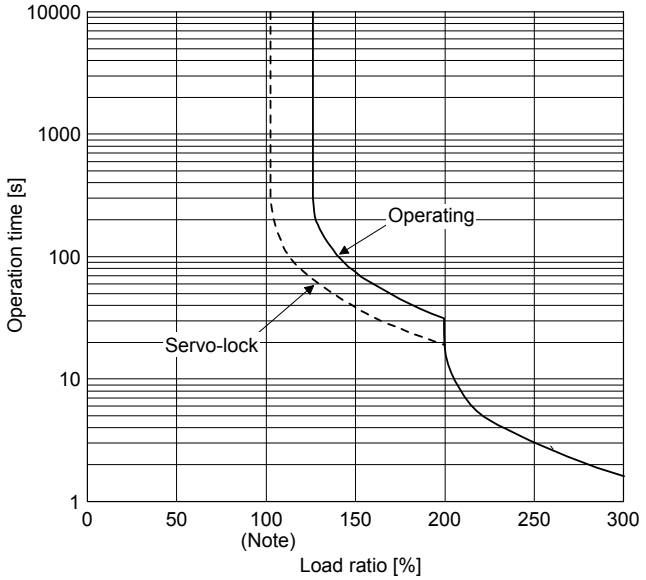
The following graphs show overload protection characteristics.



HG-AK0136/HG-AK0236/HG-AK0336

(4) MR-J4-DU_(-RJ)/MR-J3- DU_ drive unit

The following graphs show overload protection characteristics.



Note Load ratio 100% indicates the rated output of the drive unit.

1.4 Comparison of Networks

MR-J4-_B_servo amplifier is connected to controllers, including a servo system controller, on the high-speed synchronous network SSCNET III/H. The servo amplifier directly receives a command from a controller to drive a servo motor.
SSCNET III/H allows higher-speed communication of 150 Mbps for both upstream and downstream traffic to be achieved with high noise resistance enabled by adoption of the SSCNET III optical cables. Large amounts of data are exchanged in real-time between the controller and the servo amplifier. Servo monitor information is stored in the upper information system and is used for control.

1.4.1 Comparison of servo system network specifications

Item	MR-J3/MR-J3W series		MR-J4 series (Note)	
	SSCNET III		SSCNET III	SSCNET III/H
Communication media	Optical fiber cable	→	Optical fiber cable	
Communication speed	50 Mbps		50 Mbps	150 Mbps
Transmission distance	[Standard cord inside cabinet/ standard cable outside cabinet] Maximum distance between stations: 20 m		[Standard cord inside cabinet/ standard cable outside cabinet] Maximum distance between stations: 20 m	
	[Long distance cable] Maximum distance between stations: 50 m		[Long distance cable] Maximum distance between stations: 50 m	[Long distance cable] Maximum distance between stations: 100 m

Note. When you connect an amplifier with SSCNET III/H communication for the first controller communication with the factory setting, the operation mode will be fixed to "J4 mode". For SSCNET III communication, the operation mode will be fixed to "J3 compatibility mode". To return to the factory setting or to select an arbitrary mode, change the setting with the application "MR-J4 (W)-B mode selection".
The application "MR-J4 (W)-B mode selection" is available with MR Configurator2 Version 1.12N and later. When a version older than 1.12N is used, download an update version from the MITSUBISHI ELECTRIC FA Global Website.

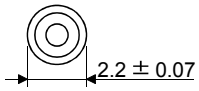
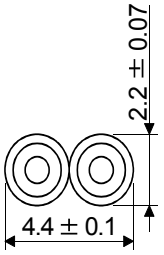
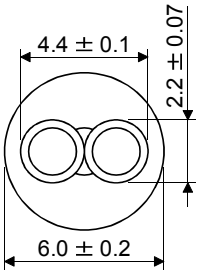
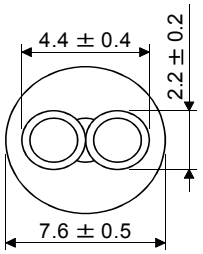
(1) Explanation of SSCNET III/H cable models

Function	Name	J4 series		MR-J3/MR-J3W series
		J4 mode	J3 compatibility mode	
SSCNET III/H communication or SSCNET III communication	Communication baud rate	150 Mbps	50 Mbps	50 Mbps
	Maximum distance between stations	100 m	50 m	50 m

Note. For cable of 30 m or shorter, contact your local sales office.
Contact Mitsubishi Electric System & Service about ultra-high flex-life cables and long distance cables longer than 50 m.

(2) SSCNET III/H cable specifications

POINT
●SSCNET III cables can be used as they are.

		Description			
SSCNET III/H cable model		MR-J3BUS_M		MR-J3BUS_M-A	MR-J3BUS_M-B
SSCNET III/H cable length		0.15 m	0.3 m to 3 m	5 m to 20 m	30 m to 50 m
Optical cable (cord)	Minimum bend radius	25 mm		Enforced covering cable: 50 mm Cord: 25 mm	Enforced covering cable: 50 mm Cord: 30 mm
	Tension strength	70 N	140 N	420 N (Enforced covering cable)	980 N (Enforced covering cable)
	Temperature range for use (Note)	-40 °C to 85 °C			-20 °C to 70 °C
	Atmosphere	Indoors (not exposed to direct sunlight), no solvent or oil.			
	Appearance [mm]				

Note. This temperature range for use is the value for optical cable (cord) only. Temperature condition for the connector is the same as that for servo amplifier.

2. SERVO AMPLIFIER DIMENSIONS/ATTACHMENT DIFFERENCES

2.1 MR-J3 series => MR-J4 series Comparison Table of Servo Amplifier Dimensions/Installation Differences

POINT
●Dimensions with differences are shown with shading.

2.1.1 General-Purpose Interface/SSCNET Interface 200 V/100 V class (22 kW or less)

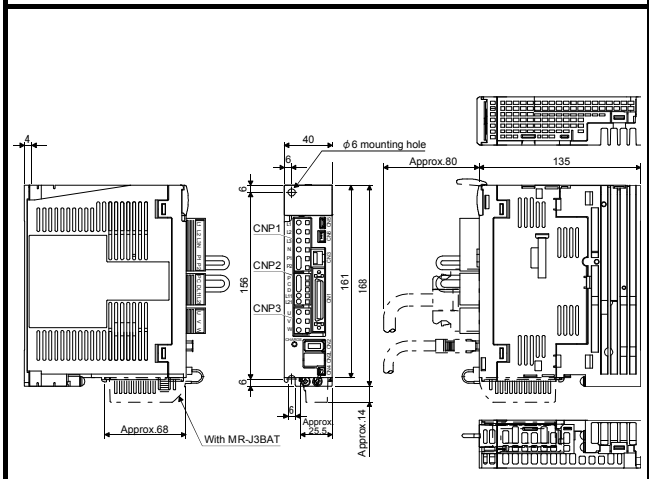
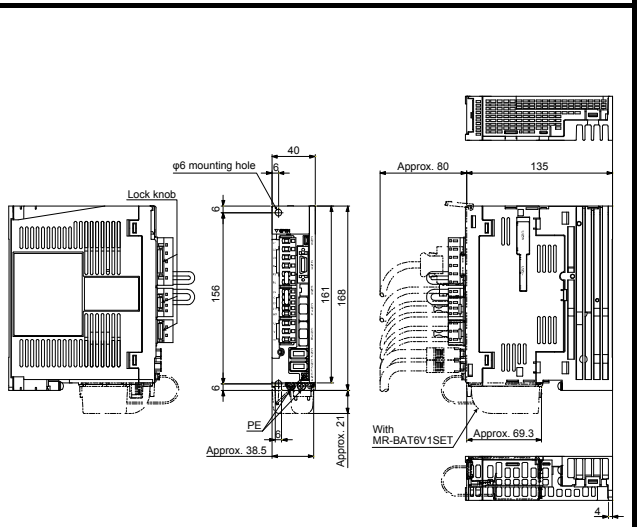
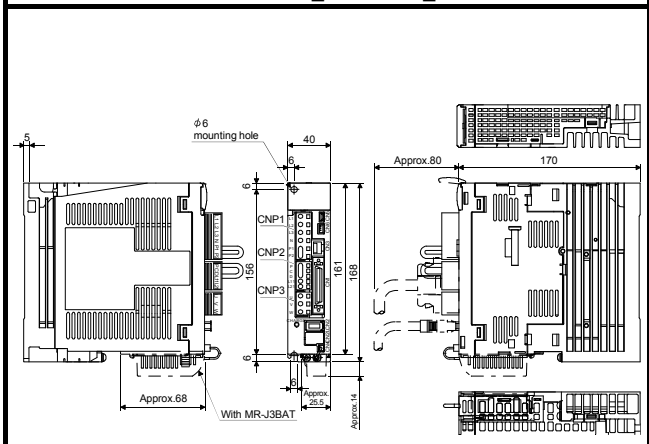
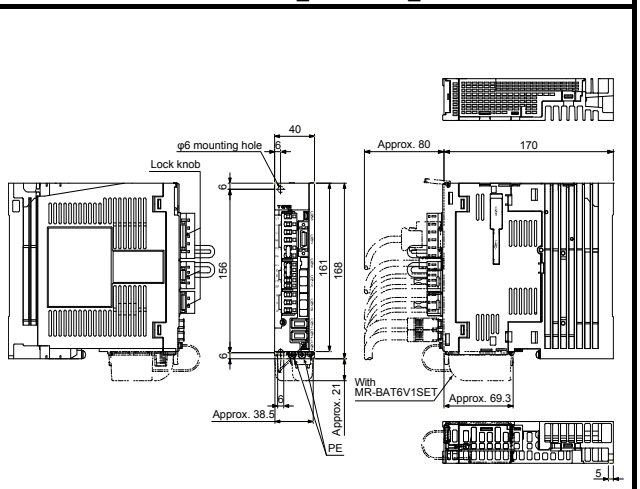
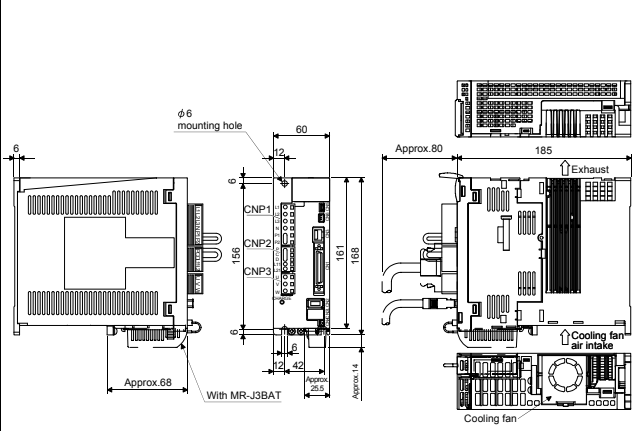
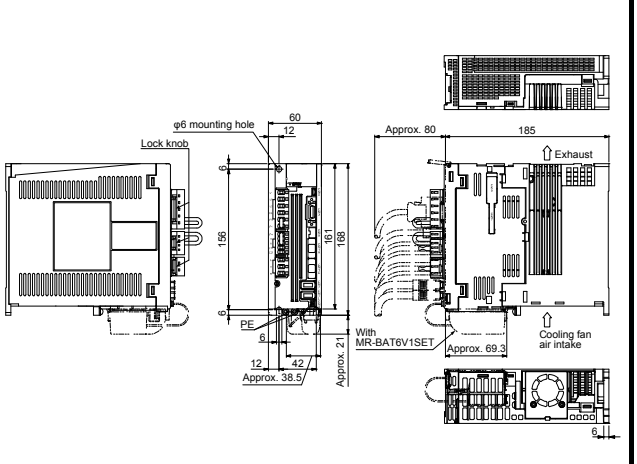
(1) Comparison of Dimensions

The following table shows comparison of the MR-J3 series and MR-J4 series dimensions. Dimensions of servo amplifiers of 3.5 kW or less, 7 kW, and 22 kW are the same and have compatibility in mounting. Note that the width and horizontal mounting screw pitch have been changed for servo amplifiers of 5 kW. For servo amplifiers of 11 kW and 15 kW, note that the width, vertical/horizontal mounting screw pitch, and screw size have been changed.

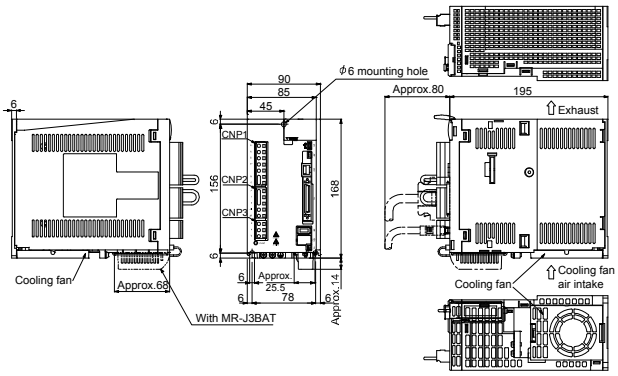
Comparison of dimensions (comparison between the same capacity types) [Unit: mm]

Model MR-J3 series	Model MR-J4 series	Height		Width		Depth		Mounting screw pitch	
		MR-J3	MR-J4	MR-J3	MR-J4	MR-J3	MR-J4	MR-J3	MR-J4
MR-J3-10_(1)	MR-J4-10_(1)	168	168	40	40	135	135	156 (Vertical) (2 screws)	156 (Vertical) (2 screws)
MR-J3-20_(1)	MR-J4-20_(1)								
MR-J3-40_(1)	MR-J4-40_(1)					170	170		
MR-J3-60 _	MR-J4-60_								
MR-J3-70_	MR-J4-70_			60	60	185	185	156 (Vertical)/ 42 (Horizontal) (3 screws)	156 (Vertical)/ 42 (Horizontal) (3 screws)
MR-J3-100_	MR-J4-100_								
MR-J3-200_(N)(-RT)	MR-J4-200_			90	90	195	195	156 (Vertical)/ 78 (Horizontal) (3 screws)	156 (Vertical)/ 78 (Horizontal) (3 screws)
MR-J3-350_	MR-J4-350_								
MR-J3-500_	MR-J4-500_	250	250	130	**105**	200	200	235 (Vertical)/ 118 (Horizontal) (4 screws)	235 (Vertical)/ **93 (Horizontal)** (4 screws)
MR-J3-700_	MR-J4-700_	300	300	172	172			285 (Vertical)/ 160 (Horizontal) (4 screws)	285 (Vertical)/ 160 (Horizontal) (4 screws)
MR-J3-11K_(-LR)	MR-J4-11K_	400	400	260	**220**	260	260	376 (Vertical)/ 236 (Horizontal) (4 screws)	**380 (Vertical)/ 196 (Horizontal)** (4 screws)
MR-J3-15K_(-LR)	MR-J4-15K_								
MR-J3-22K_	MR-J4-22K_				260				376 (Vertical)/ 236 (Horizontal) (4 screws)

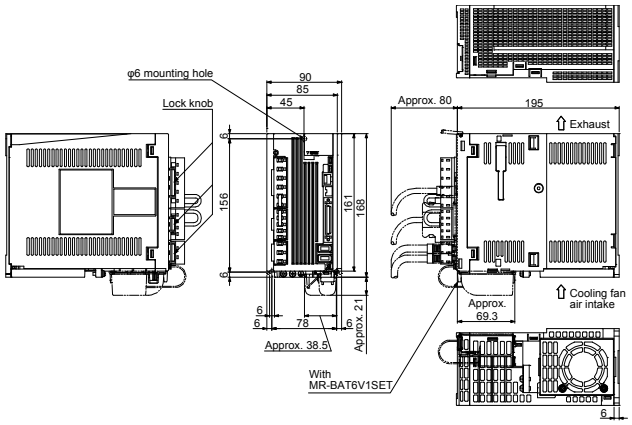
(2) Comparison of dimensions

MR-J3-10_/MR-J3-20_	MR-J4-10_/MR-J4-20_
	
MR-J3-40_/MR-J3-60_	**MR-J4-40_/MR-J4-60_**
	
MR-J3-70_/MR-J3-100_	**MR-J4-70_/MR-J4-100_**
	

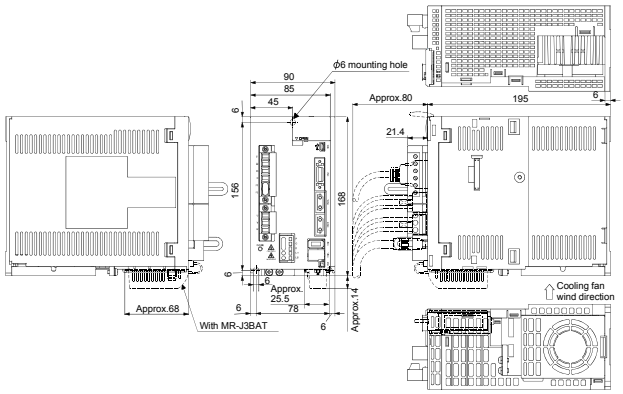
MR-J3-200_N



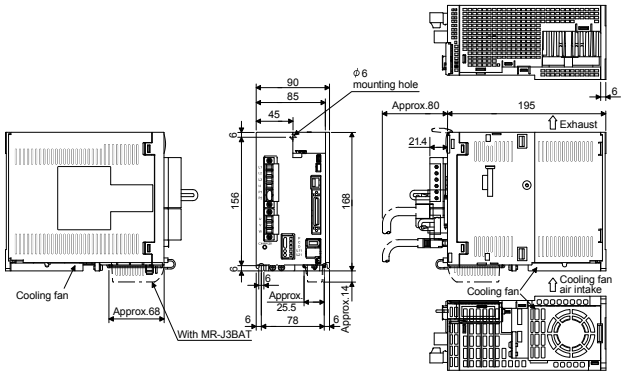
MR-J4-200_



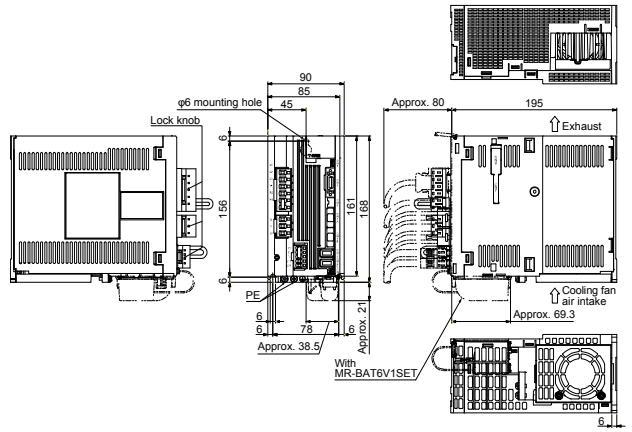
MR-J3-200_(-RT)

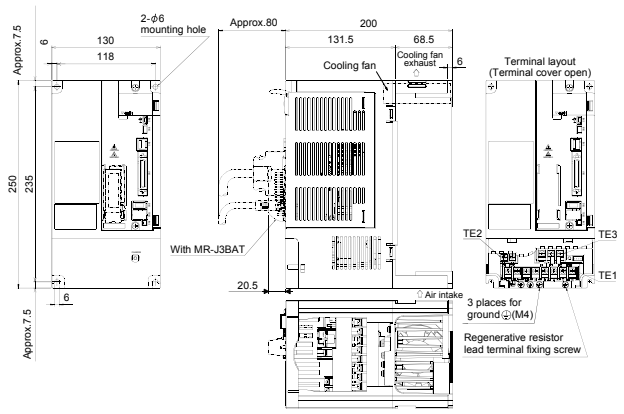
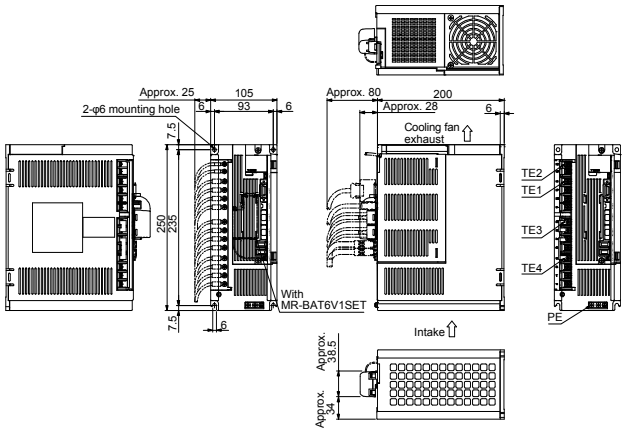
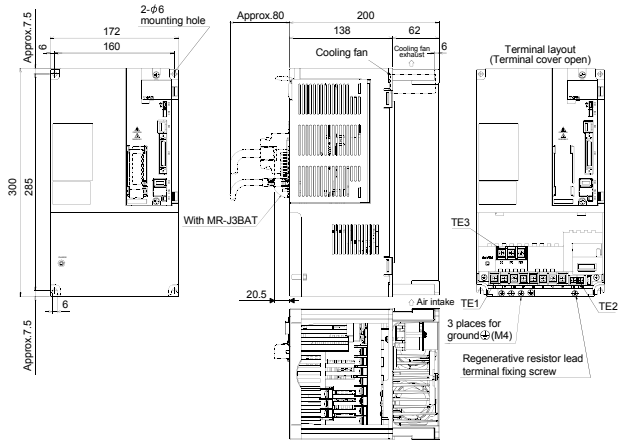
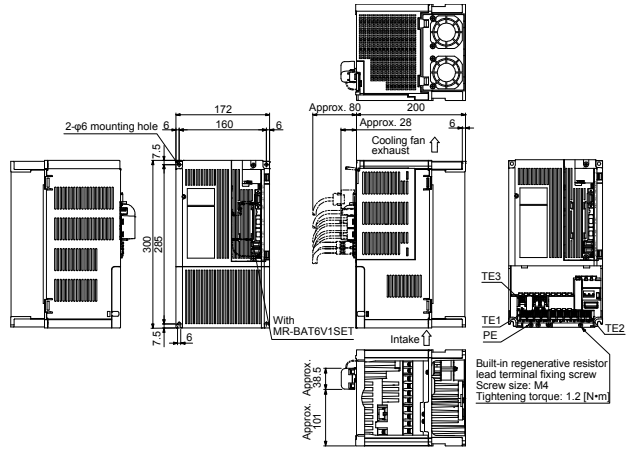


MR-J3-350_

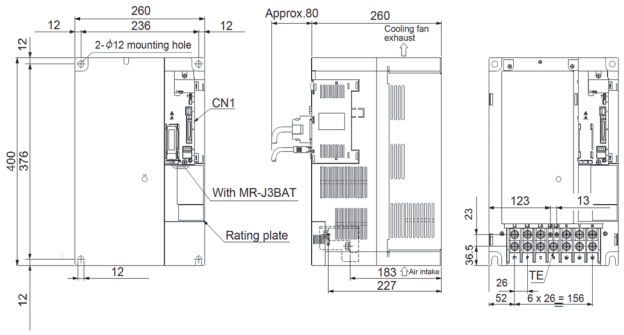


MR-J4-350_

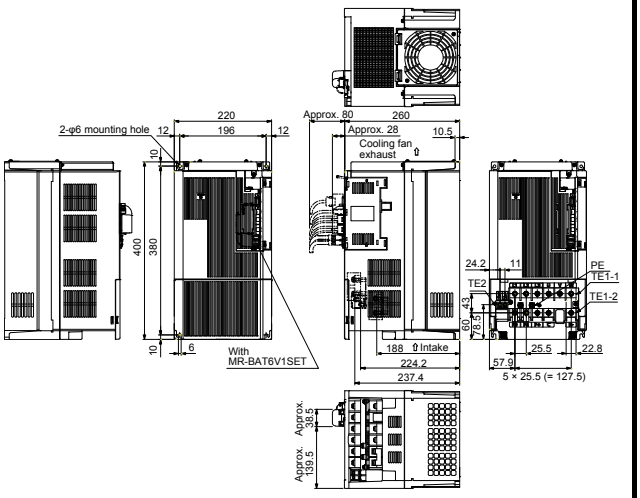


MR-J3-500_	MR-J4-500_
	
MR-J3-700_	**MR-J4-700_**
	

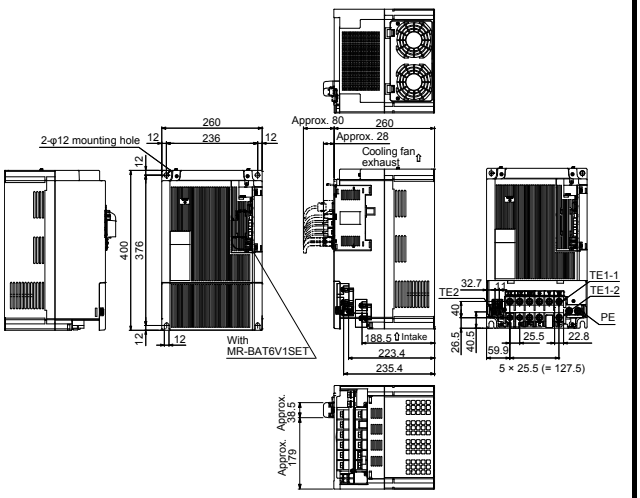
MR-J3-11K_(-LR)/MR-J3-15K_(-LR)/MR-J3-22K_



MR-J4-11K_/MR-J4-15K_



MR-J4-22K_



2.1.2 General-Purpose Interface/SSCNET Interface 400 V class (22 kW or less)

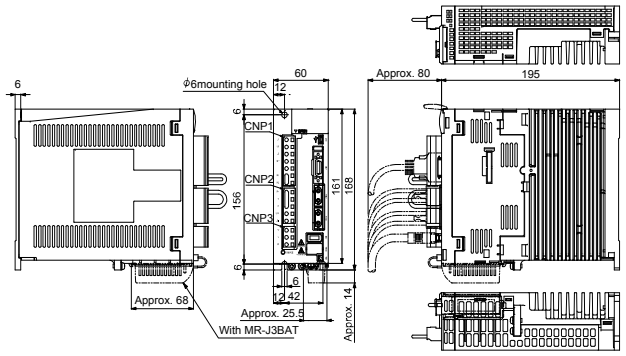
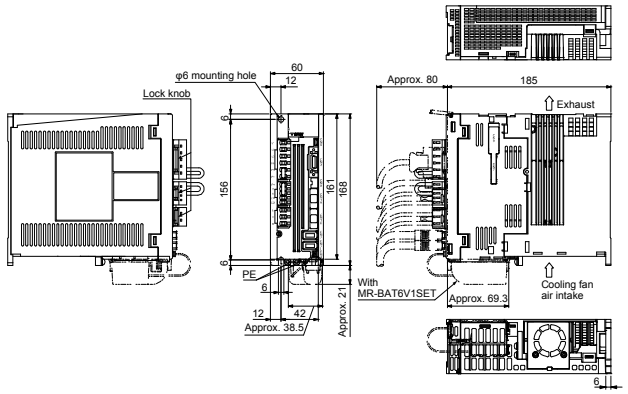
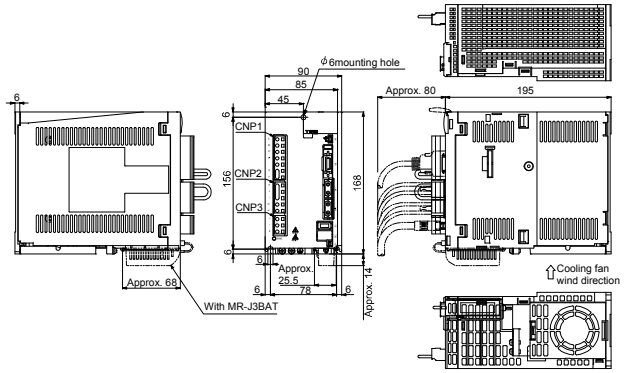
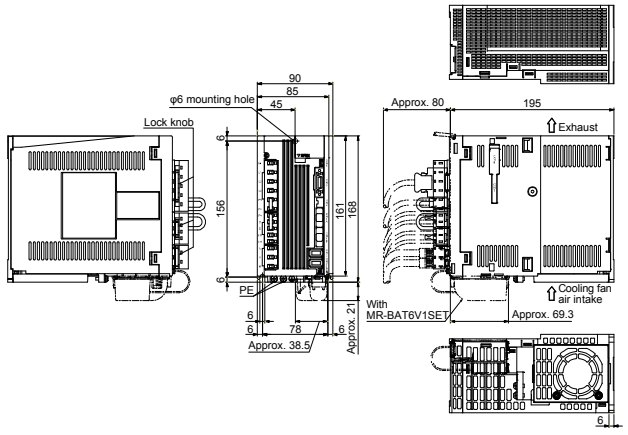
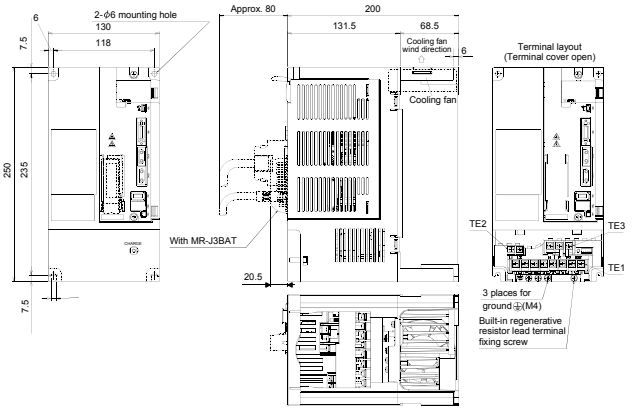
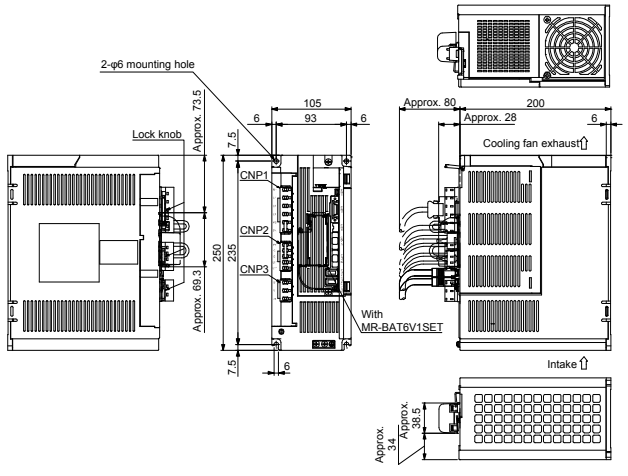
(1) Comparison of dimensions

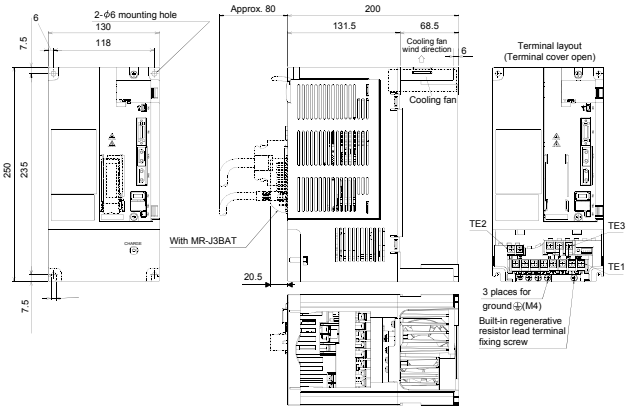
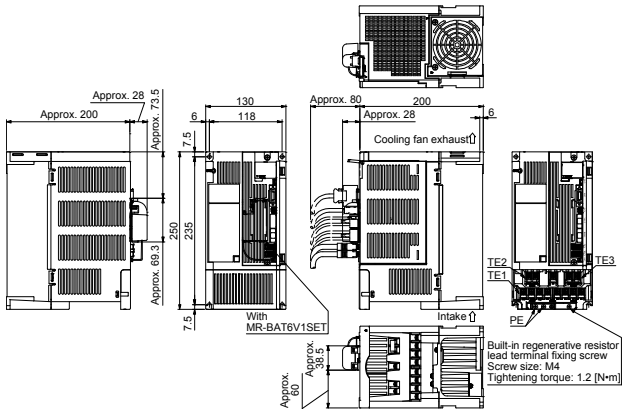
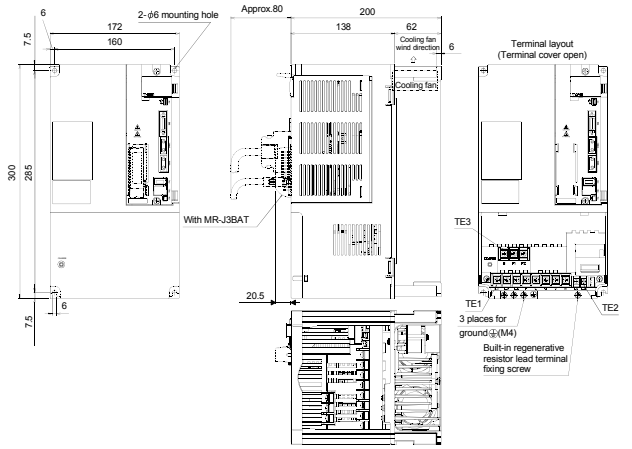
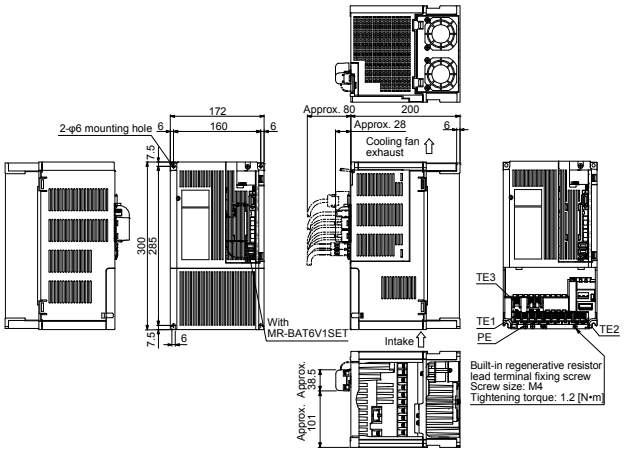
The following table shows comparison of the MR-J3 series and MR-J4 series dimensions. Dimensions of servo amplifiers of 2 kW or less, 5 kW, 7 kW, and 22 kW are the same and have compatibility in mounting. Note that the width and horizontal mounting screw pitch have been changed for servo amplifiers of 3.5 kW. For servo amplifiers of 11 kW and 15 kW, note that the width, vertical/horizontal mounting screw pitch, and screw size have been changed.

Comparison of dimensions (comparison between the same capacity types) [Unit: mm]

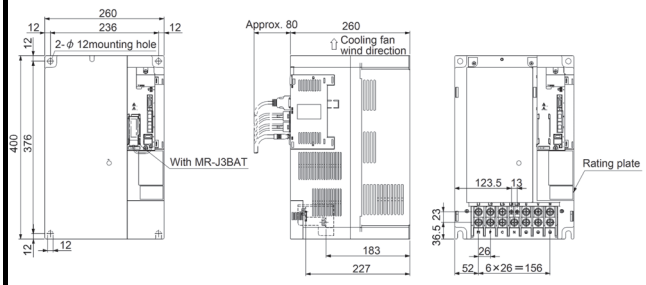
<table>
<tr><th rowspan="2">Model
MR-J3 series</th><th rowspan="2">Model
MR-J4 series</th><th colspan="2">Height</th><th colspan="2">Width</th><th colspan="2">Depth</th><th colspan="2">Mounting screw pitch</th></tr>
<tr><th>MR-J3</th><th>MR-J4</th><th>MR-J3</th><th>MR-J4</th><th>MR-J3</th><th>MR-J4</th><th>MR-J3</th><th>MR-J4</th></tr>
<tr><td>MR-J3-60_4</td><td>MR-J4-60_4</td><td rowspan="3">168</td><td rowspan="3">168</td><td rowspan="2">60</td><td rowspan="2">60</td><td rowspan="3">195</td><td rowspan="2">185</td><td rowspan="2">156 (Vertical)/
42 (Horizontal)
(3 screws)</td><td rowspan="2">156 (Vertical)/
42 (Horizontal)
(3 screws)</td></tr>
<tr><td>MR-J3-100_4</td><td>MR-J4-100_4</td></tr>
<tr><td>MR-J3-200_4</td><td>MR-J4-200_4</td><td>90</td><td>90</td><td>195</td><td>156 (Vertical)/
78 (Horizontal)
(3 screws)</td><td>156 (Vertical)/
78 (Horizontal)
(3 screws)</td></tr>
<tr><td>MR-J3-350_4</td><td>MR-J4-350_4</td><td rowspan="2">250</td><td rowspan="2">250</td><td rowspan="2">130</td><td>105</td><td rowspan="3">200</td><td rowspan="3">200</td><td rowspan="2">235 (Vertical)/
118 (Horizontal)
(4 screws)</td><td>235 (Vertical)/
93 (Horizontal)
(4 screws)</td></tr>
<tr><td>MR-J3-500_4</td><td>MR-J4-500_4</td><td>130</td><td>235 (Vertical)/
118 (Horizontal)
(4 screws)</td></tr>
<tr><td>MR-J3-700_4</td><td>MR-J4-700_4</td><td>300</td><td>300</td><td>172</td><td>172</td><td>285 (Vertical)/
160 (Horizontal)
(4 screws)</td><td>285 (Vertical)/
160 (Horizontal)
(4 screws)</td></tr>
<tr><td>MR-J3-11K_4(-LR)</td><td>MR-J4-11K_4</td><td rowspan="3">400</td><td rowspan="3">400</td><td rowspan="3">260</td><td rowspan="2">220</td><td rowspan="3">260</td><td rowspan="3">260</td><td rowspan="3">376 (Vertical)/
236 (Horizontal)
(4 screws)</td><td rowspan="2">380 (Vertical)/
196 (Horizontal)
(4 screws)</td></tr>
<tr><td>MR-J3-15K_4(-LR)</td><td>MR-J4-15K_4</td></tr>
<tr><td>MR-J3-22K_4</td><td>MR-J4-22K_4</td><td>260</td><td>376 (Vertical)/
236 (Horizontal)
(4 screws)</td></tr>
</table>

(2) Comparison of dimensions

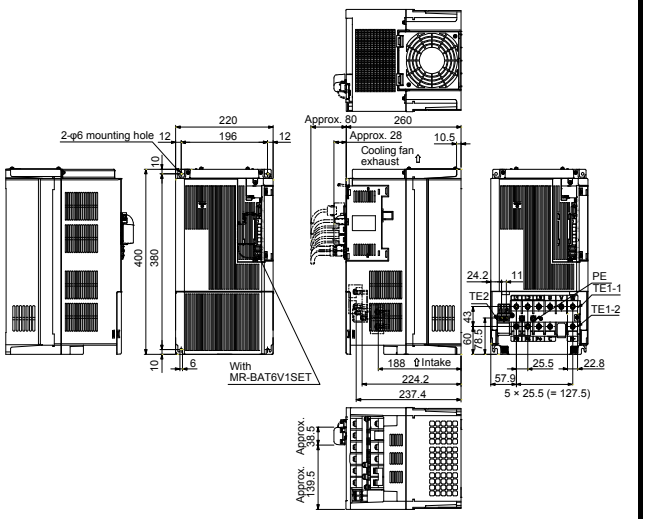
MR-J3-60_4/MR-J3-100_4	MR-J4-60_4/MR-J4-100_4
	
MR-J3-200_4	**MR-J4-200_4**
	
MR-J3-350_4	**MR-J4-350_4**
	

MR-J3-500_4	MR-J4-500_4
	
MR-J3-700_4	**MR-J4-700_4**
	

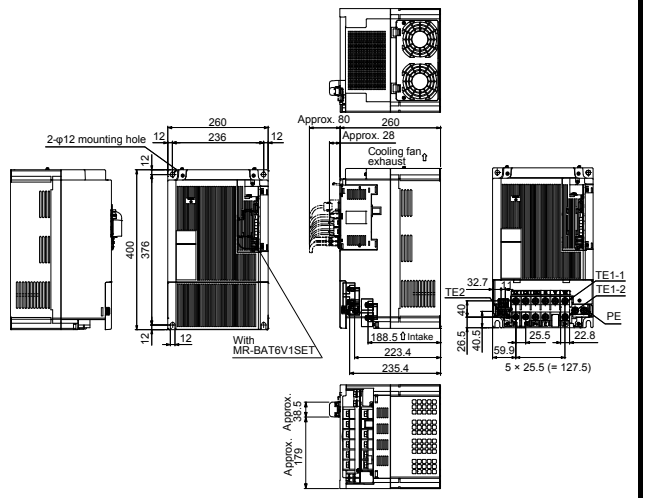
MR-J3-11K_4(-LR)/MR-J3-15K_4(-LR)/MR-J3-22K_4



MR-J4-11K_4/MR-J4-15K_4



MR-J4-22K_4



2.1.3 General purpose interface/SSCNET interface 200 V class (30 kW or more)

(1) Comparison of Dimensions

The following table shows comparison of the MR-J3 series and MR-J4 series dimensions.
The two are the same in height, width, mounting screw pitch, and screw size, and therefore compatible in mounting. When the servo amplifier is mounted so that the heat sink is inside the cabinet, the depth vary.

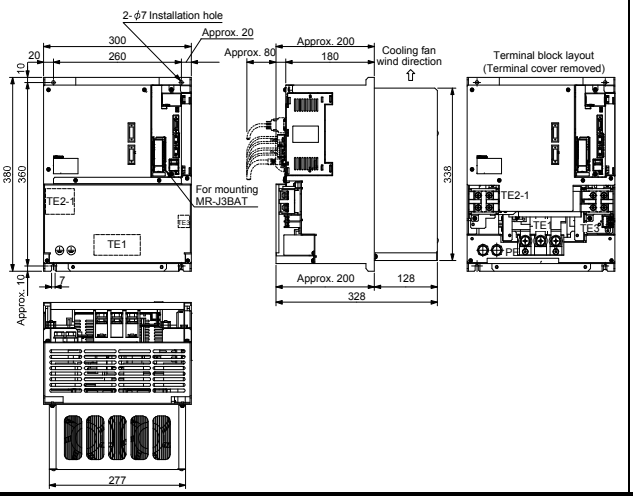
Comparison of dimensions (comparison between the same capacity types) [Unit: mm]

Model MR-J3 series	Model MR-J4 series	Height		Width		Depth		Mounting screw pitch	
		MR-J3	MR-J4	MR-J3	MR-J4	MR-J3	MR-J4	MR-J3	MR-J4
MR-J3-DU30K_	MR-J4-DU30K_	380	380	300	300	200 (328) (Note)	200 **(300)** (Note)	360 (Vertical)/ 260 (Horizontal) (4 screws)	360 (Vertical)/ 260 (Horizontal) (4 screws)
MR-J3-DU37K_	MR-J4-DU37K_								
MR-J3-CR55K	MR-CR55K	380	380	300	300	200 (328) (Note)	200 **(300)** (Note)	360 (Vertical)/ 260 (Horizontal) (4 screws)	360 (Vertical)/ 260 (Horizontal) (4 screws)

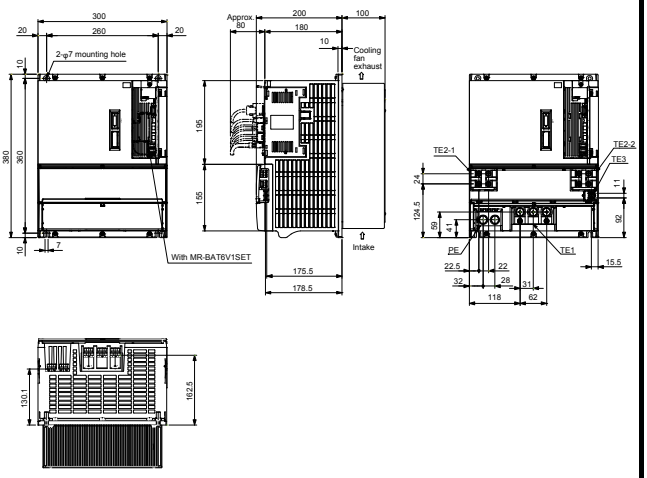
Note. The values in the parentheses are applied to when a heat sink is placed in a cabinet.

(2) Comparison dimensions

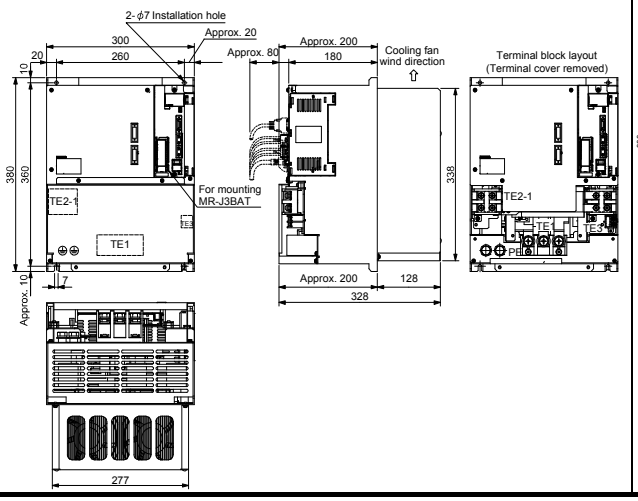
MR-J3-DU30K_



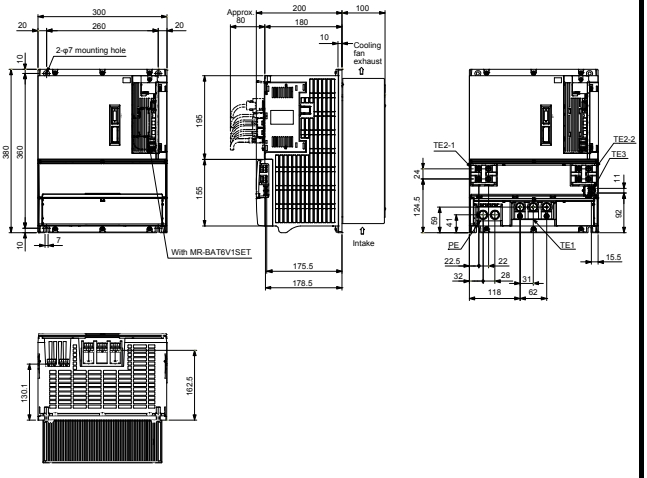
MR-J4-DU30K_

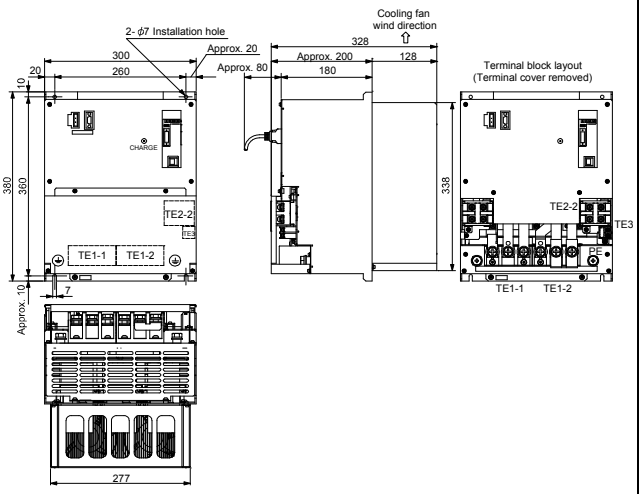
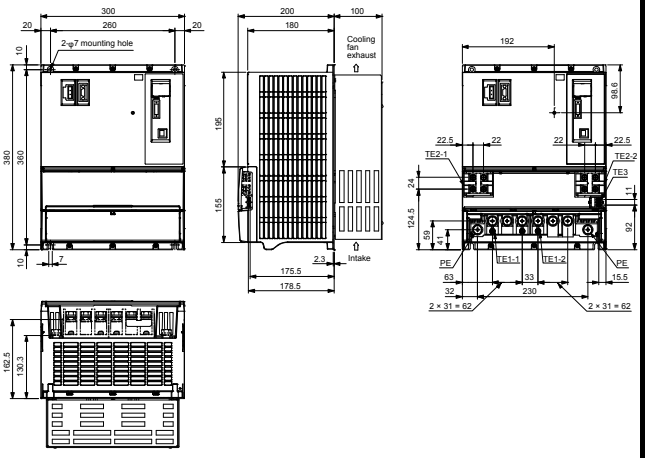


MR-J3-DU37K_



MR-J4-DU37K_



MR-J3-CR55K	MR-CR55K
	

2.1.4 General purpose interface/SSCNET interface 400 V class (30 kW or more)

(1) Comparison of Dimensions

The following table shows comparison of the MR-J3 series and MR-J4 series dimensions.The two are the same in height, width, mounting screw pitch, and screw size, and therefore compatible in mounting. When the servo amplifier is mounted so that the heat sink is inside the cabinet, the depth vary.

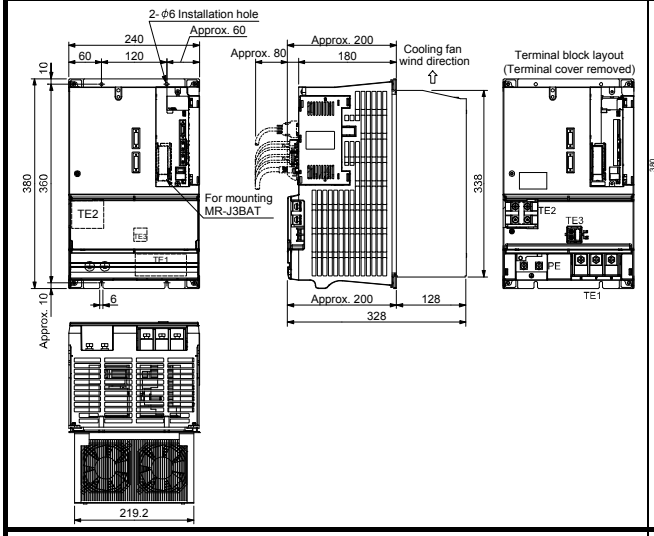
Comparison of dimensions (comparison between the same capacity types) [Unit: mm]

Model MR-J3 series	Model MR-J4 series	Height		Width		Depth		Mounting screw pitch	
		MR-J3	MR-J4	MR-J3	MR-J4	MR-J3	MR-J4	MR-J3	MR-J4
MR-J3-DU30K_4	MR-J4-DU30K_4	380	380	240	240	200 (328) (Note)	200 **(300)** (Note)	360 (Vertical)/ 120 (Horizontal) (4 screws)	360 (Vertical)/ 120 (Horizontal) (4 screws)
MR-J3-DU37K_4	MR-J4-DU37K_4								
MR-J3-DU45K_4	MR-J4-DU45K_4	380	380	300	300	200 (328) (Note)	200 **(300)** (Note)	360 (Vertical)/ 260 (Horizontal) (4 screws)	360 (Vertical)/ 260 (Horizontal) (4 screws)
MR-J3-DU55K_4	MR-J4-DU55K_4								
MR-J3-CR55K4	MR-CR55K4	380	380	300	300	200 (328) (Note)	200 **(300)** (Note)	360 (Vertical)/ 260 (Horizontal) (4 screws)	360 (Vertical)/ 260 (Horizontal) (4 screws)

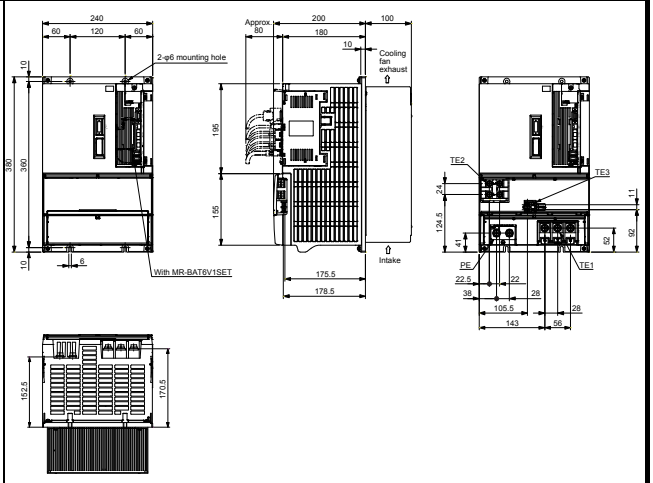
Note. The values in the parentheses are applied to when a heat sink is placed in a cabinet.

(2) Comparison dimensions

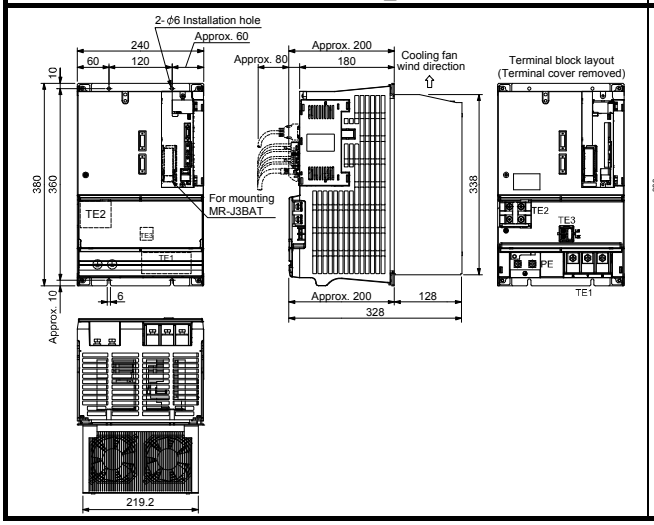
MR-J3-DU30K_4



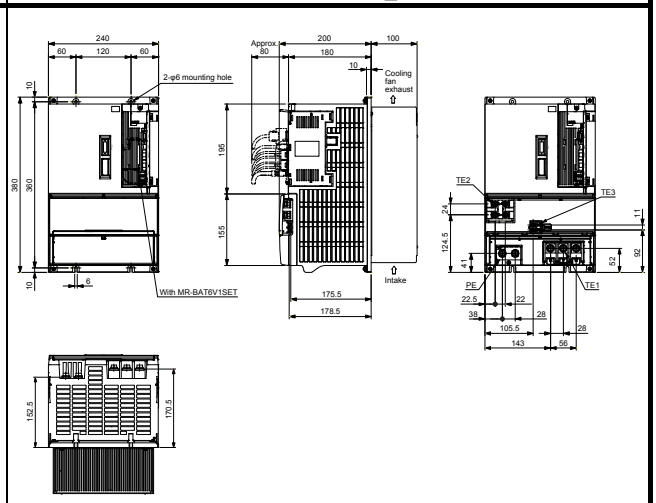
MR-J4-DU30K_4



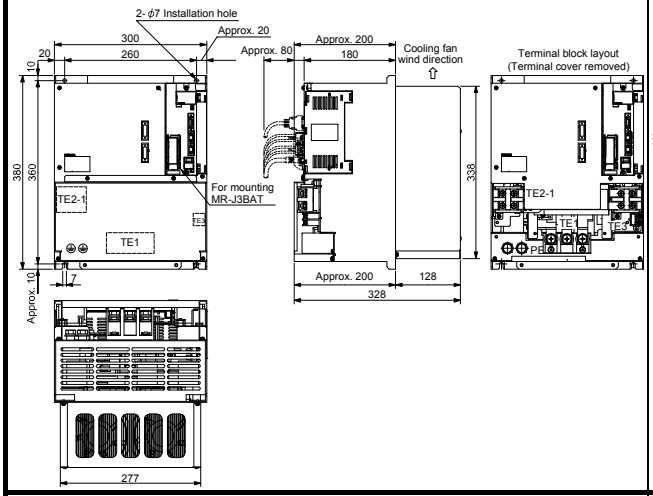
MR-J3-DU37K_4



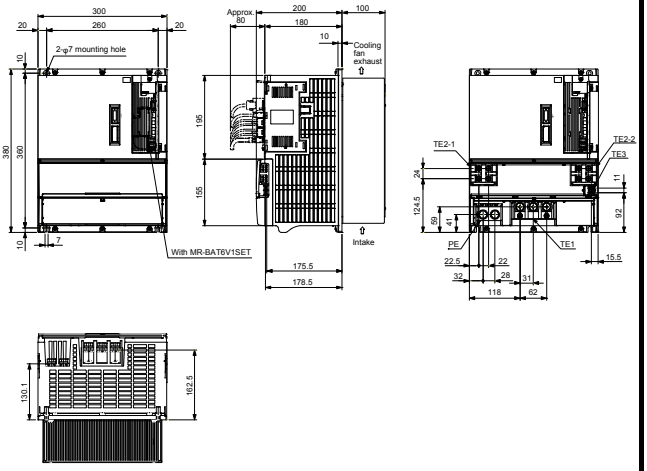
MR-J4-DU37K_4



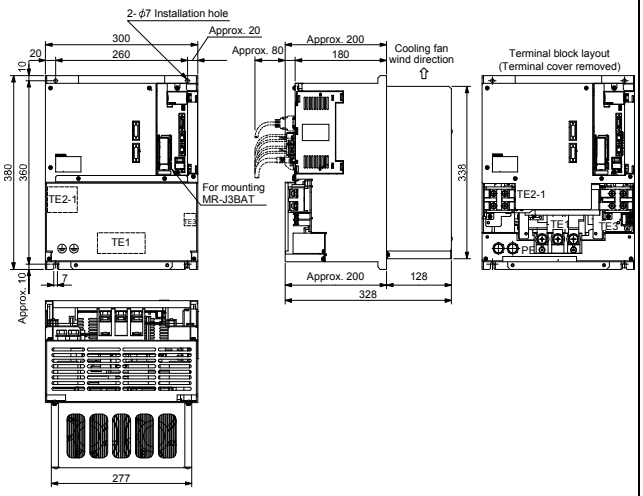
MR-J3-DU45K_4



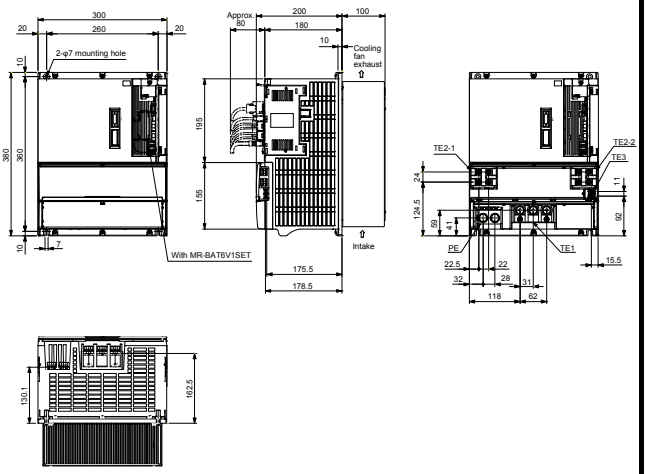
MR-J4-DU45K_4



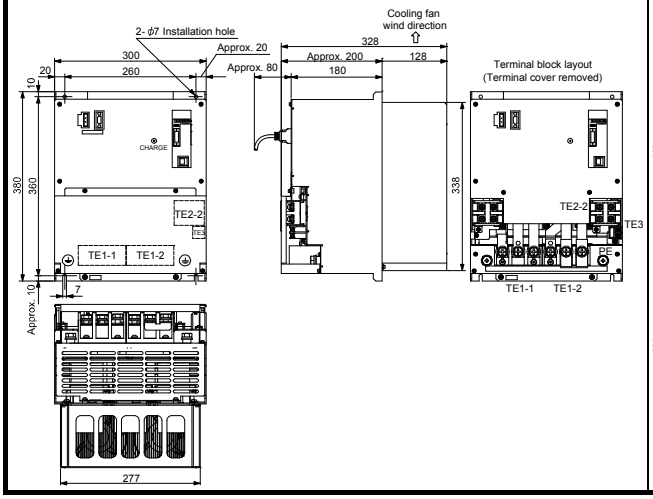
MR-J3-DU55K_4



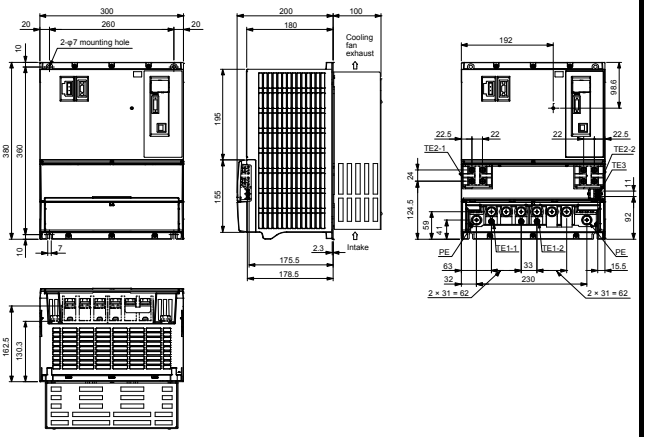
MR-J4-DU55K_4



MR-J3-CR55K4



MR-CR55K4



2.1.5 SSCNET interface (MR-J3W series)

(1) Comparison of Dimensions

The following table shows comparison of the MR-J3 series and MR-J4 series dimensions.Note that the number of the mounting screws for 200W/400W has been changed. The width, the mounting screw pitch in vertical directions, and the number of the mounting screws for 750 W/1 kW have also been changed.

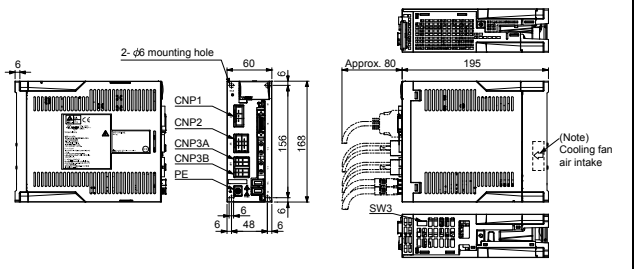
Comparison of dimensions (comparison between the same capacity types) [Unit: mm]

Model MR-J3 series	Model MR-J4 series	Height		Width		Depth		Mounting screw pitch	
		MR-J3	MR-J4	MR-J3	MR-J4	MR-J3	MR-J4	MR-J3	MR-J4
MR-J3W-22B	MR-J4W2-22B	168	168	60	60	195	195	156 (Vertical)/ 48 (Horizontal) (4 screws)	156 (Vertical) **(2 screws)**
MR-J3W-44B	MR-J4W2-44B								
MR-J3W-77B	MR-J4W2-77B	168	168	100	85 (Note)	195	195	156 (Vertical)/ 88 (Horizontal) (4 screws)	156 (Vertical)/ **73 (Horizontal) (3 screws)**
MR-J3W-1010B	MR-J4W2-1010B								
MR-J3W-0303BN6	MR-J4W2-0303B6	168	168	30	30	100	100	156 (Vertical) (2 screws)	156 (Vertical) (2 screws)

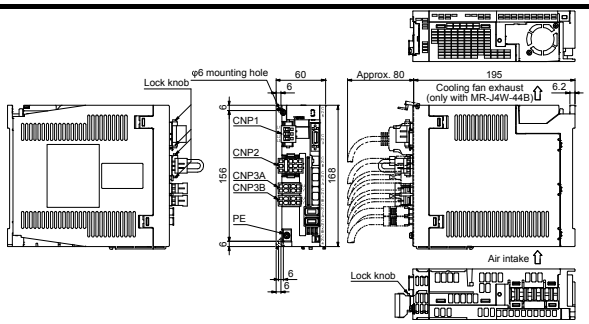
Note Some have been changed in width.

(2) Comparison dimensions

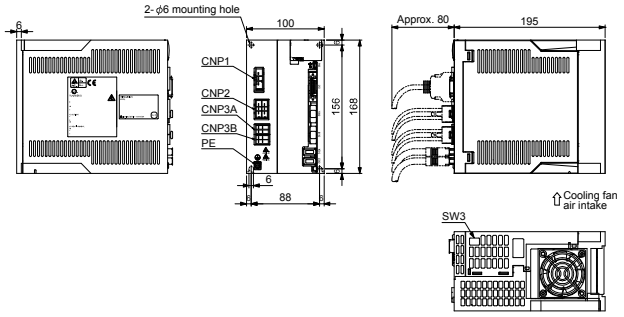
MR-J3W-22B/MR-J3W-44B



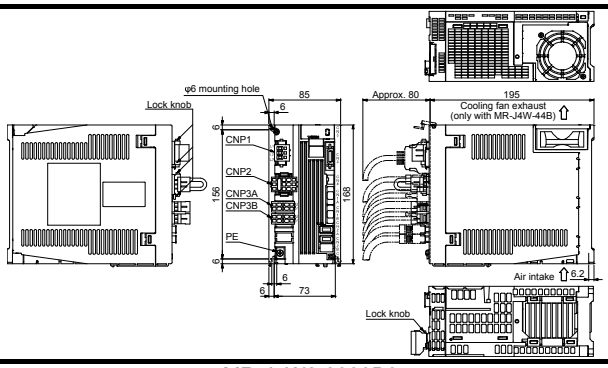
MR-J4W2-22B/MR-J4W2-44B



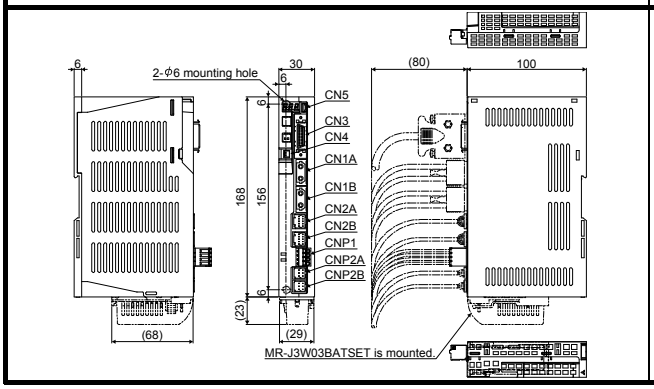
MR-J3W-77B/MR-J3W-1010B



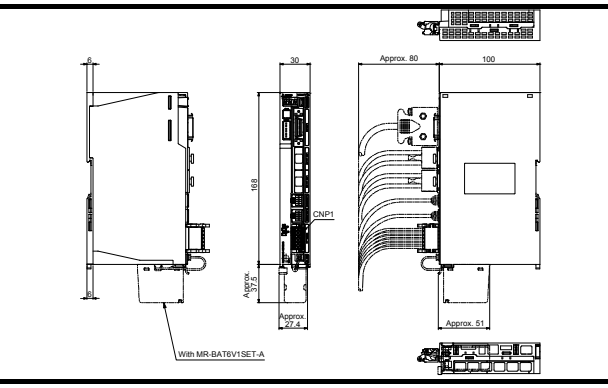
MR-J4W2-77B/MR-J4W2-1010B



MR-J3W-0303BN6



MR-J4W2-0303B6

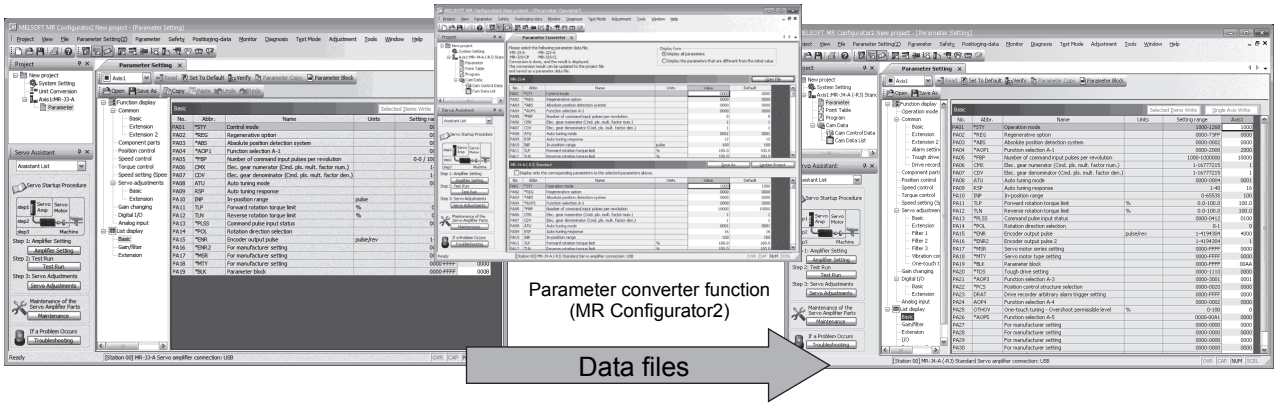


2.2 Parameter conversion

2.2.1 Operation procedure of parameter conversion

The parameter converter function of MR Configurator2 allows the servo parameters of MR-J3-_A_ to be changed to the servo parameters of MR-J4-_A_. (version 1.12N or later)

POINT
●Parameters common to MR-J3-_A_ and MR-J4-_A_ are the conversion targets. The initial value of MR-J4-_A_ is set for additional parameters of MR-J4-_A_.



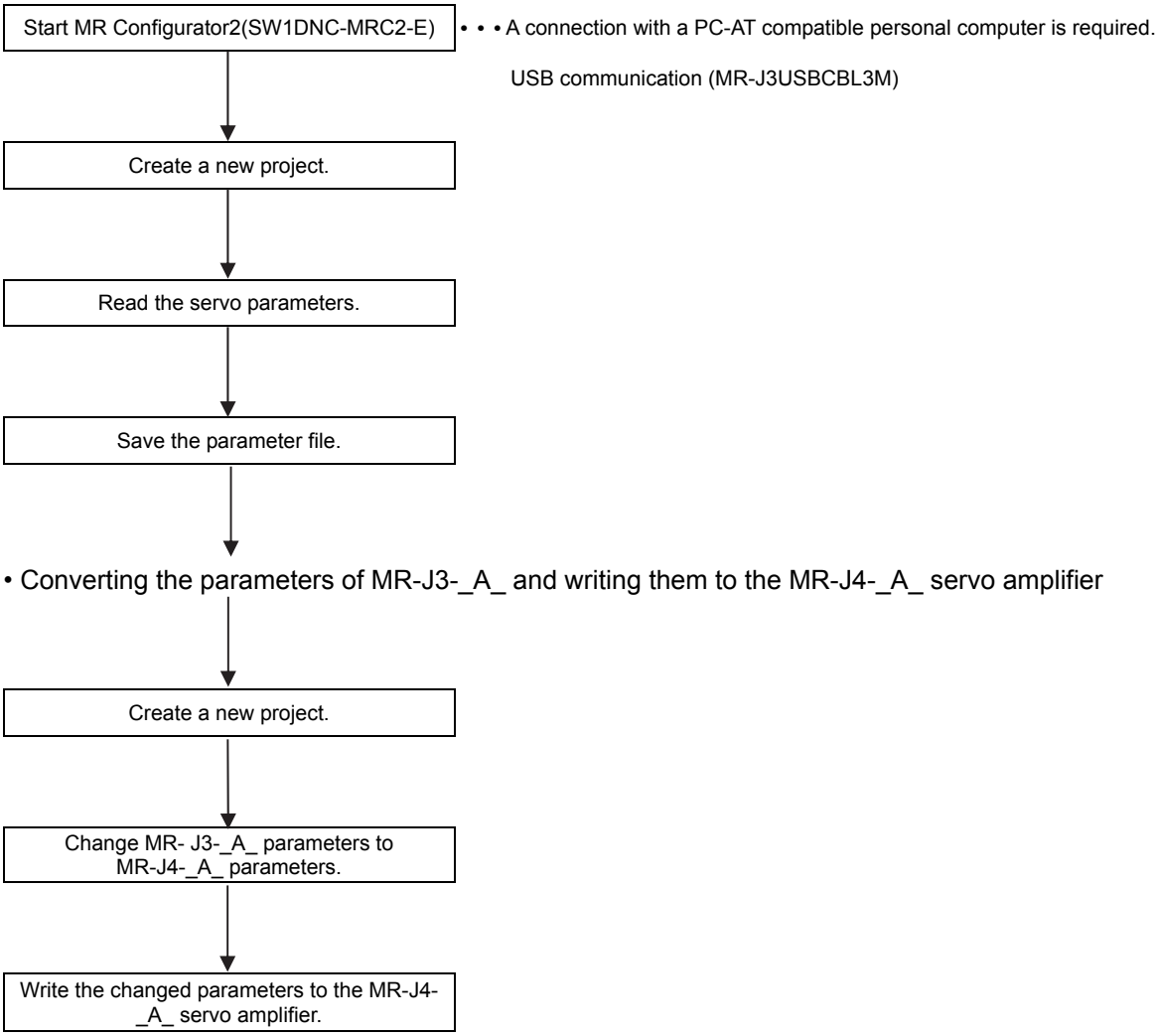
MR Configurator2 MR Configurator2

Change MR-J3-_A_ to MR-J4-_A_

2.2.2 MR-J3-_A_ parameter diversion procedure

POINT
●Parameter conversion: Set the parameter block within the readable range to read changes from the initial value.

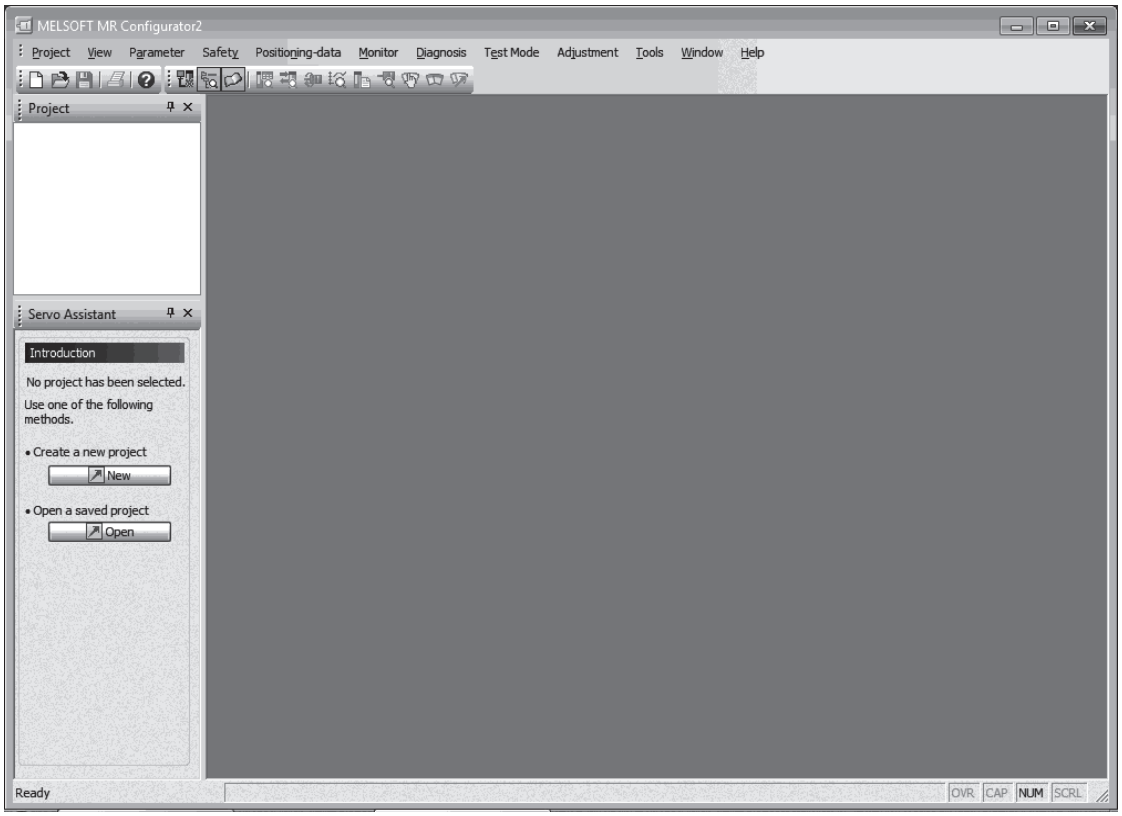
• Parameter reading from the servo amplifier MR- J3-_A_



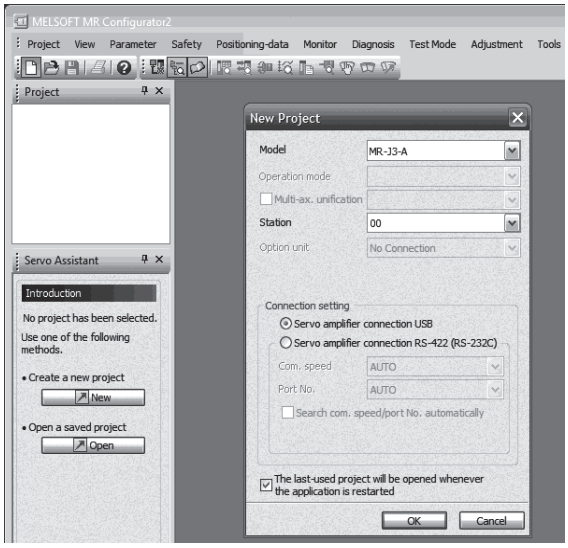
• Converting the parameters of MR-J3-_A_ and writing them to the MR-J4-_A_ servo amplifier

2.2.3 Parameter reading from the servo amplifier MR- J3-_A_

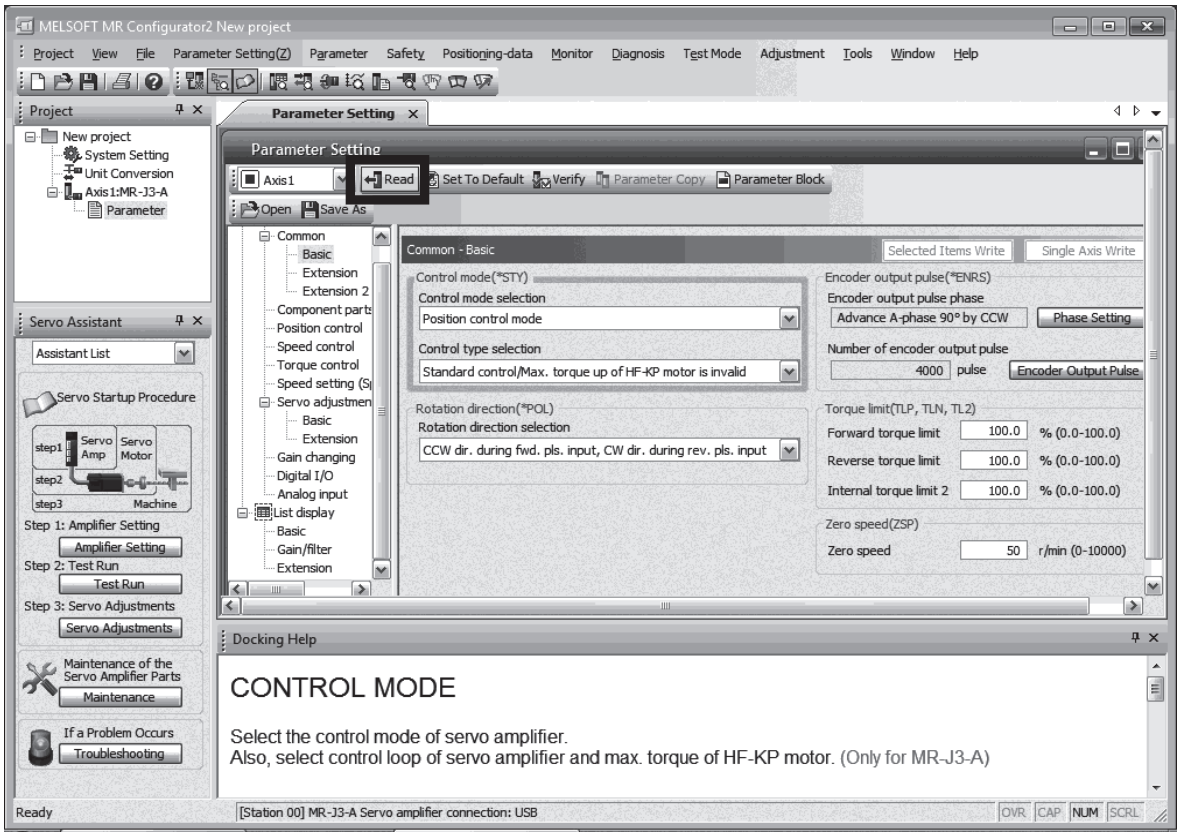
(1) Start MR Configurator2 (SW1DNC-MRC2-E).
For MR Configurator2 (SW1DNC-MRC2-E) of version 1.09K or later, the "MR-J4-A(-RJ) standard" project is created at the first startup after installation.



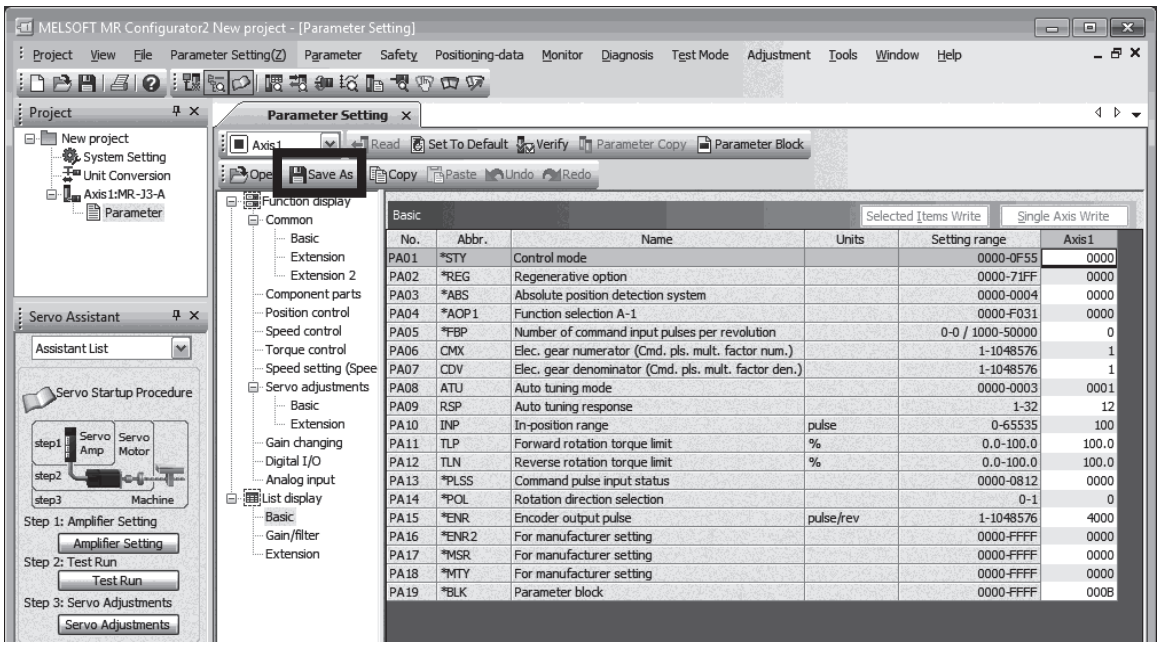
(2) Create a new project.
Select [Project] - [New] from the menu to display the New Project dialog box. Select "MR-J3-A" for Model.
The setting of "Station" must be the same as that of the servo amplifier. Set the same value as that of the parameter: [Pr. PC20].



(3) Read the servo parameters.
Click [Parameters] in the menu to display the parameter list screen.
Connect the MR- J3-_A_ amplifier to a personal computer and click the [Read] button.

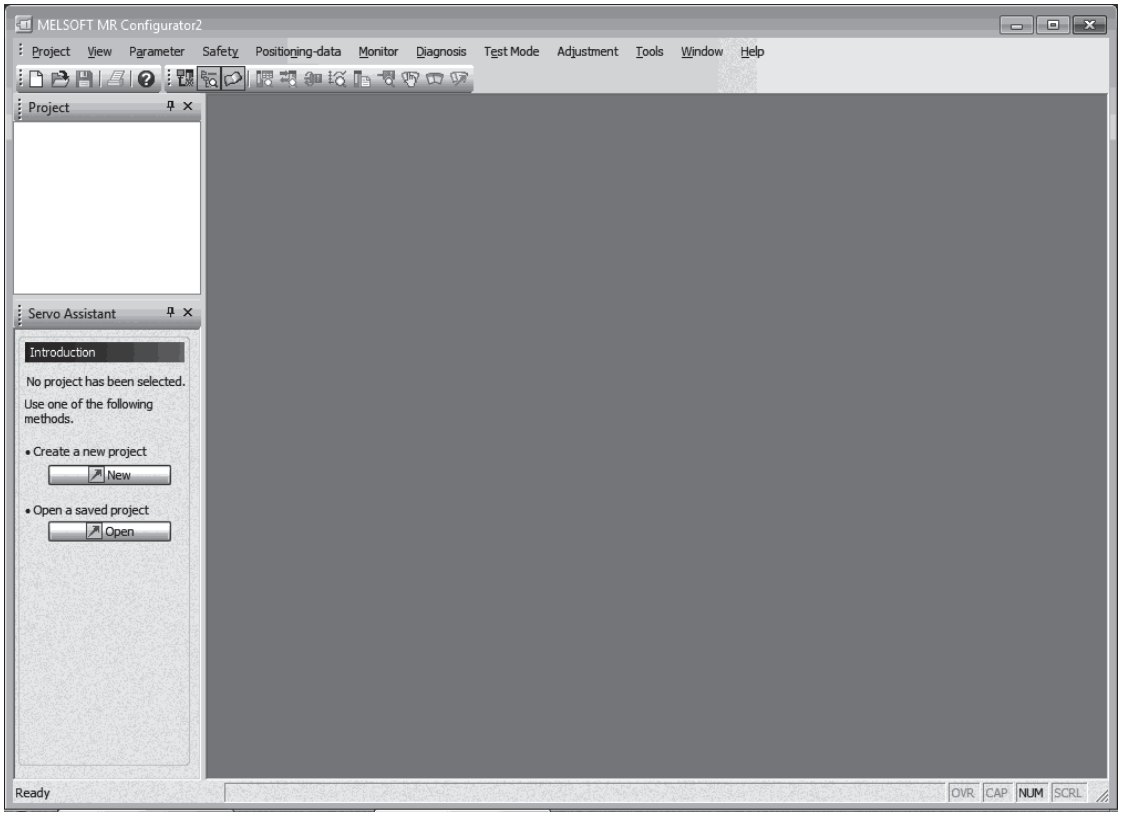


After reading the parameters is completed, select [Save As] to save the parameter file.

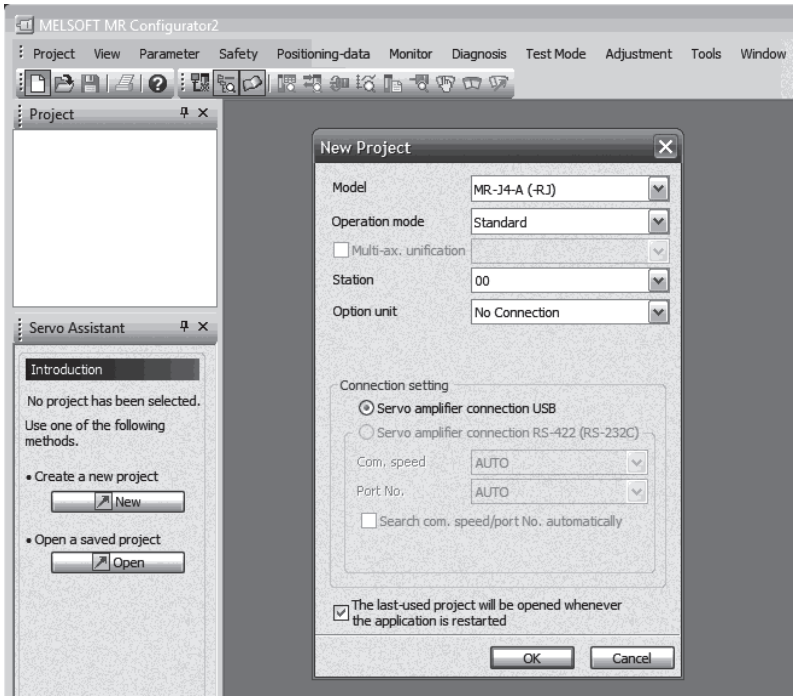


2.2.4 Converting the parameters of MR-J3-_A_ and writing them to the MR-J4-_A_ servo amplifier

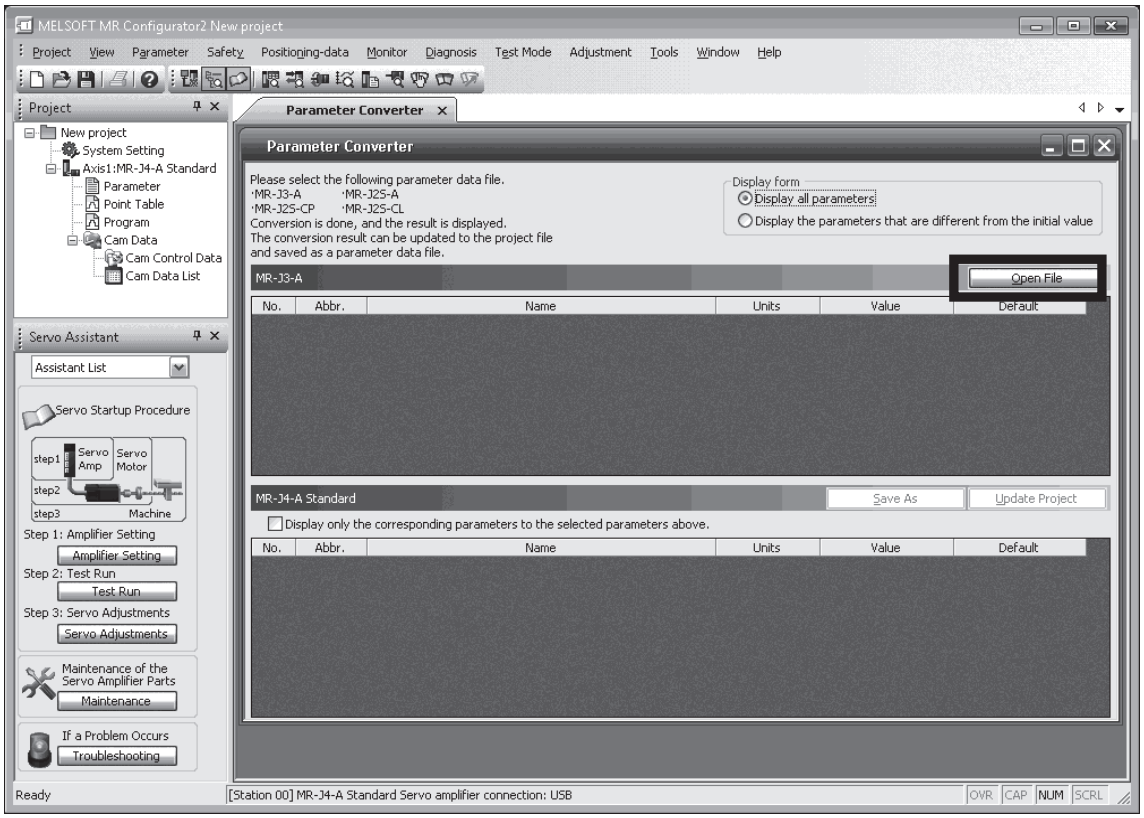
(1) Start MR Configurator2 (SW1DNC-MRC2-E).



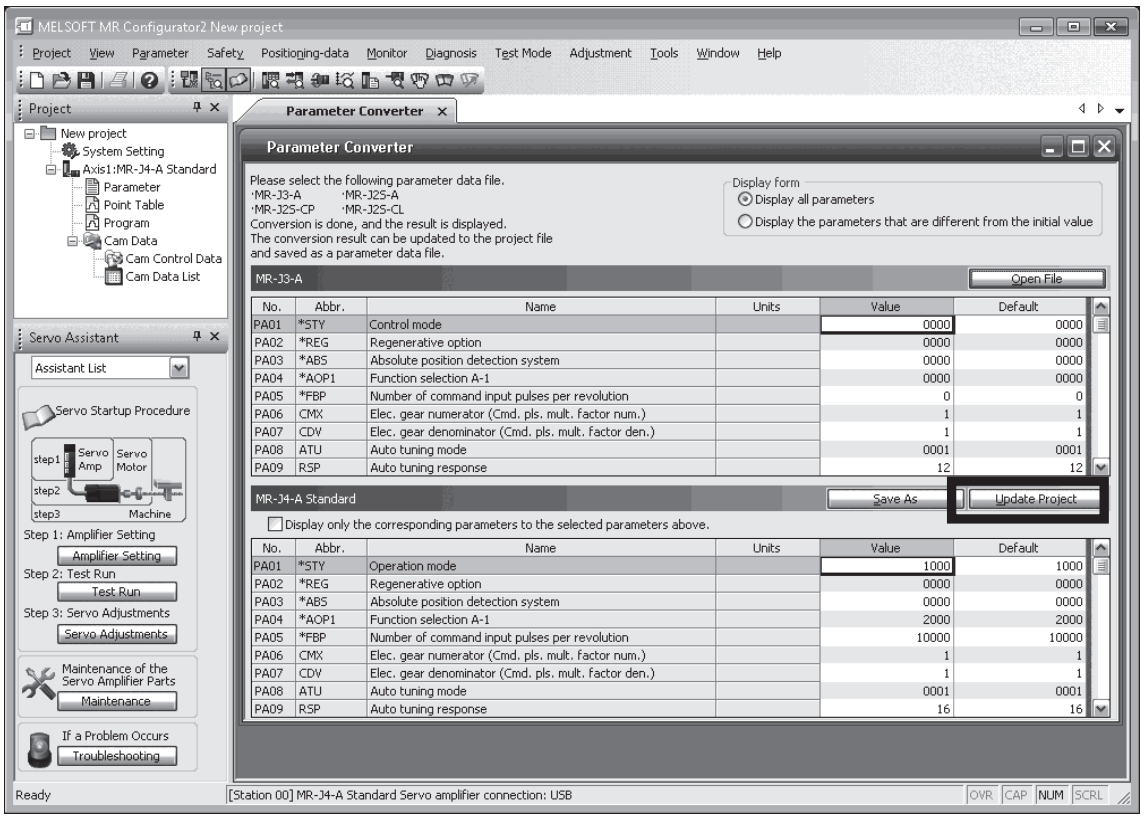
(2) Create a new project.
Select [Project] - [New] from the menu to display the New Project dialog box. Select "MR-J4-A" for Model.



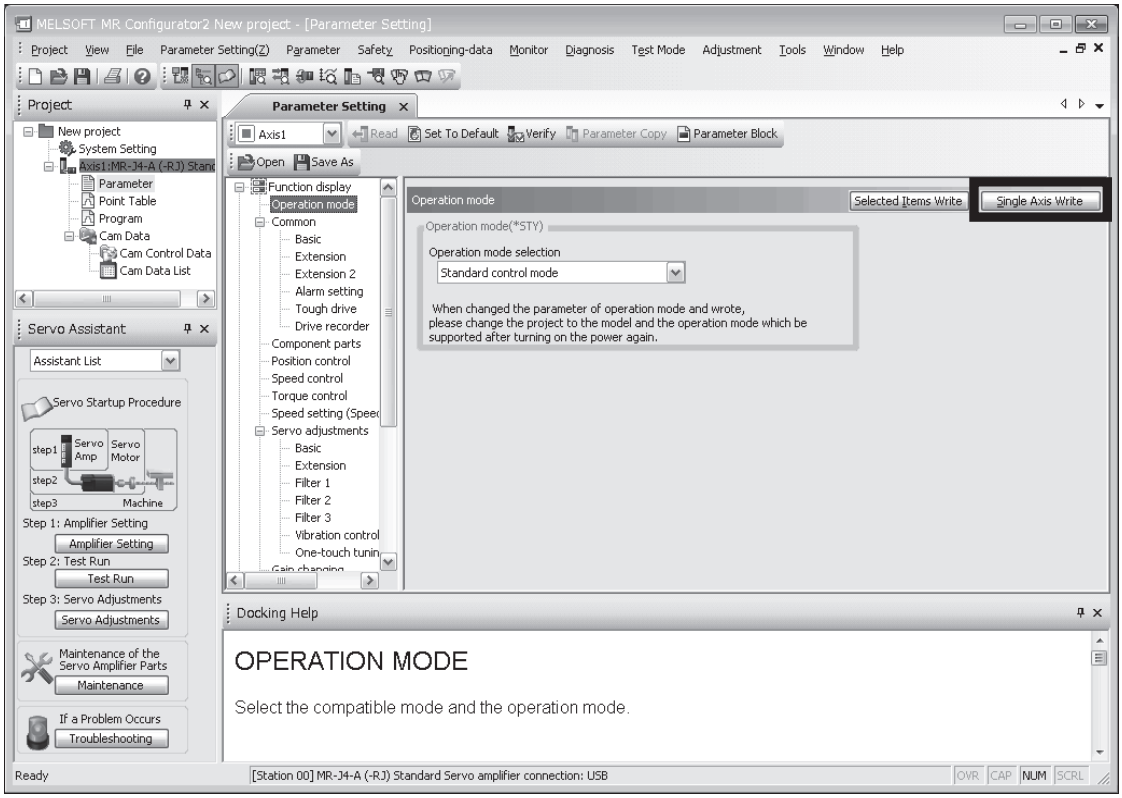
(3) Change MR-J3-_A_ parameters to MR-J4-_A_ parameters.
Select [Parameter] - [Parameter Converter] from the menu to display the parameter converter screen.
Then click the [Open file] button and specify the user file that was saved with the operation in (3) of Section 2.2.3.



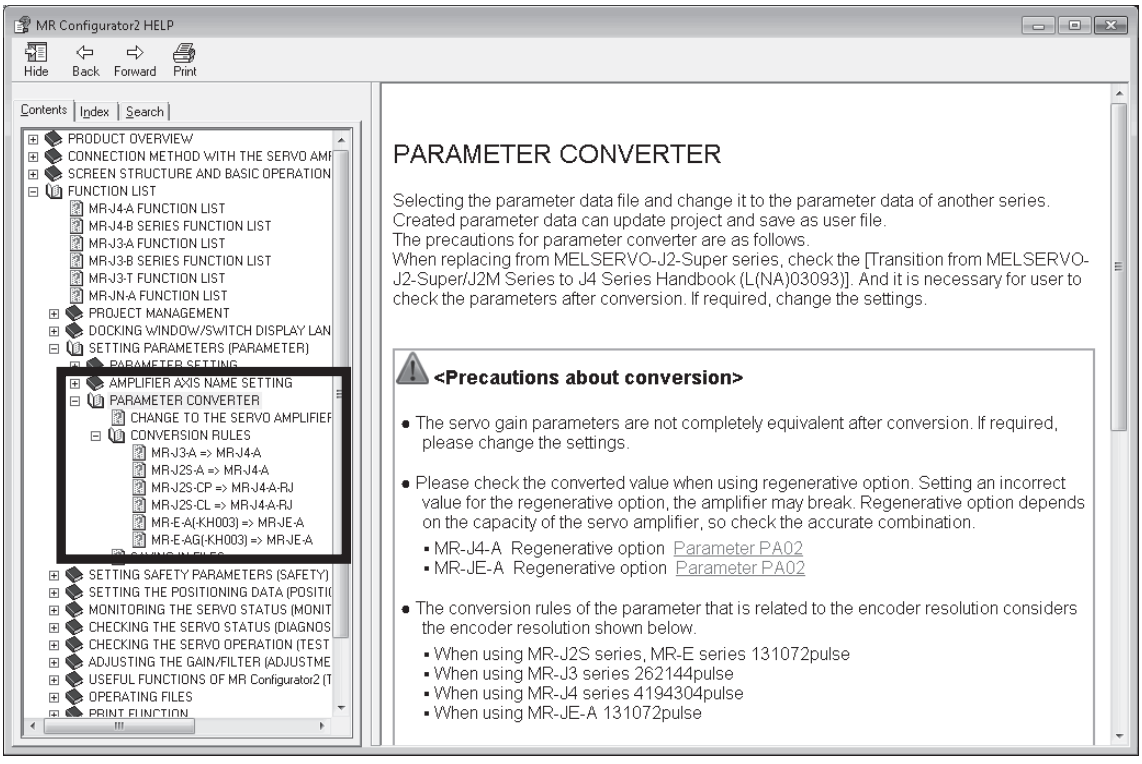
Click [Update Project].



(4) Write the changed parameters to the MR-J4-_A_servo amplifier.
Select [Parameter] - [Parameter Setting] from the menu to display the parameter setting screen.
Connect the MR-J4-_A_servo amplifier to a personal computer and click the [Single Axis Write] button.
The parameter values will be written to the MR-J4-_A_servo amplifier.



Note: The servo gain is not perfectly equal.
Refer to the MR Configurator2 (SW1DNC-MRC2-E) help for details.



2.2.5 Conversion rules (MR-J3-_A_ => MR-J4-_A_)

The following table shows the servo parameter conversion rules from MR-J3-_A_ to MR-J4- _B_.
Servo parameters not specified in the following table will be set to the initial values.

POINT

- Because the servo parameters of MR-J3-_A _ and those of MR-J4-_A_ are not completely interchangeable, the conversion rules may not be applied. Check the operations and review the settings as necessary.
- The value of the parameter writing after parameter conversion is the initial value.
  - MR-J4-_A_: [Pr. PA19] = "00AAh"
- Various offset parameters cannot be converted. Change the settings as necessary.
  - MR-J4-_A_: [Pr. PC37] to [Pr. PC40]
- The following parameters of MR-J4-_A_ are compatible with the servo amplifier's software version A3 or later. The software version can be checked in the system configuration.
  - MR-J4-_A_: [Pr. PA03 Absolute position detection system "_ _ _2h" (Absolute position detection system by communication)]
  - MR-J4-_A_: [Pr. PC21 RS-422 communication function selection]
- When the geared servo motor is replaced, the reduction ratio may differ before and after the replacement. Check the specifications of the servo motor and review the electronic gear settings as necessary.
  - MR-J4-_A_: [Pr. PA05] to [Pr. PA07]

MR-J3-_A_				MR-J4-_A_			Conversion rule
No.	Name	Type	Target	No.	Type	Target	
PA01	Control mode	Hex	_ _ _ X	PA01	Hex	_ _ _ X	The setting value will be maintained.
PA02	regenerative option	Hex	_ _ XX	PA02	Hex	_ _ XX	The setting value will be maintained.
PA03	Absolute position detection system	Hex	_ _ _ X	PA03	Hex	_ _ _ X	01_ _ will be changed to _ _ 01. 02_ _ will be changed to _ _ 02. Otherwise, _ _ 00 will be set.
PA04	Function selection A-1	Hex	_ _ _ X	PD24	Hex	_ _ XX	01_ _ will be changed to _ _ 05. (MBR) The setting value other than above will not be maintained.
PA05	Number of command input pulses per revolution	Dec	-	PA05	Dec	-	0 will be changed to 10000. Otherwise, the setting value will be maintained.
				PA21	Hex	X_ _ _	0 will be changed to 2_ _ _. Otherwise, 1_ _ _ will be set.
PA06	Electronic gear numerator (Command pulse multiplying factor numerator)	Dec	-	PA06	Dec	-	The setting value will be maintained.
PA07	Electronic gear denominator (Command pulse multiplying factor denominator)	Dec	-	PA07	Dec	-	The setting value will be maintained.
PA08	Auto tuning mode	Hex	_ _ _ X	PA08	Hex	_ _ _ X	The setting value will be maintained.
PA09	Auto tuning response	Dec	-	PA09	Dec	-	The value 4 is added to the setting value.
PA10	In-position range	Dec	-	PA10	Dec	-	The setting value will be maintained.
PA11	Forward rotation torque limit	Dec	-	PA11	Dec	-	The setting value will be maintained.
PA12	Reverse rotation torque limit	Dec	-	PA12	Dec	-	The setting value will be maintained.
PA13	Command pulse input form	Hex	_ _ XX	PA13	Hex	_ _ XX	The setting value will be maintained.
PA14	Rotation direction selection	Dec	-	PA14	Dec	-	The setting value will be maintained.

Hex: hexadecimal parameter; Dec: decimal parameter

MR-J3-_A_				MR-J4-_A_			Conversion rule
No.	Name	Type	Target	No.	Type	Target	
PA15	Encoder output pulse	Dec	-	PA15	Dec	-	(1) When the setting value of PC19 is _ _ 1 _, the value increases by 16 times. (2) When the setting value of PC19 is other than _ _ 1 _, the setting value will be maintained.
PB01	Adaptive tuning mode (Adaptive filter II)	Hex	_ _ _ X	PB01	Hex	_ _ _ X	The setting value will be maintained.
PB02	Vibration suppression control tuning mode (Advanced vibration suppression control)	Hex	_ _ _ X	PB02	Hex	_ _ _ X	The setting value will be maintained.
PB03	Position command acceleration/deceleration time constant (Position smoothing)	Dec	-	PB03	Dec	-	The setting value will be maintained.
PB04	Feed forward gain	Dec	-	PB04	Dec	-	The setting value will be maintained.
PB06	Ratio of load inertia moment to servo motor inertia moment	Dec	-	PB06	Dec	-	One decimal place will be added.
PB07	Model loop gain	Dec	-	PB07	Dec	-	One decimal place will be added.
PB08	Position loop gain	Dec	-	PB08	Dec	-	One decimal place will be added.
PB09	Speed loop gain	Dec	-	PB09	Dec	-	The setting value will be maintained.
PB10	Speed integral compensation	Dec	-	PB10	Dec	-	The setting value will be maintained.
PB11	Speed differential compensation	Dec	-	PB11	Dec	-	The setting value will be maintained.
PB13	Machine resonance suppression filter 1	Dec	-	PB13	Dec	-	The setting value will be maintained.
PB14	Notch shape selection 1	Hex	_ XX_	PB14	Hex	_ XX_	The setting value will be maintained.
PB15	Machine resonance suppression filter 2	Dec	-	PB15	Dec	-	The setting value will be maintained.
PB16	Notch shape selection 2	Hex	_ XXX	PB16	Hex	_ XXX	The setting value will be maintained.
PB17	Automatic setting parameter	Hex	_ _ XX	PB17	Hex	_ _ XX	_ _ 01 will be changed to _ _ 00. Otherwise, the setting value will be maintained.
			_ X_ _			_ X_ _	The setting value will be maintained.
PB18	Low-pass filter setting	Dec	-	PB18	Dec	-	The setting value will be maintained.
PB19	Vibration suppression control vibration frequency setting	Dec	-	PB19	Dec	-	The setting value will be maintained.
PB20	Vibration suppression control resonance frequency setting	Dec	-	PB20	Dec	-	The setting value will be maintained.
PB23	Low-pass filter selection	Hex	_ _ X_	PB23	Hex	_ _ X_	The setting value will be maintained.
PB24	Slight vibration suppression control selection	Hex	_ _ _ X	PB24	Hex	_ _ _ X	The setting value will be maintained.
PB25	Function selection B-1	Hex	_ _ X_	PB25	Hex	_ _ X_	The setting value will be maintained.
PB26	Gain changing selection	Hex	_ _ XX	PB26	Hex	_ _ XX	The setting value will be maintained.
PB27	Gain changing condition	Dec	-	PB27	Dec	-	The setting value will be maintained.
PB28	Gain changing time constant	Dec	-	PB28	Dec	-	The setting value will be maintained.
PB29	Gain changing ratio of load inertia moment to servo motor inertia moment	Dec	-	PB29	Dec	-	One decimal place will be added.
PB30	Gain changing position loop gain	Dec	-	PB30	Dec	-	One decimal place will be added.
PB31	Gain changing speed loop gain	Dec	-	PB31	Dec	-	The setting value will be maintained.
PB32	Gain changing speed integral compensation	Dec	-	PB32	Dec	-	The setting value will be maintained.
PB33	Gain changing vibration suppression control vibration frequency setting	Dec	-	PB33	Dec	-	The setting value will be maintained.
PB34	Gain changing vibration suppression control resonance frequency setting	Dec	-	PB34	Dec	-	The setting value will be maintained.
PC01	Acceleration time constant	Dec	-	PC01	Dec	-	The setting value will be maintained.

Hex: hexadecimal parameter; Dec: decimal parameter

MR-J3-_A_				MR-J4-_A_			Conversion rule
No.	Name	Type	Target	No.	Type	Target	
PC02	Deceleration time constant	Dec	-	PC02	Dec	-	The setting value will be maintained.
PC03	S-pattern acceleration/deceleration time constant	Dec	-	PC03	Dec	-	The setting value will be maintained.
PC04	Torque command time constant	Dec	-	PC04	Dec	-	The setting value will be maintained.
PC05	Internal speed command 1 Internal speed limit 1	Dec	-	PC05	Dec	-	The setting value will be maintained.
PC06	Internal speed command 2 Internal speed limit 2	Dec	-	PC06	Dec	-	The setting value will be maintained.
PC07	Internal speed command 3 Internal speed limit 3	Dec	-	PC07	Dec	-	The setting value will be maintained.
PC08	Internal speed command 4 Internal speed limit 4	Dec	-	PC08	Dec	-	The setting value will be maintained.
PC09	Internal speed command 5 Internal speed limit 5	Dec	-	PC09	Dec	-	The setting value will be maintained.
PC10	Internal speed command 6 Internal speed limit 6	Dec	-	PC10	Dec	-	The setting value will be maintained.
PC11	Internal speed command 7 Internal speed limit 7	Dec	-	PC11	Dec	-	The setting value will be maintained.
PC12	Analog speed command maximum speed Analog speed limit maximum speed	Dec	-	PC12	Dec	-	The setting value will be maintained.
PC13	Analog torque command maximum output	Dec	-	PC13	Dec	-	The setting value will be maintained.
PC14	Analog monitor 1 output	Hex	_ _ XX	PC14	Hex	_ _ XX	The setting value will be maintained.
PC15	Analog monitor 2 output	Hex	_ _ XX	PC15	Hex	_ _ XX	The setting value will be maintained.
PC16	Electromagnetic brake sequence output	Dec	-	PC16	Dec	-	The setting value will be maintained.
PC17	Zero speed	Dec	-	PC17	Dec	-	The setting value will be maintained.
PC18	Alarm history clear	Hex	_ _ _ X	PC18	Hex	_ _ _ X	The setting value will be maintained.
PC19	Encoder output pulses selection	Hex	_ _ XX	PC19	Hex	_ _ XX	The setting value will be maintained.
PC20	Station number setting	Dec	-	PC20	Dec	-	The setting value will be maintained.
PC21	Communication function selection	Hex	_ XX_	PC21	Hex	_ XX_	The setting value will be maintained.
PC22	Function selection C-1	Hex	X_ _ _	PC22	Hex	X_ _ _	The setting value will be maintained.
PC23	Function selection C-2	Hex	_ _ _ X	PC23	Hex	_ _ _ X	The setting value will be maintained.
			XX_ _			XX_ _	The setting value will be maintained.
PC24	Function selection C-3	Hex	_ _ _ X	PC24	Hex	_ _ _ X	The setting value will be maintained.
PC26	Function selection C-5	Hex	_ _ _ X	PC26	Hex	_ _ _ X	The setting value will be maintained.
PC27	Function selection C-6	Hex	_ _ _ X	PC27	Hex	_ _ _ X	The setting value will be maintained.
PC30	Acceleration time constant 2	Dec	-	PC30	Dec	-	The setting value will be maintained.
PC31	Deceleration time constant 2	Dec	-	PC31	Dec	-	The setting value will be maintained.
PC32	Command pulse multiplying factor numerator 2	Dec	-	PC32	Dec	-	The setting value will be maintained.
PC33	Command pulse multiplying factor numerator 3	Dec	-	PC33	Dec	-	The setting value will be maintained.
PC34	Command pulse multiplying factor numerator 4	Dec	-	PC34	Dec	-	The setting value will be maintained.
PC35	Internal torque limit 2	Dec	-	PC35	Dec	-	The setting value will be maintained.
PC36	Status display selection	Hex	_ _ XX	PC36	Hex	_ _ XX	_ _1_ will be changed to _ _ 00. Otherwise, the setting value will be maintained.
			_ X_ _			_ X_ _	The setting value will be maintained.

Hex: hexadecimal parameter; Dec: decimal parameter

MR-J3-_A_				MR-J4-_A_			Conversion rule
No.	Name	Type	Target	No.	Type	Target	
PD01	Input signal automatic ON selection 1	Hex	_ XXX	PD01	Hex	_ XXX	The setting value will be maintained.
PD03	Input signal device selection 1 (CN1-15)	Hex	_ _ _ _ XXXX	PD03	Hex	XXXX	The setting value will be maintained.
			_ _ XX_ _ _ _	PD04	Hex	_ _ XX	The setting value will be maintained.
PD04	Input signal device selection 2 (CN1-16)	Hex	_ _ _ _ XXXX	PD05	Hex	XXXX	The setting value will be maintained.
			_ _ XX_ _ _ _	PD06	Hex	_ _ XX	The setting value will be maintained.
PD05	Input signal device selection 3 (CN1-17)	Hex	_ _ _ _ XXXX	PD07	Hex	XXXX	The setting value will be maintained.
			_ _ XX_ _ _ _	PD08	Hex	_ _ XX	The setting value will be maintained.
PD06	Input signal device selection 4 (CN1-18)	Hex	_ _ _ _ XXXX	PD09	Hex	XXXX	The setting value will be maintained.
			_ _ XX_ _ _ _	PD10	Hex	_ _ XX	The setting value will be maintained.
PD07	Input signal device selection 5 (CN1-19)	Hex	_ _ _ _ XXXX	PD11	Hex	XXXX	The setting value will be maintained.
			_ _ XX_ _ _ _	PD12	Hex	_ _ XX	The setting value will be maintained.
PD08	Input signal device selection 6 (CN1-41)	Hex	_ _ _ _ XXXX	PD13	Hex	XXXX	The setting value will be maintained.
			_ _ XX_ _ _ _	PD14	Hex	_ _ XX	The setting value will be maintained.
PD10	Input signal device selection 8 (CN1-43)	Hex	_ _ _ _ XXXX	PD17	Hex	XXXX	The setting value will be maintained.
			_ _ XX_ _ _ _	PD18	Hex	_ _ XX	The setting value will be maintained.
PD11	Input signal device selection 9 (CN1-44)	Hex	_ _ _ _ XXXX	PD19	Hex	XXXX	The setting value will be maintained.
			_ _ XX_ _ _ _	PD20	Hex	_ _ XX	The setting value will be maintained.
PD12	Input signal device selection 10 (CN1-45)	Hex	_ _ _ _ XXXX	PD21	Hex	XXXX	The setting value will be maintained.
			_ _ XX_ _ _ _	PD22	Hex	_ _ XX	The setting value will be maintained.
PD13	Output signal device selection 1 (CN1-22)	Hex	_ _ XX	PD23	Hex	_ _ XX	The setting value will be maintained.
PD14	Output signal device selection 2 (CN1-23)	Hex	_ _ XX	PD24	Hex	_ _ XX	PA04 =_ _ _1 will be changed to _ _ 05. (MBR) Otherwise, the setting value will be maintained.
PD15	Output signal device selection 3 (CN1-24)	Hex	_ _ XX	PD25	Hex	_ _ XX	The setting value will be maintained.
PD16	Output signal device selection 4 (CN1-25)	Hex	_ _ XX	PD26	Hex	_ _ XX	The setting value will be maintained.
PD18	Output signal device selection 6 (CN1-49)	Hex	_ _ XX	PD28	Hex	_ _ XX	The setting value will be maintained.
PD19	Input filter setting	Hex	_ _ _ X	PD29	Hex	_ _ _ X	_ _ _ 1 will be changed to _ _ _ 2. _ _ _ 2 will be changed to _ _ _ 4. _ _ _ 3 will be changed to _ _ _ 4. Otherwise, the setting value will be maintained.
PD20	Function selection D-1	Hex	_ _ XX	PD30	Hex	_ _ XX	The setting value will be maintained.
PD22	Function selection D-3	Hex	_ _ _ X	PD32	Hex	_ _ _ X	The setting value will be maintained.
PD24	Function selection D-5	Hex	_ _ XX	PD34	Hex	_ _ XX	The setting value will be maintained.

Hex: hexadecimal parameter; Dec: decimal parameter

2.2.6 Parameters that need to be checked after parameter conversion

Parameter No.	Name	Initial value	Setting value	Description
PA03	Absolute position detection system	-	-	Absolute position detection system selection When the setting before conversion is "_ _ _2: Enabled (absolute position detection system by communication)", this parameter can be set for MR-J4-_A_ with software version A3 or later. A parameter error will occur when the software version A2 or earlier is used.
PA04	Function selection A-1	2000h	0_ _ _h	Forced stop deceleration function selection To configure the same settings as those for MR-J3-_A_, select "Forced stop deceleration function disabled (EM1)"
PA09	Auto tuning response	-	-	Auto tuning response setting Adjust the gain value again after the replacement.
PC21	RS-422 Absolute position detection system	-	-	• RS-422 communication baud rate selection This parameter can be set when MR-J4-_A_ with software version A3 or later is used for the conversion from MR-J3-_A_. A parameter error will occur when the software version A2 or earlier is used. • RS-422 communication response delay time (supported by software version A3 or later)
PC37	Absolute position detection system/ Analog speed limit offset	-	-	Not converted by the parameter converter function. Set the value as required.
PC38	Analog torque command offset/ Analog torque limit offset	-	-	Set the value as required.
PC39	Analog monitor 1 offset	-	-	Set the value as required.
PC40	Analog monitor 2 offset	-	-	Set the value as required.
PD29	Input signal filter setting	-	-	When the setting before conversion has exceeded 3.55 [ms], the setting will be converted to "4: 3.555 [ms]". When MR-J4-_A_ with the software version B3 or later is used, "6: 5.333 [ms]" can be set.

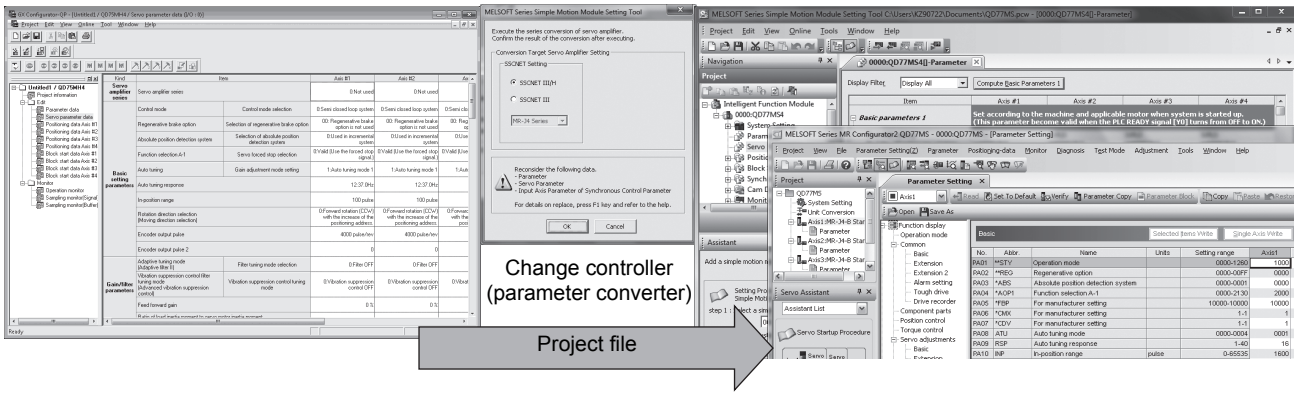
Note. For items that have no setting values listed in the table, refer to "Part 2: Review on Replacement of MR-J3-_A_ with MR-J4-_A_".

2.3 MR-J3-_B_ and MR-J3W-_B Parameter Diversion Procedure

The parameter converter functions of GX Works2 and MT Developer2 convert the servo parameters of MR-J3-_B_ and MR-J3W-_B to those of MR-J4-_B_ MR-J4W2-_B and when the controller is changed.
(GX Works2: 1.84N or later, MT Developer2: 1.41T or later)

POINT
●Parameters common to MR-J3-_B_, MR-J3W-_B, MR-J4-_B_ and MR-J4W2-_B are the conversion targets. The initial value of MR-J4-_B_ and MR-J4W2-_B is set for additional parameters of MR-J4-_B_ and MR-J4W2-_B.

(Target model)
• Positioning module QD75MH to Simple Motion module QD77MS/LD77MS
• Motion controller Q17nHCPU/Q17nDCPU/Q170MCPU to Q17nDSCPU/Q170MSCPU(-S1)



GX Configurator-QP
SW3RNC-GSV
SW6RNC-GSV

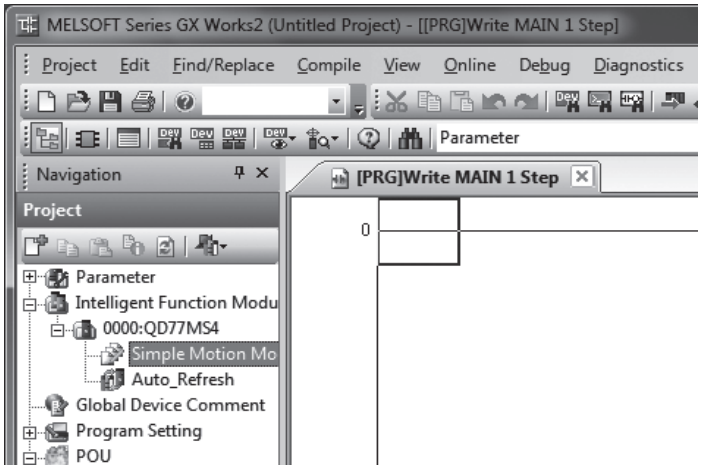
GX Works2 (Simple Motion module setting tool)
MT Developer2

Change MR-J3-_B_/MR-J3W-_B to MR-J4-_B_/MR-J4W2-_B

2.3.1 Changing QD75MH to QD77MS/LD77MS

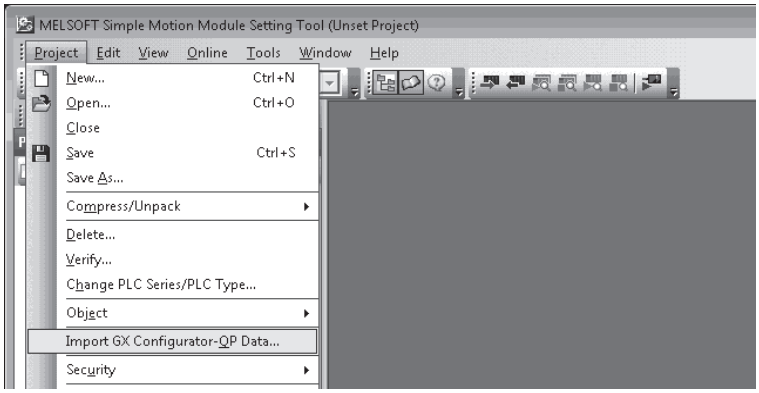
(1) Start GX Works2 and create a project.

(2) Right-click [Intelligent Function Module] in the Navigation window and select [New Module] to add the simple motion module QD77MS/LD77MS.

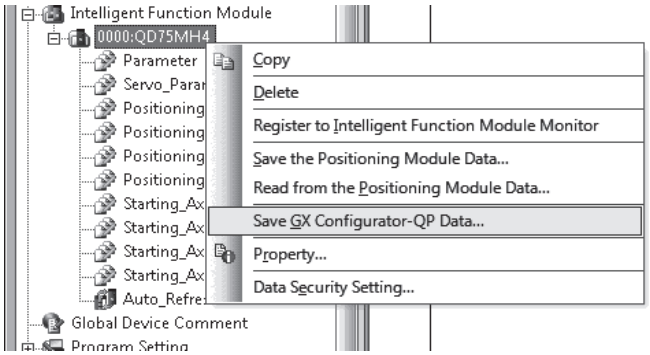


(3) Double-click [Simple Motion Module Setting] of the added simple motion module to start the simple motion module setting tool.

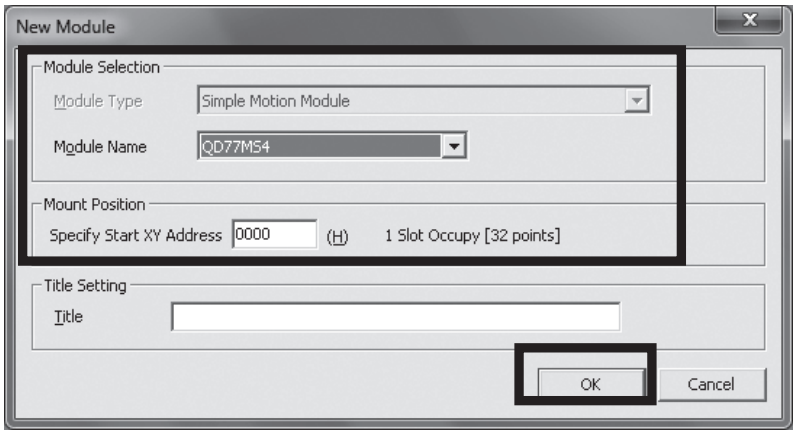
(4) Read the GX Configurator-QP data.
Click [Project] - [Import GX Configurator-QP Data] from the menu to display the screen for reading GX Configurator-QP data. Specify and read QD75MH data.



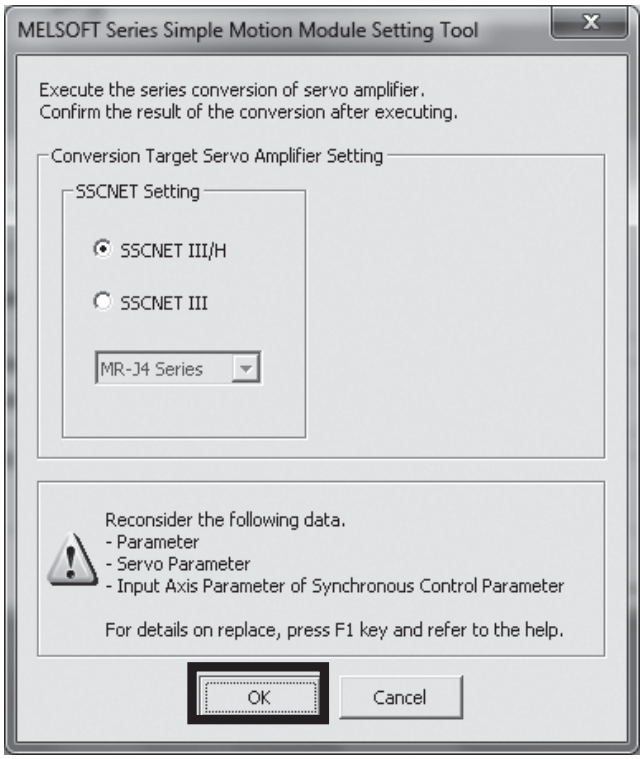
When using QD75MH data made on GX Works2, save the QD75 data as GX Configurator-QP data on GX Works2 and perform the above operation.



(5) Specify the target module.
Specify the model and the head XY address of the target module and then click the [OK] button.

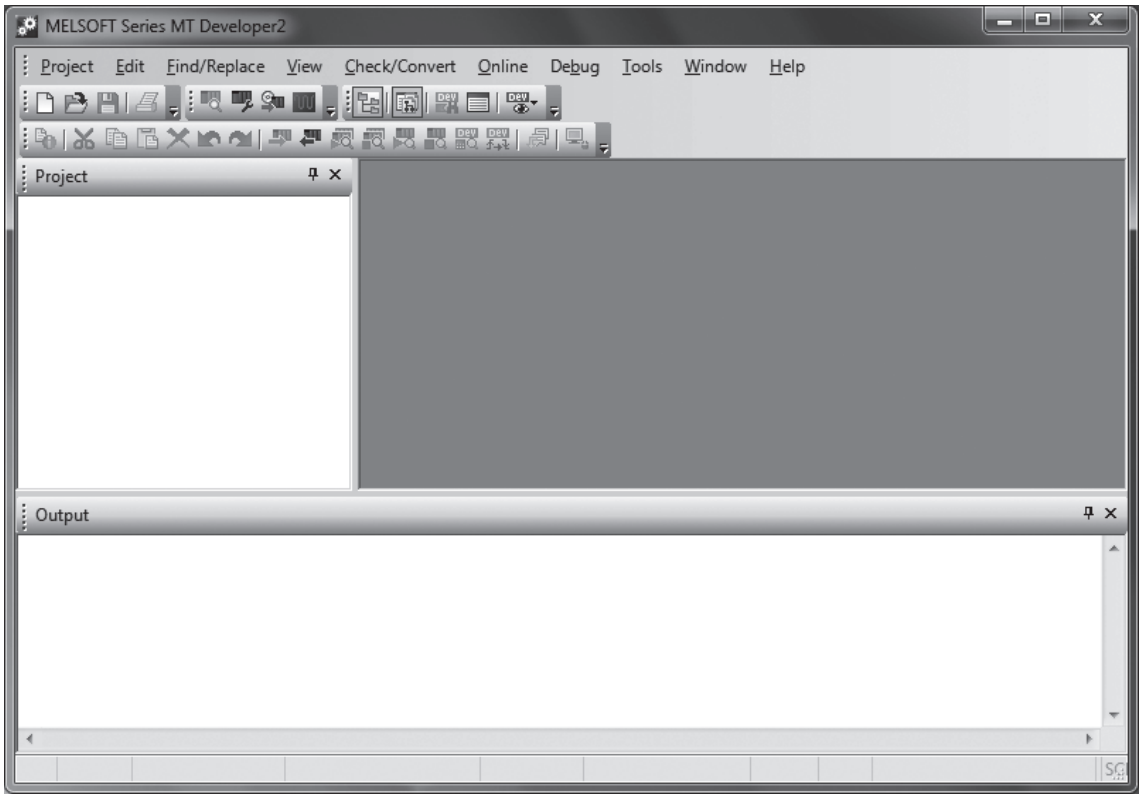


(6) Execute servo parameter conversion.
Select the target servo amplifier setting and click the [OK] button.
The servo parameters are converted as follows depending on the target servo amplifier setting.
When "SSCNET III/H" is selected, MR-J3-_B_ is converted to MR-J4-_B_, MR-J3W-_B_ is converted to MR-J4W2-_B.
When "SSCNET III" is selected: Utilize the MR-J3-_B_ and MR-J3W-_B data without conversion.

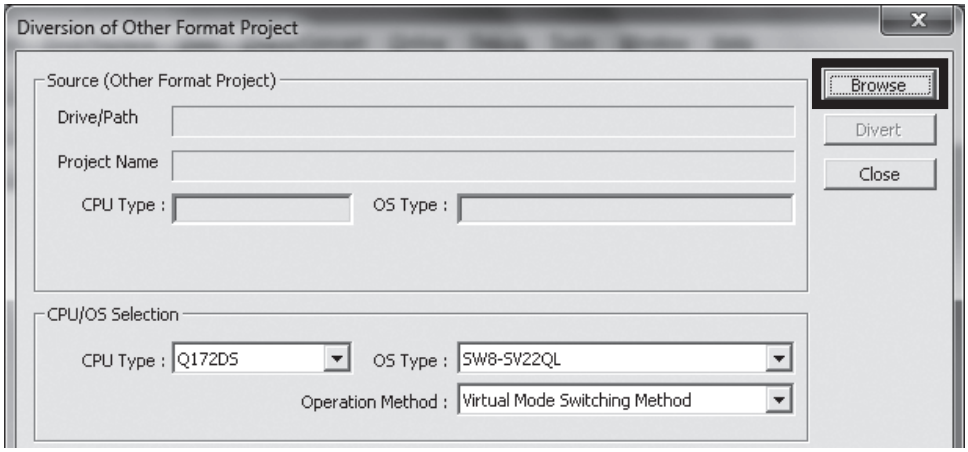


2.3.2 Changing Q17nHCPU/Q17nDCPU/Q170MCPU to Q17nDSCPU/Q170MSCPU(-S1)

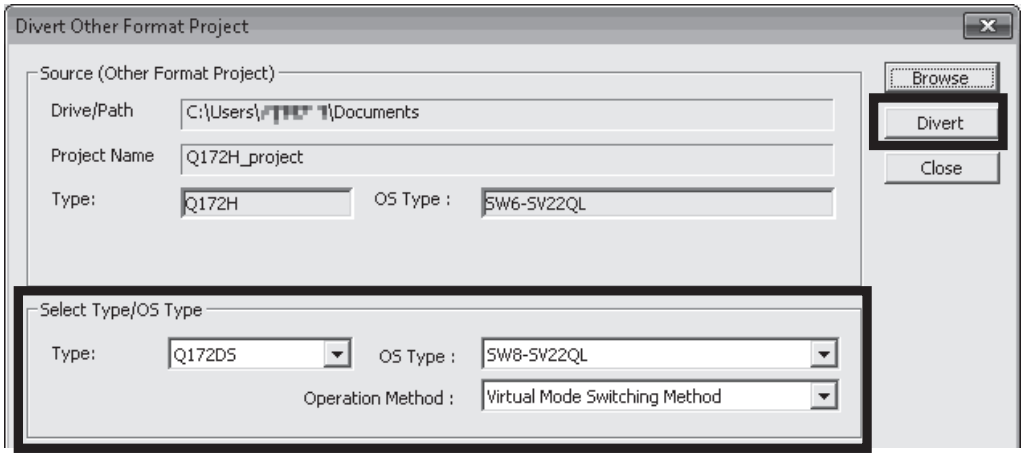
(1) Start MT Developer2.



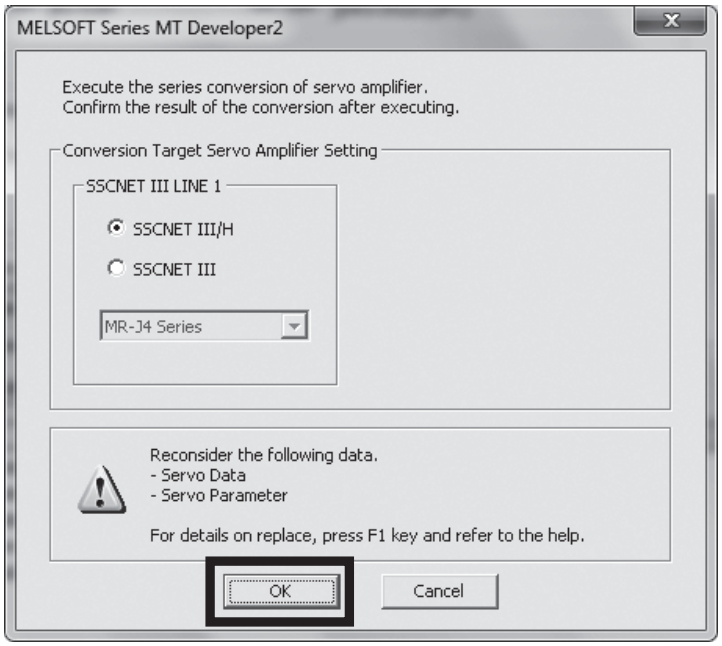
(2) Select the source project.
Click [Project] - [Divert File] - [Diversion of Other Format Project] from the menu to display the Diversion of Other Format Project window. Click the [Browse] button and select a source project.
To divert an MT Developer2 project, click [Project] - [Divert File] - [Utilize MT Developer file format Project] from the menu.



(3) Execute file diversion.
Select the CPU type, OS type, and Operation method in the CPU/OS selection, and click the [Diversion] button.



(4) Execute servo parameter conversion.
Select the target servo amplifier setting and click the [OK] button.
The servo parameters are converted as follows depending on the target servo amplifier setting.
When "SSCNET III / H" is selected, MR-J3-_B_ is converted to MR-J4-_B_, MR-J3W-_B is converted to MR-J4W2-_B
When "SSCNET III" is selected: Utilize the MR-J3-_B_ and MR-J3W-_B data without conversion.



2.3.3 Conversion rules (MR-J3-_B_ and MR-J3W-_B => MR-J4-_B_ and MR-J4W2-_B)

(1) Conversion rules (MR-J3-_B_ (standard) and MR-J3W-_B (standard) => MR-J4-_B_ (standard) and MR-J4W2-_B (standard))

The following table shows the servo parameter conversion rules from MR-J3-_B_ (standard) and MR-J3W-_B (standard) to MR-J4- _B_ (standard) and MR-J4W2-_B (standard).

Servo parameters not specified in the following table will be set to the initial values.

POINT

- Because the servo parameters of MR-J3-_B_/MR-J3W-_B and those of MR-J4-_B_/MR-J4W2-_B are not completely interchangeable, the conversion rules may not be applied. Check the operations and review the settings as necessary.
- The parameter writing inhibit after parameter conversion is the initial value (the following setting value).
  • MR-J4-_B_ and MR-J3W-_B: [Pr. PA19 Parameter writing inhibit] = "00ABh"
- Various offset parameters cannot be converted. Change the settings as necessary.
  • MR-J4-_B_ and MR-J3W-_B: [Pr. PC11]/[Pr. PC12]
- When the geared servo motor is replaced, the reduction ratio may differ before and after the replacement. Check the specifications of the servo motor and review the electronic gear settings as necessary. For the electronic gear settings, refer to the controller instruction manual.
- Some parameters are not supported depending on the software version of the servo amplifier. Refer to section 2.3.4 for details.
- Refer to section 2.3.4 (2) for differences between the servo parameters of MR-J3-_B_ and MR-J3W-_B.

MR-J3-_B_/MR-J3W-_B				MR-J4-_B_/MR-J4W2-_B			Conversion rules
No.	Name	Type	Target	No.	Type	Target	
PA02	Regenerative option	Hex	_ _ XX	PA02	Hex	_ _ XX	The setting value will be maintained.
PA03	Absolute position detection system	Hex	_ _ _ X	PA03	Hex	_ _ _ X	The setting value will be maintained.
PA04	Function selection A-1	Hex	_ X_ _	PA04	Hex	_ X_ _	The setting value will be maintained.
PA08	Auto tuning mode	Hex	_ _ _ X	PA08	Hex	_ _ _ X	The setting value will be maintained.
PA09	Auto tuning response	Dec	-	PA09	Dec	-	The value 4 is added to the setting value.
PA10	In-position range	Dec	-	PA10	Dec	-	The setting value will increase by 16 times when it is 4095 or smaller. The setting value other than the above will be 65535.
PA14	Rotation direction selection	Dec	-	PA14	Dec	-	The setting value will be maintained.
PA15	Encoder output pulses	Dec	-	PA15	Dec	-	When the setting value of PC03 is _ _ 1_, the setting value of PA15 is increased by 16 times. However, when the value is 65535 or larger, the setting value will be 65535. When the setting value of PC03 is other than _ _1_, it will be maintained.
PB01	Adaptive tuning mode (Adaptive filter II)	Hex	_ _ _ X	PB01	Hex	_ _ _ X	The setting value will be maintained.
PB02	Vibration suppression control tuning mode (advanced vibration suppression control)	Hex	_ _ _ X	PB02	Hex	_ _ _ X	The setting value will be maintained.

MR-J3-_B_/MR-J3W-_B				MR-J4-_B_/MR-J4W2-_B			Conversion rules
No.	Name	Type	Target	No.	Type	Target	
PB04	Feed forward gain	Dec	-	PB04	Dec	-	The setting value will be maintained.
PB06	Ratio of load inertia moment to servo motor inertia moment	Dec	-	PB06	Dec	-	One decimal place will be added.
PB07	Model loop gain	Dec	-	PB07	Dec	-	One decimal place will be added.
PB08	Position loop gain	Dec	-	PB08	Dec	-	One decimal place will be added.
PB09	Speed loop gain	Dec	-	PB09	Dec	-	The setting value will be maintained.
PB10	Speed integral compensation	Dec	-	PB10	Dec	-	The setting value will be maintained.
PB11	Speed differential compensation	Dec	-	PB11	Dec	-	The setting value will be maintained.
PB12	Overshoot amount compensation	Dec	-	PB12	Dec	-	The setting value will be maintained.
PB13	Machine resonance suppression filter 1	Dec	-	PB13	Dec	-	The setting value will be maintained.
PB14	Notch shape selection 1	Hex	_ XX_	PB14	Hex	_ XX_	The setting value will be maintained.
PB15	Machine resonance suppression filter 2	Dec	-	PB15	Dec	-	The setting value will be maintained.
PB16	Notch shape selection 2	Hex	_ XXX	PB16	Hex	_ XXX	The setting value will be maintained.
PB17	Automatic setting parameter	Hex	_ _ XX	PB17	Hex	_ _ XX	_ _ 01 will be changed to _ _ 00.
			_ X_ _			_ X_ _	Otherwise, the setting value will be maintained.
PB18	Low-pass filter setting	Dec	-	PB18	Dec	-	The setting value will be maintained.
PB19	Vibration suppression control vibration frequency setting	Dec	-	PB19	Dec	-	The setting value will be maintained.
PB20	Vibration suppression control resonance frequency setting	Dec	-	PB20	Dec	-	The setting value will be maintained.
PB23	Low-pass filter selection	Hex	_ _ X_	PB23	Hex	_ _ X_	The setting value will be maintained.
PB24	Slight vibration suppression control selection	Hex	_ _ XX	PB24	Hex	_ _ XX	The setting value will be maintained.
PB26	Gain changing selection	Hex	_ _ XX	PB26	Hex	_ _ XX	The setting value will be maintained.
PB27	Gain changing condition	Dec	-	PB27	Dec	-	The setting value will be maintained.
PB28	Gain changing time constant	Dec	-	PB28	Dec	-	The setting value will be maintained.
PB29	Gain changing ratio of load inertia moment to servo motor inertia moment	Dec	-	PB29	Dec	-	One decimal place will be added.
PB30	Gain changing position loop gain	Dec	-	PB30	Dec	-	One decimal place will be added.
PB31	Gain changing speed loop gain	Dec	-	PB31	Dec	-	The setting value will be maintained.
PB32	Gain changing speed integral compensation	Dec	-	PB32	Dec	-	The setting value will be maintained.
PB33	Gain changing vibration suppression control vibration frequency setting	Dec	-	PB33	Dec	-	The setting value will be maintained.
PB34	Gain changing vibration suppression control resonance frequency setting	Dec	-	PB34	Dec	-	The setting value will be maintained.
PB45	Vibration suppression control filter 2	Hex	_ XXX	PB45	Hex	_ XXX	The setting value will be maintained.
PC01	Error excessive alarm level	Dec	-	PC01	Dec	-	The setting value will be maintained.
PC02	Electromagnetic brake sequence output	Dec	-	PC02	Dec	-	The setting value will be maintained.
PC03	Encoder output pulses selection	Hex	_ _ XX	PC03	Hex	_ _ XX	The setting value will be maintained.
PC04	Function selection C-1	Hex	X_ _ _	PC04	Hex	X_ _ _	The setting value will be maintained.
PC05	Function selection C-2	Hex	_ _ _ X	PC05	Hex	_ _ _ X	The setting value will be maintained.
PC06	Function selection C-3	Hex	X_ _ _	PC06	Hex	X_ _ _	The setting value will be maintained.
PC07	Zero speed	Dec	-	PC07	Dec	-	The setting value will be maintained.
PC09	Analog monitor 1 output	Hex	_ _ _ X	PC09	Hex	_ _ _ X	The setting value will be maintained.
PC10	Analog monitor 2 output	Hex	_ _ _ X	PC10	Hex	_ _ _ X	The setting value will be maintained.

MR-J3-_B_/MR-J3W-_B				MR-J4-_B_/MR-J4W2-_B			Conversion rules
No.	Name	Type	Target	No.	Type	Target	
PC13	Analog monitor feedback position output standard data Low	Dec	-	PC13	Dec	-	The lower four digits of the calculation result of PC14 × 160000 + PC13 × 16 will be set. However, when the calculation result is -99999999 or smaller, -9999 will be set. When the calculation result is 99999999 or larger, 9999 will be set.
PC14	Analog monitor feedback position output standard data High	Dec	-	PC14	Dec	-	The integral value of the calculation result of (PC14 × 160000 + PC13 × 16) ÷ 10000 will be set. However, when the calculation result is -9999 or smaller, -9999 will be set. When the calculation result is 9999 or larger, 9999 will be set.
PC17	Function selection C-4	Hex	_ _ _ X	PC17	Hex	_ _ _ X	The setting value will be maintained.
PC20	Function selection C-7	Hex	_ _ _ X	PC20	Hex	_ _ _ X	The setting value will be maintained.
PC21	Alarm history clear	Hex	_ _ _ X	PC21	Hex	_ _ _ X	The setting value will be maintained.
PD07	Output signal device selection 1 (CN3-13)	Hex	_ _ XX	PD07	Hex	_ _ XX	_ _ 0B will be changed to _ _ 05. Otherwise, the setting value will be maintained.
PD08	Output signal device selection 2 (CN3-9)	Hex	_ _ XX	PD08	Hex	_ _ XX	_ _ 0B will be changed to _ _ 04. Otherwise, the setting value will be maintained.
PD09	Output signal device selection 3 (CN3-15)	Hex	_ _ XX	PD09	Hex	_ _ XX	_ _ 0B will be changed to _ _ 03. Otherwise, the setting value will be maintained.
PD14	Function selection D-3	Hex	_ _ X_	PD14	Hex	_ _ X_	The setting value will be maintained.
PD15	Driver communication setting	Hex	_ _ XX	PD15	Hex	_ _ XX	The setting value will be maintained.
PD16	Driver communication setting - Master - Transmit data selection 1	Hex	_ _ XX	PD16	Hex	_ _ XX	The setting value will be maintained.
PD17	Driver communication setting - Master - Transmit data selection 2	Hex	_ _ XX	PD17	Hex	_ _ XX	The setting value will be maintained.
PD20	Driver communication setting - Slave - Master axis No. selection 1	Dec	-	PD20	Dec	-	The setting value will be maintained.
PD30	Master-slave operation - Torque command coefficient on slave	Hex	XXXX	PD30	Dec	-	A hexadecimal value without sign will be converted into a decimal value. When the setting value is larger than 500, it will be 500.
PD31	Master-slave operation - Speed limit coefficient on slave	Hex	XXXX	PD31	Dec	-	A hexadecimal value without sign will be converted into a decimal value. When the setting value is larger than 500, it will be 500.
PD32	Master-slave operation - Speed limit adjusted value on slave	Hex	XXXX	PD32	Dec	-	A hexadecimal value without sign will be converted into a decimal value.

Hex: hexadecimal parameter; Dec: decimal parameter

2.3.4 Parameters that need to be checked after parameter conversion

(1) MR-J3-_B_ and MR-J3W-_B => MR-J4-_B_ and MR-J4W2-_B

Parameter No.	Name	Initial value	Setting value	Description
PA04	Function selection A-1	2000h	0_ _ _h	Forced stop deceleration function selection To configure the same settings as those for MR-J3-_B_, select "Forced stop deceleration function disabled (EM1)".
PA09	Auto tuning response	-	-	Auto tuning response setting Adjust the gain value again after the replacement.
PA10	In-position range	-	-	In-position range When the setting of MR-J3-_B_ is larger than 4095 [pulses], it will be converted into 65535 [pulses]. Check for any problems of the equipment.
PA15	Encoder output pulses	-	-	Encoder output pulses When the setting of MR-J3-_B_ is larger than 4095 [pulses] and the output dividing ratio setting is selected, 65535 [pulses] will be set. Check for any problems of the equipment.
PC03	Encoder output pulse selection	-	-	Encoder output pulse setting selection To use "_ _4_: Encoder pulse through output setting", use MR-J4-_B_ with the software version A5 or later. A parameter error will occur when the software version A4 or earlier is used.
PC11	Analog monitor 1 offset	-	-	Set the value as required.
PC12	Analog monitor 2 offset	-	-	Set the value as required.
PC13	Analog monitor feedback position output standard data Low	-	-	Set the value as required.
PC14	Analog monitor feedback position output standard data High	-	-	Set the value as required.
PD15	Driver communication setting	-	-	• Master axis operation selection • Slave axis operation selection Use MR-J4-_B_ with the software version A8 or later to use this function. A parameter error will occur when MR-J4-_B_ with the software version A7 or earlier is used.
PD16	Driver communication setting - Master - Transmit data selection 1	-	-	Driver communication setting - Master - Transmit data selection 1 Use MR-J4-_B_ with the software version A8 or later to use this function. A parameter error will occur when MR-J4-_B_ with the software version A7 or earlier is used.
PD17	Driver communication setting - Master - Transmit data selection 2	-	-	Driver communication setting - Master - Transmit data selection 2 Use MR-J4-_B_ with the software version A8 or later to use this function. A parameter error will occur when MR-J4-_B_ with the software version A7 or earlier is used.
PD20	Driver communication setting - Slave - Master axis No. selection 1	-	-	Driver communication setting - Slave - Master axis No. selection 1 Use MR-J4-_B_ with the software version A8 or later to use this function. A parameter error will occur when MR-J4-_B_ with the software version A7 or earlier is used.
PD30	Master-slave operation - Torque command coefficient on slave	-	-	Master-slave operation - Torque command coefficient on slave Use MR-J4-_B_ with the software version A8 or later to use this function. A parameter error will occur when MR-J4-_B_ with the software version A7 or earlier is used.
PD31	Master-slave operation - Speed limit coefficient on slave	-	-	Master-slave operation - Speed limit coefficient on slave Use MR-J4-_B_ with the software version A8 or later to use this function. A parameter error will occur when MR-J4-_B_ with the software version A7 or earlier is used.

Parameter No.	Name	Initial value	Setting value	Description
PD32	Master-slave operation - Speed limit adjusted value on slave	-	-	Master-slave operation - Speed limit adjusted value on slave Use MR-J4-_B_ with the software version A8 or later to use this function. A parameter error will occur when MR-J4-_B_ with the software version A7 or earlier is used.

Note. For items that have no setting value listed in the table, refer to "Part 3: Review on Replacement of MR-J3-_B_ with MR-J4-_B_", "Part 4: Review on Replacement of MR-J3W-_B_ with MR-J4W-_B_"..

(2) MR-J3W-_B => MR-J4W2-_B

Parameter No.	Name	Initial value	Setting value	Description
PC01	Error excessive alarm level	-	-	Although the initial values of the MR-J3-_B_ and MR-J3W-_B are different, the same operation is performed. Also, the setting ranges are different. Check the setting values and change them as necessary.
PC03	Encoder output pulse selection	-	-	Although the initial values of the MR-J3-_B_ and MR-J3W-_B are different, the values are overwritten with the setting values on the controller side (parameter of MR-J3-_B_) after power-on.

Note. For items that have no setting value listed in the table, refer to "Part 4: Review on Replacement of MR-J3W-_B with MR-J4W2-_B".

(3) MR-J3W-0303BN6 => MR-J4W2-0303B6

Parameter No.	Name	Initial value	Setting value	Description
PC05	Function selection C-2	-	-	Select a voltage to be connected to the main circuit power supply with an MR-J4W2-0303B6 servo amplifier. Main circuit power supply the characteristics of the servo motor vary depending on whether 48 V DC or 24 V DC is used. [Pr. PC05]: "_ 0 _ _" DC 48 V (Initial value) "_ 1 _ _" DC 24 V
Po04	Main circuit power supply selection	-	-	The setting of this digit in the J3 compatibility mode is the same as the MR-J3W-0303BN6 servo amplifier. Set it with [Pr. Po04]. Main circuit power supply the characteristics of the servo motor vary depending on whether 48 V DC or 24 V DC is used. [Pr. Po04]: "0 _ _ _" DC 48 V (Initial value) "1 _ _ _" DC 24 V

Note. For items that have no setting value listed in the table, refer to "Part 4: Review on Replacement of MR-J3W-_B with MR-J4W2-_B".

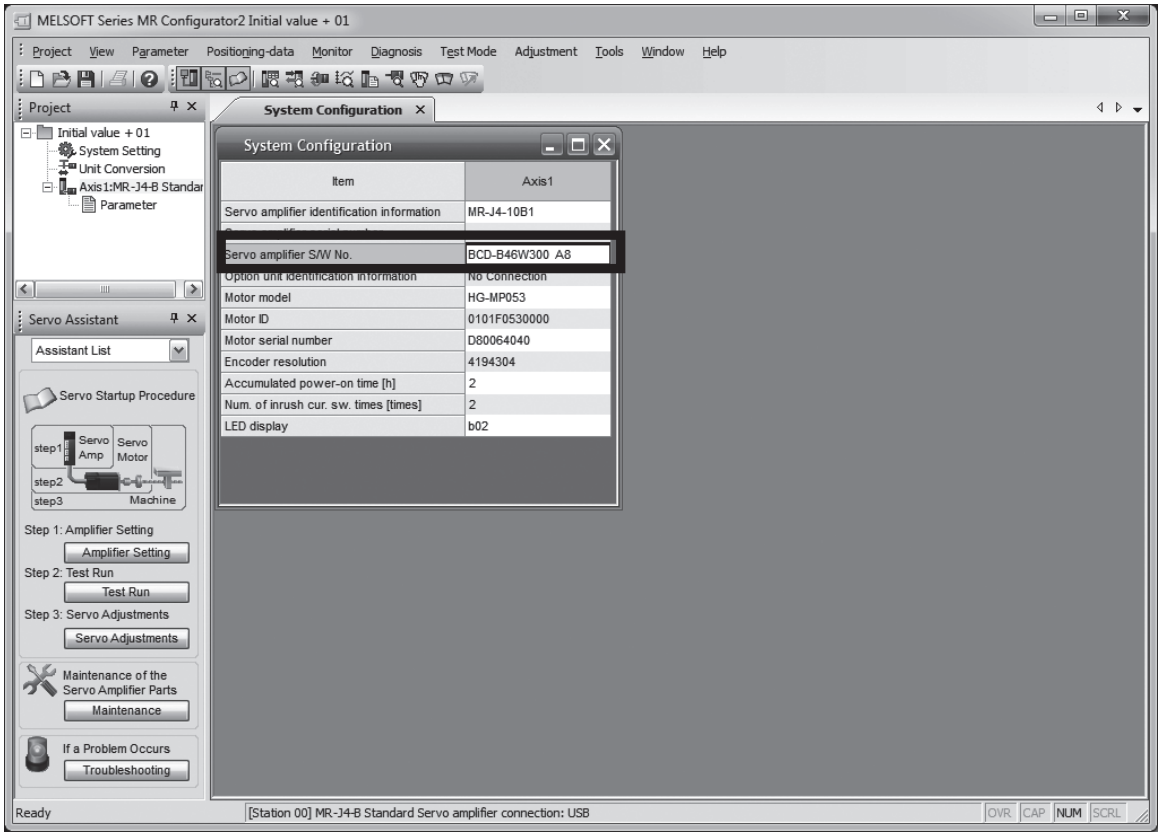
3. COMMON POINTS TO NOTE

3.1 Method for checking the software version

3.1.1 Checking with MR Configurator2 (SW1DNC-MRC2-E)

Check the software version of the servo amplifier with MR Configurator2 (SW1DNC-MRC2-E).
Start MR Configurator2. Select [Diagnosis] - [System Configuration] from the menu to display the servo amplifier software No.

Servo amplifier software No.: BCD-○○○○○○○ ○○
↓ software No. ↓ software version



Checking with MR Configurator2

4. COMMUNICATION FUNCTION (MITSUBISHI GENERAL-PURPOSE AC SERVO PROTOCOL)

POINT
●RS-422 serial communication function is supported by servo amplifier with software version A3 or later. ●The USB communication function (CN5 connector) and the RS-422 communication function (CN3 connector) are mutually exclusive functions. They cannot be used together. ●This function is not available with MR-J4-_B_(-RJ) and MR-J4W2-_B servo amplifiers.

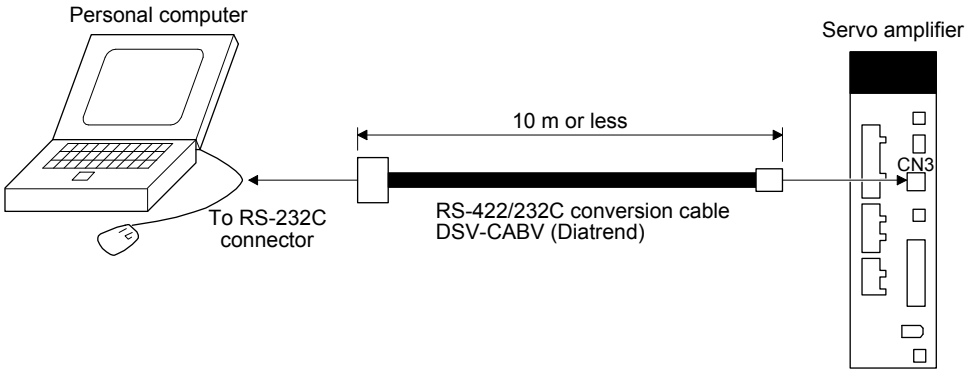
You can operate servo driving, parameter change, monitor function, etc. using RS-422 communication (Mitsubishi general-purpose AC servo protocol) with the servo amplifier.

4.1 Structure

4.1.1 Configuration diagram

(1) Single axis

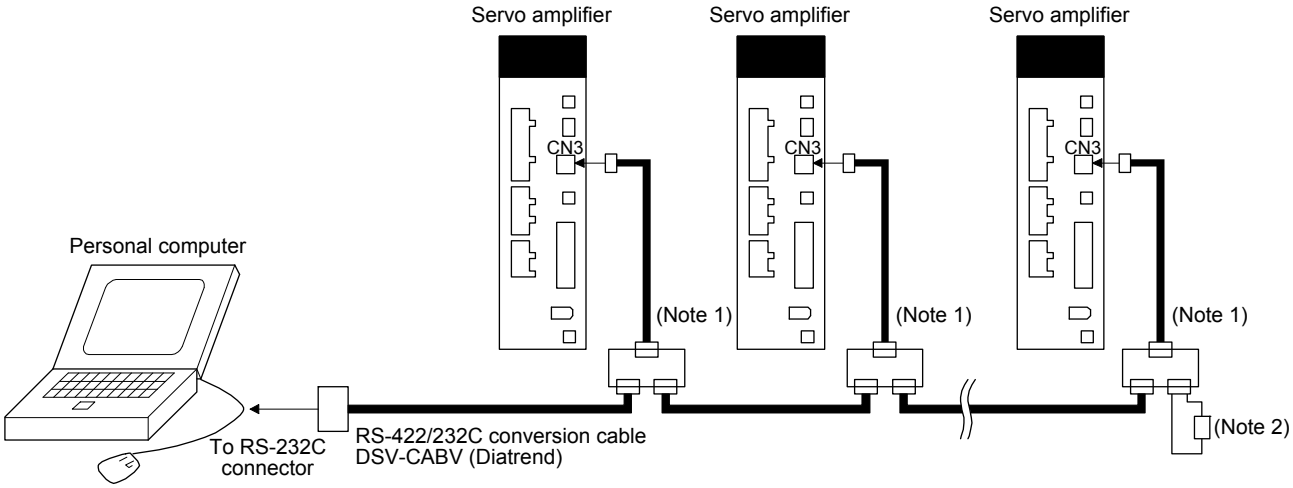
Operate the single-axis servo amplifier. It is recommended to use the following cable.



(2) Multi-drop connection

(a) Diagrammatic sketch

Up to 32 axes of servo amplifiers from stations 0 to 31 can be operated on the same bus.

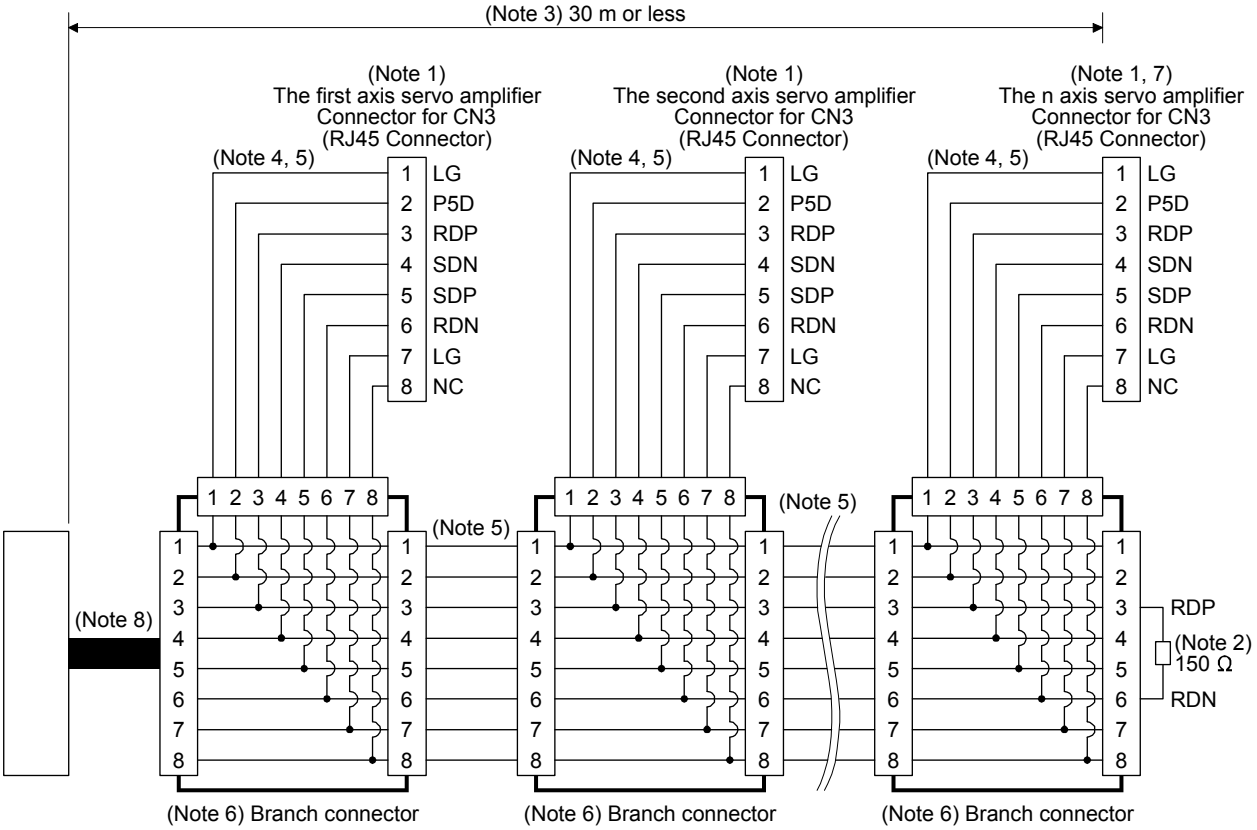


Note 1. The BMJ-8 (Hachiko Electric) is recommended as the branch connector.

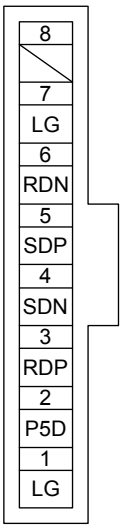
2. The final axis must be terminated between RDP (pin No.3) and RDN (pin No.6) on the receiving side (servo amplifier) with a 150 Ω resistor.

(b) Cable connection diagram

Wire the cables as follows.



Note 1. Recommended connector (Hirose Electric)
Plug: TM10P-88P
Connection tool: CL250-0228-1
The following shows pin assignment viewed from connector wiring section.



2. The final axis must be terminated between RDP (pin No.3) and RDN (pin No.6) on the receiving side (servo amplifier) with a 150 Ω resistor.
3. The overall length is 30 m or less in low-noise environment.
4. The wiring between the branch connector and servo amplifier should be as short as possible.
5. Use the EIA568-compliant cable (10BASE-T cable, etc.).
6. Recommended branch connector: BMJ-8 (Hachiko Electric)
7. n ≤ 32 (Up to 32 axes can be connected.)
8. RS-422/232C conversion cable DSV-CABV (Diatrend)

4.1.2 Precautions for using RS-422/RS-232C/USB communication function

Note the following to prevent an electric shock and malfunction of the servo amplifier.

(1) Power connection of personal computers
Connect your personal computer with the following procedures.

(a) When you use a personal computer with AC power supply
1) When using a personal computer with a three-core power plug or power plug with grounding wire, use a three-pin socket or ground the grounding wire.

2) When your personal computer has two-core plug and has no grounding wire, connect the personal computer to the servo amplifier with the following procedures.

a) Disconnect the power plug of the personal computer from an AC power socket.

b) Check that the power plug was disconnected and connect the device to the servo amplifier.

c) Connect the power plug of the personal computer to the AC power socket.

(b) When you use a personal computer with battery
You can use as it is.

(2) Connection with other devices using servo amplifier communication function
When the servo amplifier is charged with electricity due to connection with a personal computer and the charged servo amplifier is connected with other devices, the servo amplifier or the connected devices may malfunction. Connect the servo amplifier and other devices with the following procedures.

(a) Shut off the power of the device for connecting with the servo amplifier.

(b) Shut off the power of the servo amplifier which was connected with the personal computer and check the charge lamp is off.

(c) Connect the device with the servo amplifier.

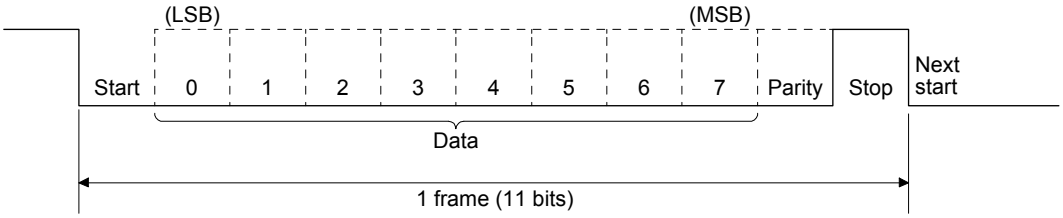
(d) Turn on the power of the servo amplifier and the device.

4.2 Communication specifications

4.2.1 Outline of communication

Receiving a command, this servo amplifier returns data. The device which gives the command (e.g. personal computer) is called a master station and the device (servo amplifier) which returns data in response to the command is called a slave station. When fetching data successively, the master station repeatedly commands the slave station to send data.

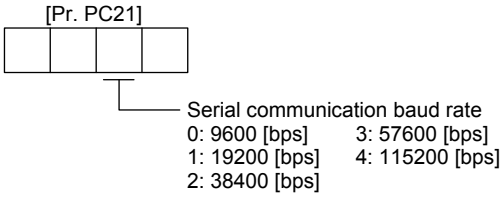
Item	Definition	
Baud rate [bps]	9600/19200/38400/57600/115200 asynchronous system	
Transfer code	Start bit	1 bit
	Data bit	8 bits
	Parity bit	1 bit (even)
	Stop bit	1 bit
Transfer method	Character method	Half-duplex communication method



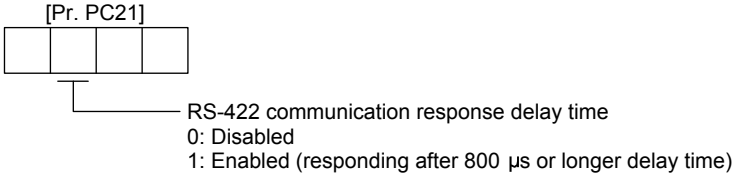
4.2.2 Parameter setting

When the RS-422 communication function is used to operate the servo, set the communication specifications of the servo amplifier with the parameters.
To enable the parameter values, cycle the power after setting.

(1) Serial communication baud rate
Select the communication speed. Match this value to the communication speed of the sending end (master station).



(2) RS-422 communication response delay time
Set the time from when the servo amplifier (slave station) receives communication data to when it returns data. Set "0" to return data in less than 800 μs or "1" to return data in 800 μs or longer.



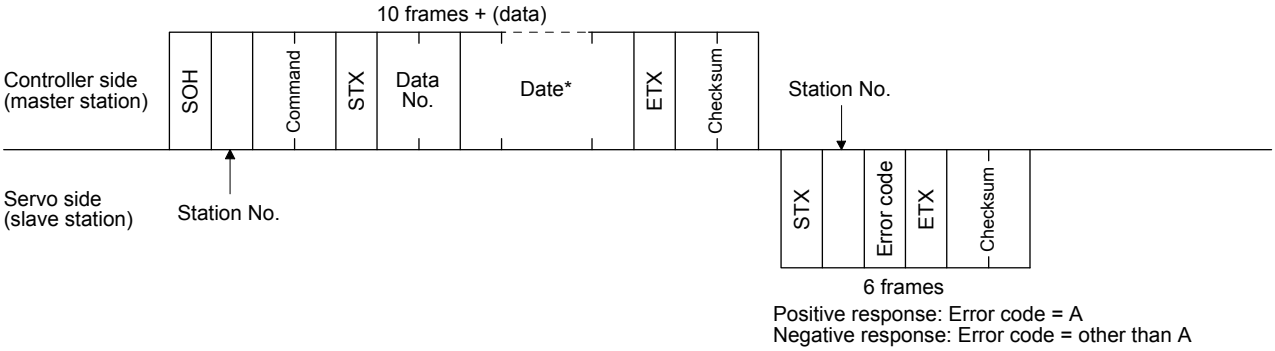
(3) Station No. setting
Set the station No. of the servo amplifier to [Pr. PC20]. The setting range is station No. 0 to 31.

4.3 Protocol

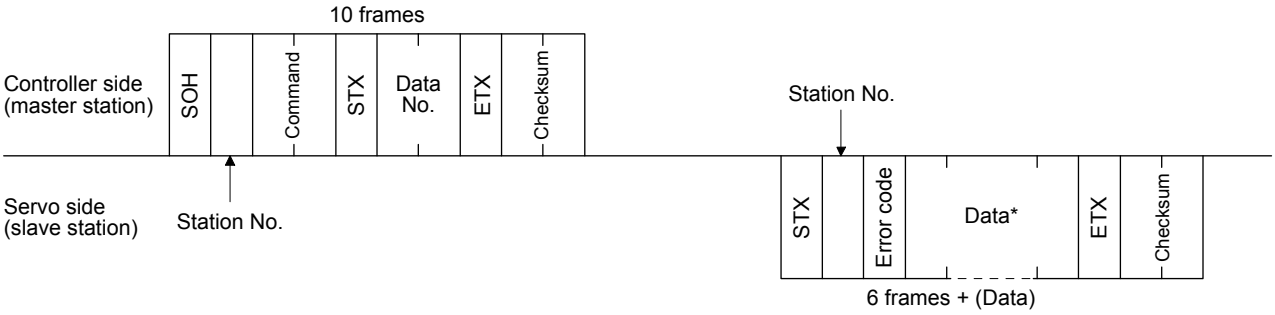
4.3.1 Transmission data configuration

Since up to 32 axes may be connected to the bus, add a station No. to the command, data No., etc. to determine the destination servo amplifier of data communication. Set the station No. to each servo amplifier using the parameters. Transmission data is enabled for the servo amplifier of the specified station No. When "*" is set as the station No. added to the transmission data, the transmission data is enabled for all servo amplifiers connected. However, when return data is required from the servo amplifier in response to the transmission data, set "0" to the station No. of the servo amplifier which must provide the return data.

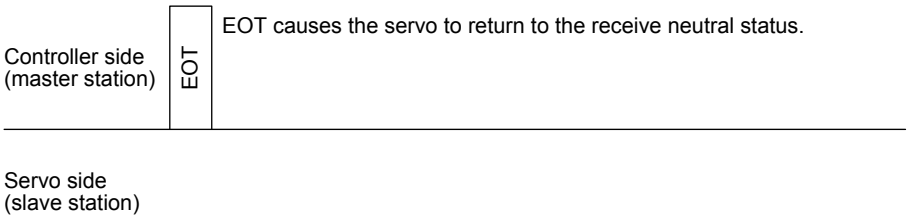
(1) Transmission of data from the controller to the servo



(2) Transmission of data request from the controller to the servo

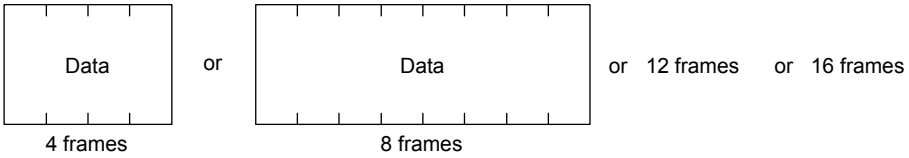


(3) Recovery of communication status by time-out



(4) Data frames

The data length depends on the command.



4.3.2 Character codes

(1) Control codes

Code name	Hexadecimal (ASCII code)	Description	Personal computer terminal key operation (general)
SOH	01H	start of head	ctrl + A
STX	02H	start of text	ctrl + B
ETX	03H	end of text	ctrl + C
EOT	04H	end of transmission	ctrl + D

(2) Codes for data

ASCII unit codes are used.

b8	0	0	0	0	0	0	0	0
b7	0	0	0	0	1	1	1	1
b6	0	0	1	1	0	0	1	1
b5	0	1	0	1	0	1	0	1

b8 to b5	b4	b3	b2	b1
	0	0	0	0
	0	0	0	1
	0	0	1	0
	0	0	1	1
	0	1	0	0
	0	1	0	1
	0	1	1	0
	0	1	1	1
	1	0	0	0
	1	0	0	1
	1	0	1	0
	1	0	1	1
	1	1	0	0
	1	1	0	1
	1	1	1	0
	1	1	1	1

R \ C	0	1	2	3	4	5	6	7
0	NUL	DLE	Space	0	@	P	`	p
1	SOH	DC_1	!	1	A	Q	a	q
2	STX	DC_2	“	2	B	R	b	r
3	ETX	DC_3	#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7			‘	7	G	W	g	w
8			(	8	H	X	h	x
9			)	9	I	Y	i	y
10			*	:	J	Z	j	z
11			+	;	K	[	k	{
12			,	<	L	¥	l	|
13			-	=	M	]	m	}
14			.	>	N	^	n	¯
15			/	?	O	_	o	DEL

(3) Station numbers

You may set 32 station Nos. from station 0 to station 31 and the ASCII unit codes are used to specify the stations.

Station No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ASCII code	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

Station No.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ASCII code	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V

For example, "30H" is transmitted in hexadecimal for the station No. "0" (axis 1).

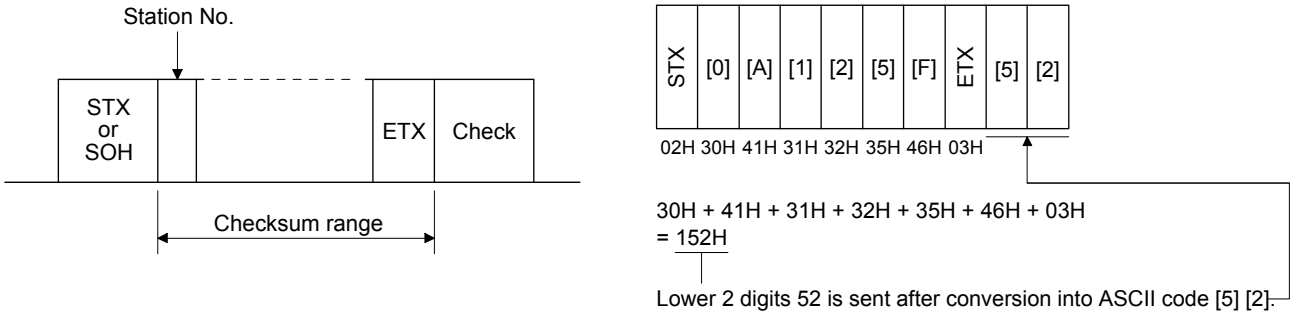
4.3.3 Error codes

Error codes are used in the following cases and an error code of single-code length is transmitted. Receiving data from the master station, the slave station sends the error code corresponding to that data to the master station. The error code sent in upper case indicates that the servo is normal and the one in lower case indicates that an alarm occurred.

Error code		Error name	Explanation	Remark
Servo: normal	Servo: alarm			
[A]	[a]	Normal	Data transmitted was processed normally.	Positive response
[B]	[b]	Parity error	Parity error occurred in the transmitted data.	Negative response
[C]	[c]	Checksum error	Checksum error occurred in the transmitted data.	
[D]	[d]	Character error	The transmitted character is out of specifications.	
[E]	[e]	Command error	The transmitted command is out of specifications.	
[F]	[f]	Data No. error	The transmitted data No. is out of specifications.	

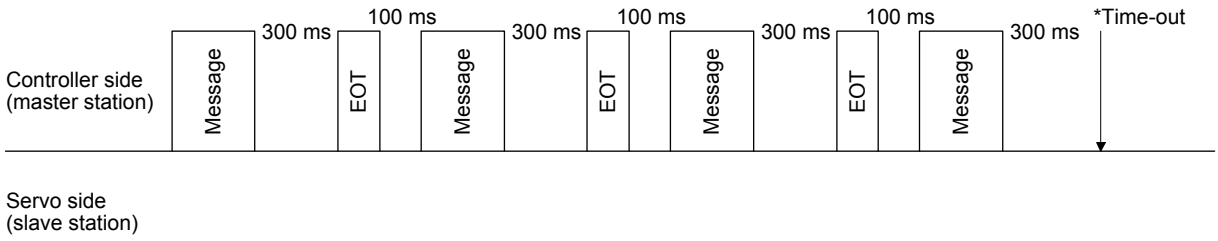
4.3.4 Checksum

The checksum is an ASCII-coded hexadecimal representing the lower two digits of the sum of ASCII-coded hexadecimal numbers up to ETX, with the exception of the first control code (STX or SOH).



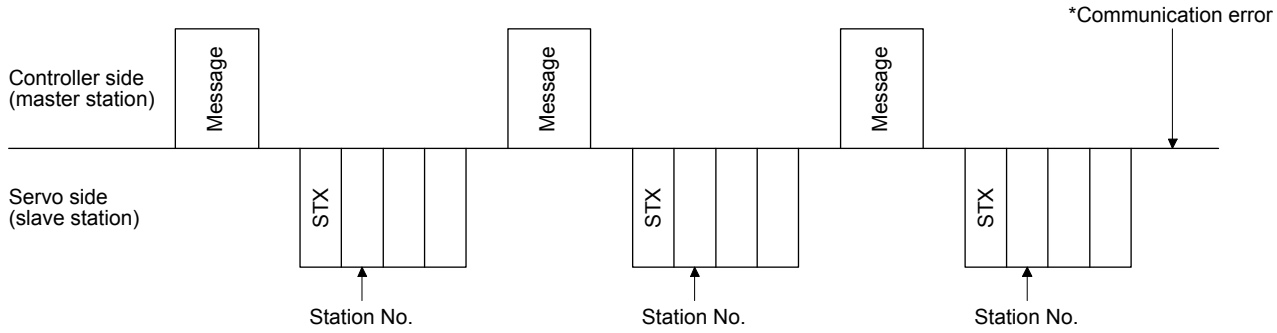
4.3.5 Time-out processing

The master station transmits EOT when the slave station does not start return processing (STX is not received) 300 [ms] after the master station has ended communication processing. 100 ms after that, the master station retransmits the message. Time-out occurs if the slave station does not answer after the master station has performed the above communication processing three times. (communication error)



4.3.6 Retry processing

When a fault occurs in communication between the master and slave stations, the error code in the response data from the slave station is a negative response code ([B] to [F], [b] to [f]). In this case, the master station retransmits the message which was sent at the occurrence of the fault (retry processing). A communication error occurs if the above processing is repeated and results in the error three or more consecutive times.



Similarly, when the master station detects a fault (e.g. checksum, parity) in the response data from the slave station, the master station retransmits the message which was sent at the occurrence of the fault. A communication error occurs if the retry processing is performed three times.

4.3.7 Initialization

After the slave station is switched on, it cannot return to communication until the internal initialization processing terminates. Hence, at power-on, ordinary communication should be started after.

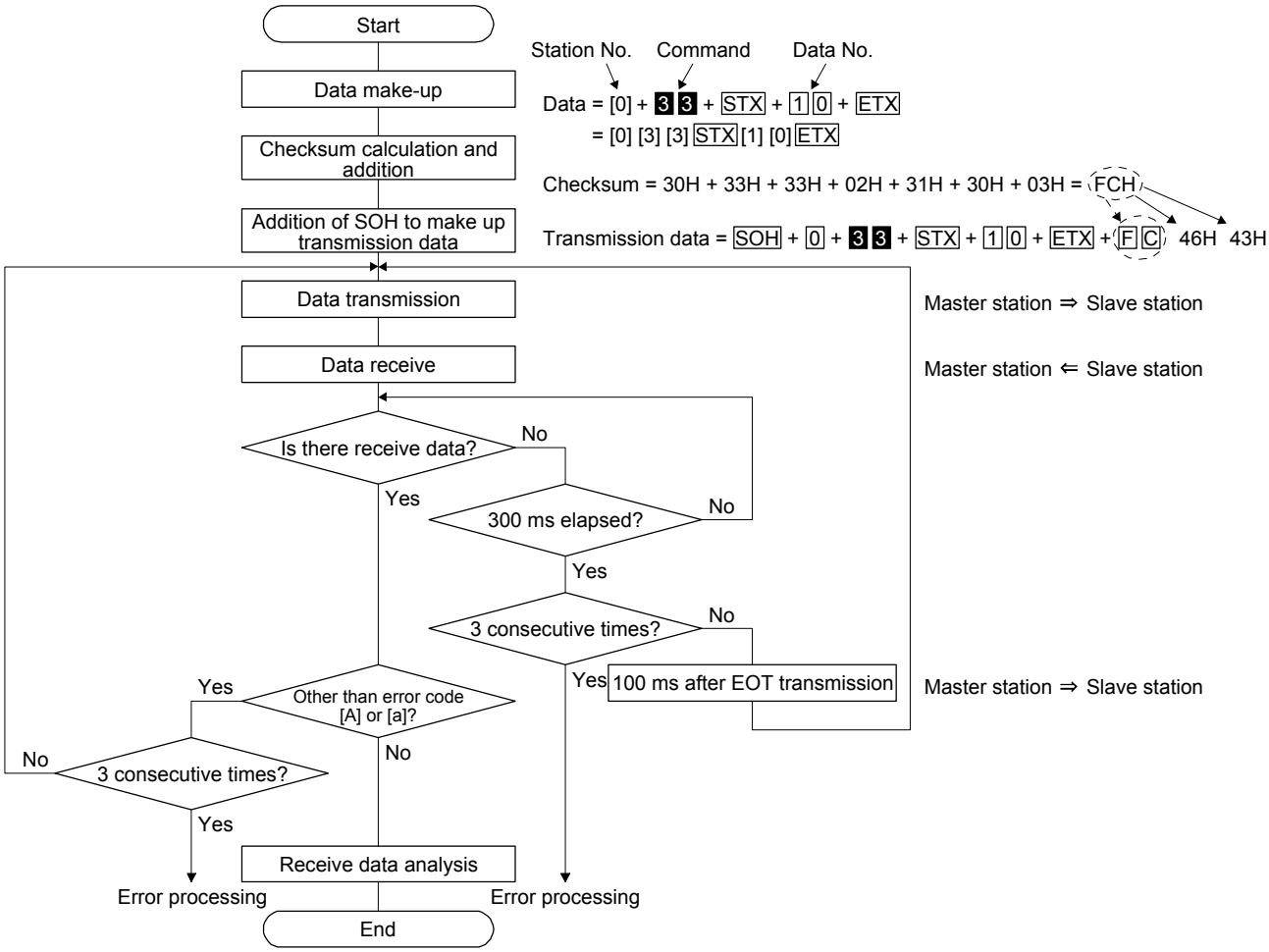
(1) Wait for 3.5 s or longer after the slave station is switched on.

(2) Check that normal communication can be made by reading the parameter or other data which does not pose any safety problems.

4.3.8 Communication procedure example

The following example reads the set value of alarm history (last alarm) from the servo amplifier of station 0.

Data item	Value	Description
Station No.	0	Servo amplifier station 0
Command	3 3	Reading command
Data No.	1 0	Alarm history (last alarm)



4.4 Command and data No. list

POINT

●Even if a command or data No. is the same between different model servo amplifiers, its description may differ.

●Commands of MR-J3-_A_ are available.
The following commands are also available.

Description	MR-J3/-J4	Only MR-J4
Current value of each parameter	[0] [5]	[1] [5]
Upper limit value of each parameter setting range	[0] [6]	[1] [6]
Lower limit value of each parameter setting range	[0] [7]	[1] [7]
Writing each parameter	[8] [4]	[9] [4]

4.4.1 Reading command

(1) Status display (command [0] [1])

Command	Data No.	Description	MR-J3-_A_		MR-J4-_A_	
			Status display	Frame length	Status display	Frame length
[0] [1]	[0] [0]	Status display symbol and unit	Cumulative feedback pulses	16	Cumulative feedback pulses Motor-side cumu. feedback pulses (after gear)	16
	[0] [1]		Servo motor speed		Servo motor speed Servo motor speed	
	[0] [2]		Droop pulses		Droop pulses Motor-side droop pulses	
	[0] [3]		Cumulative command pulses		Cumulative command pulses	
	[0] [4]		Command pulse frequency		Command pulse frequency	
	[0] [5]		Analog speed command voltage Analog speed limit voltage		Analog speed command voltage Analog speed limit voltage	
	[0] [6]		Analog torque limit voltage Analog torque command voltage		Analog torque limit voltage Analog torque command voltage	
	[0] [7]		Regenerative load ratio		Regenerative load ratio	
	[0] [8]		Effective load ratio		Effective load ratio	
	[0] [9]		Peak load ratio		Peak load ratio	
	[0] [A]		Instantaneous torque		Instantaneous torque Instantaneous thrust	
	[0] [B]		Position within one-revolution		Position within one-revolution Motor encoder position within one-revolution Virtual position within one-revolution	
	[0] [C]		ABS counter		ABS counter Motor encoder ABS counter Virtual ABS counter	
	[0] [D]		Load to motor inertia ratio		Load to motor inertia ratio Load to motor mass ratio	
	[0] [E]		Bus voltage		Bus voltage	
	[0] [F]				Load-side cumulative feedback pulses	
	[1] [0]				Load-side droop pulses	
	[1] [1]				Load-side encoder information 1 Z-phase counter	
	[1] [2]				Load-side encoder information 2	
	[1] [6]				Temperature of motor thermistor	
	[1] [7]				Motor-side cumu. feedback pulses (before gear)	
	[1] [8]				Electrical angle	
	[1] [E]				Motor-side/load-side position deviation	

Command	Data No.	Description	MR-J3-_A_		MR-J4-_A_	
			Status display	Frame length	Status display	Frame length
[0] [1]	[1] [F]	Status display symbol and unit		16	Motor-side/load-side speed deviation	16
	[2] [0]				Internal temperature of encoder	
	[2] [1]				Settling time	
	[2] [2]				Oscillation detection frequency	
	[2] [3]				Number of tough operations	
	[2] [8]				Unit power consumption	
	[2] [9]				Unit total power consumption	
[0] [1]	[8] [0]	Status display data value and processing information	Cumulative feedback pulses	12	Cumulative feedback pulses Motor-side cumu. feedback pulses (after gear)	12
	[8] [1]		Servo motor speed		Servo motor speed Servo motor speed	
	[8] [2]		Droop pulses		Droop pulses Motor-side droop pulses	
	[8] [3]		Cumulative command pulses		Cumulative command pulses	
	[8] [4]		Command pulse frequency		Command pulse frequency	
	[8] [5]		Analog speed command voltage Analog speed limit voltage		Analog speed command voltage Analog speed limit voltage	
	[8] [6]		Analog torque limit voltage Analog torque command voltage		Analog torque limit voltage Analog torque command voltage	
	[8] [7]		Regenerative load ratio		Regenerative load ratio	
	[8] [8]		Effective load ratio		Effective load ratio	
	[8] [9]		Peak load ratio		Peak load ratio	
	[8] [A]		Instantaneous torque		Instantaneous torque Instantaneous thrust	
	[8] [B]		Position within one-revolution		Position within one-revolution Motor encoder position within one-revolution Virtual position within one-revolution	
	[8] [C]		ABS counter		ABS counter Motor encoder ABS counter Virtual ABS counter	
	[8] [D]		Load to motor inertia ratio		Load to motor inertia ratio Load to motor mass ratio	
	[8] [E]		Bus voltage		Bus voltage	
	[8] [F]				Load-side cumulative feedback pulses	
	[9] [0]				Load-side droop pulses	
	[9] [1]				Load-side encoder information 1 Z-phase counter	
	[9] [2]				Load-side encoder information 2	
	[9] [6]				Temperature of motor thermistor	
	[9] [7]				Motor-side cumu. feedback pulses (before gear)	
	[9] [8]				Electrical angle	
	[9] [E]				Motor-side/load-side position deviation	
	[9] [F]				Motor-side/load-side speed deviation	
	[A] [0]				Internal temperature of encoder	
	[A] [1]				Settling time	
	[A] [2]				Oscillation detection frequency	
	[A] [3]				Number of tough operations	
	[A] [8]				Unit power consumption	
	[A] [9]				Unit total power consumption	

(2) Parameters (command [0] [4]/[0] [5]/[1] [5]/[0] [6]/[1] [6]/[0] [7]/[1] [7]/[0] [8]/[0] [9])

Command	Data No.	MR-J3-_A_		MR-J4-_A_	
		Description	Frame length	Description	Frame length
[0] [4]	[0] [1]	Parameter group read 0000: Basic setting parameter ([Pr. PA_ _]) 0001: Gain filter parameter ([Pr. PB_ _]) 0002: Extension setting parameter ([Pr. PC_ _]) 0003: I/O setting parameter ([Pr. PD_ _])	4	Parameter group reading 0000: Basic setting parameters ([Pr. PA_ _]) 0001: Gain/filter parameters ([Pr. PB_ _]) 0002: Extension setting parameters ([Pr. PC_ _]) 0003: I/O setting parameters ([Pr. PD_ _]) 0004: Extension setting 2 parameters ([Pr. PE_ _]) 0005: Extension setting 3 parameters ([Pr. PF_ _])	4
[0] [5]	[0] [1] to [F] [F]	Current values of parameters Reads the current values of the parameters in the parameter group specified with the command [8] [5] + data No. [0] [0]. Before reading the current values, therefore, always specify the parameter group with the command [8] [5] + data No. [0] [0]. The decimal equivalent of the data No. value (hexadecimal) corresponds to the parameter number.	8	Current values of parameters Reads the current values of the parameters in the parameter group specified with the command [8] [5] + data No. [0] [0]. Before reading the current values, therefore, always specify the parameter group with the command [8] [5] + data No. [0] [0]. The decimal equivalent of the data No. value (hexadecimal) corresponds to the parameter No. Command [1] [5]: Frame length 12 is available.	8
[0] [6]	[0] [1] to [F] [F]	Upper limit values of parameter setting ranges Reads the permissible upper limit values of the parameters in the parameter group specified with the command [8] [5] + data No. [0] [0]. Before reading the upper limit values, therefore, always specify the parameter group with the command [8] [5] + data No. [0] [0]. The decimal equivalent of the data No. value (hexadecimal) corresponds to the parameter number.	8	Upper limit values of parameter setting ranges Reads the permissible upper limit values of the parameters in the parameter group specified with the command [8] [5] + data No. [0] [0]. Before reading the upper limit values, therefore, always specify the parameter group with the command [8] [5] + data No. [0] [0]. The decimal equivalent of the data No. value (hexadecimal) corresponds to the parameter No. Command [1] [6]: Frame length 12 is available.	8
[0] [7]	[0] [1] to [F] [F]	Lower limit values of parameter setting ranges Reads the permissible lower limit values of the parameters in the parameter group specified with the command [8] [5] data No. [0] [0]. Before reading the lower limit values, therefore, always specify the parameter group with the command [8] [5] data No. [0] [0]. The decimal equivalent of the data No. value (hexadecimal) corresponds to the parameter number.	8	Lower limit values of parameter setting ranges Reads the permissible lower limit values of the parameters in the parameter group specified with the command [8] [5] + data No. [0] [0]. Before reading the lower limit values, therefore, always specify the parameter group with the command [8] [5] + data No. [0] [0]. The decimal equivalent of the data No. value (hexadecimal) corresponds to the parameter No. Command [1] [7]: Frame length 12 is available.	8
[0] [8]	[0] [1] to [F] [F]	Abbreviations of parameters Reads the abbreviations of the parameters in the parameter group specified with the command [8] [5] + data No. [0] [0]. Before reading the abbreviations, therefore, always specify the parameter group with the command [8] [5] + data No. [0] [0]. The decimal equivalent of the data No. value (hexadecimal) corresponds to the parameter number.	12	Parameter symbols Reads the symbols of the parameters in the parameter group specified with the command [8] [5] + data No. [0] [0]. Before reading the symbols, therefore, always specify the parameter group with the command [8] [5] + data No. [0] [0]. The decimal equivalent of the data No. value (hexadecimal) corresponds to the parameter No.	12
[0] [9]	[0] [1] to [F] [F]	Write enable/disable of parameters Reads write enable/disable of the parameters in the parameter group specified with the command [8] [5] + data No. [0] [0]. Before reading write enable/disable, therefore, always specify the parameter group with the command [8] [5] + data No. [0] [0]. 0000: Write enabled 0001: Write disabled	4	Writing enable/disable of parameters Reads writing enable/disable of the parameters in the parameter group specified with the command [8] [5] + data No. [0] [0]. Before reading the lower limit values, therefore, always specify the parameter group with the command [8] [5] + data No. [0] [0]. 0000: Writing enabled 0001: Writing disabled	4

(3) External I/O signals (command [1] [2])

Command	Data No.	MR-J3-_A_/ MR-J4-_A_ Description	Frame length
[1] [2]	[0] [0]	Input device status	8
	[4] [0]	External input pin status	
	[6] [0]	Status of input device turned on by communication	
	[8] [0]	Output device status	
	[C] [0]	External output pin status	

(4) Alarm history (command [3] [3])

Command	Data No.	Description	MR-J3-_A_		MR-J4-_A_	
			Alarm occurrence sequence	Frame length	Alarm occurrence sequence	Frame length
[3] [3]	[1] [0]	Alarm No. in alarm history	most recent alarm	4	Most recent alarm	4
	[1] [1]		first alarm in past		First alarm in past	
	[1] [2]		second alarm in past		Second alarm in past	
	[1] [3]		third alarm in past		Third alarm in past	
	[1] [4]		fourth alarm in past		Fourth alarm in past	
	[1] [5]		fifth alarm in past		Fifth alarm in past	
	[1] [6]				Sixth alarm in past	
	[1] [7]				Seventh alarm in past	
	[1] [8]				Eighth alarm in past	
	[1] [9]				Ninth alarm in past	
	[1] [A]				Tenth alarm in past	
	[1] [B]				Eleventh alarm in past	
	[1] [C]				Twelfth alarm in past	
	[1] [D]				Thirteenth alarm in past	
	[1] [E]				Fourteenth alarm in past	
	[1] [F]				Fifteenth alarm in past	
	[2] [0]	Alarm occurrence time in alarm history	most recent alarm	8	Most recent alarm	8
	[2] [1]		first alarm in past		First alarm in past	
	[2] [2]		second alarm in past		Second alarm in past	
	[2] [3]		third alarm in past		Third alarm in past	
	[2] [4]		fourth alarm in past		Fourth alarm in past	
	[2] [5]		fifth alarm in past		Fifth alarm in past	
	[2] [6]				Sixth alarm in past	
	[2] [7]				Seventh alarm in past	
	[2] [8]				Eighth alarm in past	
	[2] [9]				Ninth alarm in past	
	[2] [A]				Tenth alarm in past	
	[2] [B]				Eleventh alarm in past	
	[2] [C]				Twelfth alarm in past	
	[2] [D]				Thirteenth alarm in past	
	[2] [E]				Fourteenth alarm in past	
	[2] [F]				Fifteenth alarm in past	

(5) Current alarm (Command [0][2])

Command	Data No.	MR-J3-_A_/ MR-J4-_A_ Description	Frame length
[0] [2]	[0] [0]	Current alarm No.	4

(6) Status display at alarm occurrence (command [3] [5])

Command	Data No.	Description	MR-J3-_A_		MR-J4-_A_	
			Status display	Frame length	Status display	Frame length
[3] [5]	[8] [0]	Status display data value and processing information	Cumulative feedback pulses	12	Cumulative feedback pulses Motor-side cumu. feedback pulses (after gear)	12
	[8] [1]		Servo motor speed		Servo motor speed Servo motor speed	
	[8] [2]		Droop pulses		Droop pulses Motor-side droop pulses	
	[8] [3]		Cumulative command pulses		Cumulative command pulses	
	[8] [4]		Command pulse frequency		Command pulse frequency	
	[8] [5]		Analog speed command voltage Analog speed limit voltage		Analog speed command voltage Analog speed limit voltage	
	[8] [6]		Analog torque command voltage Analog torque limit voltage		Analog torque command voltage Analog torque limit voltage	
	[8] [7]		Regenerative load ratio		Regenerative load ratio	
	[8] [8]		Effective load ratio		Effective load ratio	
	[8] [9]		Peak load ratio		Peak load ratio	
	[8] [A]		Instantaneous torque		Instantaneous torque Instantaneous thrust	
	[8] [B]		Position within one-revolution		Position within one-revolution Motor encoder position within one-revolution Virtual position within one-revolution	
	[8] [C]		ABS counter		ABS counter Motor encoder ABS counter Virtual ABS counter	
	[8] [D]		Load to motor inertia ratio		Load to motor inertia ratio Load to motor mass ratio	
	[8] [E]		Bus voltage		Bus voltage	
	[8] [F]				Load-side cumulative feedback pulses	
	[9] [0]				Load-side droop pulses	
	[9] [1]				Load-side encoder information 1 Z-phase counter	
	[9] [2]				Load-side encoder information 2	
	[9] [6]				Temperature of motor thermistor	
	[9] [7]				Motor-side cumu. feedback pulses (before gear)	
	[9] [8]				Electrical angle	
	[9] [E]				Motor-side/load-side position deviation	
	[9] [F]				Motor-side/load-side speed deviation	
	[A] [0]				Internal temperature of encoder	
	[A] [1]				Settling time	
	[A] [2]				Oscillation detection frequency	
	[A] [3]				Number of tough operations	
	[A] [8]				Unit power consumption	
	[A] [9]				Unit total power consumption	

(7) Test operation mode (command [0] [0])

Command	Data No.	MR-J3-_A_/MR-J4-_A_	
		Description	Frame length
[0] [0]	[1] [2]	Test operation mode reading 0000: Normal mode (not test operation mode) 0001: JOG operation 0002: Positioning operation 0003: Motor-less operation 0004: Output signal (DO) forced output	4

(8) Software version (command [0] [2])

Command	Data No.	MR-J3-_A_/MR-J4-_A_	
		Description	Frame length
[0] [2]	[9] [0]	Servo motor-side pulse unit absolute position	8
	[9] [1]	Command unit absolute position	8
	[7] [0]	Software version	16

4.4.2 Writing commands

(1) Status display (command [8] [1])

Command	Data No.	MR-J3-_A_/MR-J4-_A_		
		Description	Setting range	Frame length
[8] [1]	[0] [0]	Status display data deletion	1EA5	4

(2) Parameters (command [8] [4]/[9] [4]/[8] [5])

Command	Data No.	MR-J3-_A_			MR-J4-_A_		
		Description	Setting range	Frame length	Description	Setting range	Frame length
[8] [4]	[0] [1] to [F] [F]	Write of parameters Writes the values of the parameters in the parameter group specified with the command [8] [5] data No. [0] [0]. Before writing the values, therefore, always specify the parameter group with the command [8] [5] data No. [0] [0]. The decimal equivalent of the data No. value (hexadecimal) corresponds to the parameter number.	Depending on the parameter	8	Writing each parameter Writes the values of the parameters in the parameter group specified with the command [8] [5] + data No. [0] [0]. Before writing the values, therefore, always specify the parameter group with the command [8] [5] + data No. [0] [0]. The decimal equivalent of the data No. value (hexadecimal) corresponds to the parameter No. Command [9] [4]: Frame length 12 is available.	Depending on the parameter	8
[8] [5]	[0] [0]	Parameter group write 0000: Basic setting parameter ([Pr. PA_ _]) 0001: Gain filter parameter ([Pr. PB_ _]) 0002: Extension setting parameter ([Pr. PC_ _]) 0003: I/O setting parameter ([Pr. PD_ _])	0000 to 0003	4	Parameter group writing 0000: Basic setting parameters ([Pr. PA_ _]) 0001: Gain/filter parameters ([Pr. PB_ _]) 0002: Extension setting parameters ([Pr. PC_ _]) 0003: I/O setting parameters ([Pr. PD_ _]) 0004: Extension setting 2 parameters ([Pr. PE_ _]) 0005: Extension setting 3 parameters ([Pr. PF_ _])	0000 to 0005	4

(3) External I/O signals (command [9] [2])

Command	Data No.	MR-J3-_A_/MR-J4-_A_		
		Description	Setting range	Frame length
[9] [2]	[6] [0]	Communication input device signal	Refer to section 4.5.5.	8

(4) Alarm history (command [8] [2])

Command	Data No.	MR-J3-_A_/MR-J4-_A_		
		Description	Setting range	Frame length
[8] [2]	[2] [0]	Alarm history clear	1EA5	4

(5) Current alarm (command [8] [2])

Command	Data No.	MR-J3-_A_/MR-J4-_A_		
		Description	Setting range	Frame length
[8] [2]	[0] [0]	Alarm clear	1EA5	4

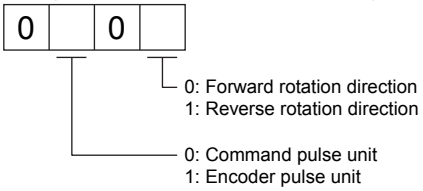
(6) I/O device prohibition (command [9] [0])

Command	Data No.	MR-J3-_A_/MR-J4-_A_		
		Description	Setting range	Frame length
[9] [0]	[0] [0]	Turns off the input device, external analog input signal or pulse train input, except EMG, LSP and LSN, independently of the external on/off status.	1EA5	4
	[0] [3]	Disables all output devices (DO).		
	[1] [0]	Cancels the prohibition of the input device, external analog input signal or pulse train input, except EMG, LSP and LSN.		
	[1] [3]	Cancels the prohibition of the output device.		

(7) Operation mode selection (command [8] [B])

Command	Data No.	MR-J3-_A_			MR-J4-_A_		
		Description	Setting range	Frame length	Description	Setting range	Frame length
[8] [B]	[0] [0]	Operation mode switching 0000: Test operation mode cancel 0001: JOG operation 0002: Positioning operation 0003: Motorless operation 0004: Output signal (DO) forced output	0000 to 0004	4	Selection of test operation mode 0000: Test operation mode cancel 0001: JOG operation 0002: Positioning operation 0004: Output signal (DO) forced output	0000 to 0002, 0004	4

(8) Test operation mode data (command [9] [2], [A] [0])

Command	Data No.	MR-J3-_A_/MR-J4-_A_		
		Description	Setting range	Frame length
[9] [2]	[0] [0]	Input signal for test operation	Refer to section 4.5.7.	8
	[A] [0]	Forced output of signal pin	Refer to section 4.5.9.	8
[A] [0]	[1] [0]	Writes the servo motor speed in the test operation mode (JOG operation and positioning operation).	0000 to 7FFF	4
	[1] [1]	Writes the acceleration/deceleration time constant in the test operation mode (JOG operation and positioning operation).	00000000 to 7FFFFFFF	8
	[2] [0]	Sets the travel distance in the test operation mode (Positioning operation).	00000000 to 7FFFFFFF	8
	[2] [1]	Selects the positioning direction of test operation (positioning operation).  	0000 to 0101	4
	[4] [0]	This is a start command for test operation (positioning operation).	1EA5	4
	[4] [1]	This is used to make a temporary stop during test operation (positioning operation). "_" in the data indicates a blank. STOP: Temporary stop GO_ _: Restart for remaining distance CLR _: Remaining distance clear	STOP GO _ _ CLR _	4

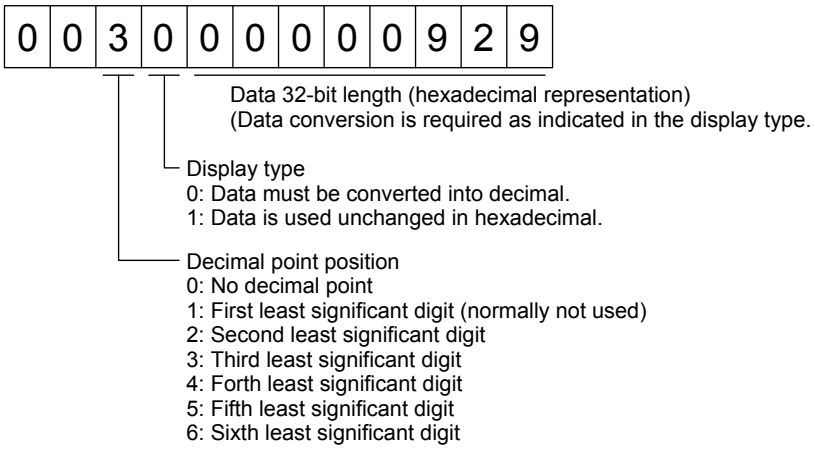
4.5 Detailed explanations of commands

4.5.1 Data processing

When the master station transmits a command data No. or a command + data No. + data to a slave station, the servo amplifier returns a response or data in accordance with the purpose.
When numerical values are represented in these send data and receive data, they are represented in decimal, hexadecimal, etc.
Therefore, data must be processed in accordance with the application.
Since whether data must be processed or not and how to process data depend on the monitoring, parameters, etc., follow the detailed explanation of the corresponding command.
The following methods are how to process send and receive data when reading and writing data.

(1) Processing a read data
When the display type is 0, the eight-character data is converted from hexadecimal to decimal and a decimal point is placed according to the decimal point position information.
When the display type is 1, the eight-character data is used unchanged.

The following example indicates how to process the receive data "003000000929" given to show.
The receive data is as follows.

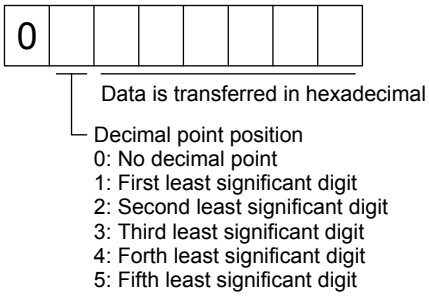


Since the display type is "0" in this case, the hexadecimal data is converted into decimal.
00000929H → 2345
As the decimal point position is "3", a decimal point is placed in the third least significant digit.
Hence, "23.45" is displayed.

(2) Writing processed data

When the data to be written is handled as decimal, the decimal point position must be specified. If it is not specified, the data cannot be written. When the data is handled as hexadecimal, specify "0" as the decimal point position.

The data to be sent is the following value.



For example, here is described how to process the set data when a value of "15.5" is sent.

Since the decimal point position is the second least significant digit, the decimal point position data is "2".

As the data to be sent is hexadecimal, the decimal data is converted into hexadecimal.

155 → 9B

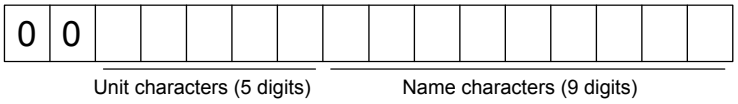
Hence, "0200009B" is transmitted.

4.5.2 Status display mode

(1) Reading the status display name and unit
The following shows how to read the status display name and unit.

(a) Transmission
Transmit the command [0] [1] and the data No. corresponding to the status display item to be read, [0] [0] to [0] [E] and [2] [0] to [2] [9]. (Refer of section 4.4.1.)

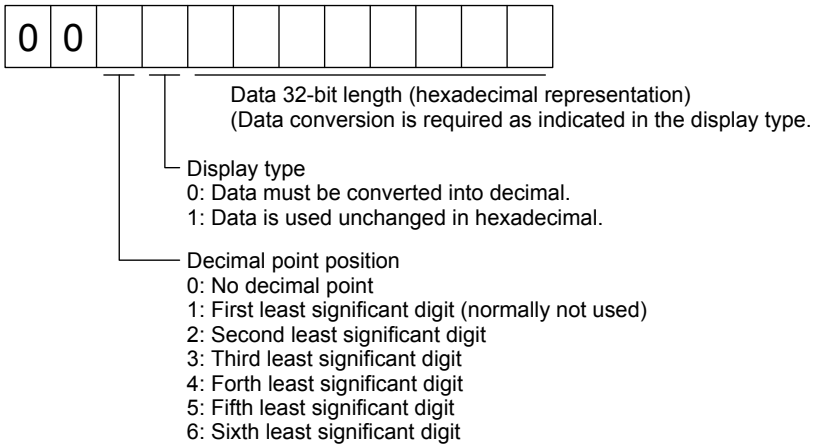
(b) Return
The slave station returns the status display name and unit requested.



(2) Status display data reading
The following shows how to read the status display data and processing information.

(a) Transmission
Transmit the command [0] [1] and the data No. corresponding to the status display item to be read, [8] [0] to [8] [E] and [A] [0] to [A] [9]. (Refer of section 4.4.1.)

(b) Return
The slave station returns the status display data requested.



(3) Status display data clear
To clear the cumulative feedback pulse data of the status display, send this command immediately after reading each status display item. The data of the status display item transmitted is cleared to "0".

Command	Data No.	Data
[8] [1]	[0] [0]	1EA5

For example, after sending command [0] [1] and data No. [8] [0] and receiving the status display data, send command [8] [1], data No. [0] [0] and data [1EA5] to clear the cumulative feedback pulse value to "0".

4.5.3 Parameter

(1) Specification of the parameter group

To read or write the parameter settings, etc., the group of the parameters to be operated must be specified in advance. Write data to the servo amplifier as follows to specify the parameter group.

Command	Data No.	Transmission data	Parameter group
[8] [5]	[0] [0]	0000	Basic setting parameters ([Pr. PA_ _])
		0001	Gain/filter parameters ([Pr. PB_ _])
		0002	Extension setting parameters ([Pr. PC_ _])
		0003	I/O setting parameters ([Pr. PD_ _])
		0004	Extension setting 2 parameters ([Pr. PE_ _])
		0005	Extension setting 3 parameters ([Pr. PF_ _])

(2) Parameter group reading

The following shows how to read the parameter group set with slave station.

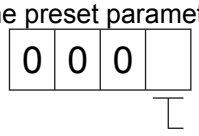
(a) Transmission

Transmit command [0] [4] and data No. [0] [1].

Command	Data No.
[0] [4]	[0] [1]

(b) Return

The slave station returns the preset parameter group.



Parameter group
0: Basic setting parameters ([Pr. PA_ _])
1: Gain/filter parameters ([Pr. PB_ _])
2: Extension setting parameters ([Pr. PC_ _])
3: I/O setting parameters ([Pr. PD_ _])
4: Extension setting 2 parameters ([Pr. PE_ _])
5: Extension setting 3 parameters ([Pr. PF_ _])

(3) Reading symbols

The following shows how to read symbols of parameters. Specify a parameter group in advance. (Refer to (1) of this section.)

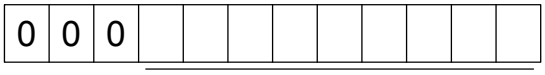
(a) Transmission

Transmit the command [0] [8] and the data No. [0] [1] to [F] [F] corresponding to the parameter No. (Refer of section 4.4.1.)

The data No. is expressed in hexadecimal. The decimal equivalent of the data No. value corresponds to the parameter No.

(b) Return

The slave station returns the symbol of the parameter requested.



(4) Reading the setting

The following shows how to read the parameter setting. Specify a parameter group in advance. (Refer to (1) of this section.)

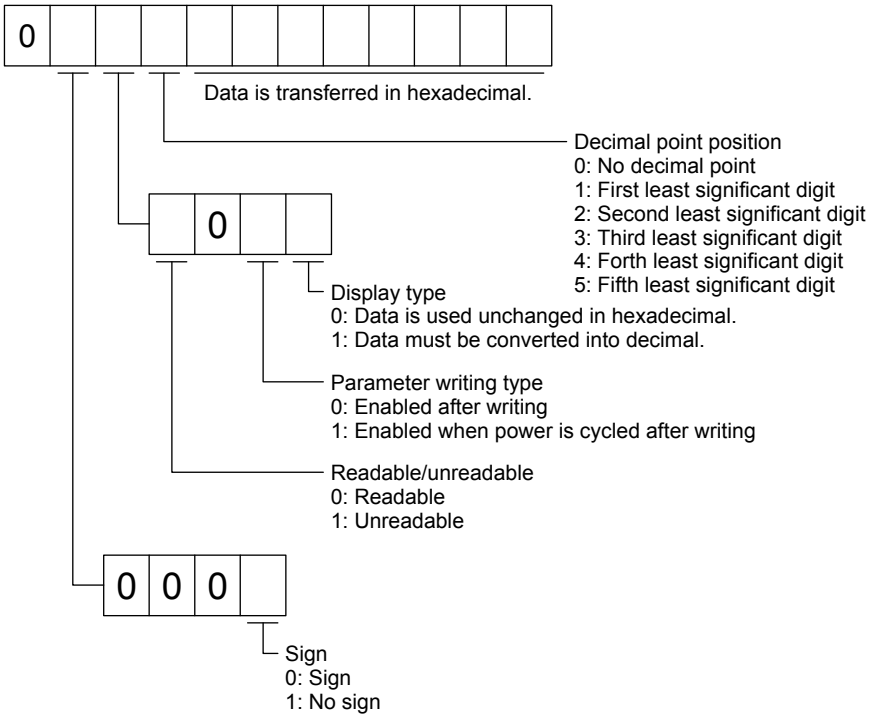
(a) Transmission

Transmit the command [1] [5] and the data No. corresponding to the parameter No [0] [1] to [F] [F]. (Refer of section 4.4.1.)

The data No. is expressed in hexadecimal. The decimal equivalent of the data No. value corresponds to the parameter No.

(b) Return

The slave station returns the data and processing information of the parameter No. requested.



For example, data "00120000270F" means 999.9 (decimal display format) and data "000000003ABC" means 3ABC (hexadecimal display format).

When the display type is "0" (hexadecimal) and the decimal point position is other than 0, the display type is a special hexadecimal display format and "F" of the data value is handled as a blank. Data "0001FFFFF053" means 053 (special hexadecimal display format).

"000000000000" is transferred when the parameter that was read is the one inaccessible for reference in the parameter writing inhibit setting of [Pr. PA19].

(5) Reading the setting range

The following shows how to read the parameter setting range. Specify a parameter group in advance. (Refer to (1) of this section.)

(a) Transmission

When reading an upper limit value, transmit the command [1] [6] and the data No. [0] [1] to [F] [F] corresponding to the parameter No. When reading a lower limit value, transmit the command [1] [7] and the data No. [0] [1] to [F] [F] corresponding to the parameter No. (Refer of section 4.4.1.)
The data No. is expressed in hexadecimal. The decimal equivalent of the data No. value corresponds to the parameter No.

(b) Return

The slave station returns the data and processing information of the parameter No. requested.

Data is transferred in hexadecimal.

For example, data "FFFFFFEC" means "-20".

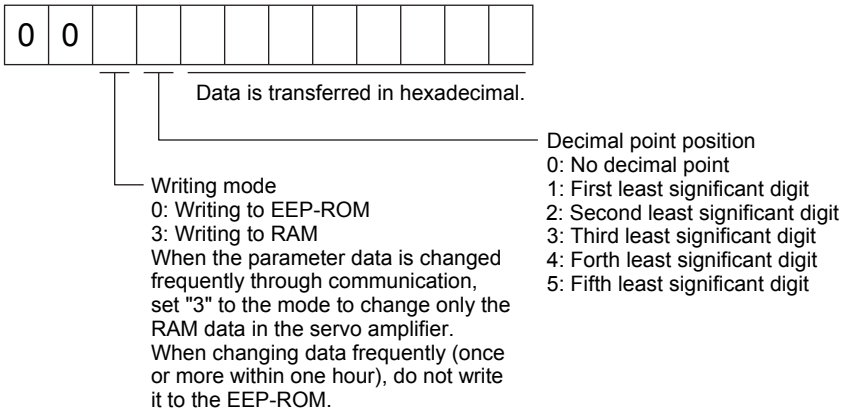
(6) Writing setting values

POINT

●If setting values need to be changed with a high frequency (i.e. one time or more per one hour), write the setting values to the RAM, not the EEP-ROM. The EEPROM has a limitation in the number of write times and exceeding this limitation causes the servo amplifier to malfunction. Note that the number of write times to the EEP-ROM is limited to approximately 100, 000.

Write the parameter setting into EEP-ROM of the servo amplifier. Specify a parameter group in advance. (Refer to (1) of this section.)
Write any value within the setting enabled range. For the setting enabled range, refer to Part2/Part3 or read the setting range by performing operation in (4) of this section.
Transmit command [9] [4], the data No., and the set data.
The data No. is expressed in hexadecimal. The decimal equivalent of the data No. value corresponds to the parameter No.
When the data to be written is handled as decimal, the decimal point position must be specified. If it is not specified, the data cannot be written. When the data is handled as hexadecimal, specify "0" as the decimal point position.
Check the writing data is within the upper/lower limit value before writing. To prevent an error, read the parameter data to be written, confirm the decimal point position, and create transmission data.
On completion of writing, read the same parameter data to verify that data has been written correctly.

Command	Data No.	Data
[9] [4]	[0] [1] to [F] [F]	See below.



4.5.4 External I/O signal status (DIO diagnosis)

(1) Reading input device status

The following shows how to read the status of the input devices.

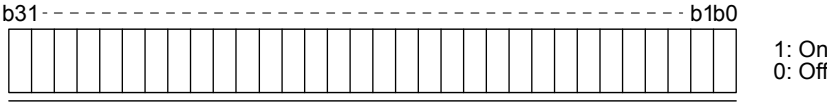
(a) Transmission

Transmit command [1] [2] and data No. [0] [0].

Command	Data No.
[1] [2]	[0] [0]

(b) Return

The slave station returns the status of the input devices.



Command of each bit is transmitted to the master station as hexadecimal data.

Bit	Symbol
0	SON
1	LSP
2	LSN
3	TL
4	TL1
5	PC
6	RES
7	CR

Bit	Symbol
8	SP1
9	SP2
10	SP3
11	ST1/RS2
12	ST2/RS1
13	CM1
14	CM2
15	LOP

Bit	Symbol
16	
17	
18	
19	
20	STAB2
21	
22	
23	

Bit	Symbol
24	
25	
26	
27	CDP
28	CLD
29	MECR
30	
31	

(2) Reading external input pin status

The following shows how to read the on/off status of the external input pins.

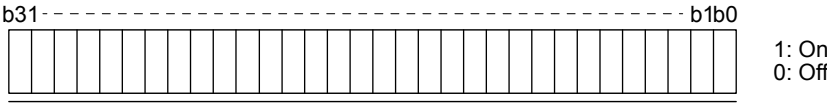
(a) Transmission

Transmit command [1] [2] and data No. [4] [0].

Command	Data No.
[1] [2]	[4] [0]

(b) Return

The on/off status of the input pins are returned.



Command of each bit is transmitted to the master station as hexadecimal data.

Bit	CN1 connector pin
0	43
1	44
2	42
3	15
4	19
5	41
6	16
7	17

Bit	CN1 connector pin
8	18
9	45
10	
11	
12	
13	
14	
15	

Bit	CN1 connector pin
16	
17	
18	
19	
20	
21	
22	
23	

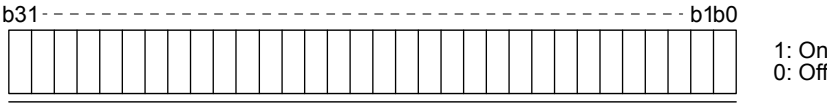
Bit	CN1 connector pin
24	
25	
26	
27	
28	
29	
30	
31	

(3) Reading the status of input devices switched on with communication
The following shows how to read the on/off status of the input devices switched on with communication.

(a) Transmission
Transmit command [1] [2] and data No. [6] [0].

Command	Data No.
[1] [2]	[6] [0]

(b) Return
The slave station returns the status of the input devices.



Command of each bit is transmitted to the master station as hexadecimal data.

Bit	Symbol
0	SON
1	LSP
2	LSN
3	TL
4	TL1
5	PC
6	RES
7	CR

Bit	Symbol
8	SP1
9	SP2
10	SP3
11	ST1/RS2
12	ST2/RS1
13	CM1
14	CM2
15	LOP

Bit	Symbol
16	
17	
18	
19	
20	STAB2
21	
22	
23	

Bit	Symbol
24	
25	
26	
27	CDP
28	CLD
29	MECR
30	
31	

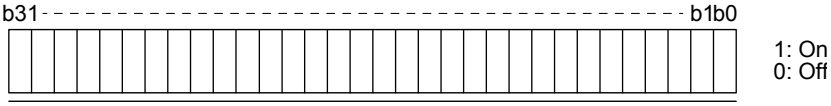
(4) Reading external output pin status
The following shows how to read the on/off status of the external output pins.

(a) Transmission
Transmit command [1] [2] and data No. [C] [0].

Command	Data No.
[1] [2]	[C] [0]

(b) Return

The slave station returns the status of the output devices.



Command of each bit is transmitted to the master station as hexadecimal data.

Bit	CN1 connector pin
0	49
1	24
2	23
3	25
4	22
5	48
6	33
7	13 (Note)

Bit	CN1 connector pin
8	14 (Note)
9	
10	
11	
12	
13	
14	
15	

Bit	CN1 connector pin
16	
17	
18	
19	
20	
21	
22	
23	

Bit	CN1 connector pin
24	
25	
26	
27	
28	
29	
30	
31	

Note. This is available when devices are assigned to the CN1-13 pin and CN1-14 pin with MR-J4-_A_-RJ 100 W or more servo amplifiers with software version B3 or later.

(5) Reading output device status

The following shows how to read the on/off status of the output devices.

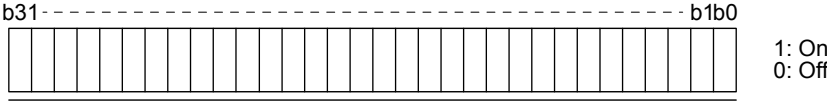
(a) Transmission

Transmit command [1] [2] and data No. [8] [0].

Command	Data No.
[1] [2]	[8] [0]

(b) Return

The slave station returns the status of the input/output devices.



Command of each bit is transmitted to the master station as hexadecimal data.

Bit	Symbol
0	RD
1	SA
2	ZSP
3	TLC
4	VLC
5	INP
6	
7	WNG

Bit	Symbol
8	ALM
9	OP
10	MBR
11	DB
12	ACD0
13	ACD1
14	ACD2
15	BWNG

Bit	Symbol
16	
17	
18	
19	
20	
21	
22	
23	

Bit	Symbol
24	
25	CDPS
26	CLDS
27	ABSV
28	
29	
30	
31	MTTR

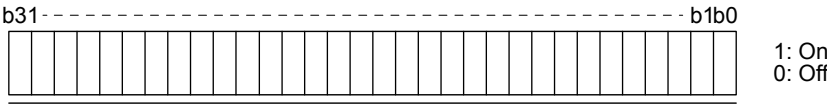
4.5.5 Input device on/off

POINT
●The on/off status of all devices in the servo amplifier are the status of the data received at last. Therefore, when there is a device which must be kept on, transmit data which turns the device on every time.

Each input device can be switched on/off. However, when the device to be switched off is in the external input signal, also switch off the input signal.

Transmit command [9] [2], data No. [6] [0], and data.

Command	Data No.	Set data
[9] [2]	[6] [0]	See below.



Command of each bit is transmitted to the master station as hexadecimal data.

Bit	Symbol
0	SON
1	LSP
2	LSN
3	TL
4	TL1
5	PC
6	RES
7	CR

Bit	Symbol
8	SP1
9	SP2
10	SP3
11	ST1/RS2
12	ST2/RS1
13	CM1
14	CM2
15	LOP

Bit	Symbol
16	
17	
18	
19	
20	STAB2
21	
22	
23	

Bit	Symbol
24	
25	
26	
27	CDP
28	CLD
29	MECR
30	
31	

4.5.6 Disabling/enabling I/O devices (DIO)

You can disable inputs regardless of the I/O device status. When inputs are disabled, the input signals (devices) are recognized as follows. However, EM2 (Forced stop 2), LSP (Forward rotation stroke end), and LSN (Reverse rotation stroke end) cannot be disabled.

Signal	Status
Input device (DI)	Off
External analog input signal	0 V
Pulse train input	None

(1) Disabling/enabling the input devices (DI), external analog input signals and pulse train inputs except EM2 (Forced stop 2), LSP (Forward rotation stroke end), and LSN (Reverse rotation stroke end). Transmit the following communication commands.

(a) Disabling

Command	Data No.	Data
[9] [0]	[0] [0]	1EA5

(b) Enabling

Command	Data No.	Data
[9] [0]	[1] [0]	1EA5

(2) Disabling/enabling the output devices (DO)
Transmit the following communication commands.

(a) Disabling

Command	Data No.	Data
[9] [0]	[0] [3]	1EA5

(b) Enabling

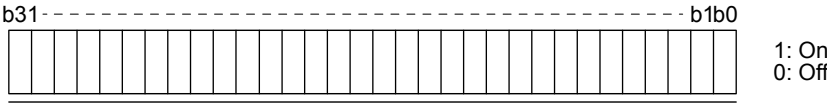
Command	Data No.	Data
[9] [0]	[1] [3]	1EA5

4.5.7 Input devices on/off (test operation)

Each input devices can be turned on/off for test operation. However, when the device to be switched off is in the external input signal, also switch off the input signal.

Transmit command [9] [2], data No. [0] [0], and data.

Command	Data No.	Set data
[9] [2]	[0] [0]	See below.



Command of each bit is transmitted to the master station as hexadecimal data.

Bit	Symbol
0	SON
1	LSP
2	LSN
3	TL
4	TL1
5	PC
6	RES
7	CR

Bit	Symbol
8	SP1
9	SP2
10	SP3
11	ST1
12	ST2
13	CM1
14	CM2
15	LOP

Bit	Symbol
16	
17	
18	
19	
20	STAB2
21	
22	
23	

Bit	Symbol
24	
25	
26	
27	CDP
28	CLD
29	MECR
30	
31	

4.5.8 Test operation mode

POINT
●The test operation mode is used to check operation. Do not use it for actual operation. ●If communication stops for longer than 0.5 s during test operation, the servo amplifier decelerates to a stop, resulting in servo-lock. To prevent this, continue communication all the time by monitoring the status display, etc. ●Even during operation, you can switch the servo amplifier to the test operation mode. In this case, switching to the test operation mode will shut off the base circuit to coast the motor.

(1) How to prepare and cancel the test operation mode

(a) Preparing the test operation mode

Set the test operation mode type with the following procedure.

1) Selection of test operation mode

Send the command [8] [B] + data No. [0] [0] + data to select the test operation mode.

Command	Data No.	Transmission data	Selection of test operation mode
[8] [B]	[0] [0]	0001	JOG operation
		0002	Positioning operation
		0004	Output signal (DO) forced output (Note)

Note Refer to section 4.5.9 for output signal (DO) forced output.

2) Check of test operation mode

Read the test operation mode set for the slave station, and check that it is set correctly.

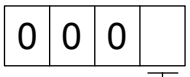
a) Transmission

Transmit command [0] [0] and data No. [1] [2].

Command	Data No.
[0] [0]	[1] [2]

b) Reply

The slave station returns the preset operation mode.



Test operation mode reading
0: Normal mode (not test operation mode)
1: JOG operation
2: Positioning operation
3: Motor-less operation
4: Output signal (DO) forced output

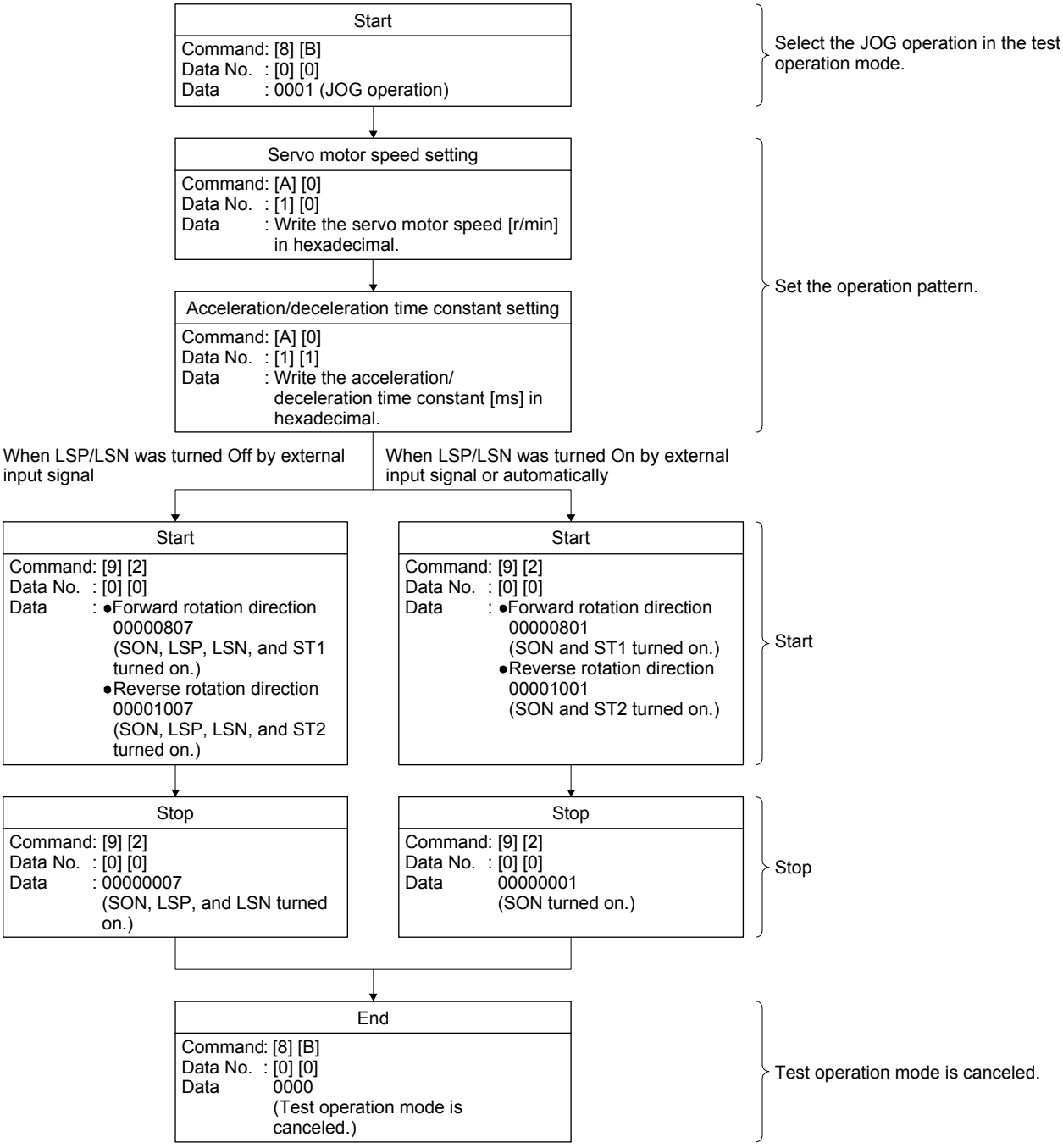
(b) Cancel of test operation mode

To terminate the test operation mode, send the command [8] [B] + data No. [0] [0] + data.

Command	Data No.	Transmission data	Selection of test operation mode
[8] [B]	[0] [0]	0000	Test operation mode cancel

(2) JOG operation

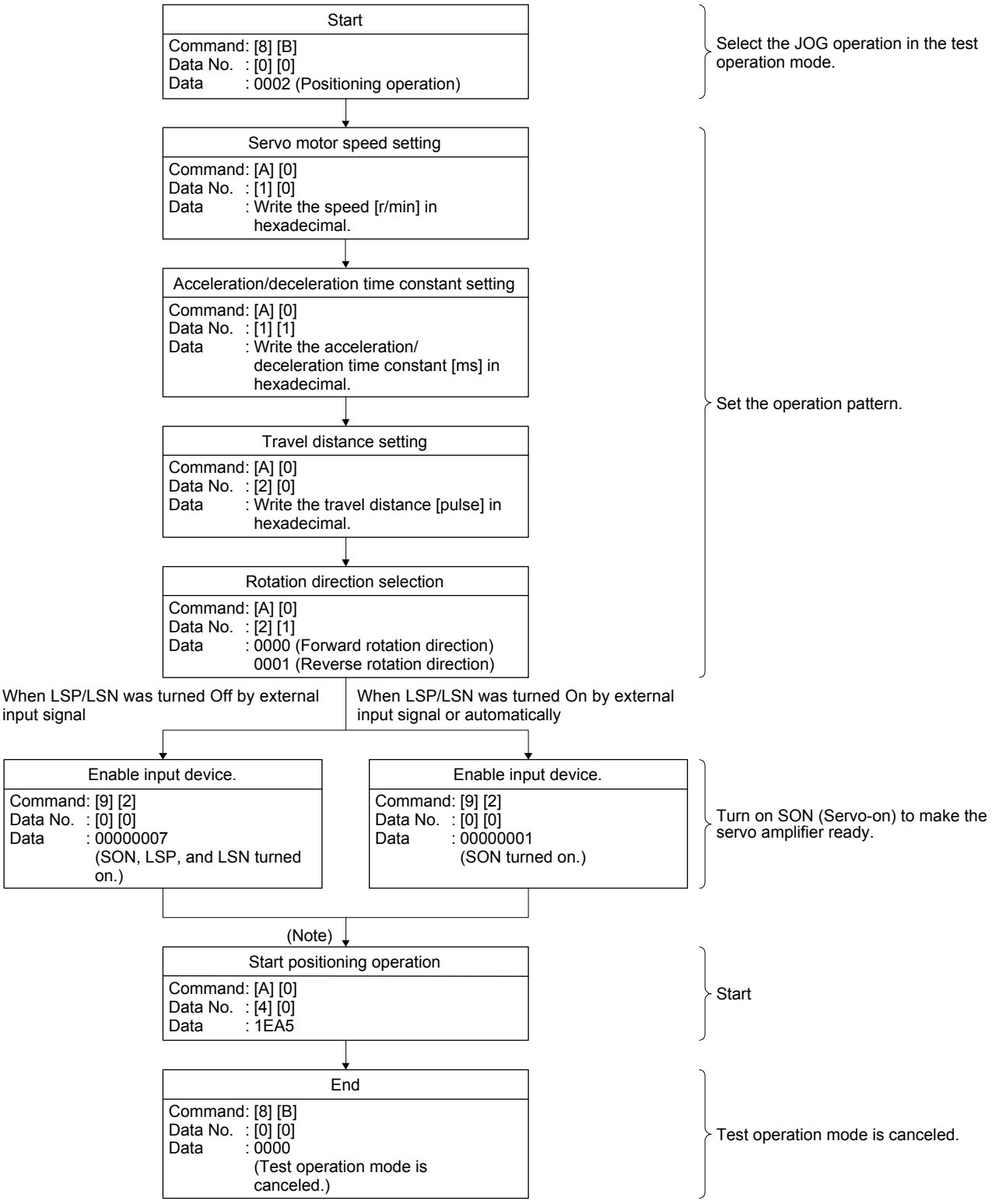
Transmit the command, data No., and data as follows to execute JOG operation.



(3) Positioning operation

(a) Operation procedure

Transmit the command, data No., and data as follows to execute positioning operation.



Note It has 100 ms delay.

(b) Temporary stop/restart/remaining distance clear

Transmit the following command, data No., and data during positioning operation to make deceleration to a stop.

Command	Data No.	Data
[A] [0]	[4] [1]	STOP

Transmit the following command, data No., and data during a temporary stop to restart.

Command	Data No.	(Note) Data
[A] [0]	[4] [1]	GO_ _

Note "_" indicates a blank.

Transmit the following command, data No., and data during a temporary stop to stop positioning operation and erase the remaining travel distance.

Command	Data No.	(Note) Data
[A] [0]	[4] [1]	CLR_

Note "_" indicates a blank.

4.5.9 Output signal pin on/off (output signal (DO) forced output)

In the test operation mode, the output signal pins can be turned on/off regardless of the servo status. Using command [9] [0], disable the external output signals in advance.

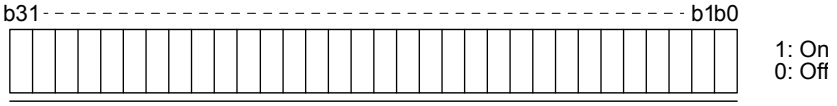
(1) Selecting output signal (DO) forced output in the test operation mode
Transmit command + [8] [B] + data No. [0] [0] + data "0004" to select output signal (DO) forced output.

0	0	0	4

Selection of test operation mode
4: Output signal (DO) forced output

(2) External output signal on/off
Transmit the following communication commands.

Command	Data No.	Set data
[9] [2]	[A] [0]	See below.



Command of each bit is transmitted to the master station as hexadecimal data.

Bit	CN1 connector pin
0	49
1	24
2	23
3	25
4	22
5	48
6	33
7	13 (Note)

Bit	CN1 connector pin
8	14 (Note)
9	
10	
11	
12	
13	
14	
15	

Bit	CN1 connector pin
16	
17	
18	
19	
20	
21	
22	
23	

Bit	CN1 connector pin
24	
25	
26	
27	
28	
29	
30	
31	

Note The MR-J4-_A_-RJ 100 W or more servo amplifier is available with software version B3 or later.

(3) Output signal (DO) forced output
Transmit command [8] [B] + data No. [0] [0] + data to stop output signal (DO) forced output.

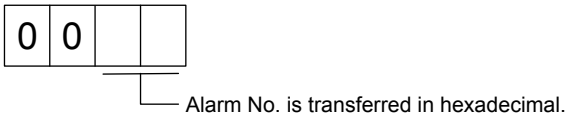
Command	Data No.	Transmission data	Selection of test operation mode
[8] [B]	[0] [0]	0000	Test operation mode cancel

4.5.10 Alarm history

(1) Alarm No. reading
The following shows how to read alarm Nos. which occurred in the past. Alarm Nos. and occurrence times of No. 0 (last alarm) to No. 15 (sixteenth alarm in the past) are read.

(a) Transmission
Transmit command [3] [3] + data No. [1] [0] to [1] [F]. Refer of section 4.4.1.

(b) Return
Alarm Nos. corresponding to the data No. is provided.

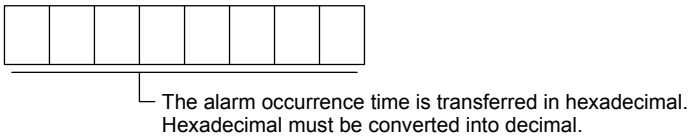


For example, "0032" means [AL. 32] and "00FF" means [AL. _ _] (no alarm).

(2) Alarm occurrence time reading
The following shows how to read alarm occurrence times which occurred in the past.
Alarm occurrence time corresponding to the data No. is provided in terms of the total time beginning with operation start, with the minute unit omitted.

(a) Transmission
Transmit command [3] [3] + data No. [2] [0] to [2] [F].
Refer of section 4.4.1.

(b) Return



For example, data "01F5" means that the alarm occurred in 501 hours after starting operation.

(3) Clearing the alarm history
Alarm history is cleared.
Transmit command [8] [2] and data No. [2] [0].

Command	Data No.	Data
[8] [2]	[2] [0]	1EA5

4.5.11 Current alarm

(1) Current alarm reading

The following shows how to read the alarm No. which is occurring currently.

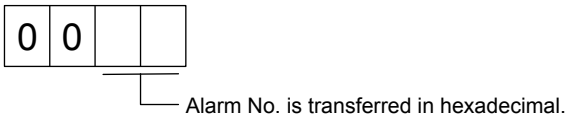
(a) Transmission

Transmit command [0] [2] and data No. [0] [0].

Command	Data No.
[0] [2]	[0] [0]

(b) Return

The slave station returns the alarm currently occurring.



For example, "0032" means [AL. 32] and "00FF" means [AL. _ _] (no alarm).

(2) Reading status display at alarm occurrence

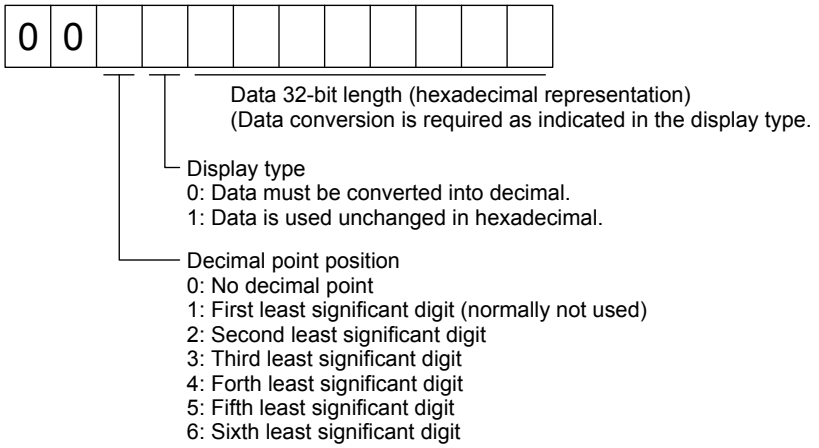
The following shows how to read the status display data at alarm occurrence. When the data No. corresponding to the status display item is transmitted, the data value and data processing information will be returned.

(a) Transmission

Transmit the command [3] [5] + the data No. corresponding to the status display item to read, [8] [0] to [8] [E] and [A] [0] to [A] [9]. Refer of section 4.4.1.

(b) Return

The slave station returns the status display data of requested alarm at occurrence.



(3) Current alarm reset

As by the reset (RES) on, reset the servo amplifier alarm to make the servo amplifier ready to operate. After removing the cause of the alarm, reset the alarm with no command entered.

Command	Data No.	Data
[8] [2]	[0] [0]	1EA5

4.5.12 Other commands

(1) Servo motor-side pulse unit absolute position

The following shows how to read the absolute position in the servo motor-side pulse unit. Note that overflow will occur in the position of 8192 or more revolutions from the home position.

(a) Transmission

Transmit command [0] [2] and data No. [9] [0].

Command	Data No.
[0] [2]	[9] [0]

(b) Return

The slave station returns the requested servo motor-side pulses.

Absolute position is sent back in hexadecimal in the servo motor-side pulse
(Data must be converted into decimal.)

For example, data "000186A0" is 100000 pulses in the motor-side pulse unit.

(2) Command unit absolute position

The following shows how to read the absolute position in the command unit.

(a) Transmission

Transmit command [0] [2] and data No. [9] [1].

Command	Data No.
[0] [2]	[9] [1]

(b) Return

The slave station returns the requested command pulses.

Absolute position is sent back in hexadecimal in the command unit.
(Data must be converted into decimal.)

For example, data "000186A0" is 100000 pulses in the command unit.

(3) Software version

The following shows how to read the software version of the servo amplifier.

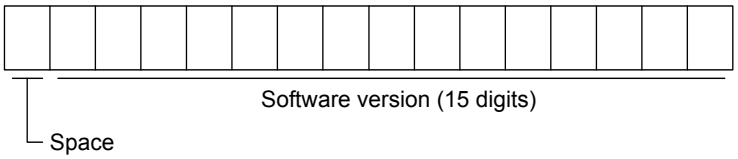
(a) Transmission

Transmit command [0] [2] and data No. [7] [0].

Command	Data No.
[0] [2]	[7] [0]

(b) Return

The slave station returns the requested software version.



5. HF-_P/HA-_P/HC-_P MOTOR DRIVE

5.1 MR-J3 series motors which are available with MR-J4-_A_ and MR-J4-_B_

POINT

●For the software version of the servo amplifier, refer to "3.1 Method for checking the software version".

●When you use a servo motor which is not supported, please contact your local sales office.

(1) 200 V class

The list for the servo motor/servo amplifier combination

Servo motor series	Servo motor model (Including servo motors with gear reducers/brakes)	Servo amplifier model (Note)	Servo amplifier software version	
			J4 mode	J3 compatibility mode
HF-KP series	HF-KP053	MR-J4-10A(-RJ)	A8 or later	
		MR-J4-10B(-RJ)		A8 or later
	HF-KP13	MR-J4-10A(-RJ)		
		MR-J4-10B(-RJ)		A8 or later
	HF-KP23	MR-J4-20A(-RJ)		
		MR-J4-20B(-RJ)		A8 or later
	HF-KP43	MR-J4-40A(-RJ)		
		MR-J4-40B(-RJ)		A8 or later
	HF-KP73	MR-J4-70A(-RJ)		
		MR-J4-70B(-RJ)		A8 or later
HF-MP series	HF-MP053	MR-J4-10A(-RJ)		
		MR-J4-10B(-RJ)		A8 or later
	HF-MP13	MR-J4-10A(-RJ)		
		MR-J4-10B(-RJ)		A8 or later
	HF-MP23	MR-J4-20A(-RJ)		
		MR-J4-20B(-RJ)		A8 or later
	HF-MP43	MR-J4-40A(-RJ)		
		MR-J4-40B(-RJ)		A8 or later
	HF-MP73	MR-J4-70A(-RJ)		
		MR-J4-70B(-RJ)		A8 or later
HF-JP 1500 r/min series	HF-JP11K1M	MR-J4-11KA(-RJ)	Unsupported	
		MR-J4-11KB(-RJ)		Unsupported
	HF-JP15K1M	MR-J4-15KA(-RJ)		
		MR-J4-15KB(-RJ)		Unsupported
HF-JP 3000 r/min series	HF-JP53	MR-J4-60A(-RJ)	A8 or later	
		MR-J4-60B(-RJ)		Unsupported
	HF-JP73	MR-J4-70A(-RJ)		
		MR-J4-70B(-RJ)		Unsupported
	HF-JP103	MR-J4-100A(-RJ)		
		MR-J4-100B(-RJ)		Unsupported
	HF-JP153	MR-J4-200A(-RJ)		
		MR-J4-200B(-RJ)		Unsupported
	HF-JP203	MR-J4-200A(-RJ)		
		MR-J4-200B(-RJ)		Unsupported
	HF-JP353	MR-J4-350A(-RJ)		
		MR-J4-350B(-RJ)		Unsupported
	HF-JP503	MR-J4-500A(-RJ)		
		MR-J4-500B(-RJ)		Unsupported
	HF-JP703	MR-J4-700A(-RJ)		
		MR-J4-700B(-RJ)		Unsupported
	HF-JP903	MR-J4-11KA(-RJ)	Unsupported	
		MR-J4-11KB(-RJ)		Unsupported

Note. not compatible with MR-J4-_B_-RJ020.

Servo motor series	Servo motor model (Including servo motors with gear reducers/brakes)	Servo amplifier model (Note)	Servo amplifier software version	
			J4 mode	J3 compatibility mode
HF-SP 1000 r/min series	HF-SP51	MR-J4-60A(-RJ)	A8 or later	
		MR-J4-60B(-RJ)		A8 or later
	HF-SP81	MR-J4-100A(-RJ)		
		MR-J4-100B(-RJ)		A8 or later
	HF-SP121	MR-J4-200A(-RJ)		
		MR-J4-200B(-RJ)		A8 or later
	HF-SP201	MR-J4-200A(-RJ)		
		MR-J4-200B(-RJ)		A8 or later
	HF-SP301	MR-J4-350A(-RJ)		
		MR-J4-350B(-RJ)		A8 or later
	HF-SP421	MR-J4-500A(-RJ)		
		MR-J4-500B(-RJ)		A8 or later
HF-SP 2000 r/min series	HF-SP52	MR-J4-60A(-RJ)		
		MR-J4-60B(-RJ)		A8 or later
	HF-SP102	MR-J4-100A(-RJ)		
		MR-J4-100B(-RJ)		A8 or later
	HF-SP152	MR-J4-200A(-RJ)		
		MR-J4-200B(-RJ)		A8 or later
	HF-SP202	MR-J4-200A(-RJ)		
		MR-J4-200B(-RJ)		A8 or later
	HF-SP352	MR-J4-350A(-RJ)		
		MR-J4-350B(-RJ)		A8 or later
	HF-SP502	MR-J4-500A(-RJ)		
		MR-J4-500B(-RJ)		A8 or later
	HF-SP702	MR-J4-700A(-RJ)		
		MR-J4-700B(-RJ)		A8 or later
HA-LP 1000 r/min series	HA-LP601	MR-J4-700A(-RJ)		
		MR-J4-700B(-RJ)		Unsupported
	HA-LP801	MR-J4-11KA(-RJ)	Unsupported	
		MR-J4-11KB(-RJ)		Unsupported
	HA-LP12K1	MR-J4-11KA(-RJ)		
		MR-J4-11KB(-RJ)		Unsupported
	HA-LP15K1	MR-J4-15KA(-RJ)		
		MR-J4-15KB(-RJ)		Unsupported
	HA-LP20K1	MR-J4-22KA(-RJ)		
		MR-J4-22KB(-RJ)		Unsupported
	HA-LP25K1	MR-J4-22KA(-RJ)		
		MR-J4-22KB(-RJ)		Unsupported
	HA-LP30K1	MR-J4-DU30KA(-RJ)		
		MR-J4-DU30KB(-RJ)		Unsupported
	HA-LP37K1	MR-J4-DU37KA(-RJ)		
		MR-J4-DU37KB(-RJ)		Unsupported
HA-LP 1500 r/min series	HA-LP701M	MR-J4-700A(-RJ)	A8 or later	
		MR-J4-700B(-RJ)		Unsupported
	HA-LP11K1M	MR-J4-11KA(-RJ)	Unsupported	
		MR-J4-11KB(-RJ)		Unsupported
	HA-LP15K1M	MR-J4-15KA(-RJ)		
		MR-J4-15KB(-RJ)		Unsupported
	HA-LP22K1M	MR-J4-22KA(-RJ)		
		MR-J4-22KB(-RJ)		Unsupported
	HA-LP30K1M	MR-J4-DU30KA(-RJ)		
		MR-J4-DU30KB(-RJ)		Unsupported
	HA-LP37K1M	MR-J4-DU37KA(-RJ)		
		MR-J4-DU37KB(-RJ)		Unsupported

Note. not compatible with MR-J4-_B_-RJ020.

Servo motor series	Servo motor model (Including servo motors with gear reducers/brakes)	Servo amplifier model (Note)	Servo amplifier software version	
			J4 mode	J3 compatibility mode
HA-LP 2000 r/min series	HA-LP502	MR-J4-500A(-RJ)	A8 or later	
		MR-J4-500B(-RJ)		Unsupported
	HA-LP702	MR-J4-700A(-RJ)		
		MR-J4-700B(-RJ)		Unsupported
	HA-LP11K2	MR-J4-11KA(-RJ)	Unsupported	
		MR-J4-11KB(-RJ)		Unsupported
	HA-LP15K2	MR-J4-15KA(-RJ)		
		MR-J4-15KB(-RJ)		Unsupported
	HA-LP22K2	MR-J4-22KA(-RJ)		
		MR-J4-22KB(-RJ)		Unsupported
	HA-LP30K2	MR-J4-DU30KA(-RJ)		
		MR-J4-DU30KB(-RJ)		Unsupported
	HA-LP37K2	MR-J4-DU37KA(-RJ)		
		MR-J4-DU37KB(-RJ)		Unsupported
HC-UP series	HC-UP72	MR-J4-70A(-RJ)	A8 or later	
		MR-J4-70B(-RJ)		Unsupported
	HC-UP152	MR-J4-200A(-RJ)	A7 or later	
		MR-J4-200B(-RJ)		Unsupported
	HC-UP202	MR-J4-350A(-RJ)	A8 or later	
		MR-J4-350B(-RJ)		Unsupported
	HC-UP352	MR-J4-500A(-RJ)		
		MR-J4-500B(-RJ)		Unsupported
	HC-UP502	MR-J4-500A(-RJ)		
		MR-J4-500B(-RJ)		Unsupported
HC-LP series	HC-LP52	MR-J4-60A(-RJ)		
		MR-J4-60B(-RJ)		Unsupported
	HC-LP102	MR-J4-100A(-RJ)		
		MR-J4-100B(-RJ)		Unsupported
	HC-LP152	MR-J4-200A(-RJ)		
		MR-J4-200B(-RJ)		Unsupported
	HC-LP202	MR-J4-350A(-RJ)		
		MR-J4-350B(-RJ)		Unsupported
	HC-LP302	MR-J4-500A(-RJ)		
		MR-J4-500B(-RJ)		Unsupported
HC-RP series	HC-RP103	MR-J4-200A(-RJ)		
		MR-J4-200B(-RJ)		Unsupported
	HC-RP153	MR-J4-200A(-RJ)		
		MR-J4-200B(-RJ)		Unsupported
	HC-RP203	MR-J4-350A(-RJ)		
		MR-J4-350B(-RJ)		Unsupported
	HC-RP353	MR-J4-500A(-RJ)		
		MR-J4-500B(-RJ)		Unsupported
	HC-RP503	MR-J4-500A(-RJ)		
		MR-J4-500B(-RJ)		Unsupported

Note. not compatible with MR-J4-_B_-RJ020.

(2) 400 Vclass

The list for the servo motor/servo amplifier combination

Servo motor series	Servo motor model	Servo amplifier model	Servo amplifier software version	
			J4 mode	J3 compatibility mode
HF-JP 1500 r/min series	HF-JP11K1M4	MR-J4-11KA4(-RJ)	Unsupported	
		MR-J4-11KB4(-RJ)		Unsupported
	HF-JP15K1M4	MR-J4-15KA4(-RJ)		
		MR-J4-15KB4(-RJ)		Unsupported
HF-JP 3000 r/min series	HF-JP534	MR-J4-60A4(-RJ)		
		MR-J4-60B4(-RJ)		Unsupported
	HF-JP734	MR-J4-100A4(-RJ)		
		MR-J4-100B4(-RJ)		Unsupported
	HF-JP1034	MR-J4-100A4(-RJ)		
		MR-J4-100B4(-RJ)		Unsupported
	HF-JP1534	MR-J4-200A4(-RJ)		
		MR-J4-200B4(-RJ)		Unsupported
	HF-JP2034	MR-J4-200A4(-RJ)		
		MR-J4-200B4(-RJ)		Unsupported
	HF-JP3534	MR-J4-350A4(-RJ)		
		MR-J4-350B4(-RJ)		Unsupported
	HF-JP5034	MR-J4-500A4(-RJ)		
		MR-J4-500B4(-RJ)		Unsupported
	HF-JP7034	MR-J4-700A4(-RJ)		
		MR-J4-700B4(-RJ)		Unsupported
	HF-JP9034	MR-J4-11KA4(-RJ)		
		MR-J4-11KB4(-RJ)		Unsupported
HF-SP 2000 r/min series	HF-SP524	MR-J4-60A4(-RJ)	Unsupported	
		MR-J4-60B4(-RJ)		Unsupported
	HF-SP1024	MR-J4-100A4(-RJ)		
		MR-J4-100B4(-RJ)		Unsupported
	HF-SP1524	MR-J4-200A4(-RJ)		
		MR-J4-200B4(-RJ)		Unsupported
	HF-SP2024	MR-J4-200A4(-RJ)		
		MR-J4-200B4(-RJ)		Unsupported
	HF-SP3524	MR-J4-350A4(-RJ)		
		MR-J4-350B4(-RJ)		Unsupported
	HF-SP5024	MR-J4-500A4(-RJ)		
		MR-J4-500B4(-RJ)		Unsupported
	HF-SP7024	MR-J4-700A4(-RJ)		
		MR-J4-700B4(-RJ)		Unsupported

Servo motor series	Servo motor model	Servo amplifier model	Servo amplifier software version	
			J4 mode	J3 compatibility mode
HA-LP 1000 r/min series	HA-LP6014	MR-J4-700A4(-RJ)	Unsupported	
		MR-J4-700B4(-RJ)		Unsupported
	HA-LP8014	MR-J4-11KA4(-RJ)		
		MR-J4-11KB4(-RJ)		Unsupported
	HA-LP12K14	MR-J4-11KA4(-RJ)		
		MR-J4-11KB4(-RJ)		Unsupported
	HA-LP15K14	MR-J4-15KA4(-RJ)		
		MR-J4-15KB4(-RJ)		Unsupported
	HA-LP20K14	MR-J4-22KA4(-RJ)		
		MR-J4-22KB4(-RJ)		Unsupported
	HA-LP25K14	MR-J4-DU30KA4(-RJ)		
		MR-J4-DU30KB4(-RJ)		Unsupported
	HA-LP30K14	MR-J4-DU30KA4(-RJ)		
		MR-J4-DU30KB4(-RJ)		Unsupported
	HA-LP37K14	MR-J4-DU37KA4(-RJ)		
		MR-J4-DU37KB4(-RJ)		Unsupported
HA-LP 1500 r/min series	HA-LP701M4	MR-J4-700A4(-RJ)	Unsupported	
		MR-J4-700B4(-RJ)		Unsupported
	HA-LP11K1M4	MR-J4-11KA4(-RJ)		
		MR-J4-11KB4(-RJ)		Unsupported
	HA-LP15K1M4	MR-J4-15KA4(-RJ)		
		MR-J4-15KB4(-RJ)		Unsupported
	HA-LP22K1M4	MR-J4-22KA4(-RJ)		
		MR-J4-22KB4(-RJ)		Unsupported
	HA-LP30K1M4	MR-J4-DU30KA4(-RJ)		
		MR-J4-DU30KB4(-RJ)		Unsupported
	HA-LP37K1M4	MR-J4-DU37KA4(-RJ)		
		MR-J4-DU37KB4(-RJ)		Unsupported
	HA-LP45K1M4	MR-J4-DU45KA4(-RJ)		
		MR-J4-DU45KB4(-RJ)		Unsupported
	HA-LP50K1M4	MR-J4-DU55KA4(-RJ)		
		MR-J4-DU55KB4(-RJ)		Unsupported
HA-LP 2000 r/min series	HA-LP11K24	MR-J4-11KA4(-RJ)	Unsupported	
		MR-J4-11KB4(-RJ)		Unsupported
	HA-LP15K24	MR-J4-15KA4(-RJ)		
		MR-J4-15KB4(-RJ)		Unsupported
	HA-LP22K24	MR-J4-22KA4(-RJ)		
		MR-J4-22KB4(-RJ)		Unsupported
	HA-LP30K24	MR-J4-DU30KA4(-RJ)		
		MR-J4-DU30KB4(-RJ)		Unsupported
	HA-LP37K24	MR-J4-DU37KA4(-RJ)		
		MR-J4-DU37KB4(-RJ)		Unsupported
	HA-LP45K24	MR-J4-DU45KA4(-RJ)		
		MR-J4-DU45KB4(-RJ)		Unsupported
	HA-LP55K24	MR-J4-DU55KA4(-RJ)		
		MR-J4-DU55KB4(-RJ)		Unsupported

5.2 MR-J3 series motors which are available with MR-J4W2-_B

POINT

●For the software version of the servo amplifier, refer to "3.1 Method for checking the software version".

●When you use a servo motor which is not supported, please contact your local sales office.

(1) 200 V class

The list for the servo motor/servo amplifier combination

Servo motor series	Servo motor model	Servo amplifier model	Servo amplifier software version	
			J4 mode	J3 compatibility mode
HF-KP series	HF-KP053	MR-J4W2-22B	D0 or later	D0 or later
		MR-J4W2-44B		
	HF-KP13	MR-J4W2-22B		
		MR-J4W2-44B		
	HF-KP23	MR-J4W2-22B		
		MR-J4W2-44B		
	HF-KP43	MR-J4W2-44B		
		MR-J4W2-77B		
		MR-J4W2-1010B		
	HF-KP73	MR-J4W2-77B		
		MR-J4W2-1010B		
HF-MP series	HF-MP053	MR-J4W2-22B		
		MR-J4W2-44B		
	HF-MP13	MR-J4W2-22B		
		MR-J4W2-44B		
	HF-MP23	MR-J4W2-22B		
		MR-J4W2-44B		
	HF-MP43	MR-J4W2-44B		
		MR-J4W2-77B		
		MR-J4W2-1010B		
	HF-MP73	MR-J4W2-77B		
		MR-J4W2-1010B		
HF-JP 3000 r/min series	HF-JP53	MR-J4W2-77B	Unsupported	Unsupported
		MR-J4W2-1010B		
	HF-JP73	MR-J4W2-77B		
		MR-J4W2-1010B		
	HF-JP103	MR-J4W2-1010B		
HF-SP 1000 r/min series	HF-SP51	MR-J4W2-77B	D0 or later	D0 or later
		MR-J4W2-1010B		
	HF-SP81	MR-J4W2-1010B		
HF-SP 2000 r/min series	HF-SP52	MR-J4W2-77B		
		MR-J4W2-1010B		
	HF-SP102	MR-J4W2-1010B		
HC-UP series	HC-UP72	MR-J4W2-77B	Unsupported	Unsupported
		MR-J4W2-1010B		
HC-LP series	HC-LP52	MR-J4W2-77B		
		MR-J4W2-1010B		
	HC-LP102	MR-J4W2-1010B		

6. APPLICATION OF FUNCTIONS

This chapter explains application of using servo amplifier functions.

POINT
●The J3 compatibility mode is compatible only with MR-J4-_B_(-RJ) and MR-J4W2-_B servo amplifiers.

6.1 J3 compatibility mode

POINT
●J3 series servo motor driving in the J3 compatibility mode will be sequentially available. For the target models and schedule, contact your local sales office. ●Specifications of the J3 compatibility mode of the servo amplifier with software version A4 or earlier differ from those with software version A5 or later. For details, refer to section 6.1.8. ●The J3 compatibility mode is not compatible with the master-slave operation function. ●The fully closed loop control in the J3 compatibility mode is available for the servo amplifiers with software version A3 or later.

6.1.1 J3 Outline of J3 compatibility mode

MR-J4-_B_(-RJ) servo amplifiers and MR-J4W2-_B have two operation modes. "J4 mode" is for using all functions with full performance and "J3 compatibility mode" is compatible with MR-J3-_B_ series for using the amplifiers as the conventional series.
When you connect an amplifier with SSCNET III/H communication for the first controller communication by factory setting, the operation mode will be fixed to "J4 mode". For SSCNET communication, it will be fixed to "J3 compatibility mode". When you set the mode back to the factory setting, use the application "MR-J4(W)-B mode selection".
The application "MR-J4(W)-B mode selection" is packed with MR Configurator2 of software version 1.12N or later.
For the operating conditions of the application "MR-J4(W)-B mode selection", use MR Configurator2.

6.1.2 Operation modes supported by J3 compatibility mode

The J3 compatibility mode supports the following operation modes.

Operation mode in J3 compatibility mode	Model of MR-J3-_B	Model of MR-J3W-_B
MR-J3-B standard control mode (rotary servo motor)	MR-J3-_B	MR-J3W-_B

Each operation mode has the same ordering as conventional MR-J3-B series servo amplifiers and is compatible with their settings.
In addition, the control response characteristic in the J3 compatibility mode will be the same as that of MR-J3 series. By enabling the J3 extension function, control response will be equal to MR-J4 series using a controller compatible with SSCNET III.

6.1.3 J3 compatibility mode supported function list

The following shows functions which compatible with J4 mode and J3 compatibility mode. The letters such as "A0" described after ◎ and ○ mean servo amplifier software versions which compatible with each function. Each function is used with servo amplifiers with these software versions or later.

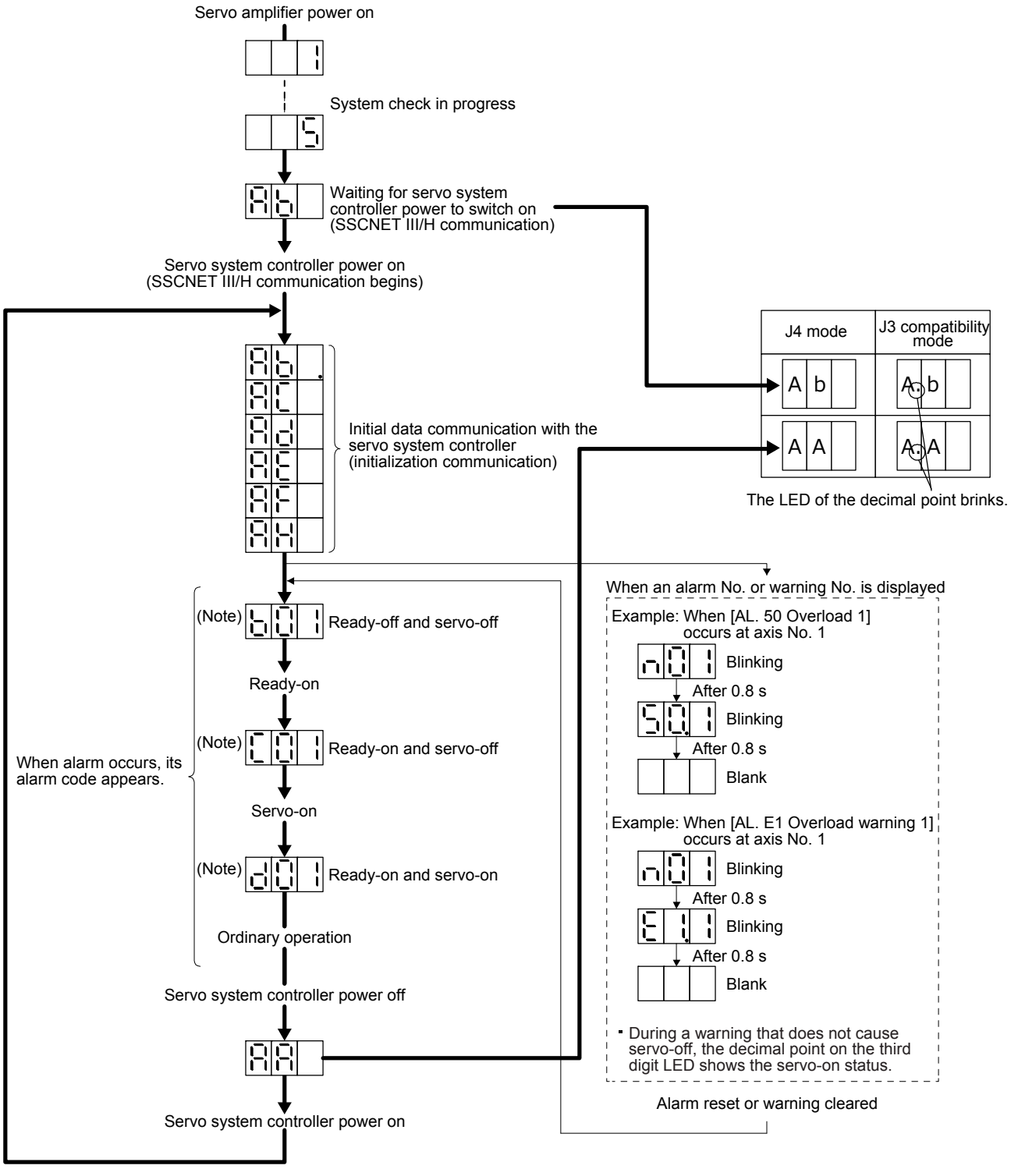
Function	Name	Compatible (◎: J4 new, ○: Equivalent to J3, ×: Not available)		
		MR-J4 series		MR-J3/MR-J3W series (Note 5)
		J4 mode	J3 compatibility mode	
Basic specification	Speed frequency response	2.5 kHz	2.1 kHz	2.1 kHz
	Encoder resolution	22 bits (Note 1)	18 bits (Note 1)	18 bits
SSCNET III/H communication or SSCNET III communication	Communication baud rate	150 Mbps	50 Mbps	50 Mbps
	Maximum distance between stations	100 m	50 m	50 m
Basic function	Absolute position detection system	○A0	○A0	○
	Motor-less operation	○A0	○A0	○
	Rotation direction selection/travel direction selection	○A0	○A0	○
Encoder output pulses	A/B-phase pulse output	○A0	○A0	○
	Z-phase pulse output	○A0 (Note 2)	○A0 (Note 2)	○ (Note 2)
Input/output	Analog monitor output	○A0 (Note 3)	○A0 (Note 3)	○
	Motor thermistor	○A0	○A0	MR-J3W-_B
Control mode	Position control mode	○A0	○A0	○
	Speed control mode	○A0	○A0	○
	Torque control mode	○A0	○A0	○
	Continuous operation to torque control mode	○A0	○A0	○
Auto tuning	Auto tuning mode 1	○A0	○A0	○
	Auto tuning mode 2	○A0	○A0	○
	2 gain adjustment mode 1 (interpolation mode)	○A0	○A0	○
	2 gain adjustment mode 2	◎A0	×	×
	Manual mode	○A0	○A0	○
Filter function	Machine resonance suppression filter 1	○A0	○A0	○
	Machine resonance suppression filter 2	○A0	○A0	○
	Machine resonance suppression filter 3	◎A0	◎B0 (Note 9)	×
	Machine resonance suppression filter 4	◎A0	◎B0 (Note 9)	×
	Machine resonance suppression filter 5	◎A0	◎B0 (Note 9)	×
	Shaft resonance suppression filter	○A0	◎B0 (Note 9)	×
	Low-pass filter	○A0	○A0	○
	Robust disturbance compensation (Note 6)	×	○A0	○
	Robust filter	◎A0	◎B0 (Note 9)	×
Vibration suppression control	Standard mode/3 inertia mode	◎A0	◎B0 (Note 9)	×
	Vibration suppression control 1	○A0	○A0	○
	Vibration suppression control 2	◎A0	◎B0 (Note 9)	×
	Command notch filter	○A0	○A0	○

Function	Name	Compatible (◎: J4 new, ○: Equivalent to J3, ×: Not available)		
		MR-J4 series		MR-J3/MR-J3W series (Note 5)
		J4 mode	J3 compatibility mode	
Applied control	Gain switching	○A0	○A0	○
	Slight vibration suppression control	○A0	○A0	○
	Overshoot amount compensation	○A0	○A0	○
	PI-PID switching control	○A0	○A0	○
	Feed forward	○A0	○A0	○
	Torque limit	○A0	○A0	○
	Master-slave operation function	○A8 (Note 3)	×	○
	Scale measurement function	◎A8	×	×
	Model adaptive control disabled	○B4	○B4	×
	Lost motion compensation function	◎B4 (Note 3)	◎B4 (Note 3, 9)	×
	Super trace control	◎B4 (Note 3)	×	×
Adjustment function	One-touch tuning	◎A0	◎B0 (Note 9)	×
	Adaptive tuning	○A0	○A0	○
	Vibration suppression control 1 tuning	○A0	○A0	○
	Vibration suppression control 2 tuning	◎A0	◎B0 (Note 9)	×
Encoder	Semi closed loop control two-wire type/four-wire type selection	○A0	○A0	○
Functional safety	STO function	○A0	○A0	×
	Forced stop deceleration function at alarm occurrence	○A0	○A0 (Note 8)	×
	Vertical axis freefall prevention function	○A0	○A0	×
Tough drive function	SEMI-F47 function	◎A0	◎B0 (Note 9, 10)	×
	Vibration tough drive	◎A0	◎B0 (Note 9)	×
	Instantaneous power failure tough drive	◎A0	◎B0 (Note 9)	×
Diagnosis function	3-digit alarm display	◎A0	◎A0	MR-J3W-_B
	16 alarm histories supported	◎A0	× (Note 4)	× (Note 4)
	Drive recorder function	◎A0	◎B0 (Note 9)	×
	Machine diagnosis function	◎A0	◎B0 (Note 9)	×
Controller	SSCNET III	×	○A0	○
	SSCNET III/H	◎A0	×	×
	Home position return function	○A0	○A0	○
Others	J4 mode/J3 compatibility mode automatic identification (Note 7)	○A0	○A0	×
	Power monitoring function	◎A0	◎B0 (Note 9)	×

Note 1. The value is at the HG series servo motor driving.
2. It is not available with the MR-J3W-_B and MR-J4W2-_B servo amplifiers.
3. It is not available with MR-J4W2-_B servo amplifiers.
4. Alarm history will be saved up to six times.
5. The functions of the product with modified parts (GA) in the MR-J3-_B servo amplifiers are all covered by the J3 compatibility mode of the MR-J4-_B servo amplifiers.
6. For MR-J4 series, the robust filter and vibration tough drive are available instead.
7. The operation mode will be identified automatically at the first controller communication. You can change the operation mode with the application "MR-J4(W)-B mode selection".
8. When MR-J4 is used as a replacement of MR-J3-_S, "Servo forced stop selection" in [Pr. PA04] will be "Disabled (_ 1 _ _)" in the initial setting. Change the setting as necessary.
9. This is available when the J3 extension function is enabled. Refer to "MR-J4-_B_ Servo amplifier instruction manual" or "MR-J4W_-_B Servo amplifier instruction manual" for details.
10. For servo system controllers which are available with this, contact your local sales office.

6.1.4 Distinguishing J3 compatibility mode

Following shows the status display of the servo amplifier axis of MR-J4-_B_ and MR-J4W2-_B. In the states of "Waiting for servo system controller power to switch on (SSCNET III/H communication)" and "Servo system controller power off", the decimal point on the first digit LED turns off in J4 mode, and blinks in J3 compatibility mode. This function can be used with servo amplifiers with software version A5 or later.

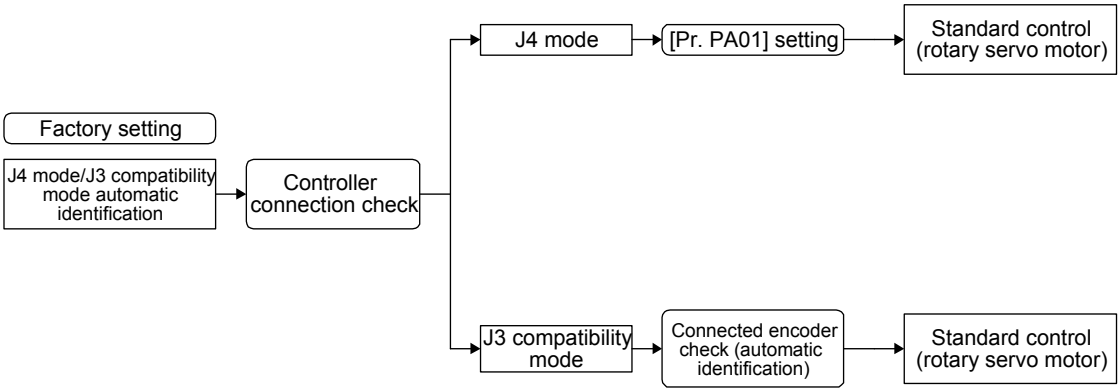


Note. Axis No. 1, Axis No. 2 ... Axis No. 64 The segment of the last 2 digits shows the axis number.

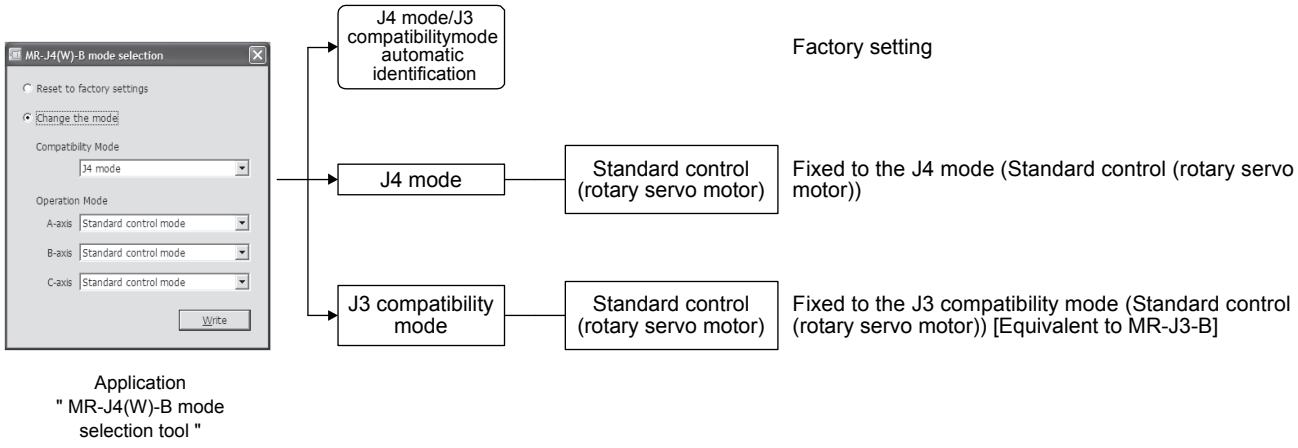
6.1.5 How to switch J4 mode/J3 compatibility mode

There are two ways to switch the J4 mode/J3 compatibility mode with the MR-J4-_B_(-RJ) servo amplifier and MR-J4W2-_B servo amplifier.

(1) Mode selection by the automatic identification of the servo amplifier
J4 mode/J3 compatibility mode is identified automatically depending on the connected controller.
When the controller makes a connection request with SSCNET III/H communication, the mode will be "J4 mode". For SSCNET communication, it will be "J3 compatibility mode".
For the J3 compatibility mode, standard control will be identified automatically with a motor (encoder) connected to the servo amplifier. For the J4 mode, the operation mode will be the setting of [Pr. PA01].



(2) Mode selection using the application software "MR-J4(W)-B mode selection"
You can set the factory setting, J4 mode/J3 compatibility mode, and operation mode with the dedicated application.



6.1.6 How to use the J3 compatibility mode

(1) Setting of the controller

To use in the J3 compatibility mode, select MR-J3 series in the system setting window.

Operation mode in J3 compatibility mode	System setting
MR-J3-B standard control mode (rotary servo motor)	Select MR-J3-_B.

(2) Setting of setup software (SETUP221E)

To use in the J3 compatibility mode, make the system setting as follows.

Operation mode in J3 compatibility mode	System setting
MR-J3-B standard control mode (rotary servo motor)	Select MR-J3-_B.

Cautions for using setup software (SETUP221E)

・The gain search cannot be used. You can use the advanced gain search.

(3) Setting of MR Configurator2

To use in the J3 compatibility mode, make the system setting as follows.

Operation mode in J3 compatibility mode	System setting
MR-J3-B standard control mode (rotary servo motor)	Select MR-J3-_B.

Cautions for using MR Configurator2

・Use MR Configurator2 with software version 1.12N or later. Older version than 1.12N cannot be used.
・Information about existing models (MR-J3) cannot be updated with the parameter setting range update function. Register a new model to use.
・The alarm will be displayed by 3 digits.
・The robust disturbance compensation cannot be used.

6.1.7 Cautions for switching J4 mode/J3 compatibility mode

The J3 compatibility mode of the operation mode is automatically identified by factory setting depending on a connected encoder. If a proper encoder is not connected at the first connection, the system will not start normally due to a mismatch with a set mode with the controller. (For the J4 mode, you can set the operation mode with [Pr. PA01].) When the operation mode mismatches, the servo amplifier will display [AL. 3E.1 Operation mode error]. Set the mode back to the factory setting or set correctly (J4 mode/J3 compatibility mode and operation mode) using the application "MR-J4(W)-B mode selection".

6.1.8 Cautions for the J3 compatibility mode

The J3 compatibility mode is partly changed and has restrictions compared with MR-J3 series.

(1) The alarm display was changed from 2 digits (_ _) to 3 digits (_ _. _). The alarm detail number (._) is displayed in addition to the alarm No (_ _). The alarm No. (_ _) is not changed.

(2) When the power of the servo amplifier is cut or fiber-optic cable is disconnected, the same type communication can be cut regardless of connection order. When you power on/off the servo amplifier during operation, use the connect/disconnect function of the controller. Refer to the following manuals for detail.
- MELSEC iQ-R Motion Controller Programming Manual (Common) (R16MTCPU/R32MTCPU) (IB-0300237) "5.3.1 Connect/disconnect function of SSCNET communication"
- Motion controller Q series Programming Manual (COMMON) (Q173D(S)CPU/Q172D(S)CPU) (IB-0300134) "4.11.1 Connect/disconnect function of SSCNET communication"
- MELSEC iQ-R Simple Motion Module User's Manual (Application) (RD77MS2/RD77MS4/RD77MS8/RD77MS16) (IB-0300247) "8.12 Connect/Disconnect Function of SSCNET Communication"
- MELSEC-Q QD77MS Simple Motion Module User's Manual (IB-0300185) "14.12 Connect/disconnect function of SSCNET communication"
- MELSEC-L LD77MH Simple Motion Module User's Manual (IB-0300172) "14.13 Connect/disconnect function of SSCNET communication"
- MELSEC-L LD77MS Simple Motion Module User's Manual (Positioning Control) (IB-0300211) "14.13 Connect/disconnect function of SSCNET communication"

(3) The J3 compatibility mode has a functional compatibility. However, the operation timing may differ. Check the operation timing on customer side to use.

(4) The J3 compatibility mode is not compatible with high-response control set by [Pr. PA01 Operation mode].

6.1.9 Change of specifications of "J3 compatibility mode" switching process

(1) Detailed explanation of "J3 compatibility mode" switching

(a) Operation when using a servo amplifier before change of specifications

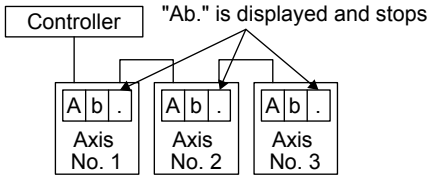
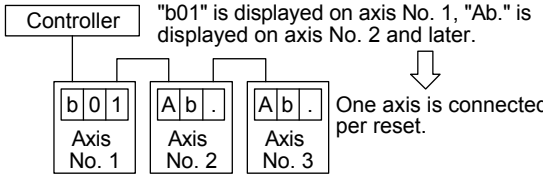
For the controllers in which "Not required" is described to controller reset in table 5.1, the mode will be switched to "J3 compatibility mode" for all axes at the first connection. However, it takes about 10 s per axis for completing the connection.

For the controllers in which "Reset required" is described in table 5.1, the operation at the first connection is shown in table 5.2. The LED displays will be "Ab." for all axes at the first connection to the controller as shown in table 5.2. After that, resetting controller will change the 1-axis to "b01". The 2-axis and later will not change from "Ab.". After that, one axis will be connected per two times of controller reset.

Table 5.1 Controller reset required/not required list (before change of specifications)

Controller	Model	Controller reset required/not required	
		Single-axis connection	Multi-axis connection
Motion controller	R_MTCPU	Not required	Not required
	Q17_DSCPU	Not required	Not required
	Q17_DCPU	Not required	Not required
	Q17_HCPU	Not required	Not required
	Q170MCPU	Not required	Not required
Simple motion module Positioning module	RD77MS_	Not required	Not required
	QD77MS_	Not required	Not required
	LD77MS_	Not required	Not required
	QD75MH_	Not required	Not required
	QD74MH_	Reset required	Reset required
	LD77MH_	Not required	Not required
	FX3U-20SSC-H	Not required	Reset required

Table 5.2 Controller connection operation before change of specifications

	Before change of specifications (software version A4 or earlier)
First connection of controller	
After controller reset	

(b) Operation when using a servo amplifier after change of specifications

For the controllers in which "Not required" is described to controller reset in table 5.3, the mode will be switched to "J3 compatibility mode" for all axes at the first connection. It takes about 10 s for completing the connection not depending on the number of axes.

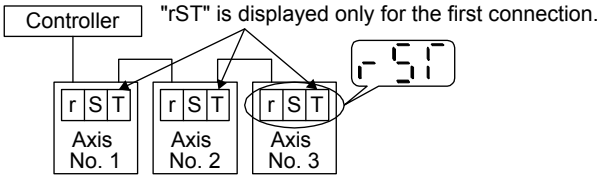
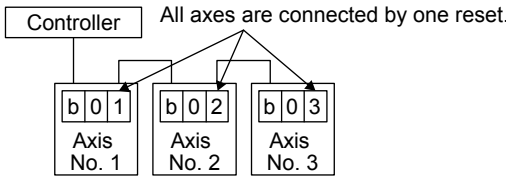
For the controllers in which "Reset required" is described in table 5.3, the operation at the first connection is shown in table 5.4. The servo amplifier's mode will be "J3 compatibility mode" and the LED displays will be "rST" for all axes at the first connection to the controller as shown in table 5.4. At the status, resetting controller once will change the display to "b##" (## means axis No.) for all axes and all axes will be ready to connect.

(One controller reset enables to all-axis connection.)

Table 5.3 Controller reset required/not required list (after change of specifications)

Controller	Model	Controller reset required/not required	
		Single-axis connection	Multi-axis connection
Motion controller	R_MTCPU	Not required	Not required
	Q17_DSCPU	Not required	Not required
	Q17_DCPU	Not required	Not required
	Q17_HCPU	Not required	Not required
	Q170MCPU	Not required	Not required
Simple motion module Positioning module	RD77MS_	Not required	Not required
	QD77MS_	Not required	Not required
	LD77MS_	Not required	Not required
	QD75MH_	Not required	Not required
	QD74MH_	Reset required	Reset required
	LD77MH_	Not required	Not required
	FX3U-20SSC-H	Reset required	Reset required

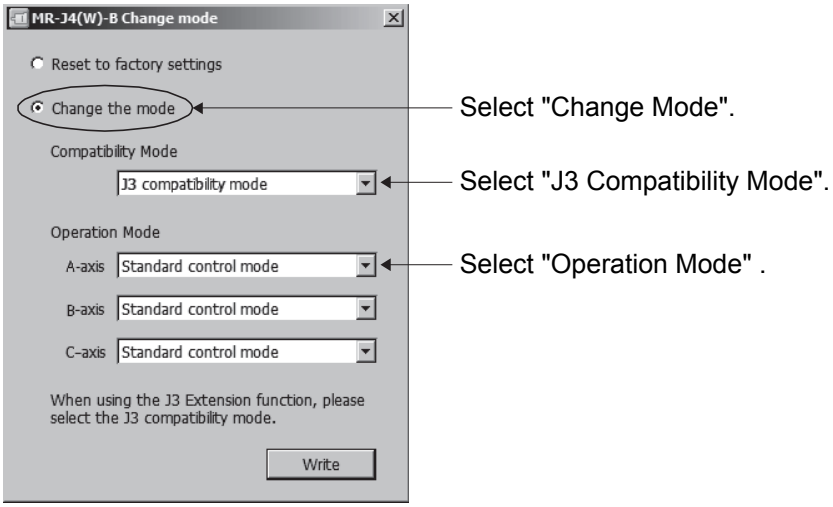
Table 5.4 Controller connection operation after change of specifications

	After change of specifications (software version A5 or above)
First connection of controller	
After controller reset	

(c) Using servo amplifiers before and after change of specifications simultaneously

When using servo amplifiers before change of specifications and after change of specifications simultaneously, controller reset is necessary for number of connecting axes of servo amplifiers.

(2) Changing the mode to "J3 compatibility mode" by using the application "MR-J4(W)-B mode selection".
You can switch the servo amplifier's mode to "J3 compatibility mode" beforehand with the built-in application software "MR-J4(W)-B mode selection" of MR Configurator2. Use it for a solution when it is difficult to reset many times with your "Reset required" controller such as "QD74MH_".
The application "MR-J4(W)-B mode selection" has no expiration date.



6.1.10 J3 extension function

POINT
●The J3 extension function is used with servo amplifiers with software version B0 or later. ●To enable the J3 extension function, MR Configurator2 with software version 1.25B or later is necessary. ●The J3 extension function of the amplifier differs from MR-J3-B in motion. ●For details of the J3 extension function, refer to each servo amplifier instruction manual.

The J3 extension function is for using functions of J4 mode with J3 compatibility mode.
By enabling the J3 extension function, control response will be equal to MR-J4 series using a controller compatible with SSCNET III.

J4 mode	J3 compatibility mode	
	J3 extension function enabled: [Pr. PX01] = "_ _ _ 1"	J3 extension function disabled: [Pr. PX01] = "_ _ _ 0"
・SSCNET III/H communication ・MR-J4-B function	・SSCNET III communication ・The same parameter ordering as MR-J3-B ・MR-J4-B control function ・Parameter added	・SSCNET III communication ・The same parameter ordering as MR-J3-B

The following shows functions used with the J3 extension function.

Function	Description
Gain switching function (Vibration suppression control 2 and model loop gain)	You can switch gains during rotation/stop, and can use input devices to switch gains during operation.
Advanced vibration suppression control II	This function suppresses vibration at the arm end or residual vibration.
Machine resonance suppression filter 3 Machine resonance suppression filter 4 Machine resonance suppression filter 5	This is a filter function (notch filter) which decreases the gain of the specific frequency to suppress the resonance of the mechanical system.
Shaft resonance suppression filter	When a load is mounted to the servo motor shaft, resonance by shaft torsion during driving may generate a mechanical vibration at high frequency. The shaft resonance suppression filter suppresses the vibration.
Robust filter	This function provides better disturbance response in case low response level that load to motor inertia ratio is high for such as roll send axes.
One-touch tuning	Gain adjustment is performed just by one click on a certain button on MR Configurator2. MR Configurator2 is necessary for this function.
Tough drive function	This function makes the equipment continue operating even under the condition that an alarm occurs. The tough drive function includes two types: the vibration tough drive and the instantaneous power failure tough drive.
SEMI-F47 function (Note 1)	Enables to avoid triggering [AL. 10 Undervoltage] using the electrical energy charged in the capacitor in case that an instantaneous power failure occurs during operation. Use a 3-phase for the input power supply of the servo amplifier. Using a 1-phase 200 V AC for the input power supply will not comply with SEMI-F47 standard.
Drive recorder function	This function continuously monitors the servo status and records the status transition before and after an alarm for a fixed period of time. You can check the recorded data on the drive recorder window on MR Configurator2 by clicking the "Graph" button. However, the drive recorder will not operate on the following conditions. 1. You are using the graph function of MR Configurator2. 2. You are using the machine analyzer function. 3. [Pr. PX30] is set to "-1". 4. The controller is not connected (except the test operation mode). 5. An alarm related to the controller is occurring.
Power monitoring function	This function calculates the power running energy and the regenerative power from the data in the servo amplifier such as speed and current. Power consumption and others are displayed on MR Configurator2 in the system of SSCNET III/H. Since the servo amplifier sends data to a servo system controller, you can analyze the data and display the data on a display.
Machine diagnosis function	From the data in the servo amplifier, this function estimates the friction and vibrational component of the drive system in the equipment and recognizes an error in the machine parts, including a ball screw and bearing. MR Configurator2 is necessary for this function.
Lost motion compensation function (Note 2)	This function improves the response delay occurred when the machine moving direction is reversed. This is used with servo amplifiers with software version B4 or later. Check the software version of the servo amplifier using MR Configurator2.

Note 1. For servo system controllers which are available with this, contact your local sales office.
2. It is not available with MR-J4W2-_B servo amplifiers.

6.2 Master-slave operation function

⚠WARNING	●Configure the circuit so that all the master and slave axes for the same machine are stopped by the controller forced stop at the moment of a stop of a master or slave axis due to such as a servo alarm. When they are not stopped simultaneously by the controller forced stop, the servo motor may operate unexpectedly and the machine can be damaged. ●All the master and slave axes for the same machine should turn on/off EM1 (Forced stop 1) simultaneously. When EM1 (Forced stop 1) is not turned on/off simultaneously, the servo motor may operate unexpectedly and the machine can be damaged.

POINT

●The master-slave operation function works only when the forced stop deceleration function is disabled. When the forced stop deceleration function is enabled, [AL. 37] will occur.
●The master-slave operation function cannot be used with the continuous operation to torque control.
●Use the master-slave operation function with the following controllers. Refer to the manuals for each servo system controller for compatible software versions, and other details.
RD77MS/QD77MS_/LD77MS_
R_MTCPU/Q17_DSCPU
Q170MSCPU
●When the function is used in vertical axis system, set the same value to the parameters regarding the dynamic brake and electromagnetic brake to prevent a drop of axes.
●The servo-on command of the master axis and slave axis should be turned on/off simultaneously. If the servo-on command is turned on only for a slave axis, torque will not be generated. Therefore, an extreme load will be applied to the electromagnetic brake of the master axis for using in vertical axis system.
●The master-slave operation function is available for servo amplifier with software version A8 or later. All servo amplifiers used in the same system connected to a controller should be software version A8 or later.
●It is not available with MR-J4W2-_B servo amplifiers.

(1) Summary

The master-slave operation function transmits a master axis torque to slave axes using driver communication and the torque as a command drives slave axes by torque control.
Transmission of torque data from the master axis to slave axes is via SSCNET III/H. Additional wiring is not required.

(2) System configuration

POINT

●The control modes compatible with the master-slave operation function are as follows.

Master-slave operation function compatibility table

Control mode	Forced stop deceleration function	Master axis (Note)	Slave axis (Note)
Standard control mode	Enabled		
	Disabled	○	○

○: Available

Note. When a setting for the master-slave operation is set to an axis which is not compatible with the master-slave operation function, [AL. 37] will occur.

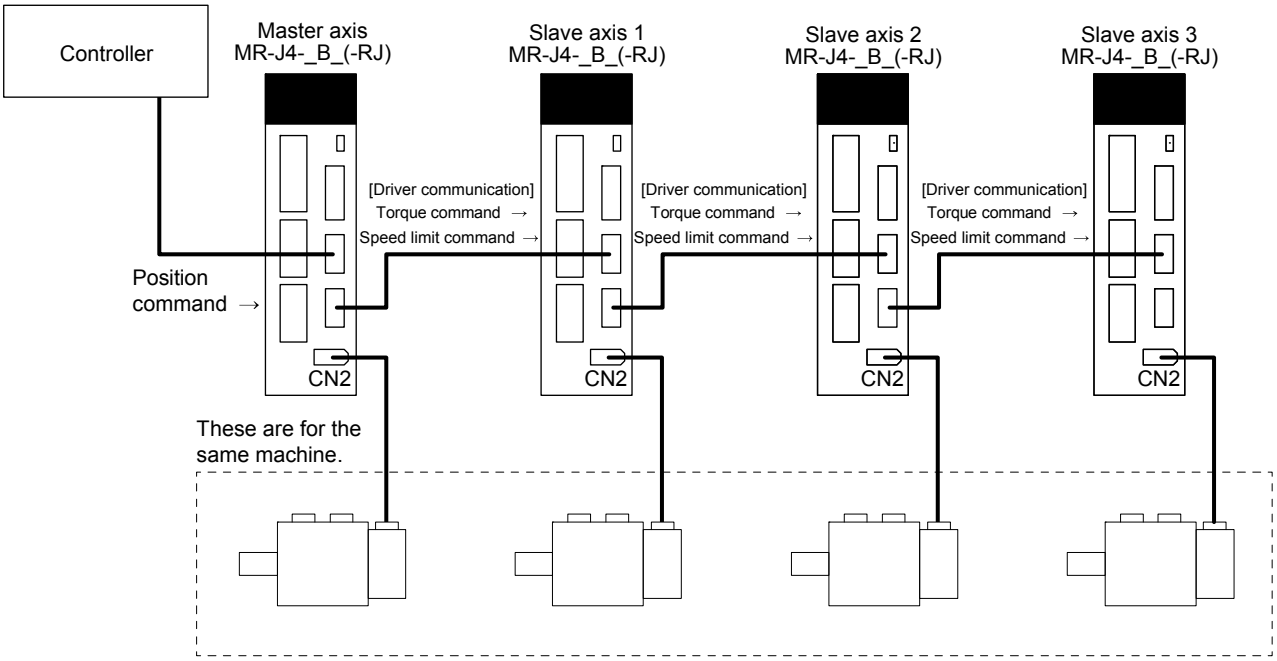
●The master axis and slave axis are recommended to use for a linked condition on a mechanical constitution. When they are not linked, they can reach a speed limit level. Doing so may cause [AL. 31 Overspeed].

●The slave axes use the control command from the master axis. Therefore, the controller mainly controls parameter settings, servo-on command, acquisition of monitor information from a servo amplifier, etc. The commands regarding absolute positioning such as setting absolute position detection and requiring home position setting from the controller to slave axes must not be made.

●Configure the circuit so that all the master and slave axes are stopped at the moment of a stop of a master or slave axis due to such as a servo alarm.

●When the STO signal of a servo amplifier is used, the master axis and slave axis should be turned off simultaneously.

Eight master axes can be set at most per one system of SSCNET III/H. The maximum number of slave axes to each master axis is not limited. However, the total number of the master and slave axes should be the maximum number of the servo amplifiers at most. In addition, when an SSCNET III/H communication shut-off occurs due to malfunction of a servo amplifier, the malfunctioning axis and later axis cannot be communicated. Therefore, the first amplifier from the controller via SSCNET III/H cable should be master axis.



(3) Parameter setting for the master-slave operation function

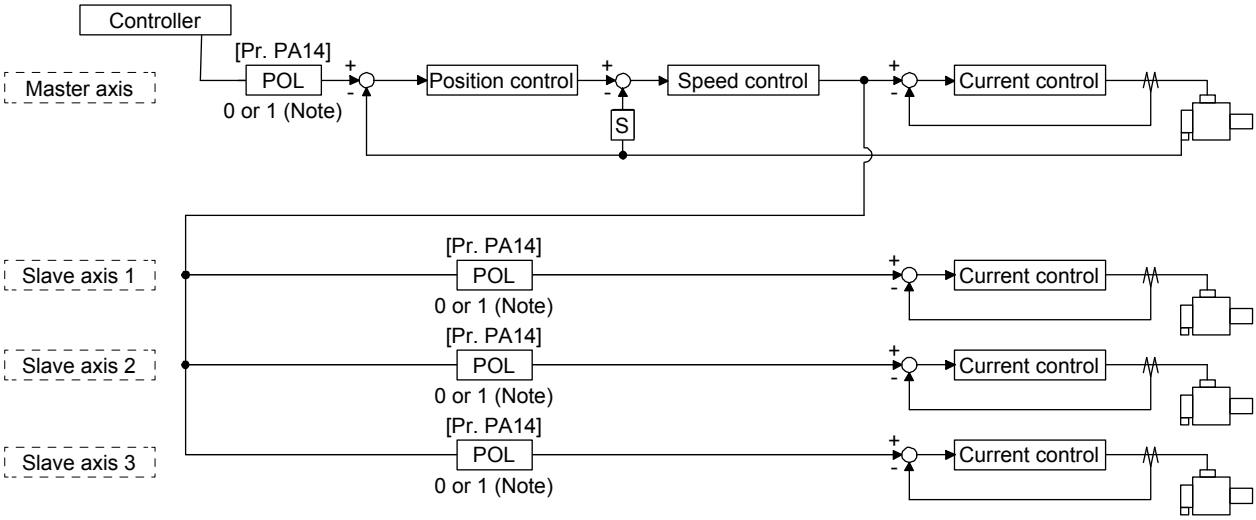
To use the master-slave operation function, the following parameter settings are necessary. For details of the parameters, refer to "Part:3, section 3.6.3".

No.	Name	Initial value	Setting value		Setting
			Master axis	Slave axis	
PA04	Forced stop deceleration function selection	2000	0 _ _ _	0 _ _ _	Used to disable the forced stop deceleration function.
PA14	Rotation direction selection/travel direction selection	0	Refer to "Part:3, section 3.6.3".		Used to set a torque generation direction.
PD15 (Note)	Driver communication setting	0000	0001	0010	Master and slave setting
PD16 (Note)	Driver communication setting - Master - Transmit data selection 1	0000	0038	0000	Communication data from master to slave ▪ Torque command ▪ Speed limit value
PD17 (Note)	Driver communication setting - Master - Transmit data selection 2	0000	003A	0000	
PD20 (Note)	Master axis No. selection 1 for slave	0	0	Master axis No.	Master axis No. of transmitting data
PD30	Master-slave operation - Torque command coefficient on slave	0	0	Refer to "Part:3, section 3.6.3".	Ratio of torque command of slave axis, ratio of speed limit value, and setting of speed limit minimum value
PD31	Master-slave operation - Speed limit coefficient on slave	0	0		
PD32	Master-slave operation - Speed limit adjusted value on slave	0	0		

Note. Always set this with servo parameters of the controller. Incorrect setting will prevent a normal SSCNET III/H communication.

(4) Rotation direction setting

Rotation directions can be different among a controller command, master axis, and slave axes. To align the directions, set [Pr. PA14] referring to (4) of this section. Not doing so can cause such as an overload due to a reverse direction torque against machine system rotation direction.



Note. Setting "1" will reverse the polarity.

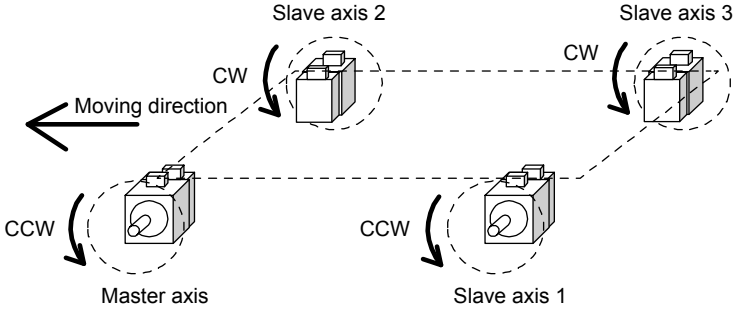
Rotation direction setting of master and slave axes with torque command method for an example of one master axis and three slave axes

Table 5.11 Rotation direction setting parameter

No.	Symbol	Name and function
PA14	*POL	Rotation direction selection 1. For master axis Select a servo motor rotation direction of master axis to SSCNET controller command. 0: Servo motor CCW rotation in positioning address increase direction 1: Servo motor CW rotation in positioning address increase direction 2. For slave axis Select servo motor rotation direction to a command from master axis. 0: Torque command polarity from master axis 1: Reverse of torque command polarity from master axis

The following shows a setting example of rotation direction for a platform truck with one master axis and three slave axes.

To set a rotation direction of the servo motor according to the moving direction, set the torque command polarity to the slave axis 1 the same as that to the master axis, and set the opposite polarity to the slave axis 2 and slave axis 3 from the master axis.



[Pr. PA14] setting

Axis	[Pr. PA14]
Master axis	0
Slave axis 1	0
Slave axis 2	1
Slave axis 3	1

6.3 Scale measurement function

The scale measurement function transmits position information of a scale measurement encoder to the controller by connecting the scale measurement encoder in semi closed loop control.

POINT

- The scale measurement function is available for the servo amplifiers of software version A8 or later.
- When the scale measurement function is used for MR-J4-_B_or MR-J4W2-_B servo amplifiers, the following restrictions apply. However, these restrictions will not be applied for MR-J4-_B_-RJ servo amplifiers.
  - A/B/Z-phase differential output type encoder cannot be used.
  - The scale measurement encoder and servo motor encoder are compatible with only the two-wire type. The four-wire type scale measurement encoder and servo motor encoder cannot be used.
  - When you use the HG-KR and HG-MR series for driving and scale measurement encoder, the optional four-wire type encoder cables (MR-EKCBL30M-L, MR-EKCBL30M-H, MR-EKCBL40M-H, and MR-EKCBL50M-H) cannot be used. When an encoder cable of 30 m to 50 m is needed, fabricate a two-wire type encoder cable according to "MR-J4-_B_ Servo Amplifier Instruction Manual" or "MR-J4W2-_B Servo Amplifier Instruction Manual".
- The scale measurement function compatible servo amplifier can be used with any of the following controllers.
  - Motion controller R_MTCPU/Q17_DSCPU
  - Simple motion module RD77MS/QD77MS_/LD77MS_

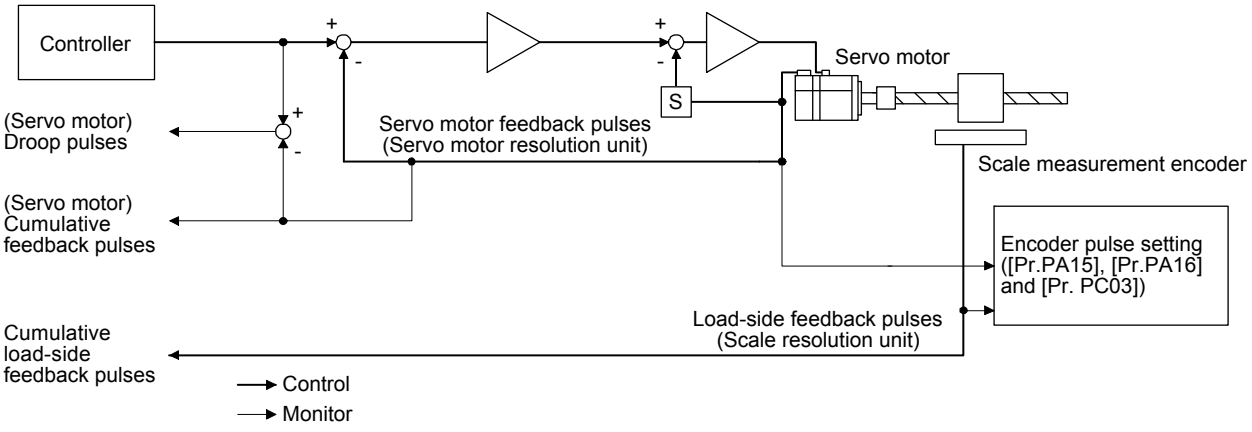
  (The MR-J4W2-_B servo amplifiers are not available with simple Motion module.)

  For settings and restrictions of controllers compatible with the scale measurement function, refer to user's manuals for each controller.
- The MR-J4W2-0303B6 servo amplifier is not compatible with the scale measurement function.

6.3.1 Functions and configuration

(1) Function block diagram

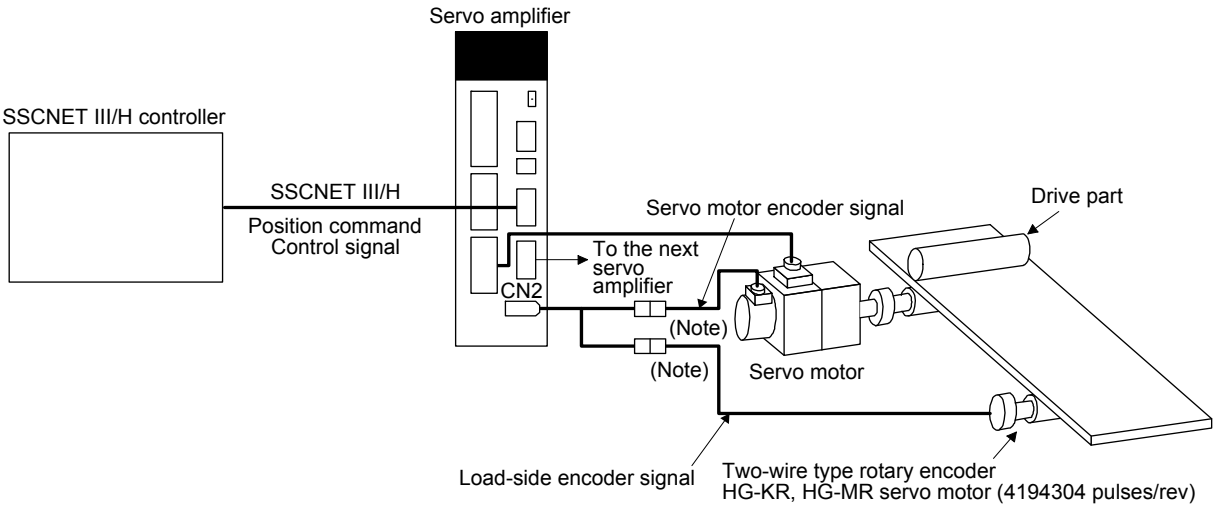
The following shows a block diagram of the scale measurement function. The control will be performed per servo motor encoder unit for the scale measurement function.



(2) System configuration

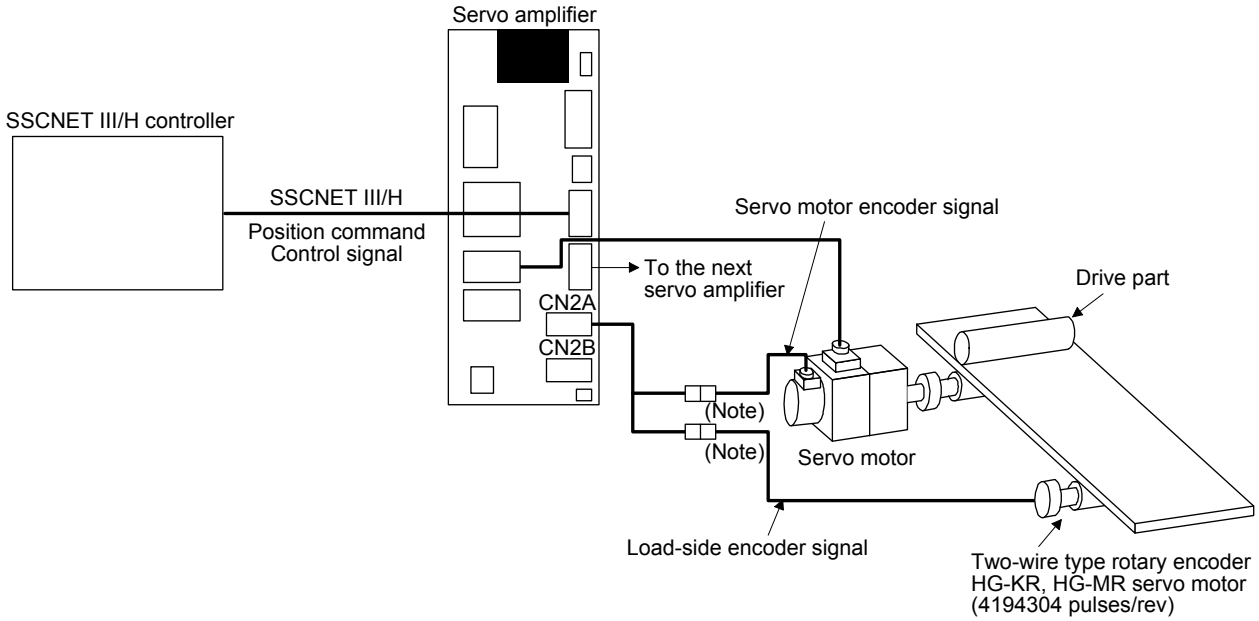
(a) For a rotary encoder

1) MR-J4-_B_ servo amplifier



Note Use a two-wire type encoder cable. A four-wire type linear encoder cable cannot be used.

2) MR-J4W2-_B servo amplifier



Note. Use a two-wire type encoder cable. A four-wire type linear encoder cable cannot be used.

6.3.2 Scale measurement encoder

POINT
●Always use the scale measurement encoder cable introduced in this section. Using other products may cause a malfunction. ●For details of the scale measurement encoder specifications, performance and assurance, contact each encoder manufacturer.

When a rotary encoder is used, an absolute position detection system can be configured by installing the encoder battery to the servo amplifier. In this case, the battery life will be shorter because the power consumption is increased as the power is supplied to the two encoders of motor side and load side.

(1) Rotary encoder
When a rotary encoder is used as a scale measurement encoder, use the following servo motor or synchronous encoder as the encoder.

Servo motor and synchronous encoder that can be used as encoder

	HG-KR	HG-MR
MR-J4-_B_	○	○

○: Available

Servo motors used as encoders

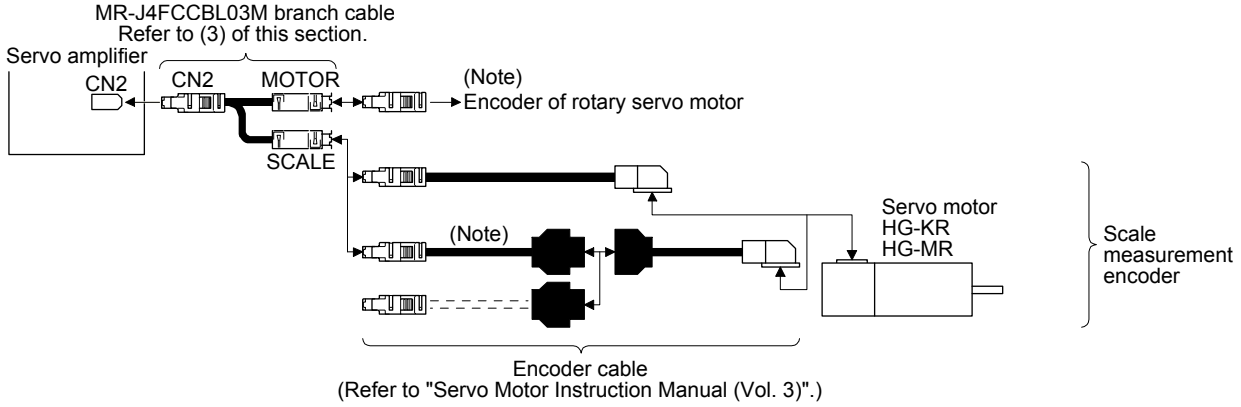
	HG-KR	HG-MR
MR-J4W2-_B	○	○

Use a two-wire type encoder cable. Do not use MR-EKCBL30M-L, MR-EKCBL30M-H, MR-EKCBL40M-H, or MR-EKCBL50M-H as they are four-wire type.
When an encoder cable of 30 m to 50 m is needed, fabricate a two-wire type encoder cable according to "MR-J4-_B_ Servo Amplifier Instruction Manual" or "MR-J4W2-_B Servo Amplifier Instruction Manual".
To use the scale measurement function in the absolute position detection system ([Pr. PA22] = 1_ _ _), the encoder battery must be installed to the servo amplifier for backing up the absolute position data of the load side. In this case, the battery life will be shorter because the power consumption is increased as the power is supplied to the two encoders of motor side and load side.

(2) Configuration diagram of encoder cable
Configuration diagram for servo amplifier and scale measurement encoder is shown below. Cables vary depending on the scale measurement encoder.

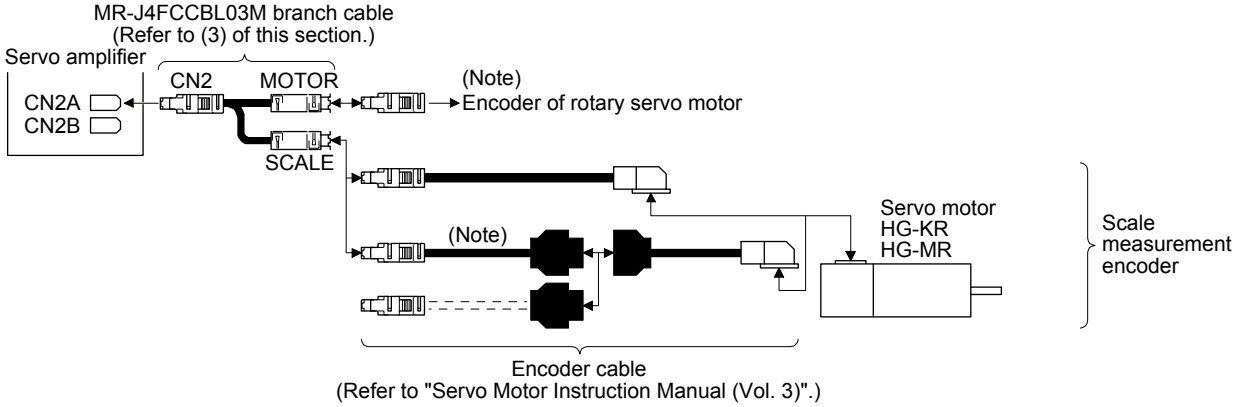
(a) Rotary encoder
Refer to "Servo Motor Instruction Manual (Vol. 3)" for encoder cables for rotary encoders.

1) MR-J4-_B_ servo amplifier



Note Use a two-wire type encoder cable. A four-wire type linear encoder cable cannot be used.

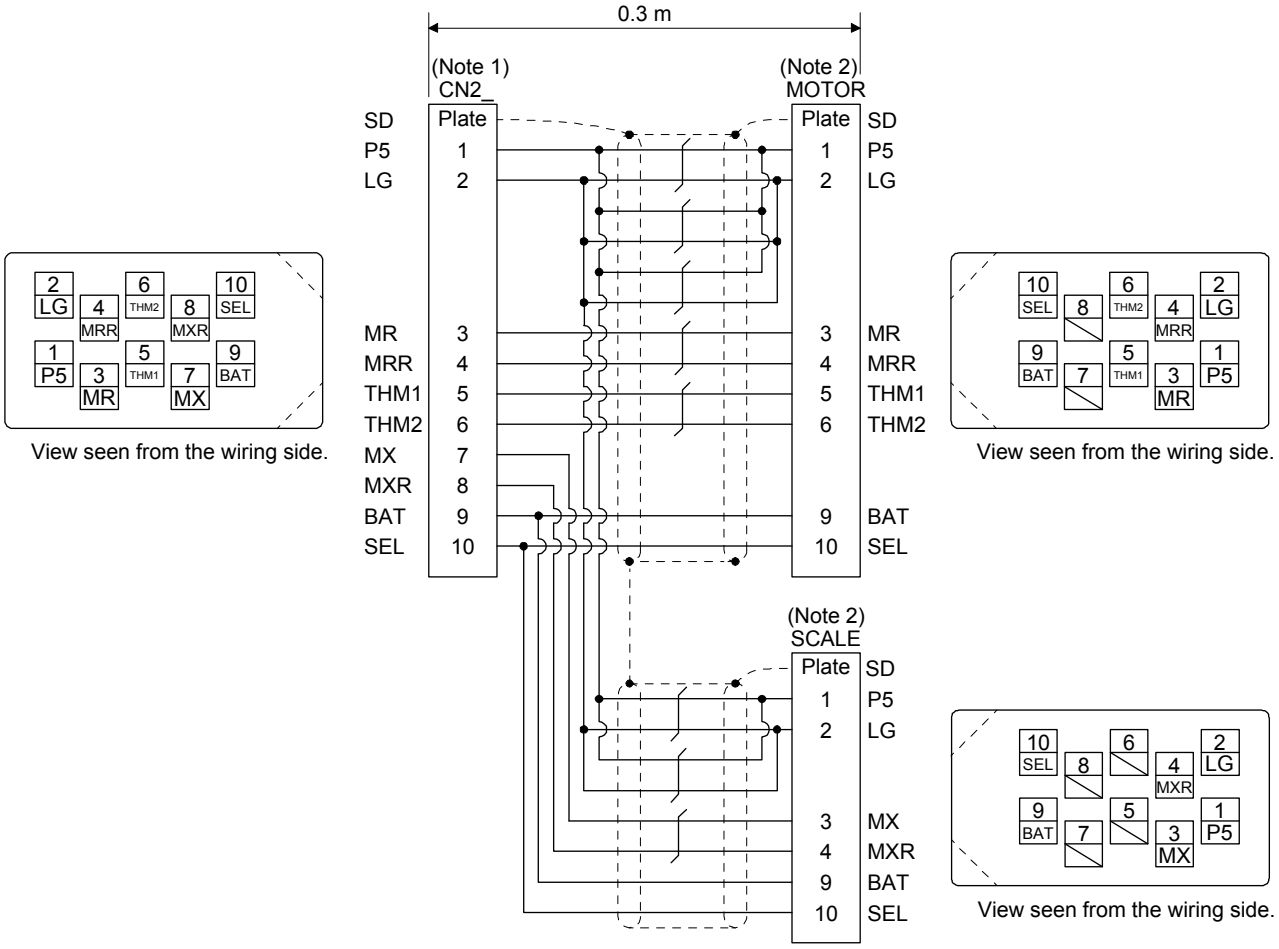
2) MR-J4W2-_B servo amplifier



Note. Use a two-wire type encoder cable. A four-wire type linear encoder cable cannot be used.

(3) MR-J4FCCBL03M branch cable

Use MR-J4FCCBL03M branch cable to connect the scale measurement encoder to CN2 connector. When fabricating the branch cable using MR-J3THMCN2 connector set, refer to "Linear Encoder Instruction Manual".



Note 1. Receptacle: 36210-0100PL, shell kit: 36310-3200-008 (3M)

2. Plug: 36110-3000FD, shell kit: 36310-F200-008 (3M)

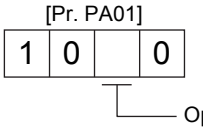
6.3.3 How to use scale measurement function

(1) Selection of scale measurement function

The scale measurement function is set with the combination of basic setting parameters [Pr. PA01] and [Pr. PA22].

(a) Operation mode selection

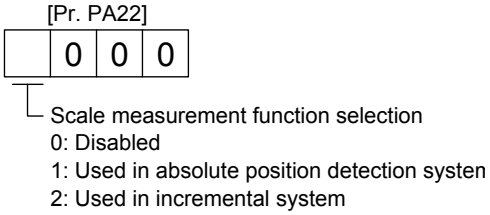
The scale measurement function can be used during semi closed loop system (standard control mode). Set [Pr. PA01] to "_ _ 0 _".



Setting value	Operation mode	Control unit
0	Semi closed loop system (Standard control mode)	Servo motor-side resolution unit

(b) Scale measurement function selection

Select the scale measurement function. Select "1 _ _ _" (Used in absolute position detection system) or "2 _ _ _" (Used in incremental system) according to the encoder you use.

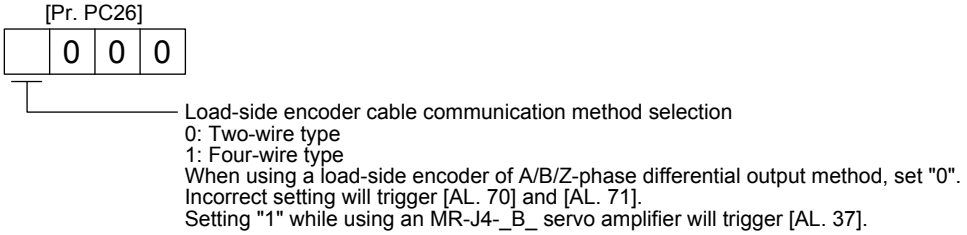


(2) Selection of scale measurement encoder communication method and polarity.

For MR-J4-_B_-RJ servo amplifiers, set the following "Load-side encoder communication method selection" of [Pr. PC26] as necessary.

The communication method differs depending on the scale measurement encoder type. Select "Four-wire type" because there is only four-wire type for synchronous encoder.

Select the cable to be connected to CN2L connector in [Pr. PC26].



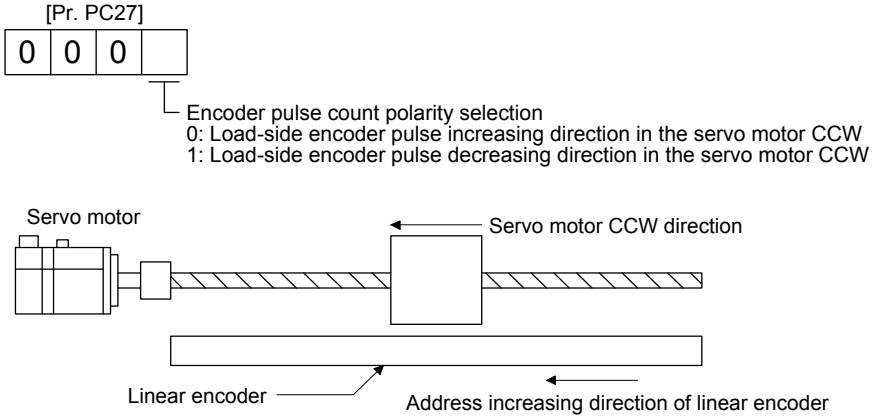
Select a polarity of the scale measurement encoder with the following "Encoder pulse count polarity selection" and "Selection of A/B/Z-phase input interface encoder Z-phase connection judgement function" of [Pr. PC27] as necessary.

POINT
●"Encoder pulse count polarity selection" in [Pr. PC27] is not related to [Pr. PA14 Rotation direction selection]. Make sure to set the parameter according to the relationships between servo motor and linear encoder/rotary encoder.

(a) Parameter setting method

1) Select an encoder pulse count polarity.

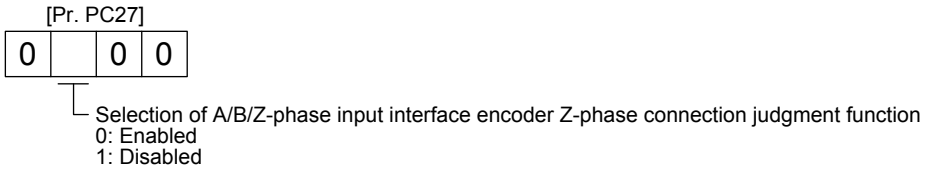
This parameter is used to set the load-side encoder polarity to be connected to CN2L connector in order to match the CCW direction of servo motor and the increasing direction of load-side encoder feedback. Set this as necessary.



2) A/B/Z-phase input interface encoder Z-phase connection judgement function (It is not available with MR-J4W2-_B servo amplifiers.)

This function can trigger an alarm by detecting non-signal for Z phase.

The Z-phase connection judgement function is enabled by default. To disable the Z-phase connection judgement function, set [Pr. PC27].



(b) How to confirm the scale measurement encoder feedback direction

You can confirm the directions of the cumulative feedback pulses of servo motor encoder and the load-side cumulative feedback pulses are matched by moving the device (scale measurement encoder) manually in the servo-off status. If mismatched, reverse the polarity.

(3) Confirmation of scale measurement encoder position data

Check the scale measurement encoder mounting and parameter settings for any problems.

Operate the device (scale measurement encoder) to check the data of the scale measurement encoder is renewed correctly. If the data is not renewed correctly, check the wiring and parameter settings.

Change the scale polarity as necessary.

Part 7
Review on Replacement of Motor

Part 7: Review on Replacement of Motor

1. SERVO MOTOR REPLACEMENT

1.1 Servo Motor Substitute Model and Compatibility

POINT

- For details about the compatibility of servo motor dimensions, reducer specifications, moment of inertia, connector specifications, and torque characteristics, refer to "Chapter 2 COMPARISON OF SERVO MOTOR SPECIFICATIONS".
- The symbols in the table mean as follows.
  (B): With brake
  (4): 400 V specifications
  (H): Foot-mounting
- When an "HA-LP motor" shown below is used, "simultaneous replacement with MR-J4-_A_/MR-J4-_B_ and an HG motor" is recommended. When an HG motor is adopted, the capacity of the servo amplifier needs to be changed. (Consider replacement, referring to "Part 7: Replacement of Motor section 2.7 Comparison of Servo Motor Torque Characteristics".)

Existing device models		Replacement models for simultaneous replacement (example)	
Servo motor	Servo amplifier	Servo motor	Servo amplifier
HA-LP25K14	MR-J3-DU30K_4	HG-JR25K14	MR-J4-22K_4
		HG-JR25K14R-S_ (Note)	
HA-LP30K2(4)	MR-J3-DU30K_(4)	HG-JR22K1M(4)	MR-J4-22K_(4)
		HG-JR22K1M(4)R-S_ (Note)	
HA-LP37K2(4)	MR-J3-DU37K_(4)	HG-JR30K1M(4)	MR-J4-DU30K_(4)
		HG-JR30K1M(4)R-S_ (Note)	
HA-LP45K24	MR-J3-DU45K_4	HG-JR37K1M4	MR-J4-DU37K_4
		HG-JR37K1M4R-S_ (Note)	
HA-LP55K24	MR-J3-DU55K_4	HG-JR45K1M4	MR-J4-DU45K_4
		HG-JR45K1M4R-S_ (Note)	

Note. Only flanges and shaft ends have compatibility in mounting.
Please contact your local sales office regarding the motor model and its delivery, since it is developed upon receipt of order.

(1) HF-KP motor series (With gears for general industrial machines with a reducer)

Series	Model	Example of replacement model	Compatibility (O: Compatible)	Note
Small capacity, low inertia HF-KP series Standard/With brake	HF-KP053(B)	HG-KR053(B)	O	
	HF-KP13(B)	HG-KR13(B)		
	HF-KP23(B)	HG-KR23(B)		
	HF-KP43(B)	HG-KR43(B)		
	HF-KP73(B)	HG-KR73(B)		
Small capacity, low inertia HF-KP series With gears for general industrial machines: G1	HF-KP053(B)G1 1/5	HG-KR053(B)G1 1/5	O	• Because the reduction gears of models marked with ◆are different from the actual reduction ratio, it is required that an electronic gear be set up. Refer to "2.4 Comparison of actual reduction ratios for geared servo motors" for the details.
	HF-KP053(B)G1 1/12	HG-KR053(B)G1 1/12		
	HF-KP053(B)G1 1/20	HG-KR053(B)G1 1/20		
	HF-KP13(B)G1 1/5	HG-KR13(B)G1 1/5		
	HF-KP13(B)G1 1/12	HG-KR13(B)G1 1/12		
	HF-KP13(B)G1 1/20	HG-KR13(B)G1 1/20		
	HF-KP23(B)G1 1/5	HG-KR23(B)G1 1/5		
	HF-KP23(B)G1 1/12	HG-KR23(B)G1 1/12 ◆		
	HF-KP23(B)G1 1/20	HG-KR23(B)G1 1/20 ◆		
	HF-KP43(B)G1 1/5	HG-KR43(B)G1 1/5		
	HF-KP43(B)G1 1/12	HG-KR43(B)G1 1/12 ◆		
	HF-KP43(B)G1 1/20	HG-KR43(B)G1 1/20 ◆		
	HF-KP73(B)G1 1/5	HG-KR73(B)G1 1/5		
	HF-KP73(B)G1 1/12	HG-KR73(B)G1 1/12 ◆		
	HF-KP73(B)G1 1/20	HG-KR73(B)G1 1/20		

(2) HF-KP series (With reduction gear for precision application compliant)

Series	Model	Example of replacement model	Compatibility (O: Compatible)	Note
Small capacity, low inertia HF-KP series Flange-mounting flange output type for precision application compliant: G5	HF-KP053(B)G5 1/5	HG-KR053(B)G5 1/5	O	
	HF-KP053(B)G5 1/11	HG-KR053(B)G5 1/11		
	HF-KP053(B)G5 1/21	HG-KR053(B)G5 1/21		
	HF-KP053(B)G5 1/33	HG-KR053(B)G5 1/33		
	HF-KP053(B)G5 1/45	HG-KR053(B)G5 1/45		
	HF-KP13(B)G5 1/5	HG-KR13(B)G5 1/5		
	HF-KP13(B)G5 1/11	HG-KR13(B)G5 1/11		
	HF-KP13(B)G5 1/21	HG-KR13(B)G5 1/21		
	HF-KP13(B)G5 1/33	HG-KR13(B)G5 1/33		
	HF-KP13(B)G5 1/45	HG-KR13(B)G5 1/45		
	HF-KP23(B)G5 1/5	HG-KR23(B)G5 1/5		
	HF-KP23(B)G5 1/11	HG-KR23(B)G5 1/11		
	HF-KP23(B)G5 1/21	HG-KR23(B)G5 1/21		
	HF-KP23(B)G5 1/33	HG-KR23(B)G5 1/33		
	HF-KP23(B)G5 1/45	HG-KR23(B)G5 1/45		
	HF-KP43(B)G5 1/5	HG-KR43(B)G5 1/5		
	HF-KP43(B)G5 1/11	HG-KR43(B)G5 1/11		
	HF-KP43(B)G5 1/21	HG-KR43(B)G5 1/21		
	HF-KP43(B)G5 1/33	HG-KR43(B)G5 1/33		
	HF-KP43(B)G5 1/45	HG-KR43(B)G5 1/45		
	HF-KP73(B)G5 1/5	HG-KR73(B)G5 1/5		
	HF-KP73(B)G5 1/11	HG-KR73(B)G5 1/11		
	HF-KP73(B)G5 1/21	HG-KR73(B)G5 1/21		
	HF-KP73(B)G5 1/33	HG-KR73(B)G5 1/33		
	HF-KP73(B)G5 1/45	HG-KR73(B)G5 1/45		
Small capacity, low inertia HF-KP series Flange-mounting shaft output type for precision application compliant: G7	HF-KP053(B)G7 1/5	HG-KR053(B)G7 1/5	O	
	HF-KP053(B)G7 1/11	HG-KR053(B)G7 1/11		
	HF-KP053(B)G7 1/21	HG-KR053(B)G7 1/21		
	HF-KP053(B)G7 1/33	HG-KR053(B)G7 1/33		
	HF-KP053(B)G7 1/45	HG-KR053(B)G7 1/45		
	HF-KP13(B)G7 1/5	HG-KR13(B)G7 1/5		
	HF-KP13(B)G7 1/11	HG-KR13(B)G7 1/11		
	HF-KP13(B)G7 1/21	HG-KR13(B)G7 1/21		
	HF-KP13(B)G7 1/33	HG-KR13(B)G7 1/33		
	HF-KP13(B)G7 1/45	HG-KR13(B)G7 1/45		
	HF-KP23(B)G7 1/5	HG-KR23(B)G7 1/5		
	HF-KP23(B)G7 1/11	HG-KR23(B)G7 1/11		
	HF-KP23(B)G7 1/21	HG-KR23(B)G7 1/21		
	HF-KP23(B)G7 1/33	HG-KR23(B)G7 1/33		
	HF-KP23(B)G7 1/45	HG-KR23(B)G7 1/45		
	HF-KP43(B)G7 1/5	HG-KR43(B)G7 1/5		
	HF-KP43(B)G7 1/11	HG-KR43(B)G7 1/11		
	HF-KP43(B)G7 1/21	HG-KR43(B)G7 1/21		
	HF-KP43(B)G7 1/33	HG-KR43(B)G7 1/33		
	HF-KP43(B)G7 1/45	HG-KR43(B)G7 1/45		
	HF-KP73(B)G7 1/5	HG-KR73(B)G7 1/5		
	HF-KP73(B)G7 1/11	HG-KR73(B)G7 1/11		
	HF-KP73(B)G7 1/21	HG-KR73(B)G7 1/21		
	HF-KP73(B)G7 1/33	HG-KR73(B)G7 1/33		
	HF-KP73(B)G7 1/45	HG-KR73(B)G7 1/45		

(3) HF-MP series (With gears for general industrial machines)

Series	Model	Example of replacement model	Compatibility (○: Compatible)	Note
Small capacity, ultralow inertia HF-MP series Standard/With brake	HF-MP053(B)	HG-MR053(B)	○	
	HF-MP13(B)	HG-MR13(B)		
	HF-MP23(B)	HG-MR23(B)		
	HF-MP43(B)	HG-MR43(B)		
	HF-MP73(B)	HG-MR73(B)		
Small capacity, ultralow inertia HF-MP series With gears for general industrial machines: G1	HF-MP053(B)G1 1/5	HG-KR053(B)G1 1/5	○	• The HG-MR series does not support the geared model. The geared model is supported with the HG-KR series. • Because the reduction gears of models marked with ◆ are different from the actual reduction ratio, it is required that an electronic gear be set up. Refer to "2.4 Comparison of actual reduction ratios for geared servo motors" for the details.
	HF-MP053(B)G1 1/12	HG-KR053(B)G1 1/12		
	HF-MP053(B)G1 1/20	HG-KR053(B)G1 1/20		
	HF-MP13(B)G1 1/5	HG-KR13(B)G1 1/5		
	HF-MP13(B)G1 1/12	HG-KR13(B)G1 1/12		
	HF-MP13(B)G1 1/20	HG-KR13(B)G1 1/20		
	HF-MP23(B)G1 1/5	HG-KR23(B)G1 1/5		
	HF-MP23(B)G1 1/12	HG-KR23(B)G1 1/12 ◆		
	HF-MP23(B)G1 1/20	HG-KR23(B)G1 1/20 ◆		
	HF-MP43(B)G1 1/5	HG-KR43(B)G1 1/5		
	HF-MP43(B)G1 1/12	HG-KR43(B)G1 1/12 ◆		
	HF-MP43(B)G1 1/20	HG-KR43(B)G1 1/20 ◆		
	HF-MP73(B)G1 1/5	HG-KR73(B)G1 1/5		
	HF-MP73(B)G1 1/12	HG-KR73(B)G1 1/12 ◆		
	HF-MP73(B)G1 1/20	HG-KR73(B)G1 1/20		

(4) HF-MP series (With reduction gear for precision application compliant)

Series	Model	Example of replacement model	Compatibility (O: Compatible)	Note
Small capacity, ultralow inertia HF-MP series With flange-output type gear reducer for high precision applications, flange mounting: G5	HF-MP053(B)G5 1/5	HG-KR053(B)G5 1/5	O	• The HG-MR series does not support the geared model. The geared model is supported with the HG-KR series.
	HF-MP053(B)G5 1/11	HG-KR053(B)G5 1/11		
	HF-MP053(B)G5 1/21	HG-KR053(B)G5 1/21		
	HF-MP053(B)G5 1/33	HG-KR053(B)G5 1/33		
	HF-MP053(B)G5 1/45	HG-KR053(B)G5 1/45		
	HF-MP13(B)G5 1/5	HG-KR13(B)G5 1/5		
	HF-MP13(B)G5 1/11	HG-KR13(B)G5 1/11		
	HF-MP13(B)G5 1/21	HG-KR13(B)G5 1/21		
	HF-MP13(B)G5 1/33	HG-KR13(B)G5 1/33		
	HF-MP13(B)G5 1/45	HG-KR13(B)G5 1/45		
	HF-MP23(B)G5 1/5	HG-KR23(B)G5 1/5		
	HF-MP23(B)G5 1/11	HG-KR23(B)G5 1/11		
	HF-MP23(B)G5 1/21	HG-KR23(B)G5 1/21		
	HF-MP23(B)G5 1/33	HG-KR23(B)G5 1/33		
	HF-MP23(B)G5 1/45	HG-KR23(B)G5 1/45		
	HF-MP43(B)G5 1/5	HG-KR43(B)G5 1/5		
	HF-MP43(B)G5 1/11	HG-KR43(B)G5 1/11		
	HF-MP43(B)G5 1/21	HG-KR43(B)G5 1/21		
	HF-MP43(B)G5 1/33	HG-KR43(B)G5 1/33		
	HF-MP43(B)G5 1/45	HG-KR43(B)G5 1/45		
	HF-MP73(B)G5 1/5	HG-KR73(B)G5 1/5		
	HF-MP73(B)G5 1/11	HG-KR73(B)G5 1/11		
	HF-MP73(B)G5 1/21	HG-KR73(B)G5 1/21		
	HF-MP73(B)G5 1/33	HG-KR73(B)G5 1/33		
	HF-MP73(B)G5 1/45	HG-KR73(B)G5 1/45		
Small capacity, ultralow inertia HF-MP series With flange-output type gear reducer for high precision applications, flange mounting: G7	HF-MP053(B)G7 1/5	HG-KR053(B)G7 1/5	O	
	HF-MP053(B)G7 1/11	HG-KR053(B)G7 1/11		
	HF-MP053(B)G7 1/21	HG-KR053(B)G7 1/21		
	HF-MP053(B)G7 1/33	HG-KR053(B)G7 1/33		
	HF-MP053(B)G7 1/45	HG-KR053(B)G7 1/45		
	HF-MP13(B)G7 1/5	HG-KR13(B)G7 1/5		
	HF-MP13(B)G7 1/11	HG-KR13(B)G7 1/11		
	HF-MP13(B)G7 1/21	HG-KR13(B)G7 1/21		
	HF-MP13(B)G7 1/33	HG-KR13(B)G7 1/33		
	HF-MP13(B)G7 1/45	HG-KR13(B)G7 1/45		
	HF-MP23(B)G7 1/5	HG-KR23(B)G7 1/5		
	HF-MP23(B)G7 1/11	HG-KR23(B)G7 1/11		
	HF-MP23(B)G7 1/21	HG-KR23(B)G7 1/21		
	HF-MP23(B)G7 1/33	HG-KR23(B)G7 1/33		
	HF-MP23(B)G7 1/45	HG-KR23(B)G7 1/45		
	HF-MP43(B)G7 1/5	HG-KR43(B)G7 1/5		
	HF-MP43(B)G7 1/11	HG-KR43(B)G7 1/11		
	HF-MP43(B)G7 1/21	HG-KR43(B)G7 1/21		
	HF-MP43(B)G7 1/33	HG-KR43(B)G7 1/33		
	HF-MP43(B)G7 1/45	HG-KR43(B)G7 1/45		
	HF-MP73(B)G7 1/5	HG-KR73(B)G7 1/5		
	HF-MP73(B)G7 1/11	HG-KR73(B)G7 1/11		
	HF-MP73(B)G7 1/21	HG-KR73(B)G7 1/21		
	HF-MP73(B)G7 1/33	HG-KR73(B)G7 1/33		
	HF-MP73(B)G7 1/45	HG-KR73(B)G7 1/45		

(5) HF-SP series (With gears for general industrial machines)

Series	Model	Example of replacement model	Compatibility (O: Compatible)	Note
Medium capacity, medium inertia HF-SP series Standard/With brake	HF-SP51(B)	HG-SR51(B)	O	• The total length of the motor will be shorter, so confirm that the motor connector does not interfere with the device side.
	HF-SP81(B)	HG-SR81(B)		
	HF-SP121(B)	HG-SR121(B)		
	HF-SP201(B)	HG-SR201(B)		
	HF-SP301(B)	HG-SR301(B)		
	HF-SP421(B)	HG-SR421(B)		
	HF-SP52(4)(B)	HG-SR52(4)(B)		
	HF-SP102(4)(B)	HG-SR102(4)(B)		
	HF-SP152(4)(B)	HG-SR152(4)(B)		
	HF-SP202(4)(B)	HG-SR202(4)(B)		
	HF-SP352(4)(B)	HG-SR352(4)(B)		
	HF-SP502(4)(B)	HG-SR502(4)(B)		
	HF-SP702(4)(B)	HG-SR702(4)(B)		
Medium capacity, medium inertia HF-SP series With gears for general industrial machines: G1	HF-SP52(4)(B)G1(H) 1/6	HG-SR52(4)(B)G1(H) 1/6	O	
	HF-SP52(4)(B)G1(H) 1/11	HG-SR52(4)(B)G1(H) 1/11		
	HF-SP52(4)(B)G1(H) 1/17	HG-SR52(4)(B)G1(H) 1/17		
	HF-SP52(4)(B)G1(H) 1/29	HG-SR52(4)(B)G1(H) 1/29		
	HF-SP52(4)(B)G1(H) 1/35	HG-SR52(4)(B)G1(H) 1/35		
	HF-SP52(4)(B)G1(H) 1/43	HG-SR52(4)(B)G1(H) 1/43		
	HF-SP52(4)(B)G1(H) 1/59	HG-SR52(4)(B)G1(H) 1/59		
	HF-SP102(4)(B)G1(H) 1/6	HG-SR102(4)(B)G1(H) 1/6		
	HF-SP102(4)(B)G1(H) 1/11	HG-SR102(4)(B)G1(H) 1/11		
	HF-SP102(4)(B)G1(H) 1/17	HG-SR102(4)(B)G1(H) 1/17		
	HF-SP102(4)(B)G1(H) 1/29	HG-SR102(4)(B)G1(H) 1/29		
	HF-SP102(4)(B)G1(H) 1/35	HG-SR102(4)(B)G1(H) 1/35		
	HF-SP102(4)(B)G1(H) 1/43	HG-SR102(4)(B)G1(H) 1/43		
	HF-SP102(4)(B)G1(H) 1/59	HG-SR102(4)(B)G1(H) 1/59		
	HF-SP152(4)(B)G1(H) 1/6	HG-SR152(4)(B)G1(H) 1/6		
	HF-SP152(4)(B)G1(H) 1/11	HG-SR152(4)(B)G1(H) 1/11		
	HF-SP152(4)(B)G1(H) 1/17	HG-SR152(4)(B)G1(H) 1/17		
	HF-SP152(4)(B)G1(H) 1/29	HG-SR152(4)(B)G1(H) 1/29		
	HF-SP152(4)(B)G1(H) 1/35	HG-SR152(4)(B)G1(H) 1/35		
	HF-SP152(4)(B)G1(H) 1/43	HG-SR152(4)(B)G1(H) 1/43		
	HF-SP152(4)(B)G1(H) 1/59	HG-SR152(4)(B)G1(H) 1/59		
	HF-SP202(4)(B)G1(H) 1/6	HG-SR202(4)(B)G1(H) 1/6		
	HF-SP202(4)(B)G1(H) 1/11	HG-SR202(4)(B)G1(H) 1/11		
	HF-SP202(4)(B)G1(H) 1/17	HG-SR202(4)(B)G1(H) 1/17		
	HF-SP202(4)(B)G1(H) 1/29	HG-SR202(4)(B)G1(H) 1/29		
	HF-SP202(4)(B)G1(H) 1/35	HG-SR202(4)(B)G1(H) 1/35		
	HF-SP202(4)(B)G1(H) 1/43	HG-SR202(4)(B)G1(H) 1/43		
	HF-SP202(4)(B)G1(H) 1/59	HG-SR202(4)(B)G1(H) 1/59		
	HF-SP352(4)(B)G1(H) 1/6	HG-SR352(4)(B)G1(H) 1/6		
	HF-SP352(4)(B)G1(H) 1/11	HG-SR352(4)(B)G1(H) 1/11		
	HF-SP352(4)(B)G1(H) 1/17	HG-SR352(4)(B)G1(H) 1/17		
	HF-SP352(4)(B)G1(H) 1/29	HG-SR352(4)(B)G1(H) 1/29		
	HF-SP352(4)(B)G1(H) 1/35	HG-SR352(4)(B)G1(H) 1/35		
	HF-SP352(4)(B)G1(H) 1/43	HG-SR352(4)(B)G1(H) 1/43		
	HF-SP352(4)(B)G1(H) 1/59	HG-SR352(4)(B)G1(H) 1/59		

(6) HF-SP series (With gears for general industrial machines/With flange-output type gear reducer for high precision applications, flange mounting)

Series	Model	Example of replacement model	Compatibility (O: Compatible)	Note
Medium capacity, medium inertia HF-SP series With gears for general industrial machines with a reducer G1	HF-SP502(4)(B)G1(H) 1/6	HG-SR502(4)(B)G1(H) 1/6	O	• The total length of the motor will be shorter, so confirm that the motor connector does not interfere with the device side.
	HF-SP502(4)(B)G1(H) 1/11	HG-SR502(4)(B)G1(H) 1/11		
	HF-SP502(4)(B)G1(H) 1/17	HG-SR502(4)(B)G1(H) 1/17		
	HF-SP502(4)(B)G1(H) 1/29	HG-SR502(4)(B)G1(H) 1/29		
	HF-SP502(4)(B)G1(H) 1/35	HG-SR502(4)(B)G1(H) 1/35		
	HF-SP502(4)(B)G1(H) 1/43	HG-SR502(4)(B)G1(H) 1/43		
	HF-SP502(4)(B)G1(H) 1/59	HG-SR502(4)(B)G1(H) 1/59		
	HF-SP702(4)(B)G1(H) 1/6	HG-SR702(4)(B)G1(H) 1/6		
	HF-SP702(4)(B)G1(H) 1/11	HG-SR702(4)(B)G1(H) 1/11		
	HF-SP702(4)(B)G1(H) 1/17	HG-SR702(4)(B)G1(H) 1/17		
	HF-SP702(4)(B)G1(H) 1/29	HG-SR702(4)(B)G1(H) 1/29		
	HF-SP702(4)(B)G1(H) 1/35	HG-SR702(4)(B)G1(H) 1/35		
	HF-SP702(4)(B)G1(H) 1/43	HG-SR702(4)(B)G1(H) 1/43		
	HF-SP702(4)(B)G1(H) 1/59	HG-SR702(4)(B)G1(H) 1/59		
Medium capacity, medium inertia HF-SP series With flange-output type gear reducer for high precision applications, flange mounting: G5	HF-SP52(4)(B)G5 1/5	HG-SR52(4)(B)G5 1/5	O	
	HF-SP52(4)(B)G5 1/11	HG-SR52(4)(B)G5 1/11		
	HF-SP52(4)(B)G5 1/21	HG-SR52(4)(B)G5 1/21		
	HF-SP52(4)(B)G5 1/33	HG-SR52(4)(B)G5 1/33		
	HF-SP52(4)(B)G5 1/45	HG-SR52(4)(B)G5 1/45		
	HF-SP102(4)(B)G5 1/5	HG-SR102(4)(B)G5 1/5		
	HF-SP102(4)(B)G5 1/11	HG-SR102(4)(B)G5 1/11		
	HF-SP102(4)(B)G5 1/21	HG-SR102(4)(B)G5 1/21		
	HF-SP102(4)(B)G5 1/33	HG-SR102(4)(B)G5 1/33		
	HF-SP102(4)(B)G5 1/45	HG-SR102(4)(B)G5 1/45		
	HF-SP152(4)(B)G5 1/5	HG-SR152(4)(B)G5 1/5		
	HF-SP152(4)(B)G5 1/11	HG-SR152(4)(B)G5 1/11		
	HF-SP152(4)(B)G5 1/21	HG-SR152(4)(B)G5 1/21		
	HF-SP152(4)(B)G5 1/33	HG-SR152(4)(B)G5 1/33		
	HF-SP152(4)(B)G5 1/45	HG-SR152(4)(B)G5 1/45		
	HF-SP202(4)(B)G5 1/5	HG-SR202(4)(B)G5 1/5		
	HF-SP202(4)(B)G5 1/11	HG-SR202(4)(B)G5 1/11		
	HF-SP202(4)(B)G5 1/21	HG-SR202(4)(B)G5 1/21		
	HF-SP202(4)(B)G5 1/33	HG-SR202(4)(B)G5 1/33		
	HF-SP202(4)(B)G5 1/45	HG-SR202(4)(B)G5 1/45		
	HF-SP352(4)(B)G5 1/5	HG-SR352(4)(B)G5 1/5		
	HF-SP352(4)(B)G5 1/11	HG-SR352(4)(B)G5 1/11		
	HF-SP352(4)(B)G5 1/21	HG-SR352(4)(B)G5 1/21		
	HF-SP502(4)(B)G5 1/5	HG-SR502(4)(B)G5 1/5		
	HF-SP502(4)(B)G5 1/11	HG-SR502(4)(B)G5 1/11		
	HF-SP702(4)(B)G5 1/5	HG-SR702(4)(B)G5 1/5		

(7) HF-SP series (With shaft-output type gear reducer for high precision applications)

Series	Model	Example of replacement model	Compatibility (O: Compatible)	Note
Medium capacity, medium inertia HF-SP series With shaft-output type gear reducer for high precision applications, flange mounting: G7	HF-SP52(4)(B)G7 1/5	HG-SR52(4)(B)G7 1/5	O	• The total length of the motor will be shorter, so confirm that the motor connector does not interfere with the device side.
	HF-SP52(4)(B)G7 1/11	HG-SR52(4)(B)G7 1/11		
	HF-SP52(4)(B)G7 1/21	HG-SR52(4)(B)G7 1/21		
	HF-SP52(4)(B)G7 1/33	HG-SR52(4)(B)G7 1/33		
	HF-SP52(4)(B)G7 1/45	HG-SR52(4)(B)G7 1/45		
	HF-SP102(4)(B)G7 1/5	HG-SR102(4)(B)G7 1/5		
	HF-SP102(4)(B)G7 1/11	HG-SR102(4)(B)G7 1/11		
	HF-SP102(4)(B)G7 1/21	HG-SR102(4)(B)G7 1/21		
	HF-SP102(4)(B)G7 1/33	HG-SR102(4)(B)G7 1/33		
	HF-SP102(4)(B)G7 1/45	HG-SR102(4)(B)G7 1/45		
	HF-SP152(4)(B)G7 1/5	HG-SR152(4)(B)G7 1/5		
	HF-SP152(4)(B)G7 1/11	HG-SR152(4)(B)G7 1/11		
	HF-SP152(4)(B)G7 1/21	HG-SR152(4)(B)G7 1/21		
	HF-SP152(4)(B)G7 1/33	HG-SR152(4)(B)G7 1/33		
	HF-SP152(4)(B)G7 1/45	HG-SR152(4)(B)G7 1/45		
	HF-SP202(4)(B)G7 1/5	HG-SR202(4)(B)G7 1/5		
	HF-SP202(4)(B)G7 1/11	HG-SR202(4)(B)G7 1/11		
	HF-SP202(4)(B)G7 1/21	HG-SR202(4)(B)G7 1/21		
	HF-SP202(4)(B)G7 1/33	HG-SR202(4)(B)G7 1/33		
	HF-SP202(4)(B)G7 1/45	HG-SR202(4)(B)G7 1/45		
	HF-SP352(4)(B)G7 1/5	HG-SR352(4)(B)G7 1/5		
	HF-SP352(4)(B)G7 1/11	HG-SR352(4)(B)G7 1/11		
	HF-SP352(4)(B)G7 1/21	HG-SR352(4)(B)G7 1/21		
	HF-SP502(4)(B)G7 1/5	HG-SR502(4)(B)G7 1/5		
	HF-SP502(4)(B)G7 1/11	HG-SR502(4)(B)G7 1/11		
	HF-SP702(4)(B)G7 1/5	HG-SR702(4)(B)G7 1/5		

(8) HC-RP series

Series	model	Example of replacement model	Compatibility (O: Compatible)	Note
Medium capacity, ultra-low inertia HC-RP series	HC-RP103(B)	HG-RR103(B)	O	
	HC-RP153(B)	HG-RR153(B)		
	HC-RP203(B)	HG-RR203(B)		
	HC-RP353(B)	HG-RR353(B)		
	HC-RP503(B)	HG-RR503(B)		
Medium capacity, ultra-low inertia HC-RP series With flange-output type gear reducer for high precision applications, flange mounting: G5	HC-RP103(B)G5 1/5◇	HG-SR102(B)G5 1/5	(Note)	• The HG-RR series does not support the geared model. The geared model is supported with the HG-SR series. • Check the output torque because the reduction ratio of models marked with ◆is greatly different. • The capacity of the corresponding servo amplifier will be different if a model marked with ◇ is replaced. The corresponding servo amplifier for HG-SR102 is MR-J4-100_, for HG-SR202 is MR-J4-200_, and for HG-SR352 is MR-J4-350_.
	HC-RP103(B)G5 1/11◇	HG-SR102(B)G5 1/11		
	HC-RP103(B)G5 1/21◇	HG-SR102(B)G5 1/21		
	HC-RP103(B)G5 1/33◇	HG-SR102(B)G5 1/33		
	HC-RP103(B)G5 1/45◇	HG-SR102(B)G5 1/45		
	HC-RP153(B)G5 1/5	HG-SR152(B)G5 1/5		
	HC-RP153(B)G5 1/11	HG-SR152(B)G5 1/11		
	HC-RP153(B)G5 1/21	HG-SR152(B)G5 1/21		
	HC-RP153(B)G5 1/33	HG-SR152(B)G5 1/33		
	HC-RP153(B)G5 1/45	HG-SR152(B)G5 1/45		
	HC-RP203(B)G5 1/5◇	HG-SR202(B)G5 1/5		
	HC-RP203(B)G5 1/11◇	HG-SR202(B)G5 1/11		
	HC-RP203(B)G5 1/21◇	HG-SR202(B)G5 1/21		
	HC-RP203(B)G5 1/33◇	HG-SR202(B)G5 1/33		
	HC-RP203(B)G5 1/45◇	HG-SR202(B)G5 1/45		
	HC-RP353(B)G5 1/5◇	HG-SR352(B)G5 1/5		
	HC-RP353(B)G5 1/11◇	HG-SR352(B)G5 1/11		
	HC-RP353(B)G5 1/21◇	HG-SR352(B)G5 1/21		
	HC-RP353(B)G5 1/33◇	HG-SR352(B)G5 1/21 ◆		
	HC-RP503(B)G5 1/5	HG-SR502(B)G5 1/5		
	HC-RP503(B)G5 1/11	HG-SR502(B)G5 1/11		
	HC-RP503(B)G5 1/21	HG-SR502(B)G5 1/11 ◆		
Medium capacity, ultra-low inertia HC-RP series With shaft-output type gear reducer for high precision applications, flange mounting: G7	HC-RP103(B)G7 1/5◇	HG-SR102(B)G7 1/5	(Note)	
	HC-RP103(B)G7 1/11◇	HG-SR102(B)G7 1/11		
	HC-RP103(B)G7 1/21◇	HG-SR102(B)G7 1/21		
	HC-RP103(B)G7 1/33◇	HG-SR102(B)G7 1/33		
	HC-RP103(B)G7 1/45◇	HG-SR102(B)G7 1/45		
	HC-RP153(B)G7 1/5	HG-SR152(B)G7 1/5		
	HC-RP153(B)G7 1/11	HG-SR152(B)G7 1/11		
	HC-RP153(B)G7 1/21	HG-SR152(B)G7 1/21		
	HC-RP153(B)G7 1/33	HG-SR152(B)G7 1/33		
	HC-RP153(B)G7 1/45	HG-SR152(B)G7 1/45		
	HC-RP203(B)G7 1/5◇	HG-SR202(B)G7 1/5		
	HC-RP203(B)G7 1/11◇	HG-SR202(B)G7 1/11		
	HC-RP203(B)G7 1/21◇	HG-SR202(B)G7 1/21		
	HC-RP203(B)G7 1/33◇	HG-SR202(B)G7 1/33		
	HC-RP203(B)G7 1/45◇	HG-SR202(B)G7 1/45		
	HC-RP353(B)G7 1/5◇	HG-SR352(B)G7 1/5		
	HC-RP353(B)G7 1/11◇	HG-SR352(B)G7 1/11		
	HC-RP353(B)G7 1/21◇	HG-SR352(B)G7 1/21		
	HC-RP353(B)G7 1/33◇	HG-SR352(B)G7 1/21 ◆		
	HC-RP503(B)G7 1/5	HG-SR502(B)G7 1/5		
	HC-RP503(B)G7 1/11	HG-SR502(B)G7 1/11		
	HC-RP503(B)G7 1/21	HG-SR502(B)G7 1/11 ◆		

Note. For mounting dimensions, refer to "2.3 Comparison of Mounting Dimensions for Geared Servo Motors".

(9) HC-LP/HC-UP/HF-JP series

Series	model	Example of replacement model	Compatibility (O: Compatible)	Note
Medium capacity, low inertia HC-LP series	HC-LP52(B) ◇	HG-JR73(B)	(Note)	・The capacity of the corresponding servo amplifier will be different if a model marked with ◇is replaced. HG-JR73 is MR-J4-70_, HG-JR153 is MR-J4-200_, HG-JR353 is MR-J4-350. Check the dimensions and others of the servo amplifier (drive unit) since the capacity is changed. ・Models shown with "◆" do not have supporting multi-axis amplifiers. ・The power supply and electromagnetic brake connector differ. For further details, refer to "2.6 Comparison of Servo Motor Connector Specifications".
	HC-LP102(B) ◇	HG-JR153(B) ◆		
	HC-LP152(B) ◇	HG-JR353(B)		
	HC-LP202(B)	HG-JR353(B)		
	HC-LP302(B)	HG-JR503(B)		
Medium capacity, flat type HC-UP series	HC-UP72(B)	HG-UR72(B)	O	
	HC-UP152(B)	HG-UR152(B)		
	HC-UP202(B)	HG-UR202(B)		
	HC-UP352(B)	HG-UR352(B)		
	HC-UP502(B)	HG-UR502(B)		
Large capacity, low inertia HF-JP series	HF-JP53(4)(B)	HG-JR53(4)(B)	O	
	HF-JP73(4)(B)	HG-JR73(4)(B)		
	HF-JP103(4)(B)	HG-JR103(4)(B)		
	HF-JP153(4)(B)	HG-JR153(4)(B)		
	HF-JP203(4)(B)	HG-JR203(4)(B)		
	HF-JP353(4)(B)	HG-JR353(4)(B)		
	HF-JP503(4)(B)	HG-JR503(4)(B)		
	HF-JP703(4)(B)	HG-JR703(4)(B)		
	HF-JP903(4)(B)	HG-JR903(4)(B)		
	HF-JP11K1M(4)(B)	HG-JR11K1M(4)(B)		
	HF-JP15K1M(4)(B)	HG-JR15K1M(4)(B)		

Note. For mounting dimensions,Refer to "2.2 Detailed comparison of servo motor mounting dimensions.

(10) HA-LP series

Series	Model	Example of replacement model	Compatibility (○: Compatible)	Note
Large capacity, low inertia HA-LP 1000 r/min series	HA-LP601(4)(B)	HG-JR601(4)(B)	(Note 1)	・Replacement from a model marked with ◇requires a new encoder cable wiring because the motor thermal wiring differs. ・The capacity of the corresponding drive unit will be different if a model marked with ◆ is replaced. HG-JR25K14 is MR-J4-22K_4 or MR-J4-DU22KB4, HG-JR22K1M(4) is MR-J4-22K_(4) or MR-J4-DU22KB(4), HG-JR30K1M(4) is MR-J4-DU30K_(4), HG-JR37K1M4 is MR-J4-DU37K_4, HG-JR45K1M4 is MR-J4-DU45K_4. When replacing to MR-J4-DU22KB (4), refer to the manufacturer catalog and instruction manual. Only MR-CV is available to MR-J4-DU22KB(4). Check the dimensions and others of the servo amplifier (drive unit) since the capacity is changed.
	HA-LP801(4)(B)	HG-JR801(4)(B)		
	HA-LP12K1(4)(B)	HG-JR12K1(4)(B)		
	HA-LP15K1(4) ◇	HG-JR15K1(4)		
	HA-LP20K1(4) ◇	HG-JR20K1(4)		
	HA-LP25K1(4) ◇ ◆	HG-JR25K1(4)		
	HA-LP30K1(4) ◇	HG-JR30K1(4)		
	HA-LP37K1(4) ◇	HG-JR37K1(4)		
	HA-LP601(4)(B)	HG-JR601(4)R(B)-S_	○ (Note 2)	
	HA-LP801(4)(B)	HG-JR801(4)R(B)-S_		
	HA-LP12K1(4)(B)	HG-JR12K1(4)R(B)-S_		
	HA-LP15K1(4) ◇	HG-JR15K1(4)R-S_		
	HA-LP20K1(4) ◇	HG-JR20K1(4)R-S_		
	HA-LP25K1(4) ◇ ◆	HG-JR25K1(4)R-S_		
	HA-LP30K1(4) ◇	HG-JR30K1(4)R-S_		
	HA-LP37K1(4) ◇	HG-JR37K1(4)R-S_		
Large capacity, low inertia HA-LP 1500 r/min series	HA-LP701M(4)(B)	HG-JR701M(4)(B)	(Note 1)	
	HA-LP11K1M(4)(B)	HG-JR11K1M(4)(B)		
	HA-LP15K1M(4)(B)	HG-JR15K1M(4)(B)		
	HA-LP22K1M(4) ◇	HG-JR22K1M(4)		
	HA-LP30K1M(4) ◇	HG-JR30K1M(4)		
	HA-LP37K1M(4) ◇	HG-JR37K1M(4)		
	HA-LP45K1M4 ◇	HG-JR45K1M4		
	HA-LP50K1M4 ◇	HG-JR55K1M4		
	HA-LP701M(4)(B)	HG-JR701M(4)R(B)-S_	○ (Note 2)	
	HA-LP11K1M(4)(B)	HG-JR11K1M(4)R(B)-S_(□250)		
	HA-LP15K1M(4)(B)	HG-JR15K1M(4)R(B)-S_		
	HA-LP22K1M(4) ◇	HG-JR22K1M(4)R-S_		
	HA-LP30K1M(4) ◇	HG-JR30K1M(4)R-S_		
	HA-LP37K1M(4) ◇	HG-JR37K1M(4)R-S_		
	HA-LP45K1M4 ◇	HG-JR45K1M4R-S_		
	HA-LP50K1M4 ◇	HG-JR55K1M4R-S_		
Large capacity, low inertia HA-LP 2000 r/min series	HA-LP502	HG-SR502	(Note 1)	
	HA-LP702	HG-SR702		
	HA-LP11K2(4)(B)	HG-JR11K1M(4)(B)		
	HA-LP15K2(4)(B)			
	HA-LP22K2(4)(B)	HG-JR15K1M(4)(B)		
	HA-LP30K2(4) ◇ ◆	HG-JR22K1M(4)		
	HA-LP37K2(4) ◇ ◆	HG-JR30K1M(4)		
	HA-LP45K24 ◇ ◆	HG-JR37K1M4		
	HA-LP55K24 ◇ ◆	HG-JR45K1M4		
	HA-LP502	HG-SR502R-S_	○ (Note 2)	
	HA-LP702	HG-SR702R-S_		
	HA-LP11K2(4)(B)	HG-JR11K1M(4)R(B)-S_(□200)		
	HA-LP15K2(4)(B)	HG-JR11K1M(4)R(B)-S_(□250)		
	HA-LP22K2(4)(B)	HG-JR15K1M(4)R(B)-S_		
	HA-LP30K2(4) ◇ ◆	HG-JR22K1M(4)R-S_		
	HA-LP37K2(4) ◇ ◆	HG-JR30K1M(4)R-S_		
	HA-LP45K24 ◇ ◆	HG-JR37K1M4R-S_		
	HA-LP55K24 ◇ ◆	HG-JR45K1M4R-S_		

Note 1. For mounting dimensions,Refer to "2.2 Detailed comparison of servo motor mounting dimensions.

2. Only flanges and shaft ends have compatibility in mounting.
Please contact your local sales office regarding the motor model and its delivery, since it is developed upon receipt of order.

2. COMPARISON OF SERVO MOTOR SPECIFICATIONS

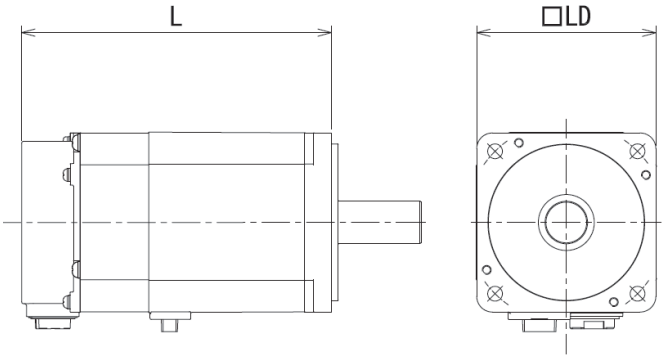
2.1 Comparison of Servo Motor Mounting Dimensions

POINT

- As for the dimensions not listed here, refer to the catalog or Instruction Manual.
- The symbols in the table mean as follows.
  (B): With brake
- The value in the parenthesis shows the value with brake.

(1) HF-KP/HF-MP/HF-SP/HC-RP series

[Unit: mm]

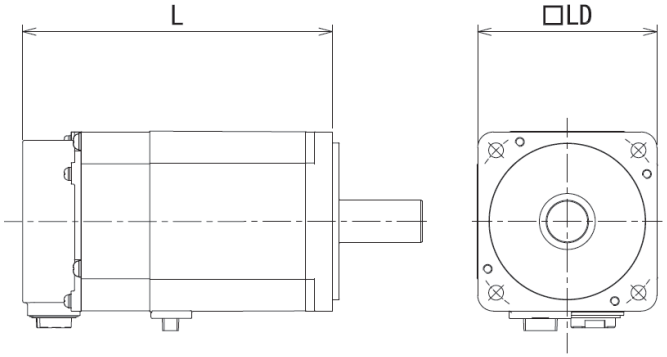


Target models			Substitute models			Note
Model	L	LD	Example of replacement model	L	LD	
HF-KP053(B)	66.4 (107.5)	40	HG-KR053(B)	66.4 (107)	40	
HF-MP053(B)			HG-MR053(B)			
HF-KP13(B)	82.4 (123.5)		HG-KR13(B)	82.4 (123)		
HF-MP13(B)			HG-MR13(B)			
HF-KP23(B) HF-MP23(B)	76.6 (116.1)	60	HG-KR23(B) HG-MR23(B)	76.6 (113.4)	60	(Note)
HF-KP43(B) HF-MP43(B)	98.5 (138)		HG-KR43(B) HG-MR43(B)	98.3 (135.1)		
HF-KP73(B) HF-MP73(B)	113.8 (157)	80	HG-KR73(B) HG-MR73(B)	112 (152.3)	80	
HF-SP51(B)	140.5 (175)	130	HG-SR51(B)	132.5 (167)	130	
HF-SP81(B)	162.5 (197)		HG-SR81(B)	146.5 (181)		
HF-SP121(B)	143.5 (193)	176	HG-SR121(B)	138.5 (188)	176	
HF-SP201(B)	183.5 (233)		HG-SR201(B)	162.5 (212)		
HF-SP301(B)	203.5 (253)		HG-SR301(B)	178.5 (228)		
HF-SP421(B)	263.5 (313)		HG-SR421(B)	218.5 (268)		
HF-SP52(B) HF-SP524(B)	118.5 (153)	130	HG-SR52(B) HG-SR524(B)	118.5 (153)	130	
HF-SP102(B) HF-SP1024(B)	140.5 (175)		HG-SR102(B) HG-SR1024(B)	132.5 (167)		
HF-SP152(B) HF-SP1524(B)	162.5 (197)		HG-SR152(B) HG-SR1524(B)	146.5 (181)		
HF-SP202(B) HF-SP2024(B)	143.5 (193)	176	HG-SR202(B) HG-SR2024(B)	138.5 (188)	176	
HF-SP352(B) HF-SP3524(B)	183.5 (233)		HG-SR352(B) HG-SR3524(B)	162.5 (212)		
HF-SP502(B) HF-SP5024(B)	203.5 (253)		HG-SR502(B) HG-SR5024(B)	178.5 (228)		
HF-SP702(B) HF-SP7024(B)	263.5 (313)		HG-SR702(B) HG-SR7024(B)	218.5 (268)		
HC-RP103(B)	145.5 (183.5)	100	HG-RR103(B)	145.5 (183)	100	
HC-RP153(B)	170.5 (208.5)		HG-RR153(B)	170.5 (208)		
HC-RP203(B)	195.5 (233.5)		HG-RR203(B)	195.5 (233)		
HC-RP353(B)	215.5 (252.5)	130	HG-RR353(B)	215.5 (252)	130	
HC-RP503(B)	272.5 (309.5)		HG-RR503(B)	272.5 (309)		

Note. Some mounting dimensions have differences. Refer to "2.2 Detailed Comparison of Servo Motor Mounting Dimensions" for detailed dimensions.

(2) HC-LP/HC-UP/HF-JP series

[Unit: mm]

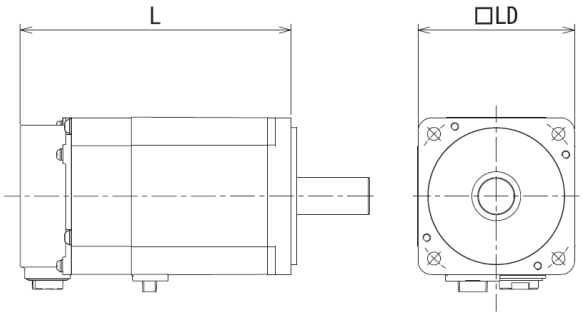


Target models			Substitute models			Note
Model	L	LD	Example of replacement model	L	LD	
HC-LP52(B)	144 (177)	130	HG-JR73(B)	145.5 (191)	90	(Note)
HC-LP102(B)	164 (197)		HG-JR153(B)	199.5 (245)		
HC-LP152(B)	191.5 (224.5)		HG-JR353(B)	213 (251.5)	130	
HC-LP202(B)	198.5 (246.5)	176	HG-JR353(B)	213 (251.5)		
HC-LP302(B)	248.5 (296.5)		HG-JR503(B)	267 (305.5)		
HC-UP72(B)	109 (142.5)	176	HG-UR72(B)	109 (142.5)	176	
HC-UP152(B)	118.5 (152)		HG-UR152(B)	118.5 (152)		
HC-UP202(B)	116.5 (159.5)	220	HG-UR202(B)	116.5 (159.5)	220	
HC-UP352(B)	140.5 (183.5)		HG-UR352(B)	140.5 (183.5)		
HC-UP502(B)	164.5 (207.5)		HG-UR502(B)	164.5 (207.5)		
HF-JP53(B) HF-JP534(B)	127.5 (173)	90	HG-JR53(B) HG-JR534(B)	127.5 (173)	90	
HF-JP73(B) HF-JP734(B)	145.5 (191)		HG-JR73(B) HG-JR734(B)	145.5 (191)		
HF-JP103(B) HF-JP1034(B)	163.5 (209)		HG-JR103(B) HG-JR1034(B)	163.5 (209)		
HF-JP153(B) HF-JP1534(B)	199.5 (245)		HG-JR153(B) HG-JR1534(B)	199.5 (245)		
HF-JP203(B) HF-JP2034(B)	235.5 (281)		HG-JR203(B) HG-JR2034(B)	235.5 (281)		
HF-JP353(B) HF-JP3534(B)	213 (251.5)	130	HG-JR353(B) HG-JR3534(B)	213 (251.5)	130	
HF-JP503(B) HF-JP5034(B)	267 (305.5)		HG-JR503(B) HG-JR5034(B)	267 (305.5)		
HF-JP703(B) HF-JP7034(B)	263.5 (313)	176	HG-JR703(B) HG-JR7034(B)	263.5 (313)	176	
HF-JP903 HF-JP9034(B)	303.5 (353)		HG-JR903 HG-JR9034(B)	303.5 (353)		
HF-JP11K1M(B) HF-JP11K1M4(B)	339.5 (412)	220	HG-JR11K1M(B) HG-JR11K1M4(B)	339.5 (412)	220	
HF-JP15K1M(B) HF-JP15K1M4(B)	439.5 (512)		HG-JR15K1M(B) HG-JR15K1M4(B)	439.5 (512)		

Note. Without attachment compatibility. Refer to "2.2 Detailed Comparison of Servo Motor Mounting Dimensions" for detailed dimensions.

(3) HA-LP 1000 r/min series

[Unit: mm]

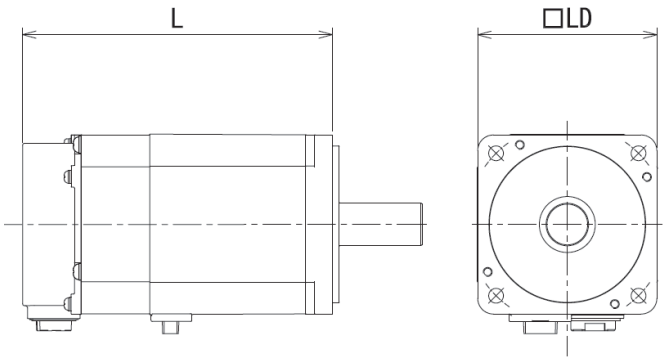


Target models			Substitute models			Note
Model	L	LD	Example of replacement model	L	LD	
HA-LP601(B) HA-LP6014(B)	480 (550)	200	HG-JR601(B) HG-JR6014(B)	299.5 (372)	220	(Note)
			HG-JR601R(B)-S_ HG-JR6014R(B)-S_	399 (472)	200	
HA-LP801(B) HA-LP8014(B)	495 (610)	250	HG-JR801(B) HG-JR8014(B)	339.5 (412)	220	(Note)
			HG-JR801R(B)-S_ HG-JR8014R(B)-S_	354 (427)	250	
HA-LP12K1(B) HA-LP12K14(B)	555 (670)		HG-JR12K1(B) HG-JR12K14(B)	439.5 (512)	220	(Note)
			HG-JR12K1R(B)-S_ HG-JR12K14R(B)-S_	454 (527)	250	
HA-LP15K1 HA-LP15K14	605	280	HG-JR15K1 HG-JR15K14	476	250	(Note)
			HG-JR15K1R-S_ HG-JR15K14R-S_	493	280	
HA-LP20K1 HA-LP20K14	650		HG-JR20K1 HG-JR20K14	538	250	(Note)
			HG-JR20K1R-S_ HG-JR20K14R-S_	555	280	
HA-LP25K1 HA-LP25K14	640	350	HG-JR25K1 HG-JR25K14	600	250	(Note)
			HG-JR25K1R-S_ HG-JR25K14R-S_	617	350	
HA-LP30K1 HA-LP30K14	685		HG-JR30K1 HG-JR30K14	600	280	(Note)
			HG-JR30K1R-S_ HG-JR30K14R-S_	610	350	
HA-LP37K1 HA-LP37K14	785		HG-JR37K1 HG-JR37K14	664	280	(Note)
			HG-JR37K1R-S_ HG-JR37K14R-S_	674	350	

Note. Without attachment compatibility. Refer to "2.2 Detailed Comparison of Servo Motor Mounting Dimensions" for detailed dimensions.

(4) HA-LP 1500 r/min series

[Unit: mm]

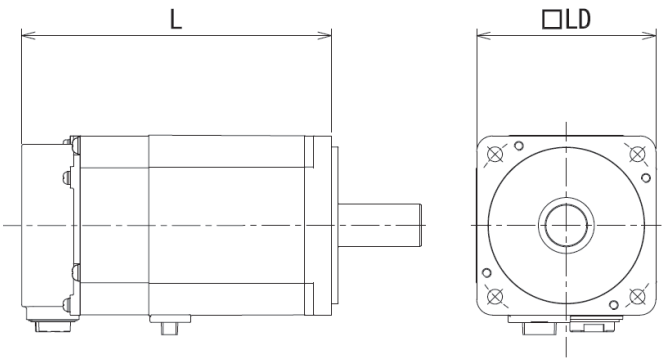


Target models			Substitute models			Note
Model	L	LD	Example of replacement model	L	LD	
HA-LP701M(B) HA-LP701M4(B)	480 (550)	200	HG-JR701M(B) HG-JR701M4(B)	299.5 (372)	220	(Note)
			HG-JR701MR(B)-S_ HG-JR701M4R(B)-S_	399 (472)	200	
HA-LP11K1M(B) HA-LP11K1M4(B)	495 (610)	250	HG-JR11K1M(B) HG-JR11K1M4(B)	339.5 (412)	220	(Note)
			HG-JR11K1MR(B)-S_(□250) HG-JR11K1M4R(B)-S_(□250)	354 (427)	250	
HA-LP15K1M(B) HA-LP15K1M4(B)	555 (670)		HG-JR15K1M(B) HG-JR15K1M4(B)	439.5 (512)	220	(Note)
			HG-JR15K1MR(B)-S_ HG-JR15K1M4R(B)-S_	454 (526.5)	250	
HA-LP22K1M HA-LP22K1M4	605	280	HG-JR22K1M HG-JR22K1M4	476	250	(Note)
			HG-JR22K1MR-S_ HG-JR22K1M4R-S_	493	280	
HA-LP30K1M	660		HG-JR30K1M	538	250	(Note)
			HG-JR30K1MR-S_	555	280	
HA-LP30K1M4	650		HG-JR30K1M4	538	250	(Note)
			HG-JR30K1M4R-S_	555	280	
HA-LP37K1M HA-LP37K1M4	640	350	HG-JR37K1M HG-JR37K1M4	600	250	(Note)
			HG-JR37K1MR-S_ HG-JR37K1M4R-S_	617	350	
HA-LP45K1M4	685		HG-JR45K1M4	600	280	(Note)
			HG-JR45K1M4R-S_	610	350	
HA-LP50K1M4	785		HG-JR55K1M4	664	280	(Note)
			HG-JR55K1M4R-S_	674	350	

Note. Without attachment compatibility. Refer to "2.2 Detailed Comparison of Servo Motor Mounting Dimensions" for detailed dimensions.

(5) HA-LP 2000 r/min series

[Unit: mm]



Target models			Substitute models			Note
Model	L	LD	Example of replacement model	L	LD	
HA-LP502	298	200	HG-SR502	178.5	176	(Note)
			HG-SR502R-S_	205	204	
HA-LP702	340		HG-SR702	218.5	176	(Note)
			HG-SR702R-S_	245	204	
HA-LP11K2(B) HA-LP11K24(B)	480 (550)		HG-JR11K1M(B) HG-JR11K1M4(B)	339.5 (412)	220	(Note)
			HG-JR11K1MR(B)-S_(□200) HG-JR11K1M4R(B)-S_(□200)	439 (512)	200	
HA-LP15K2(B) HA-LP15K24(B)	495 (610)	250	HG-JR11K1M(B) HG-JR11K1M4(B)	339.5 (412)	220	(Note)
			HG-JR11K1MR(B)-S_(□250) HG-JR11K1M4R(B)-S_(□250)	354 (427)	250	
HA-LP22K2(B) HA-LP22K24(B)	555 (670)		HG-JR15K1M(B) HG-JR15K1M4(B)	439.5 (512)	220	(Note)
			HG-JR15K1MR(B)-S_ HG-JR15K1M4R(B)-S_	454 (526.5)	250	
HA-LP30K2	615	280	HG-JR22K1M	476	250	(Note)
			HG-JR22K1MR-S_	493	280	
HA-LP30K24	605		HG-JR22K1M4	476	250	(Note)
			HG-JR22K1M4R-S_	493	280	
HA-LP37K2	660		HG-JR30K1M	538	250	(Note)
			HG-JR30K1MR-S_	555	280	
HA-LP37K24	650		HG-JR30K1M4	538	250	(Note)
			HG-JR30K1M4R-S_	555	280	
HA-LP45K24	640	350	HG-JR37K1M4	600	250	(Note)
			HG-JR37K1M4R-S_	617	350	
HA-LP55K24	685		HG-JR45K1M4	600	280	(Note)
			HG-JR45K1M4R-S_	610	350	

Note. Without attachment compatibility. Refer to "2.2 Detailed Comparison of Servo Motor Mounting Dimensions" for detailed dimensions.

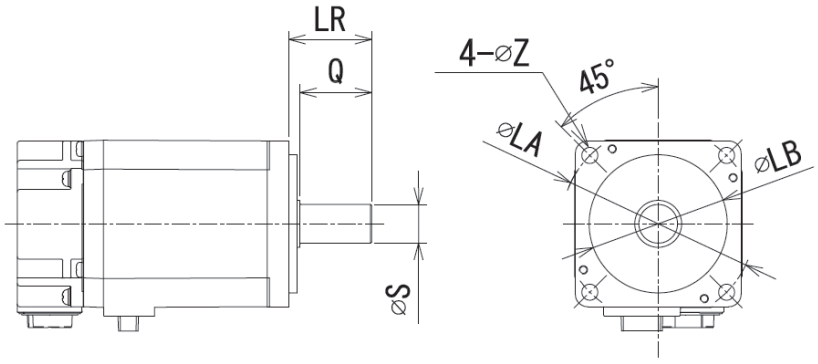
2.2 Detailed Comparison of Servo Motor Mounting Dimensions

POINT

- As for the dimensions not listed here, refer to the catalog or Instruction Manual.
- Dimensions with differences are shown with shading.
- The symbols in the table mean as follows.
  (B): With brake

(1) HF-KP/HF-MP/HF-SP/HC-RP series

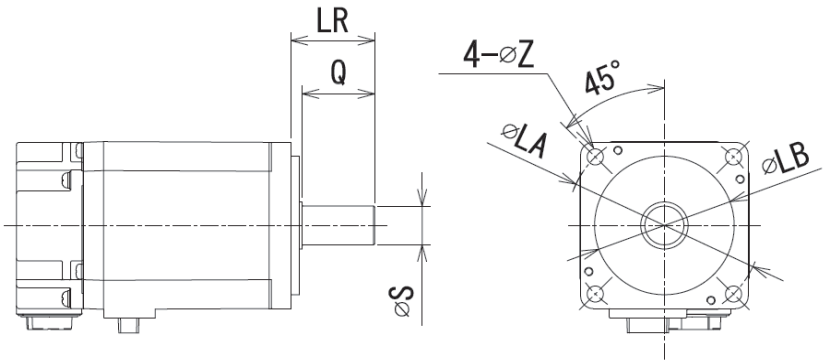
[Unit: mm]



Target models							Substitute models						
Model	LA	LB	LR	Q	S	Z	Example of replacement model	LA	LB	LR	Q	S	Z
HF-KP053(B) HF-MP053(B)	46	30	25	21.5	8	4.5	HG-KR053(B) HG-MR053(B)	46	30	25	21.5	8	4.5
HF-KP13(B) HF-MP13(B)	46	30	25	21.5	8	4.5	HG-KR13(B) HG-MR13(B)	46	30	25	21.5	8	4.5
HF-KP23(B) HF-MP23(B)	70	50	30	27	14	5.8	HG-KR23(B) HG-MR23(B)	70	50	30	26	14	5.8
HF-KP43(B) HF-MP43(B)	70	50	30	27	14	5.8	HG-KR43(B) HG-MR43(B)	70	50	30	26	14	5.8
HF-KP73(B) HF-MP73(B)	90	70	40	37	19	6.6	HG-KR73(B) HG-MR73(B)	90	70	40	36	19	6.6
HF-SP51(B)	145	110	55	50	24	9	HG-SR51(B)	145	110	55	50	24	9
HF-SP81(B)	145	110	55	50	24	9	HG-SR81(B)	145	110	55	50	24	9
HF-SP121(B)	200	114.3	79	75	35	13.5	HG-SR121(B)	200	114.3	79	75	35	13.5
HF-SP201(B)	200	114.3	79	75	35	13.5	HG-SR201(B)	200	114.3	79	75	35	13.5
HF-SP301(B)	200	114.3	79	75	35	13.5	HG-SR301(B)	200	114.3	79	75	35	13.5
HF-SP421(B)	200	114.3	79	75	35	13.5	HG-SR421(B)	200	114.3	79	75	35	13.5
HF-SP52(B) HF-SP524(B)	145	110	55	50	24	9	HG-SR52(B) HG-SR524(B)	145	110	55	50	24	9
HF-SP102(B) HF-SP1024(B)	145	110	55	50	24	9	HG-SR102(B) HG-SR1024(B)	145	110	55	50	24	9
HF-SP152(B) HF-SP1524(B)	145	110	55	50	24	9	HG-SR152(B) HG-SR1524(B)	145	110	55	50	24	9
HF-SP202(B) HF-SP2024(B)	200	114.3	79	75	35	13.5	HG-SR202(B) HG-SR2024(B)	200	114.3	79	75	35	13.5
HF-SP352(B) HF-SP3524(B)	200	114.3	79	75	35	13.5	HG-SR352(B) HG-SR3524(B)	200	114.3	79	75	35	13.5
HF-SP502(B) HF-SP5024(B)	200	114.3	79	75	35	13.5	HG-SR502(B) HG-SR5024(B)	200	114.3	79	75	35	13.5
HF-SP702(B) HF-SP7024(B)	200	114.3	79	75	35	13.5	HG-SR702(B) HG-SR7024(B)	200	114.3	79	75	35	13.5
HC-RP103(B)	115	95	45	40	24	9	HG-RR103(B)	115	95	45	40	24	9
HC-RP153(B)	115	95	45	40	24	9	HG-RR153(B)	115	95	45	40	24	9
HC-RP203(B)	115	95	45	40	24	9	HG-RR203(B)	115	95	45	40	24	9
HC-RP353(B)	145	110	63	58	28	9	HG-RR353(B)	145	110	63	58	28	9
HC-RP503(B)	145	110	63	58	28	9	HG-RR503(B)	145	110	63	58	28	9

(2) HC-LP/HC-UP/HF-JP series

[Unit: mm]

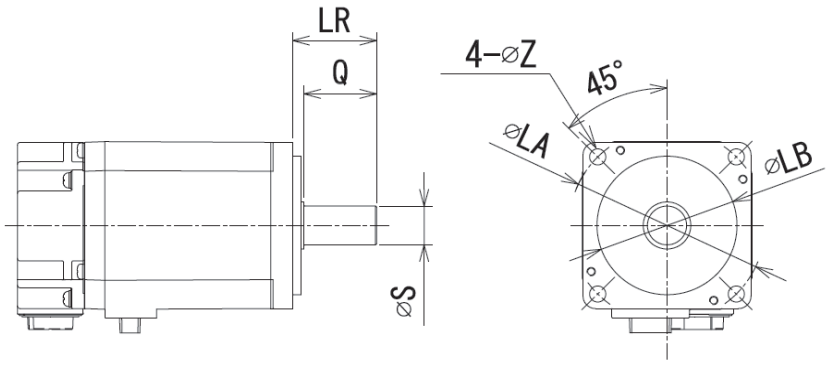


Target models							Substitute models						
Model	LA	LB	LR	Q	S	Z	Example of replacement model (Note)	LA	LB	LR	Q	S	Z
HC-LP52(B)	145	110	55	50	24	9	HG-JR73(B)	100	80	40	30	16	6.6
HC-LP102(B)	145	110	55	50	24	9	HG-JR153(B)	100	80	40	30	16	6.6
HC-LP152(B)	145	110	55	50	24	9	HG-JR353(B)	145	110	55	50	28	9
HC-LP202(B)	200	114.3	79	75	35	13.5	HG-JR353(B)	145	110	55	50	28	9
HC-LP302(B)	200	114.3	79	75	35	13.5	HG-JR503(B)	145	110	55	50	28	9
HC-UP72(B)	200	114.3	55	50	22	13.5	HG-UR72(B)	200	114.3	55	50	22	13.5
HC-UP152(B)	200	114.3	55	50	28	13.5	HG-UR152(B)	200	114.3	55	50	28	13.5
HC-UP202(B)	235	200	65	60	35	13.5	HG-UR202(B)	235	200	65	60	35	13.5
HC-UP352(B)	235	200	65	60	35	13.5	HG-UR352(B)	235	200	65	60	35	13.5
HC-UP502(B)	235	200	65	60	35	13.5	HG-UR502(B)	235	200	65	60	35	13.5
HF-JP53(B) HF-JP534(B)	100	80	40	30	16	6.6	HG-JR53(B) HG-JR534(B)	100	80	40	30	16	6.6
HF-JP73(B) HF-JP734(B)	100	80	40	30	16	6.6	HG-JR73(B) HG-JR734(B)	100	80	40	30	16	6.6
HF-JP103(B) HF-JP1034(B)	100	80	40	30	16	6.6	HG-JR103(B) HG-JR1034(B)	100	80	40	30	16	6.6
HF-JP153(B) HF-JP1534(B)	100	80	40	30	16	6.6	HG-JR153(B) HG-JR1534(B)	100	80	40	30	16	6.6
HF-JP203(B) HF-JP2034(B)	100	80	40	30	16	6.6	HG-JR203(B) HG-JR2034(B)	100	80	40	30	16	6.6
HF-JP353(B) HF-JP3534(B)	145	110	55	50	28	9	HG-JR353(B) HG-JR3534(B)	145	110	55	50	28	9
HF-JP503(B) HF-JP5034(B)	145	110	55	50	28	9	HG-JR503(B) HG-JR5034(B)	145	110	55	50	28	9
HF-JP703(B) HF-JP7034(B)	200	114.3	79	75	35	13.5	HG-JR703(B) HG-JR7034(B)	200	114.3	79	75	35	13.5
HF-JP903(B) HF-JP9034(B)	200	114.3	79	75	35	13.5	HG-JR903(B) HG-JR9034(B)	200	114.3	79	75	35	13.5
HF-JP11K1M(B) HF-JP11K1M4(B)	235	200	116	110	55	13.5	HG-JR11K1M(B) HG-JR11K1M4(B)	235	200	116	110	55	13.5
HF-JP15K1M(B) HF-JP15K1M4(B)	235	200	116	110	55	13.5	HG-JR15K1M(B) HG-JR15K1M4(B)	235	200	116	110	55	13.5

Note. Motor foot cannot be mounted to HG-JR series.

(3) HA-LP series

[Unit: mm]



Target models							Substitute models						
Model	LA	LB	LR	Q	S	Z	Example of replacement model (Note)	LA	LB	LR	Q	S	Z
HA-LP601(B) HA-LP6014(B)	215	180	85	80	42	14.5	HG-JR601(B) HG-JR6014(B)	235	200	85	79	42	13.5
HA-LP801(B) HA-LP8014(B)	265	230	110	100	55	14.5	HG-JR801(B) HG-JR8014(B)	235	200	116	110	55	13.5
HA-LP12K1(B) HA-LP12K14(B)	265	230	110	100	55	14.5	HG-JR12K1(B) HG-JR12K14(B)	235	200	116	110	55	13.5
HA-LP15K1 HA-LP15K14	300	250	140	140	60	19	HG-JR15K1 HG-JR15K14	265	230	140	130	65	24
HA-LP20K1 HA-LP20K14	300	250	140	140	60	19	HG-JR20K1 HG-JR20K14	265	230	140	130	65	24
HA-LP25K1 HA-LP25K14	350	300	140	140	65	19	HG-JR25K1 HG-JR25K14	265	230	140	130	65	24
HA-LP30K1 HA-LP30K14	350	300	140	140	65	19	HG-JR30K1 HG-JR30K14	300	250	140	140	80	24
HA-LP37K1 HA-LP37K14	350	300	170	170	80	19	HG-JR37K1 HG-JR37K14	300	250	140	140	80	24
HA-LP701M(B) HA-LP701M4(B)	215	180	85	80	42	14.5	HG-JR701M(B) HG-JR701M4(B)	235	200	85	79	42	13.5
HA-LP11K1M(B) HA-LP11K1M4(B)	265	230	110	100	55	14.5	HG-JR11K1M(B) HG-JR11K1M4(B)	235	200	116	110	55	13.5
HA-LP15K1M(B) HA-LP15K1M4(B)	265	230	110	100	55	14.5	HG-JR15K1M(B) HG-JR15K1M4(B)	235	200	116	110	55	13.5
HA-LP22K1M HA-LP22K1M4	300	250	140	140	60	19	HG-JR22K1M HG-JR22K1M4	265	230	140	130	65	24
HA-LP30K1M HA-LP30K1M4	300	250	140	140	60	19	HG-JR30K1M HG-JR30K1M4	265	230	140	130	65	24
HA-LP37K1M HA-LP37K1M4	350	300	140	140	65	19	HG-JR37K1M HG-JR37K1M4	265	230	140	130	65	24
HA-LP45K1M4	350	300	140	140	65	19	HG-JR45K1M4	300	250	140	140	80	24
HA-LP50K1M4	350	300	170	170	80	19	HG-JR55K1M4	300	250	140	140	80	24
HA-LP502	215	180	85	80	42	14.5	HG-SR502	200	114.3	79	75	35	13.5
HA-LP702	215	180	85	80	42	14.5	HG-SR702	200	114.3	79	75	35	13.5
HA-LP11K2(B) HA-LP11K24(B)	215	180	85	80	42	14.5	HG-JR11K1M(B) HG-JR11K1M4(B)	235	200	116	110	55	13.5
HA-LP15K2(B) HA-LP15K24(B)	265	230	110	100	55	14.5	HG-JR11K1M(B) HG-JR11K1M4(B)	235	200	116	110	55	13.5
HA-LP22K2(B) HA-LP22K24(B)	265	230	110	100	55	14.5	HG-JR15K1M(B) HG-JR15K1M4(B)	235	200	116	110	55	13.5
HA-LP30K2 HA-LP30K24	300	250	140	140	60	19	HG-JR22K1M HG-JR22K1M4	265	230	140	130	65	24
HA-LP37K2 HA-LP37K24	300	250	140	140	60	19	HG-JR30K1M HG-JR30K1M4	265	230	140	130	65	24
HA-LP45K24	350	300	140	140	65	19	HG-JR37K1M4	265	230	140	130	65	24
HA-LP55K24	350	300	140	140	65	19	HG-JR45K1M4	300	250	140	140	80	24

Note. Motor foot cannot be mounted to HG-JR series.

2.3 Comparison of Mounting Dimensions for Geared Servo Motors

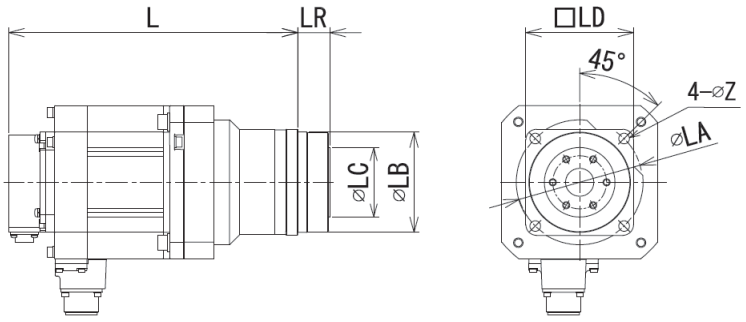
Servo motor series whose mounting dimensions of the reducer are the same before and after the replacement is omitted.

POINT

- As for the dimensions not listed here, refer to the catalog or Instruction Manual.
- Dimensions with differences are shown with shading.
- The value in the parenthesis shows the value with brake.

(1) HC-RP_G5 series (With reduction gear for precision application compliant)

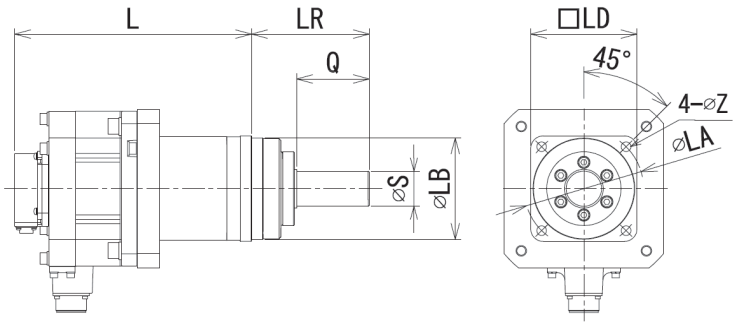
[Unit: mm]



Output (kW)	HC-RP series (G5)								HG-SR series (G5)							
	Reduction ratio	L	LR	LA	LB	LC	LD	Z	Reduction ratio	L	LR	LA	LB	LC	LD	Z
1.0	1/5	227.5 (265.5)	27	105	85	59	90	9	1/5	227.5 (262)	27	105	85	59	90	9
	1/11	227.5 (265.5)	27	105	85	59	90	9	1/11	239.5 (274)	35	135	115	84	120	11
	1/21	255.5 (293.5)	35	135	115	84	120	11	1/21	239.5 (274)	35	135	115	84	120	11
	1/33	255.5 (293.5)	35	135	115	84	120	11	1/33	255.5 (290)	53	190	165	122	170	14
	1/45	268.5 (306.5)	53	190	165	122	170	14	1/45	255.5 (290)	53	190	165	122	170	14
1.5	1/5	252.5 (290)	27	105	85	59	90	9	1/5	241.5 (276)	27	105	85	59	90	9
	1/11	280.5 (318.5)	35	135	115	84	120	11	1/11	253.5 (288)	35	135	115	84	120	11
	1/21	280.5 (318.5)	35	135	115	84	120	11	1/21	269.5 (304)	53	190	165	122	170	14
	1/33	293.5 (331.5)	53	190	165	122	170	14	1/33	269.5 (304)	53	190	165	122	170	14
	1/45	293.5 (331.5)	53	190	165	122	170	14	1/45	269.5 (304)	53	190	165	122	170	14
2.0	1/5	277.5 (315.5)	27	105	85	59	90	9	1/5	267.5 (317)	35	135	115	84	120	11
	1/11	305.5 (343.5)	35	135	115	84	120	11	1/11	267.5 (317)	35	135	115	84	120	11
	1/21	318.5 (365.5)	53	190	165	122	170	14	1/21	287.5 (337)	53	190	165	122	170	14
	1/33	318.5 (365.5)	53	190	165	122	170	14	1/33	287.5 (337)	53	190	165	122	170	14
	1/45	318.5 (365.5)	53	190	165	122	170	14	1/45	287.5 (337)	53	190	165	122	170	14
3.5	1/5	344.5 (381.5)	35	135	115	84	120	11	1/5	291.5 (341)	35	135	115	84	120	11
	1/11	344.5 (381.5)	35	135	115	84	120	11	1/11	311.5 (361)	53	190	165	122	170	14
	1/21	364.5 (401.5)	53	190	165	122	170	14	1/21	311.5 (361)	53	190	165	122	170	14
	1/33	364.5 (401.5)	53	190	165	122	170	14	1/21	311.5 (361)	53	190	165	122	170	14
5.0	1/5	401.5 (438.5)	35	135	115	84	120	11	1/5	327.5 (377)	53	190	165	122	170	14
	1/11	421.5 (458.5)	53	190	165	122	170	14	1/11	327.5 (377)	53	190	165	122	170	14
	1/21	421.5 (458.5)	53	190	165	122	170	14	1/11	327.5 (377)	53	190	165	122	170	14

(2) HC-RP_G7 series (With reduction gear for precision application compliant)

[Unit: mm]



Output (kW)	HC-RP series (G7)									HG-SR series (G7)								
	Reduction ratio	L	LR	Q	S	LA	LB	LD	Z	Reduction ratio	L	LR	Q	S	LA	LB	LD	Z
1.0	1/5	227.5 (265.5)	80	42	25	105	85	90	9	1/5	227.5 (262)	80	42	25	105	85	90	9
	1/11	227.5 (265.5)	80	42	25	105	85	90	9	1/11	239.5 (274)	133	82	40	135	115	120	11
	1/21	255.5 (293.5)	133	82	40	135	115	120	11	1/21	239.5 (274)	133	82	40	135	115	120	11
	1/33	255.5 (293.5)	133	82	40	135	115	120	11	1/33	255.5 (290)	156	82	50	190	165	170	14
	1/45	268.5 (306.5)	156	82	50	190	165	170	14	1/45	255.5 (290)	156	82	50	190	165	170	14
1.5	1/5	252.5 (290.5)	80	42	25	105	85	90	9	1/5	241.5 (276)	80	42	25	105	85	90	9
	1/11	280.5 (318.5)	133	82	40	135	115	120	11	1/11	253.5 (288)	133	82	40	135	115	120	11
	1/21	280.5 (318.5)	133	82	40	135	115	120	11	1/21	269.5 (304)	156	82	50	190	165	170	14
	1/33	293.5 (331.5)	156	82	50	190	165	170	14	1/33	269.5 (304)	156	82	50	190	165	170	14
	1/45	293.5 (331.5)	156	82	50	190	165	170	14	1/45	269.5 (304)	156	82	50	190	165	170	14
2.0	1/5	277.5 (315.5)	80	42	25	105	85	90	9	1/5	267.5 (317)	133	82	40	135	115	120	11
	1/11	305.5 (343.5)	133	82	40	135	115	120	11	1/11	267.5 (317)	133	82	40	135	115	120	11
	1/21	318.5 (356.5)	156	82	50	190	165	170	14	1/21	287.5 (337)	156	82	50	190	165	170	14
	1/33	318.5 (356.5)	156	82	50	190	165	170	14	1/33	287.5 (337)	156	82	50	190	165	170	14
	1/45	318.5 (356.5)	156	82	50	190	165	170	14	1/45	287.5 (337)	156	82	50	190	165	170	14
3.5	1/5	344.5 (381.5)	133	82	40	135	115	120	11	1/5	291.5 (341)	133	82	40	135	115	120	11
	1/11	344.5 (381.5)	133	82	40	135	115	120	11	1/11	311.5 (361)	156	82	50	190	165	170	14
	1/21	364.5 (401.5)	156	82	50	190	165	170	14	1/21	311.5 (361)	156	82	50	190	165	170	14
	1/33	364.5 (401.5)	156	82	50	190	165	170	14	1/21	311.5 (361)	156	82	50	190	165	170	14
5.0	1/5	401.5 (438.5)	133	82	40	135	115	120	11	1/5	327.5 (377)	156	82	50	190	165	170	14
	1/11	421.5 (458.5)	156	82	50	190	165	170	14	1/11	327.5 (377)	156	82	50	190	165	170	14
	1/21	421.5 (458.5)	156	82	50	190	165	170	14	1/11	327.5 (377)	156	82	50	190	165	170	14

2.4 Comparison of Actual Reduction Ratios for Geared Servo Motors

POINT

- The HG-MR series does not support the geared model. The geared model is supported with the HG-KR series.
- Actual reduction ratios with differences are shown with shading.

HF-KP_G1/HF-MP_G1(With gears for general industrial machines with a reducer) series
Because the actual reduction ratio for some models is different when replacing HF-KP_G1 or HF-MP_G1 with HG-KR_G1, it is required that an electronic gear be set up.

Output (W)	Reduction ratio	Actual reduction ratio	
		HF-KP/HF-MP series (G1)	HG-KR series (G1)
50	1/5	9/44	9/44
	1/12	49/576	49/576
	1/20	25/484	25/484
100	1/5	9/44	9/44
	1/12	49/576	49/576
	1/20	25/484	25/484
200	1/5	19/96	19/96
	1/12	25/288	961/11664
	1/20	253/5000	513/9984
400	1/5	19/96	19/96
	1/12	25/288	961/11664
	1/20	253/5000	7/135
750	1/5	1/5	1/5
	1/12	525/6048	7/87
	1/20	625/12544	625/12544

2.5 Comparison of Moment of Inertia

POINT

- As for the motor specifications not listed here, refer to the catalog or Instruction Manual.
- If the load inertia moment ratio is exceeded, please ask the sales contact.
- The symbols in the table mean as follows.
  (B): With brake
  (4): 400 V specifications
  (H): Foot-mounting
- The value in the parenthesis shows the value with brake.

(1) HF-KP series (With gears for general industrial machines with a reducer)

Series	Target models			Substitute model		
	Model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio	Example of replacement model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio
Small capacity, low inertia HF-KP series	HF-KP053(B)	0.052 (0.054)	15 times or less	HG-KR053(B)	0.0450 (0.0472)	17 times or less
	HF-KP13(B)	0.088 (0.090)		HG-KR13(B)	0.0777 (0.0837)	
	HF-KP23(B)	0.24 (0.31)	24 times or less	HG-KR23(B)	0.221 (0.243)	26 times or less
	HF-KP43(B)	0.42 (0.50)	22 times or less	HG-KR43(B)	0.371 (0.393)	25 times or less
	HF-KP73(B)	1.43 (1.63)	15 times or less	HG-KR73(B)	1.26 (1.37)	17 times or less
Small capacity, low inertia HF-KP series For general industrial machine with a reducer: G1	HF-KP053(B)G1 1/5	0.089 (0.091)	5 times or less	HG-KR053(B)G1 1/5	0.0820 (0.0840)	5 times or less
	HF-KP053(B)G1 1/12	0.111 (0.113)		HG-KR053(B)G1 1/12	0.104 (0.106)	
	HF-KP053(B)G1 1/20	0.093 (0.095)		HG-KR053(B)G1 1/20	0.0860 (0.0880)	
	HF-KP13(B)G1 1/5	0.125 (0.127)		HG-KR13(B)G1 1/5	0.115 (0.121)	
	HF-KP13(B)G1 1/12	0.147 (0.149)		HG-KR13(B)G1 1/12	0.137 (0.143)	
	HF-KP13(B)G1 1/20	0.129 (0.131)		HG-KR13(B)G1 1/20	0.119 (0.125)	
	HF-KP23(B)G1 1/5	0.400 (0.470)	7 times or less	HG-KR23(B)G1 1/5	0.375 (0.397)	7 times or less
	HF-KP23(B)G1 1/12	0.450 (0.520)		HG-KR23(B)G1 1/12	0.418 (0.440)	
	HF-KP23(B)G1 1/20	0.420 (0.490)		HG-KR23(B)G1 1/20	0.391 (0.413)	
	HF-KP43(B)G1 1/5	0.570 (0.650)		HG-KR43(B)G1 1/5	0.525 (0.547)	
	HF-KP43(B)G1 1/12	0.620 (0.700)		HG-KR43(B)G1 1/12	0.568 (0.590)	
	HF-KP43(B)G1 1/20	0.930 (1.01)		HG-KR43(B)G1 1/20	0.881 (0.903)	
	HF-KP73(B)G1 1/5	1.85 (2.05)	5 times or less	HG-KR73(B)G1 1/5	1.68 (1.79)	5 times or less
	HF-KP73(B)G1 1/12	2.52 (2.72)		HG-KR73(B)G1 1/12	2.35 (2.46)	
	HF-KP73(B)G1 1/20	2.58 (2.78)		HG-KR73(B)G1 1/20	2.41 (2.52)	

(2) HF-KP series (With reduction gear for precision application compliant)

Series	Target product			Substitute model		
	Model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio	Example of replacement model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio
Small capacity, low inertia HF-KP series With flange-output type gear reducer for high precision applications, flange mounting: G5	HF-KP053(B)G5 1/5	0.120 (0.122)	10 times or less	HG-KR053(B)G5 1/5	0.113 (0.115)	10 times or less
	HF-KP053(B)G5 1/11	0.112 (0.114)		HG-KR053(B)G5 1/11	0.105 (0.107)	
	HF-KP053(B)G5 1/21	0.103 (0.105)		HG-KR053(B)G5 1/21	0.0960 (0.0980)	
	HF-KP053(B)G5 1/33	0.097 (0.099)		HG-KR053(B)G5 1/33	0.0900 (0.0920)	
	HF-KP053(B)G5 1/45	0.097 (0.099)		HG-KR053(B)G5 1/45	0.0900 (0.0920)	
	HF-KP13(B)G5 1/5	0.156 (0.158)		HG-KR13(B)G5 1/5	0.146 (0.152)	
	HF-KP13(B)G5 1/11	0.148 (0.150)		HG-KR13(B)G5 1/11	0.138 (0.144)	
	HF-KP13(B)G5 1/21	0.139 (0.141)		HG-KR13(B)G5 1/21	0.129 (0.135)	
	HF-KP13(B)G5 1/33	0.150 (0.152)		HG-KR13(B)G5 1/33	0.140 (0.146)	
	HF-KP13(B)G5 1/45	0.149 (0.151)		HG-KR13(B)G5 1/45	0.139 (0.145)	
	HF-KP23(B)G5 1/5	0.441 (0.511)	14 times or less	HG-KR23(B)G5 1/5	0.422 (0.444)	14 times or less
	HF-KP23(B)G5 1/11	0.443 (0.513)		HG-KR23(B)G5 1/11	0.424 (0.446)	
	HF-KP23(B)G5 1/21	0.738 (0.808)		HG-KR23(B)G5 1/21	0.719 (0.741)	
	HF-KP23(B)G5 1/33	0.692 (0.762)		HG-KR23(B)G5 1/33	0.673 (0.695)	
	HF-KP23(B)G5 1/45	0.691 (0.761)		HG-KR23(B)G5 1/45	0.672 (0.694)	
	HF-KP43(B)G5 1/5	0.621 (0.701)		HG-KR43(B)G5 1/5	0.572 (0.594)	
	HF-KP43(B)G5 1/11	0.996 (1.08)		HG-KR43(B)G5 1/11	0.947 (0.969)	
	HF-KP43(B)G5 1/21	0.918 (0.998)		HG-KR43(B)G5 1/21	0.869 (0.891)	
	HF-KP43(B)G5 1/33	0.970 (1.05)		HG-KR43(B)G5 1/33	0.921 (0.943)	
	HF-KP43(B)G5 1/45	0.964 (1.04)		HG-KR43(B)G5 1/45	0.915 (0.937)	
	HF-KP73(B)G5 1/5	2.08 (2.28)	10 times or less	HG-KR73(B)G5 1/5	1.91 (2.02)	10 times or less
	HF-KP73(B)G5 1/11	1.99 (2.19)		HG-KR73(B)G5 1/11	1.82 (1.93)	
	HF-KP73(B)G5 1/21	2.18 (2.38)		HG-KR73(B)G5 1/21	2.01 (2.12)	
	HF-KP73(B)G5 1/33	1.96 (2.16)		HG-KR73(B)G5 1/33	1.79 (1.90)	
	HF-KP73(B)G5 1/45	1.96 (2.16)		HG-KR73(B)G5 1/45	1.79 (1.90)	
Small capacity, low inertia HF-KP series With shaft-output type gear reducer for high precision applications, flange mounting :G7	HF-KP053(B)G7 1/5	0.126 (0.128)	10 times or less	HG-KR053(B)G7 1/5	0.119 (0.121)	10 times or less
	HF-KP053(B)G7 1/11	0.113 (0.115)		HG-KR053(B)G7 1/11	0.106 (0.108)	
	HF-KP053(B)G7 1/21	0.103 (0.105)		HG-KR053(B)G7 1/21	0.0960 (0.0980)	
	HF-KP053(B)G7 1/33	0.097 (0.099)		HG-KR053(B)G7 1/33	0.0900 (0.0920)	
	HF-KP053(B)G7 1/45	0.097 (0.099)		HG-KR053(B)G7 1/45	0.0900 (0.0920)	
	HF-KP13(B)G7 1/5	0.162 (0.164)		HG-KR13(B)G7 1/5	0.152 (0.158)	
	HF-KP13(B)G7 1/11	0.149 (0.151)		HG-KR13(B)G7 1/11	0.139 (0.145)	
	HF-KP13(B)G7 1/21	0.139 (0.141)		HG-KR13(B)G7 1/21	0.129 (0.135)	
	HF-KP13(B)G7 1/33	0.151 (0.153)		HG-KR13(B)G7 1/33	0.141 (0.147)	
	HF-KP13(B)G7 1/45	0.149 (0.151)		HG-KR13(B)G7 1/45	0.139 (0.145)	
	HF-KP23(B)G7 1/5	0.447 (0.517)	14 times or less	HG-KR23(B)G7 1/5	0.428 (0.450)	14 times or less
	HF-KP23(B)G7 1/11	0.443 (0.513)		HG-KR23(B)G7 1/11	0.424 (0.446)	
	HF-KP23(B)G7 1/21	0.740 (0.810)		HG-KR23(B)G7 1/21	0.721 (0.743)	
	HF-KP23(B)G7 1/33	0.693 (0.763)		HG-KR23(B)G7 1/33	0.674 (0.696)	
	HF-KP23(B)G7 1/45	0.691 (0.761)		HG-KR23(B)G7 1/45	0.672 (0.694)	
	HF-KP43(B)G7 1/5	0.627 (0.707)		HG-KR43(B)G7 1/5	0.578 (0.600)	
	HF-KP43(B)G7 1/11	1.00 (1.08)		HG-KR43(B)G7 1/11	0.955 (0.977)	
	HF-KP43(B)G7 1/21	0.920 (1.00)		HG-KR43(B)G7 1/21	0.871 (0.893)	
	HF-KP43(B)G7 1/33	0.976 (1.06)		HG-KR43(B)G7 1/33	0.927 (0.949)	
	HF-KP43(B)G7 1/45	0.967 (1.05)		HG-KR43(B)G7 1/45	0.918 (0.940)	
	HF-KP73(B)G7 1/5	2.12 (2.32)	10 times or less	HG-KR73(B)G7 1/5	1.95 (2.06)	10 times or less
	HF-KP73(B)G7 1/11	2.00 (2.20)		HG-KR73(B)G7 1/11	1.83 (1.94)	
	HF-KP73(B)G7 1/21	2.20 (2.40)		HG-KR73(B)G7 1/21	2.03 (2.14)	
	HF-KP73(B)G7 1/33	1.97 (2.17)		HG-KR73(B)G7 1/33	1.80 (1.91)	
	HF-KP73(B)G7 1/45	1.96 (2.16)		HG-KR73(B)G7 1/45	1.79 (1.90)	

(3) HF-MP series (With gears for general industrial machines)

Series	Target models			Substitute models		
	Model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio	Example of replacement model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio
Small capacity, ultra-low inertia HF-MP series	HF-MP053(B)	0.019 (0.025)	30 times or less	HG-MR053(B)	0.0162 (0.0224)	35 times or less
	HF-MP13(B)	0.032 (0.039)		HG-MR13(B)	0.0300 (0.0362)	32 times or less
	HF-MP23(B)	0.088 (0.12)		HG-MR23(B)	0.0865 (0.109)	
	HF-MP43(B)	0.15 (0.18)		HG-MR43(B)	0.142 (0.164)	
	HF-MP73(B)	0.60 (0.70)		HG-MR73(B)	0.586 (0.694)	
Small capacity, ultra-low inertia HF-MP series With gears for general industrial machines: G1	HF-MP053(B)G1 1/5	0.056 (0.062)	25 times or less	HG-KR053(B)G1 1/5	0.0820 (0.0840)	5 times or less
	HF-MP053(B)G1 1/12	0.078 (0.084)		HG-KR053(B)G1 1/12	0.104 (0.106)	
	HF-MP053(B)G1 1/20	0.060 (0.066)		HG-KR053(B)G1 1/20	0.0860 (0.0880)	
	HF-MP13(B)G1 1/5	0.069 (0.076)		HG-KR13(B)G1 1/5	0.115 (0.121)	
	HF-MP13(B)G1 1/12	0.091 (0.089)		HG-KR13(B)G1 1/12	0.137 (0.143)	
	HF-MP13(B)G1 1/20	0.073 (0.080)		HG-KR13(B)G1 1/20	0.119 (0.125)	
	HF-MP23(B)G1 1/5	0.248 (0.280)		HG-KR23(B)G1 1/5	0.375 (0.397)	7 times or less
	HF-MP23(B)G1 1/12	0.298 (0.330)		HG-KR23(B)G1 1/12	0.418 (0.440)	
	HF-MP23(B)G1 1/20	0.268 (0.300)		HG-KR23(B)G1 1/20	0.391 (0.413)	
	HF-MP43(B)G1 1/5	0.300 (0.330)		HG-KR43(B)G1 1/5	0.525 (0.547)	
	HF-MP43(B)G1 1/12	0.350 (0.380)		HG-KR43(B)G1 1/12	0.568 (0.590)	
	HF-MP43(B)G1 1/20	0.660 (0.690)		HG-KR43(B)G1 1/20	0.881 (0.903)	
	HF-MP73(B)G1 1/5	1.02 (1.12)		HG-KR73(B)G1 1/5	1.68 (1.79)	5 times or less
	HF-MP73(B)G1 1/12	1.69 (1.79)		HG-KR73(B)G1 1/12	2.35 (2.46)	
	HF-MP73(B)G1 1/20	1.75 (1.85)		HG-KR73(B)G1 1/20	2.41 (2.52)	

(4) HF-MP series (With reduction gear for precision application compliant)

Series	Target models			Substitute models		
	Model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio	Example of replacement model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio
Small capacity, ultra-low inertia HF-MP series With flange-output type gear reducer for high precision applications, flange mounting: G5	HF-MP053(B)G5 1/5	0.087 (0.093)	25 times or less	HG-KR053(B)G5 1/5	0.113 (0.115)	10 times or less
	HF-MP053(B)G5 1/11	0.079 (0.085)		HG-KR053(B)G5 1/11	0.105 (0.107)	
	HF-MP053(B)G5 1/21	0.070 (0.076)		HG-KR053(B)G5 1/21	0.0960 (0.0980)	
	HF-MP053(B)G5 1/33	0.064 (0.070)		HG-KR053(B)G5 1/33	0.0900 (0.0920)	
	HF-MP053(B)G5 1/45	0.064 (0.070)		HG-KR053(B)G5 1/45	0.0900 (0.0920)	
	HF-MP13(B)G5 1/5	0.100 (0.107)		HG-KR13(B)G5 1/5	0.146 (0.152)	
	HF-MP13(B)G5 1/11	0.092 (0.099)		HG-KR13(B)G5 1/11	0.138 (0.144)	
	HF-MP13(B)G5 1/21	0.083 (0.090)		HG-KR13(B)G5 1/21	0.129 (0.135)	
	HF-MP13(B)G5 1/33	0.094 (0.101)		HG-KR13(B)G5 1/33	0.140 (0.146)	
	HF-MP13(B)G5 1/45	0.093 (0.100)		HG-KR13(B)G5 1/45	0.139 (0.145)	
	HF-MP23(B)G5 1/5	0.289 (0.321)		HG-KR23(B)G5 1/5	0.422 (0.444)	14 times or less
	HF-MP23(B)G5 1/11	0.291 (0.323)		HG-KR23(B)G5 1/11	0.424 (0.446)	
	HF-MP23(B)G5 1/21	0.586 (0.618)		HG-KR23(B)G5 1/21	0.719 (0.741)	
	HF-MP23(B)G5 1/33	0.540 (0.572)		HG-KR23(B)G5 1/33	0.673 (0.695)	
	HF-MP23(B)G5 1/45	0.539 (0.571)		HG-KR23(B)G5 1/45	0.672 (0.694)	
	HF-MP43(B)G5 1/5	0.351 (0.381)		HG-KR43(B)G5 1/5	0.572 (0.594)	
	HF-MP43(B)G5 1/11	0.726 (0.756)		HG-KR43(B)G5 1/11	0.947 (0.969)	
	HF-MP43(B)G5 1/21	0.648 (0.678)		HG-KR43(B)G5 1/21	0.869 (0.891)	
	HF-MP43(B)G5 1/33	0.700 (0.730)		HG-KR43(B)G5 1/33	0.921 (0.943)	
	HF-MP43(B)G5 1/45	0.694 (0.724)		HG-KR43(B)G5 1/45	0.915 (0.937)	
	HF-MP73(B)G5 1/5	1.25 (1.35)		HG-KR73(B)G5 1/5	1.91 (2.02)	10 times or less
	HF-MP73(B)G5 1/11	1.16 (1.26)		HG-KR73(B)G5 1/11	1.82 (1.93)	
	HF-MP73(B)G5 1/21	1.35 (1.45)		HG-KR73(B)G5 1/21	2.01 (2.12)	
	HF-MP73(B)G5 1/33	1.13 (1.23)		HG-KR73(B)G5 1/33	1.79 (1.90)	
	HF-MP73(B)G5 1/45	1.13 (1.23)		HG-KR73(B)G5 1/45	1.79 (1.90)	
Small capacity, ultra-low inertia HF-MP series With shaft-output type gear reducer for high precision applications, flange mounting: G7	HF-MP053(B)G7 1/5	0.093 (0.099)	25 times or less	HG-KR053(B)G7 1/5	0.119 (0.121)	10 times or less
	HF-MP053(B)G7 1/11	0.080 (0.086)		HG-KR053(B)G7 1/11	0.106 (0.108)	
	HF-MP053(B)G7 1/21	0.070 (0.076)		HG-KR053(B)G7 1/21	0.0960 (0.0980)	
	HF-MP053(B)G7 1/33	0.064 (0.070)		HG-KR053(B)G7 1/33	0.0900 (0.0920)	
	HF-MP053(B)G7 1/45	0.064 (0.070)		HG-KR053(B)G7 1/45	0.0900 (0.0920)	
	HF-MP13(B)G7 1/5	0.106 (0.113)		HG-KR13(B)G7 1/5	0.152 (0.158)	
	HF-MP13(B)G7 1/11	0.093 (0.100)		HG-KR13(B)G7 1/11	0.139 (0.145)	
	HF-MP13(B)G7 1/21	0.083 (0.090)		HG-KR13(B)G7 1/21	0.129 (0.135)	
	HF-MP13(B)G7 1/33	0.095 (0.102)		HG-KR13(B)G7 1/33	0.141 (0.147)	
	HF-MP13(B)G7 1/45	0.093 (0.100)		HG-KR13(B)G7 1/45	0.139 (0.145)	
	HF-MP23(B)G7 1/5	0.295 (0.327)		HG-KR23(B)G7 1/5	0.428 (0.450)	14 times or less
	HF-MP23(B)G7 1/11	0.291 (0.323)		HG-KR23(B)G7 1/11	0.424 (0.446)	
	HF-MP23(B)G7 1/21	0.588 (0.620)		HG-KR23(B)G7 1/21	0.721 (0.743)	
	HF-MP23(B)G7 1/33	0.541 (0.573)		HG-KR23(B)G7 1/33	0.674 (0.696)	
	HF-MP23(B)G7 1/45	0.539 (0.571)		HG-KR23(B)G7 1/45	0.672 (0.694)	
	HF-MP43(B)G7 1/5	0.357 (0.387)		HG-KR43(B)G7 1/5	0.578 (0.600)	
	HF-MP43(B)G7 1/11	0.734 (0.764)		HG-KR43(B)G7 1/11	0.955 (0.977)	
	HF-MP43(B)G7 1/21	0.650 (0.680)		HG-KR43(B)G7 1/21	0.871 (0.893)	
	HF-MP43(B)G7 1/33	0.706 (0.736)		HG-KR43(B)G7 1/33	0.927 (0.949)	
	HF-MP43(B)G7 1/45	0.697 (0.727)		HG-KR43(B)G7 1/45	0.918 (0.940)	
	HF-MP73(B)G7 1/5	1.29 (1.39)		HG-KR73(B)G7 1/5	1.95 (2.06)	10 times or less
	HF-MP73(B)G7 1/11	1.17 (1.27)		HG-KR73(B)G7 1/11	1.83 (1.94)	
	HF-MP73(B)G7 1/21	1.37 (1.47)		HG-KR73(B)G7 1/21	2.03 (2.14)	
	HF-MP73(B)G7 1/33	1.14 (1.24)		HG-KR73(B)G7 1/33	1.80 (1.91)	
	HF-MP73(B)G7 1/45	1.13 (1.23)		HG-KR73(B)G7 1/45	1.79 (1.90)	

(5) HF-SP series

Series	Target models			Substitute models		
	Model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio	Example of replacement model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio
Medium capacity, medium inertia HF-SP series	HF-SP51(B)	11.9 (14.0)	15 times or less	HG-SR51(B)	11.6 (13.8)	17 times or less
	HF-SP81(B)	17.8 (20.0)		HG-SR81(B)	16.0 (18.2)	
	HF-SP121(B)	38.3 (47.9)		HG-SR121(B)	46.8 (56.5)	15 times or less
	HF-SP201(B)	75.0 (84.7)		HG-SR201(B)	78.6 (88.2)	
	HF-SP301(B)	97.0 (107)		HG-SR301(B)	99.7 (109)	
	HF-SP421(B)	154 (164)		HG-SR421(B)	151 (161)	
	HF-SP52(B) HF-SP524(B)	6.1 (8.3)		HG-SR52(B) HG-SR524(B)	7.26 (9.48)	
	HF-SP102(B) HF-SP1024(B)	11.9 (14.0)		HG-SR102(B) HG-SR1024(B)	11.6 (13.8)	17 times or less
	HF-SP152(B) HF-SP1524(B)	17.8 (20.0)		HG-SR152(B) HG-SR1524(B)	16.0 (18.2)	
	HF-SP202(B) HF-SP2024(B)	38.3 (47.9)		HG-SR202(B) HG-SR2024(B)	46.8 (56.5)	15 times or less
	HF-SP352(B) HF-SP3524(B)	75.0 (84.7)		HG-SR352(B) HG-SR3524(B)	78.6 (88.2)	
	HF-SP502(B) HF-SP5024(B)	97.0 (107)		HG-SR502(B) HG-SR5024(B)	99.7 (109)	
	HF-SP702(B) HF-SP7024(B)	154 (164)		HG-SR702(B) HG-SR7024(B)	151 (161)	

(6) HF-SP series (For general industrial machine with a reducer)

Series	Target models			Substitute models		
	Model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio	Example of replacement model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio
Medium capacity, medium inertia HF-SP series With gears for general industrial machines: G1	HF-SP52(4)(B)G1(H) 1/6	7.10 (9.30)	4 times or less	HG-SR52(4)(B)G1(H) 1/6	8.08 (10.3)	4 times or less
	HF-SP52(4)(B)G1(H) 1/11	6.70 (8.80)		HG-SR52(4)(B)G1(H) 1/11	7.65 (9.85)	
	HF-SP52(4)(B)G1(H) 1/17	6.60 (8.70)		HG-SR52(4)(B)G1(H) 1/17	7.53 (9.73)	
	HF-SP52(4)(B)G1(H) 1/29	6.50 (8.70)		HG-SR52(4)(B)G1(H) 1/29	7.47 (9.67)	
	HF-SP52(4)(B)G1(H) 1/35	7.30 (9.40)		HG-SR52(4)(B)G1(H) 1/35	8.26 (10.5)	
	HF-SP52(4)(B)G1(H) 1/43	7.30 (9.40)		HG-SR52(4)(B)G1(H) 1/43	8.22 (10.4)	
	HF-SP52(4)(B)G1(H) 1/59	7.20 (9.40)		HG-SR52(4)(B)G1(H) 1/59	8.18 (10.4)	
	HF-SP102(4)(B)G1(H) 1/6	15.4 (17.5)		HG-SR102(4)(B)G1(H) 1/6	14.8 (17.0)	
	HF-SP102(4)(B)G1(H) 1/11	13.9 (16.0)		HG-SR102(4)(B)G1(H) 1/11	13.3 (15.5)	
	HF-SP102(4)(B)G1(H) 1/17	13.5 (15.6)		HG-SR102(4)(B)G1(H) 1/17	12.9 (15.1)	
	HF-SP102(4)(B)G1(H) 1/29	13.2 (15.3)		HG-SR102(4)(B)G1(H) 1/29	12.6 (14.8)	
	HF-SP102(4)(B)G1(H) 1/35	13.2 (15.3)		HG-SR102(4)(B)G1(H) 1/35	12.6 (14.8)	
	HF-SP102(4)(B)G1(H) 1/43	14.3 (16.5)		HG-SR102(4)(B)G1(H) 1/43	13.8 (16.0)	
	HF-SP102(4)(B)G1(H) 1/59	20.3 (22.4)		HG-SR102(4)(B)G1(H) 1/59	19.1 (21.3)	
	HF-SP152(4)(B)G1(H) 1/6	21.3 (23.4)		HG-SR152(4)(B)G1(H) 1/6	19.2 (21.4)	
	HF-SP152(4)(B)G1(H) 1/11	19.8 (21.9)		HG-SR152(4)(B)G1(H) 1/11	17.7 (19.9)	
	HF-SP152(4)(B)G1(H) 1/17	19.4 (21.6)		HG-SR152(4)(B)G1(H) 1/17	17.3 (19.5)	
	HF-SP152(4)(B)G1(H) 1/29	20.4 (22.6)		HG-SR152(4)(B)G1(H) 1/29	18.4 (20.6)	
	HF-SP152(4)(B)G1(H) 1/35	20.4 (22.5)		HG-SR152(4)(B)G1(H) 1/35	18.3 (20.5)	
	HF-SP152(4)(B)G1(H) 1/43	26.3 (28.4)		HG-SR152(4)(B)G1(H) 1/43	23.6 (25.8)	
	HF-SP152(4)(B)G1(H) 1/59	26.2 (28.3)		HG-SR152(4)(B)G1(H) 1/59	23.5 (25.7)	
	HF-SP202(4)(B)G1(H) 1/6	42.1 (51.7)		HG-SR202(4)(B)G1(H) 1/6	50.0 (59.4)	
	HF-SP202(4)(B)G1(H) 1/11	40.5 (50.2)		HG-SR202(4)(B)G1(H) 1/11	48.4 (57.8)	
	HF-SP202(4)(B)G1(H) 1/17	40.2 (49.8)		HG-SR202(4)(B)G1(H) 1/17	48.1 (57.5)	
	HF-SP202(4)(B)G1(H) 1/29	46.9 (56.6)		HG-SR202(4)(B)G1(H) 1/29	54.8 (64.2)	
	HF-SP202(4)(B)G1(H) 1/35	46.7 (56.4)		HG-SR202(4)(B)G1(H) 1/35	54.5 (63.9)	
	HF-SP202(4)(B)G1(H) 1/43	46.4 (56.1)		HG-SR202(4)(B)G1(H) 1/43	54.3 (63.7)	
	HF-SP202(4)(B)G1(H) 1/59	46.4 (56.0)		HG-SR202(4)(B)G1(H) 1/59	54.2 (63.6)	
	HF-SP352(4)(B)G1(H) 1/6	84.4 (94.0)		HG-SR352(4)(B)G1(H) 1/6	87.1 (96.5)	
	HF-SP352(4)(B)G1(H) 1/11	80.1 (89.8)		HG-SR352(4)(B)G1(H) 1/11	82.8 (92.2)	
	HF-SP352(4)(B)G1(H) 1/17	78.8 (88.5)		HG-SR352(4)(B)G1(H) 1/17	81.5 (90.9)	
	HF-SP352(4)(B)G1(H) 1/29	83.9 (93.6)		HG-SR352(4)(B)G1(H) 1/29	86.6 (96.0)	
	HF-SP352(4)(B)G1(H) 1/35	83.7 (93.3)		HG-SR352(4)(B)G1(H) 1/35	86.3 (95.7)	
	HF-SP352(4)(B)G1(H) 1/43	101.9 (111.5)		HG-SR352(4)(B)G1(H) 1/43	105 (114)	
	HF-SP352(4)(B)G1(H) 1/59	101.3 (110.9)		HG-SR352(4)(B)G1(H) 1/59	104 (113)	
	HF-SP502(4)(B)G1(H) 1/6	121.2 (130.8)		HG-SR502(4)(B)G1(H) 1/6	126 (135)	
	HF-SP502(4)(B)G1(H) 1/11	108.9 (118.5)		HG-SR502(4)(B)G1(H) 1/11	114 (123)	
	HF-SP502(4)(B)G1(H) 1/17	104.8 (114.5)		HG-SR502(4)(B)G1(H) 1/17	110 (119)	
	HF-SP502(4)(B)G1(H) 1/29	135.6 (145.3)		HG-SR502(4)(B)G1(H) 1/29	141 (150)	
	HF-SP502(4)(B)G1(H) 1/35	135.1 (144.8)		HG-SR502(4)(B)G1(H) 1/35	140 (150)	
	HF-SP502(4)(B)G1(H) 1/43	134.1 (143.8)		HG-SR502(4)(B)G1(H) 1/43	139 (149)	
	HF-SP502(4)(B)G1(H) 1/59	132.9 (142.6)		HG-SR502(4)(B)G1(H) 1/59	138 (147)	
	HF-SP702(4)(B)G1(H) 1/6	177.4 (187.0)		HG-SR702(4)(B)G1(H) 1/6	177 (187)	
	HF-SP702(4)(B)G1(H) 1/11	190.2 (199.9)		HG-SR702(4)(B)G1(H) 1/11	190 (199)	
	HF-SP702(4)(B)G1(H) 1/17	182.7 (192.4)		HG-SR702(4)(B)G1(H) 1/17	182 (192)	
	HF-SP702(4)(B)G1(H) 1/29	192.3 (202.0)		HG-SR702(4)(B)G1(H) 1/29	192 (202)	
	HF-SP702(4)(B)G1(H) 1/35	191.8 (201.5)		HG-SR702(4)(B)G1(H) 1/35	192 (201)	
	HF-SP702(4)(B)G1(H) 1/43	269.8 (278.3)		HG-SR702(4)(B)G1(H) 1/43	267 (277)	
	HF-SP702(4)(B)G1(H) 1/59	268.0 (276.5)		HG-SR702(4)(B)G1(H) 1/59	266 (275)	

(7) HF-SP series (With reduction gear for precision application compliant)

Series	Target models			Substitute models		
	Model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio	Example of replacement model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio
Medium capacity, medium inertia HF-SP series With flange-output type gear reducer for high precision applications, flange mounting: G5	HF-SP52(4)(B)G5 1/5	6.75 (8.95)	10 times or less	HG-SR52(4)(B)G5 1/5	7.91 (10.1)	10 times or less
	HF-SP52(4)(B)G5 1/11	6.66 (8.86)		HG-SR52(4)(B)G5 1/11	7.82 (10.0)	
	HF-SP52(4)(B)G5 1/21	9.00 (11.2)		HG-SR52(4)(B)G5 1/21	10.2 (12.4)	
	HF-SP52(4)(B)G5 1/33	8.80 (11.0)		HG-SR52(4)(B)G5 1/33	9.96 (12.2)	
	HF-SP52(4)(B)G5 1/45	8.80 (11.0)		HG-SR52(4)(B)G5 1/45	9.96 (12.2)	
	HF-SP102(4)(B)G5 1/5	12.6 (14.7)		HG-SR102(4)(B)G5 1/5	12.3 (14.5)	
	HF-SP102(4)(B)G5 1/11	15.2 (17.3)		HG-SR102(4)(B)G5 1/11	14.9 (17.1)	
	HF-SP102(4)(B)G5 1/21	14.8 (16.9)		HG-SR102(4)(B)G5 1/21	14.5 (16.7)	
	HF-SP102(4)(B)G5 1/33	16.6 (18.7)		HG-SR102(4)(B)G5 1/33	16.3 (18.5)	
	HF-SP102(4)(B)G5 1/45	16.5 (18.6)		HG-SR102(4)(B)G5 1/45	16.2 (18.4)	
	HF-SP152(4)(B)G5 1/5	18.5 (20.7)		HG-SR152(4)(B)G5 1/5	16.7 (18.9)	
	HF-SP152(4)(B)G5 1/11	21.1 (23.3)		HG-SR152(4)(B)G5 1/11	19.3 (21.5)	
	HF-SP152(4)(B)G5 1/21	23.5 (25.7)		HG-SR152(4)(B)G5 1/21	21.7 (23.9)	
	HF-SP152(4)(B)G5 1/33	22.5 (24.7)		HG-SR152(4)(B)G5 1/33	20.7 (22.9)	
	HF-SP152(4)(B)G5 1/45	22.4 (24.6)		HG-SR152(4)(B)G5 1/45	20.6 (22.8)	
	HF-SP202(4)(B)G5 1/5	42.9 (52.5)		HG-SR202(4)(B)G5 1/5	51.4 (61.1)	
	HF-SP202(4)(B)G5 1/11	42.7 (52.3)		HG-SR202(4)(B)G5 1/11	51.2 (60.9)	
	HF-SP202(4)(B)G5 1/21	44.7 (54.3)		HG-SR202(4)(B)G5 1/21	53.2 (62.9)	
	HF-SP202(4)(B)G5 1/33	43.7 (53.3)		HG-SR202(4)(B)G5 1/33	52.2 (61.9)	
	HF-SP202(4)(B)G5 1/45	43.7 (53.3)		HG-SR202(4)(B)G5 1/45	52.2 (61.9)	
	HF-SP352(4)(B)G5 1/5	79.6 (89.3)		HG-SR352(4)(B)G5 1/5	83.2 (92.8)	
	HF-SP352(4)(B)G5 1/11	83.1 (92.8)		HG-SR352(4)(B)G5 1/11	86.7 (96.3)	
	HF-SP352(4)(B)G5 1/21	81.4 (91.1)		HG-SR352(4)(B)G5 1/21	85.0 (94.6)	
	HF-SP502(4)(B)G5 1/5	107.1 (117.1)		HG-SR502(4)(B)G5 1/5	110 (119)	
	HF-SP502(4)(B)G5 1/11	105.1 (115.1)		HG-SR502(4)(B)G5 1/11	108 (117)	
	HF-SP702(4)(B)G5 1/5	164.1 (174.1)		HG-SR702(4)(B)G5 1/5	161 (171)	
Medium capacity, medium inertia HF-SP series With shaft-output type gear reducer for high precision applications, flange mounting: G7	HF-SP52(4)(B)G7 1/5	6.79 (8.99)	10 times or less	HG-SR52(4)(B)G7 1/5	7.95 (10.2)	10 times or less
	HF-SP52(4)(B)G7 1/11	6.66 (8.86)		HG-SR52(4)(B)G7 1/11	7.82 (10.0)	
	HF-SP52(4)(B)G7 1/21	9.00 (11.2)		HG-SR52(4)(B)G7 1/21	10.2 (12.4)	
	HF-SP52(4)(B)G7 1/33	8.80 (11.0)		HG-SR52(4)(B)G7 1/33	9.96 (12.2)	
	HF-SP52(4)(B)G7 1/45	8.80 (11.0)		HG-SR52(4)(B)G7 1/45	9.96 (12.2)	
	HF-SP102(4)(B)G7 1/5	12.6 (14.7)		HG-SR102(4)(B)G7 1/5	12.3 (14.5)	
	HF-SP102(4)(B)G7 1/11	15.3 (17.4)		HG-SR102(4)(B)G7 1/11	15.0 (17.2)	
	HF-SP102(4)(B)G7 1/21	14.8 (16.9)		HG-SR102(4)(B)G7 1/21	14.5 (16.7)	
	HF-SP102(4)(B)G7 1/33	16.6 (18.7)		HG-SR102(4)(B)G7 1/33	16.3 (18.5)	
	HF-SP102(4)(B)G7 1/45	16.6 (18.7)		HG-SR102(4)(B)G7 1/45	16.3 (18.5)	
	HF-SP152(4)(B)G7 1/5	18.5 (20.7)		HG-SR152(4)(B)G7 1/5	16.7 (18.9)	
	HF-SP152(4)(B)G7 1/11	21.2 (23.4)		HG-SR152(4)(B)G7 1/11	19.4 (21.6)	
	HF-SP152(4)(B)G7 1/21	23.5 (25.7)		HG-SR152(4)(B)G7 1/21	21.7 (23.9)	
	HF-SP152(4)(B)G7 1/33	22.5 (24.7)		HG-SR152(4)(B)G7 1/33	20.7 (22.9)	
	HF-SP152(4)(B)G7 1/45	22.5 (24.7)		HG-SR152(4)(B)G7 1/45	20.7 (22.9)	
	HF-SP202(4)(B)G7 1/5	43.2 (52.8)		HG-SR202(4)(B)G7 1/5	51.7 (61.4)	
	HF-SP202(4)(B)G7 1/11	42.8 (52.4)		HG-SR202(4)(B)G7 1/11	51.3 (61.0)	
	HF-SP202(4)(B)G7 1/21	44.8 (54.4)		HG-SR202(4)(B)G7 1/21	53.3 (63.0)	
	HF-SP202(4)(B)G7 1/33	43.7 (53.3)		HG-SR202(4)(B)G7 1/33	52.2 (61.9)	
	HF-SP202(4)(B)G7 1/45	43.7 (53.3)		HG-SR202(4)(B)G7 1/45	52.2 (61.9)	
	HF-SP352(4)(B)G7 1/5	79.9 (89.6)		HG-SR352(4)(B)G7 1/5	83.5 (93.1)	
	HF-SP352(4)(B)G7 1/11	83.4 (93.1)		HG-SR352(4)(B)G7 1/11	87.0 (96.6)	
	HF-SP352(4)(B)G7 1/21	81.5 (91.2)		HG-SR352(4)(B)G7 1/21	85.1 (94.7)	
	HF-SP502(4)(B)G7 1/5	108.5 (118.5)		HG-SR502(4)(B)G7 1/5	111 (121)	
	HF-SP502(4)(B)G7 1/11	105.4 (115.4)		HG-SR502(4)(B)G7 1/11	108 (117)	
	HF-SP702(4)(B)G7 1/5	165.5 (175.5)		HG-SR702(4)(B)G7 1/5	163 (173)	

(8) HC-RP series

Series	Target models			Substitute models		
	Model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio	Example of replacement model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio
Medium capacity, ultra-low inertia HC-RP series	HC-RP103(B)	1.50 (1.85)	5 times or less	HG-RR103(B)	1.50 (1.85)	5 times or less
	HC-RP153(B)	1.90 (2.25)		HG-RR153(B)	1.90 (2.25)	
	HC-RP203(B)	2.30 (2.65)		HG-RR203(B)	2.30 (2.65)	
	HC-RP353(B)	8.30 (11.8)		HG-RR353(B)	8.30 (11.8)	
	HC-RP503(B)	12.0 (15.5)		HG-RR503(B)	12.0 (15.5)	
Medium capacity, ultra-low inertia HC-RP series With flange-output type gear reducer for high precision applications, flange mounting:G5	HC-RP103(B)G5 1/5	2.33 (2.68)	5 times or less	HG-SR102(B)G5 1/5	12.3 (14.5)	10 times or less
	HC-RP103(B)G5 1/11	2.25 (2.60)		HG-SR102(B)G5 1/11	14.9 (17.1)	
	HC-RP103(B)G5 1/21	4.40 (4.75)		HG-SR102(B)G5 1/21	14.5 (16.7)	
	HC-RP103(B)G5 1/33	4.20 (4.55)		HG-SR102(B)G5 1/33	16.3 (18.5)	
	HC-RP103(B)G5 1/45	6.10 (6.45)		HG-SR102(B)G5 1/45	16.2 (18.4)	
	HC-RP153(B)G5 1/5	2.73 (3.08)		HG-SR152(B)G5 1/5	16.7 (18.9)	
	HC-RP153(B)G5 1/11	5.20 (5.55)		HG-SR152(B)G5 1/11	19.3 (21.5)	
	HC-RP153(B)G5 1/21	4.80 (5.15)		HG-SR152(B)G5 1/21	21.7 (23.9)	
	HC-RP153(B)G5 1/33	6.60 (6.95)		HG-SR152(B)G5 1/33	20.7 (22.9)	
	HC-RP153(B)G5 1/45	6.50 (6.85)		HG-SR152(B)G5 1/45	20.6 (22.8)	
	HC-RP203(B)G5 1/5	3.13 (3.48)		HG-SR202(B)G5 1/5	51.4 (61.1)	
	HC-RP203(B)G5 1/11	5.60 (5.95)		HG-SR202(B)G5 1/11	51.2 (60.9)	
	HC-RP203(B)G5 1/21	8.00 (8.35)		HG-SR202(B)G5 1/21	53.2 (62.9)	
	HC-RP203(B)G5 1/33	7.00 (7.35)		HG-SR202(B)G5 1/33	52.2 (61.9)	
	HC-RP203(B)G5 1/45	6.90 (7.25)		HG-SR202(B)G5 1/45	52.2 (61.9)	
	HC-RP353(B)G5 1/5	13.2 (16.7)		HG-SR352(B)G5 1/5	83.2 (92.8)	
	HC-RP353(B)G5 1/11	13.0 (16.5)		HG-SR352(B)G5 1/11	86.7 (96.3)	
	HC-RP353(B)G5 1/21	15.0 (18.5)		HG-SR352(B)G5 1/21	85.0 (94.6)	
	HC-RP353(B)G5 1/33	14.1 (17.6)				
	HC-RP503(B)G5 1/5	16.9 (20.4)		HG-SR502(B)G5 1/5	110 (119)	
	HC-RP503(B)G5 1/11	20.5 (24.0)		HG-SR502(B)G5 1/11	108 (117)	
	HC-RP503(B)G5 1/21	18.7 (22.2)				
Medium capacity, ultra-low inertia HC-RP series With shaft-output type gear reducer for high precision applications, flange mounting: G7	HC-RP103(B)G7 1/5	2.37 (2.72)	5 times or less	HG-SR102(B)G7 1/5	12.3 (14.5)	10 times or less
	HC-RP103(B)G7 1/11	2.25 (2.60)		HG-SR102(B)G7 1/11	15.0 (17.2)	
	HC-RP103(B)G7 1/21	4.40 (4.75)		HG-SR102(B)G7 1/21	14.5 (16.7)	
	HC-RP103(B)G7 1/33	4.20 (4.55)		HG-SR102(B)G7 1/33	16.3 (18.5)	
	HC-RP103(B)G7 1/45	6.20 (6.55)		HG-SR102(B)G7 1/45	16.3 (18.5)	
	HC-RP153(B)G7 1/5	2.77 (3.12)		HG-SR152(B)G7 1/5	16.7 (18.9)	
	HC-RP153(B)G7 1/11	5.30 (5.65)		HG-SR152(B)G7 1/11	19.4 (21.6)	
	HC-RP153(B)G7 1/21	4.80 (5.15)		HG-SR152(B)G7 1/21	21.7 (23.9)	
	HC-RP153(B)G7 1/33	6.60 (6.95)		HG-SR152(B)G7 1/33	20.7 (22.9)	
	HC-RP153(B)G7 1/45	6.60 (6.95)		HG-SR152(B)G7 1/45	20.7 (22.9)	
	HC-RP203(B)G7 1/5	3.17 (3.52)		HG-SR202(B)G7 1/5	51.7 (61.4)	
	HC-RP203(B)G7 1/11	5.70 (6.05)		HG-SR202(B)G7 1/11	51.3 (61.0)	
	HC-RP203(B)G7 1/21	8.00 (8.35)		HG-SR202(B)G7 1/21	53.3 (63.0)	
	HC-RP203(B)G7 1/33	7.00 (7.35)		HG-SR202(B)G7 1/33	52.2 (61.9)	
	HC-RP203(B)G7 1/45	7.00 (7.35)		HG-SR202(B)G7 1/45	52.2 (61.9)	
	HC-RP353(B)G7 1/5	13.5 (17.0)		HG-SR352(B)G7 1/5	83.5 (93.1)	
	HC-RP353(B)G7 1/11	13.1 (16.6)		HG-SR352(B)G7 1/11	87.0 (96.6)	
	HC-RP353(B)G7 1/21	15.1 (18.6)		HG-SR352(B)G7 1/21	85.1 (94.7)	
	HC-RP353(B)G7 1/33	14.1 (17.6)				
	HC-RP503(B)G7 1/5	17.2 (20.7)		HG-SR502(B)G7 1/5	111 (121)	
	HC-RP503(B)G7 1/11	20.7 (24.2)		HG-SR502(B)G7 1/11	108 (117)	
	HC-RP503(B)G7 1/21	18.8 (22.3)				

(9) HC-LP/HC-UP/HF-JP series

Series	Target models			Substitute models		
	Model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio	Example of replacement model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio
Medium capacity, low inertia HC-LP series	HC-LP52(B)	3.10 (5.20)	10 times or less	HG-JR73(B)	2.09 (2.59)	10 times or less
	HC-LP102(B)	4.62 (6.72)		HG-JR153(B)	3.79 (4.29)	
	HC-LP152(B)	6.42 (8.52)		HG-JR353(B)	13.2 (15.4)	
	HC-LP202(B)	22.0 (32.0)				
	HC-LP302(B)	36.0 (46.0)		HG-JR503(B)	19.0 (21.2)	
Medium capacity, flat type HC-UP series	HC-UP72(B)	10.4 (12.5)	15 times or less	HG-UR72(B)	10.4 (12.5)	15 times or less
	HC-UP152(B)	22.1 (24.2)		HG-UR152(B)	22.1 (24.2)	
	HC-UP202(B)	38.2 (46.8)		HG-UR202(B)	38.2 (46.8)	
	HC-UP352(B)	76.5 (85.1)		HG-UR352(B)	76.5 (85.1)	
	HC-UP502(B)	115 (124)		HG-UR502(B)	115 (124)	
Large capacity, low inertia HF-JP series	HF-JP53(B) HF-JP534(B)	1.52 (2.02)	10 times or less	HG-JR53(B) HG-JR534(B)	1.52 (2.02)	10 times or less
	HF-JP73(B) HF-JP734(B)	2.09 (2.59)		HG-JR73(B) HG-JR734(B)	2.09 (2.59)	
	HF-JP103(B) HF-JP1034(B)	2.65 (3.15)		HG-JR103(B) HG-JR1034(B)	2.65 (3.15)	
	HF-JP153(B) HF-JP1534(B)	3.79 (4.29)		HG-JR153(B) HG-JR1534(B)	3.79 (4.29)	
	HF-JP203(B) HF-JP2034(B)	4.92 (5.42)		HG-JR203(B) HG-JR2034(B)	4.92 (5.42)	
	HF-JP353(B) HF-JP3534(B)	13.2 (15.4)		HG-JR353(B) HG-JR3534(B)	13.2 (15.4)	
	HF-JP503(B) HF-JP5034(B)	19.0 (21.2)		HG-JR503(B) HG-JR5034(B)	19.0 (21.2)	
	HF-JP703(B) HF-JP7034(B)	43.3 (52.9)		HG-JR703(B) HG-JR7034(B)	43.3 (52.9)	
	HF-JP903(B) HF-JP9034(B)	55.8 (65.4)		HG-JR903(B) HG-JR9034(B)	55.8 (65.4)	
	HF-JP11K1M(B) HF-JP11K1M4(B)	220 (240)		HG-JR11K1M(B) HG-JR11K1M4(B)	220 (240)	
	HF-JP15K1M(B) HF-JP15K1M4(B)	315 (336)		HG-JR15K1M(B) HG-JR15K1M4(B)	315 (336)	

(10) HA-LP series

Series	Target models			Substitute models		
	Model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio	Example of replacement model	Moment of inertia J × 10^{-4} kg•m^2	Load inertia moment ratio
Large capacity, low inertia HA-LP 1000 r/min series	HA-LP601(B) HA-LP6014(B)	105 (113)	10 times or less	HG-JR601(B) HG-JR6014(B)	176 (196)	10 times or less
	HA-LP801(B) HA-LP8014(B)	220 (293)		HG-JR801(B) HG-JR8014(B)	220 (240)	
	HA-LP12K1(B) HA-LP12K14(B)	295 (369)		HG-JR12K1(B) HG-JR12K14(B)	315 (336)	
	HA-LP15K1 HA-LP15K14	550		HG-JR15K1 HG-JR15K14	489	
	HA-LP20K1 HA-LP20K14	650		HG-JR20K1 HG-JR20K14	627	
	HA-LP25K1 HA-LP25K14	1080		HG-JR25K1 HG-JR25K14	764	
	HA-LP30K1 HA-LP30K14	1310		HG-JR30K1 HG-JR30K14	1377	
	HA-LP37K1 HA-LP37K14	1870		HG-JR37K1 HG-JR37K14	1637	
Large capacity, low inertia HA-LP 1500 r/min series	HA-LP701M(B) HA-LP701M4(B)	105 (113)		HG-JR701M(B) HG-JR701M4(B)	176 (196)	
	HA-LP11K1M(B) HA-LP11K1M4(B)	220 (293)		HG-JR11K1M(B) HG-JR11K1M4(B)	220 (240)	
	HA-LP15K1M(B) HA-LP15K1M4(B)	295 (369)		HG-JR15K1M(B) HG-JR15K1M4(B)	315 (336)	
	HA-LP22K1M HA-LP22K1M4	550		HG-JR22K1M HG-JR22K1M4	489	
	HA-LP30K1M HA-LP30K1M4	650		HG-JR30K1M HG-JR30K1M4	627	
	HA-LP37K1M HA-LP37K1M4	1080		HG-JR37K1M HG-JR37K1M4	764	
	HA-LP45K1M4	1310		HG-JR45K1M4	1377	
	HA-LP50K1M4	1870		HG-JR55K1M4	1637	
Large capacity, low inertia HA-LP 2000 r/min series	HA-LP502	74.0		HG-SR502	99.7	15 times or less
	HA-LP702	94.2		HG-SR702	151	
	HA-LP11K2(B) HA-LP11K24(B)	105 (113)		HG-JR11K1M(B) HG-JR11K1M4(B)	220 (240)	10 times or less
	HA-LP15K2(B) HA-LP15K24(B)	220 (293)				
	HA-LP22K2(B) HA-LP22K24(B)	295 (369)		HG-JR15K1M(B) HG-JR15K1M4(B)	315 (336)	
	HA-LP30K2 HA-LP30K24	550		HG-JR22K1M HG-JR22K1M4	489	
	HA-LP37K2 HA-LP37K24	650		HG-JR30K1M HG-JR30K1M4	627	
	HA-LP45K24	1080		HG-JR37K1M4	764	
	HA-LP55K24	1310		HG-JR45K1M4	1377	

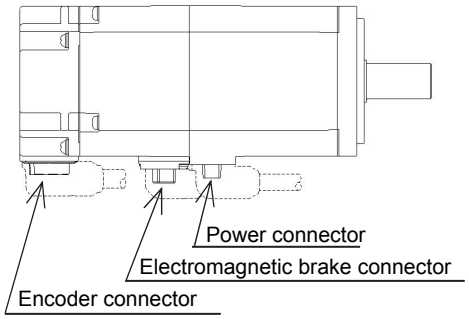
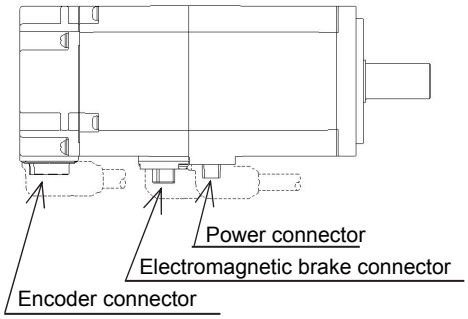
(11) HA-LP series (compatible product)

Only flanges and shaft ends have compatibility in mounting. Please contact your local sales office egarding the servo motor model and its delivery, since it is developed upon receipt of order.

Series	Target product			Replacement product		
	Model	Moment of inertia J × 10^{-4} kg•m^2	Load moment inertia ratio	Model	Moment of inertia J × 10^{-4} kg•m^2	Load moment inertia ratio
Large capacity, low inertia HA-LP 1000 r/min series	HA-LP601(B) HA-LP6014(B)	105 (113)	10 times or less	HG-JR601R(B)-S_ HG-JR6014R(B) -S_	198 (218)	10 times or less
	HA-LP801(B) HA-LP8014(B)	220 (293)		HG-JR801R(B)-S_ HG-JR8014R(B)-S_	228 (248)	
	HA-LP12K1(B) HA-LP12K14(B)	295 (369)		HG-JR12K1R(B)-S_ HG-JR12K14R(B)-S_	323 (344)	
	HA-LP15K1 HA-LP15K14	550		HG-JR15K1R-S_ HG-JR15K14R-S_	487	
	HA-LP20K1 HA-LP20K14	650		HG-JR20K1R-S_ HG-JR20K14R-S_	625	
	HA-LP25K1 HA-LP25K14	1080		HG-JR25K1R-S_ HG-JR25K14R-S_	767	
	HA-LP30K1 HA-LP30K14	1310		HG-JR30K1R-S_ HG-JR30K14R-S_	1356	
	HA-LP37K1 HA-LP37K14	1870		HG-JR37K1R-S_ HG-JR37K14R-S_	1650	
Large capacity, low inertia HA-LP 1500 r/min series	HA-LP701M(B) HA-LP701M4(B)	105 (113)		HG-JR701MR(B)-S_ HG-JR701M4R(B)-S_	198 (218)	
	HA-LP11K1M(B) HA-LP11K1M4(B)	220 (293)		HG-JR11K1MR(B)-S_(□250) HG-JR11K1M4R(B)-S_(□250)	228 (248)	
	HA-LP15K1M(B) HA-LP15K1M4(B)	295 (369)		HG-JR15K1MR(B)-S_ HG-JR15K1M4R(B)-S_	323 (344)	
	HA-LP22K1M HA-LP22K1M4	550		HG-JR22K1MR-S_ HG-JR22K1M4R-S_	487	
	HA-LP30K1M HA-LP30K1M4	650		HG-JR30K1MR-S_ HG-JR30K1M4R-S_	625	
	HA-LP37K1M HA-LP37K1M4	1080		HG-JR37K1MR-S_ HG-JR37K1M4R-S_	767	
	HA-LP45K1M4	1310		HG-JR45K1M4R-S_	1356	
	HA-LP50K1M4	1870		HG-JR55K1M4R-S_	1651	
Large capacity, low inertia HA-LP 2000r/min series	HA-LP502	74.0		HG-SR502R-S_	104	15 times or less
	HA-LP702	94.2		HG-SR702R-S_	155	
	HA-LP11K2(B) HA-LP11K24(B)	105 (113)		HG-JR11K1MR(B)-S_(□200) HG-JR11K1M4R(B)-S_(□200)	236 (256)	10 times or less
	HA-LP15K2(B) HA-LP15K24(B)	220 (293)		HG-JR11K1MR(B)-S_(□250) HG-JR11K1M4R(B)-S_(□250)	228 (248)	
	HA-LP22K2(B) HA-LP22K24(B)	295 (369)		HG-JR15K1MR(B)-S_ HG-JR15K1M4R(B)-S_	323 (344)	
	HA-LP30K2 HA-LP30K24	550		HG-JR22K1MR-S_ HG-JR22K1M4R-S_	487	
	HA-LP37K2 HA-LP37K24	650		HG-JR30K1MR-S_ HG-JR30K1M4R-S_	625	
	HA-LP45K24	1080		HG-JR37K1M4R-S_	767	
	HA-LP55K24	1310		HG-JR45K1M4R-S_	1356	

2.6 Comparison of Servo Motor Connector Specifications

(1) HF-KP/HF-MP series

<table>
<tr><td>Servo amplifier series</td><td>MR-J3 series</td><td>MR-J4 series</td></tr>
<tr><td>Servo motor series</td><td>HF-KP/HF-MP</td><td>HG-KR/HG-MR</td></tr>
<tr><td>Motor appearance</td><td> 
</td><td> 
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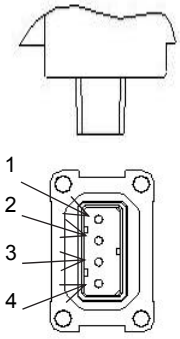
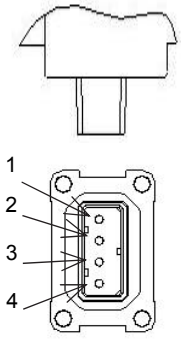
<tr><td>Power connector</td><td> 

<table>
<tr><th colspan="2">Power connector
Pin assignment</th></tr>
<tr><th>Pin No.</th><th>Signal name</th></tr>
<tr><td>1</td><td>Earth</td></tr>
<tr><td>2</td><td>U</td></tr>
<tr><td>3</td><td>V</td></tr>
<tr><td>4</td><td>W</td></tr>
</table></td><td> 

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<tr><th colspan="2">Power connector
Pin assignment</th></tr>
<tr><th>Pin No.</th><th>Signal name</th></tr>
<tr><td>1</td><td>Earth</td></tr>
<tr><td>2</td><td>U</td></tr>
<tr><td>3</td><td>V</td></tr>
<tr><td>4</td><td>W</td></tr>
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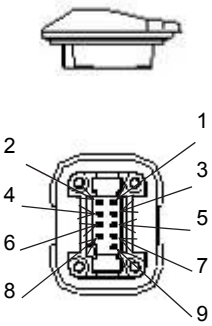
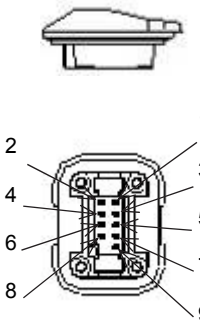
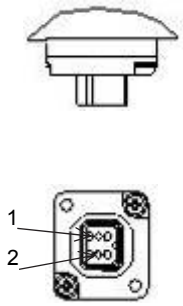
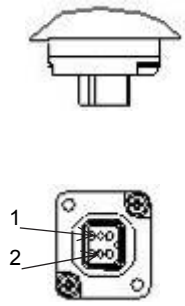
<tr><td>Encoder connector</td><td> 

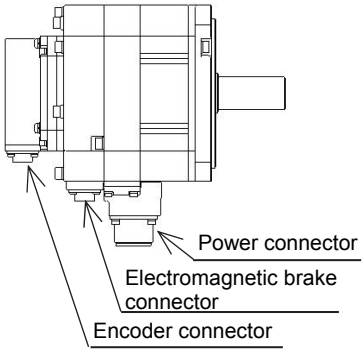
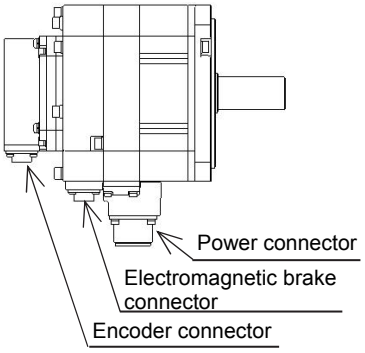
<table>
<tr><th colspan="2">Encoder connector
Pin assignment</th></tr>
<tr><th>Pin No.</th><th>Signal name</th></tr>
<tr><td>1</td><td></td></tr>
<tr><td>2</td><td>BAT</td></tr>
<tr><td>3</td><td>P5</td></tr>
<tr><td>4</td><td>MRR</td></tr>
<tr><td>5</td><td>MR</td></tr>
<tr><td>6</td><td>LG</td></tr>
<tr><td>7</td><td></td></tr>
<tr><td>8</td><td></td></tr>
<tr><td>9</td><td>SHD</td></tr>
</table></td><td> 

<table>
<tr><th colspan="2">Encoder connector
Pin assignment</th></tr>
<tr><th>Pin No.</th><th>Signal name</th></tr>
<tr><td>1</td><td></td></tr>
<tr><td>2</td><td>BAT</td></tr>
<tr><td>3</td><td>P5</td></tr>
<tr><td>4</td><td>MRR</td></tr>
<tr><td>5</td><td>MR</td></tr>
<tr><td>6</td><td>LG</td></tr>
<tr><td>7</td><td></td></tr>
<tr><td>8</td><td></td></tr>
<tr><td>9</td><td>SHD</td></tr>
</table></td></tr>
<tr><td>Electromagnetic brake connector
(Power connector)</td><td> 

<table>
<tr><th colspan="2">Electromagnetic brake
connector Pin assignment</th></tr>
<tr><th>Pin No.</th><th>Signal name</th></tr>
<tr><td>1</td><td>B1</td></tr>
<tr><td>2</td><td>B2</td></tr>
</table></td><td> 

<table>
<tr><th colspan="2">Electromagnetic brake
connector Pin assignment</th></tr>
<tr><th>Pin No.</th><th>Signal name</th></tr>
<tr><td>1</td><td>B1</td></tr>
<tr><td>2</td><td>B2</td></tr>
</table></td></tr>
</table>

(2) HF-SP motor

<table>
<tr><td>Servo amplifier series</td><td>MR-J3 series</td><td>MR-J4 series</td></tr>
<tr><td>Servo motor series</td><td>HF-SP</td><td>HG-SR</td></tr>
<tr><td>Target models</td><td>HF-SP51(B)/HF-SP81(B)/
HF-SP52(4)(B) to HF-SP152(4)(B)</td><td>HG-SR51(B)/HG-SR81(B)/
HG-SR52(4)(B) to HG-SR152(4)(B)</td></tr>
<tr><td>Motor appearance</td><td> 
</td><td> 
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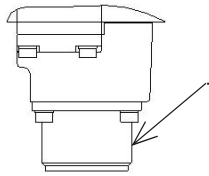
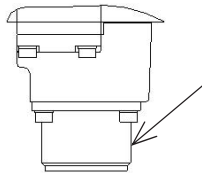
<tr><td>Power connector</td><td> 

<table>
<tr><td colspan="2">Power connector
Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>A</td><td>U</td></tr>
<tr><td>B</td><td>V</td></tr>
<tr><td>C</td><td>W</td></tr>
<tr><td>D</td><td>Earth</td></tr>
</table></td><td> 

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<tr><td colspan="2">Power connector
Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>A</td><td>U</td></tr>
<tr><td>B</td><td>V</td></tr>
<tr><td>C</td><td>W</td></tr>
<tr><td>D</td><td>Earth</td></tr>
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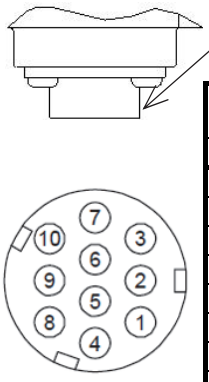
<tr><td>Encoder connector
(Note)</td><td> 

<table>
<tr><td colspan="2">Encoder connector
Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
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<tr><td>2</td><td>MRR</td></tr>
<tr><td>3</td><td></td></tr>
<tr><td>4</td><td>BAT</td></tr>
<tr><td>5</td><td>LG</td></tr>
<tr><td>6</td><td></td></tr>
<tr><td>7</td><td></td></tr>
<tr><td>8</td><td>P5</td></tr>
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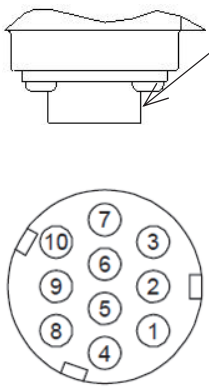
</table></td><td> 

<table>
<tr><td colspan="2">Encoder connector
Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
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<tr><td>2</td><td>MRR</td></tr>
<tr><td>3</td><td></td></tr>
<tr><td>4</td><td>BAT</td></tr>
<tr><td>5</td><td>LG</td></tr>
<tr><td>6</td><td></td></tr>
<tr><td>7</td><td></td></tr>
<tr><td>8</td><td>P5</td></tr>
<tr><td>9</td><td></td></tr>
<tr><td>10</td><td>SHD</td></tr>
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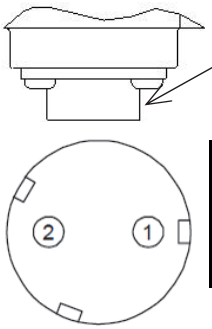
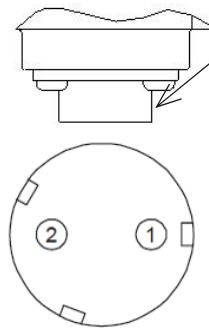
<tr><td>Electromagnetic brake connector
(Note)</td><td> 

<table>
<tr><td colspan="2">Power connector (with brake)
Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>1</td><td>B1</td></tr>
<tr><td>2</td><td>B2</td></tr>
</table></td><td> 

<table>
<tr><td colspan="2">Power connector (with brake)
Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>1</td><td>B1</td></tr>
<tr><td>2</td><td>B2</td></tr>
</table></td></tr>
</table>

Note. Although the types of encoder and electromagnetic brake connector differ, they can be wired with the existing cables because the connector specifications have compatibility in wiring.

<table>
<tr><td>Servo amplifier series</td><td>MR-J3 series</td><td>MR-J4 series</td></tr>
<tr><td>Servo motor series</td><td>HF-SP</td><td>HG-SR</td></tr>
<tr><td>Target models</td><td>HF-SP121(B) to HF-SP421(B)/
HF-SP202(4)(B) to HF-SP702(4)(B)</td><td>HG-SR121(B) to HG-SR421(B)/
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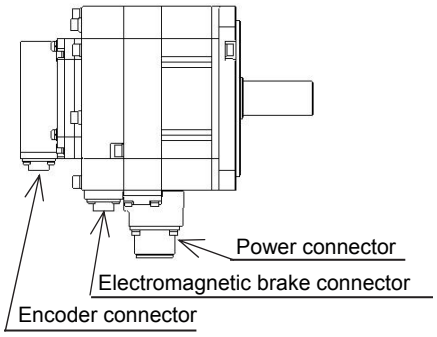
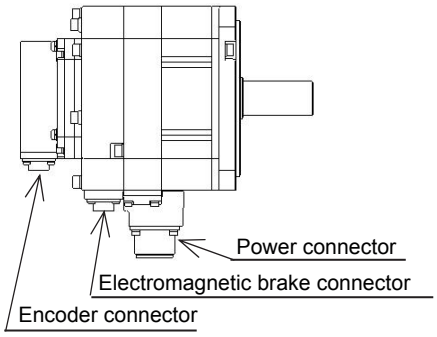
<tr><td>Motor appearance</td><td> 
</td><td> 
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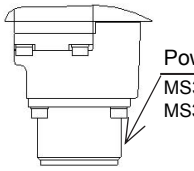
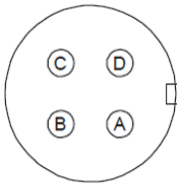
<tr><td>Power connector</td><td> 



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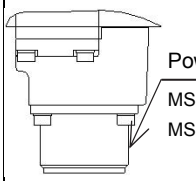
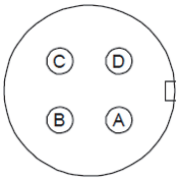
</table></td><td> 



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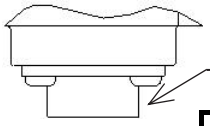
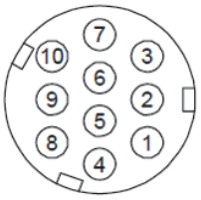
(Note)</td><td> 



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<tr><td>5</td><td>LG</td></tr>
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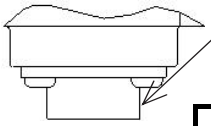
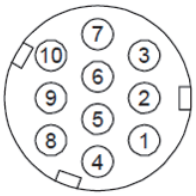
</table></td><td> 



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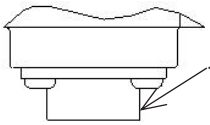
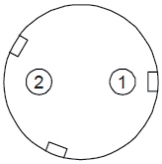
(Note)</td><td> 



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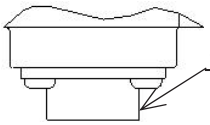
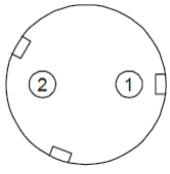
</table></td><td> 



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Note. Although the types of encoder and electromagnetic brake connector differ, they can be wired with the existing cables because the connector specifications have compatibility in wiring.

(3) HC-RP series

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<tr><td>Servo amplifier series</td><td>MR-J3 series</td><td>MR-J4 series</td></tr>
<tr><td>Servo motor series</td><td>HC-RP</td><td>HG-RR</td></tr>
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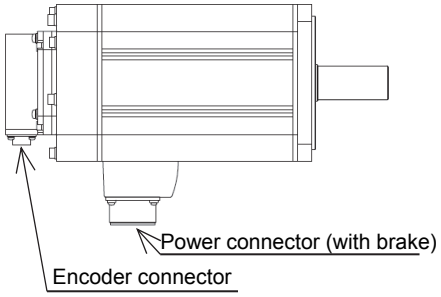
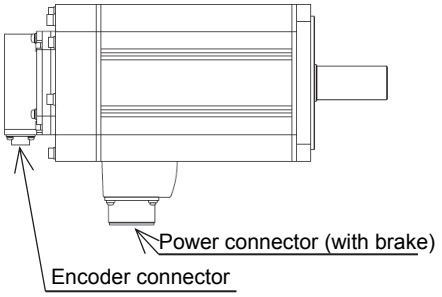
<tr><td>Motor appearance</td><td> 
</td><td> 
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 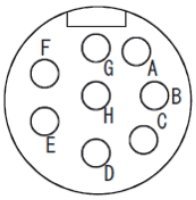

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<tr><td>B</td><td>V</td></tr>
<tr><td>C</td><td>W</td></tr>
<tr><td>D</td><td>Earth</td></tr>
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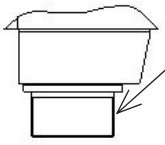
</table></td><td> 
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 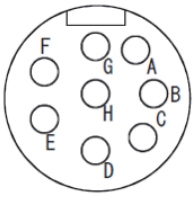

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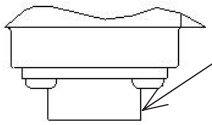
(Note)</td><td> 
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 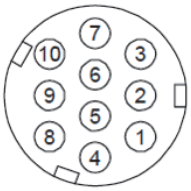

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Pin assignment</td></tr>
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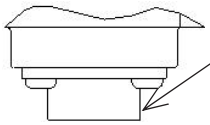
</table></td><td> 
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 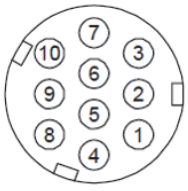

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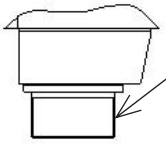
(Power connector)</td><td> 
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 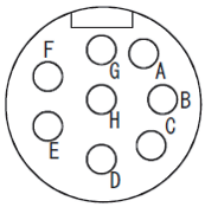

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<tr><td>B</td><td>V</td></tr>
<tr><td>C</td><td>W</td></tr>
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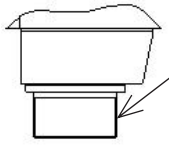
</table></td><td> 
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 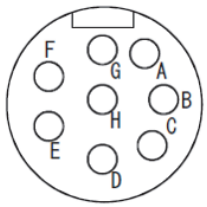

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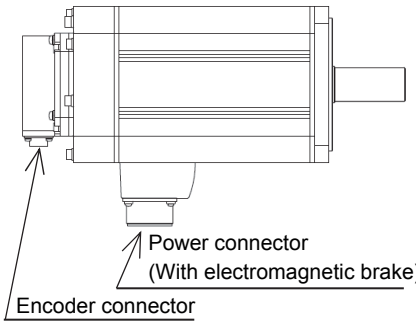
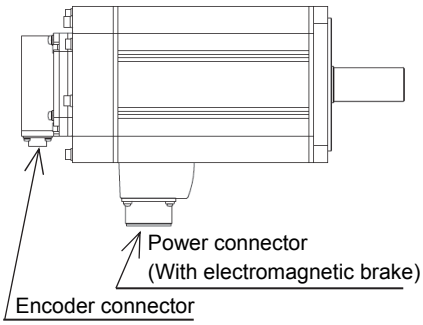
<tr><td>Motor appearance</td><td> 
</td><td> 
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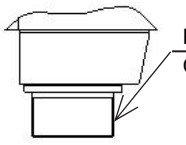
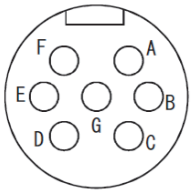
<tr><td>Power connector</td><td> 



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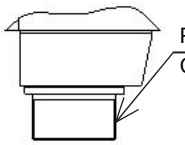
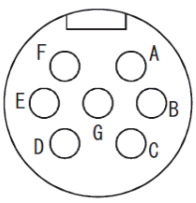
</table></td><td> 



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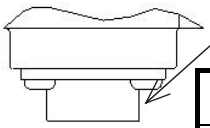
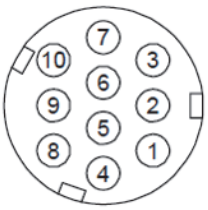
(Note)</td><td> 



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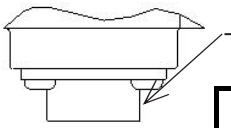
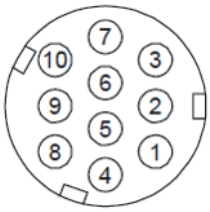
</table></td><td> 



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Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
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<tr><td>2</td><td>MRR</td></tr>
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<tr><td>5</td><td>LG</td></tr>
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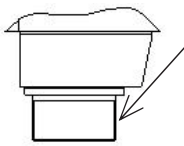
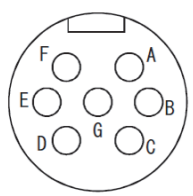
(Power connector)</td><td> 



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<tr><td>B</td><td>V</td></tr>
<tr><td>C</td><td>W</td></tr>
<tr><td>D</td><td>Earth</td></tr>
<tr><td>E</td><td>B1</td></tr>
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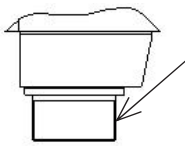
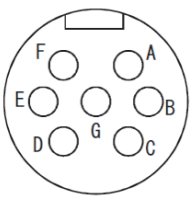
</table></td><td> 



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Note. Although the encoder connector type differs, it can be wired with the existing cables because the connector specifications have compatibility in wiring.

(4) HC-LP series

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<tr><td>Servo amplifier series</td><td>MR-J3 series</td><td>MR-J4 series</td></tr>
<tr><td>Servo motor series</td><td>HC-LP</td><td>HG-JR</td></tr>
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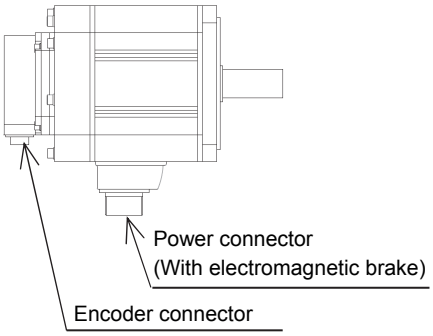
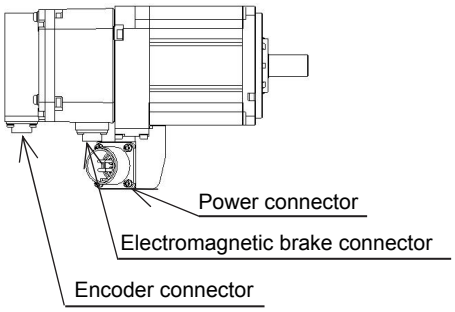
<tr><td>Motor appearance</td><td> 
</td><td> 
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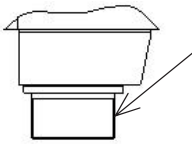
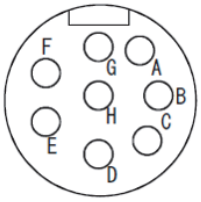
(Note 1)</td><td> 



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<tr><td>D</td><td>Earth</td></tr>
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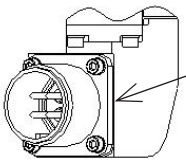
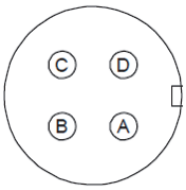
</table></td><td> 



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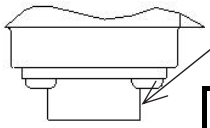
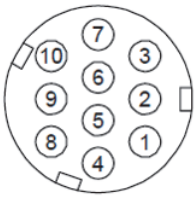
(Note 2)</td><td> 



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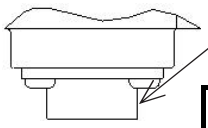
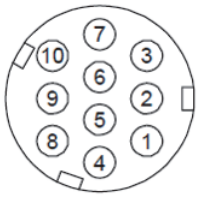
</table></td><td> 



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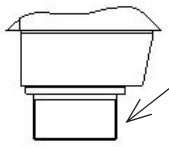
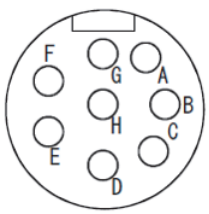
(Power connector)</td><td> 



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Pin assignment</td></tr>
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<tr><td>B</td><td>V</td></tr>
<tr><td>C</td><td>W</td></tr>
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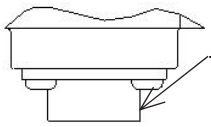
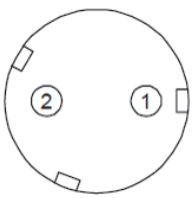
</table></td><td> 



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Note 1. The capacity of the servo amplifier is changed. Another power cable is required.
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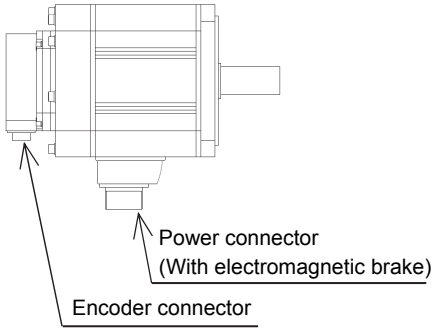
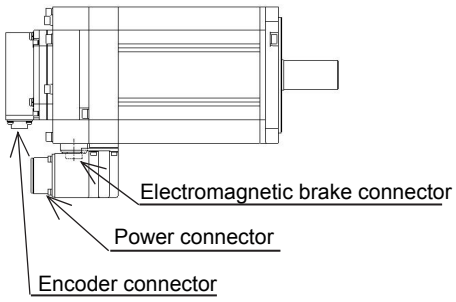
<tr><td>Target models</td><td>HC-LP152(B)</td><td>HG-JR353(B)</td></tr>
<tr><td>Motor appearance</td><td> 
</td><td> 
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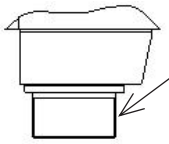
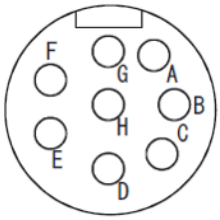
(Note 1)</td><td> 



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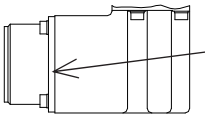
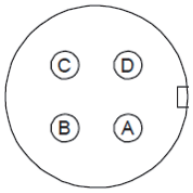
</table></td><td> 



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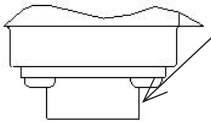
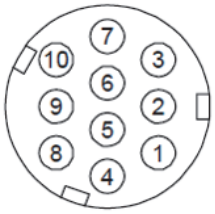
(Note 2)</td><td> 



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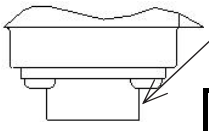
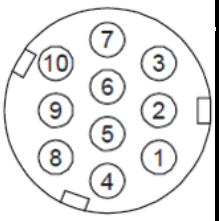
</table></td><td> 



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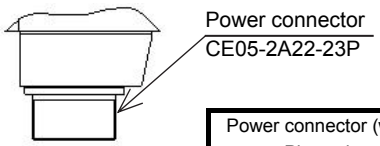
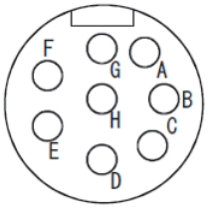
(Power connector)</td><td> 



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Pin assignment</td></tr>
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<tr><td>B</td><td>V</td></tr>
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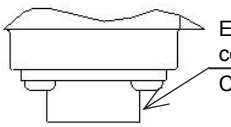
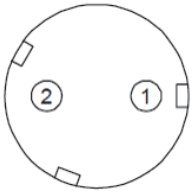
</table></td><td> 



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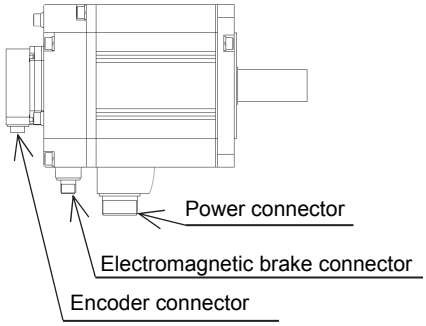
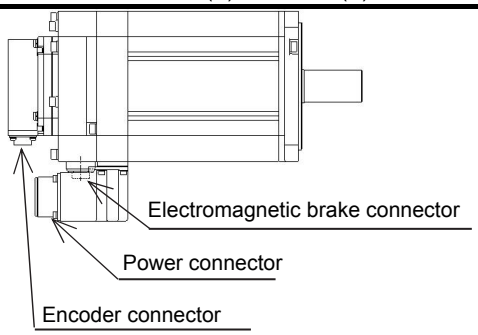
<tr><td>Servo motor series</td><td>HC-LP</td><td>HG-JR</td></tr>
<tr><td>Target models</td><td>HC-LP202(B)/HC-LP302(B)</td><td>HG-JR353(B)/HG-JR503(B)</td></tr>
<tr><td>Motor appearance</td><td> 
</td><td> 
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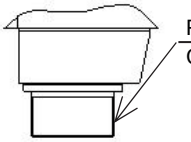
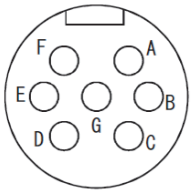
<tr><td>Power connector</td><td> 



<table>
<tr><td colspan="2">Power connector
Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>A</td><td>U</td></tr>
<tr><td>B</td><td>V</td></tr>
<tr><td>C</td><td>W</td></tr>
<tr><td>D</td><td>Earth</td></tr>
<tr><td>E</td><td></td></tr>
<tr><td>F</td><td></td></tr>
<tr><td>G</td><td></td></tr>
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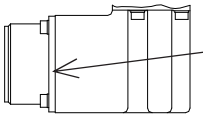
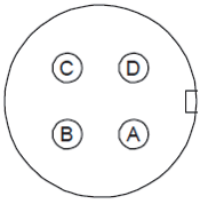
</table></td><td> 



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Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>A</td><td>U</td></tr>
<tr><td>B</td><td>V</td></tr>
<tr><td>C</td><td>W</td></tr>
<tr><td>D</td><td>Earth</td></tr>
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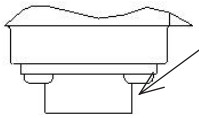
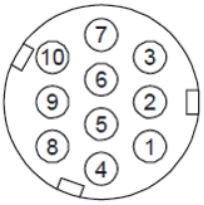
(Note)</td><td> 



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Pin assignment</td></tr>
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<tr><td>2</td><td>MRR</td></tr>
<tr><td>3</td><td></td></tr>
<tr><td>4</td><td>BAT</td></tr>
<tr><td>5</td><td>LG</td></tr>
<tr><td>6</td><td></td></tr>
<tr><td>7</td><td></td></tr>
<tr><td>8</td><td>P5</td></tr>
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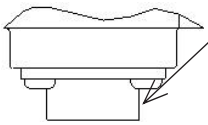
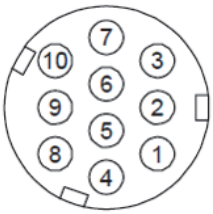
</table></td><td> 



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Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>1</td><td>MR</td></tr>
<tr><td>2</td><td>MRR</td></tr>
<tr><td>3</td><td></td></tr>
<tr><td>4</td><td>BAT</td></tr>
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<tr><td>7</td><td></td></tr>
<tr><td>8</td><td>P5</td></tr>
<tr><td>9</td><td></td></tr>
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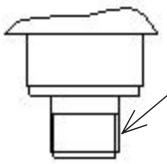
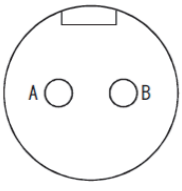
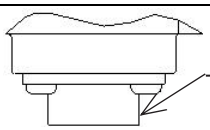
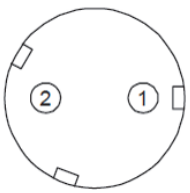
(Power connector)</td><td> 



<table>
<tr><td colspan="2">Electromagnetic brake connector Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>A</td><td>B1</td></tr>
<tr><td>B</td><td>B2</td></tr>
</table></td><td> 



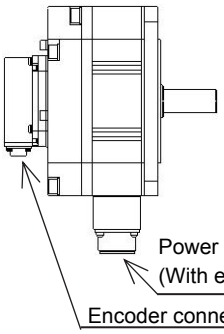
<table>
<tr><td colspan="2">Electromagnetic brake connector Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>1</td><td>B1</td></tr>
<tr><td>2</td><td>B2</td></tr>
</table></td></tr>
</table>

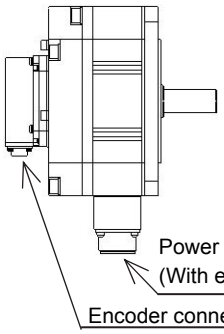
Note. Although the encoder connector type differs, it can be wired with the existing cables because the connector specifications have compatibility in wiring.

(5) HC-UP series

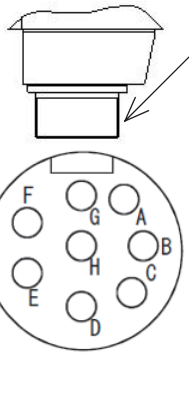
Servo amplifier series	MR-J3 series	MR-J4 series
Servo motor series	HC-UP	HG-UR
Target models	HC-UP72(B)/HC-UP152(B)	HG-UR72(B)/HG-UR152(B)

Motor appearance

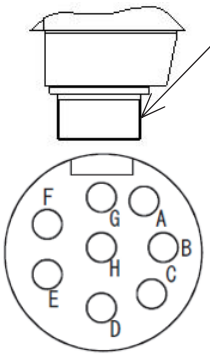




Power connector

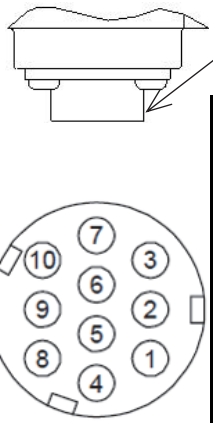


Power connector Pin assignment	
Pin No.	Signal name
A	U
B	V
C	W
D	Earth
E	
F	
G	
H	

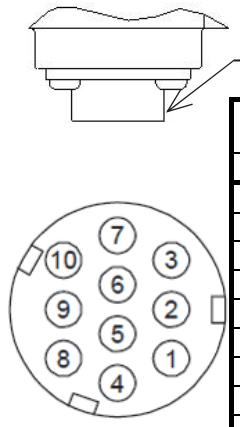


Power connector Pin assignment	
Pin No.	Signal name
A	U
B	V
C	W
D	Earth
E	
F	
G	
H	

Encoder connector (Note)

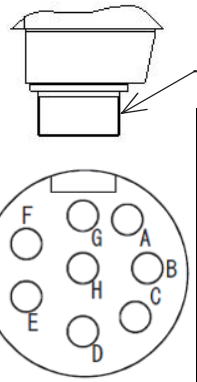


Encoder connector Pin assignment	
Pin No.	Signal name
1	MR
2	MRR
3	
4	BAT
5	LG
6	
7	
8	P5
9	
10	SHD

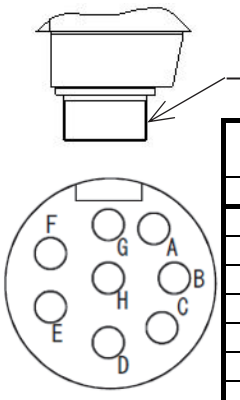


Encoder connector Pin assignment	
Pin No.	Signal name
1	MR
2	MRR
3	
4	BAT
5	LG
6	
7	
8	P5
9	
10	SHD

Electromagnetic brake connector (Power connector)

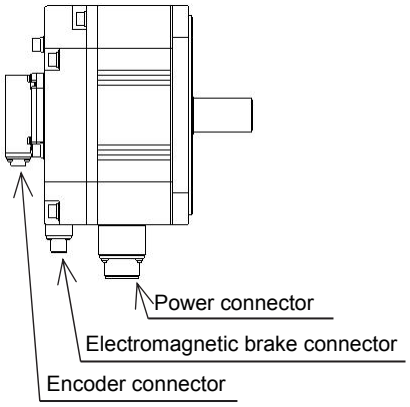
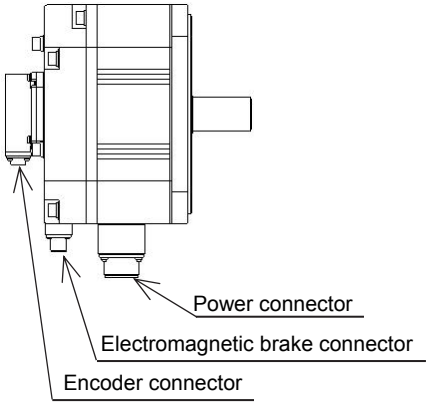


Power connector (with brake) Pin assignment	
Pin No.	Signal name
A	U
B	V
C	W
D	Earth
E	
F	
G	B1
H	B2



Power connector (with brake) Pin assignment	
Pin No.	Signal name
A	U
B	V
C	W
D	Earth
E	
F	
G	B1
H	B2

Note. Although the encoder connector type differs, it can be wired with the existing cables because the connector specifications have compatibility in wiring.

<table>
<tr><td>Servo amplifier series</td><td>MR-J3 series</td><td>MR-J4 series</td></tr>
<tr><td>Servo motor series</td><td>HC-UP</td><td>HG-UR</td></tr>
<tr><td>Target models</td><td>HC-UP202(B) to HC-UP502(B)</td><td>HG-UR202(B) to HG-UR502(B)</td></tr>
<tr><td>Motor appearance</td><td> 
</td><td> 
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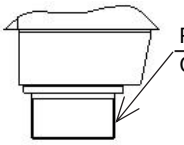
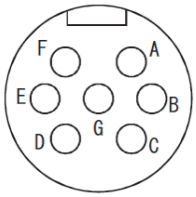
<tr><td>Power connector</td><td> 



<table>
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Pin assignment</th></tr>
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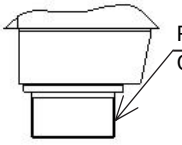
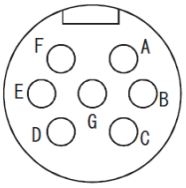
</table></td><td> 



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Pin assignment</th></tr>
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<tr><td>B</td><td>V</td></tr>
<tr><td>C</td><td>W</td></tr>
<tr><td>D</td><td>Earth</td></tr>
<tr><td>E</td><td></td></tr>
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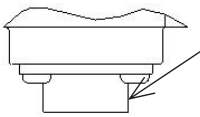
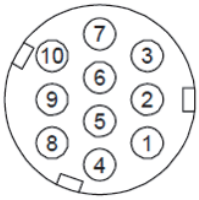
(Note)</td><td> 



<table>
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Pin assignment</th></tr>
<tr><th>Pin No.</th><th>Signal name</th></tr>
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<tr><td>2</td><td>MRR</td></tr>
<tr><td>3</td><td></td></tr>
<tr><td>4</td><td>BAT</td></tr>
<tr><td>5</td><td>LG</td></tr>
<tr><td>6</td><td></td></tr>
<tr><td>7</td><td></td></tr>
<tr><td>8</td><td>P5</td></tr>
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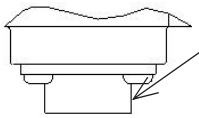
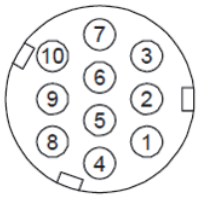
</table></td><td> 



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Pin assignment</th></tr>
<tr><th>Pin No.</th><th>Signal name</th></tr>
<tr><td>1</td><td>MR</td></tr>
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<tr><td>4</td><td>BAT</td></tr>
<tr><td>5</td><td>LG</td></tr>
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<tr><td>7</td><td></td></tr>
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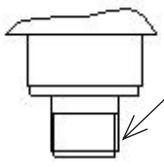
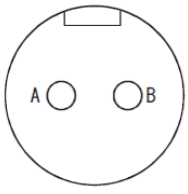
connector</td><td> 



<table>
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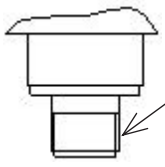
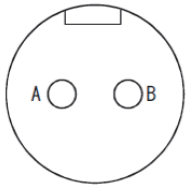
connector Pin assignment</th></tr>
<tr><th>Pin No.</th><th>Signal name</th></tr>
<tr><td>A</td><td>B1</td></tr>
<tr><td>B</td><td>B2</td></tr>
</table></td><td> 



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connector Pin assignment</th></tr>
<tr><th>Pin No.</th><th>Signal name</th></tr>
<tr><td>A</td><td>B1</td></tr>
<tr><td>B</td><td>B2</td></tr>
</table></td></tr>
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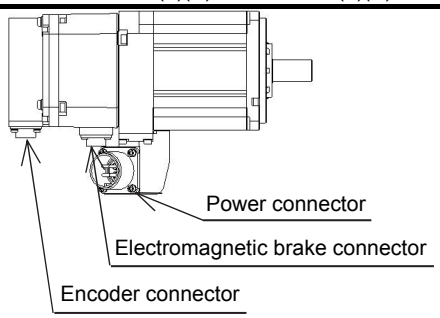
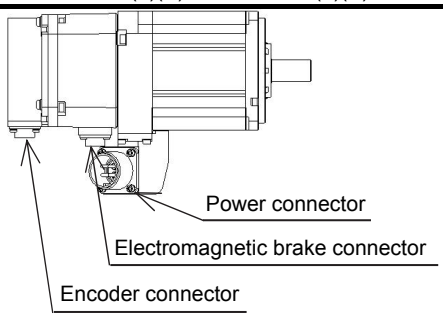
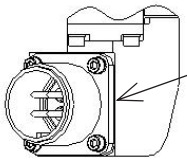
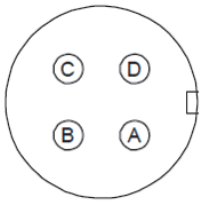
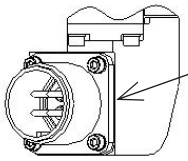
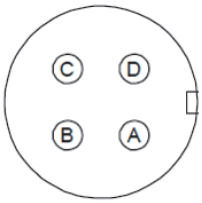
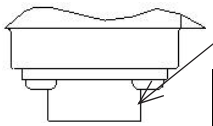
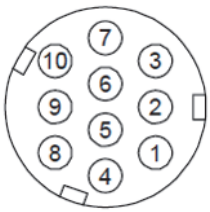
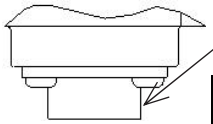
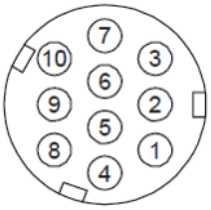
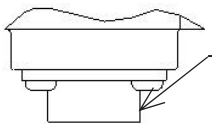
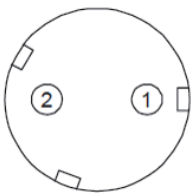
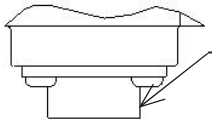
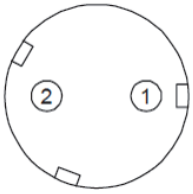
Note. Although the encoder connector type differs, it can be wired with the existing cables because the connector specifications have compatibility in wiring.

(6) HF-JP motor

Servo amplifier series	MR-J3 series	MR-J4 series
Servo motor series	HF-JP	HG-JR
Target models	HF-JP53(4)(B) to HF-JP203(4)(B)	HG-JR53(4)(B) to HG-JR203(4)(B)
Motor appearance		
Power connector	  Power connector Pin assignment Pin No. / Signal name A: U B: V C: W D: Earth	  Power connector Pin assignment Pin No. / Signal name A: U B: V C: W D: Earth
Encoder connector (Note)	  Encoder connector Pin assignment Pin No. / Signal name 1: MR 2: MRR 3: 4: BAT 5: LG 6: 7: 8: P5 9: 10: SHD	  Encoder connector Pin assignment Pin No. / Signal name 1: MR 2: MRR 3: 4: BAT 5: LG 6: 7: 8: P5 9: 10: SHD
Electromagnetic brake connector (Note)	  Electromagnetic brake connector Pin assignment Pin No. / Signal name A: B1 B: B2	  Electromagnetic brake connector Pin assignment Pin No. / Signal name A: B1 B: B2

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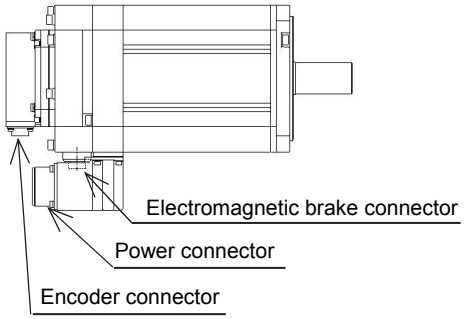
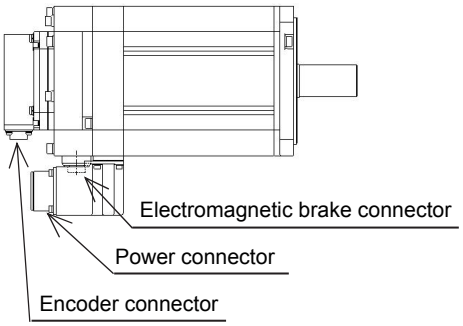
<tr><td>Motor appearance</td><td> 
</td><td> 
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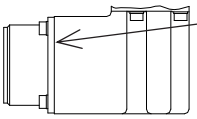
<tr><td>Power connector</td><td> 
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 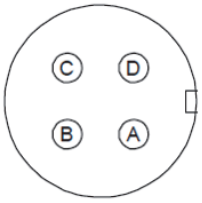

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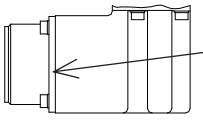
</table></td><td> 
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 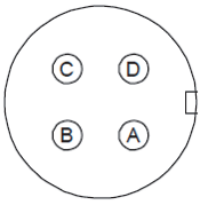

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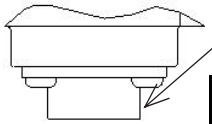
(Note)</td><td> 
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 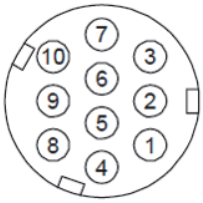

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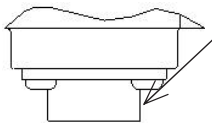
</table></td><td> 
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 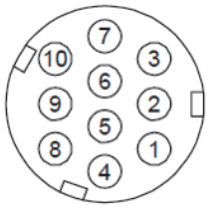

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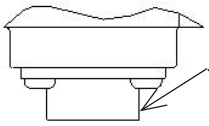
(Note)</td><td> 
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 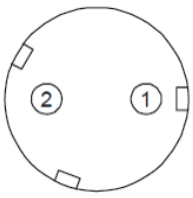

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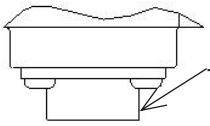
</table></td><td> 
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 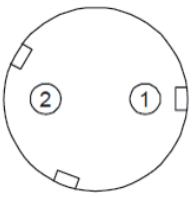

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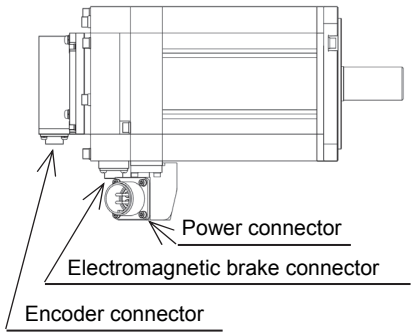
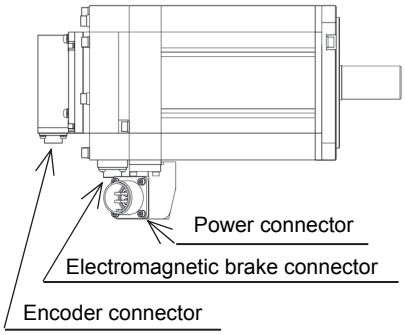
<tr><td>Motor appearance</td><td> 
</td><td> 
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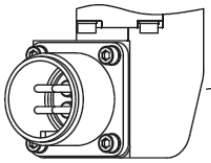
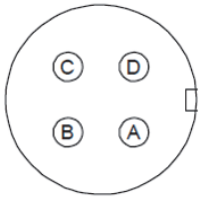
<tr><td>Power connector</td><td> 



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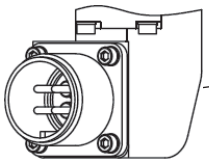
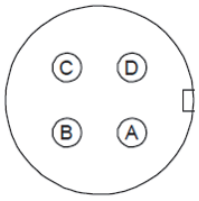
</table></td><td> 



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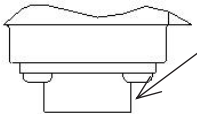
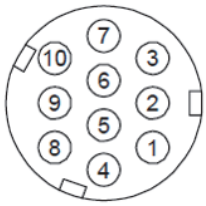
(Note)</td><td> 



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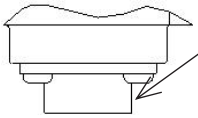
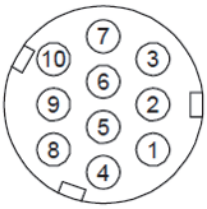
</table></td><td> 



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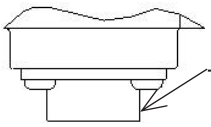
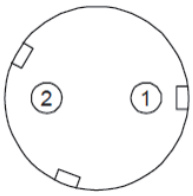
(Note)</td><td> 



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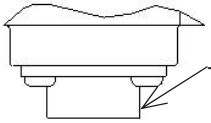
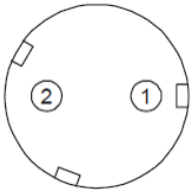
</table></td><td> 



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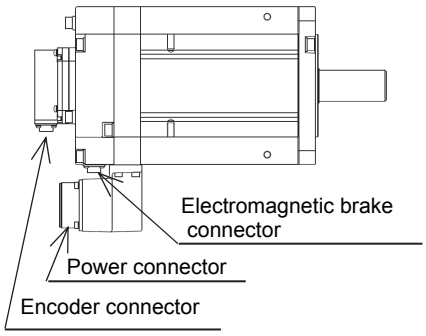
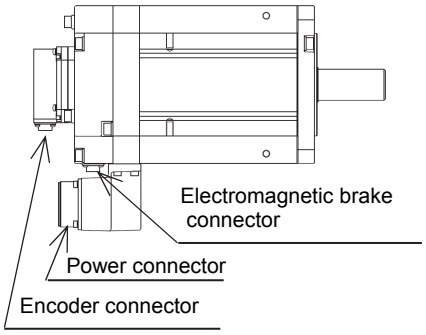
Note. Although the types of encoder and electromagnetic brake connector differ, they can be wired with the existing cables because the connector specifications have compatibility in wiring.

<table>
<tr><td>Servo amplifier series</td><td>MR-J3 series</td><td>MR-J4 series</td></tr>
<tr><td>Servo motor series</td><td>HF-JP</td><td>HG-JR</td></tr>
<tr><td>Target models</td><td>HF-JP703(4)(B)/HF-JP903(4)(B)</td><td>HG-JR703(4)(B)/HG-JR903(4)(B)</td></tr>
<tr><td>Motor appearance</td><td> 
</td><td> 
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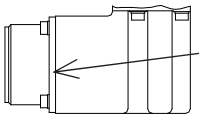
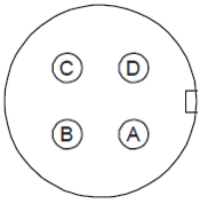
<tr><td>Power connector</td><td> 



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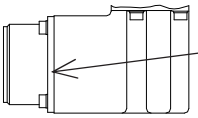
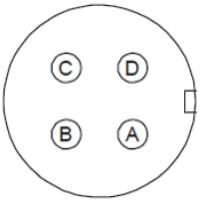
<tr><th>Pin No.</th><th>Signal name</th></tr>
<tr><td>A</td><td>U</td></tr>
<tr><td>B</td><td>V</td></tr>
<tr><td>C</td><td>W</td></tr>
<tr><td>D</td><td>Earth</td></tr>
</table></td><td> 



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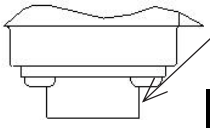
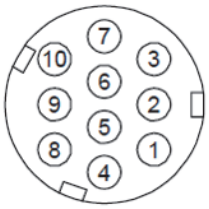
(Note)</td><td> 



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<tr><th colspan="2">Encoder connector Pin assignment</th></tr>
<tr><th>Pin No.</th><th>Signal name</th></tr>
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<tr><td>2</td><td>MRR</td></tr>
<tr><td>3</td><td></td></tr>
<tr><td>4</td><td>BAT</td></tr>
<tr><td>5</td><td>LG</td></tr>
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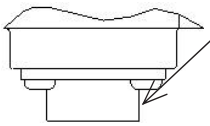
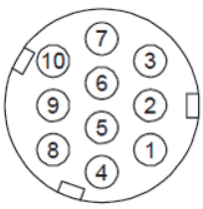
</table></td><td> 



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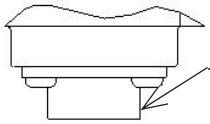
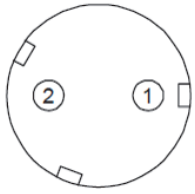
(Note)</td><td> 



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<tr><th>Pin No.</th><th>Signal name</th></tr>
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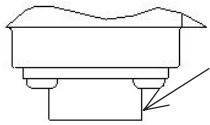
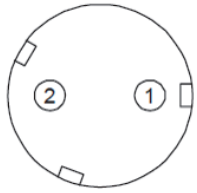
</table></td><td> 



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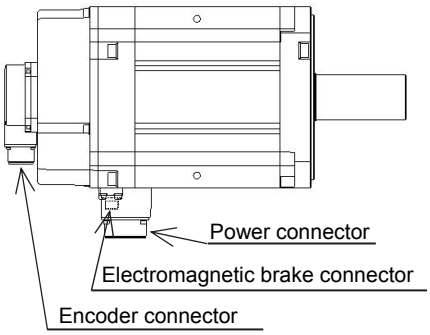
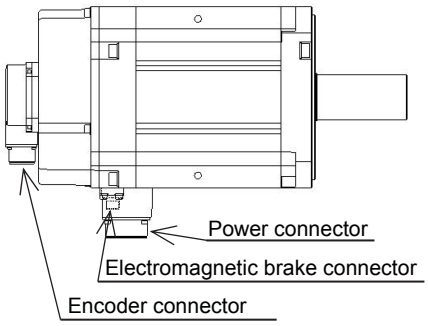
Note. Although the types of encoder and electromagnetic brake connector differ, they can be wired with the existing cables because the connector specifications have compatibility in wiring.

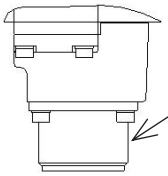
Servo amplifier series	MR-J3 series	MR-J4 series
Servo motor series	HF-JP	HG-JR
Target models	HF-JP11K1M(4)(B)/HF-JP15K1M(4)(B)	HG-JR11K1M(4)(B)/HG-JR15K1M(4)(B)

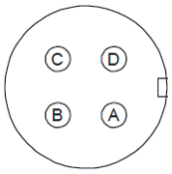
Motor appearance



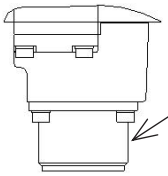


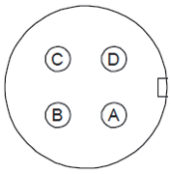
Power connector





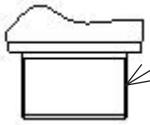
Power connector Pin assignment	
Pin No.	Signal name
A	U
B	V
C	W
D	Earth

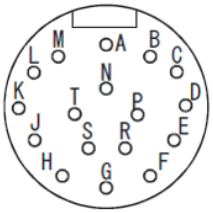




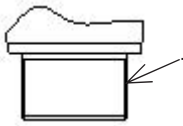
Power connector Pin assignment	
Pin No.	Signal name
A	U
B	V
C	W
D	Earth

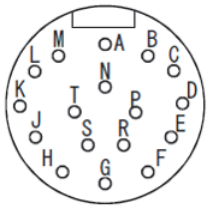
Encoder connector





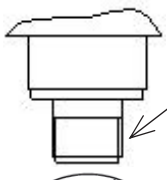
Encoder connector Pin assignment	
Pin No.	Signal name
A	
B	
C	MR
D	MRR
E	
F	BAT
G	LG
H	
J	
K	
L	
M	
N	SHD
P	
R	LG
S	P5
T	

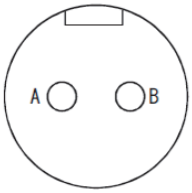




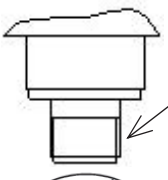
Encoder connector Pin assignment	
Pin No.	Signal name
A	
B	
C	MR
D	MRR
E	
F	BAT
G	LG
H	
J	
K	
L	
M	
N	SHD
P	
R	LG
S	P5
T	

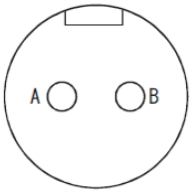
Electromagnetic brake connector





Electromagnetic brake connector Pin assignment	
Pin No.	Signal name
A	B1
B	B2



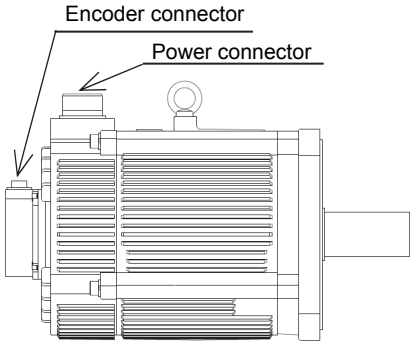


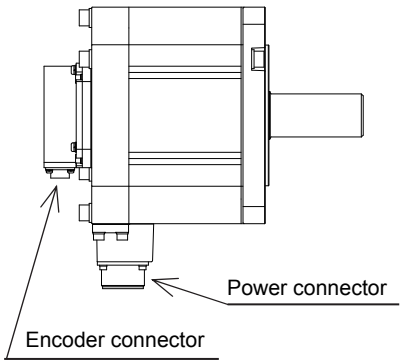
Electromagnetic brake connector Pin assignment	
Pin No.	Signal name
A	B1
B	B2

(7) HA-LP series

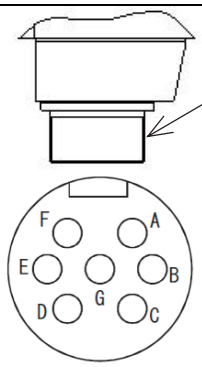
Servo amplifier series	MR-J3 series	MR-J4 series
Servo motor series	HA-LP	HG-SR
Target models	HA-LP502	HG-SR502

Motor appearance

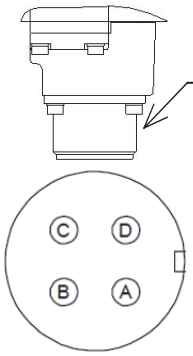




Power connector

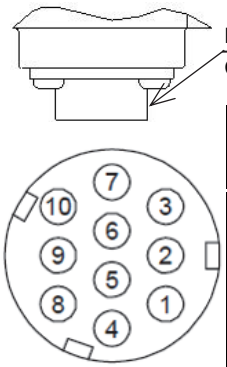


Power connector Pin assignment	
Pin No.	Signal name
A	U
B	V
C	W
D	Earth
E	
F	
G	

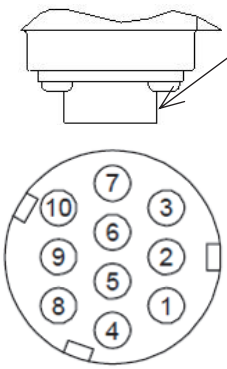


Power connector Pin assignment	
Pin No.	Signal name
A	U
B	V
C	W
D	Earth

Encoder connector (Note)



Encoder connector Pin assignment	
Pin No.	Signal name
1	MR
2	MRR
3	
4	BAT
5	LG
6	
7	
8	P5
9	
10	SHD



Encoder connector Pin assignment	
Pin No.	Signal name
1	MR
2	MRR
3	
4	BAT
5	LG
6	
7	
8	P5
9	
10	SHD

Note. Although the encoder connector type differs, it can be wired with the existing cables because the connector specifications have compatibility in wiring.

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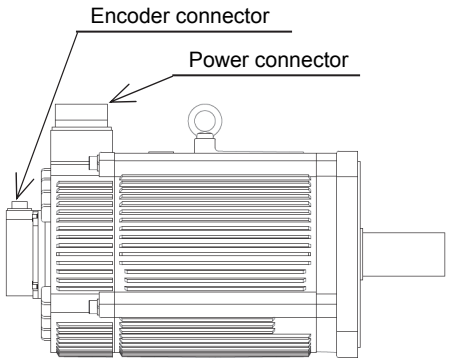
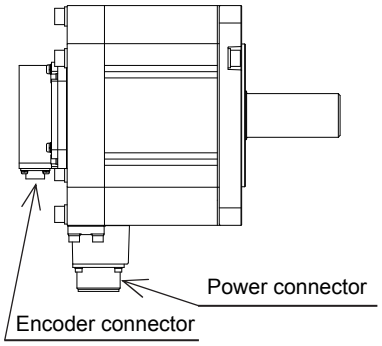
<tr><td>Servo motor series</td><td>HA-LP</td><td>HG-SR</td></tr>
<tr><td>Target models</td><td>HA-LP702</td><td>HG-SR702</td></tr>
<tr><td>Motor appearance</td><td> 
</td><td> 
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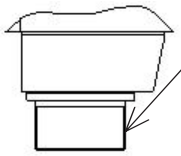
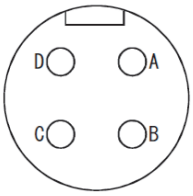
<tr><td>Power connector</td><td> 



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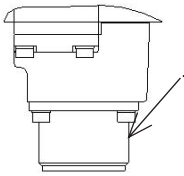
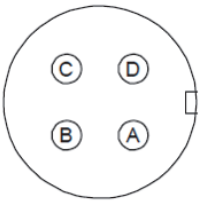
</table></td><td> 



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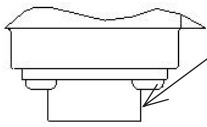
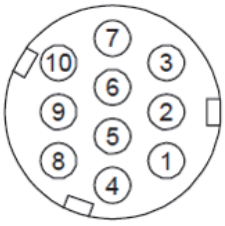
(Note)</td><td> 



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<tr><td>3</td><td></td></tr>
<tr><td>4</td><td>BAT</td></tr>
<tr><td>5</td><td>LG</td></tr>
<tr><td>6</td><td></td></tr>
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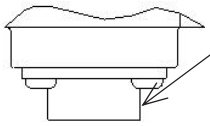
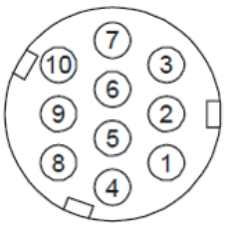
</table></td><td> 



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Note. Although the encoder connector type differs, it can be wired with the existing cables because the connector specifications have compatibility in wiring.

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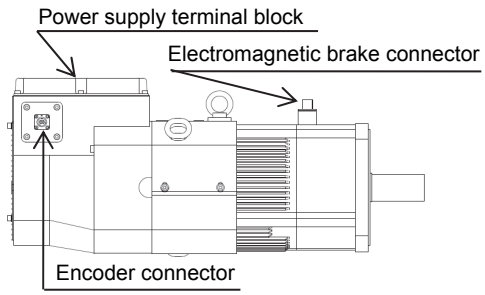
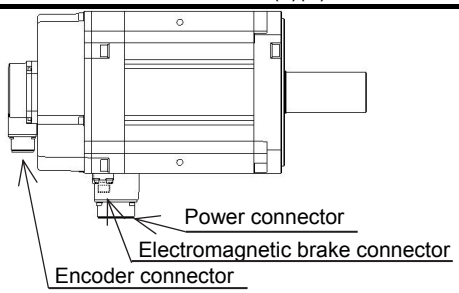
<tr><td>Motor appearance</td><td> 
</td><td> 
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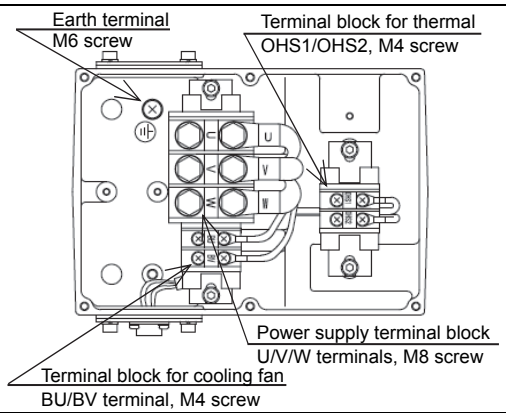
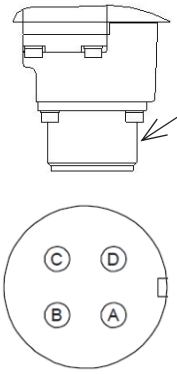
terminal box)</td><td> 
</td><td> 

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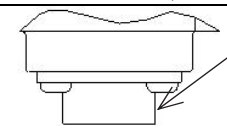
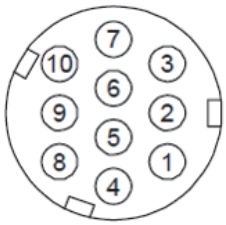
<tr><td>Encoder connector</td><td> 



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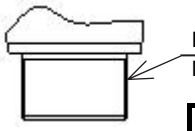
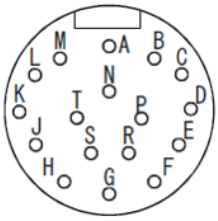
</table></td><td> 



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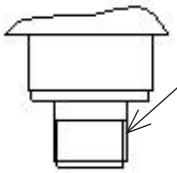
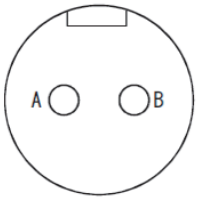
connector</td><td> 



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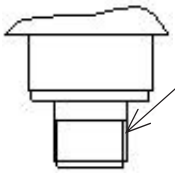
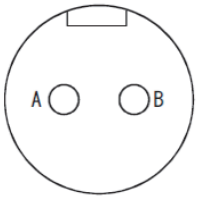
</table></td><td> 



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<tr><td>Target models</td><td>HA-LP801(4)(B)/ HA-LP12K1(4)(B)/
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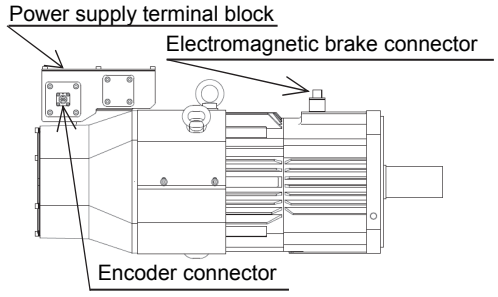
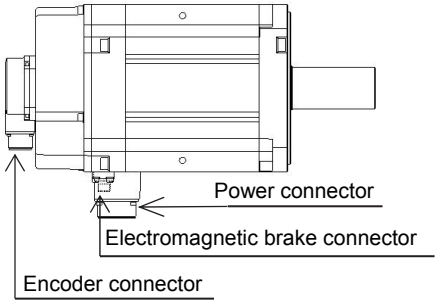
<tr><td>Motor appearance</td><td> 
</td><td> 
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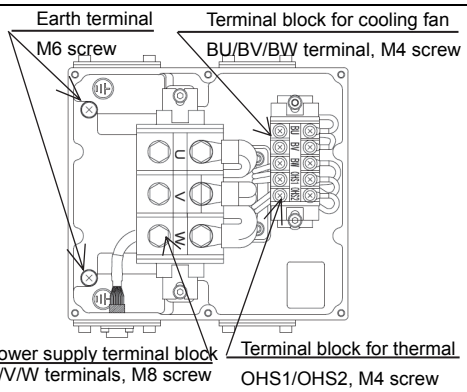
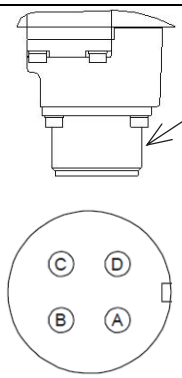
terminal box)</td><td> 
</td><td> 

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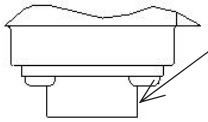
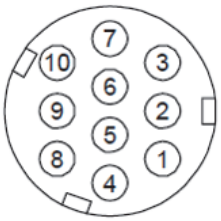
<tr><td>Encoder connector</td><td> 



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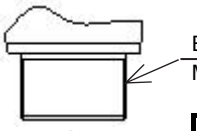
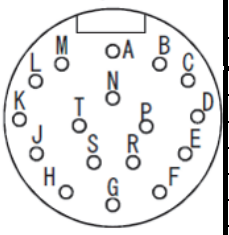
</table></td><td> 



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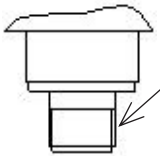
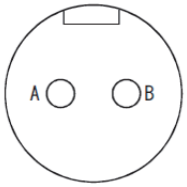
connector</td><td> 



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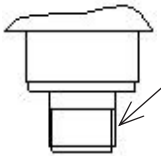
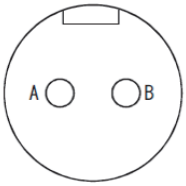
</table></td><td> 



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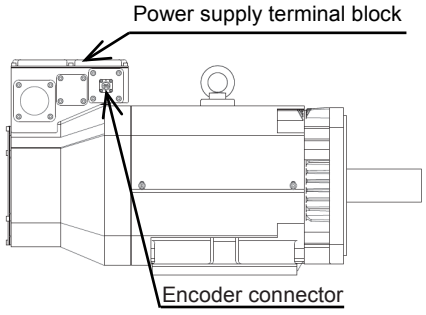
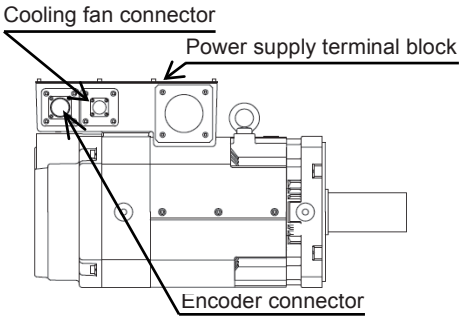
<tr><td>Motor appearance</td><td> 
</td><td> 
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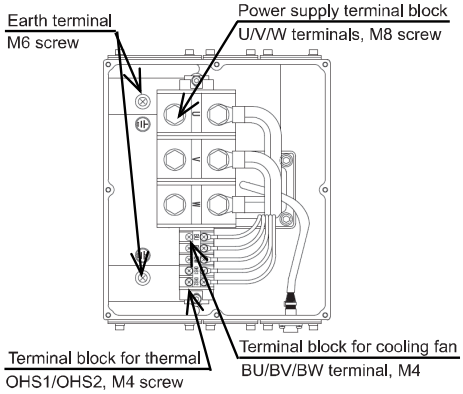
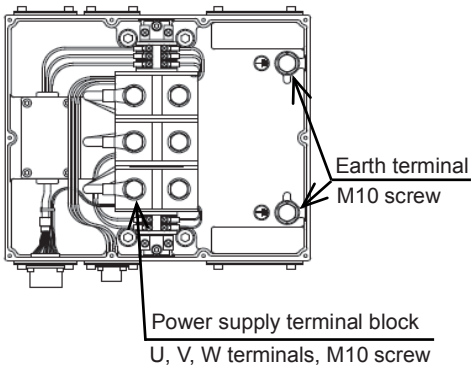
(Enlarged view of terminal box)</td><td> 
</td><td> 
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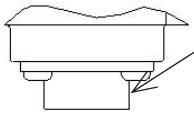
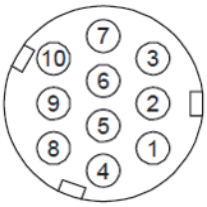
(Note)</td><td> 



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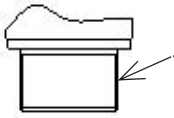
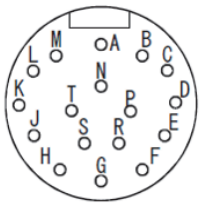
</table></td><td> 



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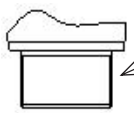
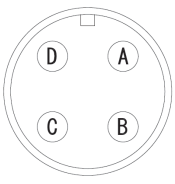
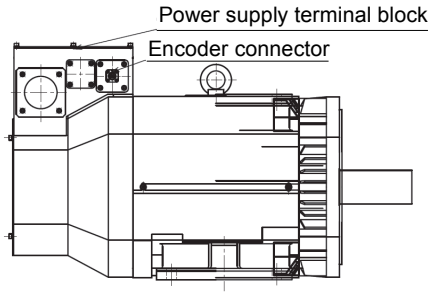
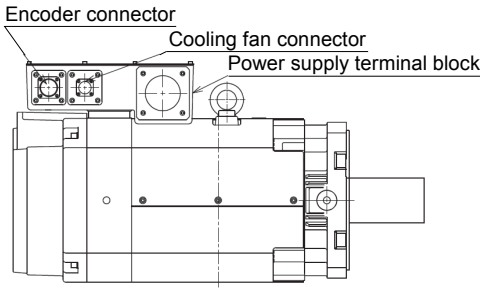
<tr><td>Cooling fan connector</td><td></td><td> 



<table>
<tr><td colspan="2">Cooling fan connector
Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>A</td><td>BU</td></tr>
<tr><td>B</td><td>BV</td></tr>
<tr><td>C</td><td>BW</td></tr>
<tr><td>D</td><td></td></tr>
</table></td></tr>
</table>

Note. The new setting of a encoder cable is required since the thermistor is added to the encoder-side connector.

<table>
<tr><td>Servo amplifier series</td><td>MR-J3 series</td><td>MR-J4 series</td></tr>
<tr><td>Servo motor series</td><td>HA-LP</td><td>HG-JR</td></tr>
<tr><td>Target models</td><td>HA-LP25K1(4) to HA-LP37K1(4)/ HA-LP30K1M/ HA-LP37K1M(4)/HA-LP45K1M4/HA-LP50K1M4/ HA-LP30K2/HA-LP37K2/HA-LP45K24/HA-LP55K24</td><td>HG-JR25K1(4) to HG-JR 37K1(4)/HG-JR22K1M/ HG-JR 30K1M/HG-JR 37K1M(4)/HG-JR45K1M4/ HG-JR55K1M4</td></tr>
<tr><td>Motor appearance</td><td> 
</td><td> 
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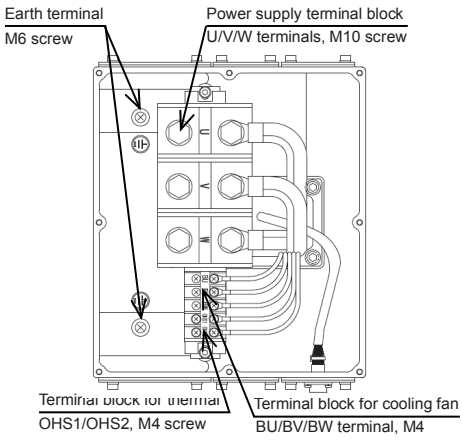
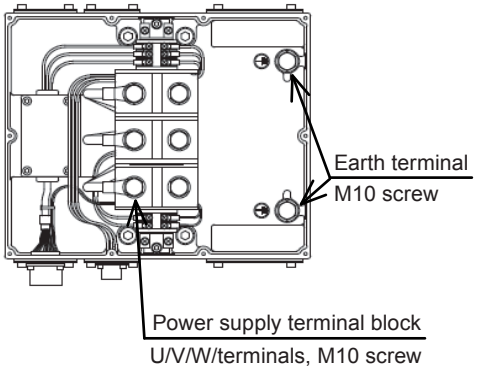
(Enlarged view of terminal box)</td><td> 
</td><td> 
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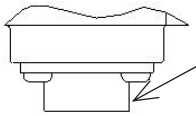
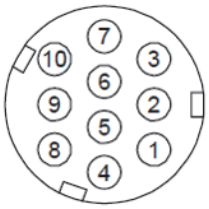
<tr><td>Encoder connector</td><td> 



<table>
<tr><td colspan="2">Encoder connector
Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
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<tr><td>2</td><td>MRR</td></tr>
<tr><td>3</td><td></td></tr>
<tr><td>4</td><td>BAT</td></tr>
<tr><td>5</td><td>LG</td></tr>
<tr><td>6</td><td></td></tr>
<tr><td>7</td><td></td></tr>
<tr><td>8</td><td>P5</td></tr>
<tr><td>9</td><td></td></tr>
<tr><td>10</td><td>SHD</td></tr>
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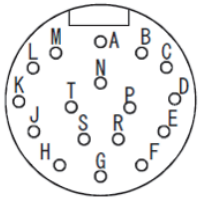

<table>
<tr><td colspan="2">Encoder connector
Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>A</td><td></td></tr>
<tr><td>B</td><td></td></tr>
<tr><td>C</td><td>MR</td></tr>
<tr><td>D</td><td>MRR</td></tr>
<tr><td>E</td><td></td></tr>
<tr><td>F</td><td>BAT</td></tr>
<tr><td>G</td><td>LG</td></tr>
<tr><td>H</td><td></td></tr>
<tr><td>J</td><td></td></tr>
<tr><td>K</td><td>THM1</td></tr>
<tr><td>L</td><td>THM1</td></tr>
<tr><td>M</td><td></td></tr>
<tr><td>N</td><td>SHD</td></tr>
<tr><td>P</td><td></td></tr>
<tr><td>R</td><td>LG</td></tr>
<tr><td>S</td><td>P5</td></tr>
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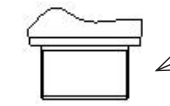
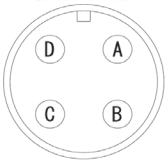
<tr><td>Cooling fan connector</td><td></td><td> 



<table>
<tr><td colspan="2">Cooling fan connector
Pin assignment</td></tr>
<tr><td>Pin No.</td><td>Signal name</td></tr>
<tr><td>A</td><td>BU</td></tr>
<tr><td>B</td><td>BV</td></tr>
<tr><td>C</td><td>BW</td></tr>
<tr><td>D</td><td></td></tr>
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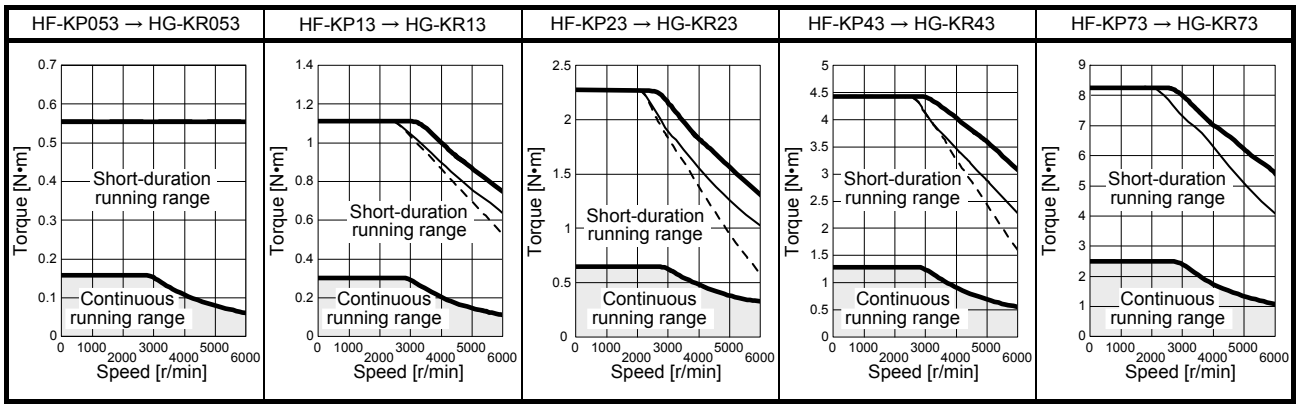
2.7 Comparison of Servo Motor Torque Characteristics

(1) HF-KP series

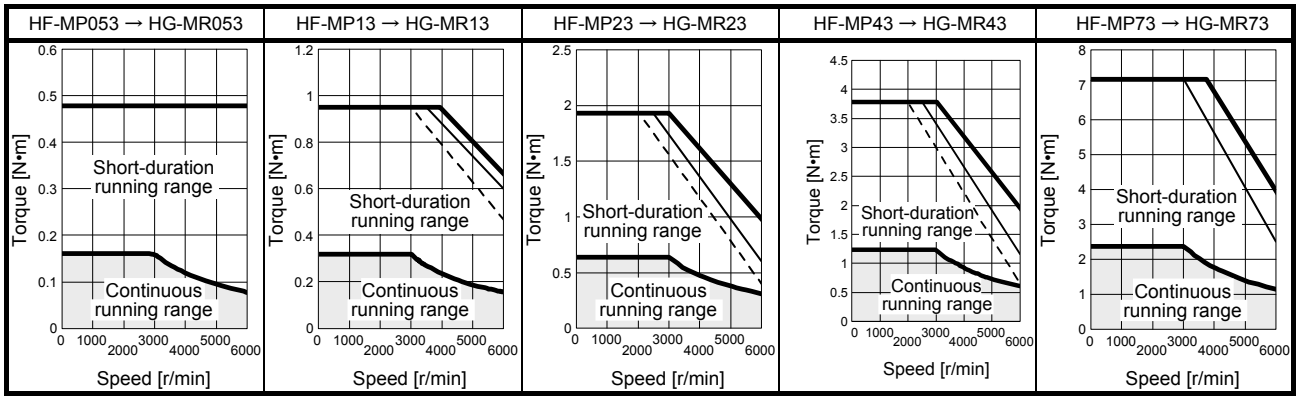
Same torque characteristics



Note 1. For the 3-phase 200 V AC and 1-phase 230 V AC power supplies, the torque characteristic is indicated by the heavy lines.
2. For the 1-phase 200 V AC power supply, part of the torque characteristic is indicated by the thin line.
3. For the 1-phase 100 V AC power supply, part of the torque characteristic is indicated by the broken line.
4. The torque characteristics of the HF-KP series are the value of the maximally increased torque.

(2) HF-MP series

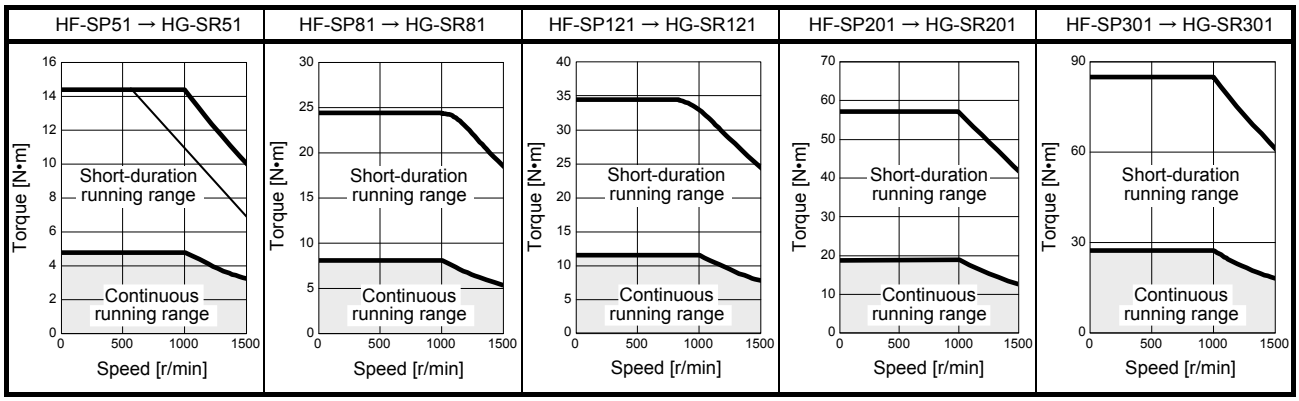
Same torque characteristics

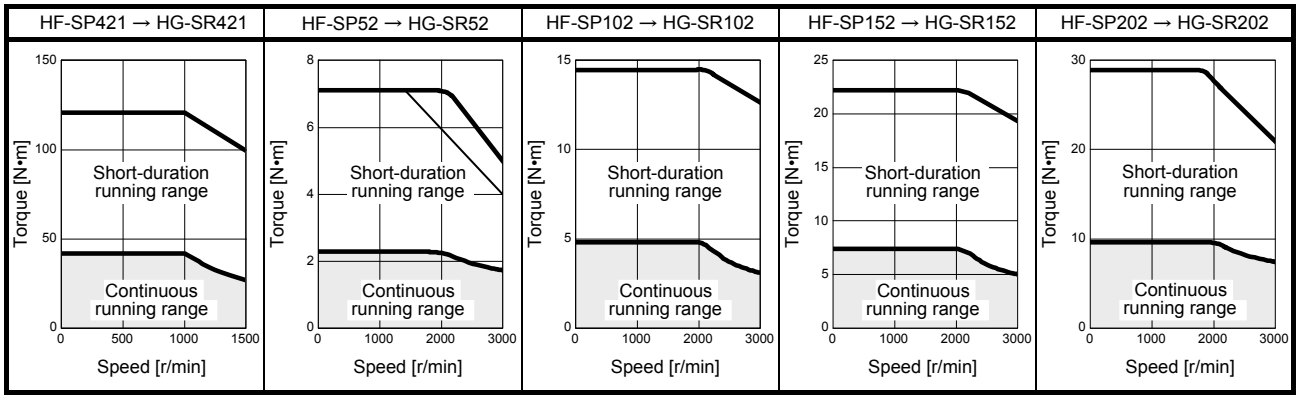


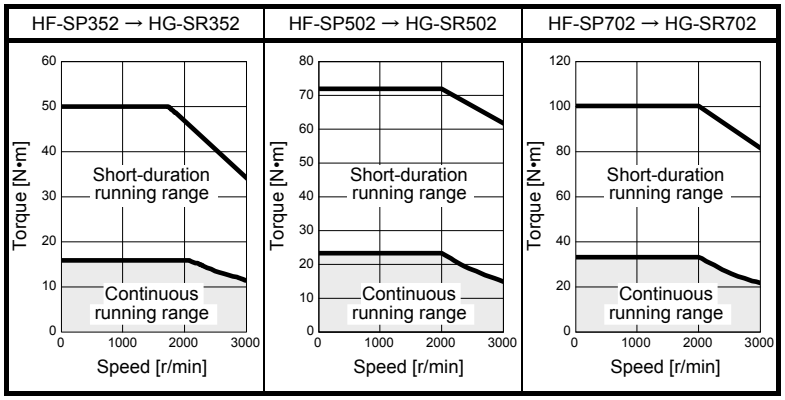
Note 1. For the 3-phase 200 V AC and 1-phase 230 V AC power supplies, the torque characteristic is indicated by the heavy lines.
2. For the 1-phase 200 V AC power supply, part of the torque characteristic is indicated by the thin line.
3. For the 1-phase 100 V AC power supply, part of the torque characteristic is indicated by the broken line.

(3) HF-SP series 200 V class

Same torque characteristics



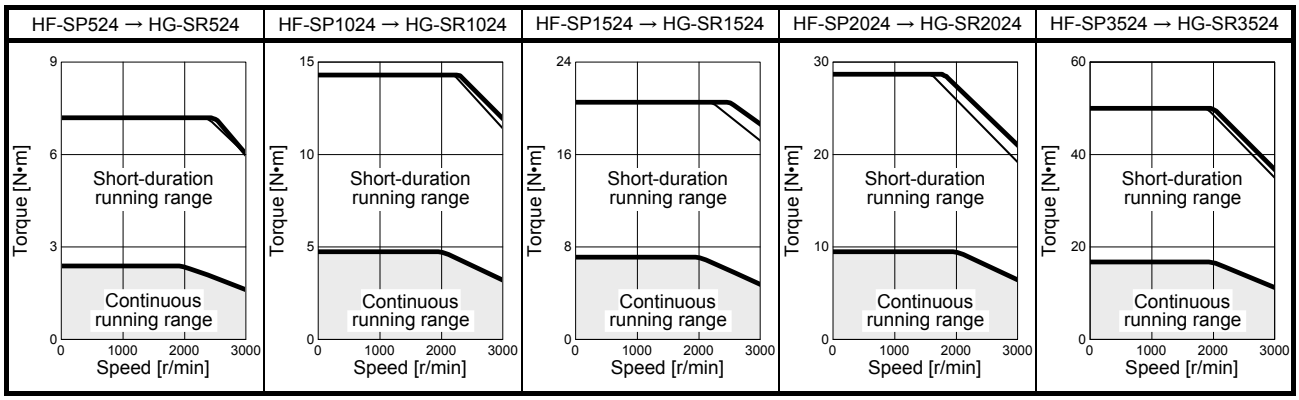


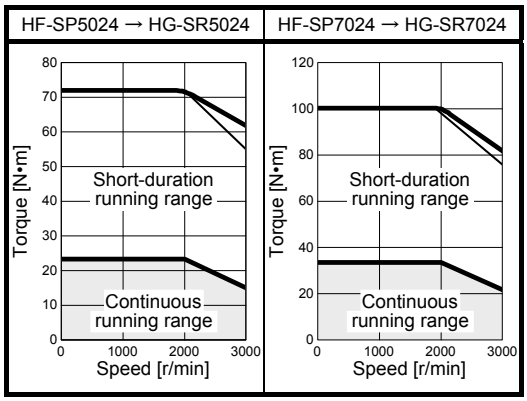


Note 1. For the 3-phase 200 V AC and 1-phase 230 V AC power supplies, the torque characteristic is indicated by the heavy lines.
2. For the 1-phase 200 V AC power supply, part of the torque characteristic is indicated by the thin line.

(4) HF-SP series 400 V class

Same torque characteristics

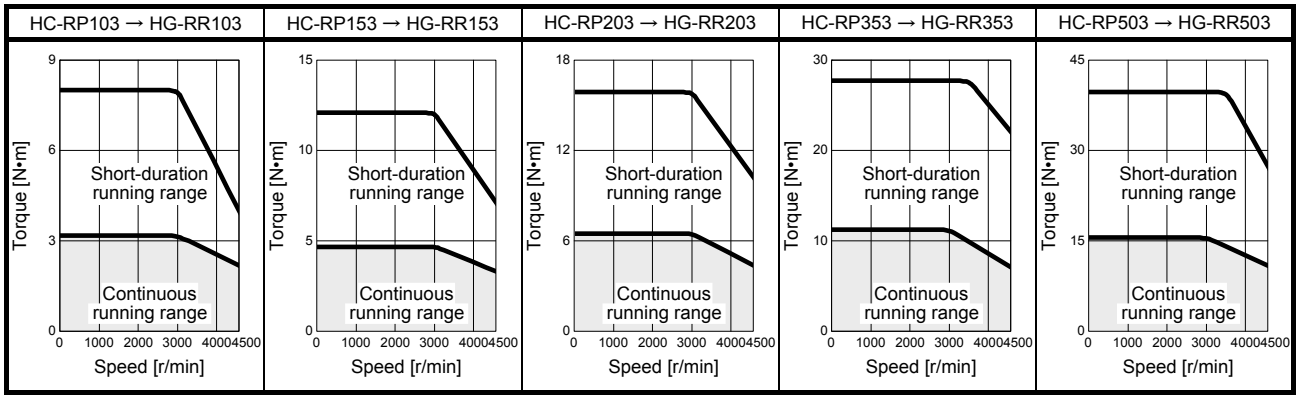




Note 1. For the 3-phase 400 V AC power supply, the torque characteristic is indicated by the heavy line.
2. For the 1-phase 380 V AC power supply, part of the torque characteristic is indicated by the thin line.

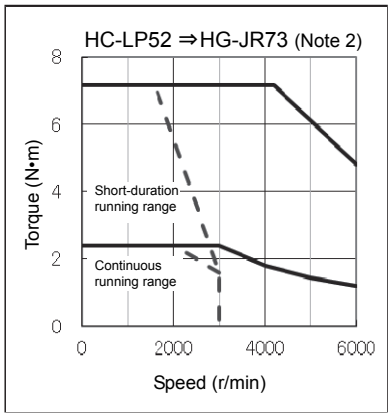
(5) HC-RP series

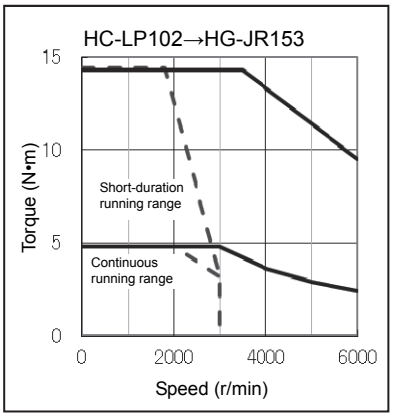
Same torque characteristics

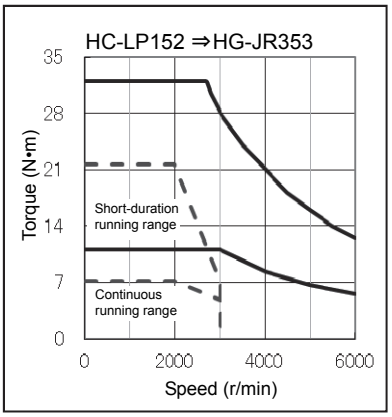


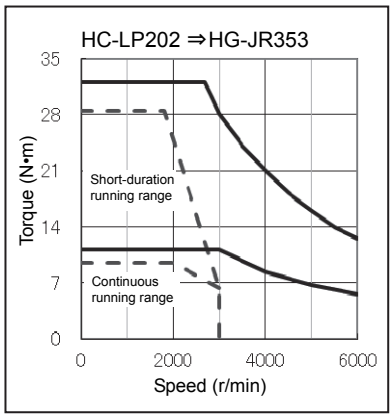
Note. The above torque characteristics are for 3-phase 200 V AC.

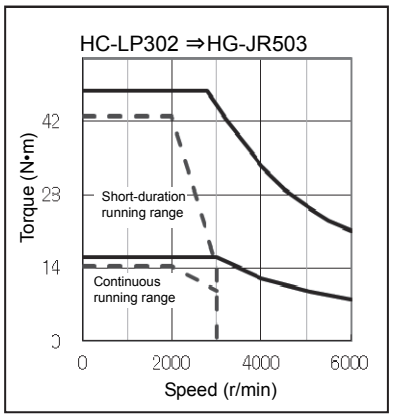
(6) HC-LP series (—— : HG-JR, – – – : HC-LP)







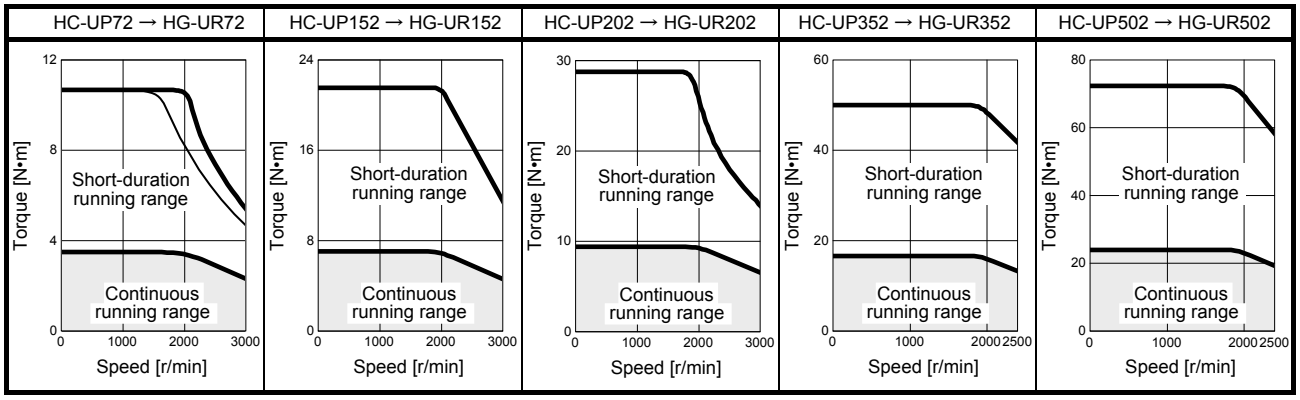




Note 1. The above torque characteristics are for 3-phase 200 V AC.
2. For the 1-phase 230 V AC power supply, please contact your local sales office.

(7) HC-UP series

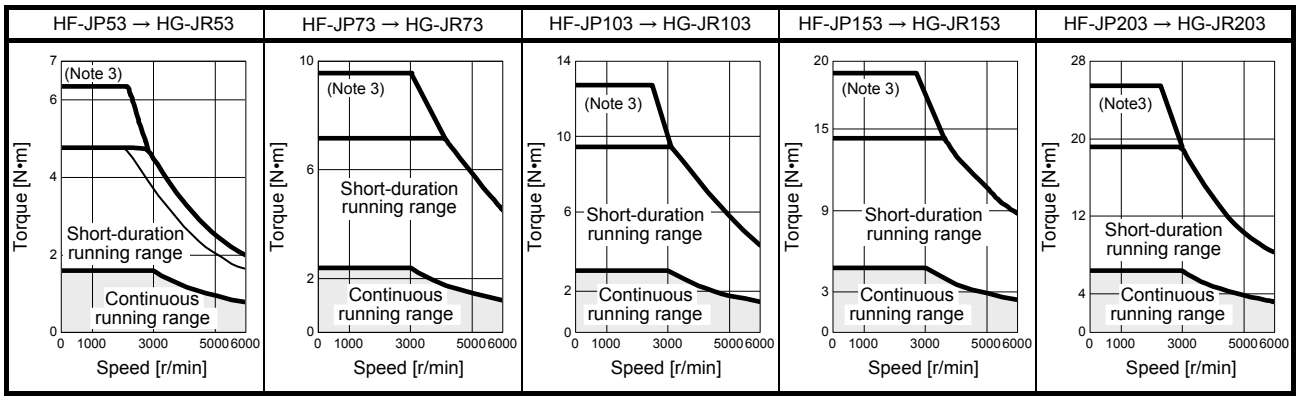
Same torque characteristics

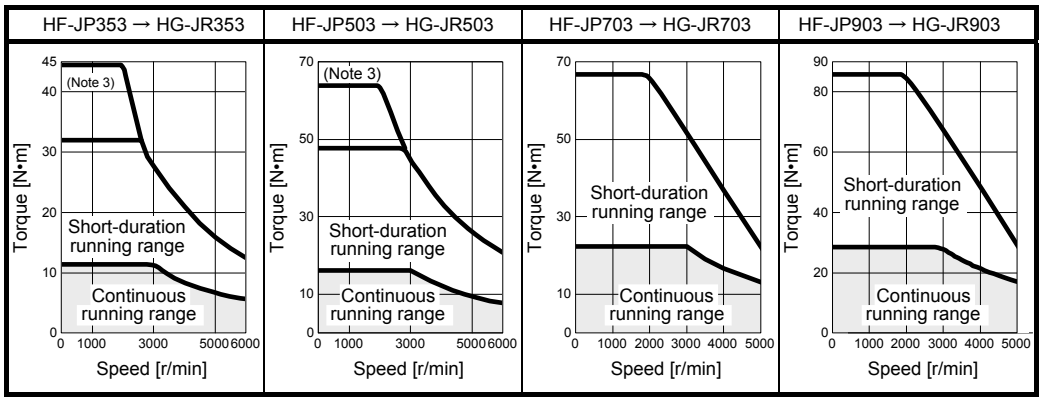


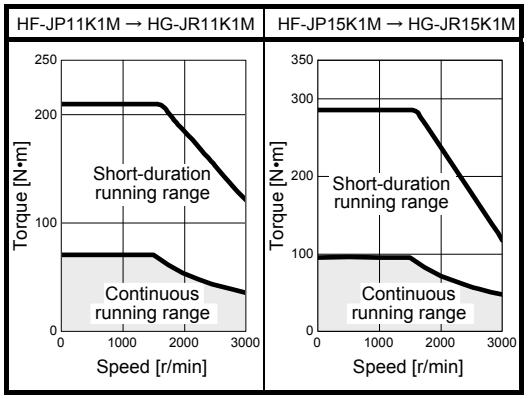
Note 1. The above torque characteristics are for 3-phase 200 V AC.
2. For the 1-phase 200 V AC power supply, part of the torque characteristic is indicated by the thin line.

(8) HF-JP series

Same torque characteristics





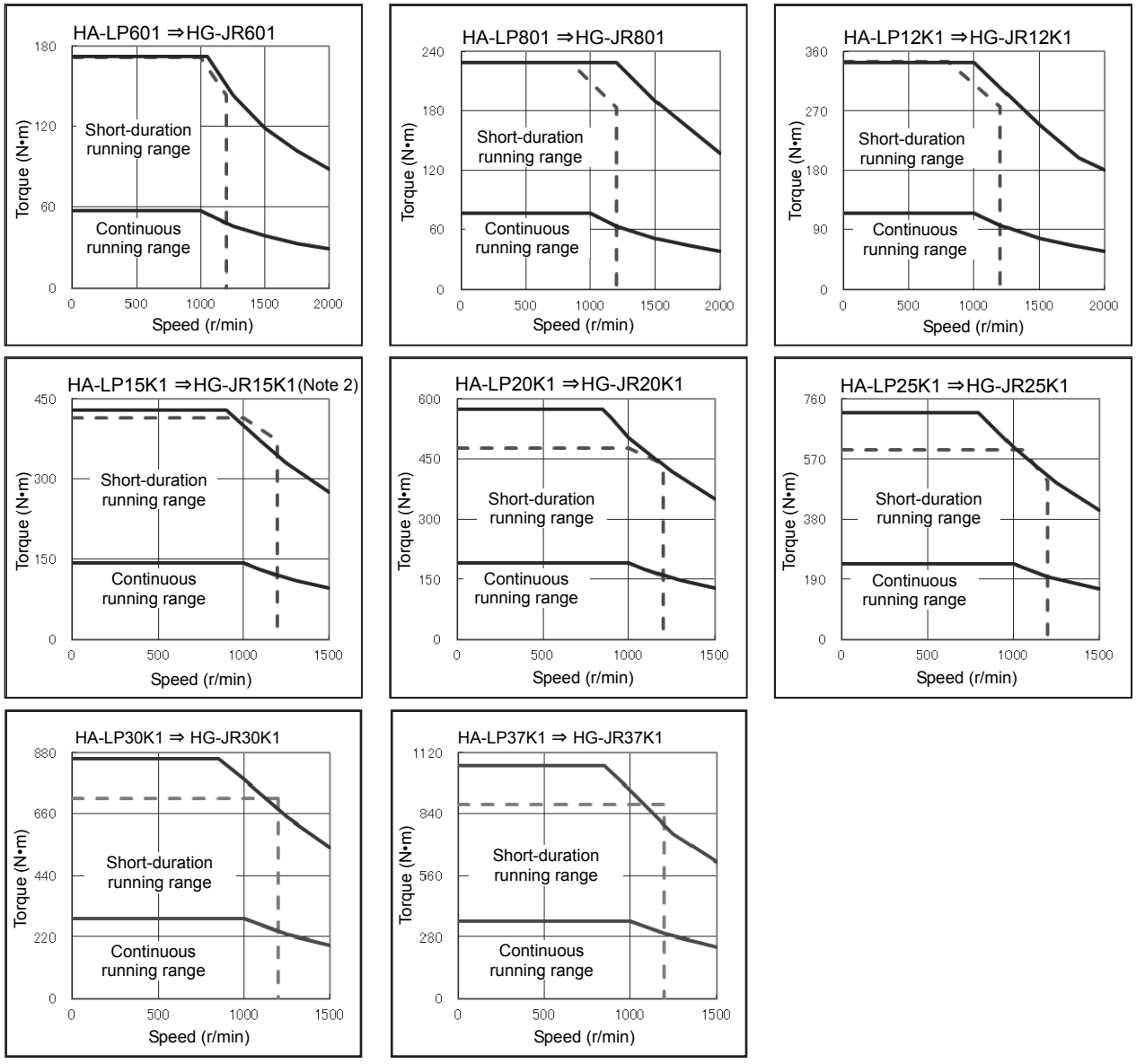


Note 1. For the 3-phase 200 V AC and 1-phase 230 V AC power supplies, the torque characteristic is indicated by the heavy lines.
2. For the 1-phase 200 V AC power supply, part of the torque characteristic is indicated by the thin line.
3. Value at the maximum torque 400%.

(9) HA-LP series (—— : HG-JR, - - - : HA-LP)

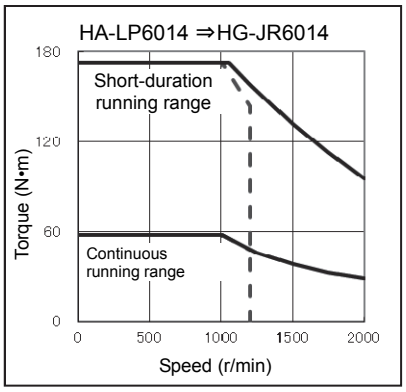
POINT
●When servo motors are replaced with HG-JR_R_-S_ motors (compatible product), the torque characteristics differ. Please contact your local sales office.

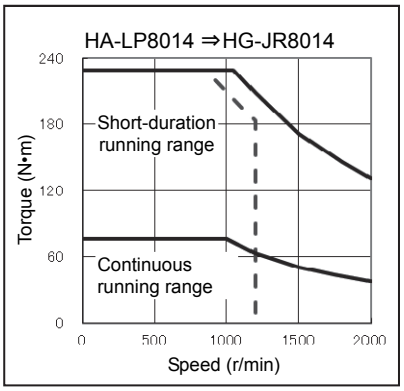
(a) HA-LP 1000 r/min series 200 V class

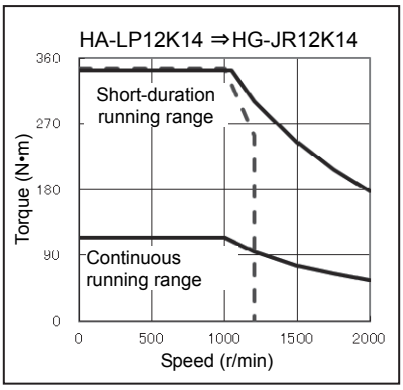


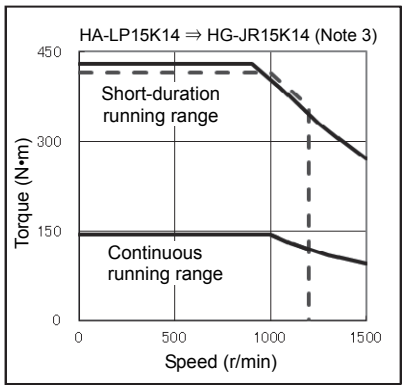
Note 1. The above torque characteristics are for 3-phase 200 V AC.
2. Please contact your local sales office if the compatibility of torque characteristics is required.

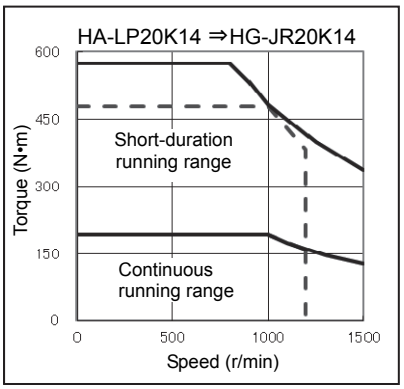
(b) HA-LP 1000 r/min series 400 Vclass

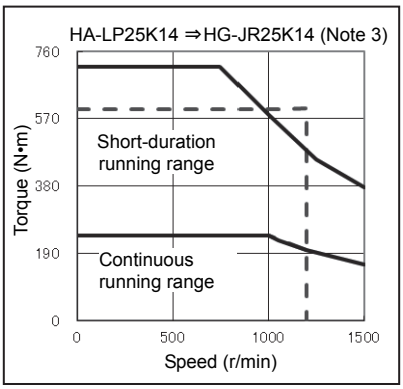


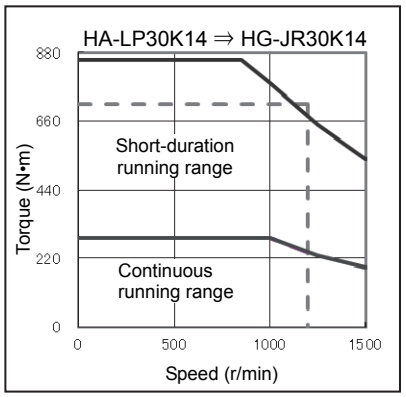


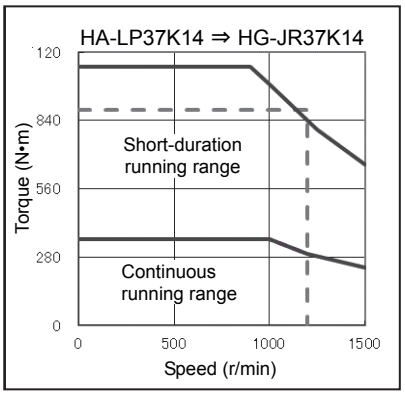






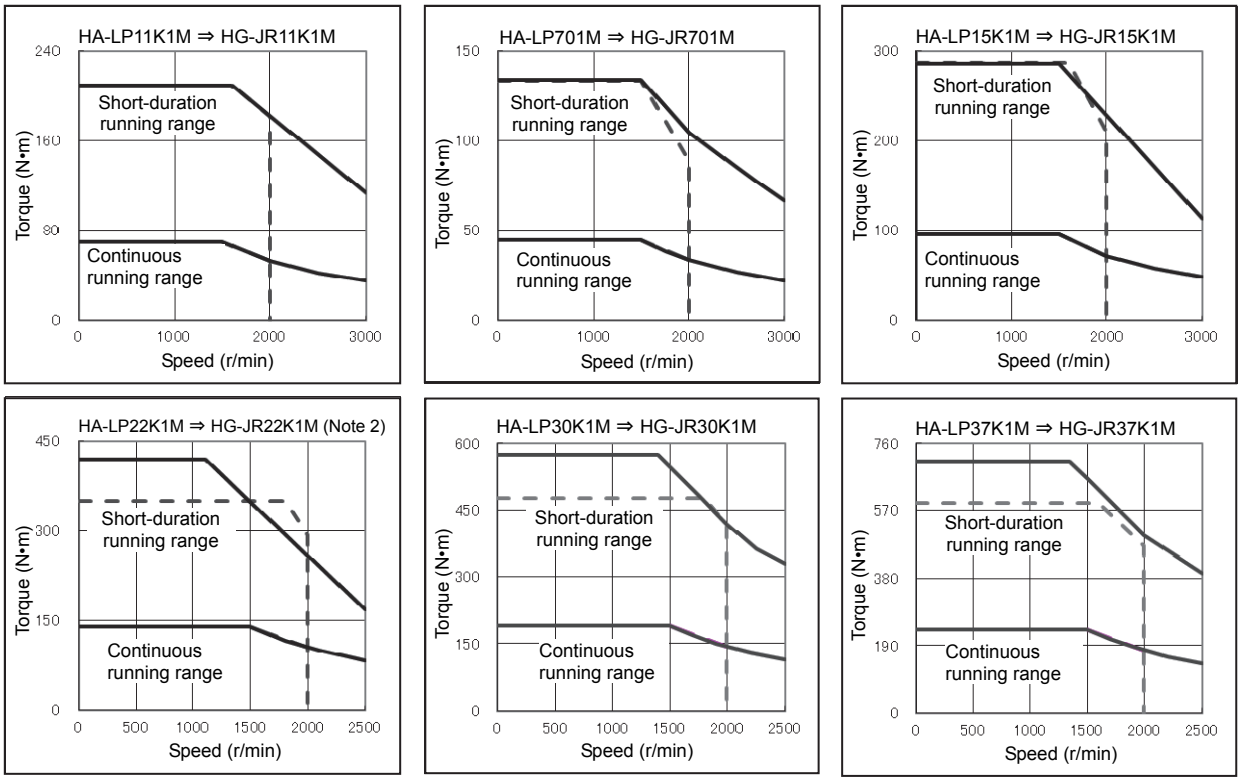






Note 1. The above torque characteristics are for 3-phase 400 V AC.
2. As for 3-phase 380 V AC, refer to the catalog or Instruction Manual.
3. Please contact your local sales office if the compatibility of torque characteristics is required.

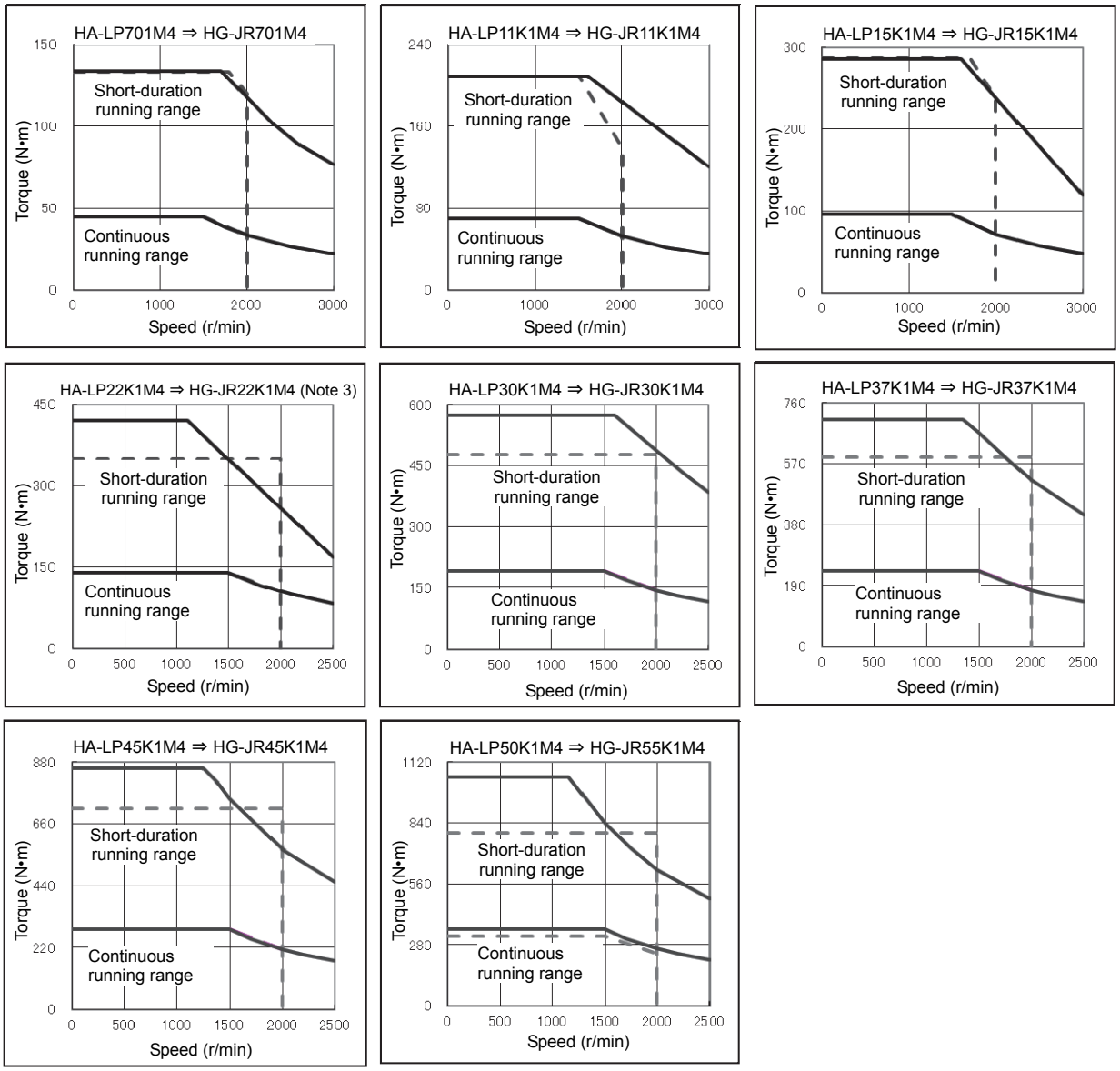
(c) HA-LP 1500 r/min series 200 V class



Note 1. The above torque characteristics are for 3-phase 200 V AC.

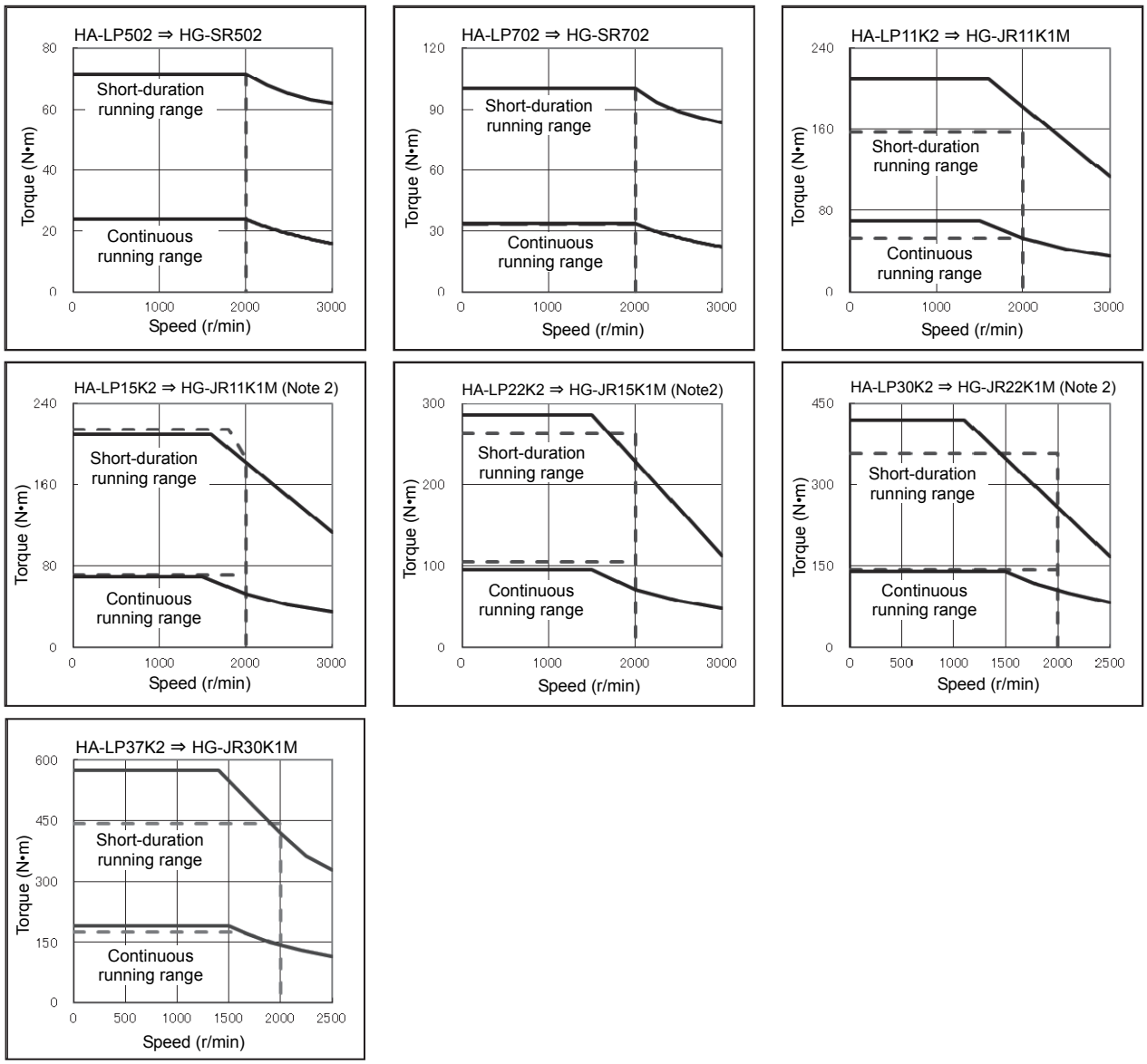
2. Please contact your local sales office if the compatibility of torque characteristics is required.

(d) HA-LP 1500 r/min series 400 V class



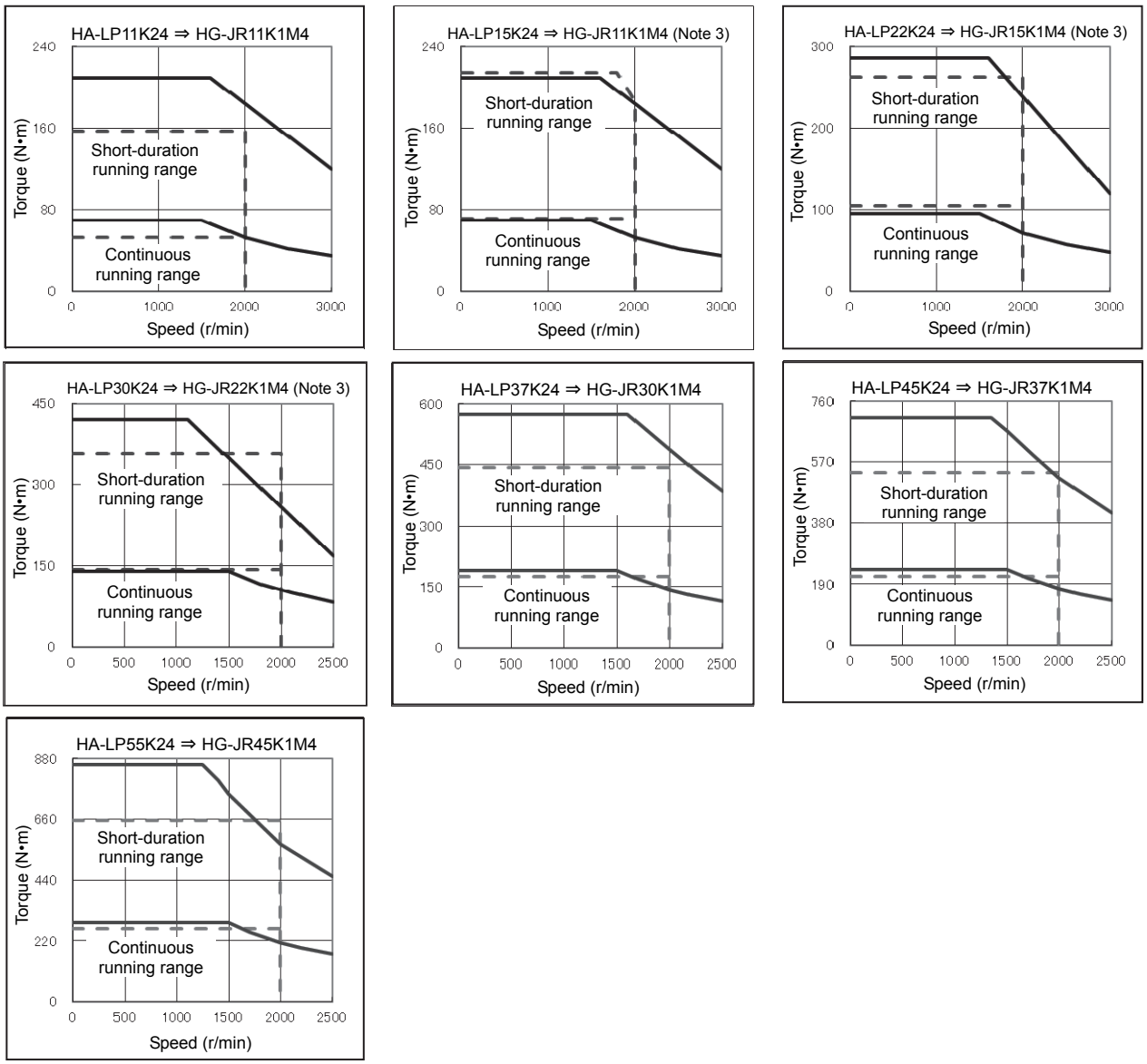
Note 1. The above torque characteristics are for 3-phase 400 V AC.
2. As for 3-phase 380V AC, refer to the catalog or Instruction Manual.
3. Please contact your local sales office if the compatibility of torque characteristics is required.

(e) HA-LP 2000 r/min series 200 V class



Note 1. The above torque characteristics are for 3-phase 200 V AC.
2. Please contact your local sales office if the compatibility of torque characteristics is required.

(f) HA-LP 2000 r/min series 400 V class



Note 1. The above torque characteristics are for 3-phase 400V AC.
2. As for 3-phase 380V AC, refer to the catalog or Instruction Manual.
3. Please contact your local sales office if the compatibility of torque characteristics is required.

Part 8
Review on Replacement of Optional Peripheral Equipment

Part 8: Review on Replacement of Optional Peripheral Equipment

1. COMPARISON TABLE OF REGENERATIVE OPTION COMBINATIONS

POINT

- The MR-J4 series provides the new regenerative options shown in the table below.
- When an MR-J3/MR-J3W series regenerative resistor is used as it is with a motor combined, an alarm may occur.
  Use the MR-J4 series in combination with the regenerative resistor for MR-J4 series.
- Do not use regenerative options newly provided by the MR-J4 series with the MR-J3/MR-J3W series because use of them causes an amplifier malfunction.

List of new regenerative options

Servo amplifier model	Regenerative option MR-RB		Accessory regenerative resistor
MR-J4-350_	3N	5N	
MR-J4-11K_	5R		GRZG400-0.8Ω × 4
MR-J4-15K_	9F		GRZG400-0.6Ω × 5
MR-J4-22K_	9T		GRZG400-0.5Ω × 5
MR-J4-700_4	3U-4	5U-4	
MR-J4-11K_4	5K-4		GRZG400-2.5Ω × 4
MR-J4-15K_4	6K-4		GRZG400-2Ω × 5
MR-J4-DU30K_4 MR-J4-DU37K_4 MR-J4-DU45K_4 MR-J4-DU55K_4	137-4	13V-4	
MR-J4W2-77B MR-J4W2-1010B	3N		

1.1 Regenerative Options 200 V class /100 V class

1.1.1 Combination and regenerative power for the MR-J3/MR-J3W series

List of regenerative options

Servo amplifier model	Built-in regenerative resistor [W]	Permissible regenerative power of regenerative option [W] MR-RB								
		032 [40 Ω]	12 [40 Ω]	30 [13 Ω]	3N [9 Ω]	31 [6.7 Ω]	32 [40 Ω]	(Note 1) 50 [13 Ω]	(Note 1) 5N [9 Ω]	(Note 1) 51 [6.7 Ω]
MR-J3-10_(1)		30								
MR-J3-20_(1)	10	30	100							
MR-J3-40_(1)	10	30	100							
MR-J3-60_	10	30	100							
MR-J3-70_	20	30	100				300			
MR-J3-100_	20	30	100				300			
MR-J3-200_(N)(-RT)	100			300				500		
MR-J3-350_	100			300				500		
MR-J3-500_	130					300				500
MR-J3-700_	170					300				500

Servo amplifier model	Built-in regenerative resistor [W]	(Note 2) Standard accessories [External]	Permissible regenerative power of regenerative option [W] MR-RB						
			(Note 2) 5E [6 Ω]	(Note 2) 5R [3.2 Ω]	(Note 2) 9P [4.5 Ω]	(Note 2) 9F [3 Ω]	(Note 2) 9T [2.5 Ω]	139 [1.3 Ω]	(Note 3) 137 [1.3 Ω]
MR-J3-11K_		GRZG400-1.5Ω × 4 500 (800)	500 (800)						
MR-J3-11K_-LR		GRZG400-0.8Ω × 4 500 (800)		500 (800)					
MR-J3-15K_		GRZG400-0.9Ω × 5 850 (1300)			850 (1300)				
MR-J3-15K_-LR		GRZG400-0.6Ω × 5 850 (1300)				850 (1300)			
MR-J3-22K_						850 (1300)			
MR-J3-DU30K_								1300	3900
MR-J3-DU37K_								1300	3900

Note 1. Always install a cooling fan.
2. The values in the parentheses are applied to when a cooling fan is installed.
3. This values are the resultant resistance of three MR-RB137.

Servo amplifier model	Built-in regenerative resistor [W]	Permissible regenerative power of regenerative option [W] MR-RB		
		14 [26 Ω]	34 [26 Ω]	3B [20 Ω]
MR-J3W-22B	10	100		
MR-J3W-44B		100		
MR-J3W-77B	100		300	
MR-J3W-1010B				300
MR-J3W-0303BN6 (Note)	1.3			

Note. MR-J3W-0303BN6 servo amplifier is not compatible with regenerative option.

1.1.2 Combination and regenerative power for MR-J4 series (replacement model)

POINT
●Changed items are shown with shading. ●Parameter settings may be required depending on the regenerative option model.

List of regenerative options

Servo amplifier model	Built-in regenerative resistor [W]	Permissible regenerative power of regenerative option [W] MR-RB								
		032 [40 Ω]	12 [40 Ω]	30 [13 Ω]	3N [9 Ω]	31 [6.7 Ω]	32 [40 Ω]	(Note 1) 50 [13 Ω]	(Note 1) 5N [9 Ω]	(Note 1) 51 [6.7 Ω]
MR-J4-10_(1)		30								
MR-J4-20_(1)	10	30	100							
MR-J4-40_(1)	10	30	100							
MR-J4-60_	10	30	100							
MR-J4-70_	20	30	100				300			
MR-J4-100_	20	30	100				300			
MR-J4-200_	100			300				500		
MR-J4-350_	100				**300**				**500**	
MR-J4-500_	130					300				500
MR-J4-700_	170					300				500

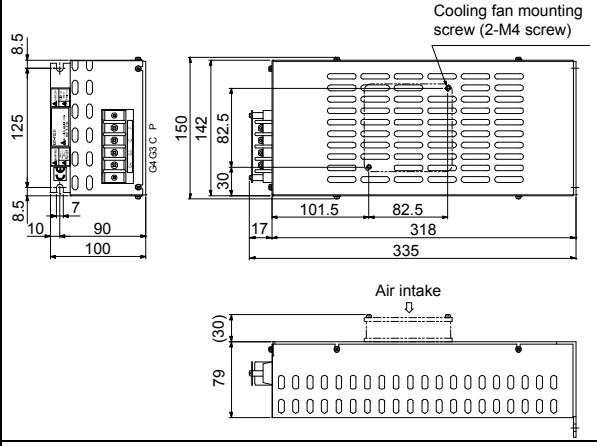
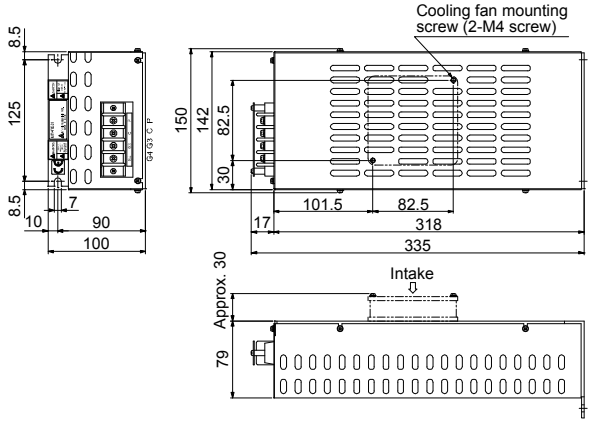
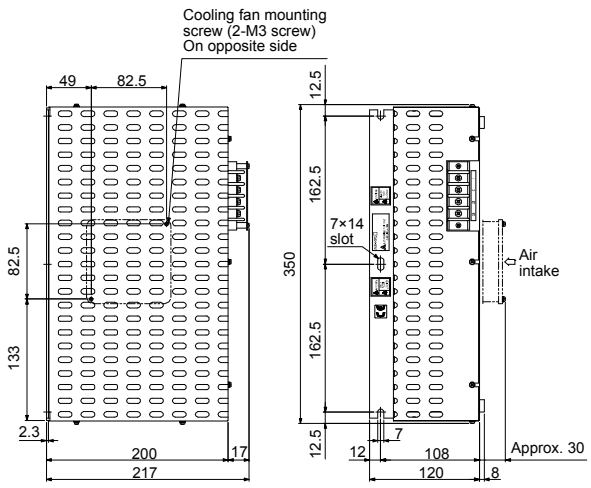
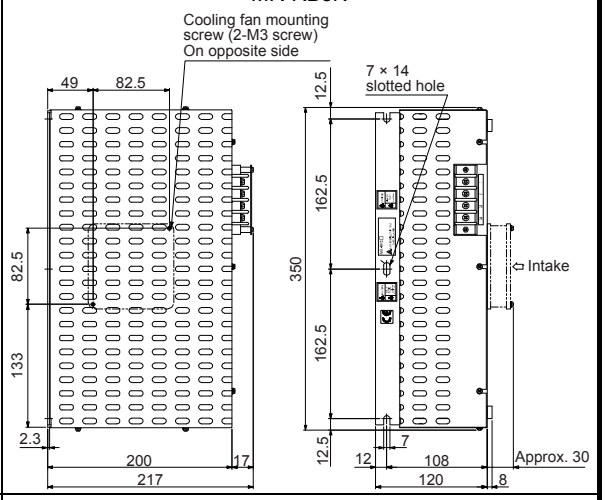
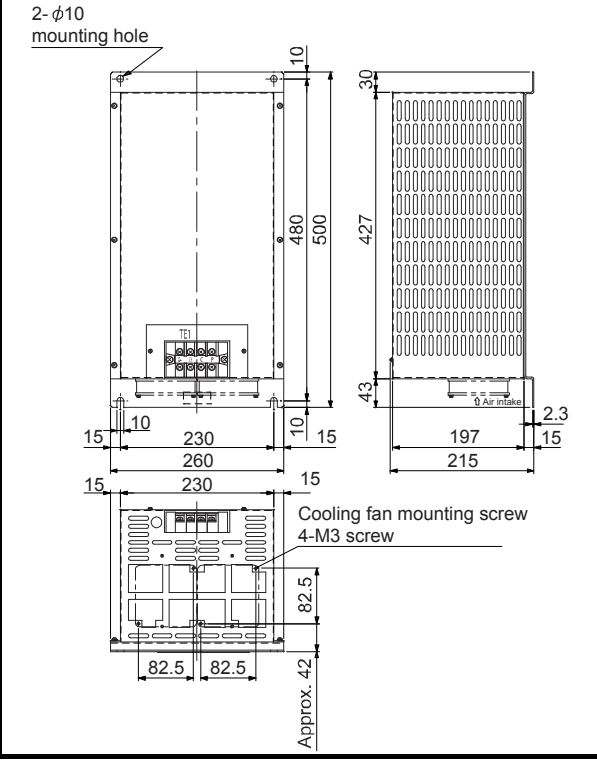
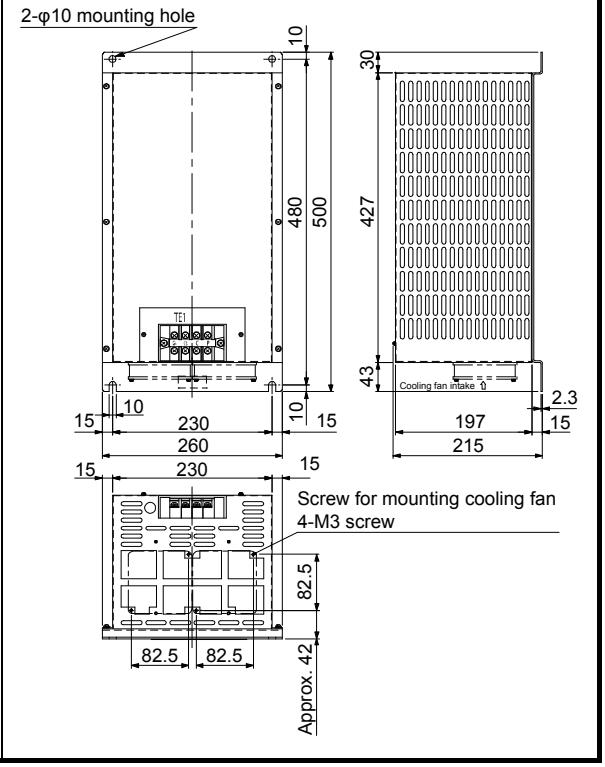
Servo amplifier model	Built-in regenerative resistor [W]	(Note 2) Standard accessories [External]	Permissible regenerative power of regenerative option [W] MR-RB						
			(Note 2) 5E [6 Ω]	(Note 2) 5R [3.2 Ω]	(Note 2) 9P [4.5 Ω]	(Note 2) 9F [3 Ω]	(Note 2) 9T [2.5 Ω]	139 [1.3 Ω]	(Note 3) 137 [1.3 Ω]
MR-J4-11K_		GRZG400-0.8Ω × 4 500 (800)		**500 (800)**					
MR-J4-15K_		GRZG400-0.6Ω × 5 850 (1300)				**850 (1300)**			
MR-J4-22K_		GRZG400-0.5Ω × 5 850 (1300)					**850 (1300)**		
MR-J4-DU30K_								1300	3900
MR-J4-DU37K_								1300	3900

Note 1. Always install a cooling fan.
2. The values in the parentheses are applied to when a cooling fan is installed.
3. This values are the resultant resistance of three MR-RB137.

Servo amplifier model	Built-in regenerative resistor [W]	Permissible regenerative power of regenerative option [W] MR-RB	
		14 [26 Ω]	3N [9 Ω]
MR-J4W2-22B	**20**	100	
MR-J4W2-44B		100	
MR-J4W2-77B	100		**300**
MR-J4W2-1010B			**300**
MR-J4W2-0303B6 (Note)	1.3		

Note. MR-J4W2-0303B6 servo amplifier is not compatible with regenerative option.

1.1.3 External Form Comparison

	MR-J3/MR-J3W series	MR-J4 series
350_	MR-RB30 	MR-RB3N 
350_	MR-RB50 	MR-RB5N 
11K_ 15K_ 22K_	MR-RB5E/MR-RB9P/MR-RB9F 	MR-RB5R/MR-RB9F/MR-RB9T 

1.2 Regenerative Options 400 V class

1.2.1 Combination and regenerative power for the MR-J3 series

List of regenerative options

Servo amplifier model	Built-in regenerative resistor [W]	Permissible regenerative power of regenerative option [W] MR-RB							
		1H-4 [82 Ω]	(Note 1) 3M-4 [120 Ω]	(Note 1) 3G-4 [47 Ω]	(Note 1) 34-4 [26 Ω]	(Note 1) 3U-4 [22 Ω]	(Note 1) 5G-4 [47 Ω]	(Note 1) 54-4 [26 Ω]	(Note 1) 5U-4 [22 Ω]
MR-J3-60_4	15	100	300						
MR-J3-100_4	15	100	300						
MR-J3-200_4	100			300			500		
MR-J3-350_4	100			300			500		
MR-J3-500_4	130				300			500	
MR-J3-700_4	170				300			500	

Servo amplifier model	Built-in regenerative resistor [W]	(Note 2) Standard accessories [External]	Permissible regenerative power of regenerative option [W] MR-RB					
			(Note 2) 5K-4 [10 Ω]	(Note 2) 6B-4 [20 Ω]	(Note 2) 60-4 [12.5 Ω]	(Note 2) 6K-4 [10 Ω]	136-4 [5 Ω]	(Note3) 138-4 [5 Ω]
MR-J3-11K_4		GRZG400-5Ω × 4 500(800)		500 (800)				
MR-J3-11K_4-LR		GRZG400-2.5Ω × 4 500 (800)	500 (800)					
MR-J3-15K_4		GRZG400-2.5Ω × 5 850 (1300)			850 (1300)			
MR-J3-15K_4-LR		GRZG400-2Ω × 5 850 (1300)				850 (1300)		
MR-J3-22K_4						850 (1300)		
MR-J3-DU30K_4							1300	3900
MR-J3-DU37K_4							1300	3900
MR-J3-DU45K_4							1300	3900
MR-J3-DU55K_4							1300	3900

Note 1. Always install a cooling fan.
2. The values in the parentheses are applied to when a cooling fan is installed.
3. The composite resistor value of three options is 5 Ω. The resistor value of one option is 15 Ω.

1.2.2 Combination and regenerative power for MR-J4 series (replacement model)

POINT
●Changed items are shown with shading. ●Parameter settings may be required depending on the regenerative option model.

List of regenerative options

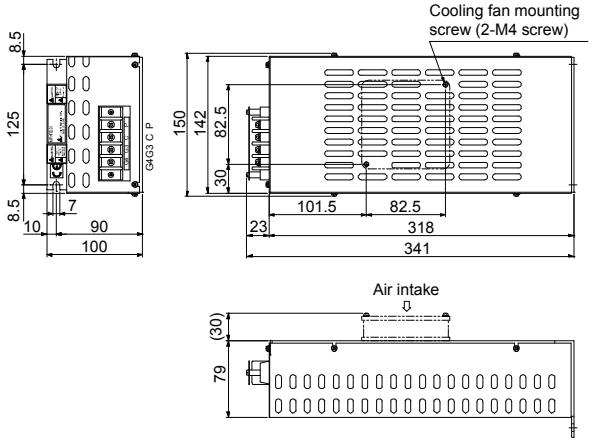
Servo amplifier model	Built-in regenerative resistor [W]	Permissible regenerative power of regenerative option [W] MR-RB							
		1H-4 [82 Ω]	(Note 1) 3M-4 [120 Ω]	(Note 1) 3G-4 [47 Ω]	(Note 1) 34-4 [26 Ω]	(Note 1) 3U-4 [22 Ω]	(Note 1) 5G-4 [47 Ω]	(Note 1) 54-4 [26 Ω]	(Note 1) 5U-4 [22 Ω]
MR-J4-60_4	15	100	300						
MR-J4-100_4	15	100	300						
MR-J4-200_4	100			300			500		
MR-J4-350_4	100			300			500		
MR-J4-500_4	130				300			500	
MR-J4-700_4	170					**300**			**500**

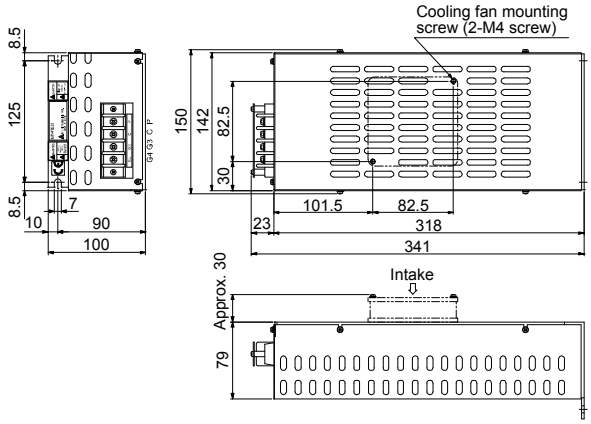
Servo amplifier model	Built-in regenerative resistor [W]	(Note 2) Standard accessories [External]	Permissible regenerative power of regenerative option [W] MR-RB					
			(Note 2) 5K-4 [10 Ω]	(Note 2) 6B-4 [20 Ω]	(Note 2) 60-4 [12.5 Ω]	(Note 2) 6K-4 [10 Ω]	137-4 [4 Ω]	(Note 3) 13V-4 [4 Ω]
MR-J4-11K_4		**GRZG400-2.5Ω × 4 500 (800)**	**500 (800)**					
MR-J4-15K_4		**GRZG400-2.0Ω × 5 850 (1300)**				**850 (1300)**		
MR-J4-22K_4		GRZG400-2.0Ω × 5 850 (1300)				850 (1300)		
MR-J4-DU30K_4							1300	3900
MR-J4-DU37K_4							1300	3900
MR-J4-DU45K_4							1300	3900
MR-J4-DU55K_4							1300	3900

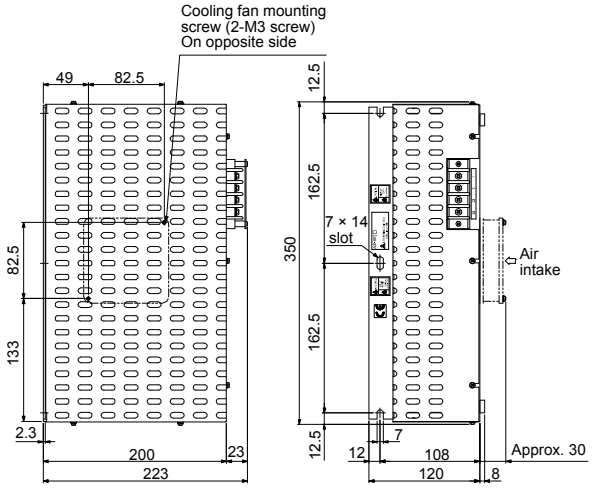
Note 1. Always install a cooling fan.
2. The values in the parentheses are applied to when a cooling fan is installed.
3. The composite resistor value of three options is 4 Ω. The resistor value of one option is 12 Ω.

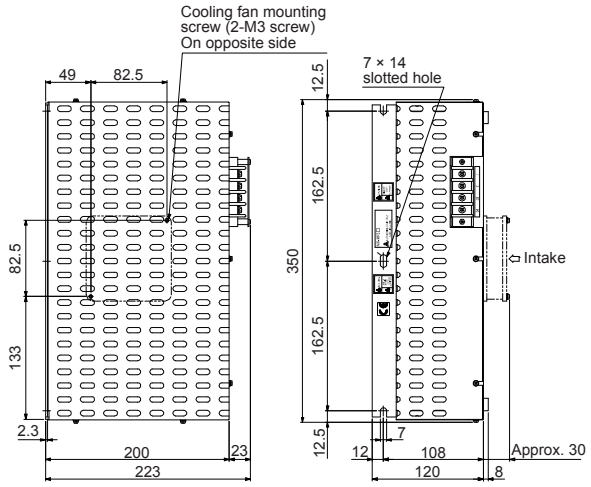
1.2.3 External Form Comparison

	MR-J3 series	MR-J4 series
700_4	MR-RB34-4	MR-RB3U-4
200_4 500_4 700_4	MR-RB5G-4/MR-RB54-4	MR-RB5G-4/MR-RB54-4/MR-RB5U-4

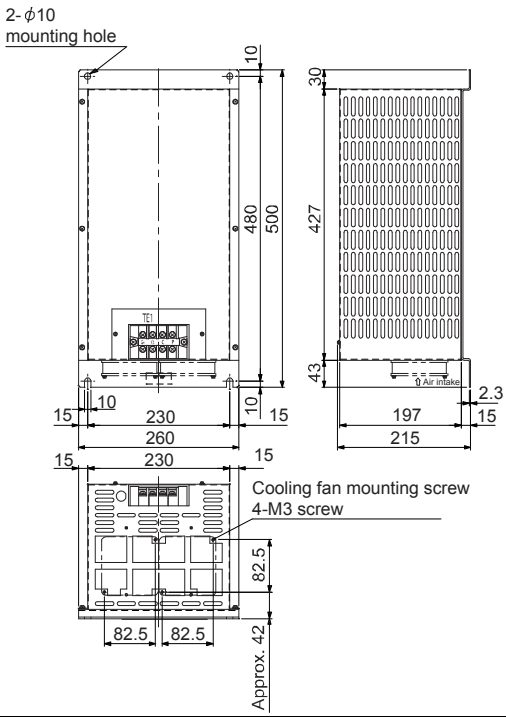
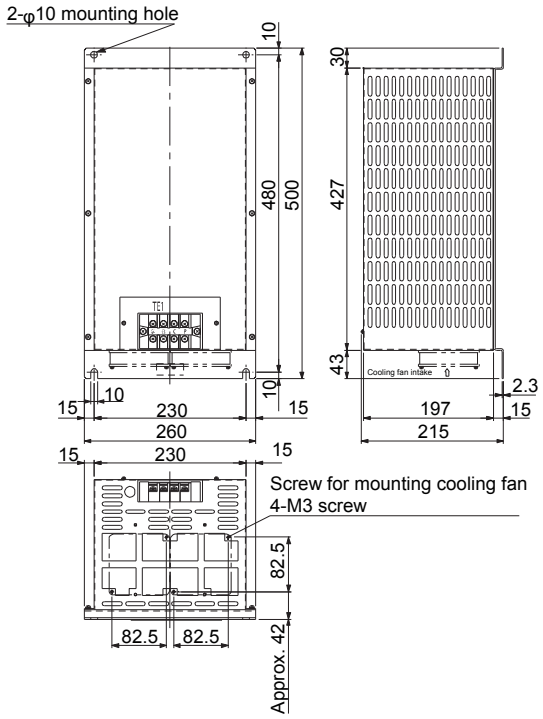
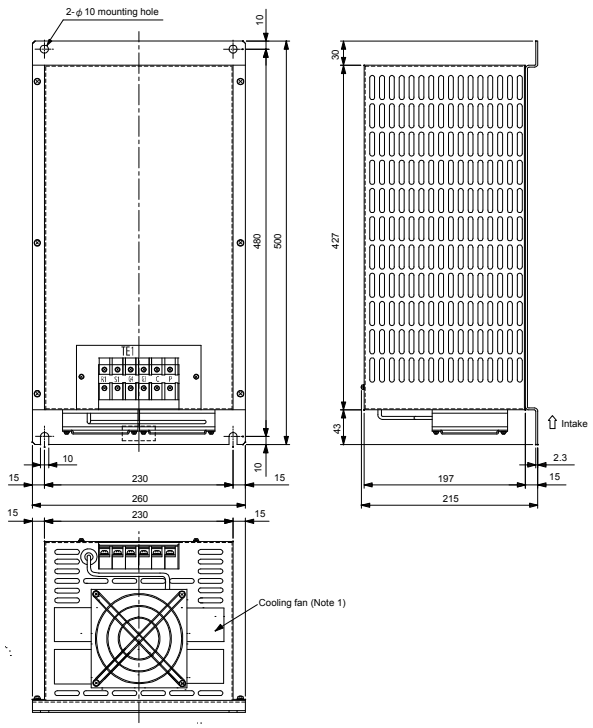
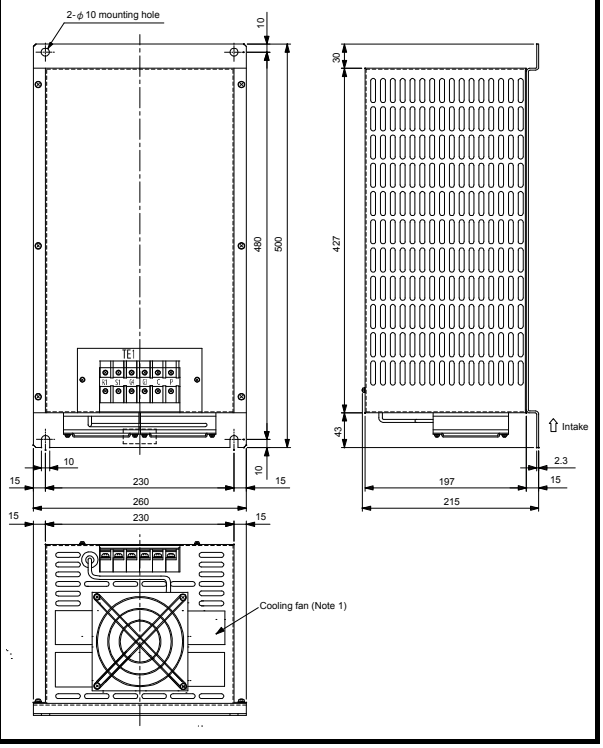








Part 8: Review on Replacement of Optional Peripheral Equipment

	MR-J3 series	MR-J4 series
11K_4 15K_4	MR-RB6B-4/MR-RB60-4/MR-RB6K-4 	MR-RB5K-4/MR-RB6K-4 
30K_4 37K_4 45K_4 55K_4	MR-RB136-4/MR-RB138-4 	MR-RB137-4/MR-RB13V-4 

Note 1. One cooling fan for MR-RB136-4/MR-RB138-4/MR-RB137-4/MR-RB13V-4.

2. COMPARISON TABLE OF DYNAMIC BRAKE OPTION COMBINATIONS

POINT

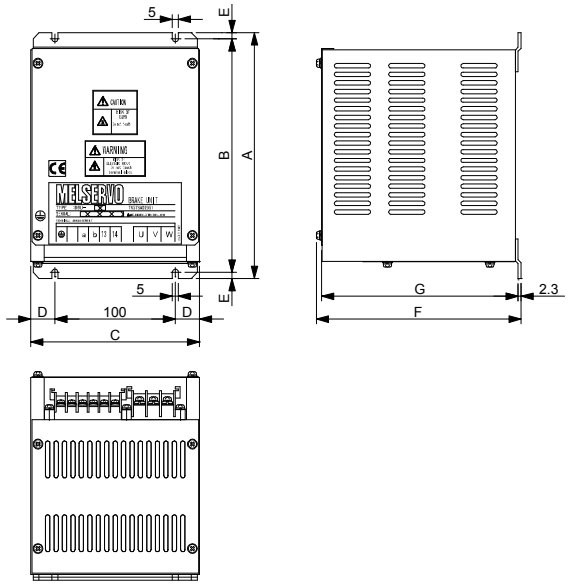
- When an MR-J4-22K servo amplifier and an HG-JR22K1M servo motor are combined, the coasting distance will be longer. Therefore, use a dynamic brake option, DBU-22K-R1.
- Changed items are shown with shading.

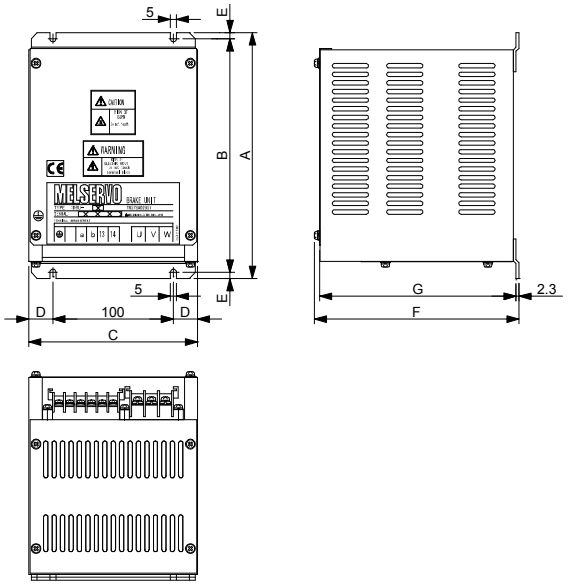
Dynamic brake option combination

Model	Applicable servo amplifier	
DBU-11K	MR-J3-11K_	MR-J4-11K_
DBU-15K	MR-J3-15K_	MR-J4-15K_
DBU-22K	MR-J3-22K_	
DBU-22K-R1		**MR-J4-22K_**
DBU-37K	MR-J3-DU30K_ MR-J3-DU37K	
DBU-37K-R1		**MR-J4-DU30K_** **MR-J4-DU37K_**
DBU-11K-4	MR-J3-11K_4	MR-J4-11K_4
DBU-22K-4	MR-J3-15K_4 MR-J3-22K_4	MR-J4-15K_4 MR-J4-22K_4
DBU-55K-4	MR-J3-DU30K_4 MR-J3-DU37K_4 MR-J3-DU45K_4 MR-J3-DU55K_4	
DBU-55K-4-R5		**MR-J4-DU30K_4** **MR-J4-DU37K_4** **MR-J4-DU45K_4** **MR-J4-DU55K_4**

2.1 External Form Comparison

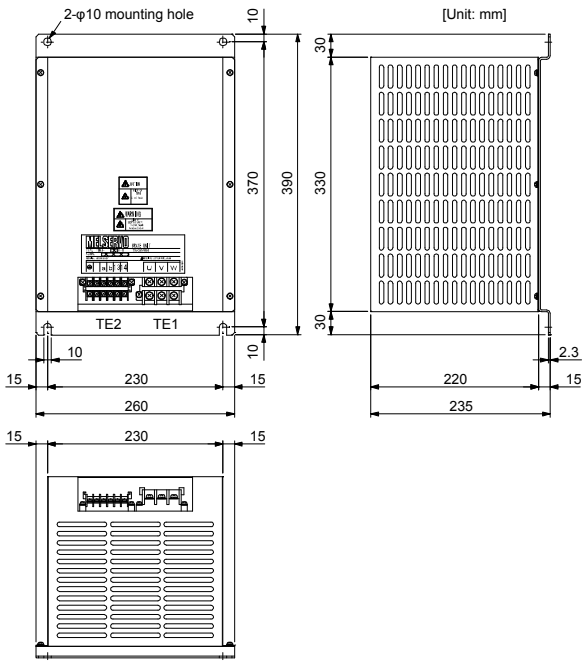
	MR-J3 series	MR-J4 series
22K_	DBU-22K	DBU-22K-R1

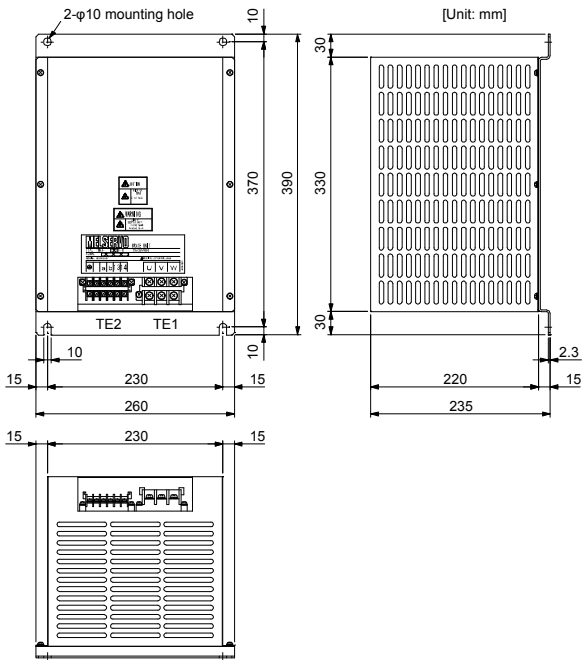




External dynamic brake	A	B	C	D	E	F	G	Mass [kg]
DBU-22K	250	238	150	25	6	235	228	6
DBU-22K-R1	250	238	150	25	6	235	228	6

	MR-J3 series	MR-J4 series
30K_ 37K_ 30K_4 37K_4 45K_4 55K_4	DBU-37K/DBU55K_4	DBU-37K-R1/ DBU-55K-4-R5





External dynamic brake	Mass [kg]
DBU-37K	8
DBU-55K4	11

External dynamic brake	Mass [kg]
DBU-37K-R1	8
DBU-55K-4-R5	11

3. COMPARISON TABLE OF CABLE OPTION COMBINATIONS

3.1 Changes from MR-J3 series to MR-J4 series

Cable option combinations

Application		MR-J3 series	MR-J4 series	Compatibility (Note 6)	Note
Encoder cable		MR-J3ENCBL_M-A_-_		○	Use the same combination. _M: Cable length A_: Leading direction -_: Bending life
		MR-J3JCBL03M-A_-L		○	
		MR-EKCBL_M-_		○	
		MR-J3JSCBL03M-A_-L		○	
		MR-J3ENSCBL_M-_		○	
		MR-ENECBL_M-H	MR-ENECBL_M-H	(Note 1)	Use the same cables for the models other than the ones shown below.
			MR-ENECBL_M-H-MTH		It is required when using 15 kW or more HG-JR 1000 r/min series or 22 kW or more HG-JR 1500 r/min series. _: Cable length
Encoder connector set		MR-ECNM		○	Use the same combination.
		MR-J3SCNS	MR-J3SCNS	(Note 1)	Use the same cables for the models other than the ones shown below.
			MR-ENECNS	(Note 1)	It is required when using 15 kW or more HG-JR 1000 r/min series or 22 kW or more HG-JR 1500 r/min series.
			MR-ENCNS2	○	The screw-type is added.
		MR-J3SCNSA	MR-J3SCNSA	○	Use the same combination.
			MR-ENCNS2A	○	The screw-type is added.
		MR-ENECNS		○	Use the same combination.
SSCNET optical communication cable		MR-J3BUS_M		○	Use the same combination. _M: Cable length -_: Bending life
		MR-J3BUS_M-_		○	
Connector set for SSCNET optical communication		MR-J3BCN1		○	Use the same combination.
Junction terminal block cable	General-Purpose Interface CN1	MR-J2M-CN1TBL_M		○	Use the same combination. _: Cable length
connector set		MR-J3CN1		○	Use the same combination.
Junction terminal block		MR-TB50		○	Use the same combination.
Junction terminal block cable	SSCNET Interface CN3	MR-J2HBUS_M		○	Use the same combination. _: Cable length
connector set		MR-CCN1		○	Use the same combination.
Servo motor power supply cable		MR-PWS1CBL_M-A_-_		○	Use the same combination. _M: Cable length A_: Leading direction -_: Bending life
		MR-PWS2CBL03M-A_-L		○	
Power connector set (Servo motor side power connector)		MR-PWCNS4		○	Use the same combination.
		MR-PWCNS5		○	
		MR-PWCNS3		○	
		MR-PWCNS1		○	
		MR-PWCNS2		○	
Electromagnetic brake cable		MR-BKS1CBL_M-A_-_		○	Use the same combination. _M: Cable length A_: Leading direction -_: Bending life
		MR-BKS2CBL03M-A_-L		○	
Electromagnetic brake connector set		MR-BKCNS1	MR-BKCNS1	○	Use the same combination.
			MR-BKCNS2	○	The screw-type is added.
		MR-BKCNS1A	MR-BKCNS1A	○	Use the same combination.
			MR-BKCNS2A	○	The screw-type is added.
		MR-BKCN		○	Use the same combination.

Application		MR-J3 series	MR-J4 series	Compatibility (Note 6)	Note
Servo amplifier power connector (1 kW or less)	CNP1	54928-0670	06JFAT-SAXGDK-H7.5	(Note 2)	Connector shape is changed because the manufacturer is changed. ( ) is for MR-J3-200_(-RT).
	CNP2	54927-0520	05JFAT-SAXGDK-H5.0	(Note 2)	
	CNP3	54928-0370	03JFAT-SAXGDK-H7.5	(Note 2)	
Servo amplifier power connector (2 kW)	CNP1	721-207/026-000 (PC4/6-STF-7.62-CRWH)	06JFAT-SAXGFK-XL	(Note 2)	
	CNP2	721-205/026-000 (54927-0520)	05JFAT-SAXGDK-H5.0	(Note 2)	
	CNP3	721-203/026-000 (PC4/3-STF-7.62-CRWH)	03JFAT-SAXGFK-XL	(Note 2)	
Servo amplifier power connector (3.5 kW)	CNP1	PC4/6-STF-7.62-CRWH	06JFAT-SAXGFK-XL	(Note 2)	
	CNP2	54927-0520	05JFAT-SAXGDK-H5.0	(Note 2)	
	CNP3	PC4/3-STF-7.62-CRWH	03JFAT-SAXGFK-XL	(Note 2)	
CN5 communication cable		MR-J3USBCBL3M		○	Use the same combination.
Battery for junction battery cable		MR-J3BTCBL03M	MR-BT6VCBL03M	(Note 3)	Use the dedicated battery of each series.
Monitor cable		MR-J3CN6CBL1M		○	Use the same combination.
Protection coordination cable		MR-J3CDL05M		○	Use the same combination.
(30 kW or more) CN40/CN40A connector set		MR-J2CN1-A		○	Use the same combination.
Termination connector		MR-J3-TM		○	Not required
Magnetic contactor wiring connector		(Note 4)		○	Use the same combination. Socket: GFKC 2.5/2-STF-7.62
Digital I/O connector				○	Use the same combination. connector: 17JE23090-02(D8A)K11-CG
STO cable			MR-D05UDL3M-B	(Note 5)	When not using the STO function, attach the short-circuit connector came with the servo amplifier to CN8.

Note 1. When using 15 kW or more HG-JR 1000 r/min series or 22 kW or more HG-JR 1500 r/min series, replace with the MR-ENECBL_M-H-MTH cable or MR-ENECNS connector set.

2. These replacement models do not have compatibility in mounting. The power connector is supplied with a servo amplifier for MR-J4 series. Replace the existing connectors with the ones supplied with the servo amplifier.
3. Use the dedicated battery of each series.
4. Supplied with converter unit.
5. MR-D05UDL3M-B is in production.
6. ○: Compatible, △: Compatible with condition, ×: Not compatible

3.2 Changes from MR-J3W series to MR-J4W2-_B Servo amplifier

Cable option combinations

Application		MR-J3W series	MR-J4W2-B Servo amplifier	Compatibility (Note 3)	Note
Encoder cable		MR-J3ENCBL_M-A_-_		○	Use the same combination. _M: Cable length A_: Leading direction -_: Bending life
		MR-J3JCBL03M-A_-L		○	
		MR-EKCBL_M-_		○	
		MR-J3JSCBL03M-A_-L		○	
		MR-J3ENSCBL_M-_		○	
Encoder connector set		MR-ECNM		○	Use the same combination
		MR-J3SCNS		○	Use the same combination
		MR-J3SCNSA		○	Use the same combination
SSCNET optical communication cable		MR-J3BUS_M		○	Use the same combination _M: Cable length -_: Bending life
		MR-J3BUS_M-_		○	
Connector set for SSCNET optical communication		MR-J3BCN1		○	Use the same combination
Junction terminal block cable	SSCNET III/H Interface CN3	MR-TBNATBL_M		○	Use the same combination _M: Cable length
connector set		MR-J2CMP2		○	
		MR-ECN1		○	
Servo motor power supply cable		MR-PWS1CBL_M-A_-_		○	Use the same combination _M: Cable length A_: Leading direction -_: Bending life
		MR-PWS2CBL03M-A_-L		○	
Power connector set (Servo motor side power connector)		MR-PWCNS1		○	Use the same combination
		MR-PWCNS4		○	
		MR-PWCNS5		○	
Electromagnetic brake cable		MR-BKS1CBL_M-A_-_		○	Use the same combination _M: Cable length A_: Leading direction -_: Bending life
		MR-BKS2CBL03M-A_-L		○	
Electromagnetic brake connector set		MR-BKCNS1		○	Use the same combination
		MR-BKCNS1A		○	Use the same combination
Servo amplifier power connector	CNP1	For MR-J3WCNP123- SP connector set CNP1 : 03JFAT-AXGFK-43 CNP2 : 06JFAT-SAXYGG-F-KK CNP3A/3B : 04JFAT-SAGG-G-KK	03JFAT-SAXGFK-43 (Note 1)	△	Replace the existing connectors with the ones supplied with the servo amplifier.
	CNP2		06JFAT-SAXYGG-F-KK (Note 1)	△	
	CNP3A/CNP3B		04JFAT-SAGG-G-KK (Note 1)	△	
CN5 communication cable		MR-J3USBCBL3M		○	Use the same combination
Encoder cable		MR-J3W03ENCBL_M-A-H		○	＜DC 48 V/24 V model＞ Use the same combination. _M: Cable length
Encoder connector set		MR-J3W03CN2-2P		○	＜DC 48 V/24 V model＞ Use the same combination.
		MR-J3W03CN2-20P		○	
Servo motor power cable		MR-J3W03PWCBL_M-A-H	MR-J4W03PWCBL_M-A-H	(Note2)	＜DC 48 V/24 V model＞ _M: Cable length -_: Bending life
		MR-J3W03PWBRCBL_M-A-H	MR-J4W03PWBRCBL_M-A-H	(Note2)	
Power connector set		MR-J3W03CNP2-2P	MR-J4W03CNP2-2P	(Note2)	＜DC 48 V/24 V model＞
		MR-J3W03CNP2-20P	MR-J4W03CNP2-20P	(Note2)	

Note 1. These replacement models do not have compatibility in mounting. The power connector is supplied with a servo amplifier for MR-J4W2-_B servo amplifier.
2. These replacement models do not have compatibility in mounting. The power connector is supplied with a servo amplifier for MR-J4 series.
3. ○: Compatible, △: Compatible with condition, ×: Not compatible

4. POWER SUPPLY WIRE SIZE

4.1 Selection of Power Supply Wire Size (Example)

4.1.1 MR-J3 series power supply wire size

POINT

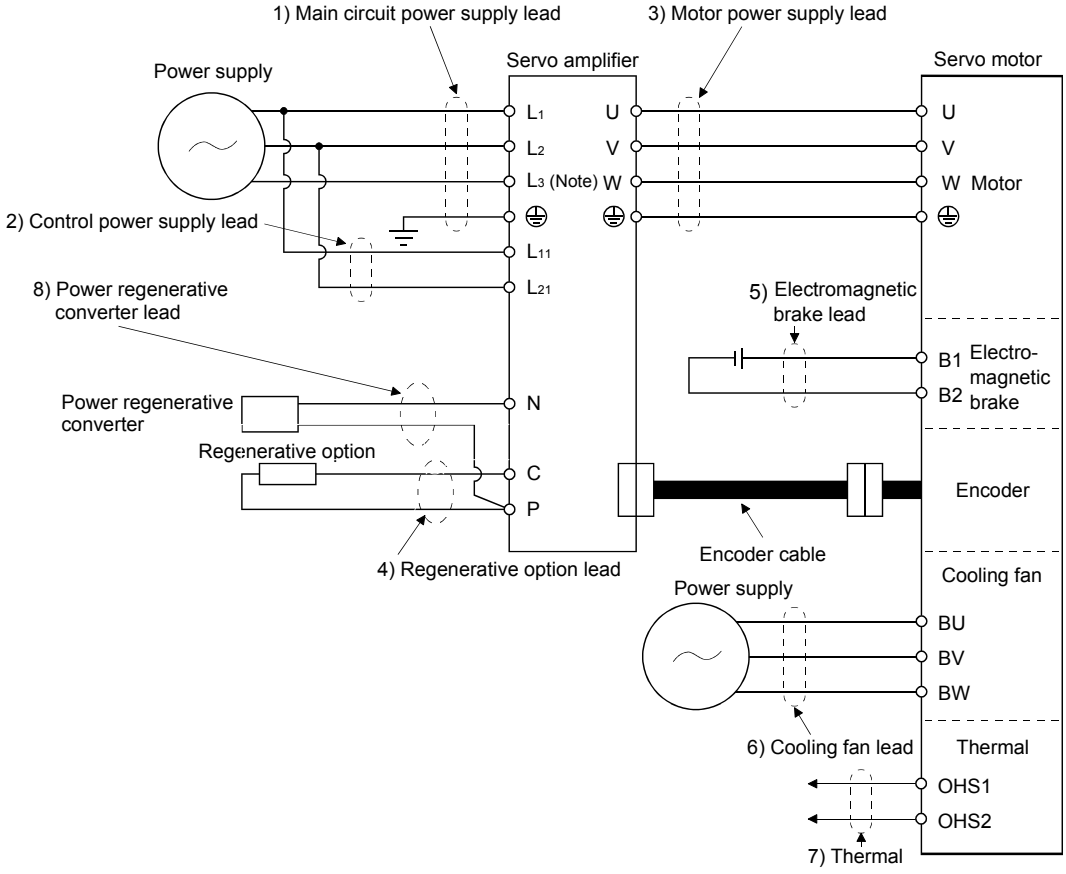
- Wires indicated in this section are separated wires. When using a cable for power line (U/V//W) between the servo amplifier and servo motor, use a 600 V grade EP rubber insulated chloroprene sheath cab-tire cable (2PNCT). For selection of cables, refer to Servo Amplifier Instruction Manual.
- To comply with the UL/C-UL (CSA) Standard, use the wires shown in the servo amplifier for wiring. To comply with other standards, use a wire that is complied with each standard.
- Selection condition of wire size is as follows.
  Construction condition: One wire is constructed in the air
  Wire length: 30m or less

(1) Wires for power supply wiring

POINT
●Use 600 V Grade heat-resistant polyvinyl chloride insulated wires (HIV wires) for HF-JP series servo motor.

The following diagram shows the wires used for wiring. Use the wires given in this section or equivalent.

In this case, the power supply wire used is a 600 V plastic one and the wiring distance is 30 m or less. When the wiring distance exceeds 30 m, select another wire size in consideration of the voltage drop. The alphabet letters (a/b/c) on the table correspond to crimp terminals used when wiring a servo amplifier.
The method of wiring a servo motor differs depending on the type and capacity of the servo motor.
To comply with the UL/cUL (CSA) standard, use UL-approved copper wires rated at 60˚C or higher for wiring.



Note There is no L_3 for 1-phase 100 to 120 V AC power supply.

Wire size selection example 1 (IV wire)
Recommended wire

Servo amplifier	Power supply wire [mm^2] (Note 1, 4)						
	1) L1/L2/L3/⏚	2) L11/L21	3) U/V/W/⏚	4) P/C	5) B1/B2	6) BU/BV/BW	7) OHS1/OHS2
MR-J3-10_(1)	2 (AWG14)	1.25 (AWG16)	1.25 (AWG16)	2 (AWG14)	1.25 (AWG16)		
MR-J3-20_(1)							
MR-J3-40_(1)							
MR-J3-60_							
MR-J3-70_			2 (AWG14)				
MR-J3-100_							
MR-J3-200_							
MR-J3-350_	3.5 (AWG12)		3.5 (AWG12)				
MR-J3-500_ (Note 2)	5.5 (AWG10): a	1.25 (AWG16): h	5.5 (AWG10): a	2 (AWG14): g			
MR-J3-700_ (Note 2)	8 (AWG8): b		8 (AWG8): b	3.5 (AWG12): a		2 (AWG14) (Note 3)	1.25 (AWG16) (Note 3)
MR-J3-11K_ (Note 2)	14 (AWG6): c	1.25(AWG16): g	22 (AWG4): d	5.5 (AWG10): j		2 (AWG14)	1.25 (AWG16)
MR-J3-15K_ (Note 2)	22 (AWG4): d		30 (AWG2): e				
MR-J3-22K_ (Note 2)	50 (AWG1/0): f		60 (AWG2/0): f	5.5 (AWG10): k			
MR-J3-60_4	2 (AWG14)	1.25 (AWG16)	1.25 (AWG16)	2 (AWG14)			
MR-J3-100_4							
MR-J3-200_4			2 (AWG14)				
MR-J3-350_4	2 (AWG14): g	1.25 (AWG16): h	2 (AWG14): g	2 (AWG14): g			
MR-J3-500_4 (Note 2)	5.5 (AWG10): a		5.5 (AWG10): a				
MR-J3-700_4 (Note 2)						2 (AWG14) (Note 3)	1.25 (AWG16) (Note 3)
MR-J3-11K_4 (Note 2)	8 (AWG8): l	1.25 (AWG16): g	8 (AWG8): l	3.5 (AWG12): j		2 (AWG14)	1.25 (AWG16)
MR-J3-15K_4 (Note 2)	14 (AWG6): c		22 (AWG4): d	5.5 (AWG10): j			
MR-J3-22K_4 (Note 2)	14 (AWG6): m		22 (AWG4): n	5.5 (AWG10): k			

Note 1. Alphabets in the table indicate crimping tools. For crimping terminals and applicable tools, refer to Section 4.2.1 of this document.
2. When connecting to the terminal block, be sure to use the screws which are provided with the terminal block.
3. For the servo motor with a cooling fan.
4. Wires are selected based on the highest rated current among combining servo motors.

Wire size selection example (HIV wire)

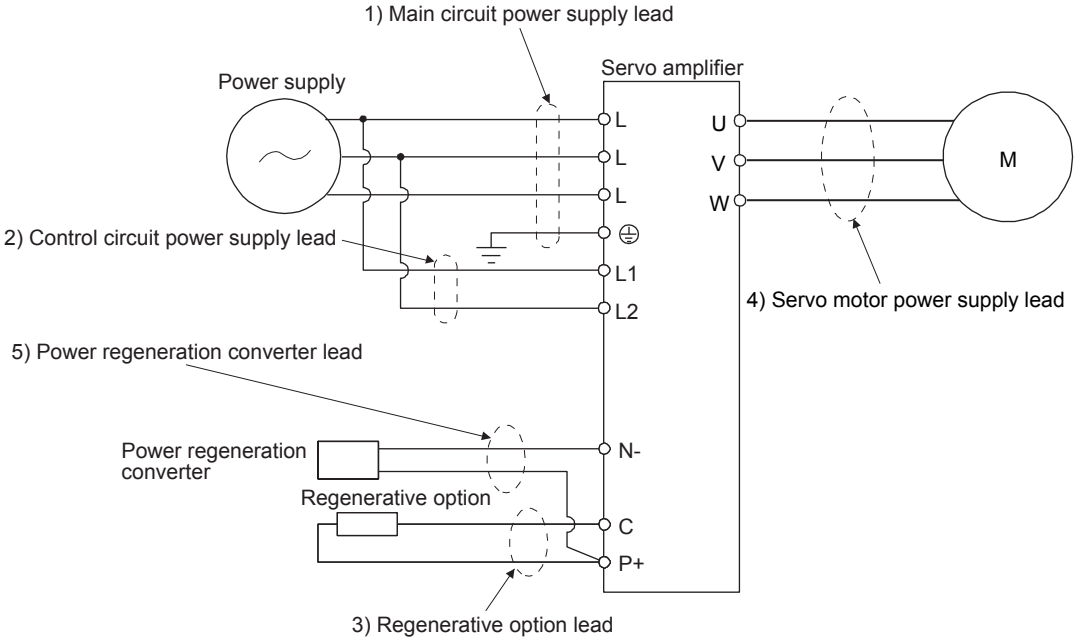
Servo amplifier	Power supply wire [mm^2] (Note 1, 4)						
	1) L1/L2/L3/⏚	2) L11/L21	3) U/V/W/⏚	4) P/C	5) B1/B2	6) BU/BV/BW	7) OHS1/OHS2
MR-J3-10_(1)	2 (AWG14)	1.25 (AWG16)	1.25 (AWG16)	2 (AWG14)	1.25 (AWG16)		
MR-J3-20_(1)							
MR-J3-40_(1)							
MR-J3-60_							
MR-J3-70_							
MR-J3-100_			1.25 (AWG16)				
MR-J3-200_			2 (AWG14)				
MR-J3-350_	3.5 (AWG12)		3.5 (AWG12)				
MR-J3-500_ (Note 2)	5.5 (AWG10): a	1.25 (AWG16): h	5.5 (AWG10): a	2 (AWG14): g			
MR-J3-700_ (Note 2)	8 (AWG8): b		8 (AWG8): b	2 (AWG14): g		1.25 (AWG16) (Note 3)	1.25 (AWG16) (Note 3)
MR-J3-11K_ (Note 2)	14 (AWG6): c	1.25 (AWG16): g	14 (AWG6): c	3.5 (AWG12): j		1.25 (AWG16)	1.25 (AWG16)
MR-J3-15K_ (Note 2)	22 (AWG4): d		22 (AWG4): d				
MR-J3-22K_ (Note 2)	38 (AWG1): p		38 (AWG1): p	5.5 (AWG10): k			
MR-J3-60_4	2 (AWG14)	1.25 (AWG16)	1.25 (AWG16)	2 (AWG14)			
MR-J3-100_4							
MR-J3-200_4			2 (AWG14)				
MR-J3-350_4	2 (AWG14): g	1.25 (AWG16): h	2 (AWG14): g	2 (AWG14): g			
MR-J3-500_4 (Note 2)	3.5 (AWG12): a		3.5 (AWG12): a				
MR-J3-700_4 (Note 2)			5.5 (AWG10): a			1.25 (AWG16) (Note 3)	1.25 (AWG16) (Note 3)
MR-J3-11K_4 (Note 2)	5.5 (AWG10): j	1.25 (AWG16): g	8 (AWG8): l	2 (AWG14): q		1.25 (AWG16)	1.25 (AWG16)
MR-J3-15K_4 (Note 2)	8 (AWG8): l		14 (AWG6): c	3.5 (AWG12): j			
MR-J3-22K_4 (Note 2)	14 (AWG6): m		14 (AWG6): m	3.5 (AWG12): k			

Note 1. Alphabets in the table indicate crimping tools. For crimping terminals and applicable tools, refer to Section 4.2.1 of this document.
2. To connect these models to a terminal block, make sure to use the screws that come with the terminal block.
3. For the servo motor with a cooling fan.
4. Wires are selected based on the highest rated current among combining servo motors.

4.1.2 MR-J4 series power supply wire size

POINT
●To comply with the IEC/EN/UL/CSA standard, use the wires shown in the instruction manuals of the servo amplifier in use for wiring. To comply with other standards, use a wire that is complied with each standard. ●Selection conditions of wire size are as follows. Construction condition: Single wire set in midair Wire length: 30 m or less

The following diagram shows the wires used for wiring. Use the wires given in this section or equivalent.



(1) Example of selecting the wire sizes

POINT
●Use the HIV wire for the replacement with MR-J4.

For the power supply wire, use a 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wire). The table below shows selection examples of power supply wire sizes.

Wire size selection example (HIV wire)
Recommended wire

<table>
<tr><th rowspan="2">Servo amplifier</th><th colspan="4">Power supply wire [mm²] (Note 1)</th></tr>
<tr><th>1) L1/L2/L3/⏚</th><th>2) L11/L21</th><th>3) P+/C</th><th>4) U/V/W/⏚ (Note 3)</th></tr>
<tr><td>MR-J4-10_(1) (-RJ)</td><td rowspan="8">2 (AWG 14)</td><td rowspan="9">1.25 to 2
(AWG 16 to 14) (Note 4)</td><td rowspan="9">2 (AWG 14)</td><td rowspan="7">AWG 18 to 14 (Note 4)</td></tr>
<tr><td>MR-J4-20_(1) (-RJ)</td></tr>
<tr><td>MR-J4-40_(1) (-RJ)</td></tr>
<tr><td>MR-J4-60_(-RJ)</td></tr>
<tr><td>MR-J4-70_(-RJ)</td></tr>
<tr><td>MR-J4-100_(-RJ)</td></tr>
<tr><td>MR-J4-200_(-RJ)</td><td rowspan="2">AWG 16 to 10</td></tr>
<tr><td>MR-J4-350_(-RJ)</td><td>3.5 (AWG 12)</td></tr>
<tr><td>MR-J4-500_(-RJ)
(Note 2)</td><td>5.5 (AWG 10): a</td><td rowspan="2">1.25 (AWG 16): a
2 (AWG 14): d (Note 4)</td><td rowspan="2">2 (AWG 14): c</td><td>2 (AWG 14): c
3.5 (AWG 12): a
5.5 (AWG 10): a</td></tr>
<tr><td>MR-J4-700_(-RJ)
(Note 2)</td><td>8 (AWG 8): b</td><td>2 (AWG 14): c
3.5 (AWG 12): a
5.5 (AWG 10): a
8 (AWG 8): b</td></tr>
<tr><td>MR-J4-11K_(-RJ)
(Note 2)</td><td>14 (AWG 6): f</td><td rowspan="3">1.25 (AWG 16): c
2 (AWG 14): c</td><td>3.5 (AWG 12): g</td><td>14 (AWG 6): f
5.5 (AWG 10): g
8 (AWG 8): k</td></tr>
<tr><td>MR-J4-15K_(-RJ)
(Note 2)</td><td>22 (AWG 4): h</td><td>5.5 (AWG 10): g</td><td>22 (AWG 4): h
8 (AWG 8): k</td></tr>
<tr><td>MR-J4-22K_(-RJ)
(Note 2)</td><td>38 (AWG 2): i</td><td>5.5 (AWG 10): j</td><td>38 (AWG 2): i</td></tr>
<tr><td>MR-J4-60_4(-RJ)/
MR-J4-100_4(-RJ)</td><td rowspan="3">2 (AWG 14)</td><td rowspan="3">1.25 to 2
(AWG 16 to 14) (Note 4)</td><td rowspan="3">2 (AWG 14)</td><td rowspan="3">AWG 16 to 14</td></tr>
<tr><td>MR-J4-200_4(-RJ)</td></tr>
<tr><td>MR-J4-350_4(-RJ)</td></tr>
<tr><td>MR-J4-500_4(-RJ)
(Note 2)</td><td>2 (AWG 14): b</td><td rowspan="2">1.25 (AWG 16): a
2 (AWG 14): c (Note 4)</td><td rowspan="2">2 (AWG 14): b</td><td>3.5 (AWG 12): a</td></tr>
<tr><td>MR-J4-700_4(-RJ)
(Note 2)</td><td>3.5 (AWG 12): a</td><td>5.5 (AWG 10): a</td></tr>
<tr><td>MR-J4-11K_4(-RJ)
(Note 2)</td><td>5.5 (AWG 10): d</td><td rowspan="3">1.25 (AWG 16): b
2 (AWG 14): b (Note 4)</td><td>2 (AWG 14): f</td><td rowspan="2">8 (AWG 8): g</td></tr>
<tr><td>MR-J4-15K_4(-RJ)
(Note 2)</td><td>8 (AWG 8): g</td><td>3.5 (AWG 12): d</td></tr>
<tr><td>MR-J4-22K_4(-RJ)
(Note 2)</td><td>14 (AWG 6): i</td><td>3.5 (AWG 12): e</td><td>5.5 (AWG 10): e
8 (AWG 8):h
14 (AWG 6): i</td></tr>
</table>

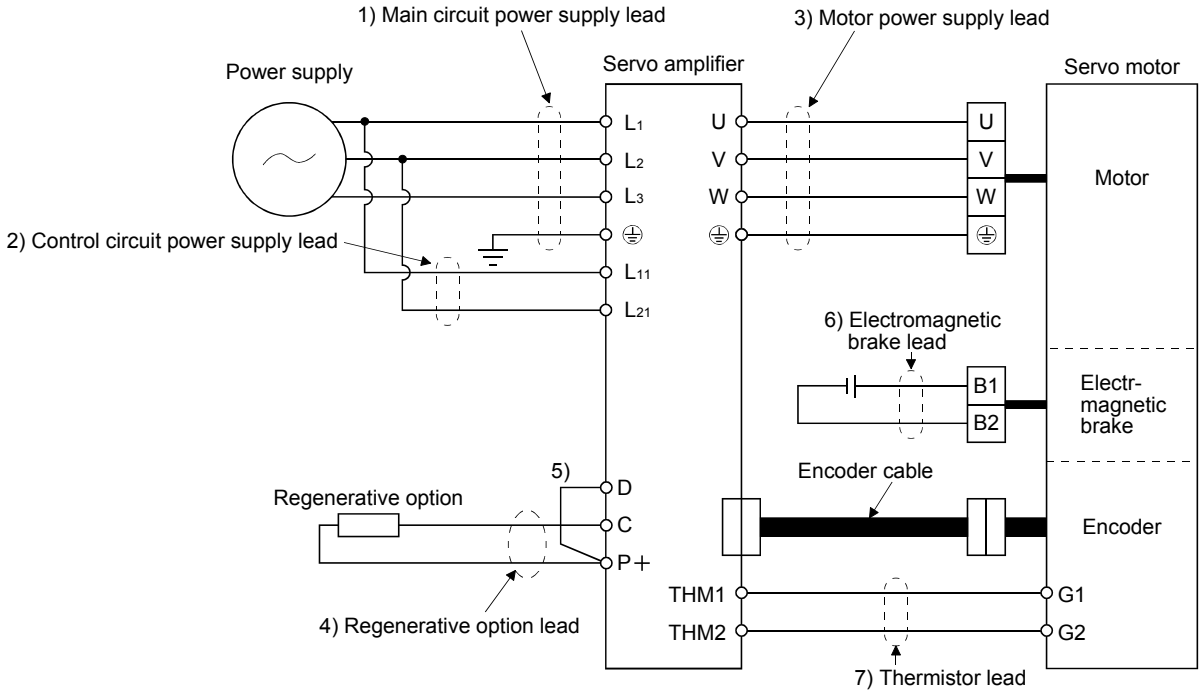
Note 1. Alphabets in the table indicate crimping tools. For crimp terminals and applicable tools, refer to 4.2.2 (1), (2) of this document.
2. To connect these models to a terminal block, make sure to use the screws that come with the terminal block.
3. This wire size is applicable to the servo amplifier connector and terminal block. For wires connecting to the servo motor, refer to each servo amplifier instruction manual.
4. To comply with the IEC/EN/UL/CSA standard, use a wire of 2 mm².

4.1.3 MR-J3W series power supply wire size

POINT
●Wires indicated in this section are separated wires. ●To comply with the UL/CSA Standard, use the wires shown in appendix 4 for wiring. To comply with other standards, use a wire that is complied with each standard. ●Selection condition of wire size is as follows. Construction condition: One wire is constructed in the air Wire length: 30m or less

(1) 200 V class wires for power supply wiring

The following diagram shows the wires used for wiring. Use the wires given in this section or equivalent.



The following table shows selection examples of cable sizes. These sizes are common for the 600V Polyvinyl chloride insulated wire (IV wire) and for the 600V Grade heat-resistant polyvinyl chloride insulated wire (HIV wire).

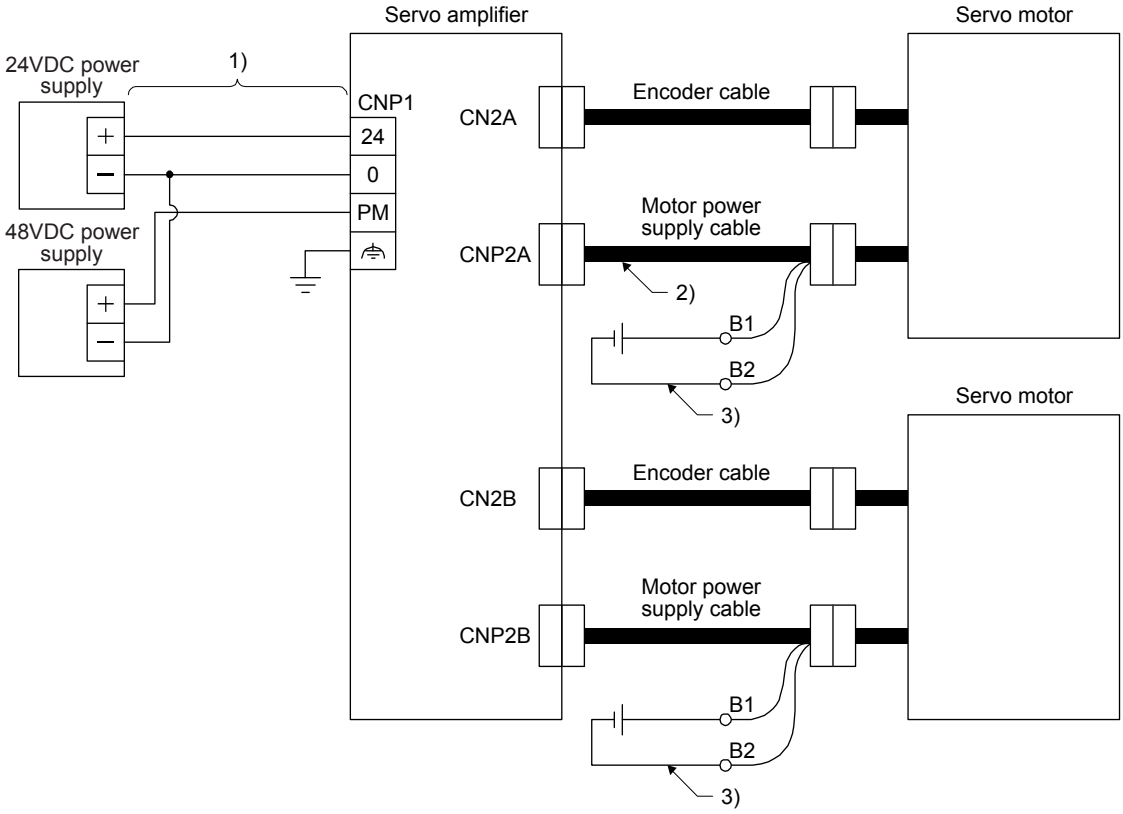
Wire size selection example 1 (IV/HIV wire)

Servo amplifier	Wires [mm^2] (Note 1)						
	1) $L_1/L_2/L_3/⏚$ (Note 3)	2) L_{11}/L_{21}	3) U/V/W/ ⏚ (Note 2, 3)	4) P+/C	5) P/+/D	6) B_1/B_2 (Note 2)	7) THM1/THM2
MR-J3W-22B	2 (AWG14)					1.25 (AWG16)	0.2 (AWG24)
MR-J3W-44B							
MR-J3W-77B							
MR-J3W-1010B							

Note 1. Wires are selected based on the highest rated current among combining servo motors.
2. This wire size indicates the size of cable extension which is used when the wiring length exceeds 10m.
3. Use the crimping terminal specified as below for the PE terminal of the servo amplifier.
Crimping terminal : FVD2-4
Tool (body) : YNT-1614
Manufacturer : JST (J.S.T. Mfg. Co.,Ltd.)
Tightening torque : 1.2 [N•m]

(2) DC 48 V/24 V class wires for power supply wiring

The following diagram shows the wires used for wiring. Use the wires or equivalent given in this section. These sizes are common for the 600V Polyvinyl chloride insulated wire (IV wire) and for the 600V Grade heat-resistant polyvinyl chloride insulated wire (HIV wire).



Wire size selection example (IV/HIV wire)

Servo amplifier	Wire (Note 1)		
	1) 24/0/PM/	2) U/V/W/	3) B1/B2
MR-J3W-0303BN6	AWG16 (Note 2, 3)	AWG19	1.25mm^2 (AWG16)

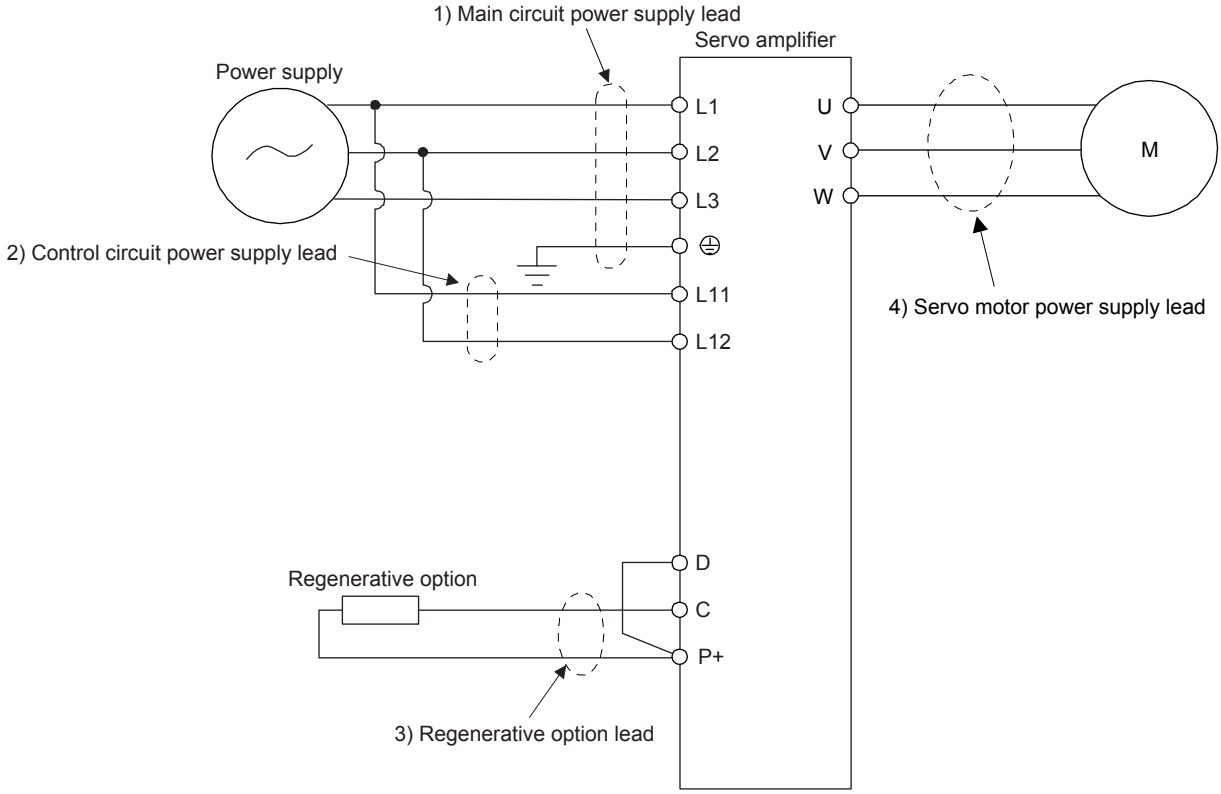
Note 1. This is a selection example when HG-AK0336(B) are used for two axes.
2. Insulator OD: 2.9 mm
3. Voltage drop will occur according to line impedance and current supplied to the servo amplifier. Be sure to use this wire.

4.1.4 MR-J4W2-_B servo amplifier, power supply wire size

POINT
●To comply with the IEC/EN/UL/CSA standard, use the wires shown in instruction manual for wiring. To comply with other standards, use a wire that is complied with each standard. ●Selection conditions of wire size are as follows. Construction condition: One wire is constructed in the air Wire length: 30 m or less

(1) 200 V class wires for power supply wiring

The following diagram shows the wires used for wiring. Use the wires given in this section or equivalent.



The following table shows the wire size selection example.

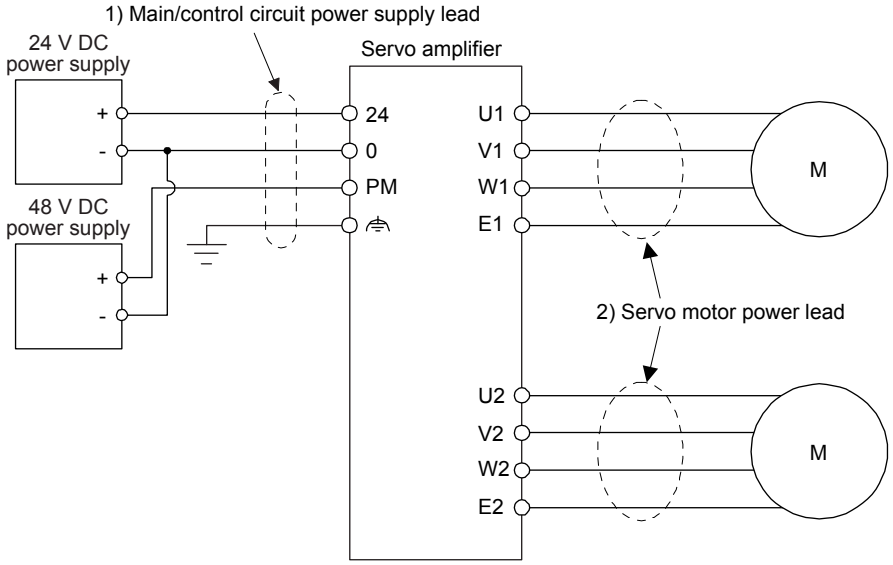
Wire size selection example (HIV wire)

Servo amplifier	Wires [mm²]			
	1) L1/L2/L3/⏚ (Note 1)	2) L11/L21	3) P+/C/D	4) U/V/W/⏚ (Note 2)
MR-J4W2-22B	2 (AWG 14)			AWG 18 to 14
MR-J4W2-44B				
MR-J4W2-77B				
MR-J4W2-1010B				

Note 1. Use the crimp terminal specified as below for the PE terminal of the servo amplifier.
Crimp terminal: FVD2-4
Tool: YNT-1614
Manufacturer: JST (J.S.T. Mfg. Co.,Ltd.)
Tightening torque: 1.2 [N•m]
2. The wire size shows applicable size of the servo amplifier connector. For wires connecting to the servo motor, refer to "Servo Motor Instruction Manual (Vol. 3)".

(2) DC 48 V/24 V class wires for power supply wiring

The following diagram shows the wires used for wiring. Use the wires or equivalent given in this section.



The following shows the wire size selection example.

Wire size selection example (HIV wire)

Servo amplifier	Wire [mm^2]	
	1) 24/0/PM/⏚	2) U1/V1/W1/E1/U2/V2/W2/E2 (Note)
MR-J4W2-0303B6	AWG 16	AWG 19

Note. The wire size shows applicable size of the servo amplifier connector. For wires connecting to the servo motor, refer to "Servo Motor Instruction Manual (Vol. 3)".

4.2 Selection Example of Crimp Terminals

4.2.1 MR-J3 series crimp terminal

Recommended crimp terminals

<table>
<tr><th rowspan="3">Symbol</th><th colspan="5">Servo amplifier-side crimp terminals</th></tr>
<tr><th rowspan="2">Crimp terminal (Note 2)</th><th colspan="3">Applicable tool</th><th rowspan="2">Manufacturer</th></tr>
<tr><th>Body</th><th>Head</th><th>Dice</th></tr>
<tr><td>a</td><td>FVD5.5-4</td><td>YNT-1210S</td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="17">JST
(J.S.T. Mfg. Co., Ltd.)</td></tr>
<tr><td>b
(Note 1)</td><td>8-4NS</td><td>YHT-8S</td></tr>
<tr><td>c</td><td>FVD14-6</td><td rowspan="2">YF-1
E-4</td><td rowspan="2">YNE-38</td><td>DH-122
DH-112</td></tr>
<tr><td>d</td><td>FVD22-6</td><td>DH-123
DH-113</td></tr>
<tr><td rowspan="2">e
(Note 1)</td><td rowspan="2">38-6</td><td>YPT-60-21</td><td></td><td rowspan="2">TD-124
TD-112</td></tr>
<tr><td>YF-1
E-4</td><td>YET-60-1</td></tr>
<tr><td rowspan="2">f
(Note 1)</td><td rowspan="2">R60-8</td><td>YPT-60-21</td><td></td><td rowspan="2">TD-125
TD-113</td></tr>
<tr><td>YF-1
E-4</td><td>YET-60-1</td></tr>
<tr><td>g</td><td>FVD2-4</td><td rowspan="2">YNT-1614</td><td rowspan="4"></td><td rowspan="4"></td></tr>
<tr><td>h</td><td>FVD2-M3</td></tr>
<tr><td>j</td><td>FVD5.5-6</td><td rowspan="2">YNT-1210S</td></tr>
<tr><td>k</td><td>FVD5.5-8</td></tr>
<tr><td>l</td><td>FVD8-6</td><td rowspan="3">YF-1
E-4</td><td rowspan="3">YNE-38</td><td>DH-121
DH-111</td></tr>
<tr><td>m</td><td>FVD14-8</td><td>DH-122
DH-112</td></tr>
<tr><td>n</td><td>FVD22-8</td><td>DH-123
DH-113</td></tr>
<tr><td rowspan="2">p
(Note 1)</td><td rowspan="2">R38-8</td><td>YPT-60-21</td><td></td><td rowspan="2">TD-124
TD-112</td></tr>
<tr><td>YF-1
E-4</td><td>YET-60-1</td></tr>
<tr><td>q</td><td>FVD2-6</td><td>YNT-1614</td><td></td><td></td></tr>
</table>

Note 1. Coat the crimping part with an insulation tube.
2. Some crimp terminals may not be mounted depending on the size. Make sure to use the recommended ones or equivalent ones.

4.2.2 MR-J4 series crimp terminal

(1) Selection example of crimp terminals 200 V class/100 V class

The table below shows selection examples of a crimp terminal for a servo amplifier terminal block.

Recommended crimp terminals

Symbol	Servo amplifier-side crimp terminals				
	Crimp terminal (Note 2)	Applicable tool			Manufacturer
		Body	Head	Dice	
a	FVD5.5-4	YNT-1210S			JST (J.S.T. Mfg. Co., Ltd.)
b (Note 1)	8-4NS	YHT-8S			
c	FVD2-4	YNT-1614			
d	FVD2-M3				
e	FVD1.25-M3	YNT-2216			
f	FVD14-6	YF-1	YNE-38	DH-122 DH-112	
g	FVD5.5-6	YNT-1210S			
h	FVD22-6	YF-1	YNE-38	DH-123 DH-113	
i	FVD38-8	YF-1	YNE-38	DH-124 DH-114	
j	FVD5.5-8	YNT-1210S			
k	FVD8-6	YF-1 E-4	YNE-38	DH-121 DH-111	

Note 1. Cover the crimped portion with an insulating tape.
2. Installation of a crimp terminal may be impossible depending on the size, so make sure to use the recommended crimp terminal or one equivalent to it.

(2) Selection example of crimp terminals 400 V class

The table below shows selection examples of a crimp terminal for a servo amplifier terminal block.

Recommended crimp terminals

Symbol	Servo amplifier-side crimp terminals				Manufacturer
	Crimp terminal (Note)	Applicable tool			
		Body	Head	Dice	
a	FVD5.5-4	YNT-1210S			JST (J.S.T. Mfg. Co., Ltd.)
b	FVD2-4	YNT-1614			
c	FVD2-M3				
d	FVD5.5-6	YNT-1210S			
e	FVD5.5-8	YNT-1210S			
f	FVD2-6	YNT-1614			
g	FVD8-6	YF-1	YNE-38	DH-121 DH-111	
h	FVD8-8				
i	FVD14-8			DH-122 DH-112	

Note. Installation of a crimp terminal may be impossible depending on the size, so make sure to use the recommended crimp terminal or one equivalent to it.

4.3 Selection of Molded-Case Circuit Breaker, Fuse, and Magnetic Contactor (Example)

4.3.1 MR-J3 series, molded-case circuit breakers, fuses, and magnetic contactors

> ⚠CAUTION
> ●Select a molded-case circuit breaker with a short shut-off time to prevent smoking and fire from the servo amplifier.
> ●Always use one molded-case circuit breaker and one magnetic contactor with one servo amplifier.

When using a fuse instead of the molded-case circuit breaker, use the one having the specifications given in this section.

Molded-case circuit breakers, fuses, and magnetic contactors

Servo amplifier	Molded-case circuit breaker (Note 3)			Fuse			Magnetic contactor (Note 2)
	Current		Voltage AC	Class (Note 1)	Current	Voltage AC	
	Not using power factor improving reactor	Using power factor improving reactor					
MR-J3-10_(1)	30 A frame 5 A	30 A frame 5 A	240 V	T	10 A	300 V	S-N10
MR-J3-20_	30 A frame 5 A	30 A frame 5 A			10 A		
MR-J3-20_1	30 A frame 10 A	30 A frame 10 A			15 A		
MR-J3-40_	30 A frame 10 A	30 A frame 5 A			15 A		
MR-J3-60_/70_/100_/40_1	30 A frame 15 A	30 A frame 10 A			20 A		
MR-J3-200_	30 A frame 20 A	30 A frame 15 A			40 A		S-N18
MR-J3-350_	30 A frame 30 A	30 A frame 30 A			70 A		S-N20
MR-J3-500_	50 A frame 50 A	50 A frame 40 A			125 A		S-N35
MR-J3-700_	100 A frame 75 A	50 A frame 50 A			150 A		S-N50
MR-J3-11K_	100 A frame 100 A	100 A frame 75 A			200 A		S-N65
MR-J3-15K_	225 A frame 125 A	100 A frame 100 A			250 A		S-N95
MR-J3-22K_	225 A frame 175 A	225 A frame 150 A			350 A		S-N125
MR-J3-60_4	30 A frame 5 A	30 A frame 5 A	600 Y/347 V		10 A	600 V	S-N10
MR-J3-100_4	30 A frame 10 A	30 A frame 10 A			15 A		
MR-J3-200_4	30 A frame 15 A	30 A frame 15 A			25 A		
MR-J3-350_4	30 A frame 20 A	30 A frame 20 A			35 A		S-N18
MR-J3-500_4	30 A frame 30 A	30 A frame 30 A			50 A		
MR-J3-700_4	50 A frame 40 A	50 A frame 30 A			65 A		S-N20
MR-J3-11K_4	60 A frame 60 A	50 A frame 50 A			100 A		S-N25
MR-J3-15K_4	100 A frame 75 A	60 A frame 60 A			150 A		S-N35
MR-J3-22K_4	225 A frame 125 A	100 A frame 100 A			175 A		S-N65

Note 1. When not using the servo amplifier as a UL/CSA Standard compliant product, K5 class fuse can be used.
2. Be sure to use a magnetic contactor with an operation delay time of 80ms or less.
3. Use a molded-case circuit breaker which has the same or more operation characteristics than our lineup.

4.3.2 MR-J4 series, molded-case circuit breakers, fuses, and magnetic contactors (recommended)

(1) For main circuit power supply

> ⚠CAUTION
> - Select a molded-case circuit breaker with a short shut-off time to prevent smoking and fire from the servo amplifier.
> - Always use one molded-case circuit breaker and one magnetic contactor with one servo amplifier.
> - Since recommended products vary between MR-J3 and MR-J4, use the recommended products of MR-J4-_.

When using a fuse instead of the molded-case circuit breaker, use the one having the specifications given in this section.

Molded-case circuit breakers, fuses, and magnetic contactors

Servo amplifier	Molded-case circuit breaker (Note 1)			Fuse			Magnetic contactor (Note 2)
	Frame, rated current		Voltage AC [V]	Class	Current [A]	Voltage AC [V]	
	Power factor improving reactor is not used	Power factor improving reactor is used					
MR-J4-10_(1)	30 A frame 5 A	30 A frame 5 A	240	T	10	300	S-N10 S-T10
MR-J4-20_							
MR-J4-20_1	30 A frame 10 A	30 A frame 10 A			15		
MR-J4-40_	30 A frame 10 A	30 A frame 5 A			15		
MR-J4-60_/70_/40_1	30 A frame 15 A	30 A frame 10 A			20		
MR-J4-70_							
MR-J4-100_ (3-phase power supply input)							
MR-J4-100_ (1-phase power supply input)	30 A frame 15 A	30 A frame 15 A			30		
MR-J4-200_	30 A frame 20 A	30 A frame 20 A			40		S-N20 (Note 3) S-T21
MR-J4-350_	30 A frame 30 A	30 A frame 30 A			70		S-N20 S-T21
MR-J4-500_	50 A frame 50 A	50 A frame 50 A			125		S-N35
MR-J4-700_	100 A frame 75 A	60 A frame 60 A			150		S-N50
MR-J4-11K_	100 A frame 100 A	100 A frame 100 A			200		
MR-J4-15K_	125 A frame 125 A	125 A frame 125 A			250		S-N65
MR-J4-22K_	225 A frame 175 A	225 A frame 175 A			350		S-N95
MR-J4-60_4	30 A frame 5 A	30 A frame 5 A	480	T	10	600	S-N10 S-T10
MR-J4-100_4	30 A frame 10 A	30 A frame 5 A			15		
MR-J4-200_4	30 A frame 15 A	30 A frame 10 A			25		
MR-J4-350_4	30 A frame 20 A	30 A frame 15 A			35		S-N20 (Note 3) S-T21
MR-J4-500_4	30 A frame 20 A	30 A frame 20 A			50		
MR-J4-700_4	30 A frame 30 A	30 A frame 30 A			65		S-N20 S-T21
MR-J4-11K_4	50 A frame 50 A	50 A frame 50 A			100		S-N25
MR-J4-15K_4	60 A frame 60 A	60 A frame 60 A			150		S-N35
MR-J4-22K_4	100 A frame 100 A	100 A frame 100 A			175		S-N50

Note 1. In order for the servo amplifier to comply with the UL/CSA standard, refer to the applicable "Servo Amplifier Instruction Manual".

2. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less.

3. S-N18 can be used when auxiliary contact is not required.

(2) For control circuit power supply

When the wiring for the control circuit power supply (L11, L21) is thinner than that for the main circuit power supply (L1, L2, L3), install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit.

Molded-case circuit breaker, fuse

Servo amplifier	Molded-case circuit breaker (Note)		Fuse (Class T)		Fuse (Class K5)	
	Frame, rated current	Voltage AC [V]	Current [A]	Voltage AC [V]	Current [A]	Voltage AC [V]
MR-J4-10_	30 A frame 5 A	240	1	300	1	250
MR-J4-20_						
MR-J4-40_						
MR-J4-60_						
MR-J4-70_						
MR-J4-100_						
MR-J4-200_						
MR-J4-350_						
MR-J4-500_						
MR-J4-700_						
MR-J4-11K_						
MR-J4-15K_						
MR-J4-22K_						
MR-J4-60_4	30 A frame 5 A	480	1	600	1	600
MR-J4-100_4						
MR-J4-200_4						
MR-J4-350_4						
MR-J4-500_4						
MR-J4-700_4						
MR-J4-11K_4						
MR-J4-15K_4						
MR-J4-22K_4						
MR-J4-10_1	30 A frame 5 A	240	1	300	1	250
MR-J4-20_1						
MR-J4-40_1						

Note. In order for the servo amplifier to comply with the UL/CSA standard, refer to the Servo Amplifier Instruction Manual.

4.3.3 MR-J3W series, no-fuse breakers, fuses, magnetic contactors

Always use one molded-case circuit breaker and one magnetic contactor with one servo amplifier. When using a fuse instead of the molded-case circuit breaker, use the one having the specifications given in this section.
When using two different types of motors in combination from a rotary servo motor, a select a molded-case circuit breaker, a fuse or a magnetic contactor temporarily assuming that the same type of the motors are used for both axes. After selecting for the two types, use the larger molded-case circuit breaker, fuse or magnetic contactor.

Total output of rotary servo motor	Molded-case circuit breaker			Fuse			Magnetic contactor (Note 2)
	Current		Voltage AC [V]	Class (Note 1)	Current [A]	Voltage AC [V]	
	Not using power factor improving AC reactor	Using power factor improving AC reactor					
300 W or less	30 A frame 5 A	30 A frame 5 A	240	K5	15	300	S-N10
From over 300W to 600W	30 A frame 10 A	30 A frame 10 A			20		
From over 600W to 1kW	30 A frame 15 A	30 A frame 10 A			20		
From over 1kW to 2.0kW	30 A frame 20 A	30 A frame 15 A			30		S-N18

Note 1. In order for the servo amplifier to comply with the UL/CSA standard, refer to the applicable "Servo Amplifier Instruction Manual".
2. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less.

Servo amplifier	Power supply specification	Circuit protector (Note)
MR-J3W-0303BN6	Control circuit power supply (24 V DC)	CP30-BA 1P 1-M 1A
	Main circuit power supply (48 V DC)	CP30-BA 1P 1-M 5A
	Control circuit power supply/main circuit power supply (24 V DC)	CP30-BA 1P 1-M 10A

Note. For operation characteristics, use an intermediate speed type.

4.3.4 MR-J4W2-_B servo amplifier, no-fuse breakers, fuses, magnetic contactors

Always use one molded-case circuit breaker and one magnetic contactor with one servo amplifier. When using a fuse instead of the molded-case circuit breaker, use the one having the specifications given in this section.
When using a combination of the rotary servo motor select a molded-case circuit breaker, a fuse or a magnetic contactor tentatively, assuming one type of the servo motors are used for two axes. After the tentative selections are made for all types of the servo motors, use the largest among all molded-case circuit breakers, fuses, or magnetic contactors.

(1) For main circuit power supply

⚠CAUTION
- To prevent the servo amplifier from smoke and a fire, select a molded-case circuit breaker which shuts off with high speed.
- Always use one molded-case circuit breaker and one magnetic contactor with one servo amplifier.

(a) For MR-J4W2-_B

Total output of rotary servo motors	Molded-case circuit breaker (Note 5, 6)		Fuse			Magnetic Contactor (Note 2)
	Frame, rated current	Voltage AC [V]	Class (Note 1)	Current [A]	Voltage AC [V]	
300 W or less	50 A frame 5 A (Note 3)	240	T	15	300	S-N10 S-T10
From over 300 W to 600 W	50 A frame 10 A (Note 3)			20		
From over 600 W to 1 kW	50 A frame 15 A (Note 3)			20		
From over 1 kW to 2 kW	50 A frame 20 A (Note 3)			30		S-N20 (Note 4) S-T21

Note 1. In order for the servo amplifier to comply with the UL/CSA standard, refer to the applicable "Servo Amplifier Instruction Manual".
2. Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less.
3. When not using the servo amplifier as an EC/EN/UL/CSA standard compliant product, molded-case circuit breaker of 30 A frame can be used.
4. S-N18 can be used when auxiliary contact is not required.
5. A molded-case circuit breaker will not change to select regardless of use of a power factor improving AC reactor.
6. Use a molded-case circuit breaker having the operation characteristics equal to or higher than Mitsubishi Electric general-purpose products.

(2) For control circuit power supply
When the wiring for the control circuit power supply (L11/L21) is thinner than that for the main circuit power supply (L1/L2/L3), install an overcurrent protection device (molded-case circuit breaker or fuse) to protect the branch circuit.

Servo amplifier	Molded-case circuit breaker		Fuse (Class T)		Fuse (Class K5)	
	Frame, rated current	Voltage AC [V]	Current [A]	Voltage AC [V]	Current [A]	Voltage AC [V]
MR-J4W2-22B	50 A frame 5 A (Note)	240	1	300	1	250
MR-J4W2-44B						
MR-J4W2-77B						
MR-J4W2-1010B						

Note. When not using the servo amplifier as an EC/EN/UL/CSA standard compliant product, molded-case circuit breaker of 30 A frame can be used.

(3) DC 24 V/DC 48 V class servo amplifier

Servo amplifier	Power supply specification	Circuit protector (Note)
MR-J4W2-0303BN6	Control circuit power supply (24 V DC)	CP30-BA 1P 1-M 1A
	Main circuit power supply (48 V DC)	CP30-BA 1P 1-M 5A
	Main circuit power supply (24 V DC)	CP30-BA 1P 1-M 10A

Note. For operation characteristics, use an intermediate speed type.

5. BATTERY

POINT

●Refer to "Servo Amplifier Instruction Manual" for the replacement procedure of the battery.

●Disconnecting the encoder cable will erase the absolute position data. After disconnecting the encoder cable, always execute home position setting and then positioning operation.

●The battery MR-J3BAT for MR-J3 series is unavailable because the voltage specification of the battery differs from that for MR-J4 series.

●The battery MR-BAT for MR-J3W series is unavailable because the voltage specification of the battery differs from that for MR-J4 series.

●The internal circuits of the servo amplifier may be damaged by static electricity. Always take the following precautions.

・Ground human body and work bench.

・Do not touch the conductive areas, such as connector pins and electrical parts, directly by hand.

⚠WARNING

●Before replacing a battery, turn off the main circuit power and wait for 15 minutes or longer (when 30 kW or more is used, 20 minutes or more) until the charge lamp turns off. Then, check the voltage between P+ and N- with a voltage tester or others. Otherwise, an electric shock may occur. In addition, when confirming whether the charge lamp is off or not, always confirm it from the front of the servo amplifier.

●If [AL. 25 Absolute position erased] or [AL. E3 Absolute position counter warning] has occurred, always perform home position setting again. Otherwise, it may cause an unexpected operation.

5.1 Combinations of batteries and the servo amplifier

Model	Name	Built-in battery	MR-J3 series	MR-J4 series	MR-J3W series	MR-J4W2 servo amplifier
MR-J3BAT	Battery		○		(Note 2)	
MR-BAT6V1SET	Battery	MR-BAT6V1		○		
MR-BAT6V1SET-A	Battery					(Note 3)
MR-BAT6V1BJ	Battery Battery for junction battery cable			○		
MR-BT6VCASE	Battery case	MR-BAT6V1 (Note 1)		○		○ (Note 4)
MR-BTCASE	Battery case	MR-BAT (Note 1)			○	

Note 1. Please purchase the battery separately.

2. It is available with MR-J3W-0303BN6.

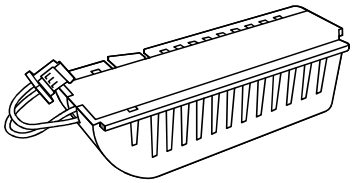
3. It is available with MR-J4W2-0303B6.

4. MR-BT6VCASE cannot be used for MR-J4W2-0303B6 servo amplifiers.

5.2 MR-J3 series Battery

(1) Purpose of use for MR-J3BAT

This battery is used to construct an absolute position detection system. Refer to Servo Amplifier Instruction Manual for the fitting method, etc..

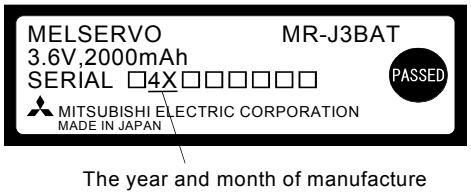


(2) Year and month when MR-J3BAT is manufactured

Production year and month of the MR-J3BAT are indicated in a serial number on the rating plate of the battery back face.

The year and month of manufacture are indicated by the last one digit of the year and 1 to 9, X (10), Y (11), Z (12).

For October 2004, the Serial No. is like, "SERIAL_4X_ _ _ _ _ _ ".



5.3 MR-J4 series Battery

5.3.1 Battery replacement procedure

Model: MR-BAT6V1SET, MR-BAT6V1BJ, MR-BT6VCASE

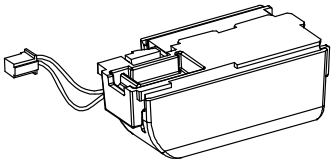
⚠WARNING	●Before replacing a battery, turn off the main circuit power and wait for 15 minutes or longer until the charge lamp turns off. Then, check the voltage between P+ and N- with a voltage tester or others. Otherwise, an electric shock may occur. In addition, when confirming whether the charge lamp is off or not, always confirm it from the front of the servo amplifier.

⚠CAUTION	●The internal circuits of the servo amplifier may be damaged by static electricity. Always take the following precautions. ・Ground your body and the work bench. ・Do not touch the conductive areas, such as connector pins and electrical parts, directly by hand. ●The built-in battery for the MR-BAT6V1BJ battery for junction battery cable cannot be replaced. Therefore, do not disassemble the MR-BAT6V1BJ battery for junction battery cable. Doing so may cause a malfunction.

POINT

●When using the BAT6V1SET battery and the MR-BT6VCASE battery case are used
Replacing a battery with the control circuit power supply turned off will erase the absolute position data.
When using the MR-BAT6V1BJ battery for junction battery cable
In order to prevent the absolute position data from being erased, replace the MR-BAT6V1BJ battery for junction battery cable according to the procedure described in the Instruction Manual.
●Verify that the battery for replacement is within its service life.
●Refer to the Instruction Manual for battery transportation and the new EU Battery Directive.

Replace the old battery with only the control circuit power supply turned on. Replacing a battery with the control circuit power supply turned on will cause [AL.9F.1 low battery] but will not erase the absolute position data.
Refer to the Instruction Manual for the procedure for mounting the battery on the servo amplifier.



POINT

●Three types of batteries are used to construct the absolute position detection system: MR-BAT6V1SET battery, MR-BAT6V1BJ battery for junction battery cable, and MR-BT6VCASE battery case. The use of the MR-BAT6V1BJ battery for junction battery cable has the following characteristics distinctive from other batteries.
- The encoder cable can be removed from the servo amplifier.
- A battery can be replaced with the control circuit power supply turned off.

●If the encoder lost the absolute position data, always perform home position setting before operation. The encoder will lose the absolute position data in the following cases. In addition, the absolute position data may be erased if the battery is used outside of the specification.
When using the MR-BAT6V1SET battery and the MR-BT6VCASE battery case
- Encoder cable is removed.
- A battery is replaced with the control circuit power supply turned off.

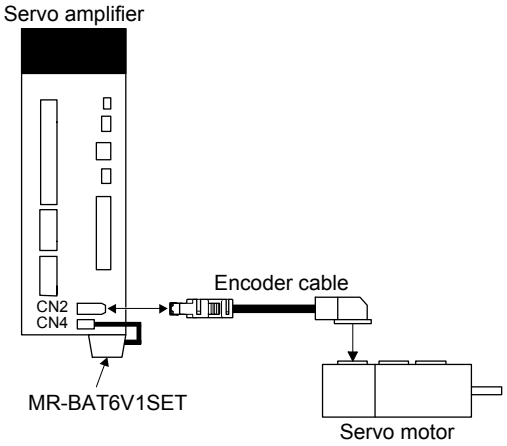
When using the MR-BAT6V1BJ battery for junction battery cable
- The connector and the cable are removed between the servo motor and the battery.
- A battery is replaced in a procedure different from the procedure described in the Instruction Manual.

●The MR-BAT6V1BJ battery for junction battery cable is compatible only with the HG series servo motor.

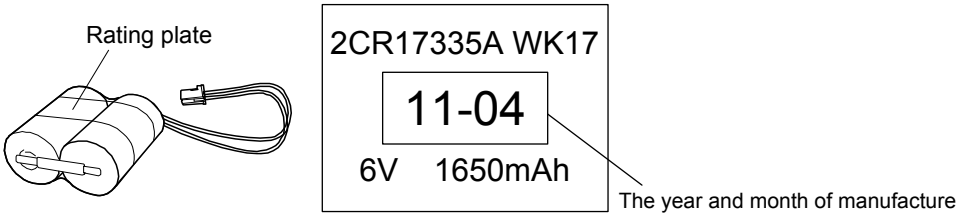
●A single MR-BT6VCASE battery case can retain the absolute position data of up to eight axes of servo motors.

5.3.2 When using the MR-BAT6V1SET battery

(a) Battery connection
Connect according to the following figure.



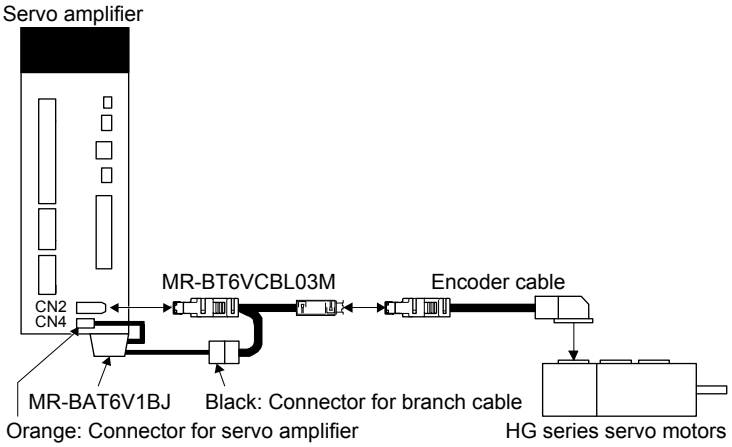
(b) Year and month of manufacture of battery
The manufacture date of an MR-BAT6V1 battery installed in MR-BAT6V1SET is written on the name plate attached to the MR-BAT6V1 battery.



5.3.3 When using MR-BAT6V1BJ battery for junction battery cable

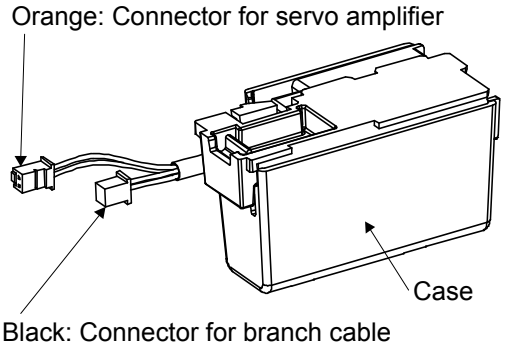
(a) Battery mounting

Connect the MR-BAT6V1BJ using the MR-BT6VCBL03M junction battery cable as follows.



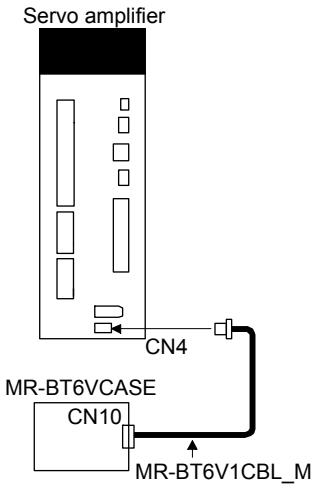
(b) Battery manufacture year and month

The manufacture year and month are described in the manufacturer's (SERIAL) number marked on the rating name plate. The second digit of the manufacturer's number indicates the first digit of the Christian Era and the third digit indicates the manufacture month (X for October, Y for November, and Z for December). For example, November 2013 is indicated as "SERIAL:_3Y_ _ _ _ _ _".

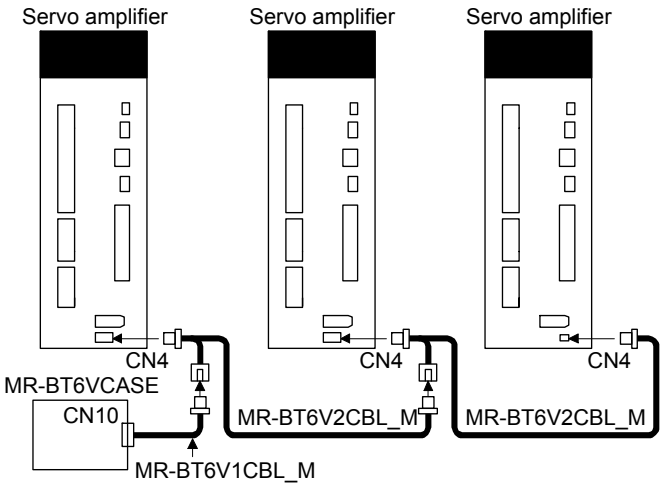


5.3.4 When using MR-BT6VCASE battery case

(a) Battery connection



Connection to a single unit of servo amplifier



Connection to eight axes of servo amplifiers

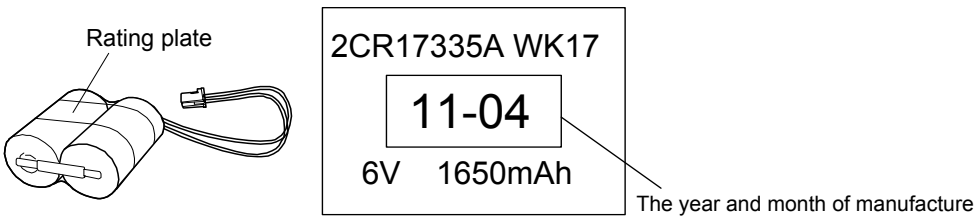
A single MR-BT6VCASE battery case can retain the absolute position data of up to eight axes of servo motors. Servo motors in the incremental system are included in the number of axes. Refer to the following table for the number of connectable axes of each servo motor.

Servo motor	Number of axes								
Rotary servo motor	0	1	2	3	4	5	6	7	8

The battery case accommodates five connected batteries. The battery case contains no batteries. Batteries need to be prepared separately.

(b) Battery manufacture year and month

The manufacture year and month of a MR-BAT6V1 to be housed in the MR-BT6VCASE battery case is written on the name plate attached to the MR-BAT6V1 battery.



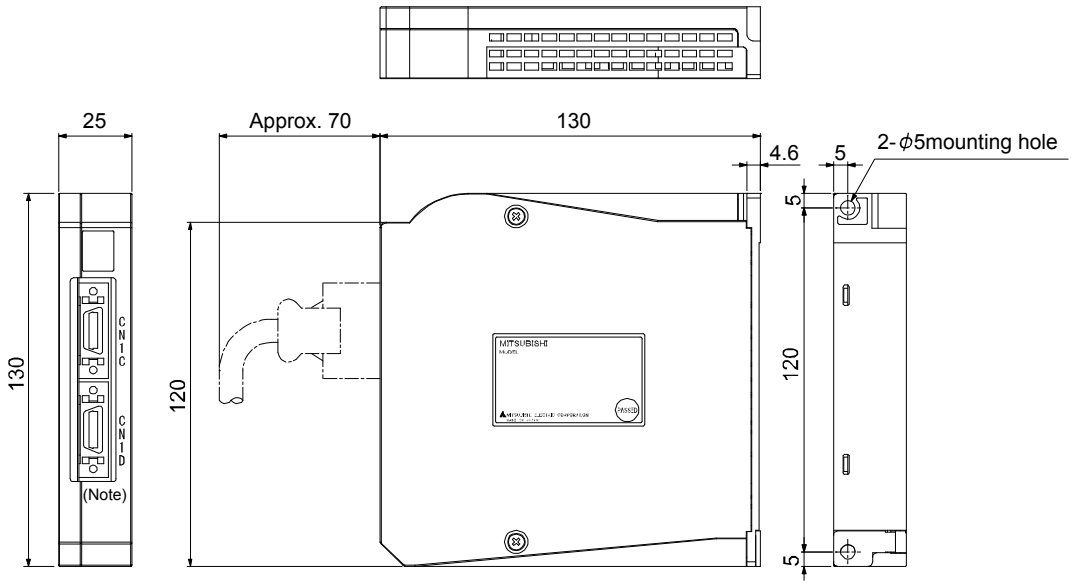
5.4 MR-J3W series Battery

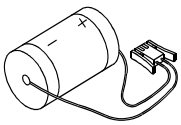
5.4.1 MR-BTCASE battery case and MR-BAT battery

POINT
●Refer to "Servo Amplifier Instruction Manual" for battery transportation and the new EU Battery Directive.
●Always install eight MR-BAT batteries to an MR-BTCASE battery case.

These are used to configure an absolute position detection system. An MR-BTCASE battery case is a case that stores eight MR-BAT batteries by connector connections. An MR-BTCASE battery case can be used by four MR-J3W-B servo amplifiers (eight axes) at maximum. To connect an MR-BTCASE battery case to a servo amplifier, the MR-J3BT1CBL_M battery cable is required. To connect multiple servo amplifiers to an MR-BTCASE battery case, use the MR-J3BT2CBL_M junction battery cable. When using an MR-J3W-B servo amplifier in the incremental system, MR-BTCASE and MR-BAT are not required.
Battery backup time (battery life without charging) is 30,000 hours for one servo amplifier (two axes) and 10,000 hours for four servo amplifiers (eight axes). Refer to servo amplifier instruction manual for the usage.

[Unit: mm]





Note. Leave this open.

Mass: 0.3 [kg]

Outline dimension drawing of MR-BTCASE

Appearance of MR-BAT

The next table shows model names of battery cables. The numbers in the Cable length column in the table go into "_" of the cable model names.

Cable model	Cable length		Fiex life	Application / Remark
	0.3m	1m		
MR-J3BT1CBL_M	03	1	Standard	
MR-J3BT2CBL_M	03	1	Standard	For junction

5.5 MR-J4W2-_B servo amplifier, battery

POINT
●Refer to "Servo Amplifier Instruction Manual" for battery transportation and the new EU Battery Directive.

This battery is used to construct an absolute position detection system. Refer to "Servo Amplifier Instruction Manual" for construction of the absolute position detection system.

5.5.1 MR-BT6VCASE battery case

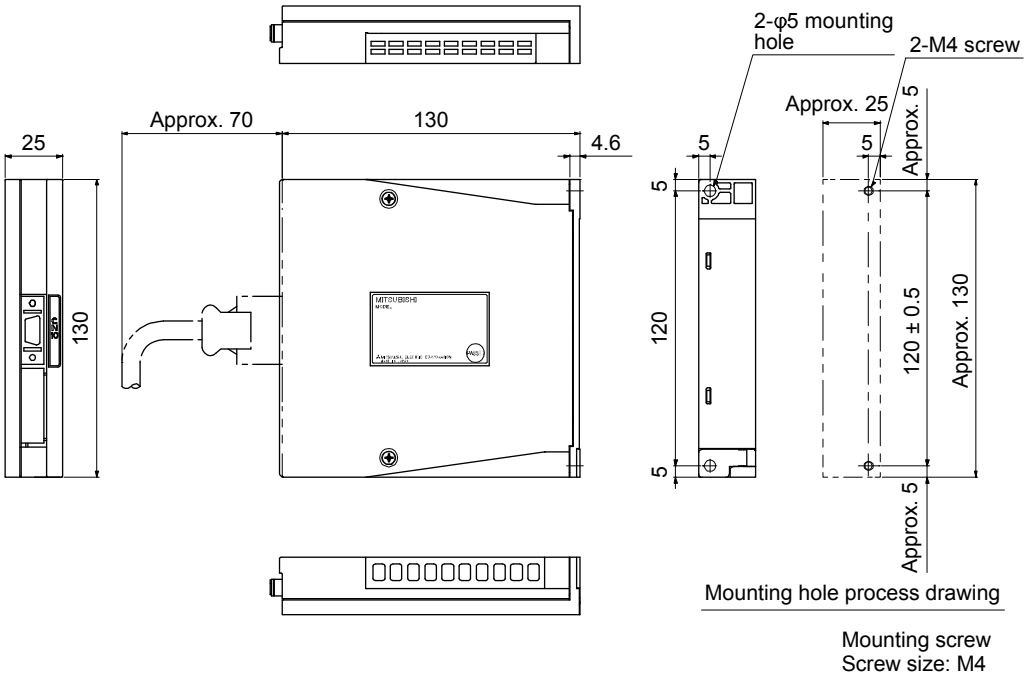
POINT
●Use an MR-BT6VCASE for 200 W or more MR-J4W_-_B servo amplifiers. MR-BT6VCASE cannot be used for MR-J4W2-0303B6 servo amplifiers. ●The battery unit consists of an MR-BT6VCASE battery case and five MR-BAT6V1 batteries. ●For the specifications and year and month of manufacture of MR-BAT6V1 battery, refer to "Servo Amplifier Instruction Manual".

MR-BT6VCASE is a case used for connecting and mounting five MR-BAT6V1 batteries. A battery case does not have any batteries. Please prepare MR-BAT6V1 batteries separately.

(1) The number of connected servo motors
One MR-BT6VCASE holds absolute position data up to eight axes servo motors.
Servo motors in the incremental system are included as the axis Nos. Refer to the following table. for the number of connectable axes of each servo motor.

(2) Dimensions

[Unit: mm]

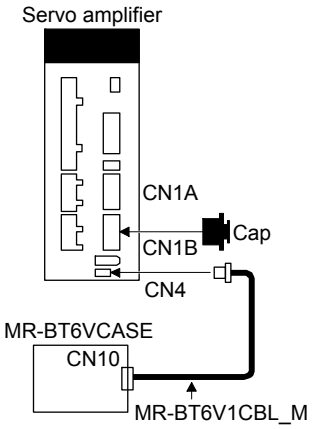


[Mass: 0.18 kg]

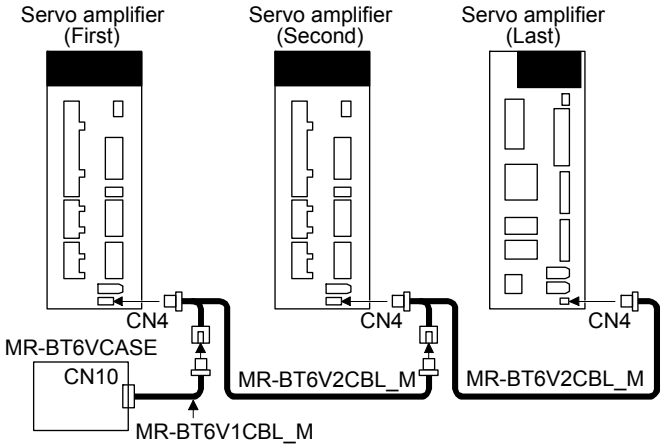
(3) Battery mounting

POINT
●One battery unit can be connected to up to 8-axis servo motors. Servo motors in the incremental system are included as the axis Nos. ●The MR-J4W_-_B servo amplifiers can be combined with MR-J4-_B_(-RJ) servo amplifiers.

(a) When using 1-axis servo amplifier



(b) When using up to 8-axis servo amplifiers



(4) Battery replacement procedure

⚠WARNING	●Before replacing a battery, turn off the main circuit power and wait for 15 minutes or longer until the charge lamp turns off. Then, check the voltage between P+ and N- with a voltage tester or others. Otherwise, an electric shock may occur. In addition, when confirming whether the charge lamp is off or not, always confirm it from the front of the servo amplifier.

⚠CAUTION	●The internal circuits of the servo amplifier may be damaged by static electricity. Always take the following precautions. ・Ground human body and work bench. ・Do not touch the conductive areas, such as connector pins and electrical parts, directly by hand.

POINT

●Replacing battery with the control circuit power off will erase the absolute position data.

●Before replacing batteries, check that the new battery is within battery life.

Replace the battery while only control circuit power is on. Replacing battery with the control circuit power on triggers [AL. 9F.1 Low battery]. However, the absolute position data will not be erased.

(a) Assembling a battery unit

CAUTION
- Do not mount new and old batteries together.
- When you replace a battery, replace all batteries at the same time.

POINT
- Always install five MR-BAT6V1 batteries to an MR-BT6VCASE battery case.

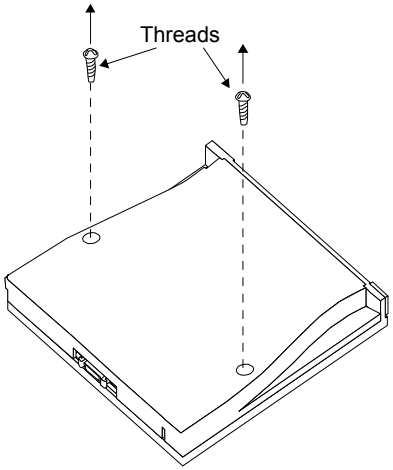
1) Required items

Product name	Model	Quantity	Remark
Battery case	MR-BT6VCASE	1	MR-BT6VCASE is a case used for connecting and mounting five MR-BAT6V1 batteries.
Battery	MR-BAT6V1	5	Lithium battery (primary battery, nominal + 6 V)

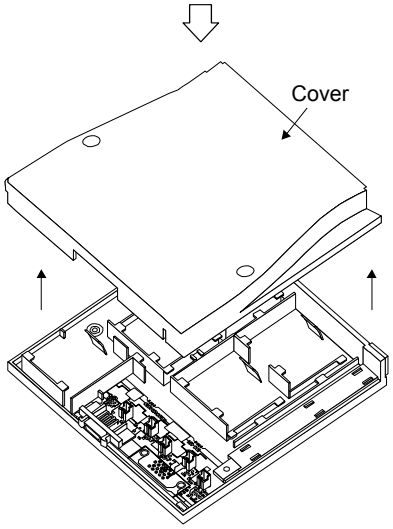
2) Disassembly and assembly of the battery case MR-BT6VCASE

a) Disassembly of the case

MR-BT6VCASE is shipped assembled. To mount MR-BAT6V1 batteries, the case needs to be disassembled.

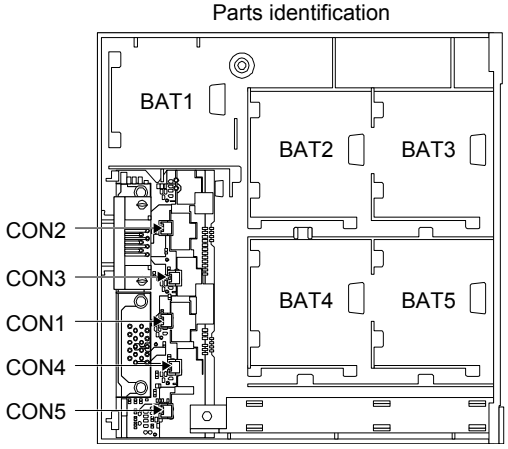


Remove the two screws using a Phillips screwdriver.

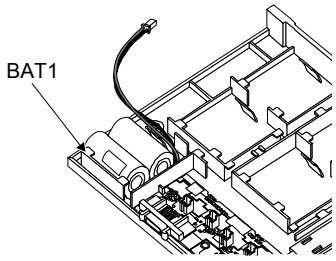


Remove the cover.

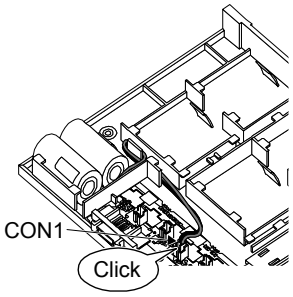
Parts identification



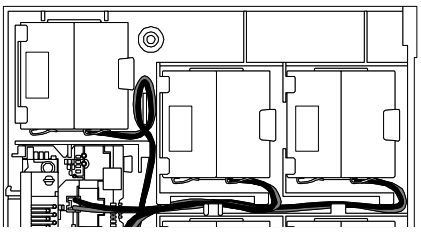
b) Mounting MR-BAT6V1



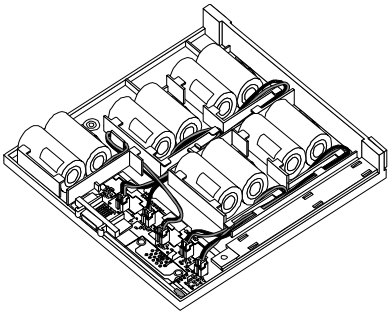
Securely mount an MR-BAT6V1 to the BAT1 holder.



Insert the MR-BAT6V1 connector mounted on BAT1 holder to CON1.
Confirm the click sound at this point.
The connector has to be connected in the right direction. If the connector is pushed forcefully in the incorrect direction, the connector will break.
Place the MR-BAT6V1 lead wire to the duct designed to store lead wires.
Insert MR-BAT6V1 to the holder in the same procedure in the order from BAT2 to BAT5.

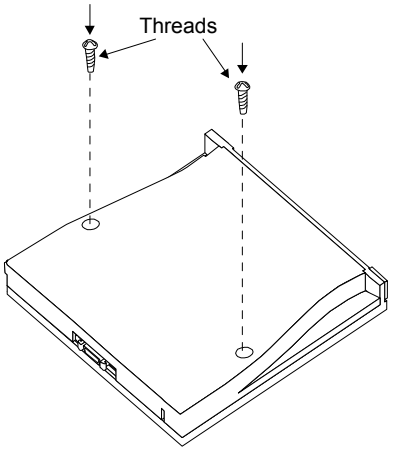


Bring out the lead wire from the space between the ribs, and bend it as shown above to store it in the duct. Connect the lead wire to the connector. Be careful not to get the lead wire caught in the case or other parts.
When the lead wire is damaged, external short circuit may occur, and the battery can become hot.



c) Assembly of the case
After all MR-BAT6V1 batteries are mounted, fit the cover and insert screws into the two holes and tighten them. Tightening torque is 0.71 N•m.

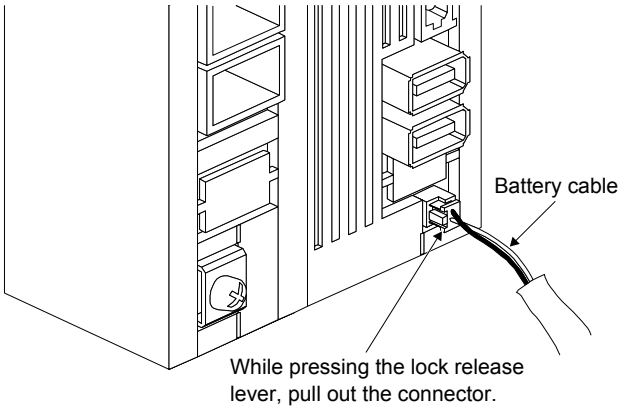
POINT
●When assembling the case, be careful not to get the lead wires caught in the fitting parts or the screwing parts.



d) Precautions for removal of battery
The connector attached to the MR-BAT6V1 battery has the lock release lever. When removing the connector, pull out the connector while pressing the lock release lever.

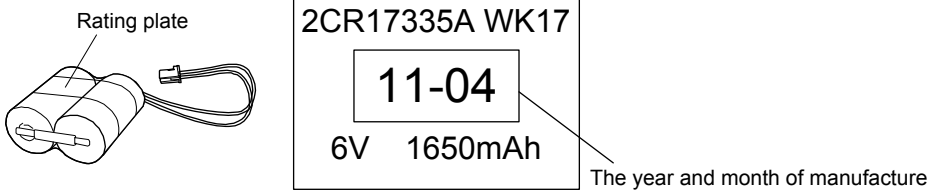
3) Battery cable removal

⚠CAUTION	●Pulling out the connector of the MR-BT6V1CBL and the MR-BT6V2CBL without the lock release lever pressed may damage the CN4 connector of the servo amplifier or the connector of the MR-BT6V1CBL or MR-BT6V2CBL.



5.5.2 MR-BAT6V1 battery

The MR-BAT6V1 battery is a primary lithium battery for replacing MR-BAT6V1SET-A and MR-BAT6V1SET and a primary lithium battery built-in MR-BT6VCASE. Store the MR-BAT6V1 in the case to use.
The year and month of manufacture of MR-BAT6V1 battery have been described to the rating plate put on an MR-BAT6V1 battery.



Item		Description
Battery pack		2CR17335A (CR17335A × 2 pcs. in series)
Nominal voltage	[V]	6
Nominal capacity	[mAh]	1650
Storage temperature	[°C]	0 to 55
Operating temperature	[°C]	0 to 55
Lithium content	[g]	1.2
Mercury content		Less than 1 ppm
Dangerous goods class		Not subject to the dangerous goods (Class 9) Refer to app. 2 for details.
Operating humidity and storage humidity		5 %RH to 90 %RH (non-condensing)
Battery life (Note)		5 years from date of manufacture
Mass	[g]	34

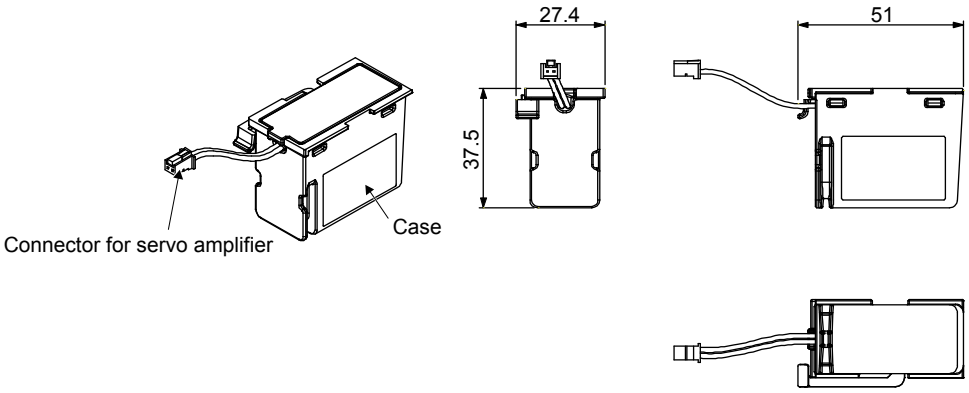
Note. Quality of the batteries degrades by the storage condition. The battery life is 5 years from the production date regardless of the connection status.

5.5.3 MR-BAT6V1SET-A battery (MR-J4W2-0303B6 only)

POINT
●Use MR-BAT6V1SET-A for MR-J4W2-0303B6 servo amplifier. The MR-BAT6V1SET- A cannot be used for MR-J4W_-B servo amplifiers other than MR-J4W2-0303B6.

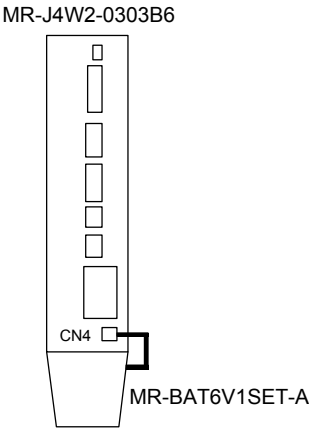
(1) Parts identification and dimensions

[Unit: mm]



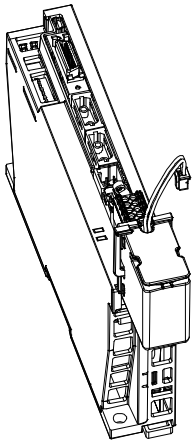
Mass: 55 [g] (including MR-BAT6V1 battery)

(2) Battery mounting
Connect as follows.

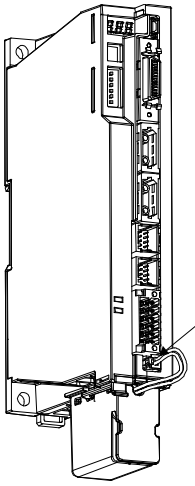


(3) Battery replacement procedure

(a) Installation procedure

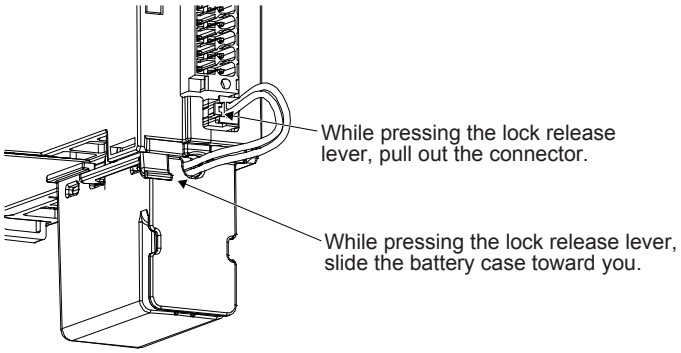


Insert the battery along the rails.



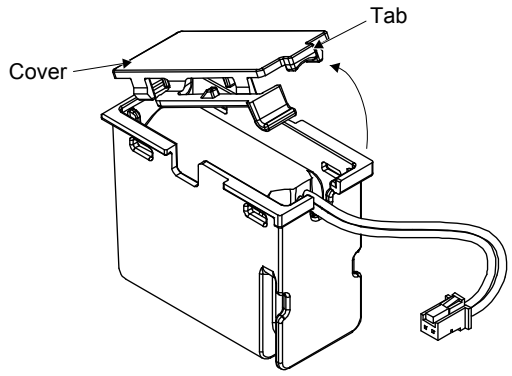
(b) Removal procedure

⚠CAUTION	●Pulling out the connector of the battery without the lock release lever pressed may damage the CN4 connector of the servo amplifier or the connector of the battery.

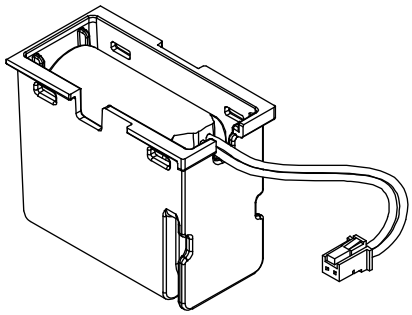


(4) Replacement procedure of the built-in battery

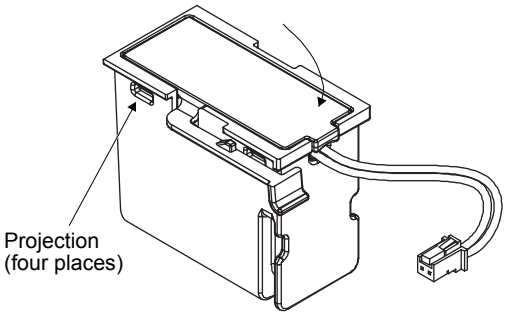
When the MR-BAT6V1SET-A reaches the end of its life, replace the built-in MR-BAT6V1 battery.



1) While pressing the locking part, open the cover.



2) Replace the battery with a new MR-BAT6V1 battery.



3) Press the cover until it is fixed with the projection of the locking part to close the cover.

6. EMC FILTER (RECOMMENDED)

6.1 MR-J3/MR-J3W/MR-J4 series EMC Filter (recommended) (100 V/200 V/400 V class)

It is recommended that one of the following filters be used to comply with EN EMC directive. Some EMC filters have large in leakage current.
When using an EMC filter, always use one for each servo amplifier.

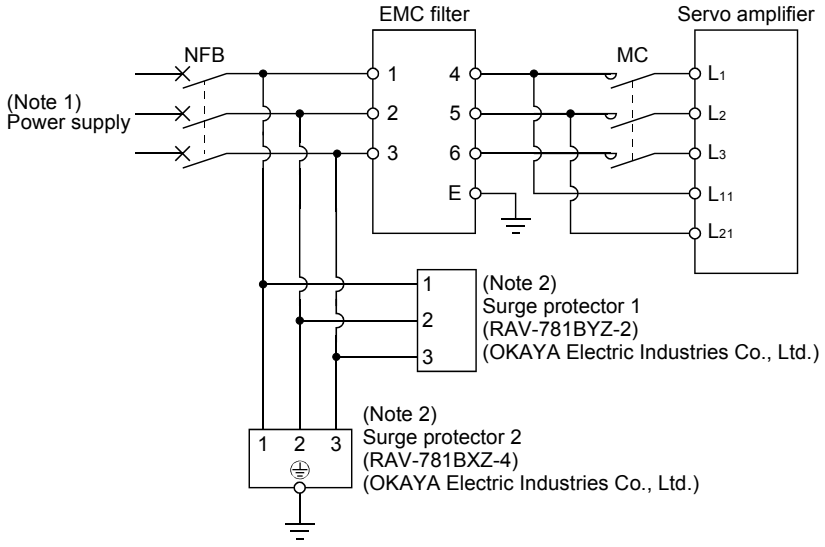
Combination with the servo amplifier

Servo amplifier	Recommended filter (Soshin Electric)				Mass [kg]
	Model	Rated current [A]	Rated voltage [V AC]	Leakage current [mA]	
MR-J3-10_ to MR-J3-100_ MR-J3-10_1 to MR-J3-40_1	HF3010A-UN (Note)	10	Max. 250	5	3.5
MR-J4-10_ to MR-J4-100_ MR-J4-10_1 to MR-J4-40_1					
MR-J3W-22B/MR-J3W-44B					
MR-J4W2-22B					
MR-J4W2-44B	HF3010A-UN2 (Note)				
MR-J3-200_N/MR-J3-350_	HF3030A-UN (Note)	30			5.5
MR-J4-200_/MR-J4-350_					
MR-J3W-77B/MR-J3W-1010B					
MR-J4W2-77B/MR-J4W2-1010B					
MR-J3-500_/MR-J3-700_	HF3040A-UN (Note)	40		6.5	6
MR-J4-500_/MR-J4-700_					
MR-J3-11K_ to MR-J3-22K_	HF3100A-UN (Note)	100			12
MR-J4-11K_ to MR-J4-22K_					
MR-J3-DU30K_/MR-J3-DU37K_ MR-J4-DU30K_/MR-J4-DU37K_	HF3200A-UN (Note)	200		9	18
MR-J3-60_4/MR-J3-100_4	TF3005C-TX	5	Max. 500	5.5	6
MR-J4-60_4/MR-J4-100_4					
MR-J3-200_4 to MR-J3-700_4	TF3020C-TX	20			
MR-J4-200_4 to MR-J4-700_4					
MR-J3-11K_4	TF3030C-TX	30			7.5
MR-J4-11K_4					
MR-J3-15K_4	TF3040C-TX	40			12.5
MR-J4-15K_4					
MR-J3-22K_4	TF3060C-TX	60			
MR-J4-22K_4					
MR-J3-DU30K_4 to MR-J3-DU55K_4 MR-J4-DU30K_4 to MR-J4-DU55K_4	TF3150C-TX	150			31

Note. This surge protector is separately required to use any of these EMC filters.

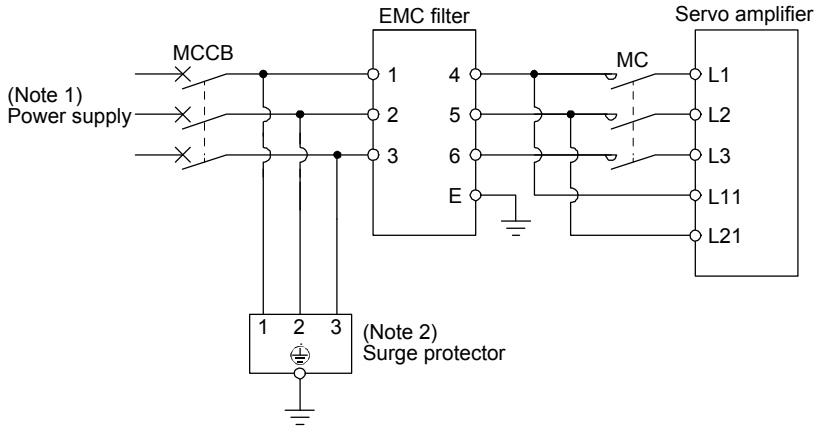
6.1.1 Connection example

(1) MR-J3/MR-J3W series



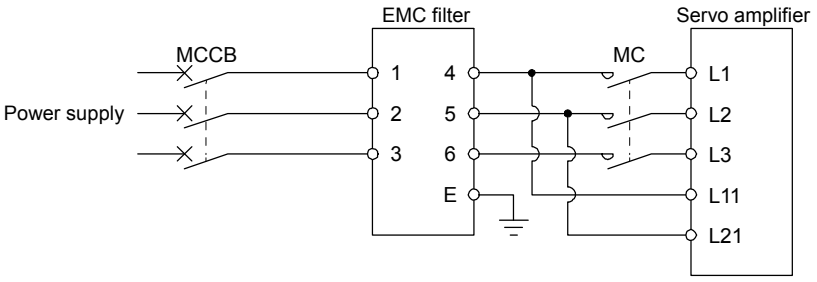
Note 1. For 1-phase 200 to 230V AC power supply, connect the power supply to L_1, L_2 and leave L_3 open.
There is no L_3 for 1-phase 100 to 120 V AC power supply. Refer to section 1.3 for the power supply specification.
2. The example is when a surge protector is connected.

(2) MR-J4 series 200 V/100 V class



Note 1. For 1-phase 200 to 240V AC power supply, connect the power supply to L_1, L_3 and leave L_2 open.
There is no L_2 for 1-phase 100 to 120 V AC power supply.
2. The example is when a surge protector is connected.

(3) MR-J4 series 400 V class

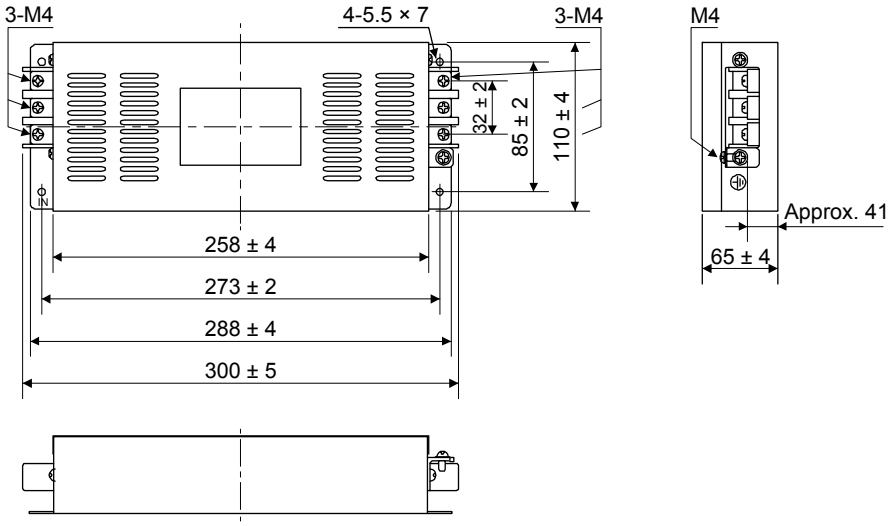


6.1.2 Dimensions

(1) EMC filter

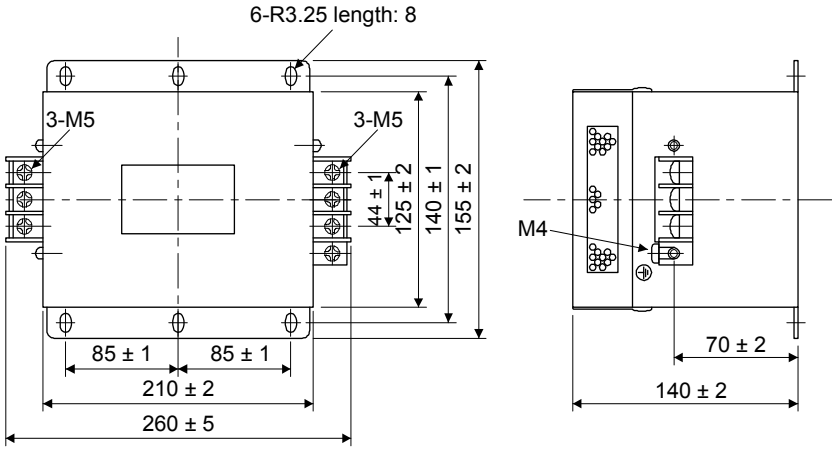
HF3010A-UN/HF3010A-UN2

[Unit: mm]



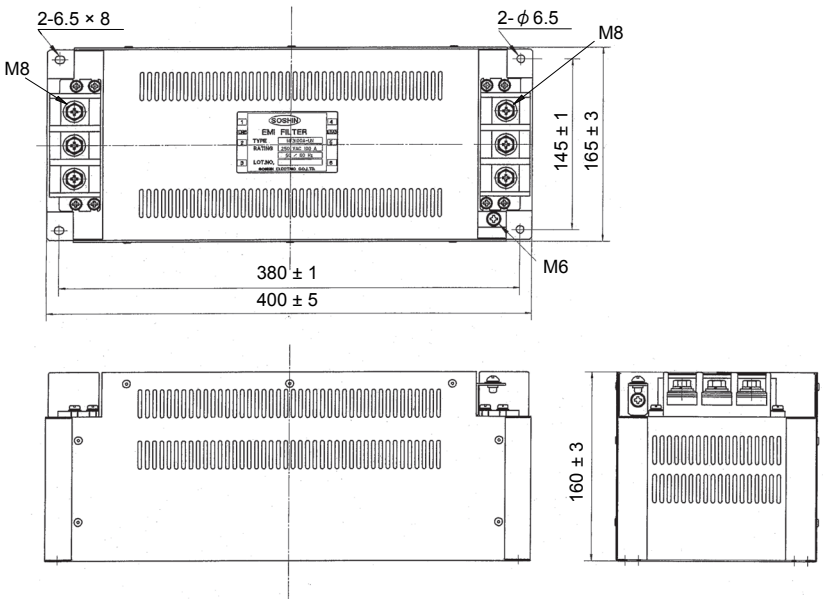
HF3030A-UN/HF3040A-UN

[Unit: mm]



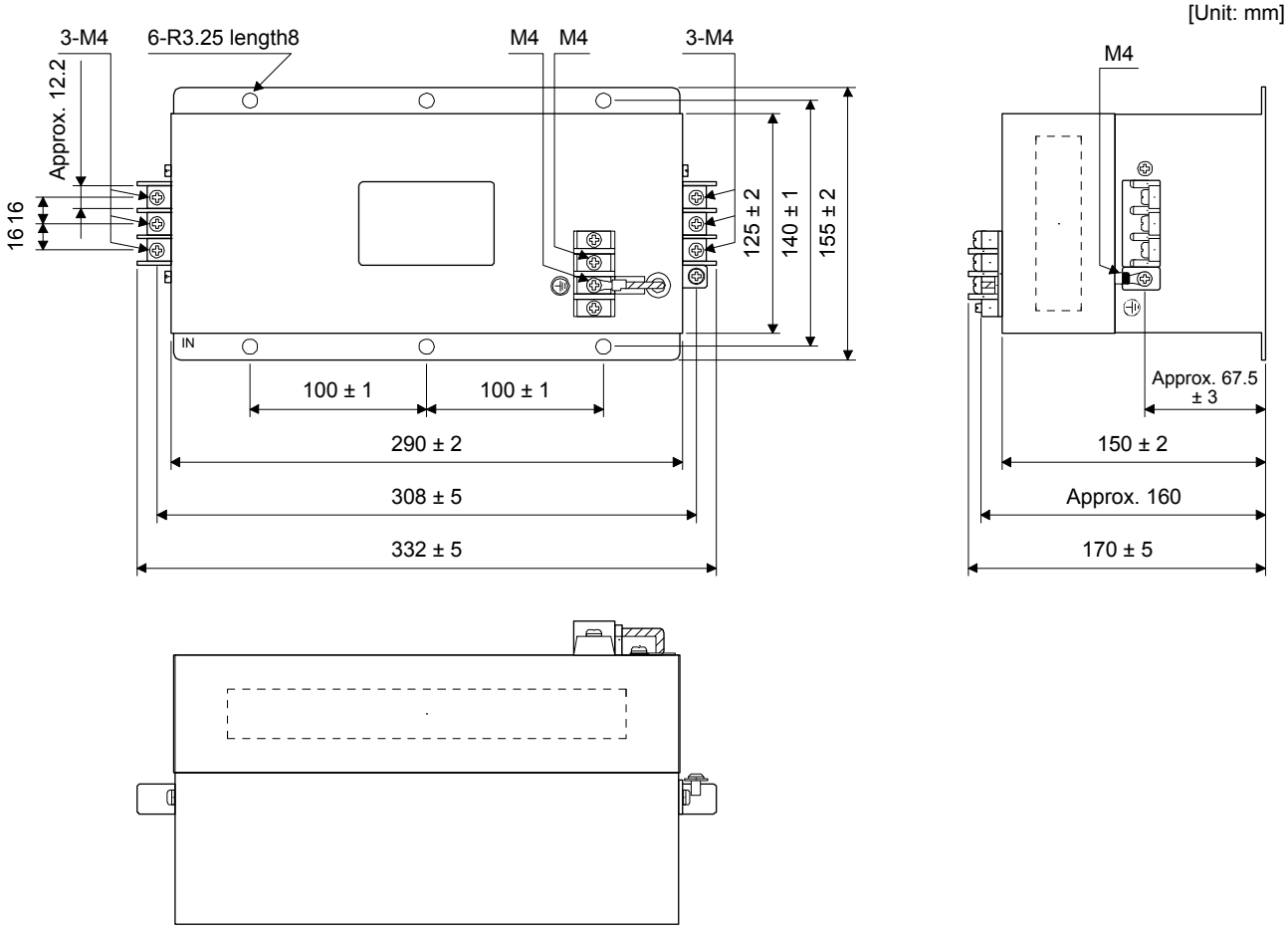
HF3100A-UN

[Unit: mm]



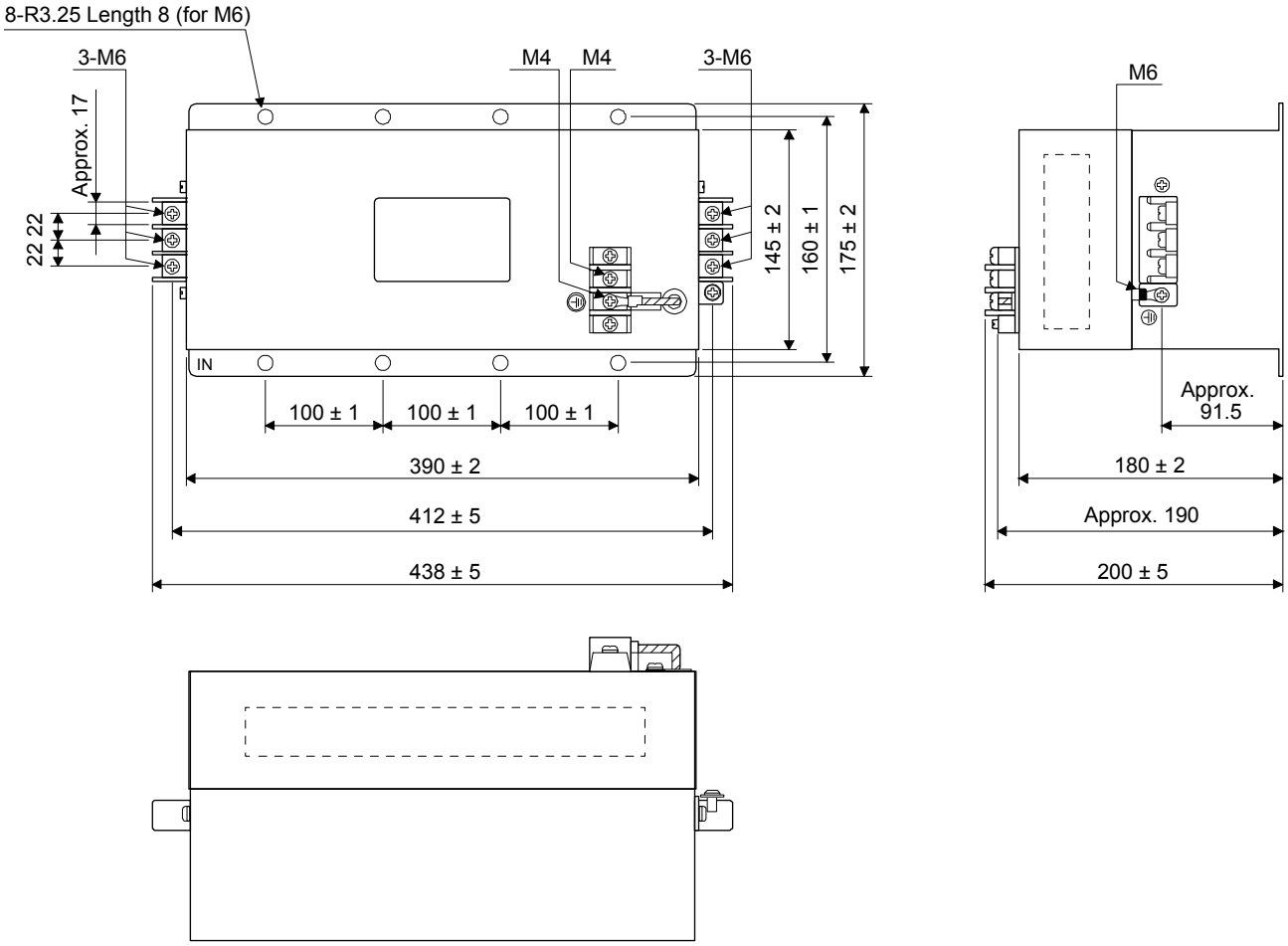
TF3005C-TX/TF3020C-TX/TF3030C-TX

[Unit: mm]



TF3040C-TX/TF3060C-TX

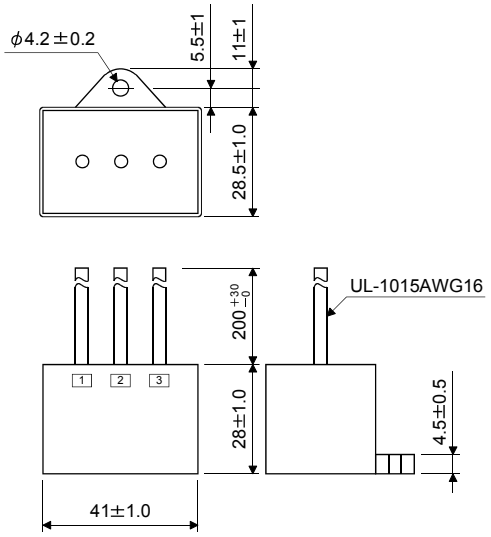
[Unit: mm]

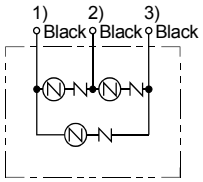


(2) Surge protector

RAV-781BYZ-2

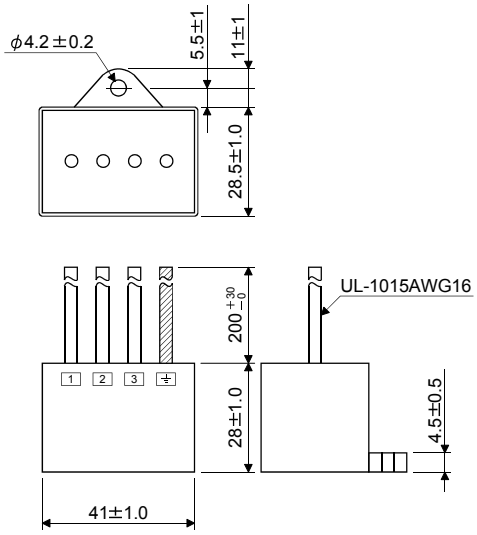
[Unit: mm]

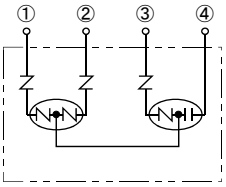




RAV-781BXZ-4

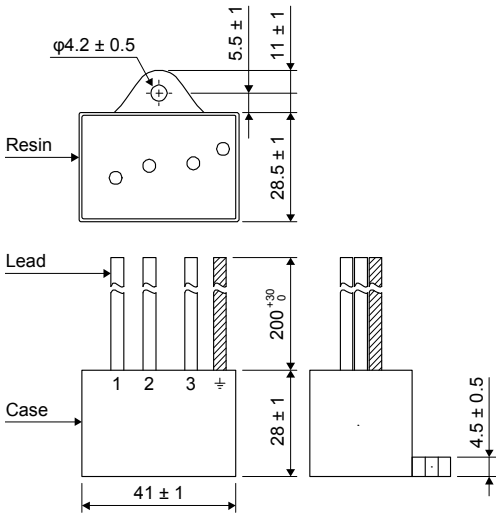
[Unit: mm]

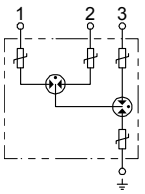




RSPD-250-U4

[Unit: mm]





7. POWER FACTOR IMPROVING AC REACTOR/POWER FACTOR IMPROVING DC REACTOR

7.1 MR-J3 series Power Factor Improving DC Reactor

POINT
●For the 100V AC power supply type (MR-J3-_A1) and MR-J3W series, the power factor improving DC reactor cannot be used.

The power factor improving DC reactor increases the form factor of the servo amplifier's input current to improve the power factor. It can decrease the power supply capacity. As compared to the power factor improving AC reactor (FR-BAL-(H)), it can decrease the loss. The input power factor is improved to about 95%. It is also effective to reduce the input side harmonics.
When connecting the power factor improving DC reactor to the servo amplifier, always disconnect P_1 and P_2 (For 11k to 22kW, disconnect P_1 and P). If it remains connected, the effect of the power factor improving DC reactor is not produced.
When used, the power factor improving DC reactor generates heat. To release heat, therefore, leave a 10 cm or more clearance at each of the top and bottom, and a 5 cm or more clearance on each side.

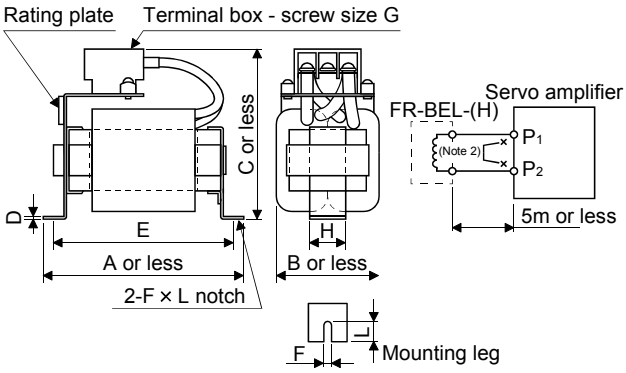


Fig. 8.1

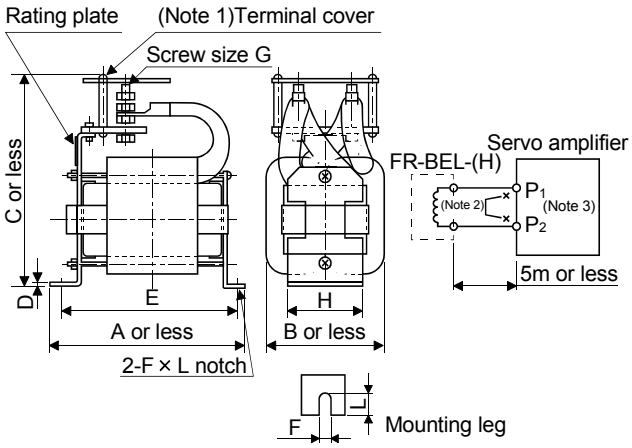
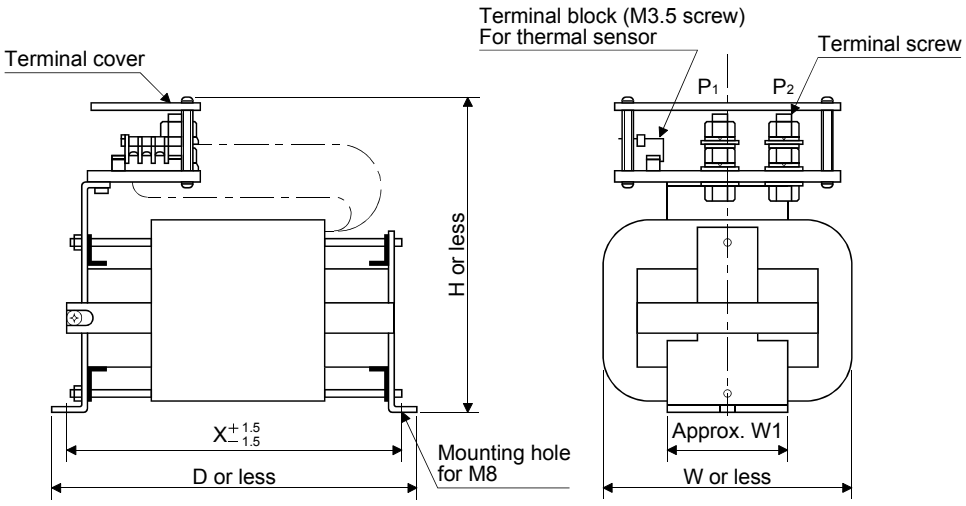


Fig. 8.2

Note 1.Since the terminal cover is supplied, attach it after connecting a wire.
2.When using power factor improving DC reactor, disconnect P_1 and P_2.
3.When 11k to 22kW, "P_2" becomes "P", respectively.

Servo amplifier	Power factor improving DC reactor	Outline drawing	Dimensions [mm]									Mounting screw size	Mass [kg (lb)]	Wire [mm^2] (Note)
			A	B	C	D	E	F	L	G	H			
MR-J3-10_/20_	FR-BEL-0.4K	Fug. 8.1	110	50	94	1.6	95	6	12	M3.5	25	M5	0.5	2 (AWG14)
MR-J3-40_	FR-BEL-0.75K		120	53	102	1.6	105	6	12	M4	25	M5	0.7	
MR-J3-60_/70_	FR-BEL-1.5K		130	65	110	1.6	115	6	12	M4	30	M5	1.1	
MR-J3-100_	FR-BEL-2.2K		130	65	110	1.6	115	6	12	M4	30	M5	1.2	
MR-J3-200_	FR-BEL-3.7K		150	75	102	2.0	135	6	12	M4	40	M5	1.7	
MR-J3-350_	FR-BEL-7.5K		150	75	126	2.0	135	6	12	M5	40	M5	2.3	3.5 (AWG12)
MR-J3-500_	FR-BEL-11K		170	93	132	2.3	155	6	14	M5	50	M5	3.1	5.5 (AWG10)
MR-J3-700_	FR-BEL-15K	Fug. 8.2	170	93	170	2.3	155	6	14	M8	56	M5	3.8	8 (AWG8)
MR-J3-11K_														22 (AWG4)
MR-J3-15K_	FR-BEL-22K		185	119	182	2.6	165	7	15	M8	70	M6	5.4	30 (AWG2)
MR-J3-22K_	FR-BEL-30K		185	119	201	2.6	165	7	15	M8	70	M6	6.7	60 (AWG2/0)
MR-J3-60_4	FR-BEL-H1.5K	Fug. 8.1	130	63	89	1.6	115	6	12	M3.5	32	M5	0.9	2 (AWG14)
MR-J3-100_4	FR-BEL-H2.2K		130	63	101	1.6	115	6	12	M3.5	32	M5	1.1	
MR-J3-200_4	FR-BEL-H3.7K		150	75	102	2	135	6	12	M4	40	M5	1.7	
MR-J3-350_4	FR-BEL-H7.5K		150	75	124	2	135	6	12	M4	40	M5	2.3	
MR-J3-500_4	FR-BEL-H11K		170	93	132	2.3	155	6	14	M5	50	M5	3.1	5.5 (AWG10)
MR-J3-700_4	FR-BEL-H15K	Fug. 8.2	170	93	160	2.3	155	6	14	M6	56	M5	3.7	8 (AWG8)
MR-J3-11K_4														
MR-J3-15K_4	FR-BEL-H22K		185	119	171	2.6	165	7	15	M6	70	M6	5.0	22 (AWG4)
MR-J3-22K_4	FR-BEL-H30K		185	119	189	2.6	165	7	15	M6	70	M6	6.7	

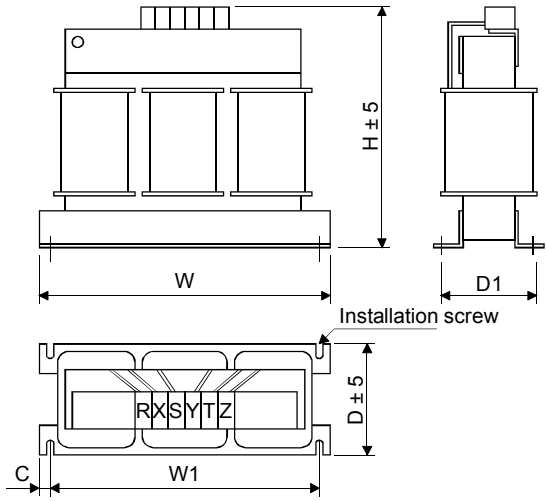
Note. Selection condition of wire size is as follows.
Wire type: 600 V Polyvinyl chloride insulated wire (IV wire)
Construction condition: One wire is constructed in the air

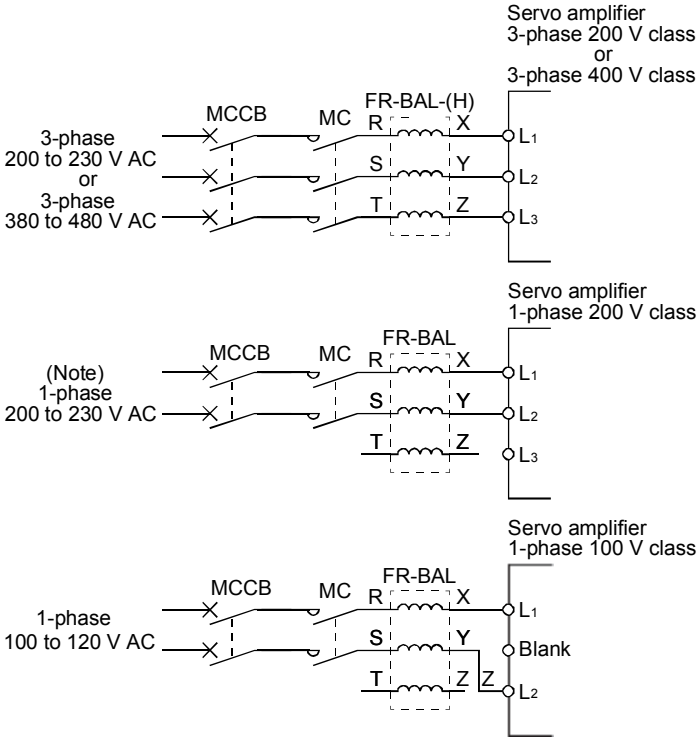


Drive unit	Power factor improving DC reactor	W	D	H	W1	X	Terminal screw	Mass [kg (lb)]
MR-J3-DU30K_	MR-DCL30K	135	255	215	80	232	M12	9.5 (20.94)
MR-J3-DU37K_	MR-DCL37K							
MR-J3-DU30K_4	MR-DCL30K-4		205	200	75	175	M8	6.5 (14.33)
MR-J3-DU37K_4	MR-DCL37K-4		225		80	197		7 (15.43)
MR-J3-DU45K_4	MR-DCL45K-4		240			212		7.5 (16.54)
MR-J3-DU55K_4	MR-DCL55K-4		260	215		232		9.5 (20.94)

7.2 MR-J3/MR-J3W series Power Factor Improving AC Reactor

The power factor improving reactors improve the phase factor by increasing the form factor of servo amplifier's input current.
It can reduce the power capacity.
The input power factor is improved to be about 90%. For use with a 1-phase power supply, it may be slightly lower than 90%.
In addition, it reduces the higher harmonic of input side.
When using power factor improving AC reactors for two or more servo amplifiers, be sure to connect a power factor improving AC reactor to each servo amplifier.
If using only one power factor improving AC reactor, enough improvement effect of phase factor cannot be obtained unless all servo amplifiers are operated.





Note. For the 1-phase 200 to 230 V AC power supply, Connect the power supply to L_1, L_2 and leave L_3 open.

MR-J3 series

Servo amplifier	Power factor improving AC reactor	Dimensions [mm]						Mounting screw size	Terminal screw size	Mass [kg (lb)]
		W	W1	H	D	D1	C			
MR-J3-10_/20_/10_1	FR-BAL-0.4K	135	120	115	59	45 $^{0}_{-2.5}$	7.5	M4	M3.5	2.0
MR-J3-40_/20_1	FR-BAL-0.75K	135	120	115	69	57 $^{0}_{-2.5}$	7.5	M4	M3.5	2.8
MR-J3-60_/70_/40_1	FR-BAL-1.5K	160	145	140	71	55 $^{0}_{-2.5}$	7.5	M4	M3.5	3.7
MR-J3-100_	FR-BAL-2.2K	160	145	140	91	75 $^{0}_{-2.5}$	7.5	M4	M3.5	5.6
MR-J3-200_	FR-BAL-3.7K	220	200	192	90	70 $^{0}_{-2.5}$	10	M5	M4	8.5
MR-J3-350_	FR-BAL-7.5K	220	200	194	120	100 $^{0}_{-2.5}$	10	M5	M5	14.5
MR-J3-500_	FR-BAL-11K	280	255	220	135	100 $^{0}_{-2.5}$	12.5	M6	M6	19
MR-J3-700_ MR-J3-11K_	FR-BAL-15K	295	270	275	133	110 $^{0}_{-2.5}$	12.5	M6	M6	27
MR-J3-15K_	FR-BAL-22K	290	240	301	199	170±5	25	M8	M8	35
MR-J3-22K_	FR-BAL-30K	290	240	301	219	190±5	25	M8	M8	43
MR-J3-60_4	FR-BAL-H1.5K	160	145	140	87	70 $^{0}_{-2.5}$	7.5	M4	M3.5	5.3
MR-J3-100_4	FR-BAL-H2.2K	160	145	140	91	75 $^{0}_{-2.5}$	7.5	M4	M3.5	5.9
MR-J3-200_4	FR-BAL-H3.7K	220	200	190	90	70 $^{0}_{-2.5}$	10	M5	M3.5	8.5
MR-J3-350_4	FR-BAL-H7.5K	220	200	192	120	100±5	10	M5	M4	14
MR-J3-500_4	FR-BAL-H11K	280	255	226	130	100±5	12.5	M6	M5	18.5
MR-J3-700_4 MR-J3-11K_4	FR-BAL-H15K	295	270	244	130	110±5	12.5	M6	M5	27
MR-J3-15K_4	FR-BAL-H22K	290	240	269	199	170±5	25	M8	M8	Approx. 35
MR-J3-22K_4	FR-BAL-H30K	290	240	290	219	190±5	25	M8	M8	Approx. 43

MR-J3W series

Total output of rotary servo motor	Power factor improving AC reactor	Dimensions [mm]						Mounting screw size	Terminal screw size	Mass [kg (lb)]
		W	W1	H	D	D1	C			
300 W or less	FR-BAL-0.4K	135	120	115	59	45	7.5	M4	M3.5	2.0 (4.41)
From over 300 W to 450 W	FR-BAL-0.75K	135	120	115	69	57	7.5	M4	M3.5	2.8 (6.17)
From over 450 W to 600 W	FR-BAL-1.5K	160	145	140	71	55	7.5	M4	M3.5	3.7 (8.16)
From over 600 W to 1 kW	FR-BAL-2.2K	160	145	140	91	75	7.5	M4	M3.5	5.6 (12.35)
From over 1 kW to 2.0 kW	FR-BAL-3.7K	220	200	192	90	70 $^{0}_{2.5}$	10	M5	M4	8.5 (18.74)

7.3 MR-J4 series Power factor improving DC reactors (200 V class)

POINT
●For the 100 V AC power supply type (MR-J4-_A1) and MR-J4W2 series, the power factor improving DC reactor cannot be used.

The following shows the advantages of using power factor improving DC reactor.

- It improves the power factor by increasing the form factor of the servo amplifier's input current.
- It decreases the power supply capacity.
- The input power factor is improved to be about 85%.
- As compared to the power factor improving AC reactor (FR-HAL-(H)), it decreases the loss.

When connecting the power factor improving DC reactor to the servo amplifier, always disconnect P3 and P4. If it remains connected, the effect of the power factor improving DC reactor is not produced.

When used, the power factor improving DC reactor generates heat. To release heat, therefore, leave a 10 cm or more clearance at each of the top and bottom, and a 5 cm or more clearance on each side.

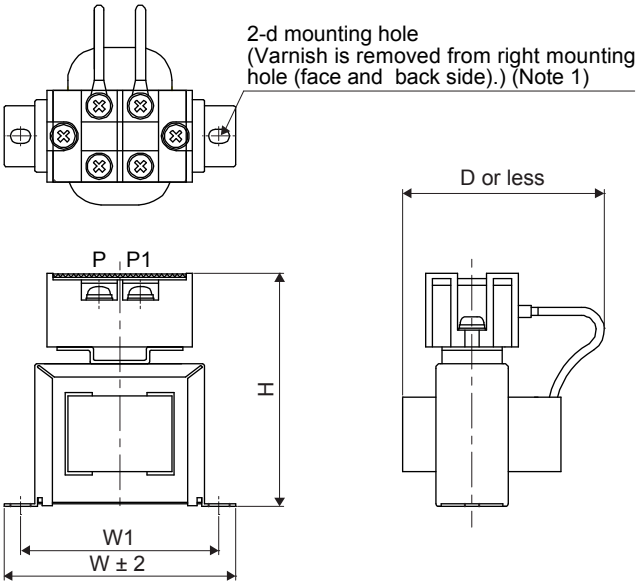


Fig. 8.3

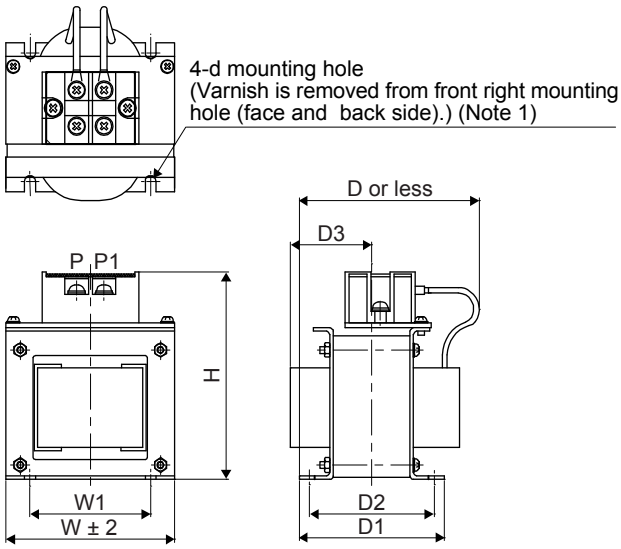


Fig. 8.4

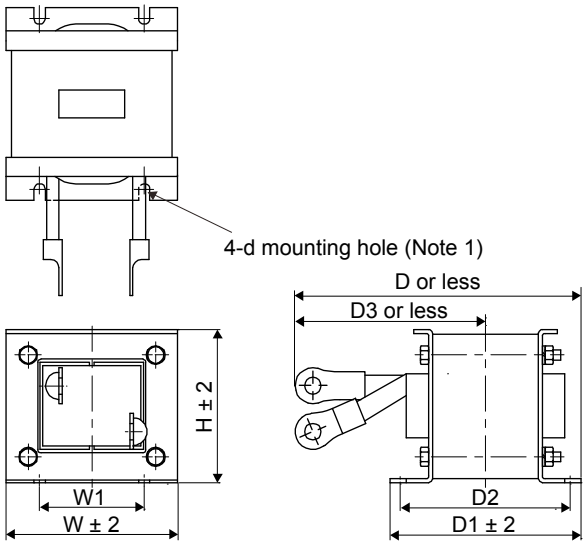
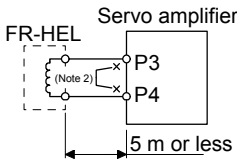


Fig. 8.5



Note 1. Use this for grounding.
2. When using the Power factor improving DC reactor, remove the short bar across P3-P4.

Servo amplifier	Power factor improving DC reactor	Outline drawing	Dimensions [mm]								Terminal size	Mass [kg]	Wire [mm²] (Note 2)
			W	W1	H	D (Note 1)	D1	D2	D3	d			
MR-J4-10_, MR-J4-20_	FR-HEL-0.4K	Fig. 8.3	70	60	71	61		21		M4	M4	0.4	2 (AWG 14)
MR-J4-40_	FR-HEL-0.75K		85	74	81	61		21		M4	M4	0.5	
MR-J4-60_, MR-J4-70_	FR-HEL-1.5K		85	74	81	70		30		M4	M4	0.8	
MR-J4-100_	FR-HEL-2.2K		85	74	81	70		30		M4	M4	0.9	
MR-J4-200_	FR-HEL-3.7K	Fig. 8.4	77	55	92	82	66	57	37	M4	M4	1.5	
MR-J4-350_	FR-HEL-7.5K		86	60	113	98	81	72	43	M4	M5	2.5	3.5 (AWG 12)
MR-J4-500_	FR-HEL-11K		105	64	133	112	92	79	47	M6	M6	3.3	5.5 (AWG 10)
MR-J4-700_	FR-HEL-15K		105	64	133	115	97	84	48.5	M6	M6	4.1	8 (AWG 8)
MR-J4-11K_	FR-HEL-15K		105	64	133	115	97	84	48.5	M6	M6	4.1	14 (AWG 6)
MR-J4-15K_	FR-HEL-22K		105	64	93	175	117	104	115 (Note 1)	M6	M10	5.6	22 (AWG 4)
MR-J4-22K_	FR-HEL-30K	Fig. 8.5	114	72	100	200	125	101	135 (Note 1)	M6	M10	7.8	38 (AWG 2)

Note 1. Maximum dimensions. The dimension varies depending on the input/output lines.

2. Selection conditions of wire size are as follows.
   Wire type: 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wire)
   Construction condition: Single wire set in midair

7.4 MR-J4 series Power factor improving DC reactors 400 V class

The following shows the advantages of using power factor improving DC reactor.

- It improves the power factor by increasing the form factor of the servo amplifier's input current.
- It decreases the power supply capacity.
- The input power factor is improved to be about 85%.
- As compared to the power factor improving AC reactor (FR-HAL-(H)), it decreases the loss.

When connecting the power factor improving DC reactor to the servo amplifier, always disconnect P3 and P4. If it remains connected, the effect of the power factor improving DC reactor is not produced.
When used, the power factor improving DC reactor generates heat. To release heat, therefore, leave a 10 cm or more clearance at each of the top and bottom, and a 5 cm or more clearance on each side.

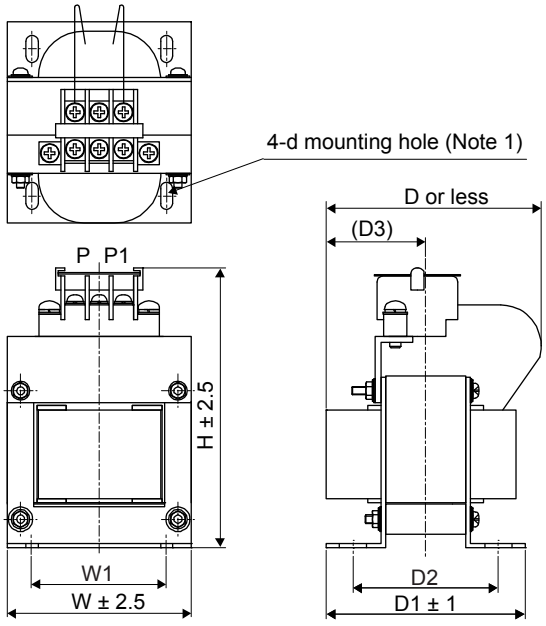


Fig. 8.6

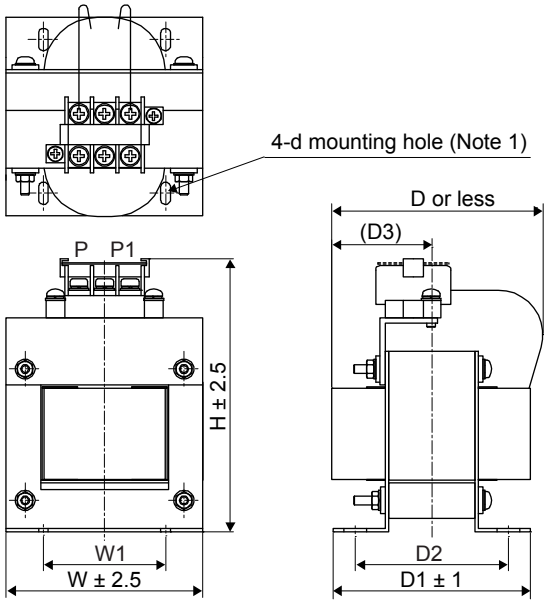
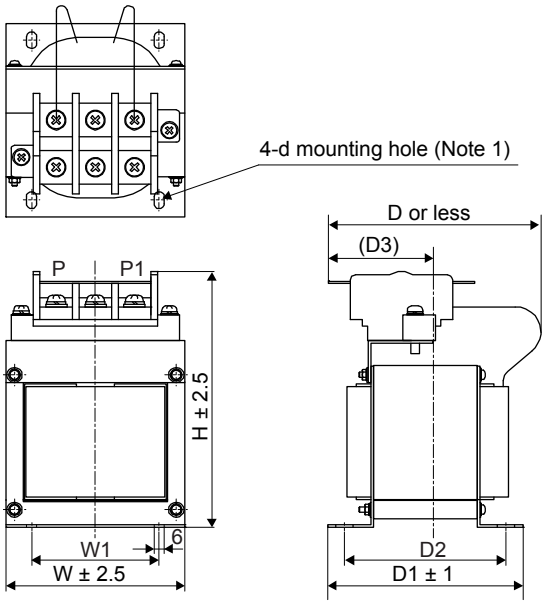


Fig. 8.7



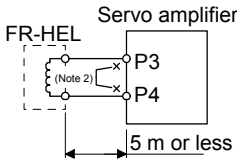


Fig. 8.8

Note 1. Use this for grounding.
2. When using the power factor improving DC reactor, remove the short bar across P3 and P4.

Servo amplifier	Power factor improving DC reactor	Outline drawing	Dimensions [mm]								Terminal size	Mass [kg]	Wire [mm^2] (Note)
			W	W1	H	D	D1	D2	D3	d			
MR-J4-60_4	FR-HEL-H1.5K	Fig. 8.6	66	50	100	80	74	54	37	M4	M3.5	1.0	2 (AWG 14)
MR-J4-100_4	FR-HEL-H2.2K		76	50	110	80	74	54	37	M4	M3.5	1.3	2 (AWG 14)
MR-J4-200_4	FR-HEL-H3.7K	Fig. 8.7	86	55	120	95	89	69	45	M4	M4	2.3	2 (AWG 14)
MR-J4-350_4	FR-HEL-H7.5K		96	60	128	105	100	80	50	M5	M4	3.5	2 (AWG 14)
MR-J4-500_4	FR-HEL-H11K		105	75	137	110	105	85	53	M5	M5	4.5	3.5 (AWG 12)
MR-J4-700_4	FR-HEL-H15K	Fig. 8.8	105	75	152	125	115	95	62	M5	M6	5.0	5.5 (AWG 10)
MR-J4-11K_4													8 (AWG 8)
MR-J4-15K_4	FR-HEL-H22K		133	90	178	120	95	75	53	M5	M6	6.0	8 (AWG 8)
MR-J4-22K_4	FR-HEL-H30K		133	90	178	120	100	80	56	M5	M6	6.5	14 (AWG 6)

Note. Selection conditions of wire size are as follows.

Wire type: 600 V grade heat-resistant polyvinyl chloride insulated wire (HIV wire)

Construction condition: Single wire set in midair

7.5 MR-J4 series Power factor improving AC reactors 200 V/100 V class

The following shows the advantages of using power factor improving AC reactor.

- It improves the power factor by increasing the form factor of the servo amplifier's input current.
- It decreases the power supply capacity.
- The input power factor is improved to be about 80%.

When using power factor improving reactors for two servo amplifiers or more, be sure to connect a power factor improving reactor to each servo amplifier. If using only one power factor improving reactor, enough improvement effect of phase factor cannot be obtained unless all servo amplifiers are operated.

When using the MR-J4W2 servo amplifier together with the rotary servo motor, select a power factor improving AC reactor tentatively, assuming one type of the servo motors are used for 2 axes. After the tentative selections are made for all types of the servo motors, use the largest among all power factor improving AC reactors.

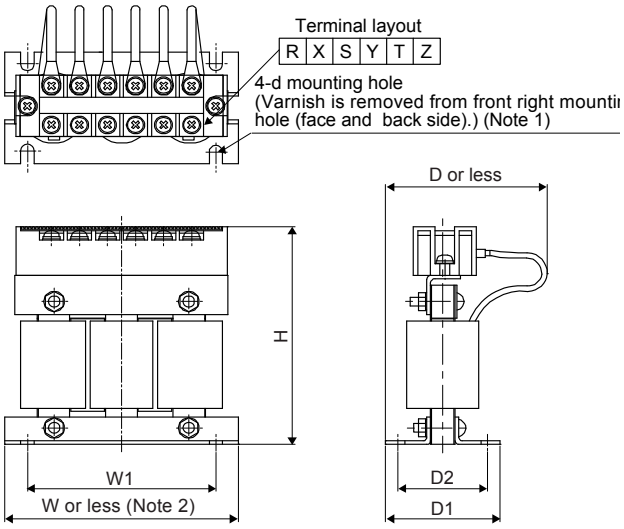
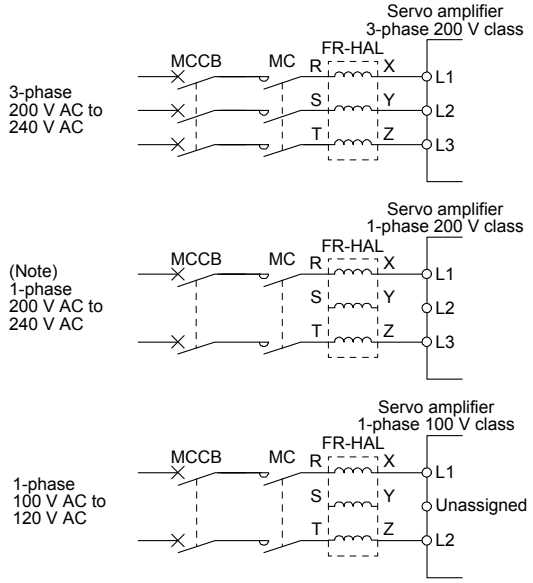


Fig. 8.9

Note 1. Use this hole for grounding.
2. W ± 2 is applicable for FR-HAL-0.4K to FR-HAL-1.5K.



Note. For 1-phase 200 V AC to 240 V AC, connect the power supply to L1 and L3. Leave L2 open.

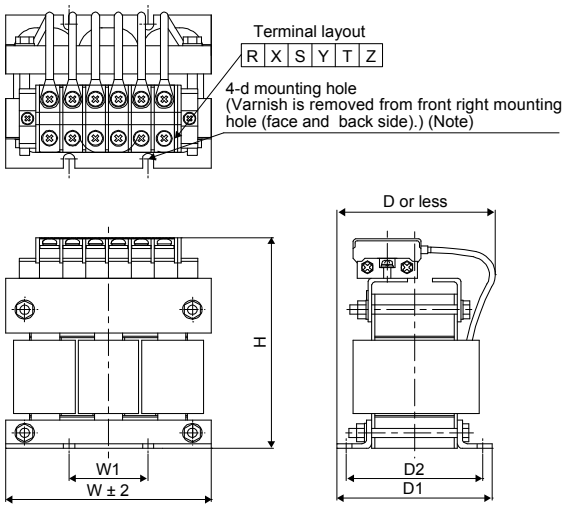


Fig. 8.10

Note. Use this hole for grounding.

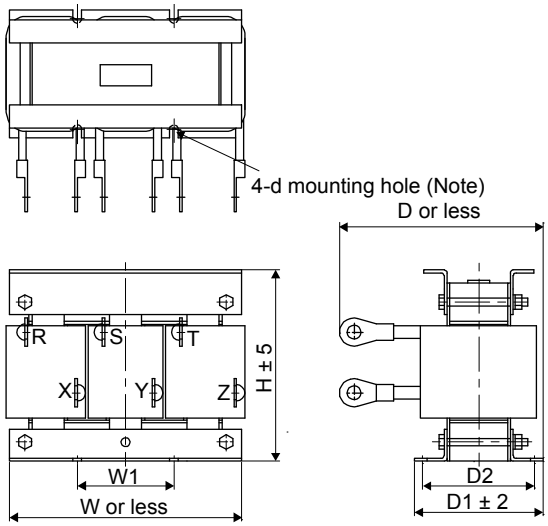


Fig. 8.11

Note. Use this for grounding.

Servo amplifier	Power factor improving AC reactor	Outline drawing	Dimensions [mm]							Terminal size	Mass [kg]
			W	W1	H	D (Note)	D1	D2	d		
MR-J4-10_, MR-J4-20_	FR-HAL-0.4K	Fig. 8.9	104	84	99	72	51	40	M5	M4	0.6
MR-J4-40_	FR-HAL-0.75K		104	84	99	74	56	44	M5	M4	0.8
MR-J4-60_, MR-J4-70_	FR-HAL-1.5K		104	84	99	77	61	50	M5	M4	1.1
MR-J4-100_	FR-HAL-2.2K		115 (Note)	40	115	77	71	57	M6	M4	1.5
MR-J4-200_	FR-HAL-3.7K		115 (Note)	40	115	83	81	67	M6	M4	2.2
MR-J4-350_	FR-HAL-7.5K	Fig. 8.10	130	50	135	100	98	86	M6	M5	4.2
MR-J4-500_	FR-HAL-11K		160	75	164	111	109	92	M6	M6	5.2
MR-J4-700_	FR-HAL-15K		160	75	167	126	124	107	M6	M6	7.0
MR-J4-11K_	FR-HAL-15K		160	75	167	126	124	107	M6	M6	7.0
MR-J4-15K_	FR-HAL-22K		185 (Note)	75	150	158	100	87	M6	M8	9.0
MR-J4-22K_	FR-HAL-30K	Fig. 8.11	185 (Note)	75	150	168	100	87	M6	M10	9.7

Note. Maximum dimensions. The dimension varies depending on the input/output lines.

(1) For MR-J4W2-_B servo amplifier

Total output of rotary servo motors	Power factor improving AC reactor
450 W or less	FR-HAL-0.75K
From over 450 W to 600 W	FR-HAL-1.5K
From over 600 W to 1 kW	FR-HAL-2.2K
From over 1 kW to 2.0 kW	FR-HAL-3.7K

7.6 MR-J4 series Power factor improving AC reactors 400 V class

The following shows the advantages of using power factor improving AC reactor.

- It improves the power factor by increasing the form factor of the servo amplifier's input current.
- It decreases the power supply capacity.
- The input power factor is improved to be about 80%.

When using power factor improving reactors for two servo amplifiers or more, be sure to connect a power factor improving reactor to each servo amplifier. If using only one power factor improving reactor, enough improvement effect of phase factor cannot be obtained unless all servo amplifiers are operated.

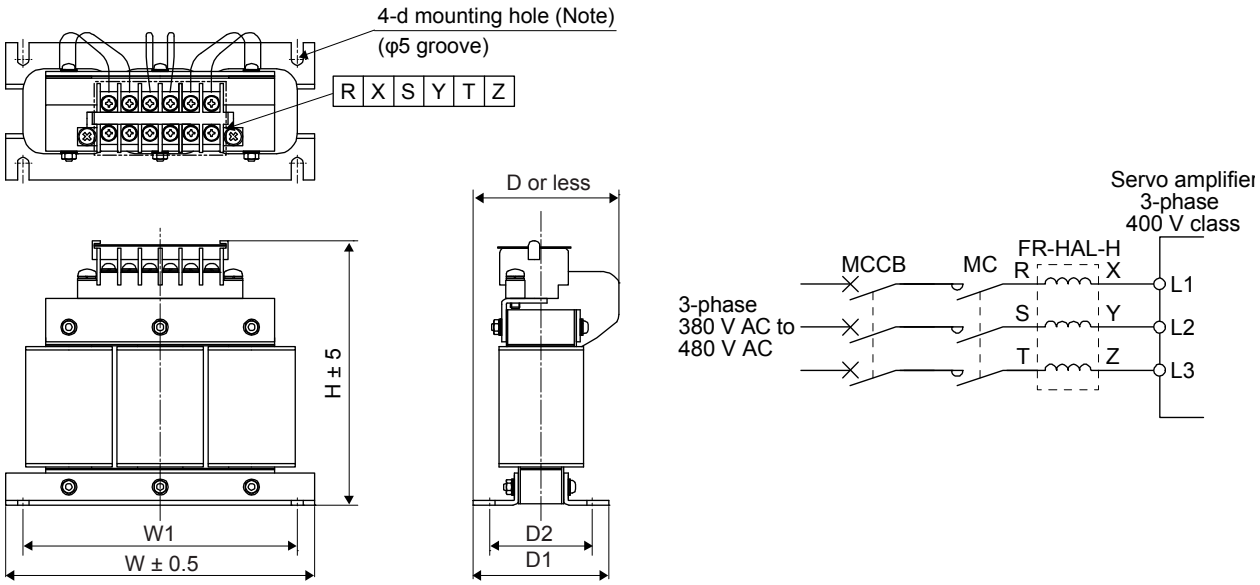


Fig. 8.15

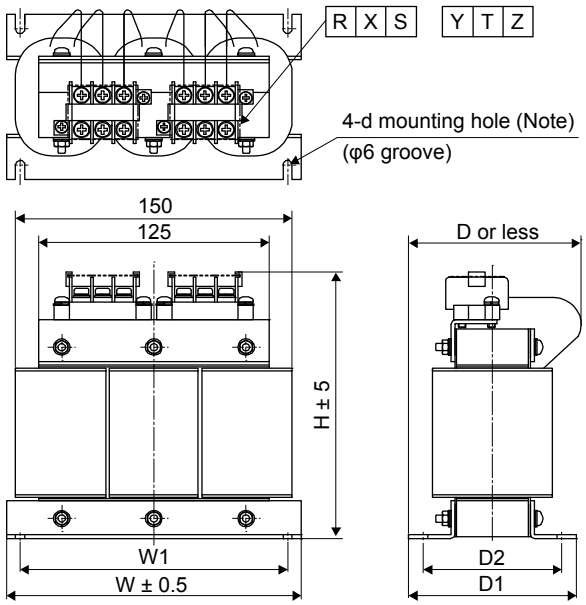


Fig. 8.16

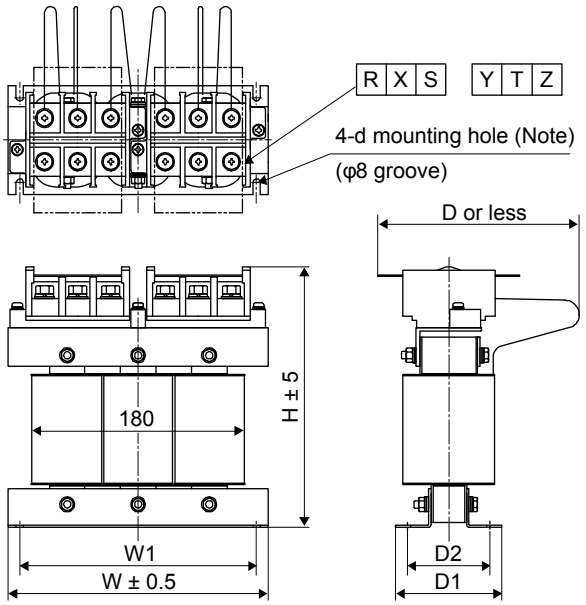


Fig. 8.17

Note. Use this for grounding.

Servo amplifier	Power factor improving AC reactor	Outline drawing	Dimensions [mm]							Terminal size	Mass [kg]
			W	W1	H	D (Note)	D1	D2	d		
MR-J4-60_4	FR-HAL-H1.5K	Fig. 8.15	135	120	115	59	59.6	45	M4	M3.5	1.5
MR-J4-100_4	FR-HAL-H2.2K		135	120	115	59	59.6	45	M4	M3.5	1.5
MR-J4-200_4	FR-HAL-H3.7K		135	120	115	69	70.6	57	M4	M3.5	2.5
MR-J4-350_4	FR-HAL-H7.5K	Fig. 8.16	160	145	142	91	91	75	M4	M4	5.0
MR-J4-500_4	FR-HAL-H11K		160	145	146	91	91	75	M4	M5	6.0
MR-J4-700_4 MR-J4-11K_4	FR-HAL-H15K		220	200	195	105	90	70	M5	M5	9.0
MR-J4-15K_4	FR-HAL-H22K	Fig. 8.17	220	200	215	170	90	70	M5	M8	9.5
MR-J4-22K_4	FR-HAL-H30K		220	200	215	170	96	75	M5	M8	11

Note. Maximum dimensions. The dimension varies depending on the input/output lines.

8. SETUP SOFTWARE (SETUP221E)

8.1 MR-J3/MR-J3W series Setup Software (SETUP221E)

The Setup Software (MRZJW3-SETUP221E) uses the communication function of the servo amplifier to perform parameter setting changes, graph display, test operation, etc. on a personal computer.

* MR Configurator2 (SW1DNC-MRC2-E) is available for the MR-J3/MR-J3W series.

8.1.1 Specifications

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Compatibility with a servo amplifier</td><td>The following table shows Setup Software (SETUP221E) software version for each servo amplifier.
<table>
<tr><th rowspan="3">Version</th><th colspan="6">Compatible servo amplifier (Drive unit)</th></tr>
<tr><th colspan="3">200 V class</th><th colspan="3">400 V class</th></tr>
<tr><th>7 kW or less</th><th>11 to 22 kW</th><th>30 to 37 kW</th><th>7 kW or less</th><th>11 to 22 kW</th><th>30 to 55 kW</th></tr>
<tr><td>B0 to B2</td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>B3</td><td>O</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>B4</td><td>O</td><td>O</td><td></td><td></td><td>O</td><td></td></tr>
<tr><td>B5</td><td>O</td><td>O</td><td>O</td><td></td><td>O</td><td>O</td></tr>
<tr><td>B8 or later</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td><td>O</td></tr>
</table>
O: Enabled
<table>
<tr><th>Version</th><th>MR-J3W series servo amplifier</th></tr>
<tr><td>CO or later (Note1)</td><td>O</td></tr>
</table></td></tr>
<tr><td>Baud rate [bps]</td><td>115200/57600/38400/19200/9600</td></tr>
<tr><td>Monitor</td><td>Display all, high-speed display, graph display
(Minimum resolution changes with the processing speed of the personal computer.)</td></tr>
<tr><td>Alarm</td><td>Display, history, amplifier data</td></tr>
<tr><td>Diagnosis</td><td>DI/DO display, display of the reason for no rotation, power ON cumulative display, software No. display, motor information display, tuning data display, ABS data display, VC automatic offset display, axis name setting</td></tr>
<tr><td>Parameter</td><td>Parameter list, turning, change list, detailed information</td></tr>
<tr><td>Test operation</td><td>JOG operation, positioning operation, motor-less operation, DO forced output, and program operation</td></tr>
<tr><td>Advanced function (Note2)</td><td>Machine analyzer, gain search, machine simulation, robust disturbance compensation, advanced Gain search</td></tr>
<tr><td>File operation</td><td>Data read, save, delete, print</td></tr>
<tr><td>Others</td><td>Automatic demo, help display</td></tr>
</table>

Note 1. C3 or later software version is recommended.
2. The advanced gain search is supported by MR Configurator with software version C2 or later.

8.2 MR-J4 series MR Configurator2

MR Configurator2 (SW1DNC-MRC2-E) uses the communication function of the servo amplifier to perform parameter setting changes, graph display, test operation, etc. on a personal computer.

8.2.1 Specifications

Item	Description
Project	Create/read/save/delete project, system setting, and print
Parameter	Parameter setting, axis name setting, parameter converter
Monitor	Display all, I/O monitor, graph, and ABS data display
Diagnosis	Alarm display, alarm onset data, drive recorder, no motor rotation, system configuration, life diagnosis, machine diagnosis
Test operation	Positioning operation, motor-less operation (Note), DO forced output, and program operation, test mode information
Adjustment	One-touch tuning, tuning, and machine analyzer
Others	Servo assistant, parameter setting range update, help display

Note. This is available only in the standard control mode.

8.3 System configuration

8.3.1 Components

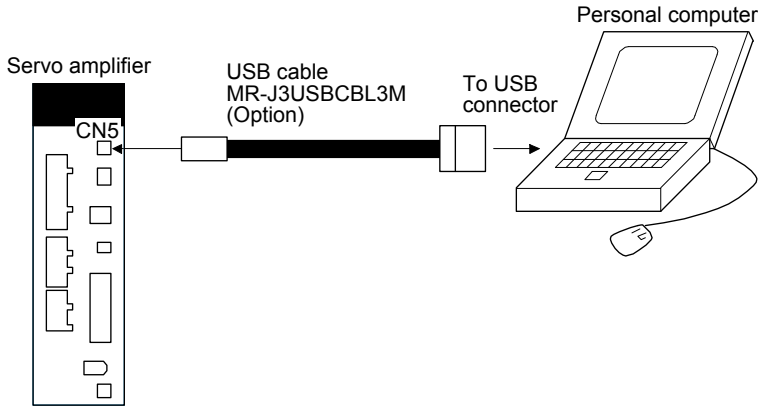
MR Configurator2 (SW1DNC-MRC2-E) the following components are required in addition to the servo amplifier and servo motor.

Equipment		Description (Note 1)
Personal computer (Note 2, 3, 4, 5)	OS	Microsoft® Windows® 10 Home Operating System Microsoft® Windows® 10 Pro Operating System Microsoft® Windows® 10 Enterprise Operating System Microsoft® Windows® 10 Education Operating System Microsoft® Windows® 8.1 Operating System Microsoft® Windows® 8.1 Pro, Operating System Microsoft® Windows® 8.1 Enterprise Operating System Microsoft® Windows® 8 Operating System Microsoft® Windows® 8 Pro Operating System Microsoft® Windows® 8 Enterprise Operating System Microsoft® Windows® 7 Starter Operating System Microsoft® Windows® 7 Home Premium Operating System Microsoft® Windows® 7 Professional Operating System Microsoft® Windows® 7 Ultimate Operating System Microsoft® Windows® 7 Enterprise Operating System Microsoft® Windows Vista® Enterprise Operating System (Note 6) Microsoft® Windows Vista® Ultimate Operating System (Note 6) Microsoft® Windows Vista® Business Operating System (Note 6) Microsoft® Windows Vista® Home Premium Operating System (Note 6) Microsoft® Windows Vista® Home Basic Operating System (Note 6) Microsoft® Windows® XP Professional Operating System SP3 (Note 6) Microsoft® Windows® XP Home Edition Operating System SP3 (Note 6)
	CPU	Desktop personal computer: Intel® Celeron® processor, 2.8 GHz or more recommended Laptop personal computer: Intel® Pentium® M processor, 1.7 GHz or more recommended
	Memory	512 MB or more (for 32-bit OS) and 1 GB or more (for 64-bit OS)
	Hard Disk	1 GB or more of free space
	Communication Interface	USB port (Note 6).
Browser	Windows® Internet Explorer® 4.0 or later (Note 1)	
Display	One whose resolution is 1024 × 768 or more and that can provide a high color (16 bit) display. Connectable with the above personal computer.	
Keyboard	Connectable with the above personal computer.	
Mouse	Connectable with the above personal computers.	
Printer	Connectable with the above personal computer.	
USB cable	MR-J3USBCBL3M	

Note 1. Microsoft, Windows, Internet Explorer, and Windows Vista are registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.
Celeron, Pentium is the registered trademarks of Intel Corporation.

2. When Windows® 7 or later is used, NET Framework 3.5 (including .NET2.0 and 3.0) must be enabled.
3. When the following functions are used, this product may not operate correctly.• Windows Program Compatibility mode
   - Windows® Program Compatibility mode
   - Remote Desktop
   - Windows touch or touch
   - Client Hyper-V
   - Virtual desktop
   - Fast User Switching
   - Windows XP Mode
   - Modern UI
   - Tablet mode
4. In the following cases, the display of this product may not operate correctly.
   - The size of the text or other items on the screen is set to other than the prescribed value (96DPI, 100%. 9pt, etc.).
   - Resolution of the screen is changed during operation.
   - The screen is set as multi display.
5. When using this software with Windows Vista® or later, log in as "Standard user" or "Administrator".
6. 64-bit Windows is not supported.

8.3.2 Connection with servo amplifier



8.3.3 Precautions for using USB communication function

Note the following to prevent an electric shock and malfunction of the servo amplifier.

(1) Power connection of personal computers
Connect your personal computer with the following procedures.

(a) When you use a personal computer with AC power supply
1) When using a personal computer with a three-core power plug or power plug with grounding wire, use a three-pin socket or ground the grounding wire.
2) When your personal computer has two-core plug and has no grounding wire, connect the personal computer to the servo amplifier with the following procedures.
a) Disconnect the power plug of the personal computer from an AC power socket.
b) Check that the power plug was disconnected and connect the device to the servo amplifier.
c) Connect the power plug of the personal computer to the AC power socket.

(b) When you use a personal computer with battery
You can use as it is.

(2) Connection with other devices using servo amplifier communication function
When the servo amplifier is charged with electricity due to connection with a personal computer and the charged servo amplifier is connected with other devices, the servo amplifier or the connected devices may malfunction. Connect the servo amplifier and other devices with the following procedures.

(a) Shut off the power of the device for connecting with the servo amplifier.

(b) Shut off the power of the servo amplifier which was connected with the personal computer and check the charge lamp is off.

(c) Connect the device with the servo amplifier.

(d) Turn on the power of the servo amplifier and the device.

9. PANEL THROUGH ATTACHMENT

POINT

●MR-J3ACN can be used only for MR-J4-22K_(4).

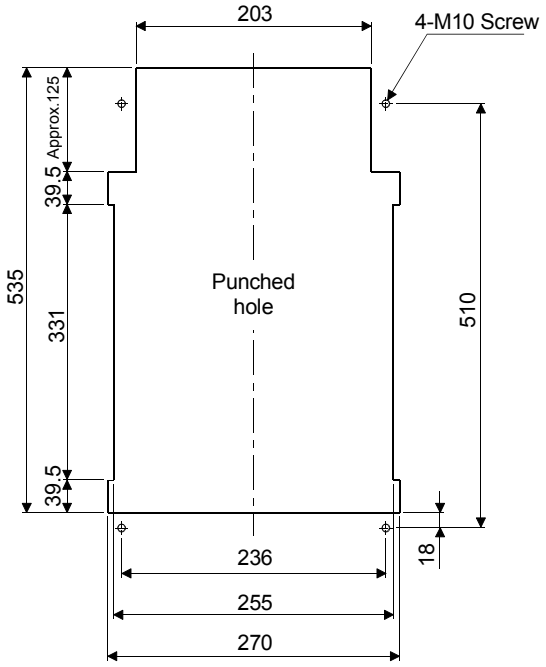
Panel through attachment	MR-J3 series	MR-J4 series
MR-J4ACN15K		MR-J4-11K_(4)(-RJ) MR-J4-15K_(4)(-RJ)
MR-J3ACN	MR-J3-11K_(4) to MR-J3-22K_(4)	MR-J4-22KA(4)(-RJ)

9.1 MR-J3 series (MR-J3ACN)

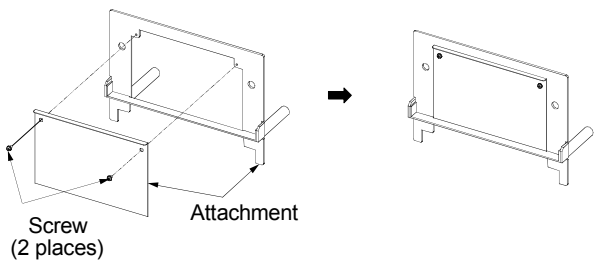
Use the Panel through attachment to mount the heat generation area of the servo amplifier in the outside of the control box to dissipate servo amplifier-generated heat to the outside of the box and reduce the amount of heat generated in the box, thereby allowing a compact control box to be designed.
In the control box, machine a hole having the panel cut dimensions, fit the panel through attachment to the servo amplifier with the fitting screws (4 screws supplied), and install the servo amplifier to the control box.
The environment outside the control box when using the panel through attachment should be within the range of the servo amplifier operating environment conditions.

(1) Panel cut dimensions

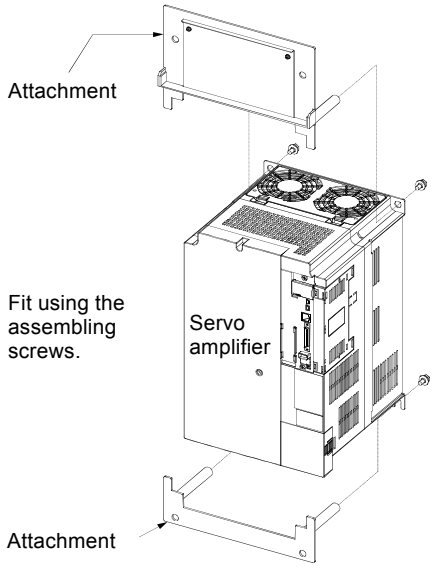
[Unit : mm]



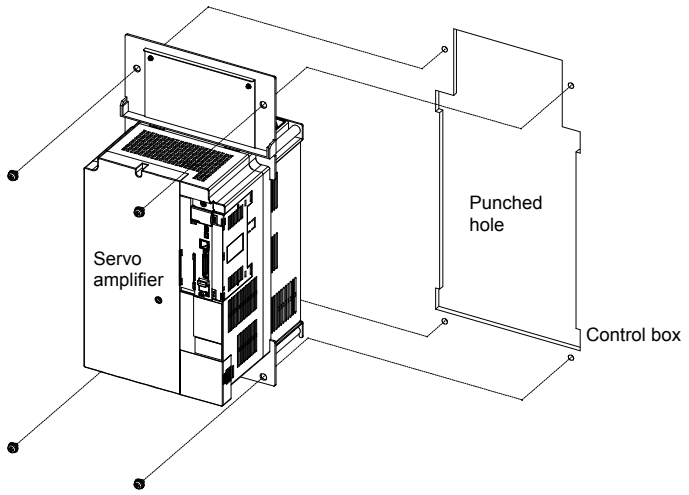
(2) How to assemble the attachment for a panel through attachment



(3) Fitting method



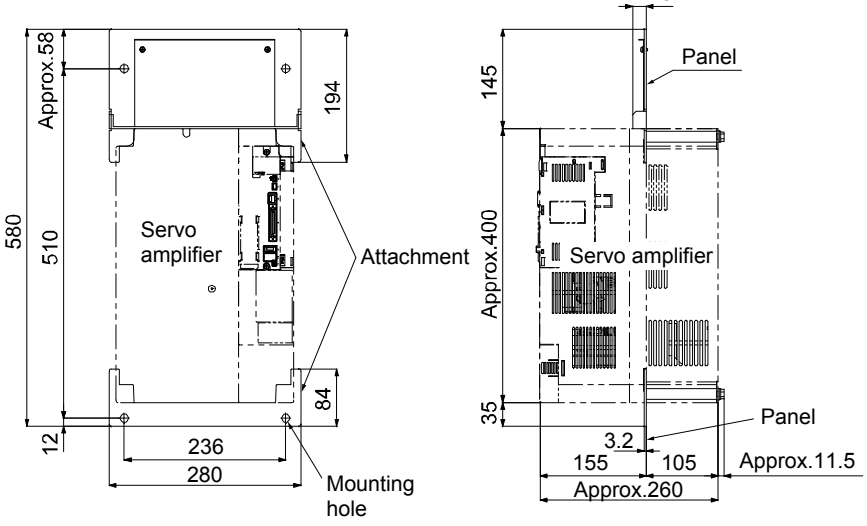
a. Assembling the panel through attachment

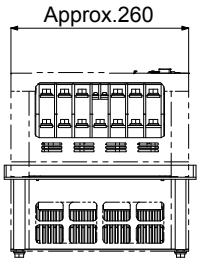


b. Installation to the control box

(4) Outline dimension drawing

[Unit: mm]





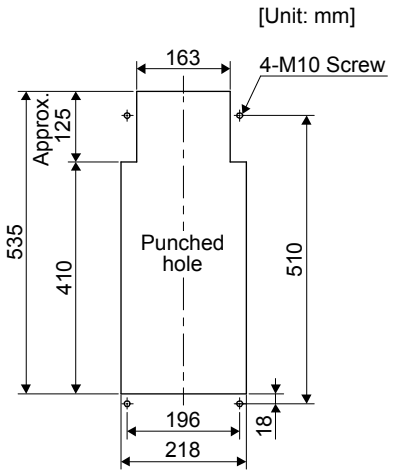
9.2 MR-J4 series (MR-J4ACN15K/MR-J3ACN)

Use the panel through attachment to mount the heat generation area of the servo amplifier in the outside of the cabinet to dissipate servo amplifier-generated heat to the outside of the cabinet and reduce the amount of heat generated in the cabinet. In addition, designing a compact cabinet is allowed.
In the cabinet, machine a hole having the panel cut dimensions, fit the panel through attachment to the servo amplifier with the fitting screws (4 screws supplied), and install the servo amplifier to the cabinet.
Please prepare screws for mounting. They do not come with.
The environment outside the cabinet when using the panel through attachment should be within the range of the servo amplifier operating environment.
The panel through attachments are used for MR-J4-11K_(-RJ) to MR-J4-22K_(-RJ) and MR-J4-11K_4(-RJ) to MR-J4-22K_4(-RJ).
The following shows the combinations.

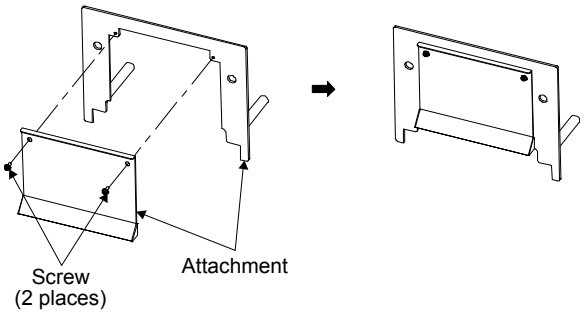
Servo amplifier	Panel through attachment
MR-J4-11K_(-RJ) MR-J4-15K_(-RJ)	MR-J4ACN15K
MR-J4-22K_(-RJ)	MR-J3ACN
MR-J4-11K_4(-RJ) MR-J4-15K_4(-RJ)	MR-J4ACN15K
MR-J4-22K_4(-RJ)	MR-J3ACN

(1) MR-J4ACN15K

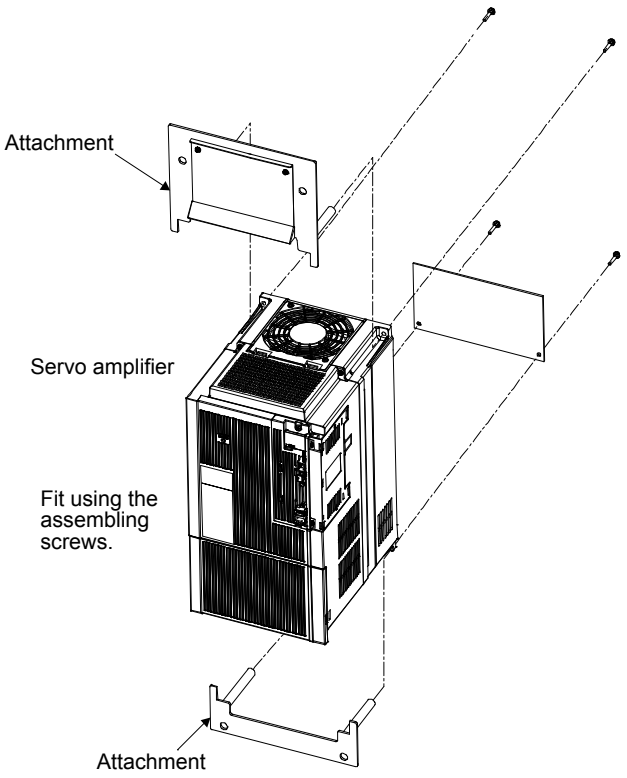
(a) Panel cut dimensions



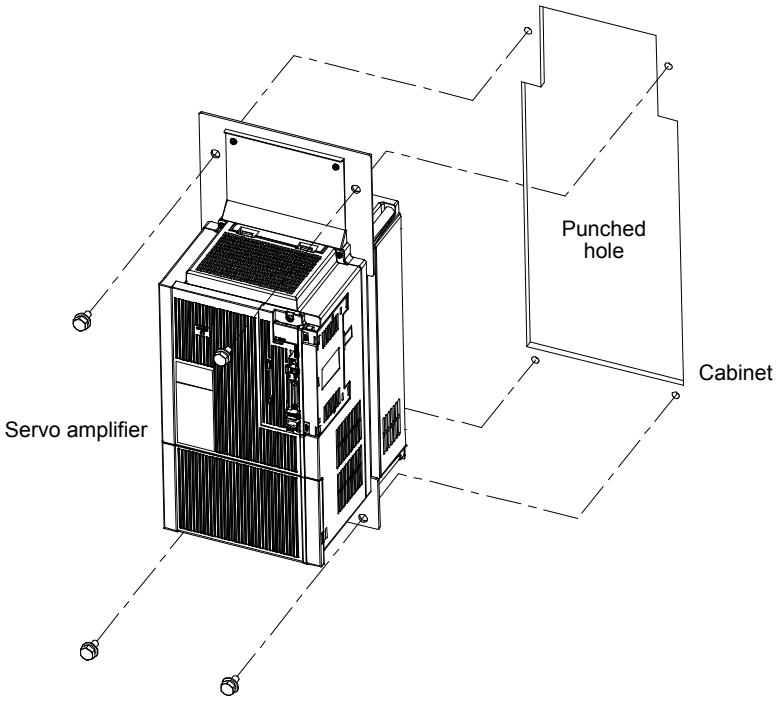
(b) How to assemble the attachment for panel through attachments



(c) Mounting method



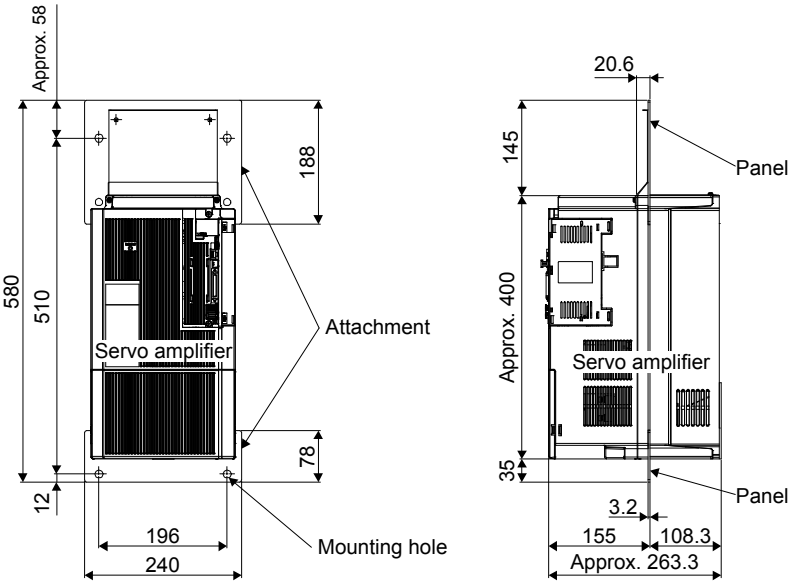
a. Assembling the panel through attachment



b. Mounting it to inside cabinet

(d) Mounting dimensional diagram

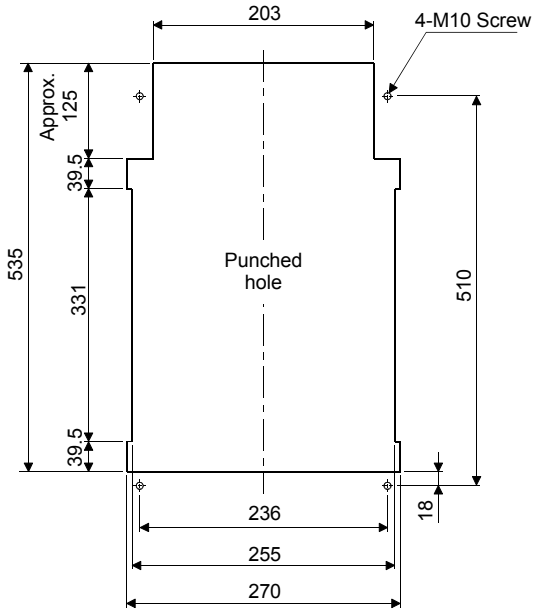
[Unit: mm]



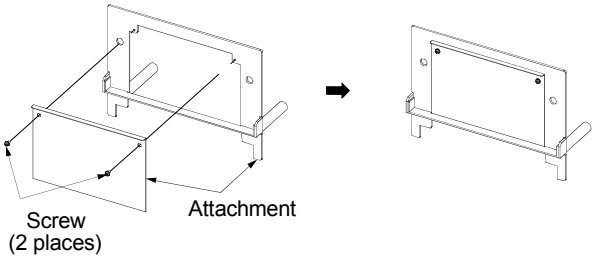
(2) MR-J3ACN

(a) Panel cut dimensions

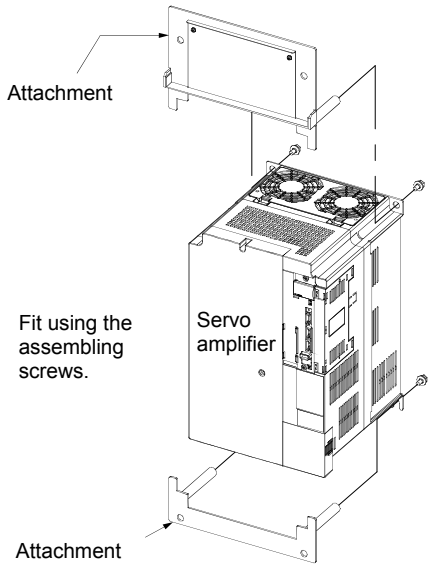
[Unit : mm]



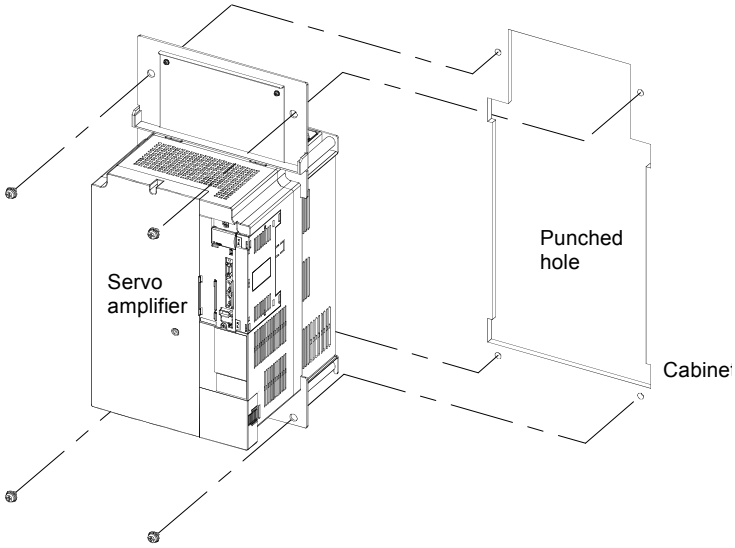
(b) How to assemble the attachment for panel through attachment



(c) Mounting method



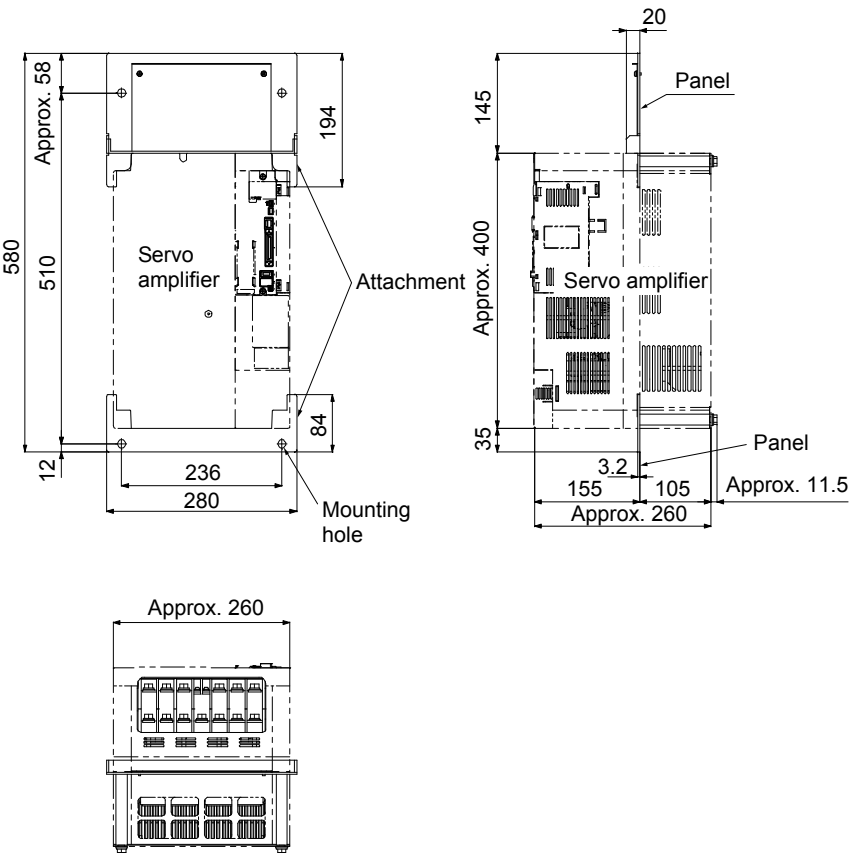
a. Assembling the panel through attachment



b. Mounting it to inside cabinet

(d) Mounting dimensional diagram

[Unit: mm]



Part 9
Startup Procedure Manual

Part 9: Startup Procedure Manual

1. STARTUP

⚠WARNING	●When executing a test run, follow the notice and procedures in this instruction manual. Otherwise, it may cause a malfunction, damage to the machine, or injury. ●Do not operate the switches with wet hands. Otherwise, it may cause an electric shock.

⚠CAUTION	●Before starting operation, check the parameters. Improper settings may cause some machines to operate unexpectedly. ●The servo amplifier heat sink, regenerative resistor, servo motor, etc., may be hot while power is on or for some time after power-off. Take safety measures, example, provide covers to avoid accidentally touching the parts (cables, etc.) by hand. Otherwise, it may cause a burn injury and parts damaged. ●During operation, never touch the rotor of the servo motor. Otherwise, it may cause injury. ●Before wiring, switch operation, etc., eliminate static electricity. Otherwise, it may cause a malfunction.

1.1 Switching power on for the first time

When switching power on for the first time, follow this section to make a startup.

1.1.1 Startup procedure

Parameter settings check for the currently used model	・・・ Confirm the parameter settings of the currently used MR-J3/MR-J3W servo amplifier with the display or with the setup software and record them.
↓	
Wiring check	・・・ Visually verify that the wires are correctly connected to the servo amplifier and the servo motor.
↓	
Surrounding environment check	・・・ Check the surrounding environment of the servo amplifier and servo motor.
↓	
Parameter setting (Note 1)	・・・ Set the parameters as necessary, such as the used control mode and regenerative option selection. (Refer to this Replacement Manual.)
↓	
Test operation of the servo motor alone in the test operation mode (Note 1, 2)	・・・ For the test operation, with the servo motor disconnected from the machine and operated at the speed as low as possible, check whether the servo motor rotates correctly.
↓	
Test operation with the servo motor and machine connected	・・・ After connecting the servo motor to the machine, check the motions of the machine by sending operation commands from a higher-level command-issuing device.
↓	
Gain adjustment (Note 1)	・・・ Make gain adjustment to optimize the machine motions.
↓	
Actual operation (Note 2)	・・・ Perform a home position return as necessary when in position control mode.
↓	
Stop	・・・ Stop giving commands and stop operation. In addition, check the conditions when the servo motor operation stops.

Note 1. For details about the settings for each servo amplifier and its test operation, refer to the applicable Servo Amplifier Instruction Manual. If the gain of the existing servo amplifier is extremely high, there may be slight differences in characteristics upon primary replacement. Make sure to set the gain again.

2. When turning on the power supply, also turn on the 24V DC power supply for the external interface. Otherwise, AL. E6.1 occurs.

MEMO

[Appendix 1] Introduction to Renewal Tool

Mitsubishi Electric System & Service Co., Ltd. provides the related services.
For details, please refer to the following address.

Mitsubishi Electric System & Service Co., Ltd.
http://www.melsc.co.jp/business/

OVERSEAS SERVICE SUPPORT SECTION
Email: osb.webmaster@melsc.jp

[Appendix 1] Introduction to Renewal Tool

POINT
●For details and the latest version of the tool and compatible models, check the website of Mitsubishi Electric System & Service Co., Ltd.

1. SUMMARY

The MR-J3 renewal tool is a tool to replace the presently used "MR-J3 series", "MR-J3W series" servo amplifier with the "MR-J4 series" servo amplifier. We are prepared to provide mounting attachments compatible with the existing mounting dimensions and conversion cables compatible with the existing cables.

1.1 Servo amplifier replacement model

Type	Former model		Replacement
General-purpose interface	MR-J3-_A MR-J3-_A4	→	MR-J4-_A MR-J4-_A4
SSCNET Interface	MR-J3-_B MR-J3-_B4		MR-J4-_B MR-J4-_B4
	MR-J3W-_B		MR-J4W2-_B

1.2 Features

・Wiring work can be shortened because the existing cables can be connected as they are. (except for some models)
・The renewal kit can be mounted using the existing mounting holes.

2. IMPORTANT POINTS TO NOTE WHEN REPLACING

(1) Depending on the condition of the existing setup, sometimes noise reduction techniques are necessary when replacing.

(2) When using the existing cables, please consider the remaining life of the cables. If deterioration is significant, replacing with a new cable is recommended.

(3) Because the conversion cable does not have a long bending life, fix the cable when using.

(4) When using the control signal conversion cable "SC-J3WJ4WCTC03M", refer to the cable connection diagram in section 6.2.5.

(5) Contact a Mitsubishi Electric. if the existing MR-J3 servo amplifier or servo motor is a special product.

3. REPLACMENT COMBINATION LIST

3.1 Servo amplifier replacement combination list

(1) Replacement model and tool for replacing MR-J3 series with MR-J4 series

(a) General-Purpose Interface/SSCNET Interface 200 V class

model	Replacement models (example)	Connector compatibility	Attachment compatibility	Conversion cable	Mounting attachment
MR-J3-10_	MR-J4-10_	(Note 1)	○		
MR-J3-20_	MR-J4-20_	(Note 1)	○		
MR-J3-40_	MR-J4-40_	(Note 1)	○		
MR-J3-60_	MR-J4-60_	(Note 1)	○		
MR-J3-70_	MR-J4-70_	(Note 1)	○		
MR-J3-100_	MR-J4-100_	(Note 1)	○		
MR-J3-200_ (N)(-RT)	MR-J4-200_	(Note 1)	○		
MR-J3-350_	MR-J4-350_	(Note 1)	○		
MR-J3-500_	MR-J4-500_	○	(Note 2)		SC-J2SJ4BS04
MR-J3-700_	MR-J4-700_	○	○		
MR-J3-11K_	MR-J4-11K_	○	(Note 2)		SC-J2SJ4BS06
MR-J3-11K_-LR					
MR-J3-15K_	MR-J4-15K_	○	(Note 2)		
MR-J3-15K_-LR					
MR-J3-22K_	MR-J4-22K_	○	○		

Note 1. As for servo amplifiers of 3.5 kW or less, replace the power connector (CNP1, CNP2, and CNP3) with the ones supplied with the servo amplifier.
2. Existing mounting holes are available by using a mounting attachment.

(b) General-Purpose Interface/SSCNET Interface 400 V class

model	Replacement models (example)	Connector compatibility	Attachment compatibility	Conversion cable	Mounting attachment
MR-J3-60_4	MR-J4-60_4	(Note 1)	○		
MR-J3-100_4	MR-J4-100_4	(Note 1)	○		
MR-J3-200_4	MR-J4-200_4	(Note 1)	○		
MR-J3-350_4	MR-J4-350_4	(Note 1)	(Note 2)		SC-J2SJ4BS04
MR-J3-500_4	MR-J4-500_4	○	○		
MR-J3-700_4	MR-J4-700_4	○	○		
MR-J3-11K_4	MR-J4-11K_4	○	(Note 2)		SC-J2SJ4BS06
MR-J3-11K_4-LR					
MR-J3-15K_4	MR-J4-15K_4	○	(Note 2)		
MR-J3-15K_4-LR					
MR-J3-22K_4	MR-J4-22K_4	○	○		

Note 1. As for servo amplifiers of 3.5 kW or less, replace the power connector (CNP1, CNP2, and CNP3) with the ones supplied with the servo amplifier.
2. Existing mounting holes are available by using a mounting attachment.

(2) Replacement model and tool for replacing MR-J3W series with MR-J4 series

(a) SSCNET Interface 200 V class

model	Replacement models (example)	Connector compatibility	Attachment compatibility	Conversion cable (Note 3)	Mounting attachment
MR-J3W-22B	MR-J4W2-22B	(Note 1)	○	SC-J3WJ4WCTC03M (Control signal conversion cable)	
MR-J3W-44B	MR-J4W2-44B	(Note 1)	○		
MR-J3W-77B	MR-J4W2-77B	(Note 1)	(Note 2)		SC-J3WJ4WBS02
MR-J3W-1010B	MR-J4W2-1010B	(Note 1)	(Note 2)		

Note 1. A conversion cable is required since the pin assignment is different though the connector for control signal is the same.
2. Existing mounting holes are available by using a mounting attachment.
3. A conversion cable is not required since the power cable and encoder cable have connector compatibility.

3.2 Servo Motor Substitute Model and Compatibility

POINT

●Refer to the website of Mitsubishi Electric System & Service for the latest details and models.
●The symbols in the table mean as follows.
(B): With brake
(4): 400 V specifications
●For notes, refer to App. 1-5.
●Some model does not have connector compatibility. Check "Conversion cable" in the following table.

(1) Medium capacity, low inertia HC-LP series

Model	Replacement models (example)	Connector compatibility	Conversion cable			
			Power supply cable	Electromagnetic brake cable	Encoder cable	Cooling fan cable
HC-LP52(B)	HG-JR73(B)	×	SC-SAJ3PW2KC1M-S2	(Note 2)	Existing cable can be used.	
HC-LP102(B)	HG-JR153(B)	×	(Note 1)			
HC-LP152(B)	HG-JR353(B)	×				
HC-LP202(B)	HG-JR353(B)	×	SC-HAJ3PW1C1M			
HC-LP302(B)	HG-JR503(B)	×				

(2) HA-LP series

Model	Replacement models (example)	Connector compatibility	Conversion cable			
			Power supply cable	Electromagnetic brake cable	Encoder cable	Cooling fan cable
HA-LP601(4)(B)	HG-JR601(4)(B)	×	SC-J2SJ4PW3C1M-A_	Existing cable can be used.	SC-J3J4ENM1C1M (Note 4) SC-J3J4ENM1C1M-A_ (Note 4)	(Note 3)
HA-LP801(4)(B)	HG-JR801(4)(B)	×				
HA-LP12K1(4)(B)	HG-JR12K1(4)(B)	×				
HA-LP15K1(4)	HG-JR15K1(4)	×	(Note 5)		(Note 6)	SC-J2SJ4FAN1C1M
HA-LP20K1(4)	HG-JR20K1(4)	×				
HA-LP25K1(4)	HG-JR25K1(4)	×				
HA-LP601(4)(B)	HG-JR601(4)R(B)-S_	×	SC-J2SJ4PW3C1M-A_	Existing cable can be used.	SC-J3J4ENM1C1M (Note 4) SC-J3J4ENM1C1M-A_ (Note 4)	(Note 3)
HA-LP801(4)(B)	HG-JR801(4)R(B)-S_	×				
HA-LP12K1(4)(B)	HG-JR12K1(4)R(B)-S_	×				
HA-LP15K1(4)	HG-JR15K1(4)R-S_	×	(Note 5)		(Note 6)	SC-J2SJ4FAN1C1M
HA-LP20K1(4)	HG-JR20K1(4)R-S_	×				
HA-LP25K1(4)	HG-JR25K1(4)R-S_	×				

(3) Large capacity, low inertia HA-LP1500 r/min series

Model	Replacement models (example)	Connector compatibility	Conversion cable			
			Power supply cable	Electromagnetic brake cable	Encoder cable	Cooling fan cable
HA-LP701M(4)(B)	HG-JR701M(4)(B)	×	SC-J2SJ4PW3C1M-A_	Existing cable can be used.	SC-J3J4ENM1C1M (Note 4) SC-J3J4ENM1C1M-A_ (Note 4)	(Note 3)
HA-LP11K1M(B)	HG-JR11K1M(B)	×				
HA-LP11K1M4(B)	HG-JR11K1M4(B)	×				
HA-LP15K1M(B)	HG-JR15K1M(B)	×	SC-J3J4PW1C1M-A_			
HA-LP15K1M4(B)	HG-JR15K1M4(B)	×	SC-J2SJ4PW3C1M-A_			
HA-LP22K1M(4)	HG-JR22K1M(4)	×	(Note 5)		(Note 6)	SC-J2SJ4FAN1C1M
HA-LP701M(4)(B)	HG-JR701M(4)R(B)-S_	×	SC-J2SJ4PW3C1M-A_	Existing cable can be used.	SC-J3J4ENM1C1M (Note 4) SC-J3J4ENM1C1M-A_ (Note 4)	(Note 3)
HA-LP11K1M(4)(B)	HG-JR11K1M(4)R(B)-S_(□250)	×				
HA-LP15K1M4(B)	HG-JR15K1M4R(B)-S_	×				
HA-LP15K1M(B)	HG-JR15K1MR(B)-S_	×	SC-J3J4PW1C1M-A_			
HA-LP22K1M(4)	HG-JR22K1M(4)R-S_	×	(Note 5)		(Note 6)	SC-J2SJ4FAN1C1M

(4) Large capacity, low inertia HA-LP2000 r/min series

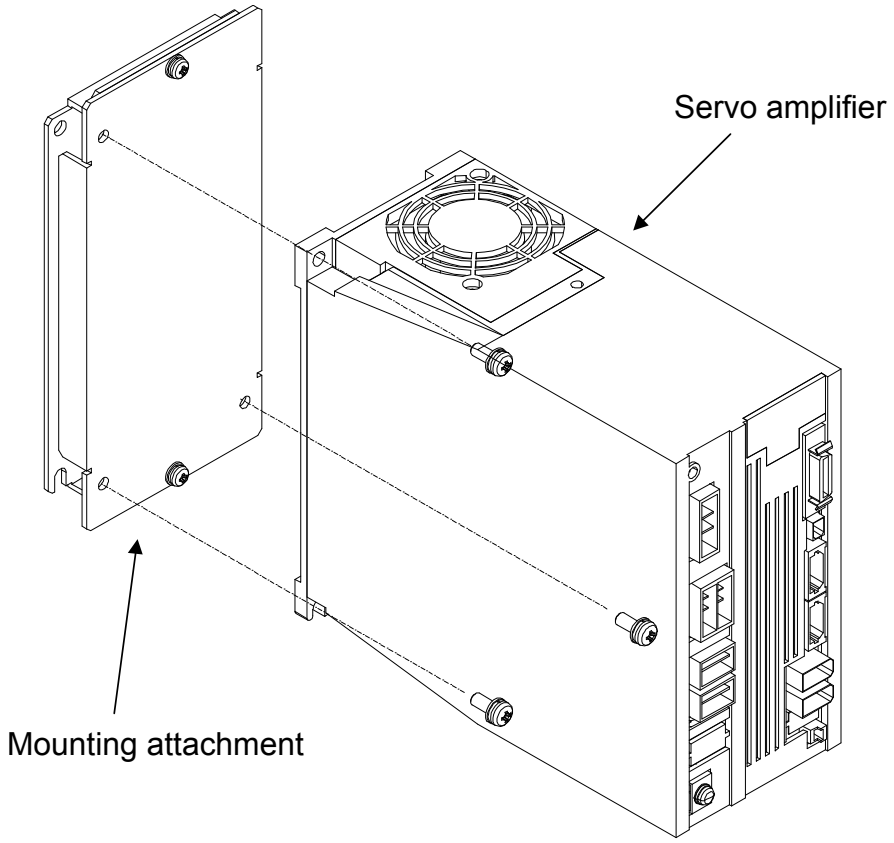
<table>
<tr><th rowspan="2">Model</th><th rowspan="2">Replacement models (example)</th><th rowspan="2">Connector compatibility</th><th colspan="4">Conversion cable</th></tr>
<tr><th>Power supply cable</th><th>Electromagnetic brake cable</th><th>Encoder cable</th><th>Cooling fan cable</th></tr>
<tr><td>HA-LP502</td><td>HG-SR502</td><td>×</td><td>SC-HAJ3PW1C1M</td><td></td><td>Existing cable can be used.</td><td></td></tr>
<tr><td>HA-LP11K2(4)(B)</td><td>HG-JR11K1M(4)(B)</td><td>×</td><td rowspan="3">SC-J2SJ4PW3C1M-A_</td><td rowspan="3">Existing cable can be used.</td><td rowspan="3">SC-J3J4ENM1C1M (Note 4)
SC-J3J4ENM1C1M-A_ (Note 4)</td><td rowspan="3">(Note 3)</td></tr>
<tr><td>HA-LP15K2(B)</td><td>HG-JR11K1M(B)</td><td>×</td></tr>
<tr><td>HA-LP15K24(B)</td><td>HG-JR11K1M4(B)</td><td>×</td></tr>
<tr><td>HA-LP22K2(B)</td><td>HG-JR15K1M(B)</td><td>×</td><td>SC-J3J4PW1C1M-A_</td></tr>
<tr><td>HA-LP22K24(B)</td><td>HG-JR15K1M4(B)</td><td>×</td><td>SC-J2SJ4PW3C1M-A_</td></tr>
<tr><td>HA-LP30K2</td><td>HG-JR22K1M</td><td>×</td><td>Existing cable can be used.</td><td rowspan="3"></td><td rowspan="2">(Note 6)</td><td rowspan="2">SC-J2SJ4FAN1C1M</td></tr>
<tr><td>HA-LP30K24</td><td>HG-JR22K1M4</td><td>×</td><td>(Note 5)</td></tr>
<tr><td>HA-LP502</td><td>HG-SR502R-S_</td><td>×</td><td>SC-HAJ3PW1C1M</td><td>Existing cable can be used.</td><td rowspan="5">(Note 3)</td></tr>
<tr><td>HA-LP11K2(4)(B)</td><td>HG-JR11K1M(4)R(B)-S_(□200)</td><td>×</td><td rowspan="3">SC-J2SJ4PW3C1M-A_</td><td rowspan="5">Existing cable can be used.</td><td rowspan="5">SC-J3J4ENM1C1M (Note 4)
SC-J3J4ENM1C1M-A_ (Note 4)</td></tr>
<tr><td>HA-LP15K2(B)</td><td>HG-JR11K1MR(B)-S_(□250)</td><td>×</td></tr>
<tr><td>HA-LP15K24(B)</td><td>HG-JR11K1M4R(B)-S_(□250)</td><td>×</td></tr>
<tr><td>HA-LP22K2(B)</td><td>HG-JR15K1MR(B)-S_</td><td>×</td><td>SC-J3J4PW1C1M-A_</td></tr>
<tr><td>HA-LP22K24(B)</td><td>HG-JR15K1M4R(B)-S_</td><td>×</td><td>SC-J2SJ4PW3C1M-A_</td></tr>
<tr><td>HA-LP30K2</td><td>HG-JR22K1MR-S_</td><td>×</td><td>Existing cable can be used.</td><td rowspan="2"></td><td rowspan="2">(Note 6)</td><td rowspan="2">SC-J2SJ4FAN1C1M</td></tr>
<tr><td>HA-LP30K24</td><td>HG-JR22K1M4R-S_</td><td>×</td><td>(Note 5)</td></tr>
</table>

Note 1. Another power cable is required since the size of the existing wire is not applicable to the replaced servo motor.
2. Since the servo motor with an electromagnetic brake has the power connector and brake connector independently, the new setting of an electromagnetic brake is required.
3. Remove or insulate the cooling fan cable since a cooling fan is not attached on the replaced servo motor.
4. It is available for both two-wire type and four-wire type.
5. Changing crimp terminals of the existing power cable is required when the servo motor is replaced. Refer to chapter 7 for details.
6. Another encoder cable is required when the servo motor with a thermistor is replaced.
7. Refer to chapter 7 when replacing the servo motor not written in the table of combination. For optional products, contact Mitsubishi Electric Corporation.

4. RENEWAL TOOL PRODUCT LIST

(1) Mounting attachment

No.	Model	Application	Replacement method
1	SC-J2SJ4BS04	MR-J4-_A_ servo amplifier capacity: 5 kW (200 V), 3.5 kW (400 V)	Used for primary Replacement and Simultaneous replacement
2	SC-J2SJ4BS06	MR-J4-_A_ servo amplifier capacity: 11 kW, 15 kW	
3	SC-J3WJ4WBS02	MR-J4W2-77B/MR-J4W2-1010B	

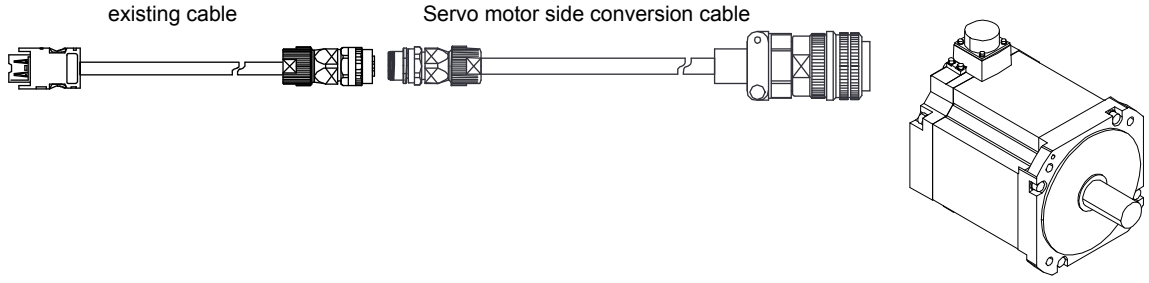


(example SC-J3WJ4WBS02)

(2) Servo motor side conversion cable (For compatibility of servo motor connectors)

No.	Name	Model	Replacement servo motor model	Replacement method
1	Servo motor side encoder conversion cable	SC-J3J4ENM1C1M (Note)	HA-LP601(4)(B), HA-LP701M(4)(B), HA-LP11K2(4)(B) → HG-JR601(4)(B), HG-JR701M(4)(B), HG-JR11K1M(4)(B)	Used for secondary replacement and simultaneous replacement.
2		SC-J3J4ENM1C1M-A_ (Note)	HA-LP801(4)(B), HA-LP12K1(4)(B), HA-LP11K1M(4)(B), HA-LP15K1M(4)(B), HA-LP15K2(4)(B), HA-LP22K2(4)(B) → HG-JR801(4)(B), HG-JR12K1(4)(B), HG-JR11K1M(4)(B), HG-JR15K1M(4)(B)	
3	Servo motor side power supply conversion cable	SC-SAJ3PW2KC1M-S2	HC-LP52(B) → HG-JR73(B)	
4		SC-HAJ3PW1C1M	HC-LP202(B), HC-LP302(B) → HG-JR353(B), HG-JR503(B) HA-LP502 → HG-SR502	
5		SC-J2SJ4PW3C1M-A_	HA-LP601(4)(B), HA-LP701M(4)(B), HA-LP11K2(4)(B) → HG-JR601(4)(B), HG-JR701M(4)(B), HG-JR11K1M(4)(B) HA-LP801(4)(B), HA-LP12K1(4)(B), HA-LP11K1M(4)(B), HA-LP15K1M4(B), HA-LP15K2(4)(B), HA-LP22K24(B) → HG-JR801(4)(B), HG-JR12K1(4)(B), HG-JR11K1M(4)(B), HG-JR15K1M4(B)	
6		SC-J3J4PW1C1M-A_	HA-LP15K1M(B), HA-LP22K2(B) → HG-JR15K1M(B)	
7	Servo motor side conversion cable for the cooling fan	SC-J2SJ4FAN1C1M	HA-LP15K1(4), HA-LP20K1(4), HA-LP22K1M(4) → HG-JR15K1(4), HG-JR20K1(4), HG-JR22K1M(4) HA-LP30K2(4), HA-LP25K1(4) → HG-JR22K1M(4), HG-JR25K1(4)	

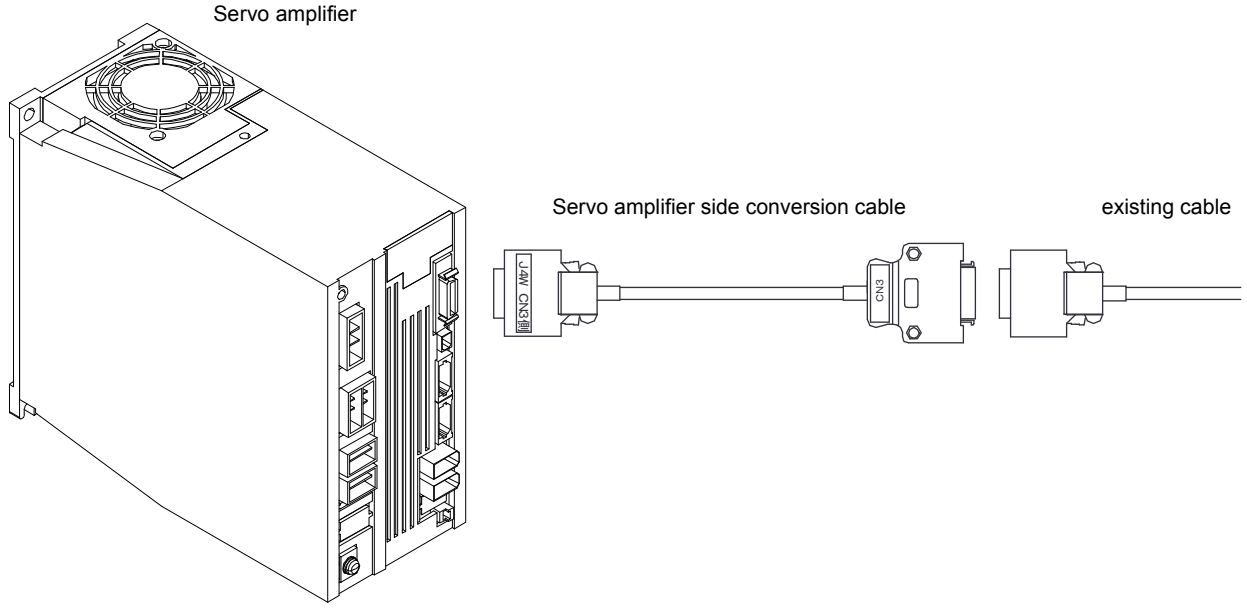
Note. It is available for both two-wire type and four-wire type.



(example SC-J3J4ENM1C1M)

(3) Servo amplifier side conversion cable

No.	Name	Model	Application	Replacement method
1	Servo amplifier side conversion cable	SC-J3WJ4WCTC03M	For changing MR-J4W2-_B input/output signals	Used for primary replacement and simultaneous replacement.



5. SPECIFICATIONS

5.1 Standard Specifications

(1) Mounting attachment specifications

Item		Specifications
Environment	Usage ambient temperature	0°C to +55°C (non-freezing).
	Storage ambient temperature	-20°C to +65°C (non-freezing).
	Usage ambient humidity	90%RH or less (non-condensing).
	Storage ambient humidity	
	Ambience	Indoors (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, and dirt
	Altitude	Max. 2000 m above sea level
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y, and Z axes)
Material		SPCC (Cold rolled steel plate)
Surface treatment		Trivalent chromate
Mass		About 750 g

(2) Conversion cable specifications (For both servo amplifier side and servo motor side)

Item		Specifications
Environment	Usage ambient temperature	0°C to +55°C (non-freezing).
	Storage ambient temperature	-20°C to +65°C (non-freezing).
	Usage ambient humidity	90%RH or less (non-condensing).
	Storage ambient humidity	
	Ambience	Indoors (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, and dirt
	Altitude	Max. 2000 m above sea level
	Vibration resistance	5.9 m/s^2 at 10 Hz to 55 Hz (directions of X, Y, and Z axes)
Minimum bend radius		6 times or more of the cable outer diameter

6. DIMENSIONS

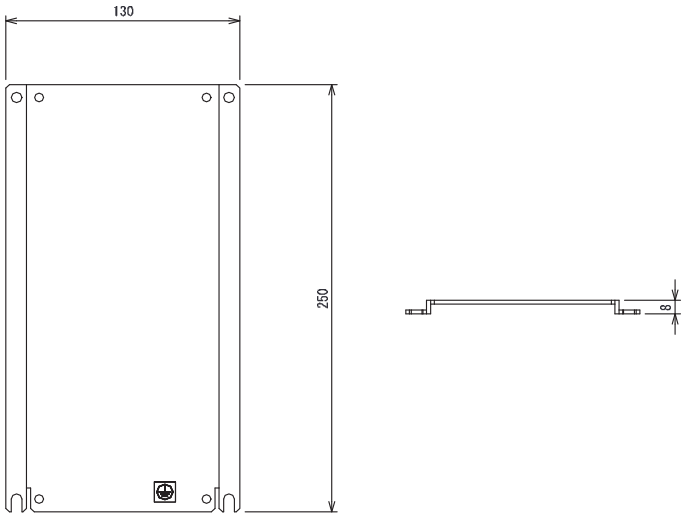
6.1 Mounting attachment

General-purpose interface and SSCNET III interface are compatible in dimensions.

(1) SC-J2SJ4BS04

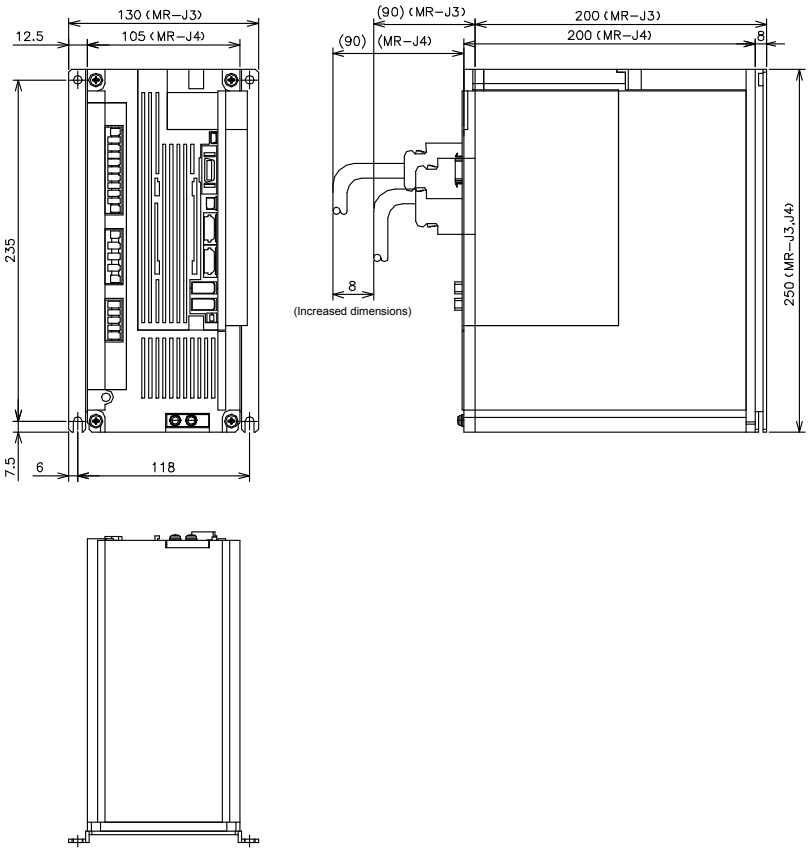
(a) Mounting attachment alone

Unit [mm]



(b) Mounting attachment + Combination with servo amplifier

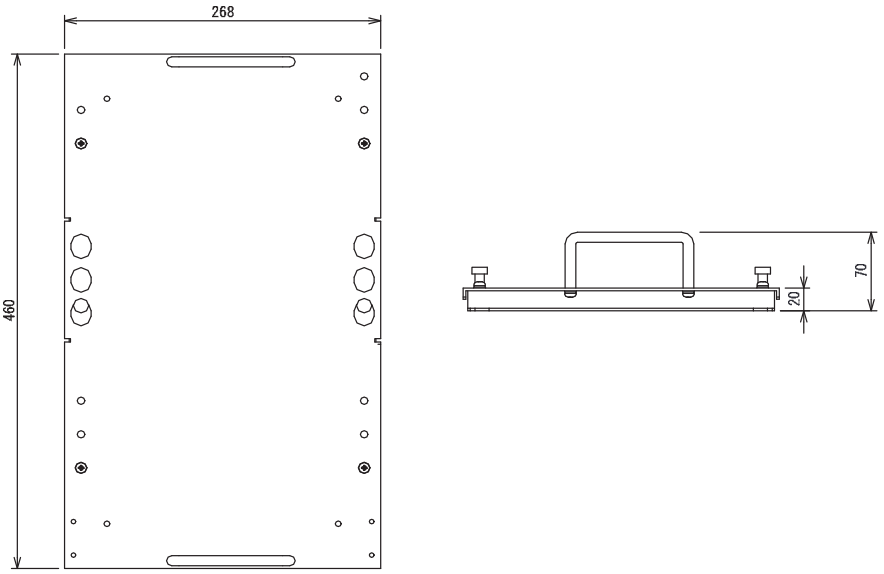
Unit [mm]



(2) SC-J2SJ4BS06

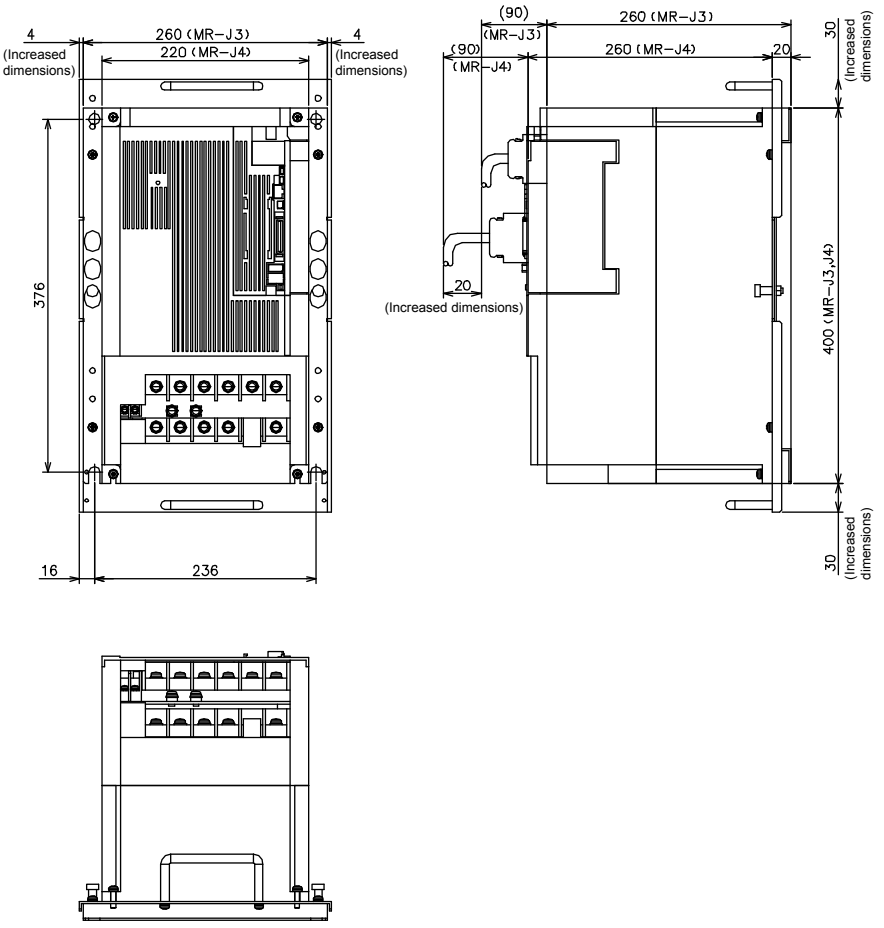
(a) Mounting attachment alone

Unit [mm]



(b) Mounting attachment + Combination with servo amplifier

Unit [mm]

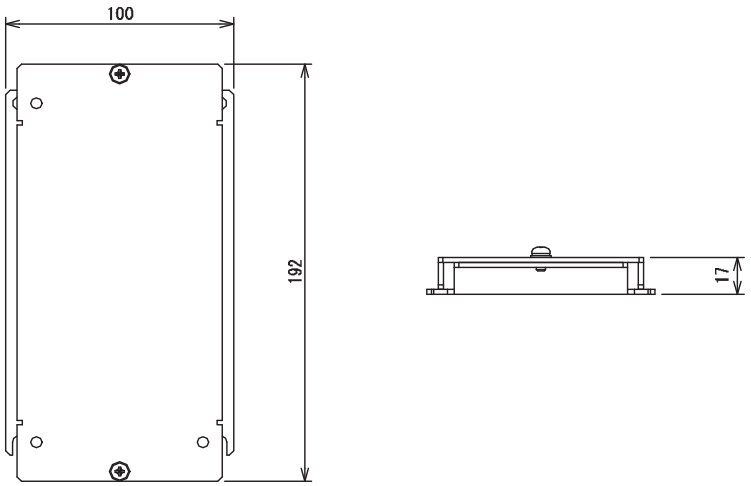


Note. The mounting attachment cannot be used for mounting panel through attachments of MR-J3 servo amplifier.

(3) SC-J3WJ4WBS02

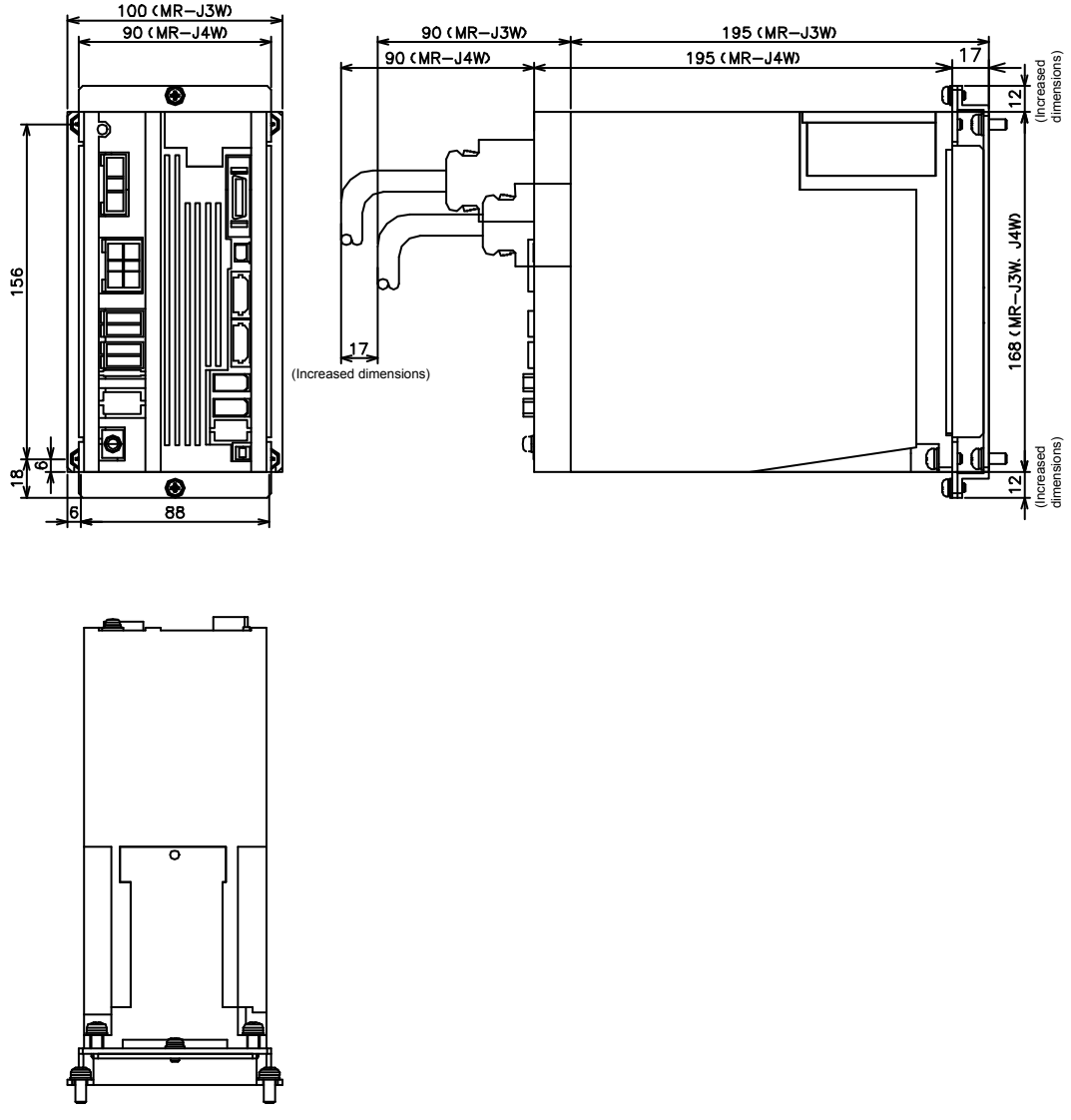
(a) Mounting attachment alone

Unit [mm]



(b) Mounting attachment + Combination with servo amplifier

Unit [mm]



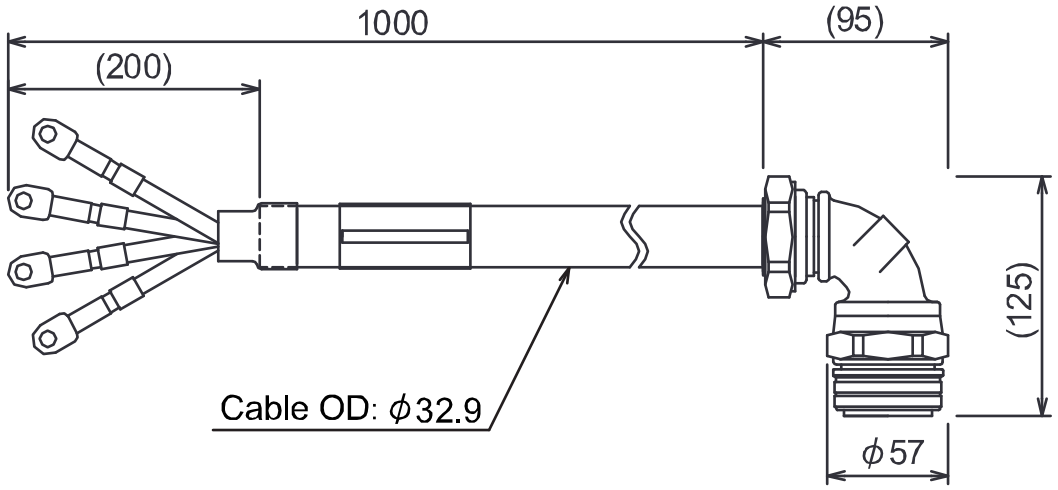
6.2 Conversion cable

6.2.1 Servo motor side power supply conversion cable

(1) SC-J3J4PW1C1M-_

Cable pulling direction: A1, A2 (Note)

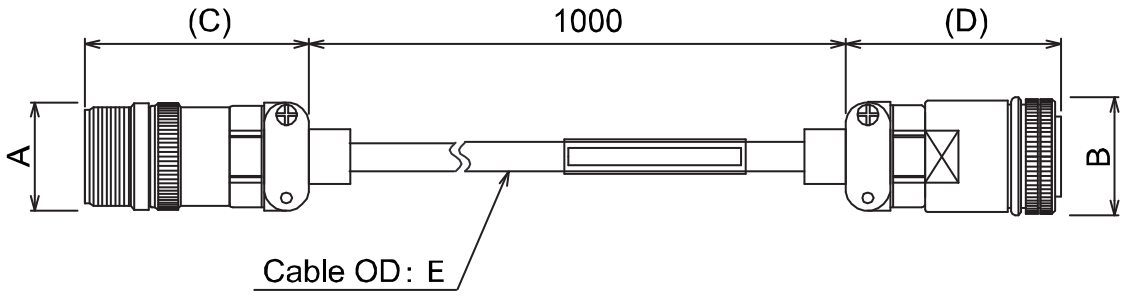
Unit [mm]



Note. For the cable pulling directions, refer to section 6.2.3.

(2) SC-SAJ3PW2KC1M-S2/SC-HAJ3PW1C1M

Unit [mm]

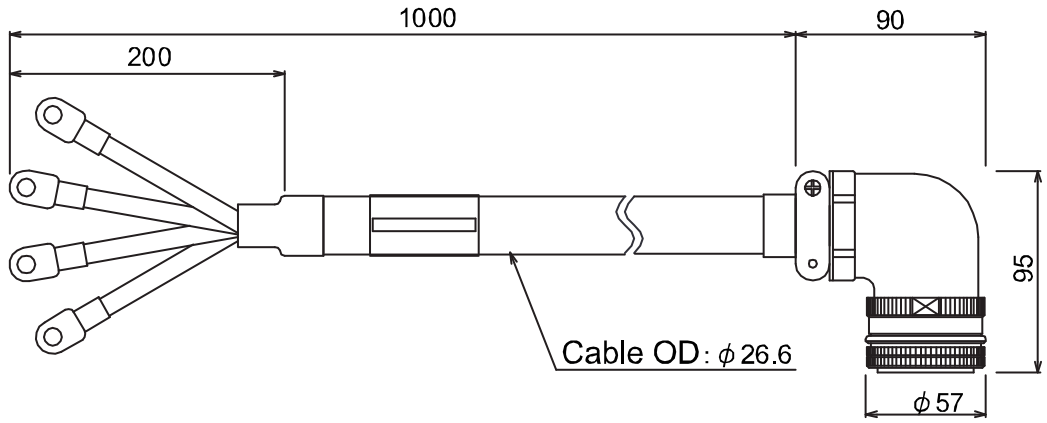


Item		Specifications	
Model		SC-SAJ3PW2KC1M-S2	SC-HAJ3PW1C1M
Connector dimensions	A	ϕ35	ϕ39
	B	ϕ35	ϕ41
	C	68	74
	D	78	77
Cable shape	E	ϕ12.0	ϕ16.5

(3) SC-J2SJ4PW3C1M-__

Cable pulling direction: A1, A2 (Note)

Unit [mm]

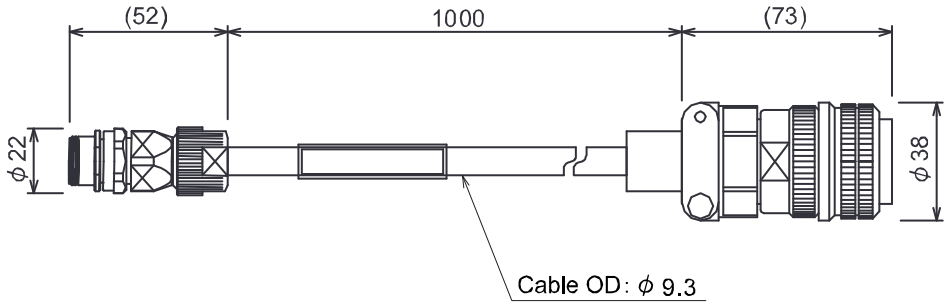


Note. For the cable pulling directions, refer to section 6.2.3.

6.2.2 Servo motor side encoder conversion cable

(1) SC-J3J4ENM1C1M

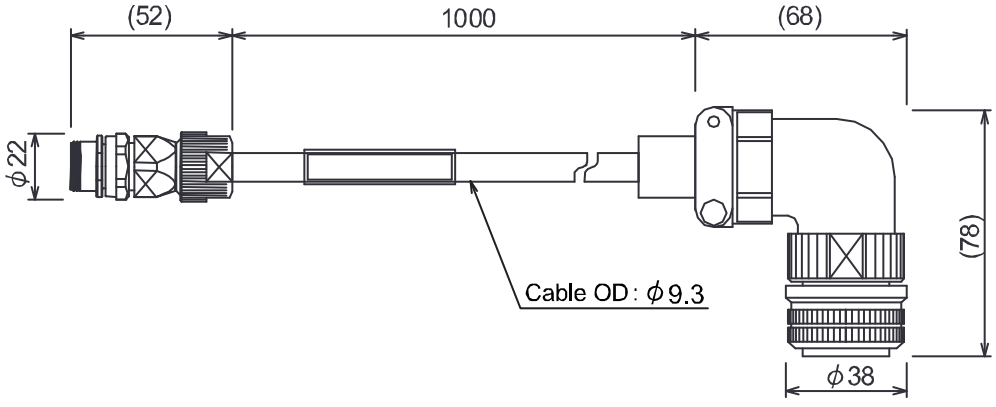
Unit [mm]



(2) SC-J3J4ENM1C1M-__

Cable pulling direction: A2, A3, A4 (Note)

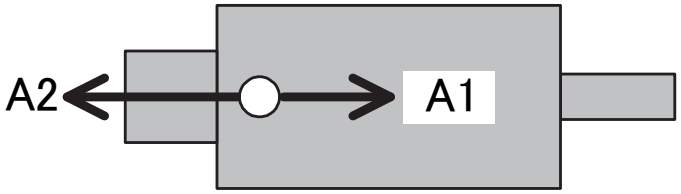
Unit [mm]



Note. For the cable pulling directions, refer to section 6.2.3.

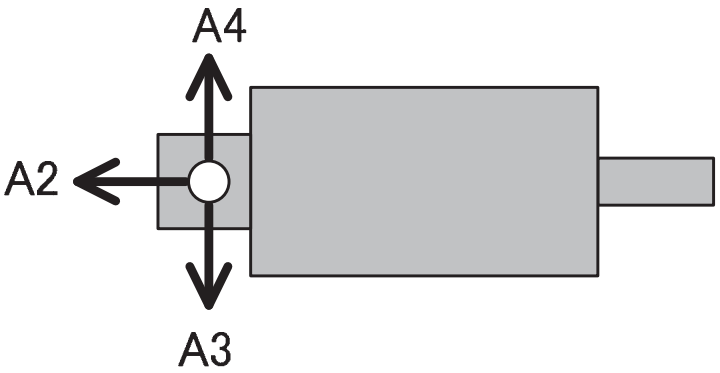
6.2.3 Cable pulling direction

(1) Pulling direction of the servo motor side power supply conversion cable



Cable pulling direction
(Diagram viewed from the front of the cable insertion hole)

(2) Pulling direction of the servo motor side encoder conversion cable

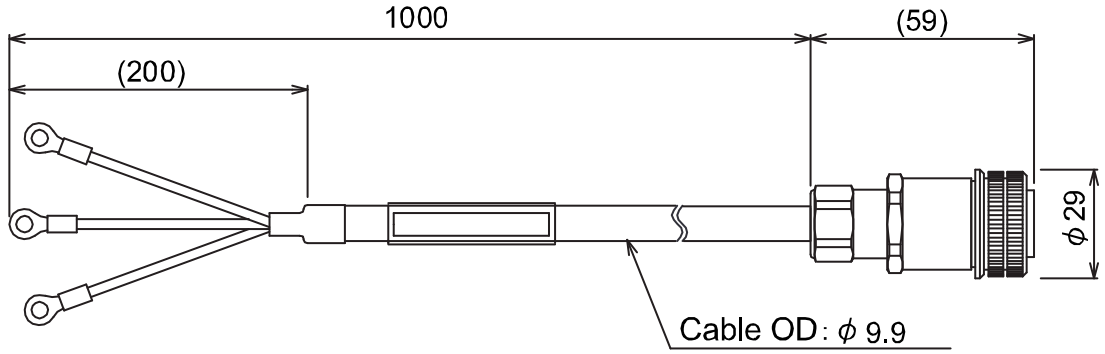


Cable pulling direction
(Diagram viewed from the front of the cable insertion hole)

6.2.4 Servo motor side conversion cable for the cooling fan

(1) SC-J2SJ4FAN1C1M

Unit [mm]

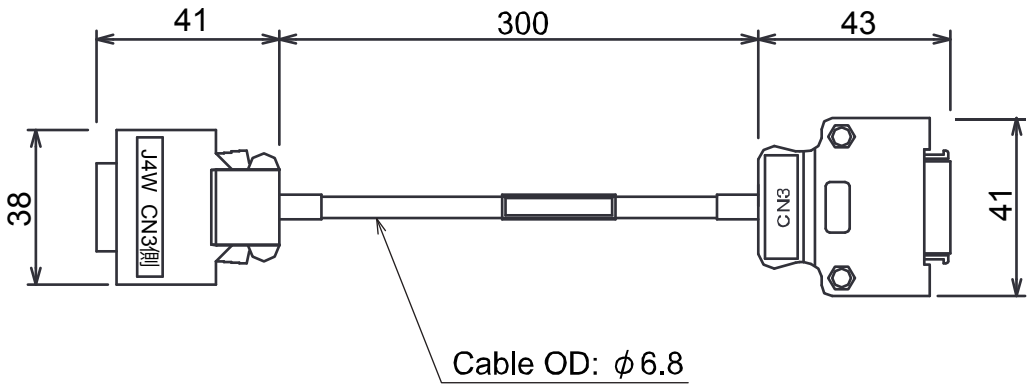


6.2.5 The control signal conversion cable for the servo amplifier side

POINT
●The following shows the names of the cable connection diagram signals. Servo amplifier side: The initial value of the parameters of MR-J4W2_B Existing control signal cable side: The initial value of the parameters of MR-J3W_B After checking the cable connection diagrams and "Part 4: Replacement of MR-J3W-_B with MR-J4W2-_B", use the product according to your specification.

(1) SC-J3WJ4WCTC03M

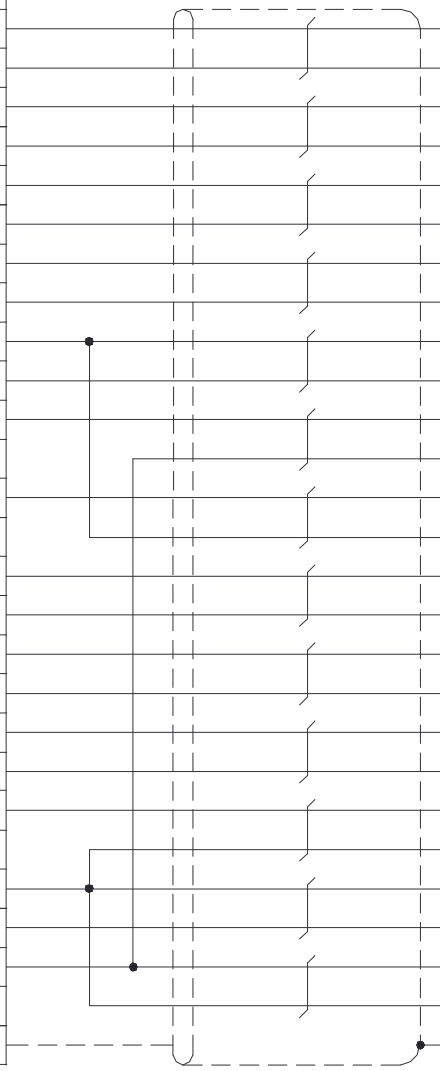
Unit [mm]



Connection diagrams

Servo amplifier side
(J4W CN3 side)

Signal name	Pin No.
LA-A	3
LAR-A	16
LB-A	4
LBR-A	17
LA-B	5
LAR-B	18
LB-B	6
LBR-B	19
DICOM	23
CALM	11
DI1-A	7
DI1-C	1
DI1-B	20
DI2-C	2
DI3-A	9
DI3-B	22
MBR-A	12
DI2-A	8
MBR-B	25
DI2-B	21
CINP	24
MBR-C	13
DOCOM	26
EM2	10
LG	14
DI3-C	15
	SHELL



Existing control signal cable side
(CN3 side)

Pin No.	Signal name
3	LA-A
16	LAR-A
4	LB-A
17	LBR-A
5	LA-B
18	LAR-B
6	LB-B
19	LBR-B
23	DICOM
11	ALM-A
7	DI1-A
1	LG
20	DI1-B
2	MO1
9	DI3-A
22	DI3-B
12	MBR-A
8	DI2-A
25	MBR-B
21	DI2-B
24	ALM-B
13	
26	DOCOM
10	EM1
14	LG
15	MO2
SHELL	SHD

Note. After checking the cable connection diagrams, use the product according to your specification.

REVISIONS

*The installation guide number is given on the bottom left of the back cover.

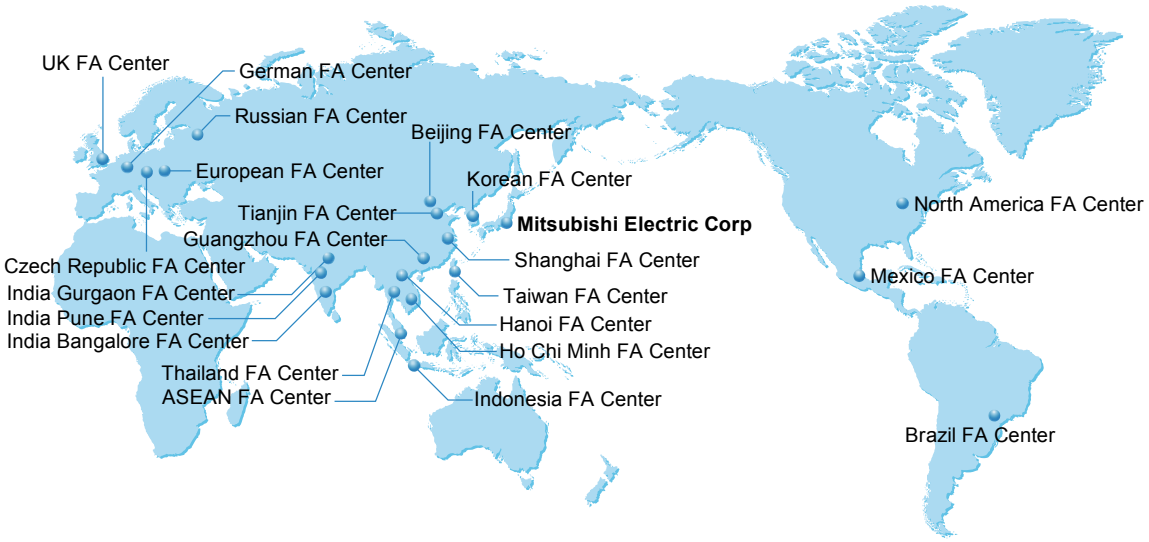
Print date	*Installation guide number	Revision description	
Nov. 2016	L(NA)03127ENG-A	First edition	
Aug. 2017	L(NA)03127ENG-B	MR-J3W series is added.	
		Safety Instructions	Partially changed.
		Part 1	MR-J3W series/MR-J4W2-_B servo amplifier are added.
		Part 1 Chapter 1	Partially changed.
		Part 1 Section 2.1	The table is partially changed.
		Part 1 Section 3.1.1	The diagram is partially changed.
		Part 1 Section 3.1.4	The table is added.
		Part 1 Section 3.2.1	The table is partially changed.
		Part 1 Section 3.2.2 (2)	The table is added.
		Part 1 Section 3.2.2 (3)	The table is partially changed.
		Part 1 Section 3.2.4	Partially changed.
		Part 1 Section 4.2	Partially changed.
		Part 1 Section 4.3	Partially changed.
		Part 2 Section 2.2 (2)	The diagram is partially changed.
		Part 2 Section 3.5.3	The table is partially changed.
		Part 3 Section 2.1	The diagram is partially changed.
		Part 3 Section 2.2	The diagram is partially changed.
		Part 3 Section 3.2	POINT is added.
		Part 3 Section 3.6.3	The table is partially changed.
		Part 3 Chapter 4	POINT is added.
		Part 4	Newly added.
		Part 5	MR-J3W series/MR-J4W2-_B servo amplifier is added.
		Part 5 Section 1.1 (1)	The table is partially changed.
		Part 5 Section 1.2.2	The table is partially changed.
		Part 5 Section 1.2.3 (1)	Table (b) is newly added.
		Part 5 Section 1.2.3 (3)	The table is partially changed.
		Part 5 Section 1.2.4 (1)	The table is partially changed.
		Part 5 Section 1.2.6	Partially changed.
		Part 5 Section 1.2.7	The table is partially changed.
		Part 5 Section 1.3	Newly added.
		Part 5 Section 2.3	Partially changed.
		Part 5 Section 2.3.4 (2)	Newly added.
		Part 5 Chapter 5	Newly added.
		Part 5 Chapter 6	Moved from Part 2.
		Part 5 Section 6.1.2	The table is partially changed.
		Part 5 Section 6.1.3	The table is partially changed.
		Part 5 Section 6.1.9	The table is partially changed.
		Part 7	MR-J3W series/MR-J4W2-_B servo amplifier is added.
		Part 7 Chapter 1	The table is partially changed.
		Part 7 Section 1.1.1	The table is partially changed.
		Part 7 Section 1.1.2	The table is partially changed.
		Part 7 Chapter 3	The table is partially changed.
		Part 7 Section 4.1.3	Newly added.
		Part 7 Section 4.1.4	Newly added.
		Part 7 Section 4.3.3	Newly added.
		Part 7 Section 4.3.4	Newly added.
		Part 7 Section 5.1	Newly added.

Print date	*Installation guide number	Revision description	
Aug. 2017	L(NA)03127ENG-B	Part 7 Section 5.4	Newly added.
		Part 7 Section 5.5	Newly added.
		Part 7 Section 6.1	The table is partially changed.
		Part 7 Chapter 7	Partially changed.
		Part 7 Section 8.3.1	The table is partially changed.
		Part 8 Section 1.1	The diagram is partially changed.
May. 2018	L(NA)03127ENG-C	MR-J3-DU_/MR-J4-DU_ servo amplifier are added.	
		MR-J3W-0303BN6/MR-J4W2-0303B6 servo amplifier are added.	
		Introduction to Renewal Tool are added.	
		Part 1 Section 3.1.3	POINT is added.
		Part 1 Section 3.1.4	The table is partially changed.
		Part 1 Section 3.2.1	The table is partially changed.
		Part 1 Section 3.2.2 (1)	The table (c) (d) (g) (h) newly added.
		Part 1 Section 3.2.2 (2)	The table (b) is newly added.
		Part 1 Section 3.2.2 (3)	Table (a) (b) are partially changed.
		Part 1 Section 3.2.2 (3)	Table (c) is newly added.
		Part 1 Section 3.2.4	Partially changed.
		Part 1 Section 4.2	Partially changed.
		Part 2 Section 3.1	POINT is added.
		Part 2 Section 3.1	The table is partially changed.
		Part 2 Section 3.6	POINT is added.
		Part 3 Section 3.1	POINT is added.
		Part 3 Section 3.1	The table is partially changed.
		Part 4	MR-J3W-0303BN6/MR-J4W2-0303B6 servo amplifier are newly added.
		Part 4 Section 2.2	The table is partially changed.
		Part 4 Section 3.1 (1)	The table is partially changed.
		Part 4 Section 3.1 (2)	Newly added.
		Part 4 Section 3.2 (3)	Newly added.
		Part 4 Section 3.2 (4)	Newly added.
		Part 4 Section 3.5.2	Newly added.
		Part 4 Section 3.7.1	The table is partially changed.
		Part 4 Section 3.7.2	The table is partially changed.
		Part 4 Section 3.7.3	The table is partially changed.
		Part 5	MR-J3-DU_/MR-J4-DU_ servo amplifier servo amplifier are newly added.
		Part 6	Part number is changed from 5
		Part 6 Section 1.1	POINT is added.
		Part 6 Section 1.2.1	The table is partially changed.
		Part 6 Section 1.2.3	The table is partially changed.
		Part 6 Section 1.2.6 (3)	Newly added.
		Part 6 Section 1.2.6 (4)	Newly added.
		Part 6 Section 1.2.6 (5)	Newly added.
		Part 6 Section 1.3	Newly added.
		Part 6 Section 2.1	POINT is added.
		Part 6 Section 2.1.3	Newly added.
		Part 6 Section 2.1.4	Newly added.
		Part 6 Section 5.1	The table is partially added.
		Part 6 Section 5.2	Newly added.

Print date	*Installation guide number	Revision description	
May. 2018	L(NA)03127ENG-C	Part 6 Section 6.1	POINT is added.
		Part 6 Section 6.1.4	Newly added.
		Part 6 Section 6.1.10	POINT is added.
		Part 6 Section 6.3	POINT is added.
		Part 7	Part number is changed from 6
		Part 7 Section 1.1	POINT is added.
		Part 7 Section 2.1	POINT is added.
		Part 7 Section 2.1	The table is partially changed.
		Part 7 Section 2.2	POINT is added.
		Part 7 Section 2.2	The table is partially changed.
		Part 7 Section 2.3	POINT is added.
		Part 7 Section 2.4	POINT is added.
		Part 7 Section 2.4	The table is partially changed.
		Part 7 Section 2.6	The table is partially changed.
		Part 7 Section 2.7	The diagram is partially changed.
		Part 8	Part number is changed from 7
		Part 8 Chapter 1	The table is partially changed.
		Part 8 Section 1.1.1	The table is partially changed.
		Part 8 Section 1.1.2	The table is partially changed.
		Part 8 Section 1.2.1	The table is partially changed.
		Part 8 Section 1.2.2	POINT is added.
		Part 8 Section 1.2.2	The table is partially changed.
		Part 8 Section 1.2.3	The table is partially changed.
		Part 8 Chapter 2	POINT is added.
		Part 8 Chapter 2	The table is partially changed.
		Part 8 Section 2.1	The table is partially changed.
		Part 8 Section 3.1	The table is partially changed.
		Part 8 Section 3.2	The table is partially changed.
		Part 8 Section 4.1.3	Partially changed.
		Part 8 Section 4.3.2	POINT is added.
		Part 8 Section 4.3.4	Partially changed.
		Part 8 Section 4.3.4	The table is partially changed.
		Part 8 Section 5.1.1	POINT is added.
		Part 8 Section 5.5.3	Newly added.
		Part 8 Section 5.5.3	The table is partially changed.
		Part 8 Section 8.1.1	The table is partially changed.
		App.1	Introduction to Renewal Tool newly added.

Service Network

Global FA Centers



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Transition from MELSERVO-J3/J3W Series to J4 Series Handbook

⚠ 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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