



General-Purpose AC Servo

MITSUBISHI SERVO AMPLIFIERS & MOTORS
MELSERVO-J4

CC-Link IE Field Network interface with Motion
MODEL (Servo amplifier)

MR-J4- B-RJ010

MODEL (CC-Link IE Field Network interface unit)

MR-J3-T10

SERVO AMPLIFIER
INSTRUCTION MANUAL

● Safety Instructions ●

Please read the instructions carefully before using the equipment.

To use the equipment correctly, do not attempt to install, operate, maintain, or inspect the equipment until you have read through this Instruction Manual, Installation guide, and appended documents carefully. Do not use the equipment until you have a full knowledge of the equipment, safety information and instructions. In this Instruction Manual, the safety instruction levels are classified into "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 what must not be done. For example, "No Fire" is indicated by



Indicates what must be done. For example, grounding is indicated by

In this Instruction Manual, instructions at a lower level than the above, instructions for other functions, and so on are classified into "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. Otherwise, it 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 an electric shock, always connect the protective earth (PE) terminal (marked ) of the servo amplifier to the protective earth (PE) of the cabinet.
- When using an earth-leakage current breaker (RCD), select the type B.
- 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 power supply and the main circuit power supply (L1, L2, and L3) of the servo amplifier, in order to configure a circuit that shuts down the power supply 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 a fire when the servo amplifier malfunctions.
- When using the regenerative resistor, switch power off with the alarm signal. Not doing so may cause a 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, servo motor, and MR-J3-T10.
- Always connect a molded-case circuit breaker to the power supply of the servo amplifier.

3. To prevent injury, note the following

CAUTION

- Only the voltage specified in the Instruction Manual should be applied to each terminal. Otherwise, a burst, damage, etc. may occur.
- Connect cables to the correct terminals. Otherwise, a burst, damage, etc. may occur.
- Ensure that 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, etc.

(1) Transportation and 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 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.
- Leave specified clearances between the servo amplifier and the cabinet walls or other equipment.
- Do not install or operate the servo amplifier and MR-J3-T10 which have been damaged or have any parts missing.
- Do not block the intake and exhaust areas of the servo amplifier and MR-J3-T10. Otherwise, it may cause a malfunction.
- Do not drop or strike the servo amplifier, servo motor, and MR-J3-T10. Isolate them from all impact loads.
- When you keep or use the equipment, please fulfill the following environment.

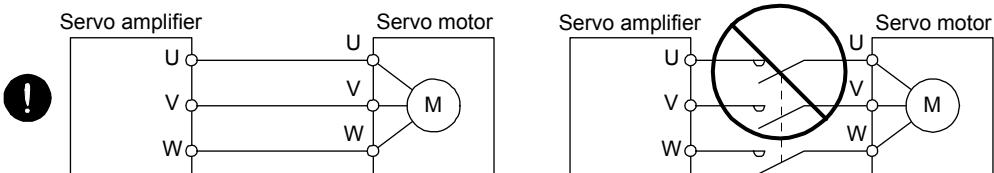
Item		Environment
Ambient temperature	Operation	0 °C to 55 °C (non-freezing)
	Storage	-20 °C to 65 °C (non-freezing)
Ambient humidity	Operation	90 %RH or less (non-condensing)
	Storage	
Ambience	Indoors (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, and dirt	
Altitude	1000 m or less above sea level	
Vibration resistance	5.9 m/s ² , at 10 Hz to 55 Hz (directions of X, Y and Z axes)	

- When the product has been stored for an extended period of time, contact your local sales office.
- When handling the servo amplifier and MR-J3-T10, be careful about the edged parts such as corners of them.
- The servo amplifier and MR-J3-T10 must be installed in a metal cabinet.
- When you disinfect or protect wooden packing from insects, take measures except by fumigation. Fumigating the servo amplifier or packing the servo amplifier with fumigated wooden packing can cause a malfunction of the servo amplifier due to halogen materials (such as fluorine, chlorine, bromine, and iodine) which are contained in fumigant.
- The servo amplifier must not be used with parts which contain halogen-series flame retardant materials (such as bromine) under coexisting conditions.

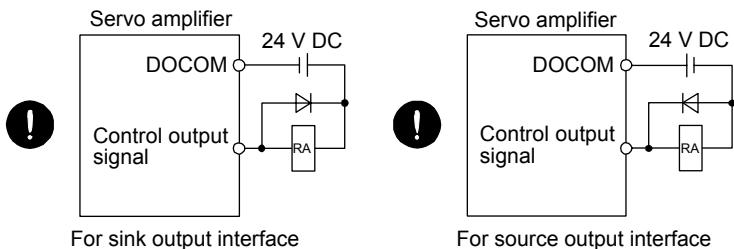
(2) Wiring

⚠ CAUTION

- Wire the equipment correctly and securely. Otherwise, the servo motor may operate unexpectedly.
- Do not install a power capacitor, surge killer, or radio noise filter (FR-BIF option) on the servo amplifier output side.
- To avoid a malfunction, connect the wires to the correct phase terminals (U, V, and W) of the servo amplifier and servo motor.
- Connect the servo amplifier power output (U, V, and W) to the servo motor power input (U, V, and W) directly. Do not let a magnetic contactor, etc. intervene. Otherwise, it may cause a malfunction.



- The connection diagrams in this installation guide 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.
- Connecting a servo motor for different axis to U, V, W, or CN2 of the servo amplifier may cause a malfunction.

(3) Test run and adjustment

⚠ CAUTION

- Before operation, check the parameter settings. Improper settings may cause some machines to operate unexpectedly.
- Never make a drastic adjustment or change to the parameter values as doing so will make the operation unstable.
- Do not close to moving parts at servo-on status.

(4) Usage

⚠ CAUTION

- When it is assumed that a hazardous condition may occur due to a power failure or product malfunction, use a servo motor with an external brake to prevent the condition.
- Do not disassemble, repair, or modify the equipment.

(4) Usage

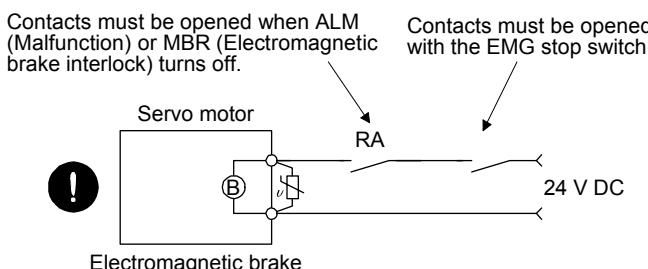
⚠ CAUTION

- 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.
- Use a noise filter, etc. to minimize the influence of electromagnetic interference. Electromagnetic interference may be given to the electronic equipment used near the servo amplifier.
- Burning or breaking a servo amplifier may cause a toxic gas. Do not burn or break it.
- Use the servo amplifier with the specified servo motor.
- 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 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.

(5) Corrective actions

⚠ CAUTION

- When it is assumed that a hazardous condition may occur due to a power failure or product malfunction, use a servo motor with an electromagnetic brake or external brake to prevent the condition.
- Configure an electromagnetic brake circuit so that it is activated also by an external EMG stop switch.



- When any alarm has occurred, eliminate its cause, ensure safety, and deactivate the alarm before restarting operation.
- Provide an adequate protection to prevent unexpected restart after an instantaneous power failure.

(6) Maintenance, inspection and parts replacement

⚠ CAUTION

- With age, the electrolytic capacitor of the servo amplifier will deteriorate. To prevent a secondary accident due to a malfunction, it is recommend that the electrolytic capacitor be replaced every 10 years when it is used in general environment. Please contact your local sales office.

(7) General instruction

- To illustrate details, the equipment in the diagrams of this Instruction 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 this Instruction Manual.

● DISPOSAL OF WASTE ●

Please dispose a servo amplifier, battery (primary battery) and other options according to your local laws and regulations.

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

When using the STO function of the servo amplifier, refer to chapter 13 of "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".

For the MR-J3-D05 safety logic unit, refer to appendix 7 of "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".

Compliance with global standards

For the compliance with overseas standards, refer to appendix 4 of "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".

«About the manual»

You must have this Instruction Manual and the following manuals to use the servo. Ensure to prepare them to use the servo safely.

Relevant manuals

Manual name	Manual No.
MELSERVO-J4 Series Instructions and Cautions for Safe Use of AC Servos (Packed with the servo amplifier)	IB(NA)0300175
MR-J4-_B(-RJ) AMPLIFIER INSTRUCTION MANUAL	SH(NA)030106
MELSERVO-J4 SERVO AMPLIFIER INSTRUCTION MANUAL (TROUBLESHOOTING)	SH(NA)030109
MELSERVO Servo Motor Instruction Manual (Vol. 3)	SH(NA)030113
EMC Installation Guidelines	IB(NA)67310
MELSEC-Q QD77GF Simple motion module User's Manual (Positioning Control)	IB(NA)0300202
MELSEC-Q QD77GF Simple motion module User's Manual (Network)	IB(NA)0300203

This Instruction Manual does not describe the following items. The followings are the same as MR-J4-_B servo amplifiers. For details of the items, refer to each chapter/section of the detailed description field.

Item	Detailed explanation
Normal gain adjustment	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual chapter 6
Special adjustment functions (except gain switching function)	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual chapter 7
Characteristics	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual chapter 10
Absolute position detection system	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual chapter 12
Using STO function	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual chapter 13

«Cables used for wiring»

Wires mentioned in this Instruction Manual are selected based on the 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 [in]
Torque	1 [N•m]	141.6 [oz•in]
Moment of inertia	1 [$\times 10^{-4}$ kg•m ²])	5.4675 [oz•in ²]
Load (thrust load/axial load)	1 [N]	0.2248 [lbf]
Temperature	N [°C] × 9/5 + 32	N [°F]

MEMO

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1. FUNCTIONS AND CONFIGURATION

1. FUNCTIONS AND CONFIGURATION

The following item is the same as MR-J4-_B Servo amplifiers. For details of the item, refer to the section of the detailed description field.

Item	Detailed explanation
Removal and reinstallation of the front cover	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 1.7.2

1.1 Summary

This instruction manual explains about CC-Link IE Field Network interface AC servo amplifier with Motion MR-J4-_B-RJ010 and CC-Link IE Field Network interface unit MR-J3-T10. Refer to "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual" for the information not given in this manual.

Always use MR-J4-_B-RJ010 with MR-J3-T10.

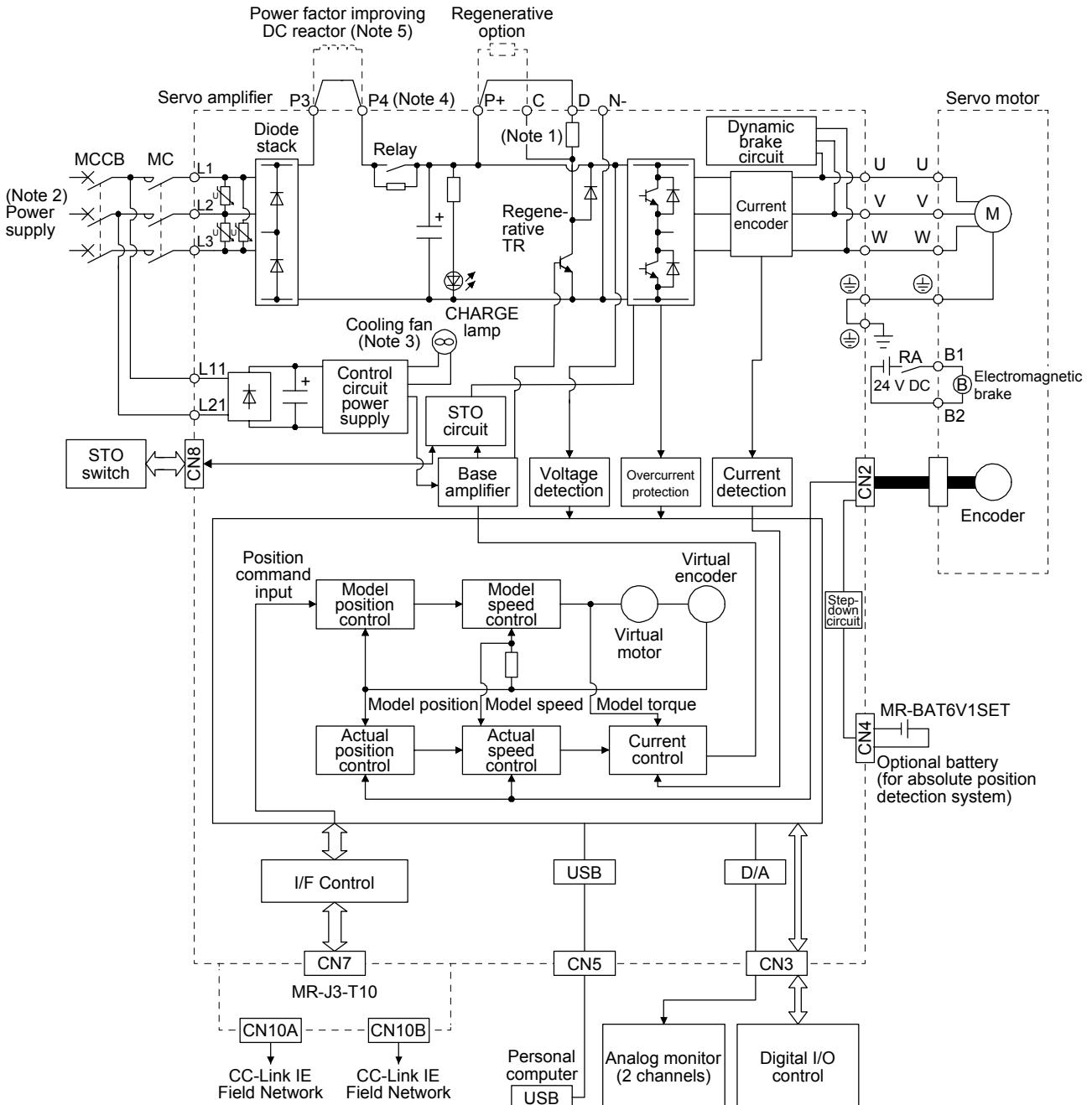
Connecting MR-J4-_B-RJ010 and MR-J3-T10 to CC-Link IE Field simple motion module QD77GF_ enables you to drive a servo motor using CC-Link IE Field motion function.

1. FUNCTIONS AND CONFIGURATION

1.2 Function block diagram

The function block diagram of this servo is shown below.

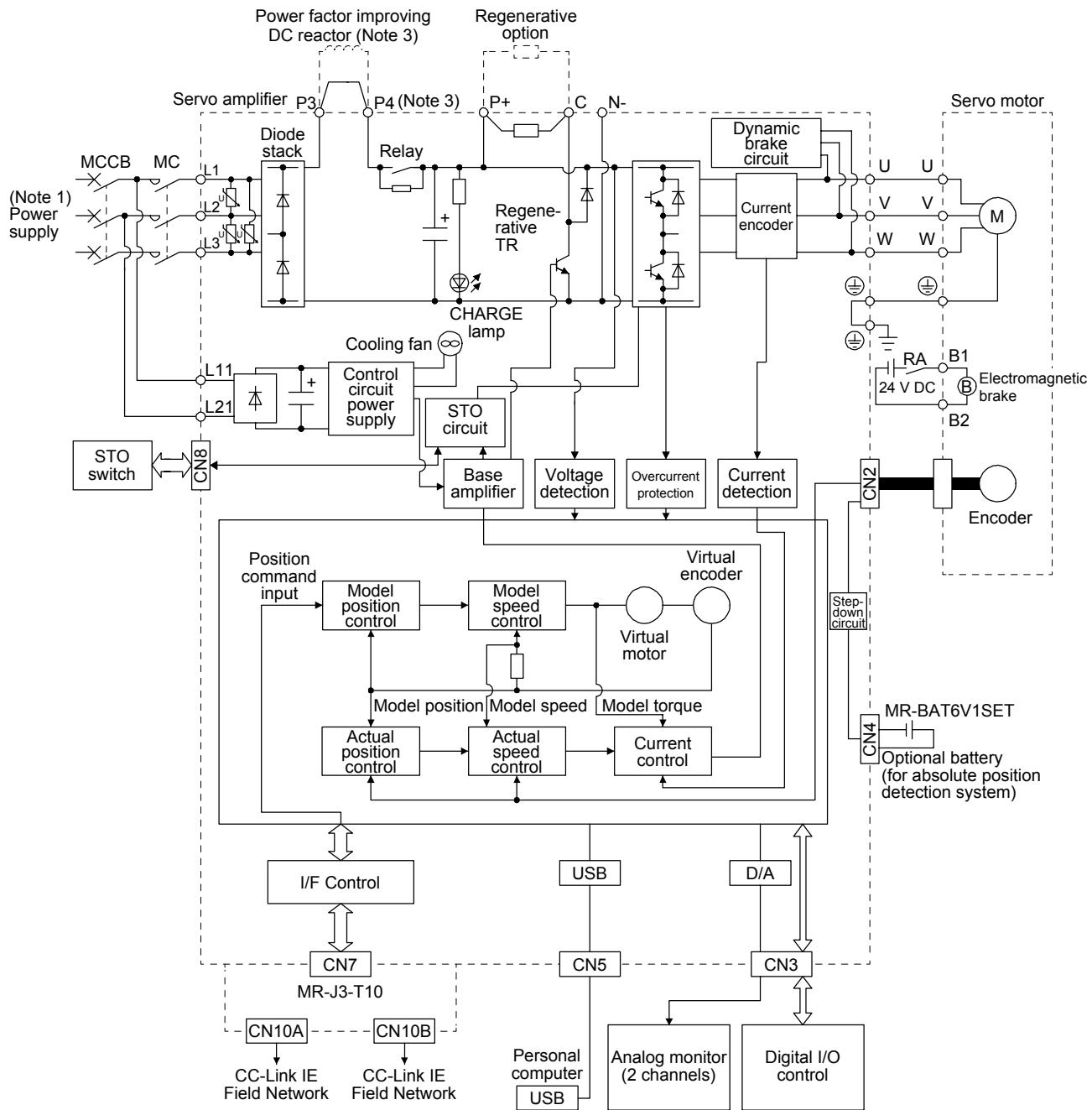
(1) MR-J4-500B-RJ010 or less



- Note
1. The built-in regenerative resistor is not provided for the MR-J4-10B-RJ010.
 2. For 1-phase 200 V AC to 240 V AC, connect the power supply to L1 and L3. Leave L2 open.
For power supply specifications, refer to section 1.3.1.
 3. Servo amplifiers MR-J4-70B-RJ010 or more have a cooling fan.
 4. MR-J4 servo amplifier has P3 and P4 in the upstream of the inrush current suppression circuit. They are different from P1 and P2 of MR-J3 servo amplifiers.
 5. 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.

1. FUNCTIONS AND CONFIGURATION

(2) MR-J4-700B-RJ010



Note 1. For power supply specifications, refer to section 1.3.1.

2. MR-J4 servo amplifier has P3 and P4 in the upstream of the inrush current suppression circuit. They are different from P1 and P2 of MR-J3 servo amplifiers.

3. 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.

1. FUNCTIONS AND CONFIGURATION

1.3 Standard specifications

1.3.1 Servo amplifier

Model: MR-J4-_-RJ010		10B	20B	40B	60B	70B	100B	200B	350B	500B	700B						
Output	Rated voltage	3-phase 170 V AC															
	Rated current [A]	1.1	1.5	2.8	3.2	5.8	6.0	11.0	17.0	28.0	37.0						
Main circuit power supply	Voltage/Frequency	3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz					3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz										
	Rated current [A]	0.9	1.5	2.6	3.2 (Note 5)	3.8	5.0	10.5	16.0	21.7	28.9						
	Permissible voltage fluctuation	3-phase or 1-phase 170 V AC to 264 V AC					3-phase 170 V AC to 264 V AC										
	Permissible frequency fluctuation	Within ±5%															
	Power supply capacity [kVA]	MR-J4-_-B(-RJ) Servo Amplifier Instruction Manual section 10.2															
	Inrush current [A]	MR-J4-_-B(-RJ) Servo Amplifier Instruction Manual section 10.5															
Control circuit power supply	Voltage/Frequency	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz															
	Rated current [A]	0.2								0.3							
	Permissible voltage fluctuation	1-phase 170 V AC to 264 V AC															
	Permissible frequency fluctuation	Within ±5%															
	Power consumption [W]	30								45							
	Inrush current [A]	MR-J4-_-B(-RJ) Servo Amplifier Instruction Manual section 10.5															
Interface power supply	Voltage	24 V DC ± 10%															
	Current capacity [A]	(Note 1) 0.3 (including CN8 connector signals)															
Control method		Sine-wave PWM control, current control method															
Dynamic brake		Built-in															
Communication function		USB: connection to a personal computer or others (MR Configurator2-compatible)															
Encoder output pulses		Compatible (A/B/Z-phase pulse)															
Analog monitor		2 channels															
Protective functions		Overcurrent shut-off, regenerative overvoltage shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, regenerative error protection, undervoltage, instantaneous power failure protection, overspeed protection, and error excessive protection															
Safety function		STO (IEC/EN 61800-5-2)															
Safety performance	Standards certified by CB	EN ISO 13849-1 category 3 PL d, EN 61508 SIL 2, EN 62061 SIL CL 2, and EN 61800-5-2 SIL 2															
	Response performance	8 ms or less (STO input off → energy shut off)															
	(Note 3) Test pulse input (STO)	Test pulse interval: 1 Hz to 25 Hz Test pulse off time: Up to 1 ms															
Compliance to standards	CE marking	LVD: EN 61800-5-1 EMC: EN 61800-3 MD: EN ISO 13849-1, EN 61800-5-2, EN 62061															
	UL standard	UL 508C															
Structure (IP rating)			Natural cooling, open (IP20)				Force cooling, open (IP20)			Force cooling, open (IP20) (Note 4)							
Close mounting (Note 2)			Possible				Impossible										
Environment	Ambient temperature	Operation	0 °C to 55 °C (non-freezing)														
		Storage	-20 °C to 65 °C (non-freezing)														
	Ambient humidity	Operation	90 %RH or less (non-condensing)														
		Storage															
	Ambience	Indoors (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, and dirt															
	Altitude	1000 m or less above sea level															
Vibration resistance			5.9 m/s ² , at 10 Hz to 55 Hz (directions of X, Y and Z axes)														
Mass			[kg]	0.8	1.0	1.4	2.1	2.3	4.0	6.2							

- Note 1. 0.3 A is the value applicable when all I/O signals are used. The current capacity can be decreased by reducing the number of I/O points.
2. When closely mounting the servo amplifier of 3.5 kW or less, operate them at the ambient temperatures of 0 °C to 45 °C or at 75% or smaller effective load ratio.
3. Test pulse is a signal which instantaneously turns off a signal to the servo amplifier at a constant period for external circuit to self-diagnose.
4. Except for the terminal block.
5. The rated current is 2.9 A when the servo amplifier is used with UL or CSA compliant servo motor.

1. FUNCTIONS AND CONFIGURATION

1.3.2 MR-J3-T10 Field Network interface unit

Model			MR-J3-T10
Control circuit power supply	Voltage		5 V DC (supplied from the servo amplifier)
	Rated current [A]		0.8
I/O interfaces			CC-Link IE Field Network interface
Number of communication ports			2 (CN10A connector/CN10B connector)
Structure			Natural-cooling, open (IP rating: IP 00)
Environment	Ambient temperature	Operation	0 °C to 55 °C (non-freezing)
		Storage	-20 °C to 65 °C (non-freezing)
	Ambient humidity	Operation	90 %RH or less (non-condensing)
		Storage	
	Ambience	Indoors (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, and dirt	
	Altitude	1000 m or less above sea level	
	Vibration resistance	5.9 m/s ² , at 10 Hz to 55 Hz (directions of X, Y and Z axes)	
Mass	[g]	150	

1.4 Combinations of servo amplifiers and servo motors

POINT	
● Linear servo motors and direct drive motors cannot be used with the MR-J4-_B-RJ010 servo amplifier.	

Servo amplifier	Rotary servo motor						
	HG-KR	HG-MR	HG-SR	HG-UR	HG-RR	HG-JR	(at maximum torque 400%)
MR-J4-10B-RJ010	053 13	053 13					
MR-J4-20B-RJ010	23	23					
MR-J4-40B-RJ010	43	43					
MR-J4-60B-RJ010			51 52			53	
MR-J4-70B-RJ010	73	73		72		73	
MR-J4-100B-RJ010			81 102			103	53
MR-J4-200B-RJ010			121 201 152 202	152	103 153	153 203	73 103
MR-J4-350B-RJ010			301 352	202	203	353	153 203
MR-J4-500B-RJ010			421 502	352 502	353 503	503	353
MR-J4-700B-RJ010			702			703	503

1. FUNCTIONS AND CONFIGURATION

1.5 Function list

The following table lists the functions of this servo. For details of the functions, refer to each section of the detailed description field. "MR-J4-_B" means "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".

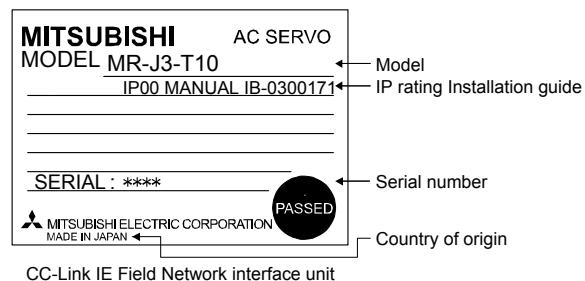
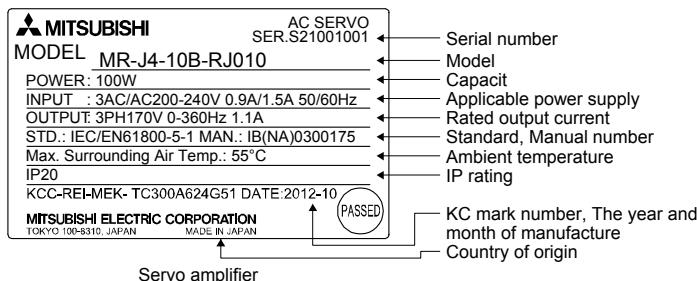
Function	Description	Detailed explanation
Position control mode	This servo is used as a position control servo.	
Speed control mode	This is not available with the MR-J4-_B-RJ010 servo amplifier.	
Torque control mode	This is not available with the MR-J4-_B-RJ010 servo amplifier.	
High-resolution encoder	High-resolution encoder of 4194304 pulses/rev is used as the encoder of the rotary servo motor compatible with the MELSERVO-J4 series.	
Absolute position detection system	Merely setting a home position once makes home position return unnecessary at every power-on.	MR-J4-_B chapter 12
Gain switching function	This is not available with the MR-J4-_B-RJ010 servo amplifier.	
Advanced vibration suppression control II	This function suppresses vibration at the arm end or residual vibration.	MR-J4-_B section 7.1.5
Adaptive filter II	Servo amplifier detects mechanical resonance and sets filter characteristics automatically to suppress mechanical vibration.	MR-J4-_B section 7.1.2
Low-pass filter	Suppresses high-frequency resonance which occurs as servo system response is increased.	MR-J4-_B section 7.1.4
Machine analyzer function	Analyzes the frequency characteristic of the mechanical system by simply connecting a MR Configurator2 installed personal computer and servo amplifier. MR Configurator2 is necessary for this function.	
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.	[Pr. PE41]
Slight vibration suppression control	Suppresses vibration of ± 1 pulse produced at a servo motor stop.	[Pr. PB24]
Auto tuning	Automatically adjusts the gain to optimum value if load applied to the servo motor shaft varies.	MR-J4-_B section 6.3
Brake unit	Used when the regenerative option cannot provide enough regenerative power. Can be used for the 5 kW or more servo amplifier.	MR-J4-_B section 11.3
Power regenerative converter	Used when the regenerative option cannot provide enough regenerative power. Can be used for the 5 kW or more servo amplifier.	MR-J4-_B section 11.4
Regenerative option	Used when the built-in regenerative resistor of the servo amplifier does not have sufficient regenerative capability for the regenerative power generated.	MR-J4-_B section 11.2
Alarm history clear	Alarm history is cleared.	[Pr. PC21]
Output signal selection (device settings)	The output devices including ALM (Malfunction) can be assigned to specified pins of the CN3 connector.	[Pr. PD07] to [Pr. PD09]
Output signal (DO) forced output	Output signal can be forced on/off independently of the servo status. Use this function for checking output signal wiring, etc.	MR-J4-_B section 4.5.1 (1) (d)
Test operation mode	Jog operation, positioning operation, motor-less operation, DO forced output, and program operation MR Configurator2 is necessary for this function.	MR-J4-_B section 4.5
Analog monitor output	Servo status is output in terms of voltage in real time.	[Pr. PC09], [Pr. PC10]
MR Configurator2	Using a personal computer, you can perform the parameter setting, test operation, monitoring, and others. Use MR Configurator2 of software version 1.19V or later for the MR-J4-_B-RJ010 servo amplifier.	MR-J4-_B section 11.7
Linear servo system	This is not available with the MR-J4-_B-RJ010 servo amplifier.	
Direct drive servo system	This is not available with the MR-J4-_B-RJ010 servo amplifier.	
Fully closed loop system	This is not available with the MR-J4-_B-RJ010 servo amplifier.	
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.	MR-J4-_B section 6.2
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.	MR-J4-_B section 7.3

1. FUNCTIONS AND CONFIGURATION

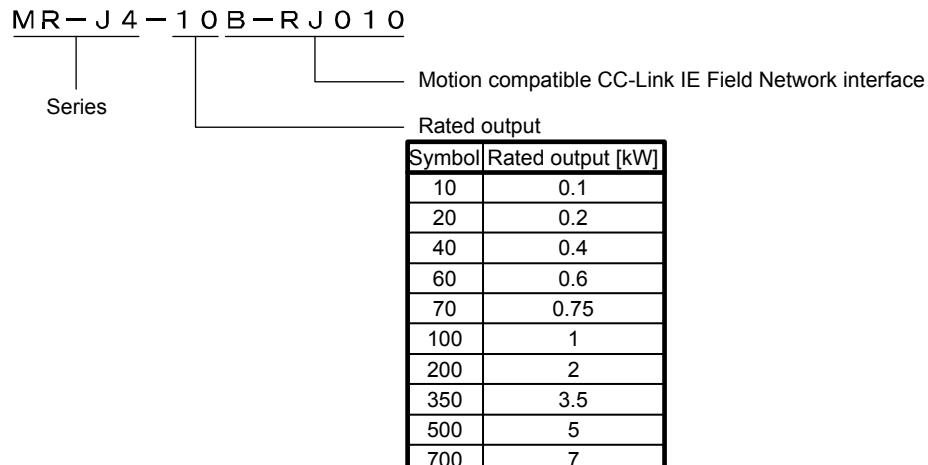
Function	Description	Detailed explanation
Drive recorder function	<p>This function continuously monitors the servo status and records the status transition before and after an alarm for a fixed period of time. You can check the recorded data on the drive recorder window on MR Configurator2 by clicking the "Graph" button.</p> <p>However, the drive recorder will not operate on the following conditions.</p> <ol style="list-style-type: none"> 1. You are using the graph function of MR Configurator2. 2. You are using the machine analyzer function. 3. [Pr. PF21] is set to "-1". 4. The controller is not connected (except the test operation mode). 5. An alarm related to the controller is occurring. 	[Pr. PA23]
STO function	This function is a safety function that complies with IEC/EN 61800-5-2. You can create a safety system for the equipment easily.	
Servo amplifier life diagnosis function	<p>You can check the cumulative energization time and the number of on/off times of the inrush relay. This function gives an indication of the replacement time for parts of the servo amplifier including a capacitor and a relay before they malfunction.</p> <p>MR Configurator2 is necessary for this function.</p>	
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.	
Machine diagnosis function	<p>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.</p> <p>MR Configurator2 is necessary for this function.</p>	

1.6 Model designation

(1) Rating plate



(2) Model



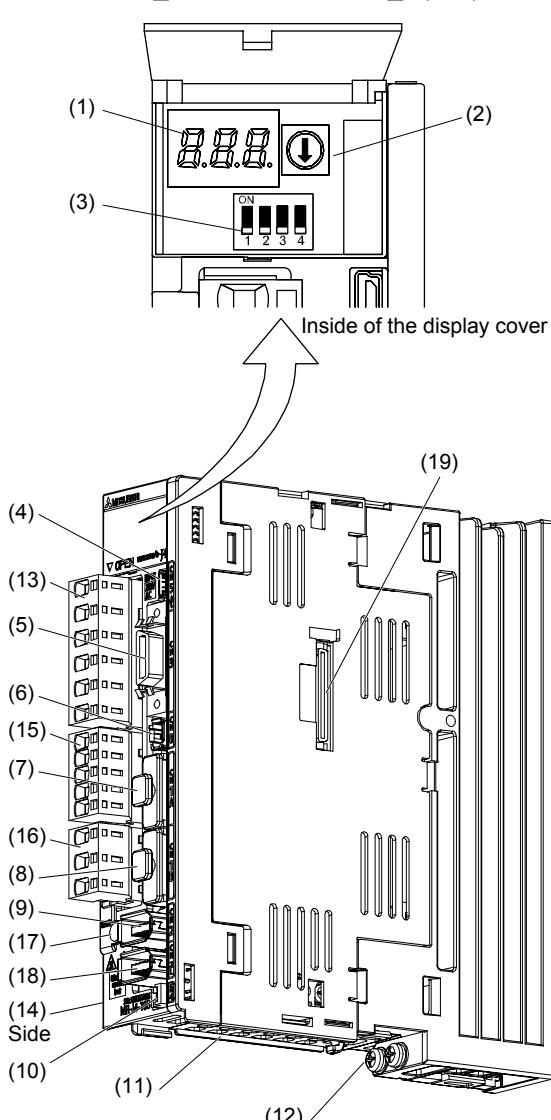
1. FUNCTIONS AND CONFIGURATION

1.7 Structure

1.7.1 Parts identification

(1) MR-J4-200B-RJ010 or less

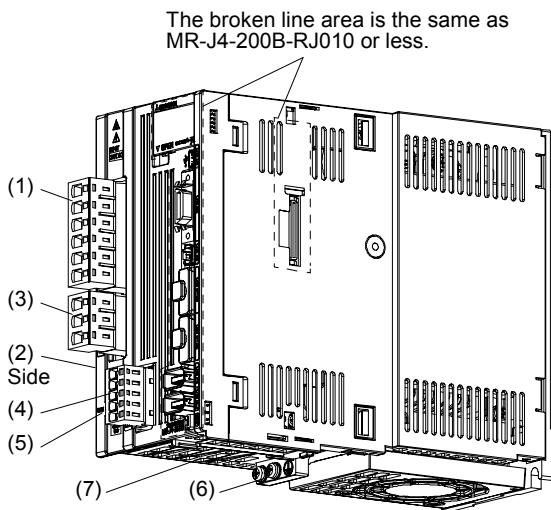
"MR-J4-_B" means "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".



No.	Name/Application	Detailed explanation
(1)	Display The 3-digit, seven-segment LED shows the servo status and the alarm number.	Section 4.2
(2)	Station number setting rotary switch (SW1) Used to set a station No. of servo amplifier.	
(3)	Auxiliary station number setting switch (SW2) This consists of the test operation select switch and auxiliary station number setting switches.	Section 4.2
(4)	USB communication connector (CN5) Connect with the personal computer.	MR-J4-_B section 11.7
(5)	I/O signal connector (CN3) Used to connect digital I/O signals.	Section 3.1 MR-J4-_B section 3.4
(6)	STO input signal connector (CN8) Used to connect MR-J3-D05 safety logic unit and external safety relay.	MR-J4-_B chapter 13 MR-J4-_B app. 5
(7)	Manufacturer setting connector (CN1A) This is not available with the servo amplifier. Always cap the connector.	
(8)	Manufacturer setting connector (CN1B) This is not available with the servo amplifier. Always cap the connector.	
(9)	Encoder connector (CN2) Used to connect the servo motor encoder.	MR-J4-_B section 3.4
(10)	Battery connector (CN4) Used to connect the battery or the battery unit for absolute position data backup.	MR-J4-_B chapter 12
(11)	Battery holder Install the the battery for absolute position data backup.	MR-J4-_B section 12.4
(12)	Protective earth (PE) terminal Grounding terminal	MR-J4-_B section 3.1 MR-J4-_B section 3.3
(13)	Main circuit power supply connector (CNP1) Connect the input power supply.	
(14)	Rating plate	Section 1.6
(15)	Control circuit power supply connector (CNP2) Connect the control circuit power supply or regenerative option.	MR-J4-_B section 3.1 MR-J4-_B section 3.3
(16)	Servo motor power supply connector (CNP3) Connect the servo motor.	
(17)	Charge lamp When the main circuit is charged, this will light. While this lamp is lit, do not reconnect the cables.	
(18)	Manufacturer setting connector (CN2L) This is not available with the servo amplifier.	
(19)	Optional unit connector (CN7) This is for connecting MR-J3-T10.	Section 1.8

1. FUNCTIONS AND CONFIGURATION

(2) MR-J4-350B-RJ010



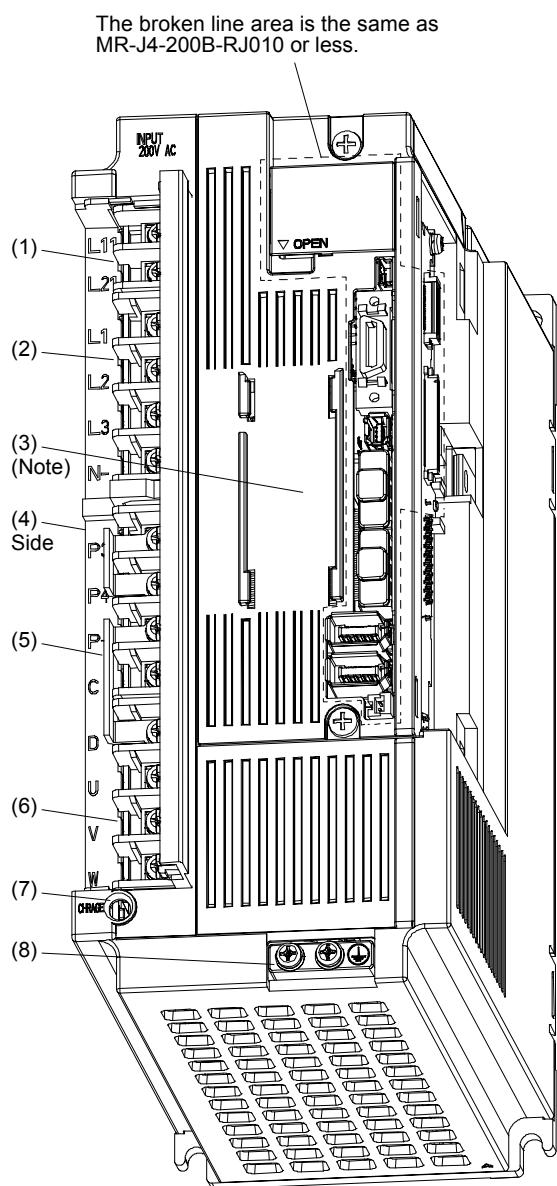
No.	Name/Application	Detailed explanation
(1)	Main circuit power supply connector (CNP1) Connect the input power supply.	MR-J4_B section 3.1 MR-J4_B section 3.3
(2)	Rating plate	Section 1.6
(3)	Servo motor power supply connector (CNP3) Connect the servo motor.	MR-J4_B section 3.1
(4)	Control circuit power supply connector (CNP2) Connect the control circuit power supply or regenerative option.	MR-J4_B section 3.3
(5)	Charge lamp When the main circuit is charged, this will light. While this lamp is lit, do not reconnect the cables.	
(6)	Protective earth (PE) terminal Grounding terminal	MR-J4_B section 3.1 MR-J4_B section 3.3
(7)	Battery holder Install the the battery for absolute position data backup.	MR-J4_B section 12.4

1. FUNCTIONS AND CONFIGURATION

(3) MR-J4-500B-RJ010

POINT

- The servo amplifier is shown with the front cover open. The front cover cannot be removed.



No.	Name/Application	Detailed explanation
(1)	Control circuit terminal block (TE2) Used to connect the control circuit power supply.	MR-J4_B section 3.1
(2)	Main circuit terminal block (TE1) Connect the input power supply.	MR-J4_B section 3.3
(3)	Battery holder Install the the battery for absolute position data backup.	MR-J4_B section 12.4
(4)	Rating plate	Section 1.6
(5)	Regenerative option/power factor improving reactor terminal block (TE3) Used to connect regenerative options and a power factor improving DC reactor.	MR-J4_B section 3.1 MR-J4_B section 3.3
(6)	Servo motor power supply terminal block (TE4) Connect the servo motor.	
(7)	Charge lamp When the main circuit is charged, this will light. While this lamp is lit, do not reconnect the cables.	
(8)	Protective earth (PE) terminal Grounding terminal	MR-J4_B section 3.1 MR-J4_B section 3.3

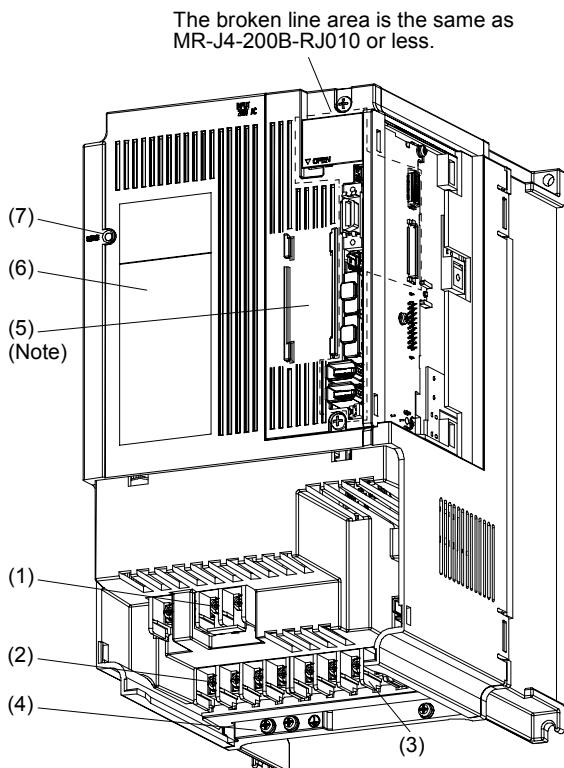
Note. Lines for slots around the battery holder are omitted from the illustration.

1. FUNCTIONS AND CONFIGURATION

(4) MR-J4-700B-RJ010

POINT

- The servo amplifier is shown without the front cover. For removal of the front cover, refer to section 1.7.2 of "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".

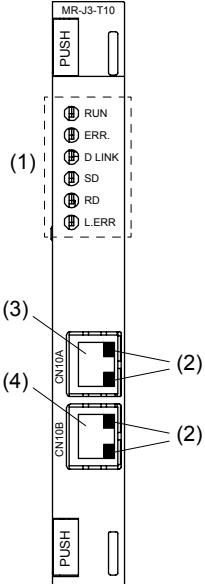


No.	Name/Application	Detailed explanation
(1)	Power factor improving reactor terminal block (TE3) Used to connect the DC reactor.	MR-J4-_B section 3.1 MR-J4-_B section 3.3
(2)	Main circuit terminal block (TE1) Used to connect the input power supply, regenerative option, and servo motor.	
(3)	Control circuit terminal block (TE2) Used to connect the control circuit power supply.	
(4)	Protective earth (PE) terminal Grounding terminal	
(5)	Battery holder Install the battery for absolute position data backup.	MR-J4-_B section 12.4
(6)	Rating plate	
(7)	Charge lamp When the main circuit is charged, this will light. While this lamp is lit, do not reconnect the cables.	Section 1.6

Note. Lines for slots around the battery holder are omitted from the illustration.

1. FUNCTIONS AND CONFIGURATION

1.7.2 Parts identification of MR-J3-T10



No.	Name/Application	Detailed explanation
(1)	Display RUN D LINK SD RD ERR. L ERR.	Status of CC-Link IE communication is displayed.
(2)	Display LINK L.E.R	Status of CC-Link IE communication is displayed.
(3)	CC-Link IE Field Network communication connector (CN10A) Connect to CC-Link IE Field Network.	
(4)	CC-Link IE Field Network communication connector (CN10B) Connect to CC-Link IE Field Network.	Section 3.1 Chapter 8

1. FUNCTIONS AND CONFIGURATION

1.8 Installation and removal of MR-J3-T10

⚠ WARNING

- Before installing or removing the CC-Link IE interface unit, 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.

⚠ CAUTION

- Avoid installing and removing MR-J3-T10 repeatedly. Any contact failure of the connector may be caused.
- Avoid unsealing MR-J3-T10 to be free of dust and dirt against the connector except installing. Make sure to use the pre-packing when storing.
- Avoid using MR-J3-T10 of which the hook and knobs for fixing are damaged. Any contact failure of the connector may be caused.
- When installing and removing MR-J3-T10 to the MR-J4-500B-RJ010 or more, avoid dropping out the installing screw inside it. Otherwise, it may cause a malfunction.
- When installing MR-J3-T10 to the MR-J3-500B-RJ010 or more, avoid damaging the control board by the fixing plate. Otherwise, it may cause a malfunction.
- Make sure to tighten MR-J3-T10 with the enclosed installing screws when installing.

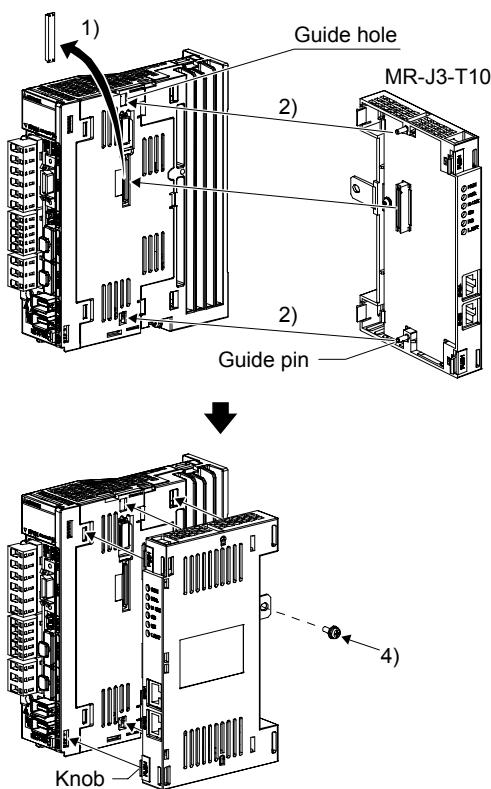
POINT

- The internal circuits of the servo amplifier and MR-J3-T10 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.

1. FUNCTIONS AND CONFIGURATION

(1) MR-J4-350B-RJ010 or smaller capacity models

(a) Installation of MR-J3-T10



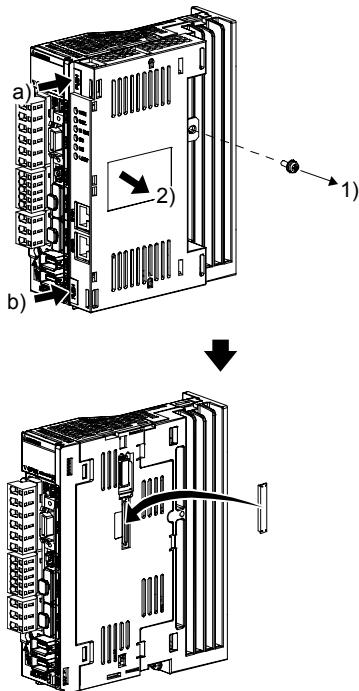
1) Remove the cover of connector for connecting an option.
Make sure to store the removed cover.

2) Find the guide hole on the side of the servo amplifier. To the guide hole, insert the MR-J3-T10's guide pins.

3) Push MR-J3-T10 until the knobs click.

4) Tighten the unit with the enclosed installing screw (M4).

(b) Removal of MR-J3-T10



1) Remove the installing screw.

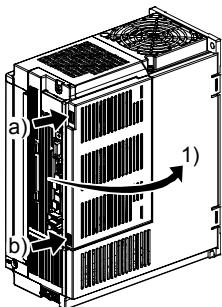
2) Keep pushing the knobs (a) , b) and pull out MR-J3-T10 to the arrow direction. Avoid pulling out MR-J3-T10 while it is tightened with the installation screw.

After removing MR-J3-T10, make sure to cap the connector for connecting an option to avoid dust and dirt.

1. FUNCTIONS AND CONFIGURATION

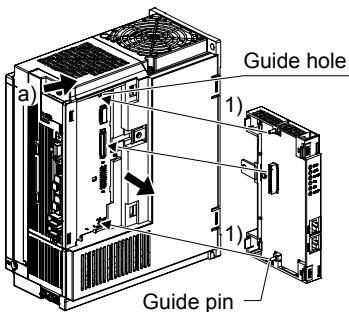
(2) MR-J4-350B-RJ010/MR-J4-500B-RJ010/MR-J4-700B-RJ010

(a) Removal of the side cover

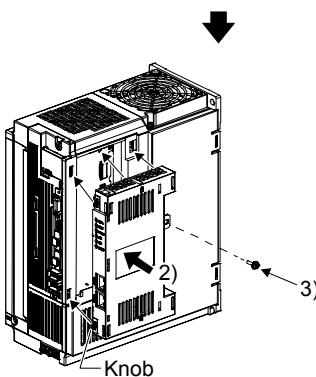


- 1) Keep pushing the knobs (a) , b) and pull out the side cover to the arrow direction.

(b) Installation of MR-J3-T10

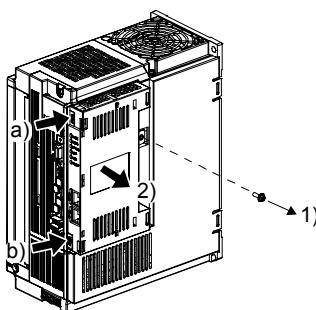


- 1) Find the guide hole on the side of the servo amplifier. To the guide hole, insert the MR-J3-T10's guide pins.



- 2) Push MR-J3-T10 until the knobs click.
- 3) Tighten the unit with the enclosed installing screw (M4).

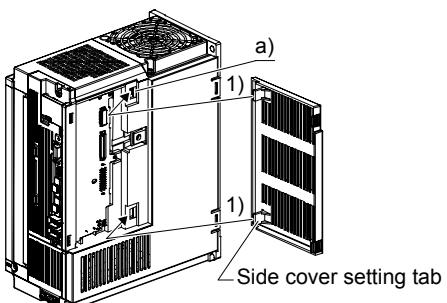
(c) Removal of MR-J3-T10



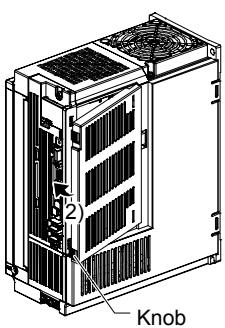
- 1) Remove the installing screw.
- 2) Keep pushing the knobs (a) , b) and pull out MR-J3-T10 to the arrow direction. Avoid pulling out MR-J3-T10 while it is tightened with the installation screw.

1. FUNCTIONS AND CONFIGURATION

(d) Installation of the side cover



- 1) Insert the side cover setting tabs into the sockets a) of servo amplifier.



- 2) Push the side cover at the supporting point a) until the knobs click.

1. FUNCTIONS AND CONFIGURATION

1.9 Configuration including peripheral equipment

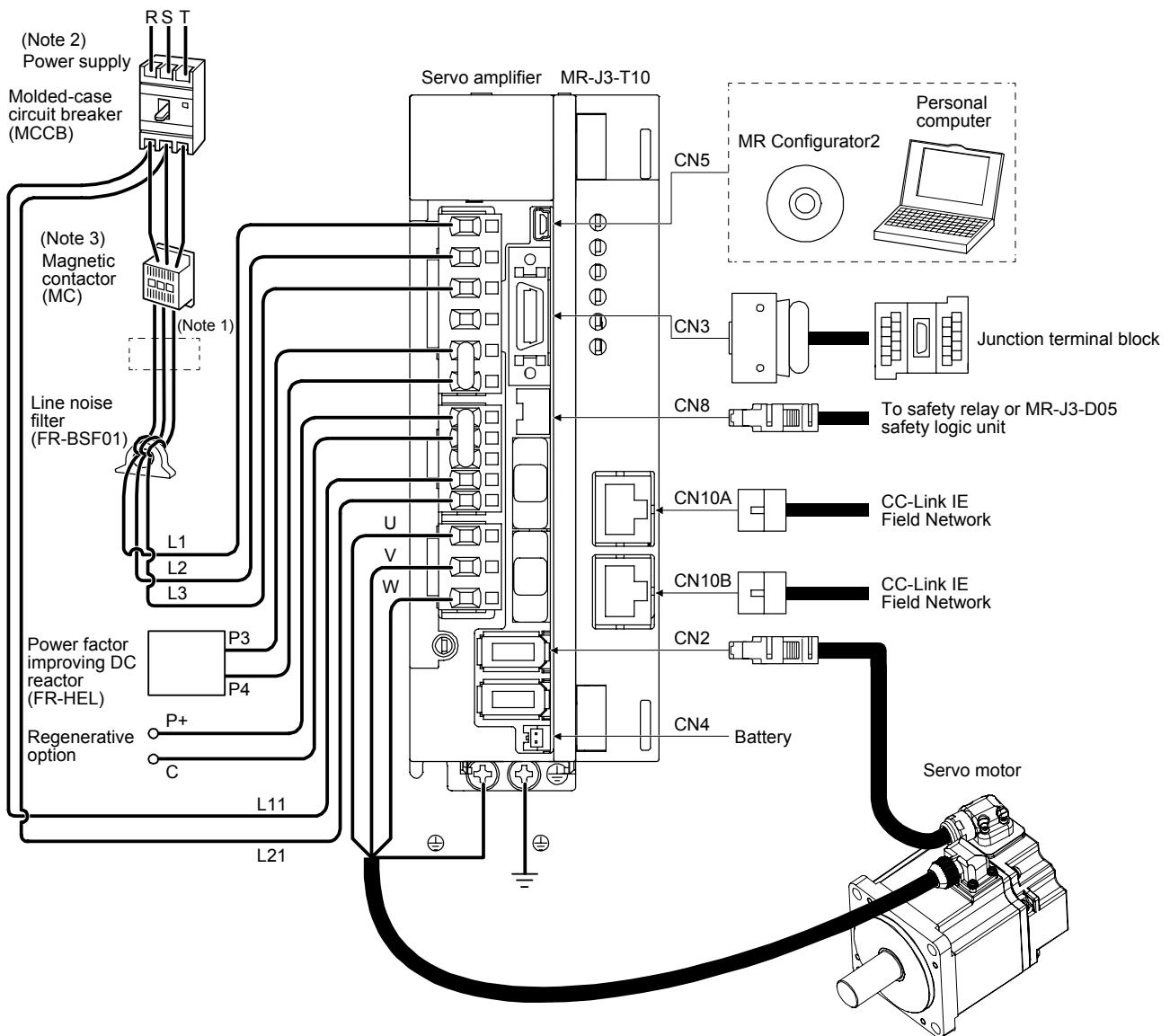


● Connecting a servo motor for different axis to U, V, W, or CN2 of the servo amplifier may cause a malfunction.

POINT

● Equipment other than the servo amplifier and servo motor are optional or recommended products.

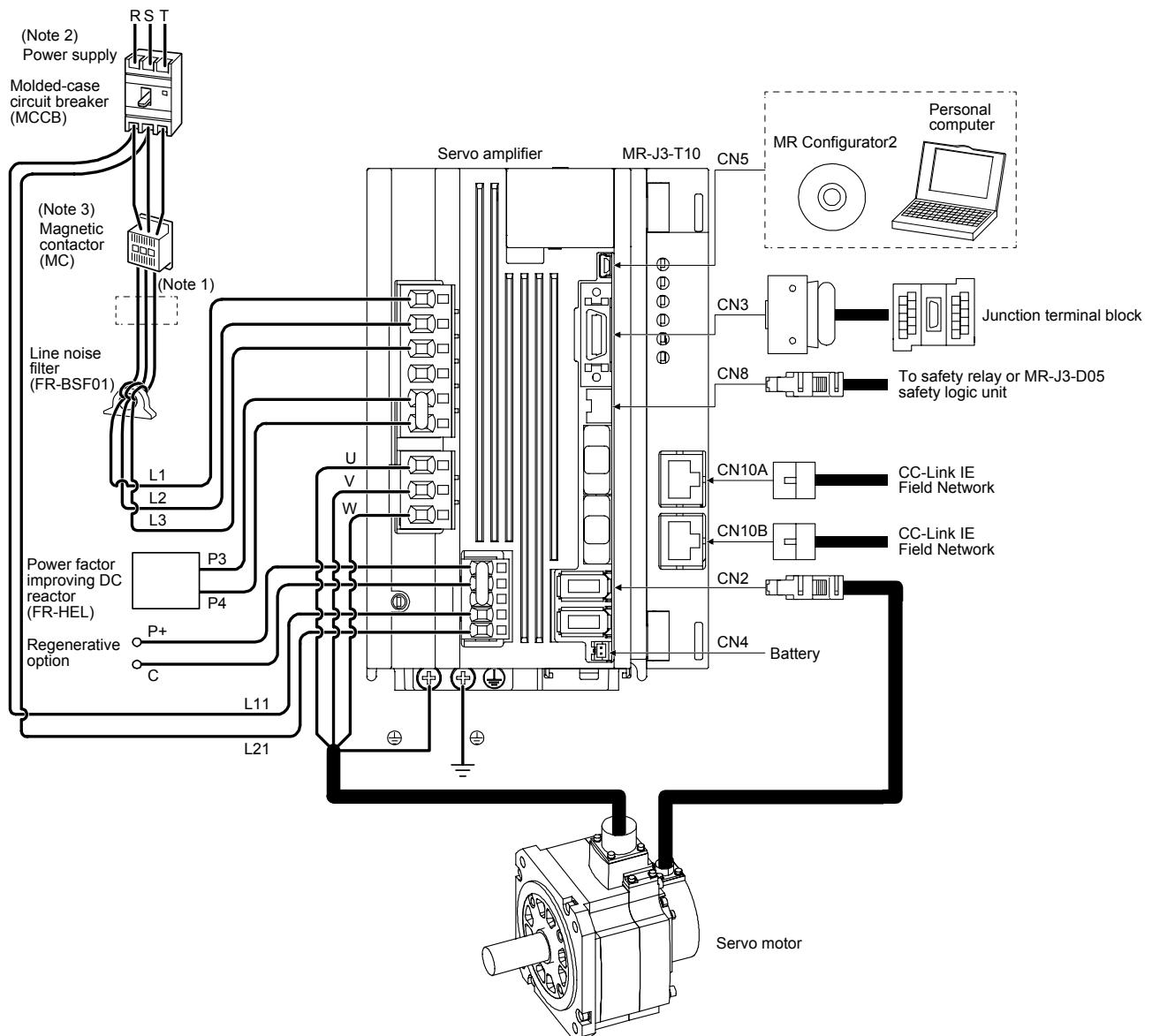
(1) MR-J4-200B-RJ010 or less



- 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. A 1-phase 200 V AC to 240 V AC power supply may be used with the servo amplifier of MR-J4-70B-RJ010 or less. For 1-phase 200 V AC to 240 V AC, connect the power supply to L1 and L3. Leave L2 open. For power supply specifications, refer to section 1.3.1.
 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.

1. FUNCTIONS AND CONFIGURATION

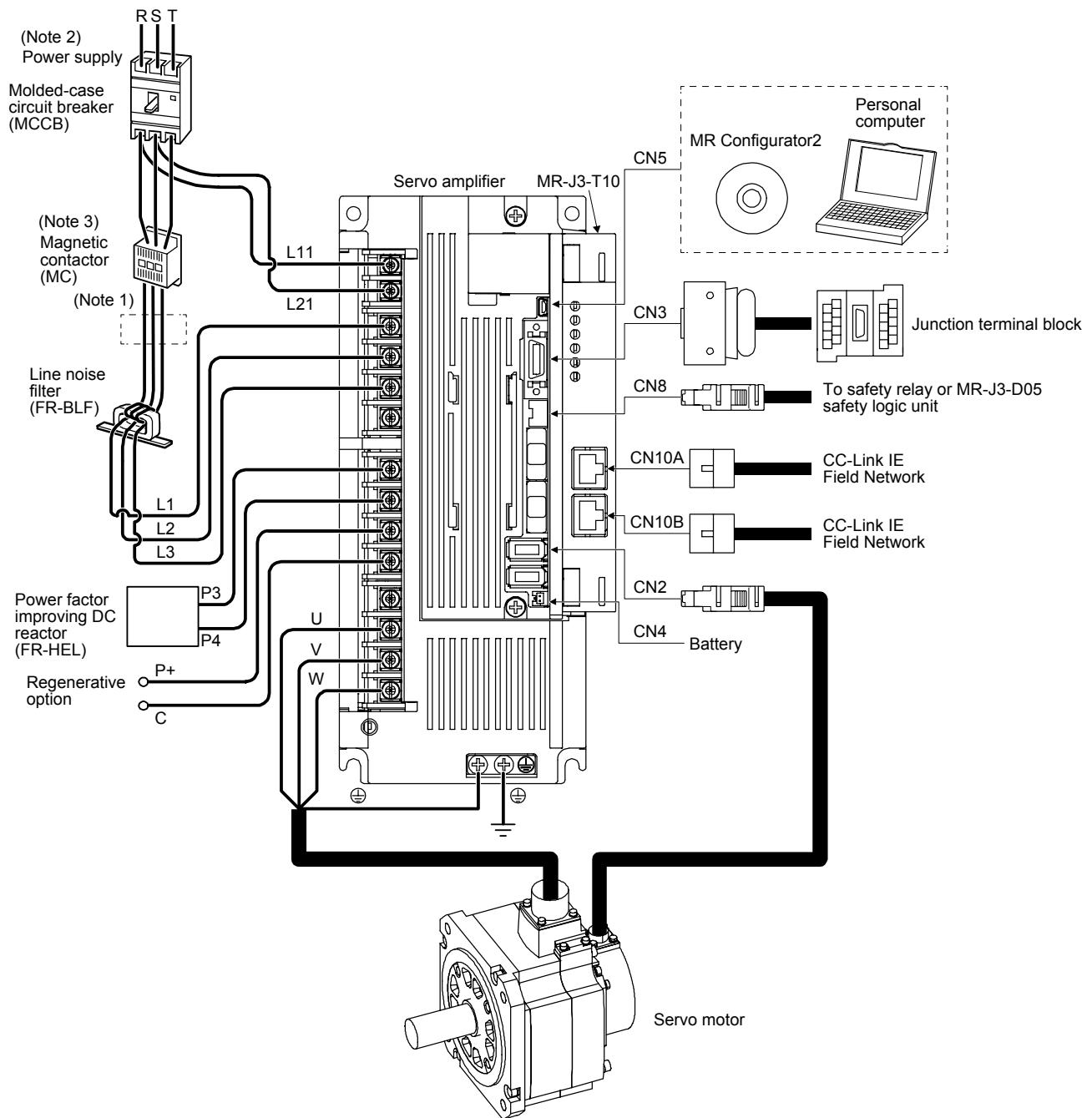
(2) MR-J4-350B-RJ010



- 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 section 1.3.1.
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.

1. FUNCTIONS AND CONFIGURATION

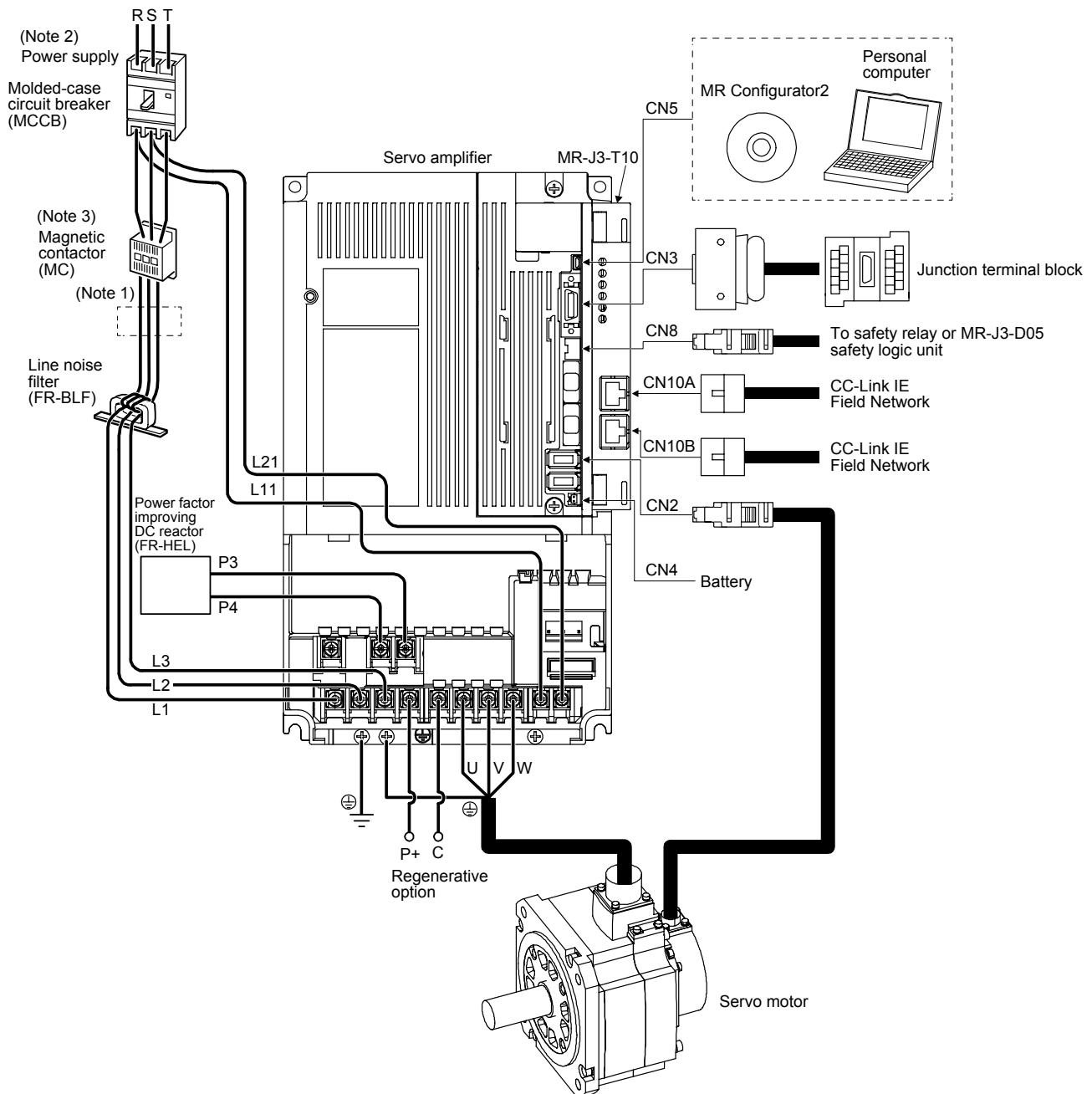
(3) MR-J4-500B-RJ010



- 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 section 1.3.1.
 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.

1. FUNCTIONS AND CONFIGURATION

(4) MR-J4-700B-RJ010



- 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 section 1.3.1.
 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.

2. INSTALLATION

2. INSTALLATION



WARNING ●To prevent electric shock, ground each equipment securely.

- Stacking in excess of the specified number of product packages is not allowed.
- Install the equipment on incombustible material. Installing it directly or close to combustibles will lead to a fire.
- 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. Otherwise, it may cause injury.
- Use the equipment within the specified environment. For the environment, refer to section 1.3.
- Provide adequate protection to prevent screws and other conductive matter, oil and other combustible matter from entering the servo amplifier and MR-J3-T10.
- Do not block the intake and exhaust areas of the servo amplifier and MR-J3-T10. Otherwise, it may cause a malfunction.
- Do not drop or strike the servo amplifier and MR-J3-T10. Isolate them from all impact loads.
- Do not install or operate the servo amplifier and MR-J3-T10 which have been damaged or have any parts missing.
- When the product has been stored for an extended period of time, contact your local sales office.
- When handling the servo amplifier and MR-J3-T10, be careful about the edged parts such as corners of them.
- The servo amplifier and MR-J3-T10 must be installed in a metal cabinet.
- When you disinfect or protect wooden packing from insects, take measures except by fumigation. Fumigating the servo amplifier or packing the servo amplifier with fumigated wooden packing can cause a malfunction of the servo amplifier due to halogen materials (such as fluorine, chlorine, bromine, and iodine) which are contained in fumigant.
- The servo amplifier must not be used with parts which contain halogen-series flame retardant materials (such as bromine) under coexisting conditions.

POINT

- When pulling out CNP1, CNP2, and CNP3 connectors of MR-J4-40B-RJ010 or less servo amplifiers, pull out CN3 and CN8 connectors beforehand.

The following item is the same as MR-J4-_B servo amplifiers. For details of the items, refer to each chapter/section of the detailed description field.

Item	Detailed explanation
Keep out foreign materials	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 2.2
Encoder cable stress	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 2.3
Inspection items	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 2.5
Parts having service lives	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 2.6

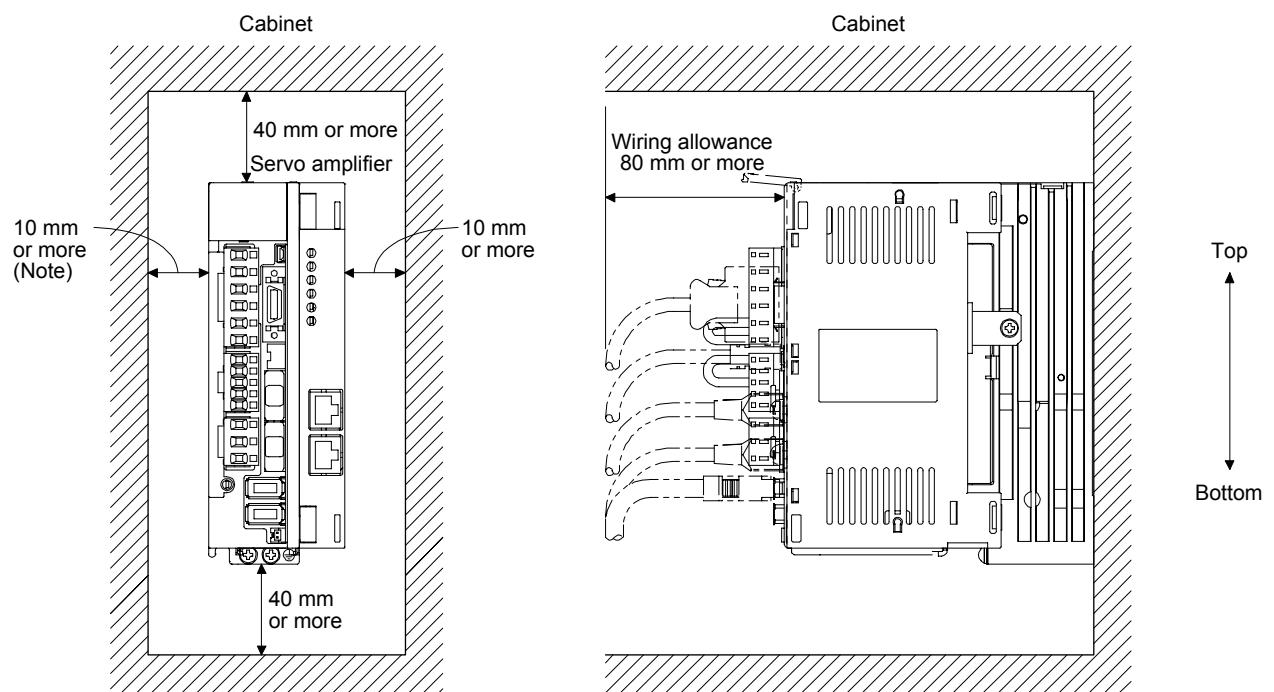
2. INSTALLATION

2.1 Installation direction and clearances

- The equipment must be installed in the specified direction. Otherwise, it may cause a malfunction.
- Leave specified clearances between the servo amplifier/MR-J3-T10 and the cabinet walls or other equipment. Otherwise, it may cause a malfunction.
- For the branch of CC-Link IE Field Network by the switching hub, use DT135TX (MITSUBISHI CABLE INDUSTRIES,LTD.). For details of the switching hub, refer to "MELSEC-Q QD77GF Simple Motion Module User's Manual (Positioning Control)".

(1) Installation clearances of the servo amplifier

(a) Installation of one servo amplifier



Note. For the 5 kW servo amplifier, the clearance between the left side and wall will be 25 mm or more.

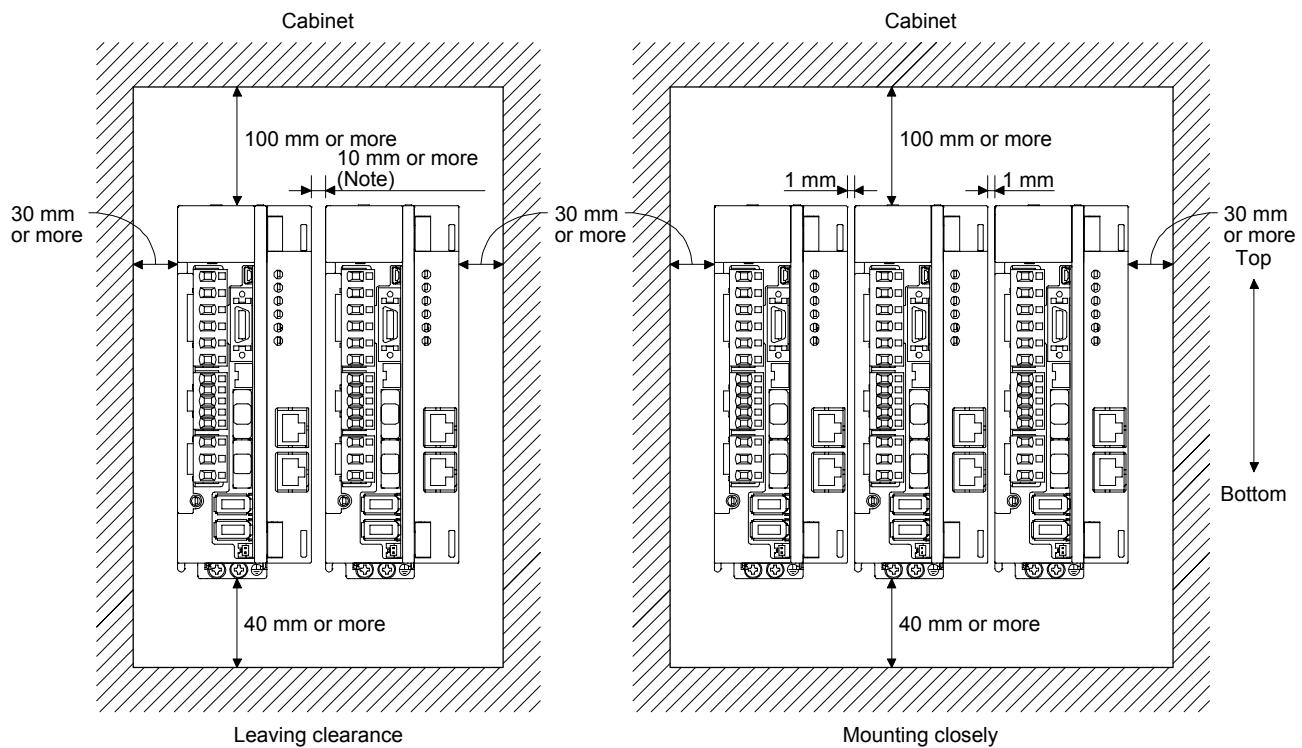
2. INSTALLATION

(b) Installation of two or more servo amplifiers

POINT

- Close mounting is possible depending on the capacity of the servo amplifier. Refer to section 1.3.1 for availability of close mounting.
- When mounting the servo amplifiers closely, do not install the servo amplifier whose depth is larger than that of the left side servo amplifier since CNP1, CNP2, and CNP3 connectors cannot be disconnected.

Leave a large clearance between the top of the servo amplifier and the cabinet walls, and install a cooling fan to prevent the internal temperature of the cabinet from exceeding the environment. When mounting the servo amplifiers closely, leave a clearance of 1 mm between the adjacent servo amplifiers in consideration of mounting tolerances. In this case, keep the ambient temperature within 0 °C to 45 °C or use the servo amplifier with 75% or less of the effective load ratio.



Note. For the 5 kW servo amplifier, the clearance between the left side and wall will be 25 mm or more.

(2) Others

When using heat generating equipment such as the regenerative option, install them with full consideration of heat generation so that the servo amplifier is not affected.

Install the servo amplifier on a perpendicular wall in the correct vertical direction.

2. INSTALLATION

2.2 Keep out foreign materials

- (1) When drilling in the cabinet, prevent drill chips and wire fragments from entering the servo amplifier.
- (2) Prevent oil, water, metallic dust, etc. from entering the servo amplifier through openings in the cabinet or a cooling fan installed on the ceiling.
- (3) When installing the cabinet in a place where toxic gas, dirt and dust exist, conduct an air purge (force clean air into the cabinet from outside to make the internal pressure higher than the external pressure) to prevent such materials from entering the cabinet.

3. SIGNALS AND WIRING

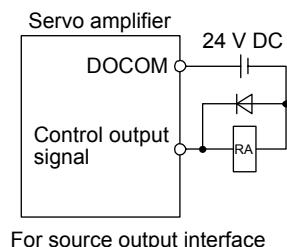
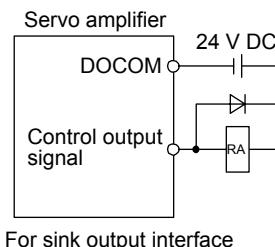
3. SIGNALS AND WIRING

- Any person who is involved in wiring should be fully competent to do the work.
- Before wiring, 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.



- WARNING
- Ground the servo amplifier and servo motor securely.
 - Do not attempt to wire the servo amplifier and servo motor until they have been installed. Otherwise, it may cause an electric shock.
 - The cables should not be damaged, stressed, loaded, or pinched. Otherwise, it may cause an electric shock.
 - To avoid an electric shock, insulate the connections of the power supply terminals.

- Wire the equipment correctly and securely. Otherwise, the servo motor may operate unexpectedly, resulting in injury.
- Connect cables to the correct terminals. Otherwise, a burst, damage, etc. may occur.
- Ensure that polarity (+/-) is correct. Otherwise, a burst, damage, etc. may occur.
- 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.

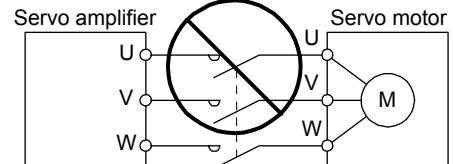
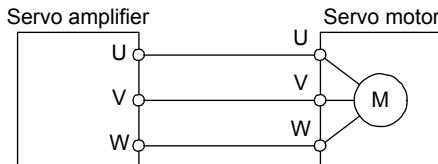


- Use a noise filter, etc. to minimize the influence of electromagnetic interference. Electromagnetic interference may be given to the electronic equipment used near the servo amplifier.
- Do not install a power capacitor, surge killer or radio noise filter (FR-BIF option) with the power line of the servo motor.
- When using the regenerative resistor, switch power off with the alarm signal. Otherwise, a transistor fault or the like may overheat the regenerative resistor, causing a fire.
- Do not modify the equipment.

3. SIGNALS AND WIRING

- Connect the servo amplifier power output (U, V, and W) to the servo motor power input (U, V, and W) directly. Do not let a magnetic contactor, etc. intervene. Otherwise, it may cause a malfunction.

! CAUTION



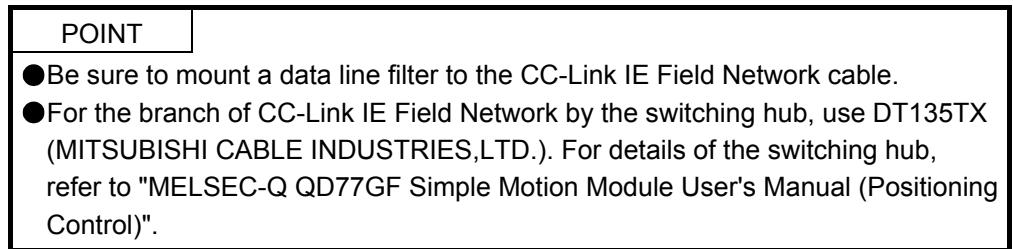
- Connecting a servo motor for different axis to U, V, W, or CN2 of the servo amplifier may cause a malfunction.

The following item is the same as MR-J4-_B servo amplifiers. For details of the items, refer to each chapter/section of the detailed description field.

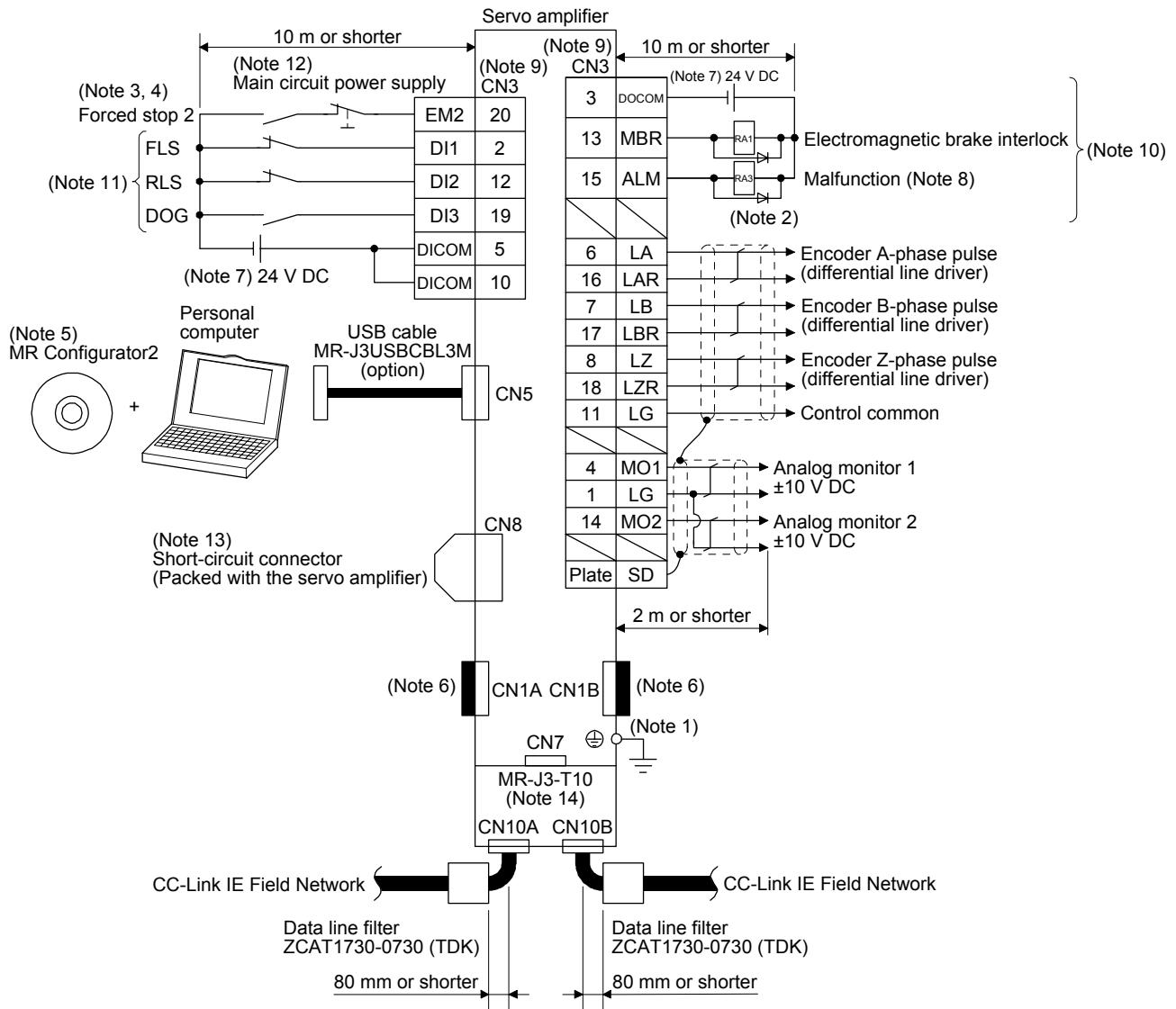
Item	Detailed explanation
Input power supply circuit	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 3.1
Explanation of power supply system	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 3.3
Connector and pin assignment	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 3.4
Signal (device) explanations	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 3.5
Forced stop deceleration function	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 3.6
Interface	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 3.8
Grounding	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 3.11

3. SIGNALS AND WIRING

3.1 I/O signal connection example



3.1.1 For sink I/O interface

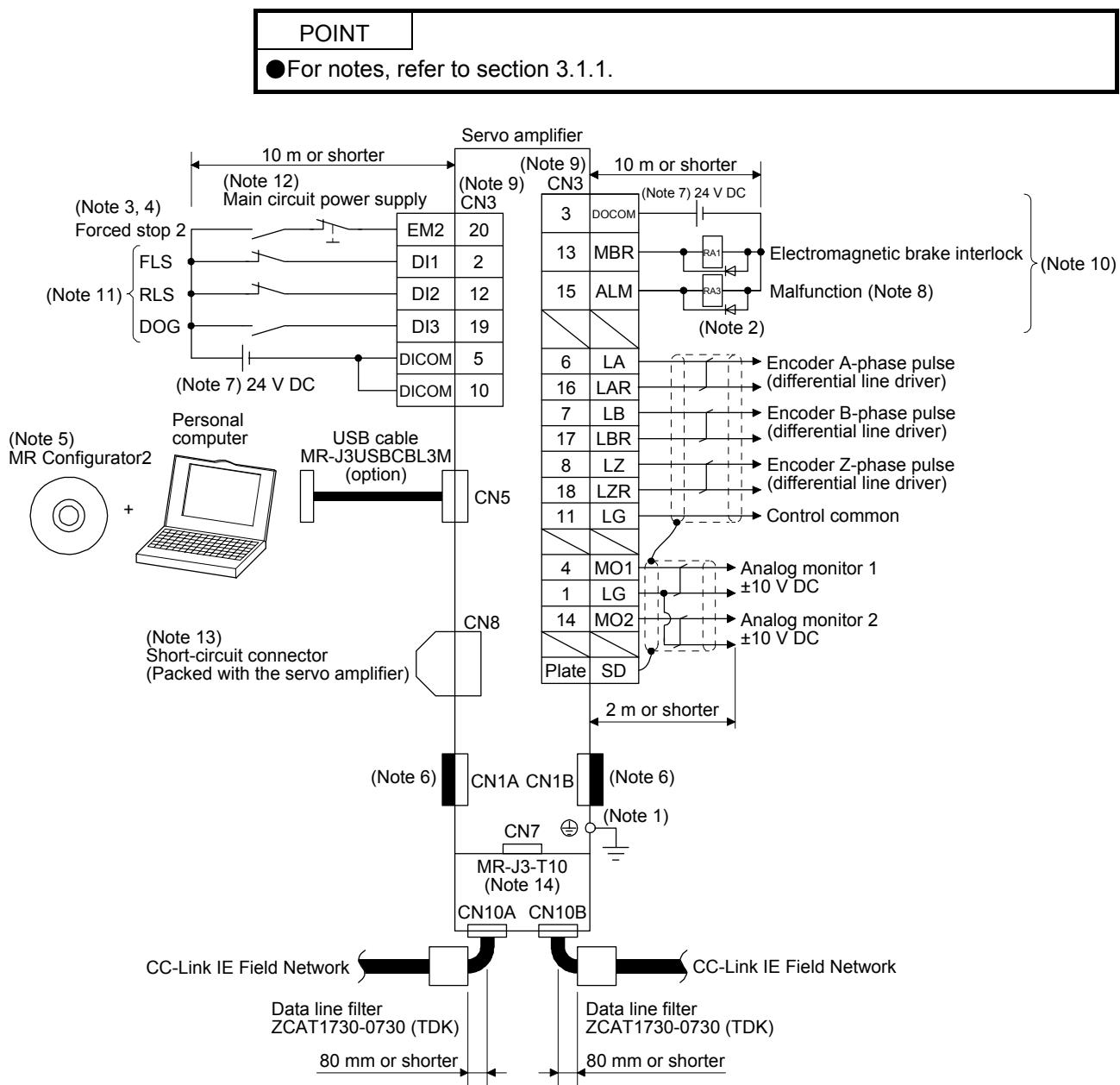


3. SIGNALS AND WIRING

- Note
1. To prevent an electric shock, always connect the protective earth (PE) terminal (marked \oplus) of the servo amplifier to the protective earth (PE) of the cabinet.
 2. Connect the diode in the correct direction. If it is connected reversely, the servo amplifier will malfunction and will not output signals, disabling EM2 (Forced stop 2) and other protective circuits.
 3. If the controller does not have forced stop function, always install the forced stop 2 switch (normally closed contact).
 4. When starting operation, always turn on EM2 (Forced stop 2). (Normally closed contact)
 5. Use SW1DNC-MRC2-J. (Refer to MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.7.)
 6. CN1A and CN1B cannot be used. Be sure to cap CN1A and CN1B connector.
 7. Supply 24 V DC \pm 10% for interfaces from outside. Set the total current capacity to 300 mA. 300 mA is the value applicable when all I/O signals are used. The current capacity can be decreased by reducing the number of I/O points. Refer to section 3.8.2 (1) of "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual" that gives the current value necessary for the interface. The illustration of the 24 V DC power supply is divided between input signal and output signal for convenience. However, they can be configured by one.
 8. ALM (Malfunction) turns on in normal alarm-free condition. (Normally closed contact)
 9. The pins with the same signal name are connected in the servo amplifier.
 10. You can change devices of these pins with [Pr. PD07], [Pr. PD08], and [Pr. PD09].
 11. Devices can be assigned for these devices with controller setting. For devices that can be assigned, refer to the controller instruction manual. The following devices can be assigned for QD77GF_._
FLS: Upper stroke limit
RLS: Lower stroke limit
DOG: Proximity dog
 12. Configure a circuit to turn off EM2 when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.
 13. When not using the STO function, attach a short-circuit connector supplied with a servo amplifier.
 14. Connector covers are mounted on the CN10A and the CN10B connectors when the product is shipped from the factory.
Remove those connector covers to connect the CC-Link IE Field Network cables.

3. SIGNALS AND WIRING

3.1.2 For source I/O interface



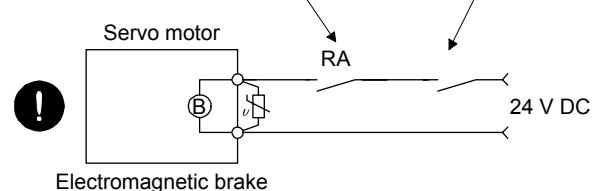
3. SIGNALS AND WIRING

3.2 Servo motor with an electromagnetic brake

3.2.1 Safety precautions

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

Contacts must be opened when ALM (Malfunction) or MBR (Electromagnetic brake interlock) turns off. Contacts must be opened with the EMG stop switch.



! CAUTION

- The electromagnetic brake is provided for holding purpose and must not be used for ordinary braking.
 - Before operating the servo motor, be sure to confirm that the electromagnetic brake operates properly.
 - Do not use the 24 V DC interface power supply for the electromagnetic brake. Always use the power supply designed exclusively for the electromagnetic brake. Otherwise, it may cause a malfunction.

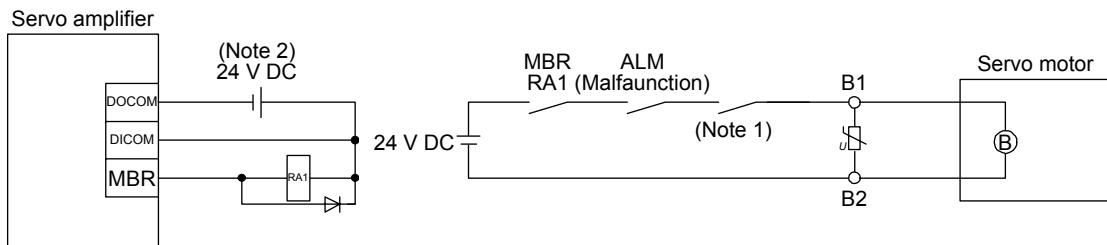
POINT

- Refer to "Servo Motor Instruction Manual (Vol. 3)" for specifications such as the power supply capacity and operation delay time of the electromagnetic brake.
 - Refer to "Servo Motor Instruction Manual (Vol. 3)" for the selection of a surge absorber for the electromagnetic brake.

Note the following when the servo motor with an electromagnetic brake is used.

- 1) The brake will operate when the power (24 V DC) turns off.
 - 2) Turn off the servo-on command after the servo motor stopped.

(1) Connection diagram



Note 1. Create the circuit in order to shut off by interlocking with the emergency stop switch.
2. Do not use the 24 V DC interface power supply for the electromagnetic brake.

(2) Setting

In [Pr. PC02 Electromagnetic brake sequence output], set the time delay (Tb) from electromagnetic brake operation to base circuit shut-off at a servo-off as in the timing chart in section 3.2.2.

3. SIGNALS AND WIRING

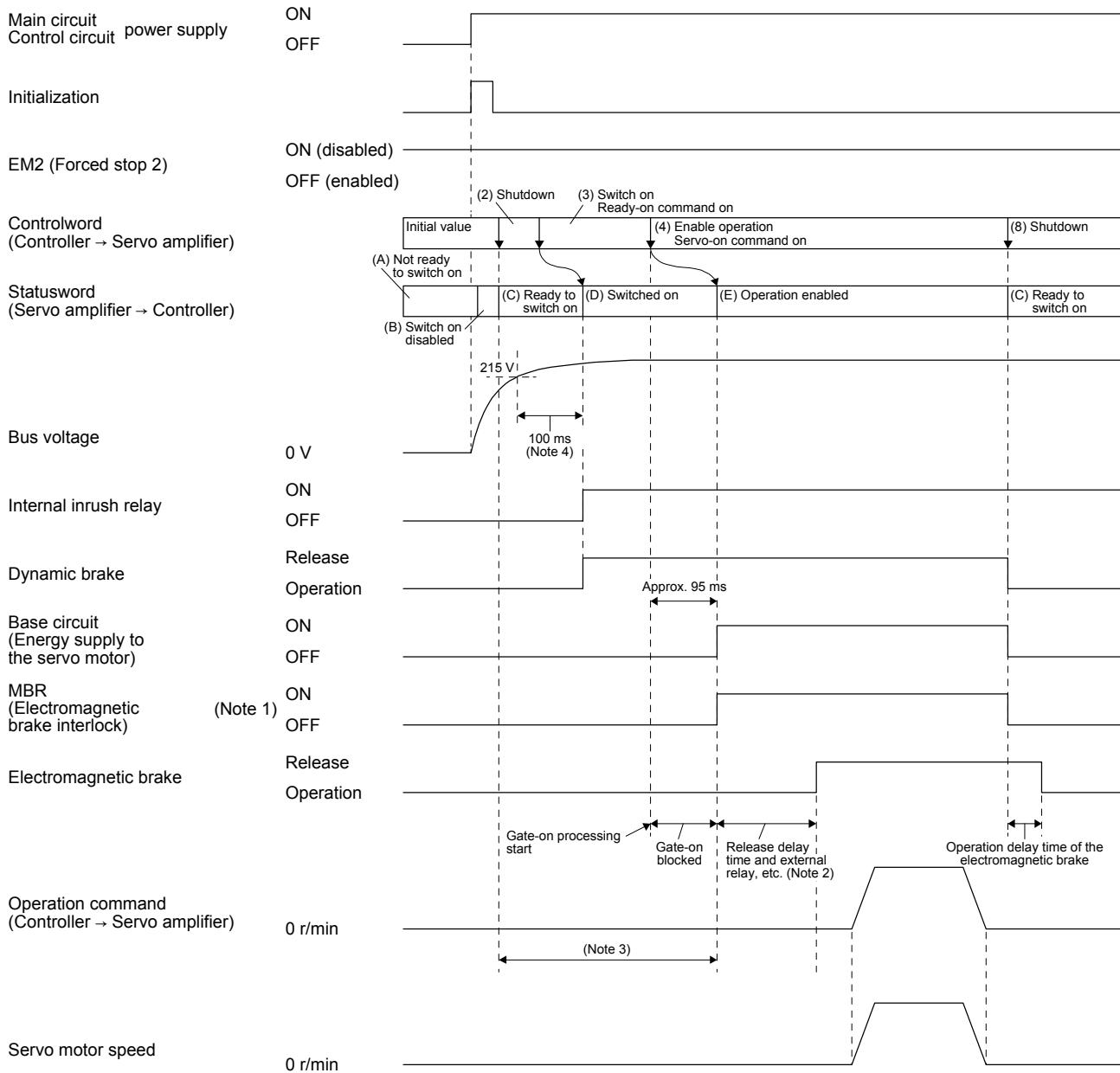
3.2.2 Timing chart

(1) When you use the forced stop deceleration function

POINT

● To enable the function, set "2 ____ (initial value)" in [Pr. PA04].

(a) At power-on to ready-off from the controller



Note 1. ON: Electromagnetic brake is not activated.

OFF: Electromagnetic brake is activated.

2. Electromagnetic brake is released after delaying for the release delay time of electromagnetic brake and operation time of external circuit relay. For the release delay time of electromagnetic brake, refer to "Servo Motor Instruction Manual (Vol. 3)".

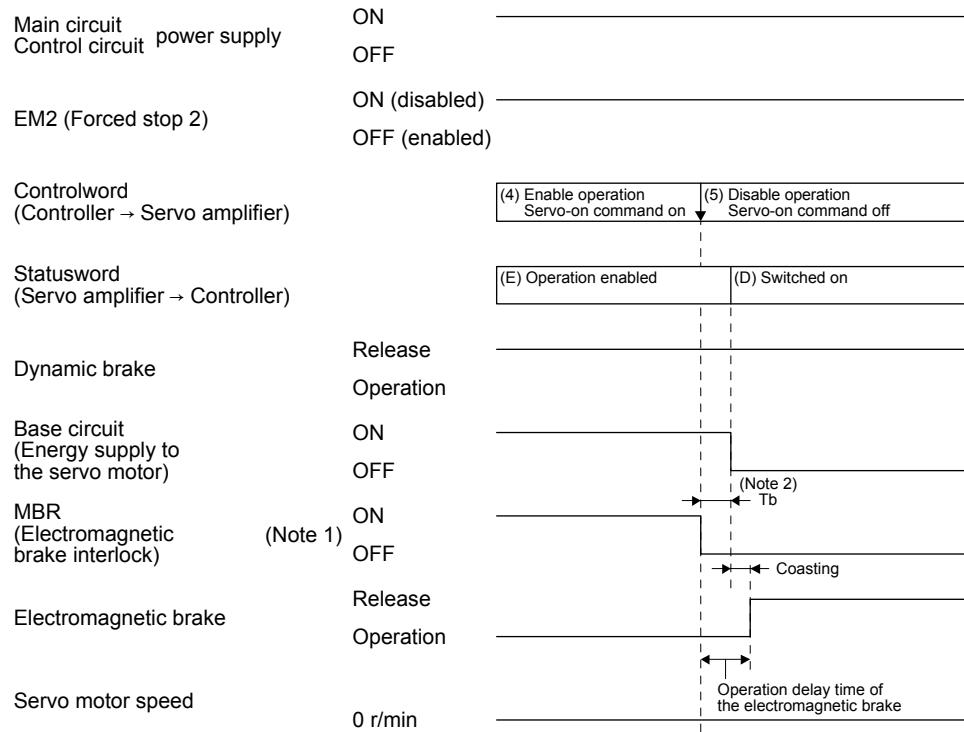
3. To prevent the servo motor from rotating rapidly at servo-on, give a current position as a position command from the controller before servo-on.

4. It will be 200 ms for 5 kW and 7 kW servo amplifiers.

3. SIGNALS AND WIRING

(b) Servo-on command on/off

When servo-on command is turned off, the servo lock will be released after Tb [ms], and the servo motor will coast. If the electromagnetic brake is enabled during servo-lock, the brake life may be shorter. Therefore, set Tb about 1.5 times of the minimum delay time where the moving part will not drop down for a vertical axis system, etc.



Note 1. ON: Electromagnetic brake is not activated.

OFF: Electromagnetic brake is activated.

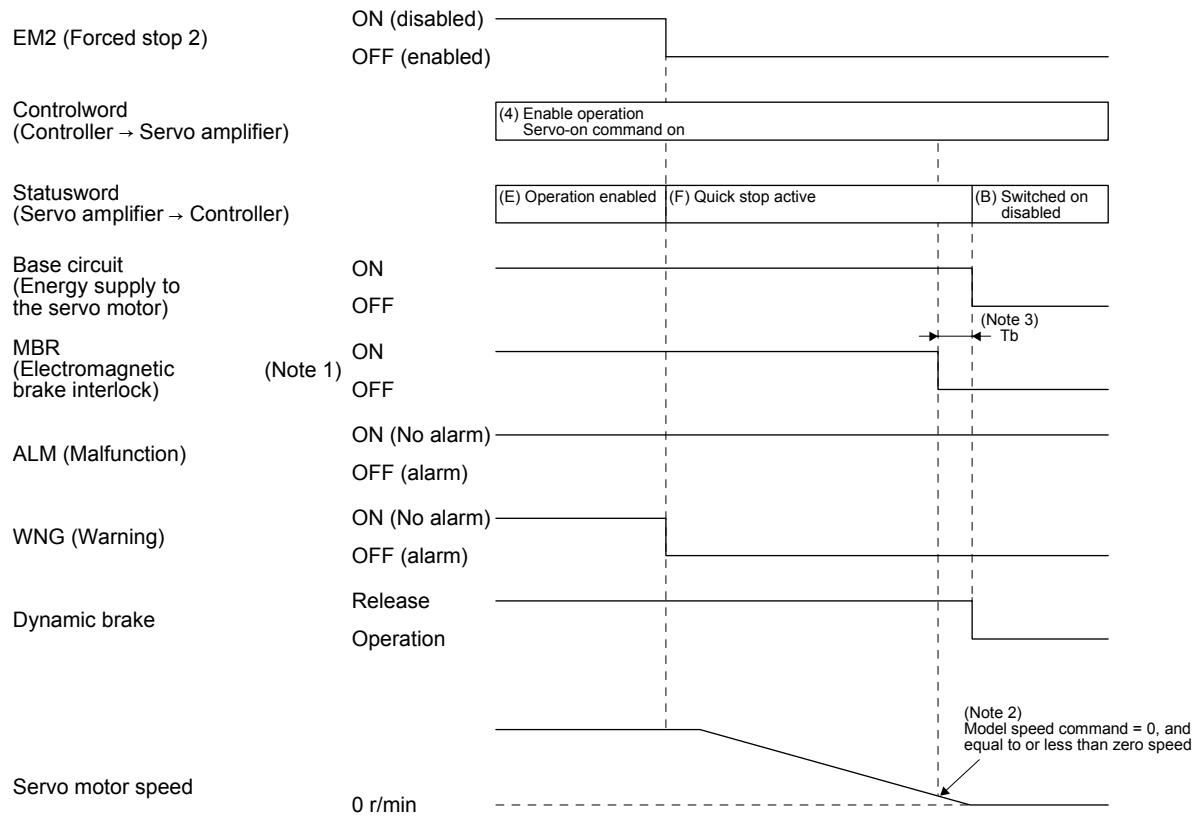
2. Tb is a delay time from electromagnetic brake start to base circuit shut-off at servo-off. Set Tb in [Pr. PC02].

3. SIGNALS AND WIRING

POINT

● To enable the function, set "2 ___ (initial value)" in [Pr. PA04].

(c) Forced stop 2 on/off



Note 1. ON: Electromagnetic brake is not activated.

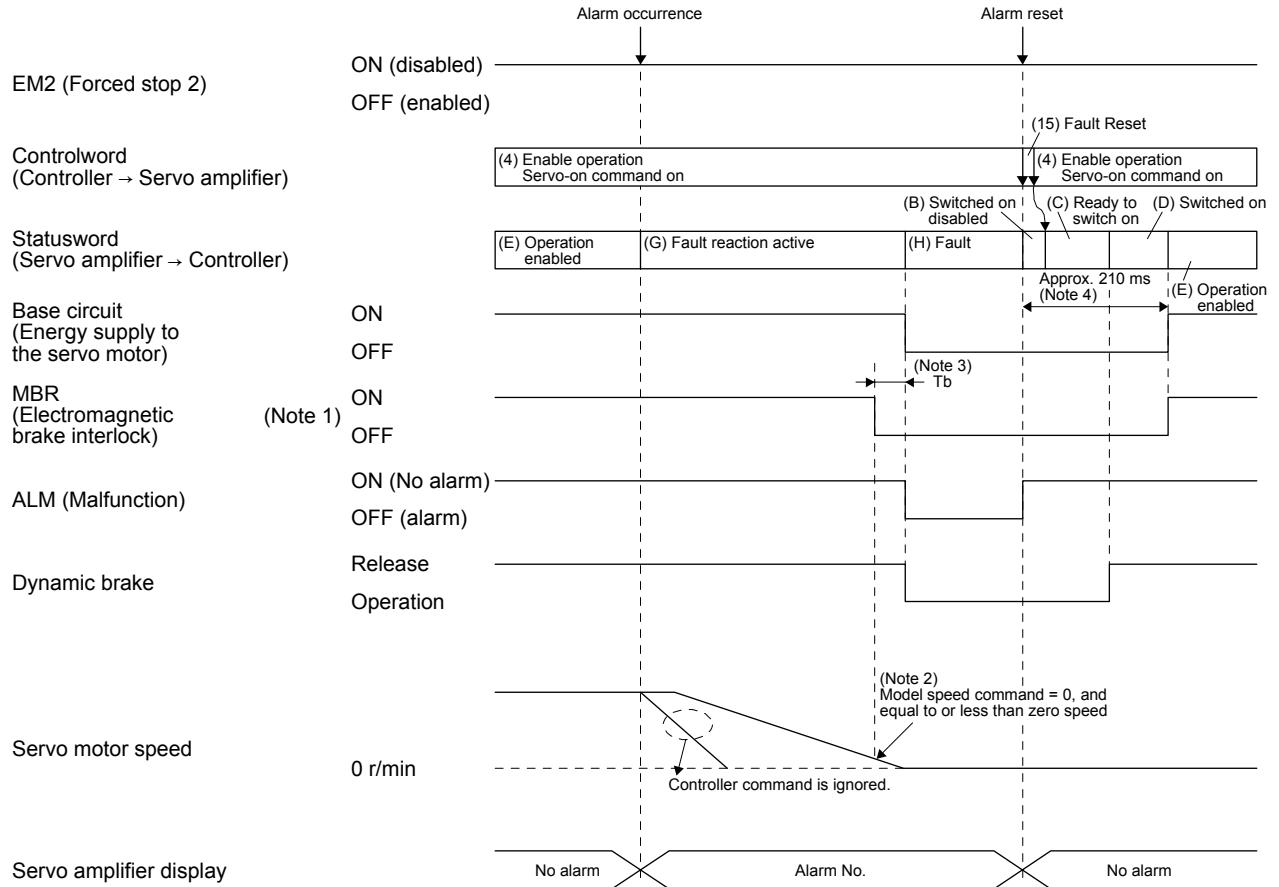
OFF: Electromagnetic brake is activated.

2. The model speed command is a speed command generated in the servo amplifier for forced stop deceleration of the servo motor.
3. T_b is a delay time from electromagnetic brake start to base circuit shut-off at servo-off. Set T_b in [Pr. PC02].

3. SIGNALS AND WIRING

(d) Alarm occurrence

1) When the forced stop deceleration function is enabled



Note 1. ON: Electromagnetic brake is not activated.

OFF: Electromagnetic brake is activated.

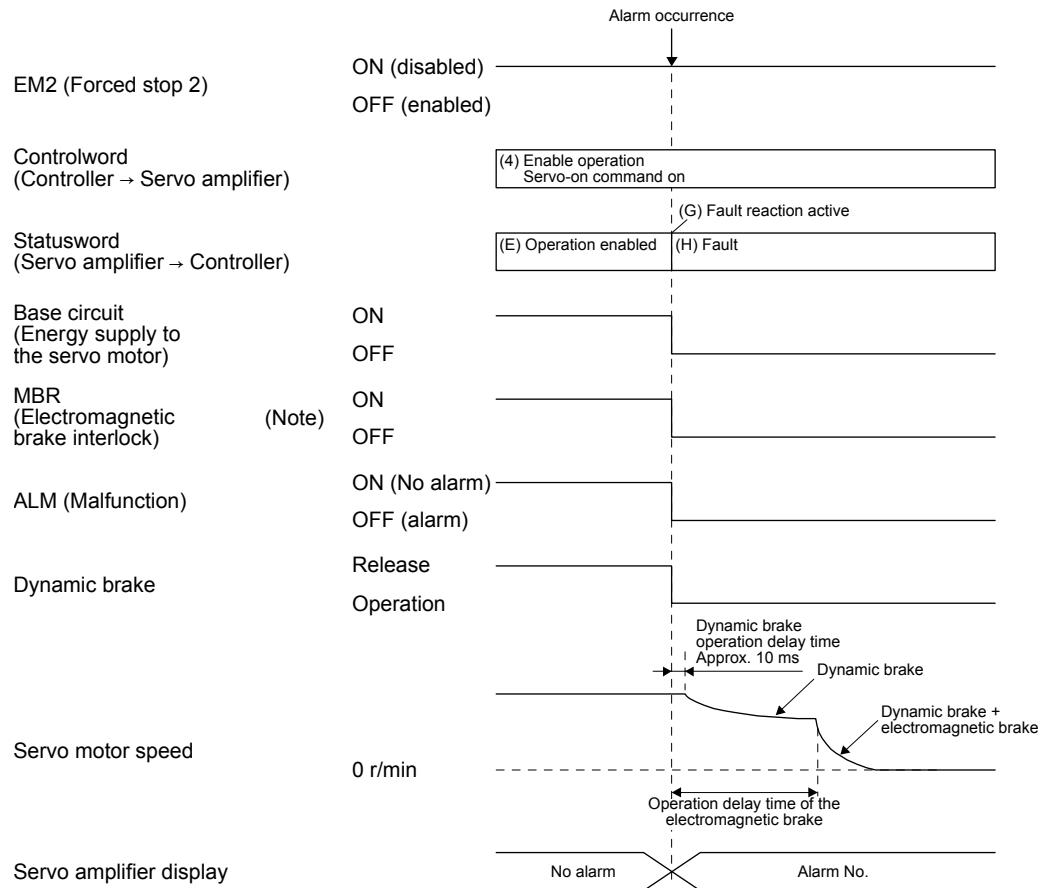
2. The model speed command is a speed command generated in the servo amplifier for forced stop deceleration of the servo motor.

3. Tb is a delay time from electromagnetic brake start to base circuit shut-off at servo-off. Set Tb in [Pr. PC02].

4. Waiting time for relay-on + waiting time for servo-on

3. SIGNALS AND WIRING

2) When the forced stop deceleration function is disabled

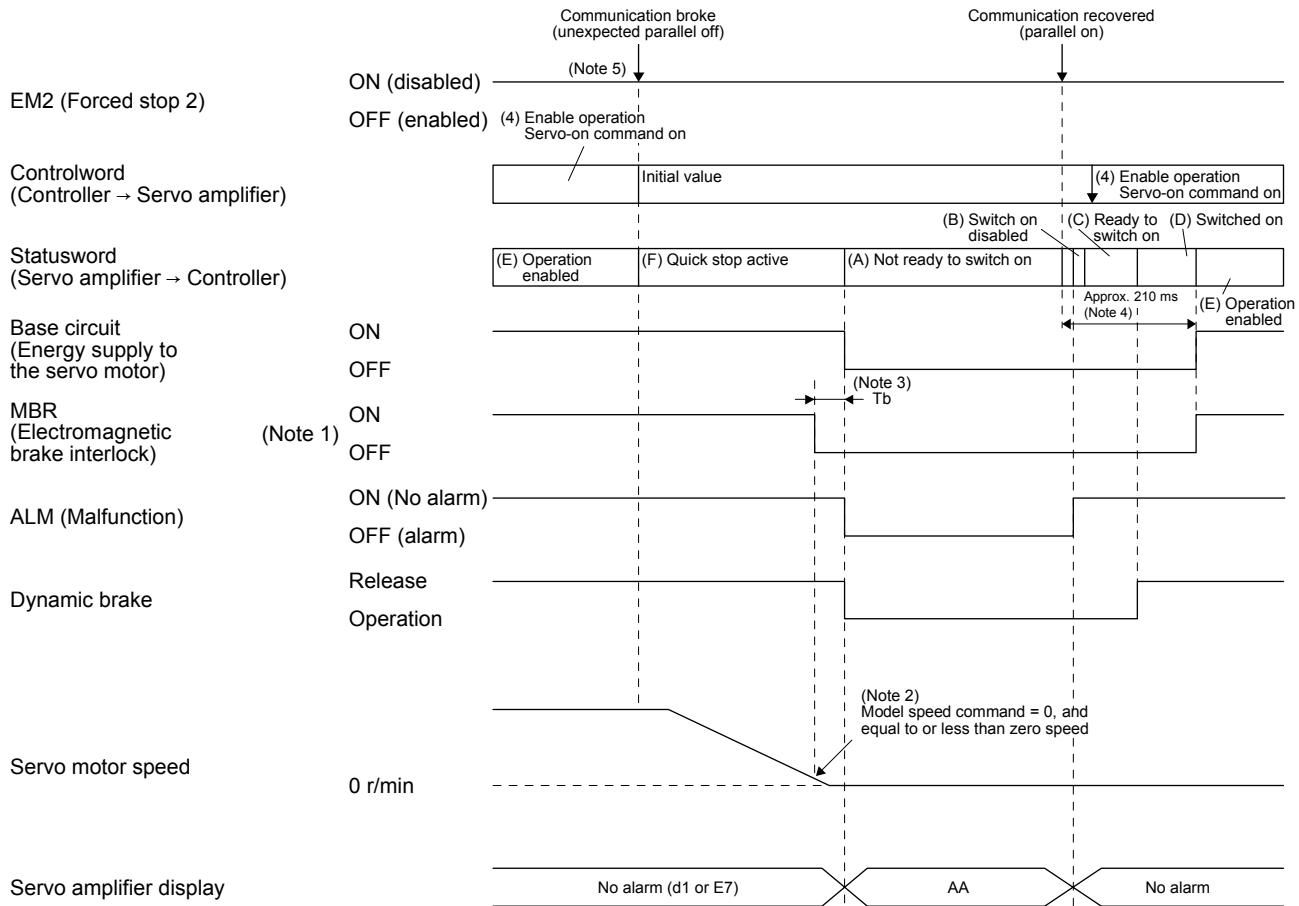


Note. ON: Electromagnetic brake is not activated.

OFF: Electromagnetic brake is activated.

3. SIGNALS AND WIRING

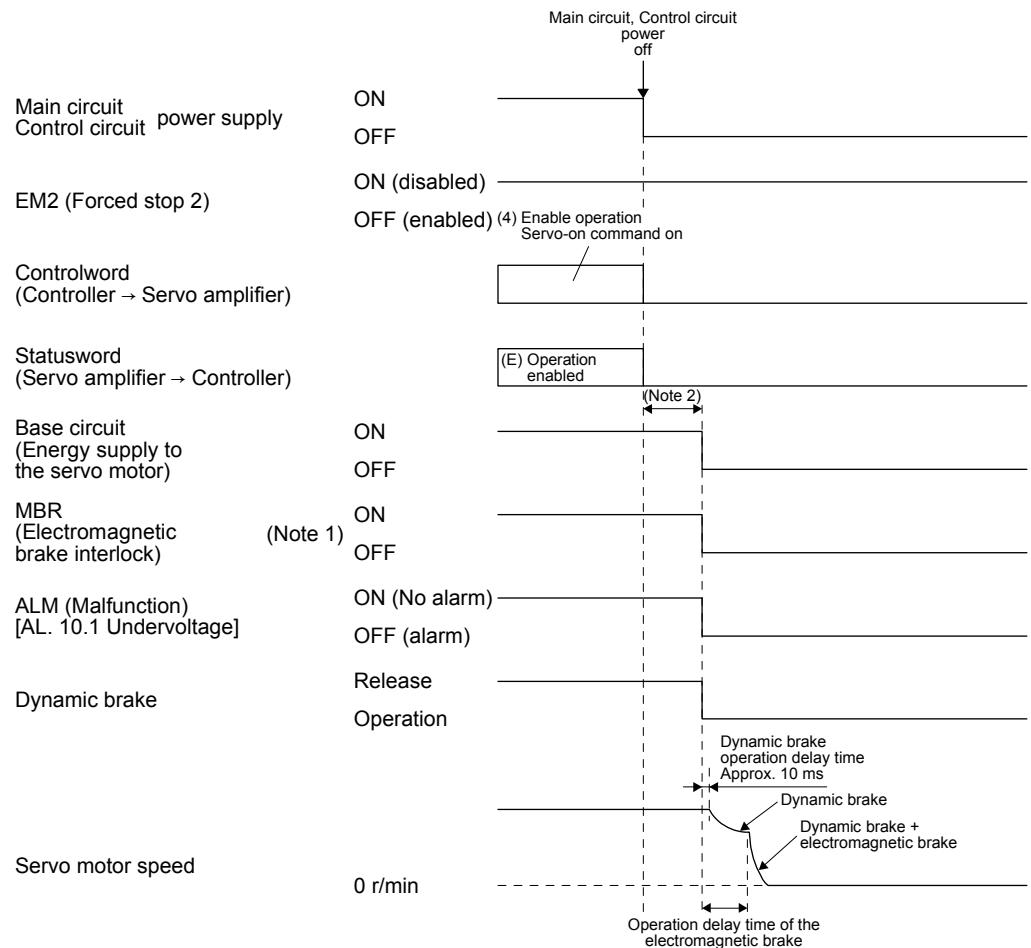
3) When CC-Link IE Field communication brake occurred



- Note
1. ON: Electromagnetic brake is not activated.
OFF: Electromagnetic brake is activated.
 2. The model speed command is a speed command generated in the servo amplifier for forced stop deceleration of the servo motor.
 3. Tb is a delay time from electromagnetic brake start to base circuit shut-off at servo-off. Set Tb in [Pr. PC02].
 4. Waiting time for relay-on + waiting time for servo-on
 5. A delay time will be generated between communication brake occurrence and deceleration start due to processing time of parallel off. The dynamic brake will start depending on status of communication brake.

3. SIGNALS AND WIRING

(c) Both main and control circuit power supplies off



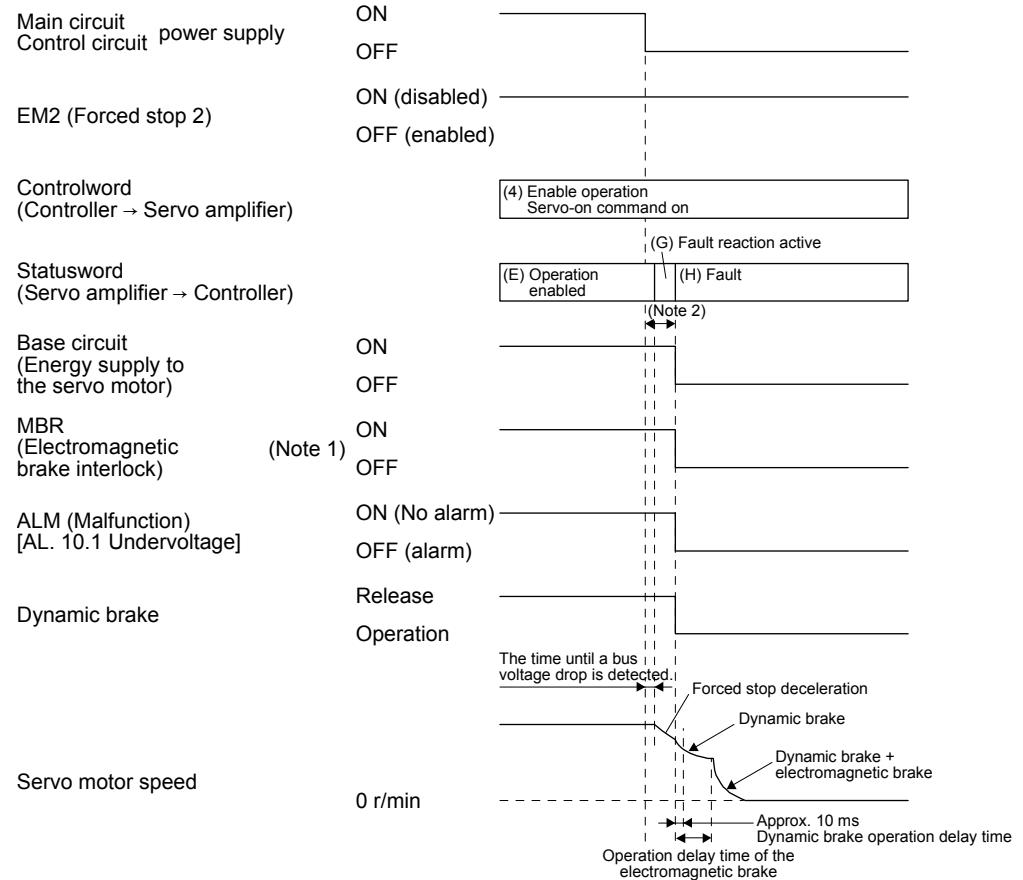
Note 1. ON: Electromagnetic brake is not activated.

OFF: Electromagnetic brake is activated.

2. Variable according to the operation status.

3. SIGNALS AND WIRING

(d) Main circuit power supply off during control circuit power supply on



Note 1. ON: Electromagnetic brake is not activated.

OFF: Electromagnetic brake is activated.

2. Variable according to the operation status.

3. SIGNALS AND WIRING

- (2) When you do not use the forced stop deceleration function

POINT

●To disable the function, set "0 ___" in [Pr. PA04].

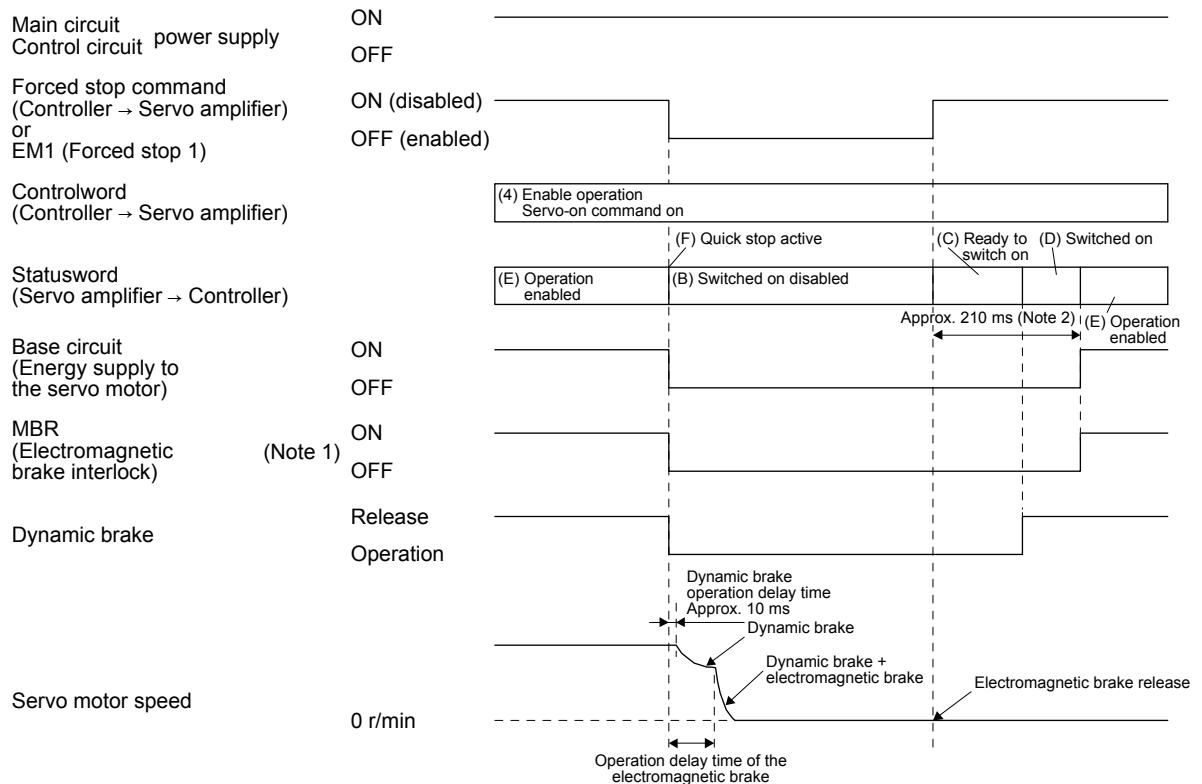
- (a) At power-on to ready-off from the controller

It is the same as (1) (a) of this section.

- (b) Servo-on command on/off

It is the same as (1) (b) of this section.

- (c) Off/on of the forced stop command or Forced stop 1



Note 1. ON: Electromagnetic brake is not activated.

OFF: Electromagnetic brake is activated.

2. Waiting time for relay-on + waiting time for servo-on

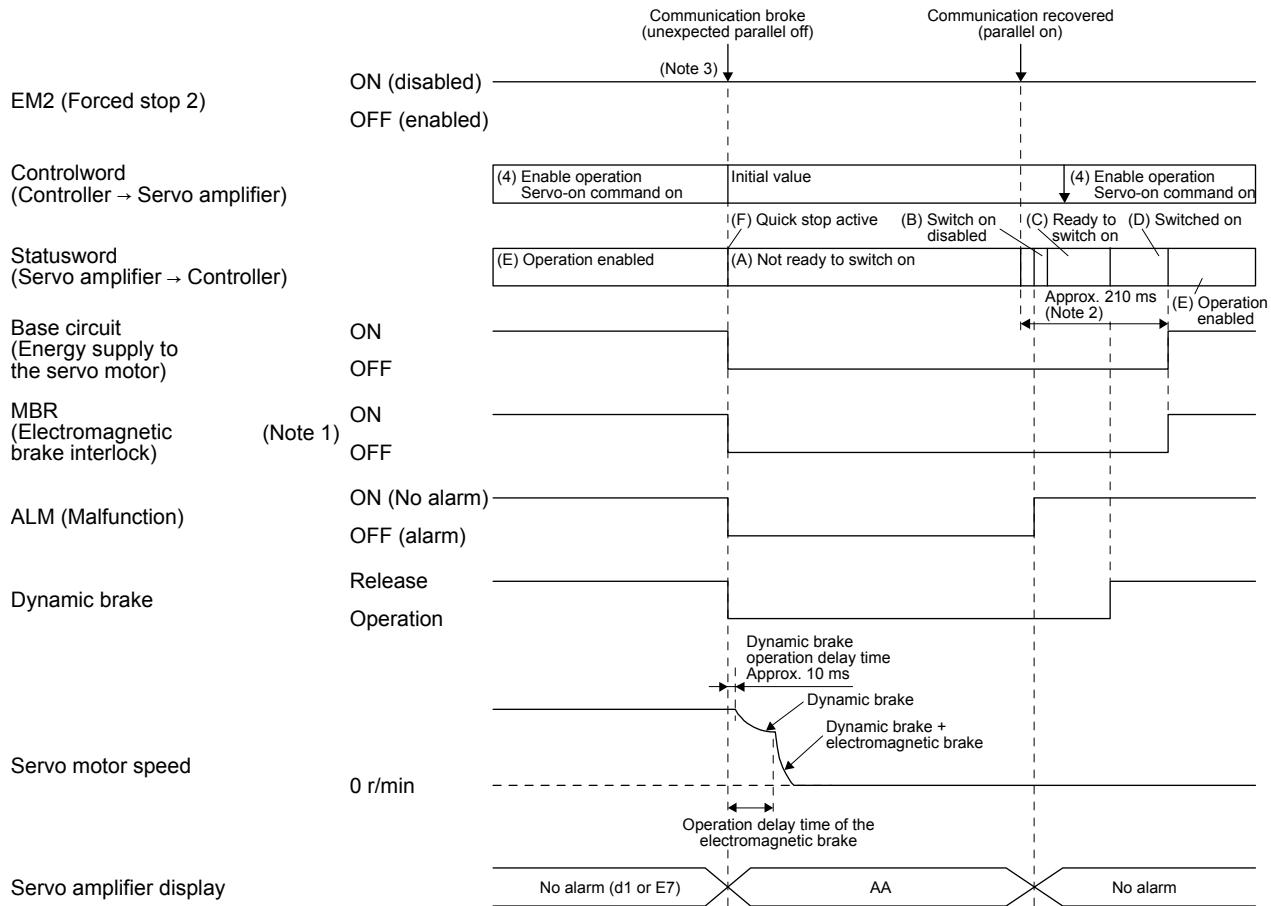
- (d) Alarm occurrence

- 1) At alarm occurrence

The servo motor driving during an alarm is the same as (1) (d) 2 of this section.

3. SIGNALS AND WIRING

2) When CC-Link IE Field communication brake occurred



Note 1. ON: Electromagnetic brake is not activated.

OFF: Electromagnetic brake is activated.

2. Waiting time for relay-on + waiting time for servo-on

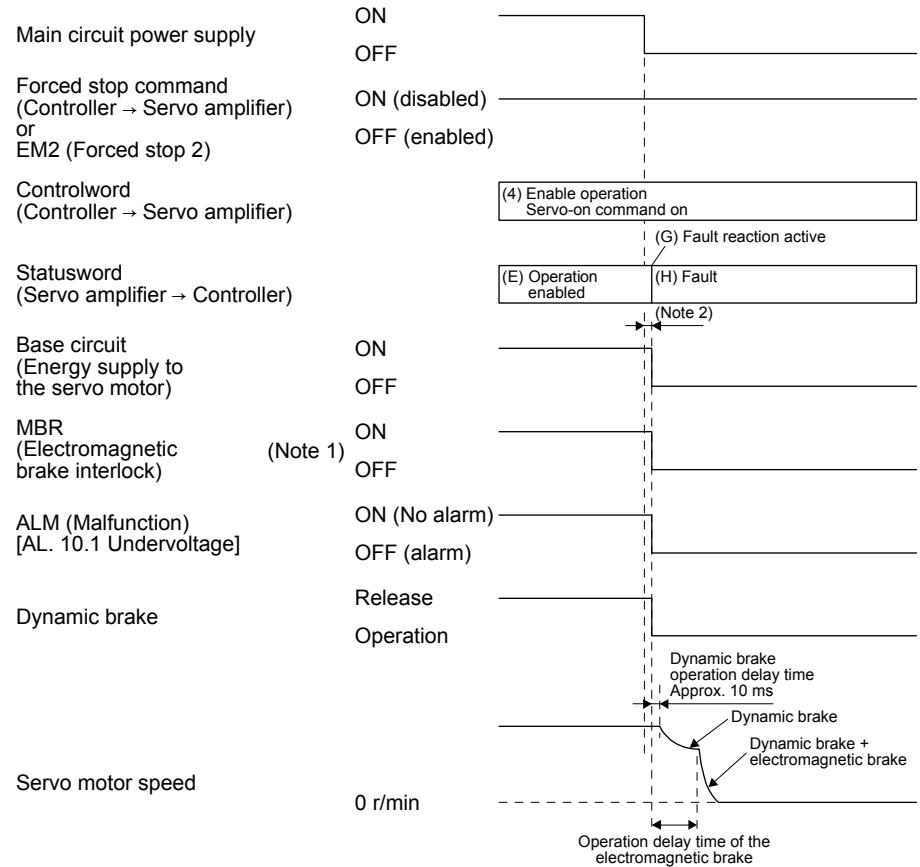
3. A delay time will be generated between communication brake occurrence and deceleration start due to processing time of parallel off.

(e) Both main and control circuit power supplies off

It is the same as (1) (c) of this section.

3. SIGNALS AND WIRING

(f) Main circuit power supply off during control circuit power supply on



Note 1. ON: Electromagnetic brake is not activated.

OFF: Electromagnetic brake is activated.

2. Waiting time for relay-on + waiting time for servo-on

3. SIGNALS AND WIRING

MEMO

4. STARTUP

4. STARTUP



WARNING ●Do not operate the switches with wet hands. Otherwise, it may cause an electric shock.



- 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, e.g. provide covers, to avoid accidentally touching the parts (cables, etc.) by hand.
- During operation, never touch the rotor of the servo motor. Otherwise, it may cause injury.

The following item is the same as MR-J4-B servo amplifiers. For details of the items, refer to each chapter/section of the detailed description field.

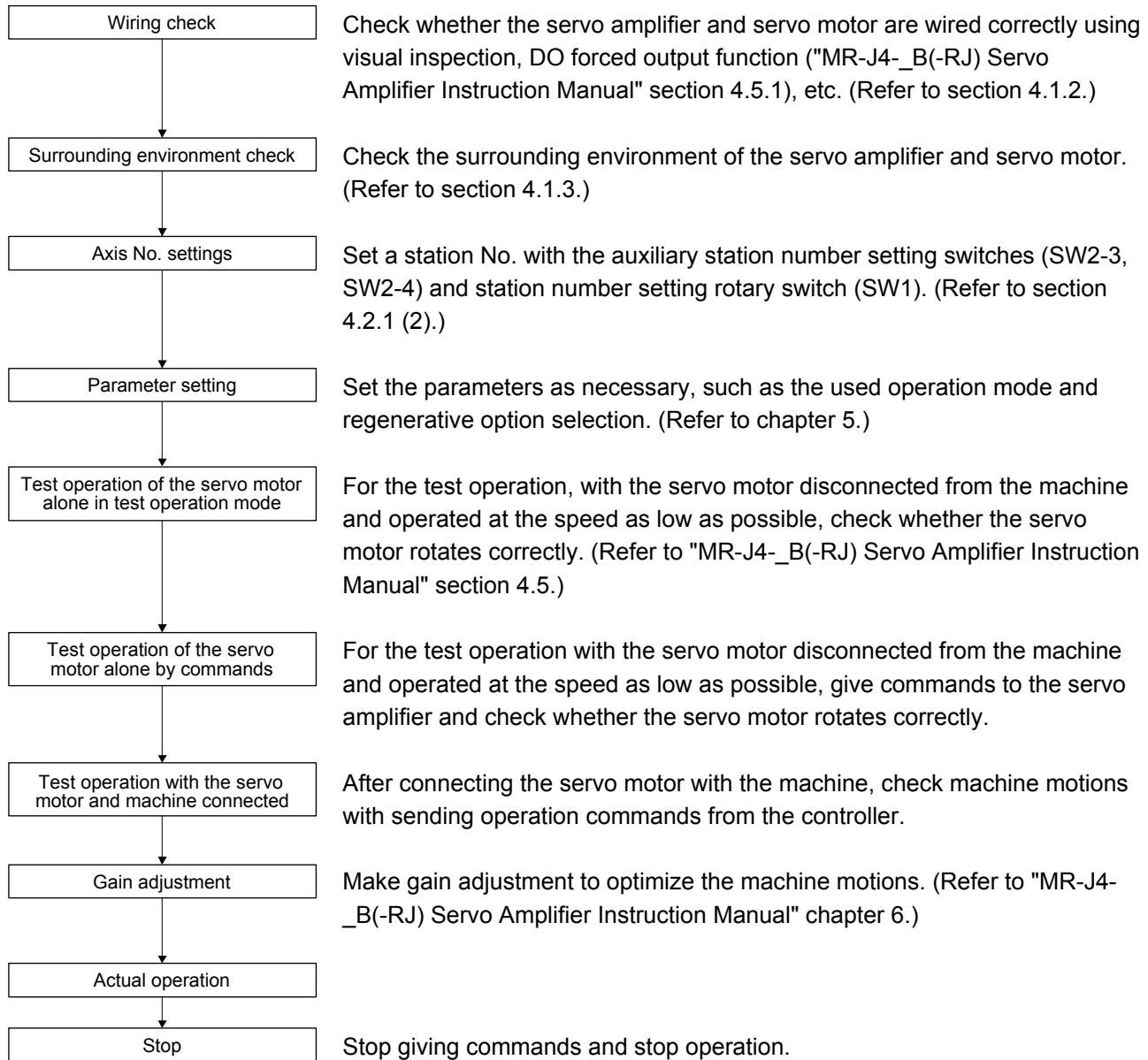
Item	Detailed explanation
Test operation	MR-J4- <u>B</u> (-RJ) Servo Amplifier Instruction Manual section 4.4
Test operation mode	MR-J4- <u>B</u> (-RJ) Servo Amplifier Instruction Manual section 4.5

4. STARTUP

4.1 Switching power on for the first time

When switching power on for the first time, follow this section to make a startup.

4.1.1 Startup procedure



4. STARTUP

4.1.2 Wiring check

(1) Power supply system wiring

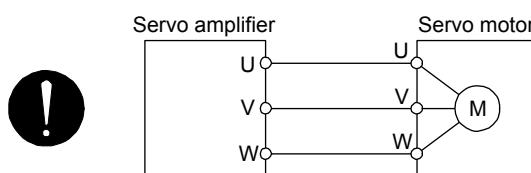
Before switching on the main circuit and control circuit power supplies, check the following items.

(a) Power supply system wiring

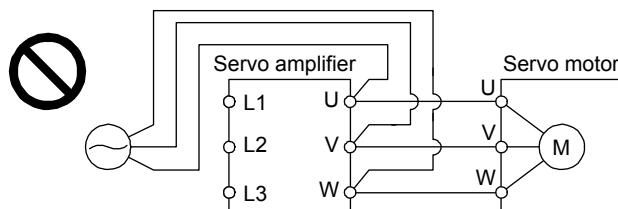
The power supplied to the power input terminals (L1, L2, L3, L11, and L21) of the servo amplifier should satisfy the defined specifications. (Refer to section 1.3.1.)

(b) Connection of servo amplifier and servo motor

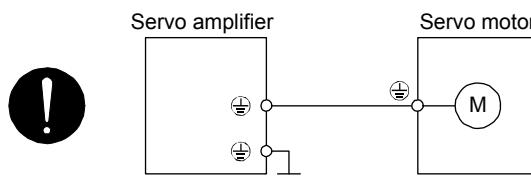
- 1) The servo amplifier power output (U, V, and W) should match in phase with the servo motor power input terminals (U, V, and W).



- 2) The power supplied to the servo amplifier should not be connected to the power outputs (U, V, and W). Doing so will fail the connected servo amplifier and servo motor.

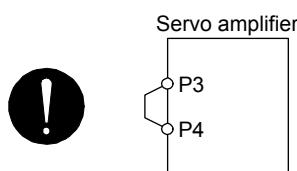


- 3) The grounding terminal of the servo motor is connected to the PE terminal of the servo amplifier.



- 4) The CN2 connector of the servo amplifier should be connected to the encoder of the servo motor securely using the encoder cable.

- 5) Between P3 and P4 should be connected.

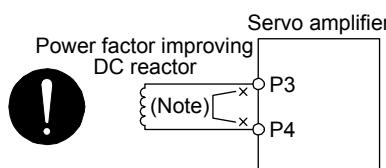


(c) When you use an option and peripheral equipment

- 1) When you use a regenerative option for 5 kW or less servo amplifiers for 200 V class
 - The lead wire between P+ and D terminal of CNP2 connector (3.5 kW or less) or TE3 terminal block (5 kW) should not be connected.
 - The regenerative option should be connected to P+ terminal and C terminal.
 - A twisted cable should be used. (Refer to "MR-J4_-B(-RJ) Servo Amplifier Instruction Manual" section 11.2.4.)

4. STARTUP

- 2) When you use a regenerative option for 7 kW servo amplifiers for 200 V class
 - The lead wire of built-in regenerative resistor connected to P+ terminal and C terminal should not be connected.
 - The regenerative option should be connected to P+ terminal and C terminal.
 - A twisted cable should be used when wiring is over 5 m and under 10 m. (Refer to "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual" section 11.2.4.)
- 3) When you use a brake unit and power regenerative converter for 7 kW servo amplifiers
 - The lead wire of built-in regenerative resistor connected to P+ terminal and C terminal should not be connected.
 - Brake unit or power regenerative converter should be connected to P+ terminal and N- terminal. (Refer to "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual" section 11.3 to 11.4.)
- 4) When you use a power regenerative common converter
 - For 5 kW or less servo amplifiers, the lead wire between P+ terminal and D terminal should not be connected.
 - For 7 kW servo amplifiers, the lead wire of built-in regenerative resistor connected to P+ terminal and C terminal should not be connected.
The wire of power regenerative common converter should be connected to P4 terminal and N- terminal.
(Refer to "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual" section 11.5.)
- 5) The power factor improving DC reactor should be connected between P3 and P4. (Refer to "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual" section 11.11.)



Note. Always disconnect between P3 and P4 terminals.

(2) I/O signal wiring

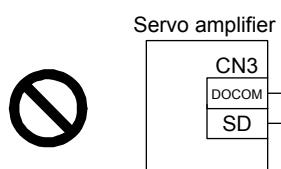
- (a) The I/O signals should be connected correctly.

Use DO forced output to forcibly turn on/off the pins of the CN3 connector. This function can be used to perform a wiring check. In this case, switch on the control circuit power supply only.

Refer to section 3.1 for details of I/O signal connection.

- (b) 24 V DC or higher voltage is not applied to the pins of the CN3 connector.

- (c) SD and DOCOM of the CN3 connector is not shorted.



4. STARTUP

4.1.3 Surrounding environment

(1) Cable routing

(a) The wiring cables should not be stressed.

(b) The encoder cable should not be used in excess of its bending life. (Refer to "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual" section 10.4.)

(c) The connector of the servo motor should not be stressed.

(2) Environment

Signal cables and power cables are not shorted by wire offcuts, metallic dust or the like.

4.2 Switch setting and display of the servo amplifier

Switching to the test operation mode and setting station No. are enabled with switches on the servo amplifier.

On the servo amplifier display (three-digit, seven-segment LED), check the status of communication with the controller at power-on and station No., and diagnose a malfunction at occurrence of an alarm.

4.2.1 Switches

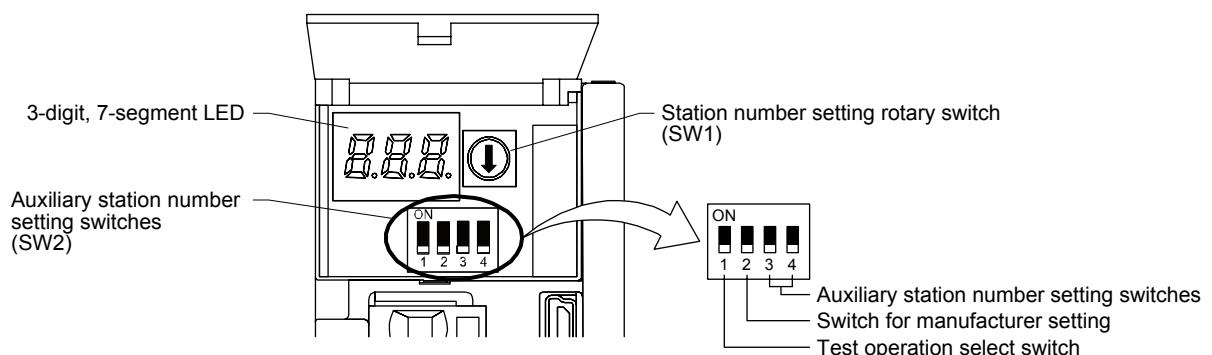


● When switching the station number setting rotary switch (SW1) and auxiliary station number setting switches (SW2), use an insulated screw driver. Do not use a metal screw driver. Touching patterns on electronic boards, lead of electronic parts, etc. may cause an electric shock.

POINT

- Turning "ON (up)" all the auxiliary station number setting switches (SW2) enables an operation mode for manufacturer setting and displays "off". The mode is not available. Set the auxiliary station number setting switches (SW2) correctly according to this section.
- Cycling the main circuit power supply and control circuit power supply enables the setting of each switch.

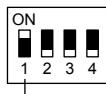
The following explains the test operation select switch, the auxiliary station number setting switches, and the station number setting rotary switch.



4. STARTUP

(1) Test operation select switch (SW2-1)

To use the test operation mode, turn "ON (up)" the switch. Turning "ON (up)" the switch enables the test operation mode. In the test operation mode, the functions such as JOG operation, positioning operation, and machine analyzer are available with MR Configurator2.



Test operation select switch
Turn it "ON (up)".

(2) Switches for setting station No.

POINT

- Set a station No. with the auxiliary station number setting switches (SW2-3, SW2-4) and station number setting rotary switch (SW1). When connecting the amplifier to the Mitsubishi simple motion module QD77GF_, set the station No. between 1 and 16.
- For setting the station number setting rotary switch, use a flat-blade screwdriver with the blade edge width of 2.1 mm to 2.3 mm and the blade edge thickness of 0.6 mm to 0.7 mm.
- When connecting the amplifier to the Mitsubishi simple motion module QD77GF_, set the station No. between 1 and 16.

You can set the station No. between 1 and 63 by using the auxiliary station number setting switches with the station number setting rotary switch. (Refer to (2) (c) in this section.)

If the same numbers are set to different stations in a single communication system, the system will not operate properly. The station numbers may be set independently of the CC-Link IE cable connection sequence. The following shows the description of each switch.

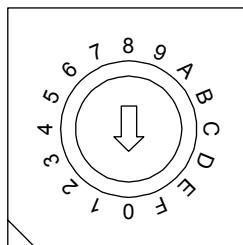
(a) Auxiliary station number setting switches (SW2-3 and SW2-4)

Turning these switches "ON (up)" enables you to set the station No. 16 or more.

(b) Station number setting rotary switch (SW1)

You can set the station No. between 1 and 63 by using auxiliary station number setting switches with this switch. (Refer to (2) (c) of this section.)

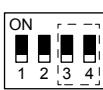
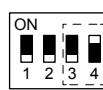
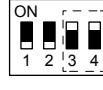
Station number setting rotary switch (SW1)



4. STARTUP

(c) Switch combination list for the station No. setting

The following lists show the setting combinations of the auxiliary station number setting switches and station number setting rotary switch.

Auxiliary station number setting switch	Station number setting rotary switch	Station No.	Auxiliary station number setting switch	Station number setting rotary switch	Station No.	
	0	Station No. setting standby		0	16	
	1	1		1	17	
	2	2		2	18	
	3	3		3	19	
	4	4		4	20	
	5	5		5	21	
	6	6		6	22	
	7	7		7	23	
	8	8		8	24	
	9	9		9	25	
	A	10		10	A	26
	B	11		11	B	27
	C	12		12	C	28
	D	13		13	D	29
	E	14		14	E	30
	F	15		15	F	31
	0	32		0	48	
	1	33		1	49	
	2	34		2	50	
	3	35		3	51	
	4	36		4	52	
	5	37		5	53	
	6	38		6	54	
	7	39		7	55	
	8	40		8	56	
	9	41		9	57	
	A	42		A	58	
	B	43		B	59	
	C	44		C	60	
	D	45		D	61	
	E	46		E	62	
	F	47		F	63	

The station No. of the servo amplifier will be set in the following order of priority.

Priority order	Prior station No.
1	Station No. specified with master station
2	Station No. 1 to 120 specified with [Pr. Po02] (Note)
3	Station No. set with the station number setting rotary switch and auxiliary station number setting switches when [Pr. Po02] is "0"

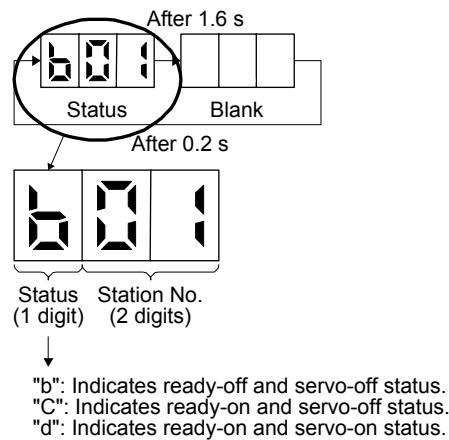
Note. Set a station No. with [Pr. Po02] within the range of 1 to 120. Setting over the range will result in [AL. 37 Parameter error].

4. STARTUP

4.2.2 Scrolling display

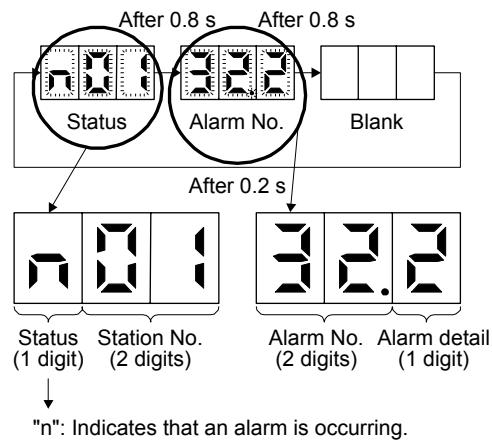
(1) Normal display

When there is no alarm, the station No. and blank are displayed in rotation.



(2) Alarm display

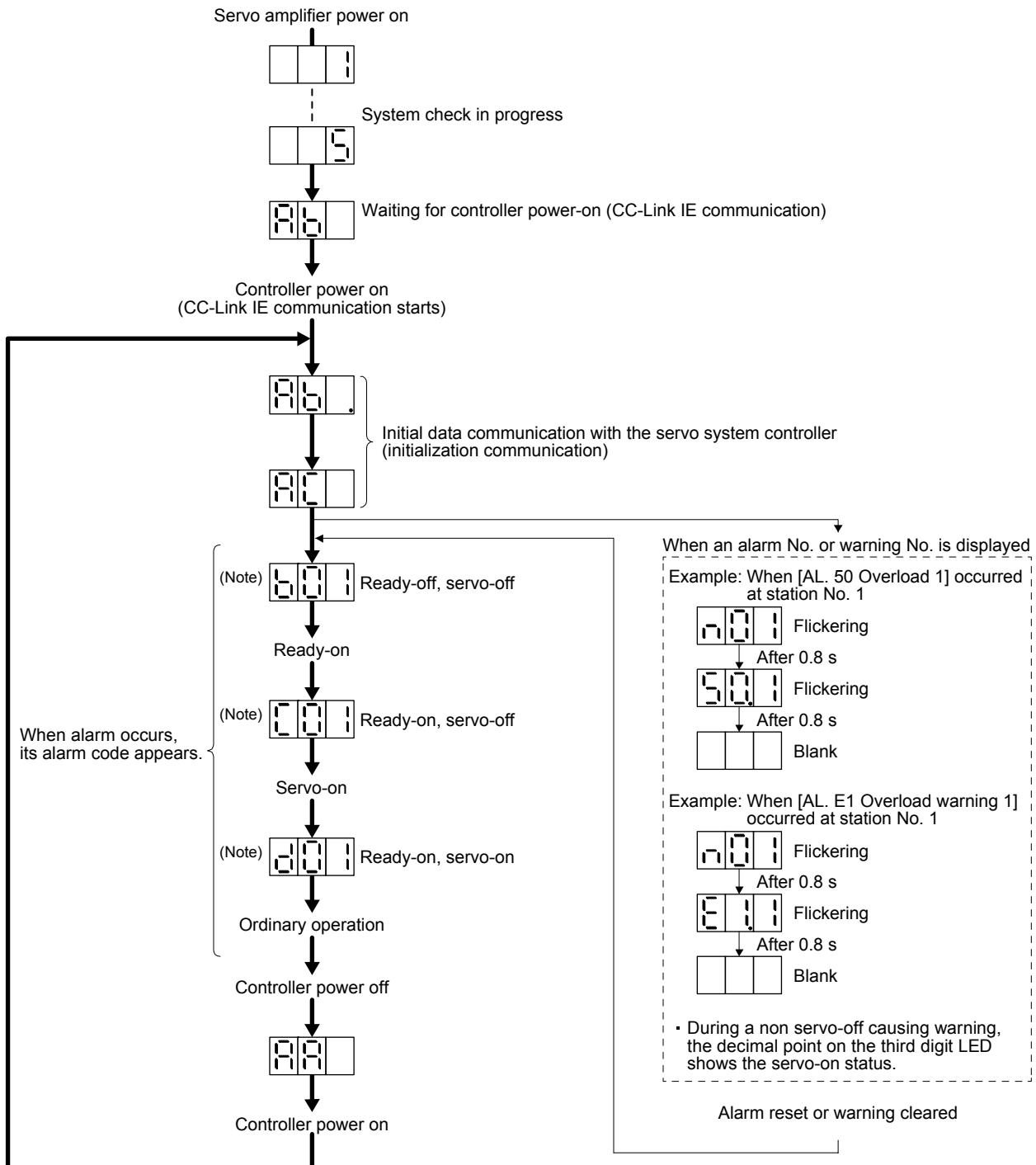
When an alarm occurs, the alarm number (two digits) and the alarm detail (one digit) are displayed following the status display. For example, the following shows when [AL. 32 Overcurrent] is occurring.



4. STARTUP

4.2.3 Status display of a station

(1) Display sequence



Note. **001** **002** ... **63** The segment of the last 2 digits shows the station number.

Station No. 1 Station No. 2 Station No. 63

4. STARTUP

(2) Indication list

Display	Status	Description
	Initializing	System check in progress
	Initializing	<ul style="list-style-type: none"> The servo amplifier power was switched on when the controller power was off. The station Nos. set to the auxiliary station number setting switches (SW2-3 and SW2-4) and the station number setting rotary switch (SW1) do not match the one set to the servo system controller. A servo amplifier malfunctioned, or communication error occurred with the controller or the previous station servo amplifier. The controller is malfunctioning.
	Initializing	During initial setting for communication specifications
	Initializing	The initial setting for communication specifications was completed and the amplifier received a communication synchronization setting from the controller. Synchronizing
	Initializing standby	<p>The power supply of controller was turned off during the servo amplifier power supply on. The communication did not continue and resulted in parallel off.</p>
	Ready-off	The ready-off command from the controller was received.
	Servo-on	The servo-on command from the controller was received.
	Servo-off	The servo-off command from the controller was received.
	Alarm and warning	The alarm No. and the warning No. that occurred is displayed.
	CPU error	CPU watchdog error has occurred.
	(Note 3) Test operation mode	Motor-less operation

Note 1. The meanings of ## are listed below. They are displayed in decimal to 99. However, they will be irregular from 100. (The tenths and hundreds digits will be hexadecimal.)

##	Description	Remarks
00	Set to the test operation mode.	
--	Station No. 0 (unspecified)	If 0 (unspecified) is set as the station No., the communication is performed with the station No. set by the master station.
01	Station No. 1	
02	Station No. 2	
:	:	
99	Station No. 99	
A0	Station No. 100	
:	:	
A9	Station No. 109	
B0	Station No. 110	
:	:	
b9	Station No. 119	
C0	Station No. 120	

2. "****" indicates the alarm No. and the warning No.
3. Requires the MR Configurator2.
4. The decimal point in the first digit flickers.

4. STARTUP

4.3 Display of MR-J3-T10 CC-Link IE Field Network interface unit

The table below shows the detailed description of the communication alarm display area. MR-J3-T10 has eight kinds of LED indication.

Table 4.1 LED indication list

No.	LED	Name	LED status	Description
1	RUN	Operation status	Lit	Operating normally (RUN status)
			Extinguished	Hardware error (WDT error)
2	D LINK	Cyclic communication status	Lit	Linking data (In cyclic transmission)
			Flickering	Data not linked (after receiving Parameter)
			Extinguished	Data not linked (In parallel off)
3	SD	Network transmission status	Lit	Data transmitting
4	RD	Network reception status	Lit	Data receiving
5	ERR.	Unit error status	Lit	Unit error
			Extinguished	No problem found.
6	L ERR.	Line error status	Lit	Erroneous data is being received.
7	L ER (port 1/2)	Line error status	Lit	Erroneous data is being received.
8	LINK (port 1/2)	Link status	Lit	Linking up

The following shows indication example of each state.

No.	Status	RUN	D LINK	ERR.	L ERR.	L ER (port 1/2)	LINK (port 1/2)	Servo amplifier display
1	Error at start	●	●	○	-	-	-	74.1 74.2 37.1
2	Normal (condition before communication connection)	○	●	●	●	●	-	1 to 5 Ab
3	Normal (condition before cyclic commutation established)	○	◎	●	●	●	-	Ab AC
4	Normal (during cyclic communication)	○	○	●	●	●	-	b** C** d**
5	Error occurred (communication disabled due to MRJ3-T10 malfunction)	○	●	○	●	●	-	74.4
6	Error occurred (cyclic communication stopped due to MRJ3-T10 malfunction)	○	◎	○	●	●	-	74.5
7	Error occurred (WDT error)	●	●	○	-	-	-	74.3
8	Error occurred (MR-J3-T10 came off)	●	●	●	●	●	●	75.3 75.4
9	Error occurred (cyclic communication stopped due to incorrect setting)	○	◎	○	●	●	-	9d.1 to 9d.4
10	Error occurred (erroneous data received)	○	-	○	○	-	-	9E.1
11	Error occurred (parallel off due to twisted pair cable, etc. came off)	○	●	○	●	●	-	8d.2
12	Error occurred (cyclic data not received)	○	◎	○	●	●	-	8d.1 8d.7
13	Error occurred (erroneous station/network No. designated by the master)	○	-	○	●	●	-	8d.3
14	Reserved station specification	○	◎	○	●	●	-	8d.5
15	Error occurred (watchdog counter error)	○	○	○	●	●	-	8d.6 8d.8
16	Error occurred (synchronization error)	○	-	○	●	●	-	8d.9 8d.A

(○: Lit, ●: Extinguished, ◎: Flickers, -: Refer to table 4.1.)

MEMO

5. PARAMETERS

5. PARAMETERS



- Never make a drastic adjustment or change to the parameter values as doing so will make the operation 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 set values other than described values to each parameter.

POINT

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

5.1 Parameter list

POINT

- 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.

5. PARAMETERS

5.1.1 Basic setting parameters ([Pr. PA_ _])

No.	Symbol	Name	Initial value	Unit
PA01		For manufacturer setting	1000h	
PA02	**REG	Regenerative option	0000h	
PA03	*ABS	Absolute position detection system	0000h	
PA04	*AOP1	Function selection A-1	2000h	
PA05		For manufacturer setting	10000	
PA06			1	
PA07			1	
PA08	ATU	Auto tuning mode	0001h	
PA09	RSP	Auto tuning response	16	
PA10	INP	In-position range	1600	[pulse]
PA11		For manufacturer setting	1000.0	
PA12			1000.0	
PA13			0000h	
PA14	*POL	Rotation direction selection	0	
PA15	*ENR	Encoder output pulses	4000	[pulse/rev]
PA16	*ENR2	Encoder output pulses 2	1	
PA17		For manufacturer setting	0000h	
PA18			0000h	
PA19	*BLK	Parameter writing inhibit	00ABh	
PA20	*TDS	Tough drive setting	0000h	
PA21	*AOP3	Function selection A-3	0001h	
PA22		For manufacturer setting	0000h	
PA23	DRAT	Drive recorder arbitrary alarm trigger setting	0000h	
PA24	AOP4	Function selection A-4	0000h	
PA25	OTHOV	One-touch tuning - Overshoot permissible level	0	[%]
PA26		For manufacturer setting	0000h	
PA27			0000h	
PA28			0000h	
PA29			0000h	
PA30			0000h	
PA31			0000h	
PA32			0000h	

5. PARAMETERS

5.1.2 Gain/filter setting parameters ([Pr. PB_ _])

No.	Symbol	Name	Initial value	Unit
PB01	FILT	Adaptive tuning mode (adaptive filter II)	0000h	
PB02	VRFT	Vibration suppression control tuning mode (advanced vibration suppression control II)	0000h	
PB03		For manufacturer setting	18000	
PB04	FFC	Feed forward gain	0	[%]
PB05		For manufacturer setting	500	
PB06	GD2	Load to motor inertia ratio	7.00	[Multiplier]
PB07	PG1	Model loop gain	15.0	[rad/s]
PB08	PG2	Position loop gain	37.0	[rad/s]
PB09	VG2	Speed loop gain	823	[rad/s]
PB10	VIC	Speed integral compensation	33.7	[ms]
PB11		For manufacturer setting	980	
PB12	OVA	Overshoot amount compensation	0	[%]
PB13	NH1	Machine resonance suppression filter 1	4500	[Hz]
PB14	NHQ1	Notch shape selection 1	0000h	
PB15	NH2	Machine resonance suppression filter 2	4500	[Hz]
PB16	NHQ2	Notch shape selection 2	0000h	
PB17	NHF	Shaft resonance suppression filter	0000h	
PB18	LPF	Low-pass filter setting	3141	[rad/s]
PB19	VRF11	Vibration suppression control 1 - Vibration frequency	100.0	[Hz]
PB20	VRF12	Vibration suppression control 1 - Resonance frequency	100.0	[Hz]
PB21	VRF13	Vibration suppression control 1 - Vibration frequency damping	0.00	
PB22	VRF14	Vibration suppression control 1 - Resonance frequency damping	0.00	
PB23	VFBF	Low-pass filter selection	0000h	
PB24	*MVS	Slight vibration suppression control	0000h	
PB25		For manufacturer setting	0000h	
PB26			0000h	
PB27			10	
PB28			1	
PB29			7.00	
PB30			0.0	
PB31			0	
PB32			0.0	
PB33			0.0	
PB34			0.0	
PB35			0.00	
PB36			0.00	
PB37			1600	
PB38			0.00	
PB39			0.00	
PB40			0.00	
PB41			0	
PB42			0	
PB43			0000h	
PB44			0.00	
PB45	CNHF	Command notch filter	0000h	
PB46	NH3	Machine resonance suppression filter 3	4500	[Hz]
PB47	NHQ3	Notch shape selection 3	0000h	
PB48	NH4	Machine resonance suppression filter 4	4500	[Hz]
PB49	NHQ4	Notch shape selection 4	0000h	
PB50	NH5	Machine resonance suppression filter 5	4500	[Hz]
PB51	NHQ5	Notch shape selection 5	0000h	
PB52	VRF21	Vibration suppression control 2 - Vibration frequency	100.0	[Hz]
PB53	VRF22	Vibration suppression control 2 - Resonance frequency	100.0	[Hz]

5. PARAMETERS

No.	Symbol	Name	Initial value	Unit
PB54	VRF23	Vibration suppression control 2 - Vibration frequency damping	0.00	
PB55	VRF24	Vibration suppression control 2 - Resonance frequency damping	0.00	
PB56		For manufacturer setting	0.0	
PB57			0.0	
PB58			0.00	
PB59			0.00	
PB60			0.0	
PB61			0.0	
PB62			0000h	
PB63			0000h	
PB64			0000h	

5.1.3 Extension setting parameters ([Pr. PC_ _])

No.	Symbol	Name	Initial value	Unit
PC01	ERZ	Error excessive alarm level	0	[rev]
PC02	MBR	Electromagnetic brake sequence output	0	[ms]
PC03	*ENRS	Encoder output pulse selection	0000h	
PC04	**COP1	Function selection C-1	0000h	
PC05	**COP2	Function selection C-2	0000h	
PC06	*COP3	Function selection C-3	0000h	
PC07	ZSP	Zero speed	50	[r/min]
PC08	OSL	Overspeed alarm detection level	0	[r/min]
PC09	MOD1	Analog monitor 1 output	0000h	
PC10	MOD2	Analog monitor 2 output	0001h	
PC11	MO1	Analog monitor 1 offset	0	[mV]
PC12	MO2	Analog monitor 2 offset	0	[mV]
PC13	MOSDL	Analog monitor - Feedback position output standard data - Low	0	[pulse]
PC14	MOSDH	Analog monitor - Feedback position output standard data - High	0	[10000 pulses]
PC15		For manufacturer setting	0	
PC16			0000h	
PC17	**COP4	Function selection C-4	0000h	
PC18	*COP5	Function selection C-5	0000h	
PC19		For manufacturer setting	0000h	
PC20	*COP7	Function selection C-7	0000h	
PC21	*BPS	Alarm history clear	0000h	
PC22		For manufacturer setting	0	
PC23			0000h	
PC24	RSBR	Forced stop deceleration time constant	100	[ms]
PC25		For manufacturer setting	0	
PC26			0000h	
PC27			0000h	
PC28			0000h	
PC29			0000h	
PC30			0	
PC31	RSUP1	Vertical axis freefall prevention compensation amount	0	[0.0001 rev]
PC32		For manufacturer setting	0000h	
PC33			0	
PC34			100	
PC35			0000h	
PC36			0000h	
PC37			0000h	
PC38			0000h	
PC39			0000h	
PC40			0000h	

5. PARAMETERS

No.	Symbol	Name	Initial value	Unit
PC41		For manufacturer setting	0000h	
PC42			0000h	
PC43			0000h	
PC44			0000h	
PC45			0000h	
PC46			0000h	
PC47			0000h	
PC48			0000h	
PC49			0000h	
PC50			0000h	
PC51			0000h	
PC52			0000h	
PC53			0000h	
PC54			0000h	
PC55			0000h	
PC56			0000h	
PC57			0000h	
PC58			0000h	
PC59			0000h	
PC60			0000h	
PC61			0000h	
PC62			0000h	
PC63			0000h	
PC64			0000h	

5.1.4 I/O setting parameters ([Pr. PD_ _])

No.	Symbol	Name	Initial value	Unit
PD01		For manufacturer setting	0000h	
PD02	*DIA2	Input signal automatic on selection 2	0000h	
PD03		For manufacturer setting	0020h	
PD04			0021h	
PD05			0022h	
PD06			0000h	
PD07	*DO1	Output device selection 1	0005h	
PD08	*DO2	Output device selection 2	0004h	
PD09	*DO3	Output device selection 3	0003h	
PD10		For manufacturer setting	0000h	
PD11			0004h	
PD12			0000h	
PD13			0000h	
PD14	*DOP3	Function selection D-3	0000h	
PD15		For manufacturer setting	0000h	
PD16			0000h	
PD17			0000h	
PD18			0000h	
PD19			0000h	
PD20			0	
PD21			0	
PD22			0	
PD23			0	
PD24			0000h	
PD25			0000h	
PD26			0000h	
PD27			0000h	
PD28			0000h	

5. PARAMETERS

No.	Symbol	Name	Initial value	Unit
PD29		For manufacturer setting	0000h	
PD30			0	
PD31			0	
PD32			0	
PD33			0000h	
PD34			0000h	
PD35			0000h	
PD36			0000h	
PD37			0000h	
PD38			0000h	
PD39			0000h	
PD40			0000h	
PD41			0000h	
PD42			0000h	
PD43			0000h	
PD44			0000h	
PD45			0000h	
PD46			0000h	
PD47			0000h	
PD48			0000h	

5.1.5 Extension setting 2 parameters ([Pr. PE_ _])

No.	Symbol	Name	Initial value	Unit
PE01		For manufacturer setting	0000h	
PE02			0000h	
PE03			0003h	
PE04			1	
PE05			1	
PE06			400	
PE07			100	
PE08			10	
PE09			0000h	
PE10			0000h	
PE11			0000h	
PE12			0000h	
PE13			0000h	
PE14			0111h	
PE15			20	
PE16			0000h	
PE17			0000h	
PE18			0000h	
PE19			0000h	
PE20			0000h	
PE21			0000h	
PE22			0000h	
PE23			0000h	
PE24			0000h	
PE25			0000h	
PE26			0000h	
PE27			0000h	
PE28			0000h	
PE29			0000h	
PE30			0000h	

5. PARAMETERS

No.	Symbol	Name	Initial value	Unit
PE31		For manufacturer setting	0000h	
PE32			0000h	
PE33			0000h	
PE34			1	
PE35			1	
PE36			0.0	
PE37			0.00	
PE38			0.00	
PE39			20	
PE40			0000h	
PE41	EOP3	Function selection E-3	0000h	
PE42		For manufacturer setting	0	
PE43			0.0	
PE44			0000h	
PE45			0000h	
PE46			0000h	
PE47			0000h	
PE48			0000h	
PE49			0000h	
PE50			0000h	
PE51			0000h	
PE52			0000h	
PE53			0000h	
PE54			0000h	
PE55			0000h	
PE56			0000h	
PE57			0000h	
PE58			0000h	
PE59			0000h	
PE60			0000h	
PE61			0.00	
PE62			0.00	
PE63			0.00	
PE64			0.00	

5.1.6 Extension setting 3 parameters ([Pr. PF__])

No.	Symbol	Name	Initial value	Unit
PF01		For manufacturer setting	0000h	
PF02			0000h	
PF03			0000h	
PF04			0	
PF05			0000h	
PF06	*FOP5	Function selection F-5	0000h	
PF07		For manufacturer setting	0000h	
PF08			0000h	
PF09			0	
PF10			0	
PF11			0	
PF12	DBT	Electronic dynamic brake operating time	2000	[ms]
PF13		For manufacturer setting	0000h	
PF14			10	
PF15			0000h	
PF16			0000h	
PF17			0000h	
PF18			0000h	

5. PARAMETERS

No.	Symbol	Name	Initial value	Unit
PF19		For manufacturer setting	0000h	
PF20			0000h	
PF21	DRT	Drive recorder switching time setting	0	[s]
PF22		For manufacturer setting	200	
PF23	OSCL1	Vibration tough drive - Oscillation detection level	50	[%]
PF24	*OSCL2	Vibration tough drive function selection	0000h	
PF25	CVAT	SEMI-F47 function - Instantaneous power failure detection time	200	[ms]
PF26		For manufacturer setting	0	
PF27			0	
PF28			0	
PF29			0000h	
PF30			0	
PF31	FRIC	Machine diagnosis function - Friction judgement speed	0	[r/min]
PF32		For manufacturer setting	50	
PF33			0000h	
PF34			0000h	
PF35			0000h	
PF36			0000h	
PF37			0000h	
PF38			0000h	
PF39			0000h	
PF40			0000h	
PF41			0000h	
PF42			0000h	
PF43			0000h	
PF44			0000h	
PF45			0000h	
PF46			0000h	
PF47			0000h	
PF48			0000h	

5.1.7 Option setting parameters ([Pr. Po_ _])

No.	Symbol	Name	Initial value	Unit
Po01		For manufacturer setting	0000h	
Po02	*STNO	CC-Link IE communication station No. selection	0	
Po03	*NWNO	CC-Link IE communication network number	0	
Po04		For manufacturer setting	0000h	
Po05			0000h	
Po06			0	
Po07			0	
Po08			0	
Po09			0	
Po10			0	
Po11			0	
Po12			0000h	
Po13			0000h	
Po14			0000h	
Po15			0000h	
Po16			0000h	
Po17			0000h	
Po18			0000h	
Po19			0000h	
Po20			0000h	

5. PARAMETERS

No.	Symbol	Name	Initial value	Unit
Po21		For manufacturer setting	0000h	
Po22			0000h	
Po23			0000h	
Po24			0000h	
Po25			0000h	
Po26			0000h	
Po27			0000h	
Po28			0000h	
Po29			0000h	
Po30			0000h	
Po31			0000h	
Po32			0000h	

5. PARAMETERS

5.2 Detailed list of parameters

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

5.2.1 Basic setting parameters ([Pr. PA_ _])

No.	Symbol	Name and function	Initial value [unit]	Setting range												
PA02	**REG	<p>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.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> <tr> <td>__x x</td><td> Regenerative option selection 00: Regenerative option is not used. <ul style="list-style-type: none"> • For servo amplifier of 100 W, regenerative option is not used. • For servo amplifier of 0.2 kW to 7 kW, built-in regenerative resistor is used. 01: FR-RC/FR-CV/FR-BU2 When you use FR-RC, FR-CV, or FR-BU2, select "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.) </td><td>00h</td></tr> <tr> <td>_x __</td><td rowspan="2">For manufacturer setting</td><td>0h</td></tr> <tr> <td>x __ __</td><td>0h</td></tr> </table>	Setting digit	Explanation	Initial value	__x x	Regenerative option selection 00: Regenerative option is not used. <ul style="list-style-type: none"> • For servo amplifier of 100 W, regenerative option is not used. • For servo amplifier of 0.2 kW to 7 kW, built-in regenerative resistor is used. 01: FR-RC/FR-CV/FR-BU2 When you use FR-RC, FR-CV, or FR-BU2, select "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.)	00h	_x __	For manufacturer setting	0h	x __ __	0h	Refer to Name and function column.		
Setting digit	Explanation	Initial value														
__x x	Regenerative option selection 00: Regenerative option is not used. <ul style="list-style-type: none"> • For servo amplifier of 100 W, regenerative option is not used. • For servo amplifier of 0.2 kW to 7 kW, built-in regenerative resistor is used. 01: FR-RC/FR-CV/FR-BU2 When you use FR-RC, FR-CV, or FR-BU2, select "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.)	00h														
_x __	For manufacturer setting	0h														
x __ __		0h														
PA03	*ABS	<p>Absolute position detection system Set this parameter when using the absolute position detection system.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> <tr> <td>__x x</td><td> 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>_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> </table>	Setting digit	Explanation	Initial value	__x 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 __ __	0h	x __ __ __	0h	Refer to Name and function column.
Setting digit	Explanation	Initial value														
__x 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 __ __		0h														
x __ __ __		0h														

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No.	Symbol	Name and function	Initial value [unit]	Setting range																																					
PA04	*AOP1	<p>Function selection A-1 This is used to select the forced stop input and forced stop deceleration function.</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>___ x</td> <td>For manufacturer setting</td> <td>0h</td> </tr> <tr> <td>__ x _</td> <td></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 table 5.1 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 table 5.1 for details.</td> <td>2h</td> </tr> </tbody> </table> <p style="text-align: center;">Table 5.1 Deceleration method</p> <table border="1"> <thead> <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> </thead> <tbody> <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> </tbody> </table>	Setting digit	Explanation	Initial value	___ x	For manufacturer setting	0h	__ x _		0h	_ 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 5.1 for details.	0h	x ___	Forced stop deceleration function selection 0: Forced stop deceleration function disabled (EM1) 2: Forced stop deceleration function enabled (EM2) Refer to table 5.1 for details.	2h	Setting value	EM2/EM1	Deceleration method		EM2 or EM1 is off	Alarm occurred	0 0 __	EM1	MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.	MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.	2 0 __	EM2	MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.	MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.	0 1 __	Not using EM2 or EM1		MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.	2 1 __	Not using EM2 or EM1		MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.	Refer to Name and function column.	
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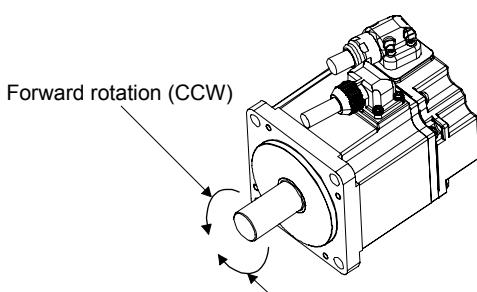
5. PARAMETERS

No.	Symbol	Name and function	Initial value [unit]	Setting range															
PA08	ATU	<p>Auto tuning mode Select the gain adjustment mode.</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>---</td> <td>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 5.2 for details.</td> <td>1h</td> </tr> <tr> <td>__x__</td> <td>For manufacturer setting</td> <td>0h</td> </tr> <tr> <td>_x_</td> <td></td> <td>0h</td> </tr> <tr> <td>x ___</td> <td></td> <td>0h</td> </tr> </tbody> </table>	Setting digit	Explanation	Initial value	---	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 5.2 for details.	1h	__x__	For manufacturer setting	0h	_x_		0h	x ___		0h		Refer to Name and function column.
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__x__	For manufacturer setting	0h																	
x		0h																	
x ___		0h																	

Table 5.2 Gain adjustment mode selection

Setting value	Gain adjustment mode	Automatically adjusted parameter
---0	2 gain adjustment mode 1 (interpolation mode)	[Pr. PB06 Load to motor inertia ratio] [Pr. PB08 Position loop gain] [Pr. PB09 Speed loop gain] [Pr. PB10 Speed integral compensation]
---1	Auto tuning mode 1	[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]
---2	Auto tuning mode 2	[Pr. PB07 Model loop gain] [Pr. PB08 Position loop gain] [Pr. PB09 Speed loop gain] [Pr. PB10 Speed integral compensation]
---3	Manual mode	
---4	2 gain adjustment mode 2	[Pr. PB08 Position loop gain] [Pr. PB09 Speed loop gain] [Pr. PB10 Speed integral compensation]

5. PARAMETERS

No.	Symbol	Name and function	Initial value [unit]	Setting range																																																																																													
PA09	RSP	<p>Auto tuning response Set a response of the auto tuning.</p> <table border="1"> <thead> <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> </thead> <tbody> <tr><td>1</td><td rowspan="20">Low 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> </tbody> </table> <table border="1"> <thead> <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> </thead> <tbody> <tr><td>21</td><td rowspan="19">Middle 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>High response</td><td>642.7</td></tr> </tbody> </table>	Setting value	Machine characteristic		Response	Guideline for machine resonance frequency [Hz]	1	Low response	2.7	2	3.6	3	4.9	4	6.6	5	10.0	6	11.3	7	12.7	8	14.3	9	16.1	10	18.1	11	20.4	12	23.0	13	25.9	14	29.2	15	32.9	16	37.0	17	41.7	18	47.0	19	52.9	20	59.6	Setting value	Machine characteristic		Response	Guideline for machine resonance frequency [Hz]	21	Middle response	67.1	22	75.6	23	85.2	24	95.9	25	108.0	26	121.7	27	137.1	28	154.4	29	173.9	30	195.9	31	220.6	32	248.5	33	279.9	34	315.3	35	355.1	36	400.0	37	446.6	38	501.2	39	571.5	40	High response	642.7	16	1 to 40
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PA10	INP	<p>In-position range Set an in-position range per command pulse.</p>	1600 [pulse]	0 to 65535																																																																																													
PA14	*POL	<p>Rotation direction selection Select the rotation direction of command input pulse.</p> <table border="1"> <thead> <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> </thead> <tbody> <tr><td>0</td><td>CCW</td><td>CW</td></tr> <tr><td>1</td><td>CW</td><td>CCW</td></tr> </tbody> </table> <p>The following shows the servo motor rotation directions.</p> 	Setting value	Servo motor rotation direction		Positioning address increase	Positioning address decrease	0	CCW	CW	1	CW	CCW	0	0 to 1																																																																																		
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No.	Symbol	Name and function	Initial value [unit]	Setting range
PA15	*ENR	<p>Encoder output pulses</p> <p>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)</p> <p>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].</p> <p>The maximum output frequency is 4.6 Mpps. Set the parameter within this range.</p>	4000 [pulse/rev]	1 to 65535
PA16	*ENR2	<p>Encoder output pulses 2</p> <p>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].</p>	1	1 to 65535
PA19	*BLK	<p>Parameter writing inhibit</p> <p>Select a reference range and writing range of the parameter.</p> <p>Refer to table 5.3 for settings.</p>	00ABh	Refer to Name and function column.

Table 5.3 [Pr. PA19] setting value and reading/writing range

PA19	Setting operation	PA	PB	PC	PD	PE	PF	Po
Other than below	Reading	○						
	Writing	○						
000Ah	Reading	Only 19						
	Writing	Only 19						
000Bh	Reading	○	○	○				
	Writing	○	○	○				
000Ch	Reading	○	○	○	○			
	Writing	○	○	○	○			
000Eh	Reading	○	○	○	○			○
	Writing	○	○	○	○			○
000Fh	Reading	○	○	○	○	○		○
	Writing	○	○	○	○	○		○
00AAh	Reading	○	○	○	○	○	○	
	Writing	○	○	○	○	○	○	
00ABh (initial value)	Reading	○	○	○	○	○	○	○
	Writing	○	○	○	○	○	○	○
100Bh	Reading	○						
	Writing	Only 19						
100Ch	Reading	○	○	○	○			
	Writing	Only 19						
100Eh	Reading	○	○	○	○			○
	Writing	Only 19						○
100Fh	Reading	○	○	○	○	○		○
	Writing	Only 19						○
10AAh	Reading	○	○	○	○	○	○	
	Writing	Only 19						
10ABh	Reading	○	○	○	○	○	○	○
	Writing	Only 19						○

5. PARAMETERS

No.	Symbol	Name and function	Initial value [unit]	Setting range															
PA20	*TDS	<p>Tough drive setting Alarms may not be avoided with the tough drive function depending on the situations of the power supply and load fluctuation. You can assign MTTR (During tough drive) to pins CN3-9 to CN3-13 and CN3-15 with [Pr. PD07] to [Pr. PD09].</p> <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>___x</td><td>For manufacturer setting</td><td>0h</td></tr> <tr> <td>__x_</td><td>Vibration tough drive selection 0: Disabled 1: Enabled Selecting "1" enables to suppress vibrations by automatically changing setting values of [Pr. PB13 Machine resonance suppression filter 1] and [Pr. PB15 Machine resonance suppression filter 2] in case that the vibration exceed the value of the oscillation level set in [Pr. PF23]. For details, refer to section 7.3 of "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".</td><td>0h</td></tr> <tr> <td>_x__</td><td>SEMI-F47 function selection (instantaneous power failure tough drive selection) 0: Disabled 1: Enabled Selecting "1" enables to avoid occurring [AL. 10.1 Voltage drop in the control circuit power] using the electrical energy charged in the capacitor in case that an instantaneous power failure occurs during operation. Set the time of until [AL. 10.1 Voltage drop in the control circuit power] occurs in [Pr. PF25 SEMI-F47 function - Instantaneous power failure detection time].</td><td>0h</td></tr> <tr> <td>x___</td><td>For manufacturer setting</td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	___x	For manufacturer setting	0h	__x_	Vibration tough drive selection 0: Disabled 1: Enabled Selecting "1" enables to suppress vibrations by automatically changing setting values of [Pr. PB13 Machine resonance suppression filter 1] and [Pr. PB15 Machine resonance suppression filter 2] in case that the vibration exceed the value of the oscillation level set in [Pr. PF23]. For details, refer to section 7.3 of "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".	0h	_x__	SEMI-F47 function selection (instantaneous power failure tough drive selection) 0: Disabled 1: Enabled Selecting "1" enables to avoid occurring [AL. 10.1 Voltage drop in the control circuit power] using the electrical energy charged in the capacitor in case that an instantaneous power failure occurs during operation. Set the time of until [AL. 10.1 Voltage drop in the control circuit power] occurs in [Pr. PF25 SEMI-F47 function - Instantaneous power failure detection time].	0h	x___	For manufacturer setting	0h	Refer to Name and function column.	
Setting digit	Explanation	Initial value																	
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x___	For manufacturer setting	0h																	
PA21	*AOP3	<p>Function selection A-3</p> <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>___x</td><td>One-touch tuning function selection 0: Disabled 1: Enabled When the digit is "0", the one-touch tuning with MR Configurator2 will be disabled.</td><td>1h</td></tr> <tr> <td>__x_</td><td>For manufacturer setting</td><td>0h</td></tr> <tr> <td>_x__</td><td></td><td>0h</td></tr> <tr> <td>x___</td><td></td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	___x	One-touch tuning function selection 0: Disabled 1: Enabled When the digit is "0", the one-touch tuning with MR Configurator2 will be disabled.	1h	__x_	For manufacturer setting	0h	_x__		0h	x___		0h	Refer to Name and function column.	
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_x__		0h																	
x___		0h																	

5. PARAMETERS

No.	Symbol	Name and function	Initial value [unit]	Setting range													
PA23	DRAT	<p>Drive recorder arbitrary alarm trigger setting</p> <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>__x x</td><td> Alarm detail No. setting Set the digits when you execute the trigger with arbitrary alarm detail No. for the drive recorder function. When these digits are "0 0", only the arbitrary alarm No. setting will be enabled. </td><td>00h</td></tr> <tr> <td>x x __</td><td> Alarm No. setting Set the digits when you execute the trigger with arbitrary alarm No. for the drive recorder function. When "0 0" are set, arbitrary alarm trigger of the drive recorder will be disabled. </td><td>00h</td></tr> </tbody> </table> <p>Setting example: To activate the drive recorder when [AL. 50 Overload 1] occurs, set "5 0 0 0". To activate the drive recorder when [AL. 50.3 Thermal overload error 4 during operation] occurs, set "5 0 0 3".</p>	Setting digit	Explanation	Initial value	__x x	Alarm detail No. setting Set the digits when you execute the trigger with arbitrary alarm detail No. for the drive recorder function. When these digits are "0 0", only the arbitrary alarm No. setting will be enabled.	00h	x x __	Alarm No. setting Set the digits when you execute the trigger with arbitrary alarm No. for the drive recorder function. When "0 0" are set, arbitrary alarm trigger of the drive recorder will be disabled.	00h		Refer to Name and function column.				
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x x __	Alarm No. setting Set the digits when you execute the trigger with arbitrary alarm No. for the drive recorder function. When "0 0" are set, arbitrary alarm trigger of the drive recorder will be disabled.	00h															
PA24	AOP4	<p>Function selection A-4</p> <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>___x</td><td> Vibration suppression mode selection 0: Standard mode 1: 3 inertia mode 2: Low response mode When two low resonance frequencies are generated, select "3 inertia mode (___1)". When the load to motor inertia ratio exceeds the recommended load to motor inertia ratio, select "Low response mode (___2)". When you select the standard mode or low response mode, "Vibration suppression control 2" is not available. When you select the 3 inertia mode, the feed forward gain is not available. </td><td>0h</td></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> </tbody> </table>	Setting digit	Explanation	Initial value	___x	Vibration suppression mode selection 0: Standard mode 1: 3 inertia mode 2: Low response mode When two low resonance frequencies are generated, select "3 inertia mode (___1)". When the load to motor inertia ratio exceeds the recommended load to motor inertia ratio, select "Low response mode (___2)". When you select the standard mode or low response mode, "Vibration suppression control 2" is not available. When you select the 3 inertia mode, the feed forward gain is not available.	0h	__x _	For manufacturer setting	0h	_x __	0h	x __ __	0h		Refer to Name and function column.
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_x __		0h															
x __ __		0h															
PA25	OTHOV	<p>One-touch tuning - Overshoot permissible level</p> <p>This is used to set a permissible value of overshoot amount with a percentage to in-position range.</p> <p>However, setting "0" will be 50%.</p>	0 [%]	0 to 100													

5. PARAMETERS

5.2.2 Gain/filter setting parameters ([Pr. PB_ _])

No.	Symbol	Name and function	Initial value [unit]	Setting range															
PB01	FILT	Adaptive tuning mode (adaptive filter II) Set the adaptive filter tuning. <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>--- x</td><td>Filter tuning mode selection Select the adjustment mode of the machine resonance suppression filter 1. For details, refer to section 7.1.2 of "MR-J4_B(-RJ) Servo Amplifier Instruction Manual". 0: Disabled 1: Automatic setting 2: Manual setting</td><td>0h</td></tr> <tr> <td>__ x __</td><td>For manufacturer setting</td><td>0h</td></tr> <tr> <td>_ x _ _</td><td></td><td>0h</td></tr> <tr> <td>x _ _ _</td><td></td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	--- x	Filter tuning mode selection Select the adjustment mode of the machine resonance suppression filter 1. For details, refer to section 7.1.2 of "MR-J4_B(-RJ) Servo Amplifier Instruction Manual". 0: Disabled 1: Automatic setting 2: Manual setting	0h	__ x __	For manufacturer setting	0h	_ x _ _		0h	x _ _ _		0h	Refer to Name and function column.	
Setting digit	Explanation	Initial value																	
--- x	Filter tuning mode selection Select the adjustment mode of the machine resonance suppression filter 1. For details, refer to section 7.1.2 of "MR-J4_B(-RJ) Servo Amplifier Instruction Manual". 0: Disabled 1: Automatic setting 2: Manual setting	0h																	
__ x __	For manufacturer setting	0h																	
_ x _ _		0h																	
x _ _ _		0h																	
PB02	VRFT	Vibration suppression control tuning mode (advanced vibration suppression control II) This is used to set the vibration suppression control tuning. For details, refer to section 7.1.5 of "MR-J4_B(-RJ) Servo Amplifier Instruction Manual". <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>--- x</td><td>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>__ x __</td><td>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>_ x _ _</td><td>For manufacturer setting</td><td>0h</td></tr> <tr> <td>x _ _ _</td><td></td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	--- 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 _ _ _		0h	Refer to Name and function column.	
Setting digit	Explanation	Initial value																	
--- 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 _ _ _		0h																	
PB04	FFC	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.	0 [%]	0 to 100															
PB06	GD2	Load to motor inertia ratio This is used to set the load to motor inertia 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 border="1"> <thead> <tr> <th>Pr. PA08</th><th>This parameter</th></tr> </thead> <tbody> <tr> <td>--- 0 (2 gain adjustment mode 1 (interpolation mode))</td><td>Automatic setting</td></tr> <tr> <td>--- 1: (Auto tuning mode 1)</td><td></td></tr> <tr> <td>--- 2: (Auto tuning mode 2)</td><td>Manual setting</td></tr> <tr> <td>--- 3: (Manual mode)</td><td></td></tr> <tr> <td>--- 4: (2 gain adjustment mode 2)</td><td></td></tr> </tbody> </table>	Pr. PA08	This parameter	--- 0 (2 gain adjustment mode 1 (interpolation mode))	Automatic setting	--- 1: (Auto tuning mode 1)		--- 2: (Auto tuning mode 2)	Manual setting	--- 3: (Manual mode)		--- 4: (2 gain adjustment mode 2)		7.00 [Multiplier]	0.00 to 300.00			
Pr. PA08	This parameter																		
--- 0 (2 gain adjustment mode 1 (interpolation mode))	Automatic setting																		
--- 1: (Auto tuning mode 1)																			
--- 2: (Auto tuning mode 2)	Manual setting																		
--- 3: (Manual mode)																			
--- 4: (2 gain adjustment mode 2)																			

5. PARAMETERS

No.	Symbol	Name and function	Initial value [unit]	Setting range										
PB07	PG1	<p>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/or 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.</p> <table border="1"> <thead> <tr> <th>Pr. PA08</th><th>This parameter</th></tr> </thead> <tbody> <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> </tbody> </table>	Pr. PA08	This parameter	___ 0 (2 gain adjustment mode 1 (interpolation mode))	Manual setting	___ 1: (Auto tuning mode 1)	Automatic setting	___ 2: (Auto tuning mode 2)	___ 3: (Manual mode)	Manual setting	___ 4: (2 gain adjustment mode 2)	15.0 [rad/s]	1.0 to 2000.0
Pr. PA08	This parameter													
___ 0 (2 gain adjustment mode 1 (interpolation mode))	Manual setting													
___ 1: (Auto tuning mode 1)	Automatic setting													
___ 2: (Auto tuning mode 2)														
___ 3: (Manual mode)	Manual setting													
___ 4: (2 gain adjustment mode 2)														
PB08	PG2	<p>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/or 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.</p> <table border="1"> <thead> <tr> <th>Pr. PA08</th><th>This parameter</th></tr> </thead> <tbody> <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="2">Manual setting</td></tr> <tr> <td>___ 3: (Manual mode)</td></tr> <tr> <td>___ 4: (2 gain adjustment mode 2)</td><td>Automatic setting</td></tr> </tbody> </table>	Pr. PA08	This parameter	___ 0 (2 gain adjustment mode 1 (interpolation mode))	Automatic setting	___ 1: (Auto tuning mode 1)	___ 2: (Auto tuning mode 2)	Manual setting	___ 3: (Manual mode)	___ 4: (2 gain adjustment mode 2)	Automatic setting	37.0 [rad/s]	1.0 to 2000.0
Pr. PA08	This parameter													
___ 0 (2 gain adjustment mode 1 (interpolation mode))	Automatic setting													
___ 1: (Auto tuning mode 1)														
___ 2: (Auto tuning mode 2)	Manual setting													
___ 3: (Manual mode)														
___ 4: (2 gain adjustment mode 2)	Automatic setting													
PB09	VG2	<p>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/or 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.</p>	823 [rad/s]	20 to 65535										
PB10	VIC	<p>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/or 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.</p>	33.7 [ms]	0.1 to 1000.0										
PB12	OVA	<p>Overshoot amount compensation This is used to set a viscous friction torque in percentage to the rated torque at servo motor rated speed. When the response level is low, or when the torque is limited, the efficiency of the parameter may be lower.</p>	0 [%]	0 to 100										
PB13	NH1	<p>Machine resonance suppression filter 1 Set the notch frequency of the machine resonance suppression filter 1. When you select "Automatic setting (___ 1)" of "Filter tuning mode selection" in [Pr. PB01], this parameter will be adjusted automatically. When you select "Manual setting (___ 2)" of "Filter tuning mode selection" in [Pr. PB01], the setting value will be enabled.</p>	4500 [Hz]	10 to 4500										

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No.	Symbol	Name and function	Initial value [unit]	Setting range															
PB14	NHQ1	<p>Notch shape selection 1 Set the shape of the machine resonance suppression filter 1. When you select "Automatic setting (_ _ _ 1)" of "Filter tuning mode selection" in [Pr. PB01], this parameter will be adjusted automatically. Set manually for the manual setting.</p> <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>_ _ _ x</td><td>For manufacturer setting</td><td>0h</td></tr> <tr> <td>_ _ x _</td><td>Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB</td><td>0h</td></tr> <tr> <td>_ x _ _</td><td>Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$</td><td>0h</td></tr> <tr> <td>x _ _ _</td><td>For manufacturer setting</td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	_ _ _ x	For manufacturer setting	0h	_ _ x _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h	_ x _ _	Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$	0h	x _ _ _	For manufacturer setting	0h		Refer to Name and function column.
Setting digit	Explanation	Initial value																	
_ _ _ x	For manufacturer setting	0h																	
_ _ x _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h																	
_ x _ _	Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$	0h																	
x _ _ _	For manufacturer setting	0h																	
PB15	NH2	<p>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].</p>	4500 [Hz]	10 to 4500															
PB16	NHQ2	<p>Notch shape selection 2 Set the shape of the machine resonance suppression filter 2.</p> <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>_ _ _ x</td><td>Machine resonance suppression filter 2 selection 0: Disabled 1: Enabled</td><td>0h</td></tr> <tr> <td>_ _ x _</td><td>Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB</td><td>0h</td></tr> <tr> <td>_ x _ _</td><td>Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$</td><td>0h</td></tr> <tr> <td>x _ _ _</td><td>For manufacturer setting</td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	_ _ _ x	Machine resonance suppression filter 2 selection 0: Disabled 1: Enabled	0h	_ _ x _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h	_ x _ _	Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$	0h	x _ _ _	For manufacturer setting	0h		Refer to Name and function column.
Setting digit	Explanation	Initial value																	
_ _ _ x	Machine resonance suppression filter 2 selection 0: Disabled 1: Enabled	0h																	
_ _ x _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h																	
_ x _ _	Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$	0h																	
x _ _ _	For manufacturer setting	0h																	

5. PARAMETERS

No.	Symbol	Name and function	Initial value [unit]	Setting range												
PB17	NHF	<p>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. Set manually for "Manual setting (_ _ _ 1)". 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.</p> <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>_ _ x x</td><td>Shaft resonance suppression filter setting frequency selection This is used for setting the shaft resonance suppression filter. Refer to table 5.4 for settings. Set the value closest to the frequency you need.</td><td>00h</td></tr> <tr> <td>_ x _ _</td><td>Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB</td><td>0h</td></tr> <tr> <td>x _ _ _</td><td>For manufacturer setting</td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	_ _ x x	Shaft resonance suppression filter setting frequency selection This is used for setting the shaft resonance suppression filter. Refer to table 5.4 for settings. Set the value closest to the frequency you need.	00h	_ x _ _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h	x _ _ _	For manufacturer setting	0h	Refer to Name and function column.	
Setting digit	Explanation	Initial value														
_ _ x x	Shaft resonance suppression filter setting frequency selection This is used for setting the shaft resonance suppression filter. Refer to table 5.4 for settings. Set the value closest to the frequency you need.	00h														
_ x _ _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h														
x _ _ _	For manufacturer setting	0h														
PB18	LPF	<p>Low-pass filter setting Set the low-pass filter. The following shows a relation of a required parameter to this parameter.</p> <table border="1"> <thead> <tr> <th>[Pr. PB23]</th><th>[Pr. PB18]</th></tr> </thead> <tbody> <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> </tbody> </table>	[Pr. PB23]	[Pr. PB18]	_ _ 0 _ (Initial value)	Automatic setting	_ _ 1 _	Setting value enabled	_ _ 2 _	Setting value disabled	3141 [rad/s]	100 to 18000				
[Pr. PB23]	[Pr. PB18]															
_ _ 0 _ (Initial value)	Automatic setting															
_ _ 1 _	Setting value enabled															
_ _ 2 _	Setting value disabled															

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No.	Symbol	Name and function	Initial value [unit]	Setting range															
PB19	VRF11	<p>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 "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)". For details, refer to section 7.1.5 of "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".</p>	100.0 [Hz]	0.1 to 300.0															
PB20	VRF12	<p>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 "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)". For details, refer to section 7.1.5 of "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".</p>	100.0 [Hz]	0.1 to 300.0															
PB21	VRF13	<p>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 "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)". For details, refer to section 7.1.5 of "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".</p>	0.00	0.00 to 0.30															
PB22	VRF14	<p>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 "Automatic setting (_ _ _ 1)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ _ 2)". For details, refer to section 7.1.5 of "MR-J4-_B(-RJ) Servo Amplifier Instruction Manual".</p>	0.00	0.00 to 0.30															
PB23	VFBF	<p>Low-pass filter selection Select the shaft resonance suppression filter and low-pass filter.</p> <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>_ _ _ x</td><td> <p>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.</p> </td><td>0h</td></tr> <tr> <td>_ _ x _</td><td> <p>Low-pass filter selection 0: Automatic setting 1: Manual setting 2: Disabled</p> </td><td>0h</td></tr> <tr> <td>_ x _ _</td><td>For manufacturer setting</td><td>0h</td></tr> <tr> <td>x _ _ _</td><td></td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	_ _ _ x	<p>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.</p>	0h	_ _ x _	<p>Low-pass filter selection 0: Automatic setting 1: Manual setting 2: Disabled</p>	0h	_ x _ _	For manufacturer setting	0h	x _ _ _		0h	Refer to Name and function column.	
Setting digit	Explanation	Initial value																	
_ _ _ x	<p>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.</p>	0h																	
_ _ x _	<p>Low-pass filter selection 0: Automatic setting 1: Manual setting 2: Disabled</p>	0h																	
_ x _ _	For manufacturer setting	0h																	
x _ _ _		0h																	
PB24	*MVS	<p>Slight vibration suppression control Select the slight vibration suppression control</p> <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>_ _ _ x</td><td> <p>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].</p> </td><td>0h</td></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> </tbody> </table>	Setting digit	Explanation	Initial value	_ _ _ x	<p>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].</p>	0h	_ _ x _	For manufacturer setting	0h	_ x _ _	0h	x _ _ _	0h	Refer to Name and function column.			
Setting digit	Explanation	Initial value																	
_ _ _ x	<p>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].</p>	0h																	
_ _ x _	For manufacturer setting	0h																	
_ x _ _		0h																	
x _ _ _		0h																	

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No.	Symbol	Name and function	Initial value [unit]	Setting range												
PB45	CNHF	<p>Command notch filter Set the command notch filter.</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>__xx</td> <td>Command notch filter setting frequency selection Refer to table 5.5 for the relation of setting values to frequency.</td> <td>00h</td> </tr> <tr> <td>_x__</td> <td>Notch depth selection Refer to table 5.6 for details.</td> <td>0h</td> </tr> <tr> <td>x___</td> <td>For manufacturer setting</td> <td>0h</td> </tr> </tbody> </table>	Setting digit	Explanation	Initial value	__xx	Command notch filter setting frequency selection Refer to table 5.5 for the relation of setting values to frequency.	00h	_x__	Notch depth selection Refer to table 5.6 for details.	0h	x___	For manufacturer setting	0h	Refer to Name and function column.	
Setting digit	Explanation	Initial value														
__xx	Command notch filter setting frequency selection Refer to table 5.5 for the relation of setting values to frequency.	00h														
_x__	Notch depth selection Refer to table 5.6 for details.	0h														
x___	For manufacturer setting	0h														

Table 5.5 Command notch filter setting frequency selection

Setting	Frequency [Hz]	Setting	Frequency [Hz]	Setting	Frequency [Hz]
00	Disabled	20	70	40	17.6
01	2250	21	66	41	16.5
02	1125	22	62	42	15.6
03	750	23	59	43	14.8
04	562	24	56	44	14.1
05	450	25	53	45	13.4
06	375	26	51	46	12.8
07	321	27	48	47	12.2
08	281	28	46	48	11.7
09	250	29	45	49	11.3
0A	225	2A	43	4A	10.8
0B	204	2B	41	4B	10.4
0C	187	2C	40	4C	10
0D	173	2D	38	4D	9.7
0E	160	2E	37	4E	9.4
0F	150	2F	36	4F	9.1
10	140	30	35.2	50	8.8
11	132	31	33.1	51	8.3
12	125	32	31.3	52	7.8
13	118	33	29.6	53	7.4
14	112	34	28.1	54	7.0
15	107	35	26.8	55	6.7
16	102	36	25.6	56	6.4
17	97	37	24.5	57	6.1
18	93	38	23.4	58	5.9
19	90	39	22.5	59	5.6
1A	86	3A	21.6	5A	5.4
1B	83	3B	20.8	5B	5.2
1C	80	3C	20.1	5C	5.0
1D	77	3D	19.4	5D	4.9
1E	75	3E	18.8	5E	4.7
1F	72	3F	18.2	5F	4.5

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No.	Symbol	Name and function	Initial value [unit]	Setting range																																				
PB45	CNHF	<p style="text-align: center;">Table 5.6 Notch depth selection</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Setting</th><th>Depth [dB]</th></tr> </thead> <tbody> <tr><td>0</td><td>-40.0</td></tr> <tr><td>1</td><td>-24.1</td></tr> <tr><td>2</td><td>-18.1</td></tr> <tr><td>3</td><td>-14.5</td></tr> <tr><td>4</td><td>-12.0</td></tr> <tr><td>5</td><td>-10.1</td></tr> <tr><td>6</td><td>-8.5</td></tr> <tr><td>7</td><td>-7.2</td></tr> </tbody> </table> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Setting</th><th>Depth [dB]</th></tr> </thead> <tbody> <tr><td>8</td><td>-6.0</td></tr> <tr><td>9</td><td>-5.0</td></tr> <tr><td>A</td><td>-4.1</td></tr> <tr><td>B</td><td>-3.3</td></tr> <tr><td>C</td><td>-2.5</td></tr> <tr><td>D</td><td>-1.8</td></tr> <tr><td>E</td><td>-1.2</td></tr> <tr><td>F</td><td>-0.6</td></tr> </tbody> </table>	Setting	Depth [dB]	0	-40.0	1	-24.1	2	-18.1	3	-14.5	4	-12.0	5	-10.1	6	-8.5	7	-7.2	Setting	Depth [dB]	8	-6.0	9	-5.0	A	-4.1	B	-3.3	C	-2.5	D	-1.8	E	-1.2	F	-0.6		Refer to Name and function column.
Setting	Depth [dB]																																							
0	-40.0																																							
1	-24.1																																							
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7	-7.2																																							
Setting	Depth [dB]																																							
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C	-2.5																																							
D	-1.8																																							
E	-1.2																																							
F	-0.6																																							
PB46	NH3	<p>Machine resonance suppression filter 3</p> <p>Set the notch frequency of the machine resonance suppression filter 3.</p> <p>To enable the setting value, select "Enabled (_ _ _ 1)" of "Machine resonance suppression filter 3 selection" in [Pr. PB47].</p>	4500 [Hz]	10 to 4500																																				
PB47	NHQ3	<p>Notch shape selection 3</p> <p>Set the shape of the machine resonance suppression filter 3.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>_ _ _ x</td><td>Machine resonance suppression filter 3 selection 0: Disabled 1: Enabled</td><td>0h</td></tr> <tr> <td>_ _ x _</td><td>Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB</td><td>0h</td></tr> <tr> <td>_ x _ _</td><td>Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$</td><td>0h</td></tr> <tr> <td>x _ _ _</td><td>For manufacturer setting</td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	_ _ _ x	Machine resonance suppression filter 3 selection 0: Disabled 1: Enabled	0h	_ _ x _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h	_ x _ _	Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$	0h	x _ _ _	For manufacturer setting	0h		Refer to Name and function column.																					
Setting digit	Explanation	Initial value																																						
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_ _ x _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h																																						
_ x _ _	Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$	0h																																						
x _ _ _	For manufacturer setting	0h																																						
PB48	NH4	<p>Machine resonance suppression filter 4</p> <p>Set the notch frequency of the machine resonance suppression filter 4.</p> <p>To enable the setting value, select "Enabled (_ _ _ 1)" of "Machine resonance suppression filter 4 selection" in [Pr. PB49].</p>	4500 [Hz]	10 to 4500																																				

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No.	Symbol	Name and function	Initial value [unit]	Setting range															
PB49	NHQ4	<p>Notch shape selection 4 Set the shape of the machine resonance suppression filter 4.</p> <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>___ x</td><td>Machine resonance suppression filter 4 selection 0: Disabled 1: Enabled When you select "Enabled" of this digit, [Pr. PB17 Shaft resonance suppression filter] is not available.</td><td>0h</td></tr> <tr> <td>__ x _</td><td>Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB</td><td>0h</td></tr> <tr> <td>_ x __</td><td>Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$</td><td>0h</td></tr> <tr> <td>x ___</td><td>For manufacturer setting</td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	___ x	Machine resonance suppression filter 4 selection 0: Disabled 1: Enabled When you select "Enabled" of this digit, [Pr. PB17 Shaft resonance suppression filter] is not available.	0h	__ x _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h	_ x __	Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$	0h	x ___	For manufacturer setting	0h		Refer to Name and function column.
Setting digit	Explanation	Initial value																	
___ x	Machine resonance suppression filter 4 selection 0: Disabled 1: Enabled When you select "Enabled" of this digit, [Pr. PB17 Shaft resonance suppression filter] is not available.	0h																	
__ x _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h																	
_ x __	Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$	0h																	
x ___	For manufacturer setting	0h																	
PB50	NH5	<p>Machine resonance suppression filter 5 Set the notch frequency of the machine resonance suppression filter 5. To enable the setting value, select "Enabled (_ _ 1)" of "Machine resonance suppression filter 5 selection" in [Pr. PB51].</p>	4500 [Hz]	10 to 4500															
PB51	NHQ5	<p>Notch shape selection 5 Set the shape of the machine resonance suppression filter 5. When you select "Enabled (_ _ 1)" of "Robust filter selection" in [Pr. PE41], the machine resonance suppression filter 5 is not available.</p> <table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>___ x</td><td>Machine resonance suppression filter 5 selection 0: Disabled 1: Enabled</td><td>0h</td></tr> <tr> <td>__ x _</td><td>Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB</td><td>0h</td></tr> <tr> <td>_ x __</td><td>Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$</td><td>0h</td></tr> <tr> <td>x ___</td><td>For manufacturer setting</td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	___ x	Machine resonance suppression filter 5 selection 0: Disabled 1: Enabled	0h	__ x _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h	_ x __	Notch width selection 0: $\alpha = 2$ 1: $\alpha = 3$ 2: $\alpha = 4$ 3: $\alpha = 5$	0h	x ___	For manufacturer setting	0h		Refer to Name and function column.
Setting digit	Explanation	Initial value																	
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__ x _	Notch depth selection 0: -40 dB 1: -14 dB 2: -8 dB 3: -4 dB	0h																	
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x ___	For manufacturer setting	0h																	
PB52	VRF21	<p>Vibration suppression control 2 - Vibration frequency Set the vibration frequency for vibration suppression control 2 to suppress low-frequency machine vibration. To enable this, select "3 inertia mode (_ _ 1)" of "Vibration suppression mode selection" in [Pr. PA24]. When "Vibration suppression control 2 tuning mode selection" is "Automatic setting (_ _ 1 _)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ 2 _)".</p>	100.0 [Hz]	0.1 to 300.0															

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No.	Symbol	Name and function	Initial value [unit]	Setting range
PB53	VRF22	<p>Vibration suppression control 2 - Resonance frequency Set the resonance frequency for vibration suppression control 2 to suppress low-frequency machine vibration. To enable this, select "3 inertia mode (_ _ _ 1)" of "Vibration suppression mode selection" in [Pr. PA24]. When "Vibration suppression control 2 tuning mode selection" is "Automatic setting (_ _ 1 _)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ 2 _)".</p>	100.0 [Hz]	0.1 to 300.0
PB54	VRF23	<p>Vibration suppression control 2 - Vibration frequency damping Set a damping of the vibration frequency for vibration suppression control 2 to suppress low-frequency machine vibration. To enable this, select "3 inertia mode (_ _ _ 1)" of "Vibration suppression mode selection" in [Pr. PA24]. When "Vibration suppression control 2 tuning mode selection" is "Automatic setting (_ _ 1 _)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ 2 _)".</p>	0.00	0.00 to 0.30
PB55	VRF24	<p>Vibration suppression control 2 - Resonance frequency damping Set a damping of the resonance frequency for vibration suppression control 2 to suppress low-frequency machine vibration. To enable this, select "3 inertia mode (_ _ _ 1)" of "Vibration suppression mode selection" in [Pr. PA24]. When "Vibration suppression control 2 tuning mode selection" is "Automatic setting (_ _ 1 _)" in [Pr. PB02], this parameter will be set automatically. Set manually for "Manual setting (_ _ 2 _)".</p>	0.00	0.00 to 0.30

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5.2.3 Extension setting parameters ([Pr. PC_ _ _])

No.	Symbol	Name and function	Initial value [unit]	Setting range																																					
PC01	ERZ	Error excessive alarm level Set an error excessive alarm level. Set this per rev for rotary servo 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].	0 [rev] (Note)	0 to 1000																																					
PC02	MBR	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.	0 [ms]	0 to 1000																																					
PC03	*ENRS	Encoder output pulse selection This is used to select the encoder pulse direction and encoder output pulse setting.	Refer to Name and function column.																																						
		<table border="1"> <thead> <tr> <th>Setting digit</th><th colspan="2">Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>___ x</td><td colspan="2">Encoder output pulse phase selection 0: Increasing A-phase 90° in CCW 1: Increasing A-phase 90° in CW</td><td>0h</td></tr> <tr> <td></td><td> <table border="1"> <thead> <tr> <th>Setting value</th><th colspan="2">Servo motor rotation direction</th></tr> <tr> <th></th><th>CCW</th><th>CW</th></tr> </thead> <tbody> <tr> <td>0</td><td></td><td></td></tr> <tr> <td>1</td><td></td><td></td></tr> </tbody> </table> </td><td></td></tr> <tr> </tr> <tr> <td></td><td> <table border="1"> <thead> <tr> <th>Setting digit</th><th colspan="2">Explanation</th><th>Initial value</th></tr> <tr> <td>__ x _</td><td colspan="2">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</td><td>0h</td></tr> <tr> <td>_ x __</td><td colspan="2">For manufacturer setting</td><td>0h</td></tr> </thead></table> </td><td></td><td></td></tr> <tr> </tr> <tr> </tr> </tbody> </table>	Setting digit	Explanation		Initial value	___ x	Encoder output pulse phase selection 0: Increasing A-phase 90° in CCW 1: Increasing A-phase 90° in CW		0h		<table border="1"> <thead> <tr> <th>Setting value</th><th colspan="2">Servo motor rotation direction</th></tr> <tr> <th></th><th>CCW</th><th>CW</th></tr> </thead> <tbody> <tr> <td>0</td><td></td><td></td></tr> <tr> <td>1</td><td></td><td></td></tr> </tbody> </table>	Setting value	Servo motor rotation direction			CCW	CW	0			1					<table border="1"> <thead> <tr> <th>Setting digit</th><th colspan="2">Explanation</th><th>Initial value</th></tr> <tr> <td>__ x _</td><td colspan="2">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</td><td>0h</td></tr> <tr> <td>_ x __</td><td colspan="2">For manufacturer setting</td><td>0h</td></tr> </thead></table>	Setting digit	Explanation		Initial value	__ 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		0h	_ x __	For manufacturer setting		0h		
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_ x __	For manufacturer setting		0h																																						
PC04	**COP1	Function selection C-1 Select the encoder cable communication method selection.	Refer to Name and function column.																																						
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No.	Symbol	Name and function	Initial value [unit]	Setting range													
PC05	**COP2	<p>Function selection C-2</p> <p>This is used to select the motor-less operation.</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>___ x</td> <td>Motor-less operation selection 0: Disabled 1: Enabled</td> <td>0h</td> </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> </tbody> </table>	Setting digit	Explanation	Initial value	___ x	Motor-less operation selection 0: Disabled 1: Enabled	0h	__ x _	For manufacturer setting	0h	_ x __	0h	x ___	0h	Refer to Name and function column.	
Setting digit	Explanation	Initial value															
___ x	Motor-less operation selection 0: Disabled 1: Enabled	0h															
__ x _	For manufacturer setting	0h															
_ x __		0h															
x ___		0h															
PC06	*COP3	<p>Function selection C-3</p> <p>Select the error excessive alarm level setting for [Pr. PC01].</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <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>Error excessive alarm level unit selection 0: 1 rev unit 1: 01 rev unit 2: 001 rev unit 3: 0001 rev unit</td> <td>0h</td> </tr> </tbody> </table>	Setting digit	Explanation	Initial value	___ x	For manufacturer setting	0h	__ x _	0h	_ x __	0h	x ___	Error excessive alarm level unit selection 0: 1 rev unit 1: 01 rev unit 2: 001 rev unit 3: 0001 rev unit	0h		
Setting digit	Explanation	Initial value															
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_ x __		0h															
x ___	Error excessive alarm level unit selection 0: 1 rev unit 1: 01 rev unit 2: 001 rev unit 3: 0001 rev unit	0h															
PC07	ZSP	<p>Zero speed</p> <p>Used to set the output range of ZSP (Zero speed detection).</p> <p>ZSP (Zero speed detection) has hysteresis of 20 r/min.</p>	50 [r/min]	0 to 10000													
PC08	OSL	<p>Overspeed alarm detection level</p> <p>This is used to set an overspeed alarm detection level.</p> <p>When you set a value more than "servo motor maximum speed × 120%", the set value will be clamped.</p> <p>When you set "0", the value of "servo motor maximum speed × 120%" will be set.</p>	0 [r/min]	0 to 20000													

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No.	Symbol	Name and function	Initial value [unit]	Setting range																																		
PC09	MOD1	Analog monitor 1 output Select a signal to output to MO1 (Analog monitor 1). Refer to app. 2 (3) for detection point of output selection.		Refer to Name and function column.																																		
		<table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>__ x x</td><td>Analog monitor 1 output selection Refer to table 5.7 for settings.</td><td>00h</td></tr> <tr> <td>_ x __</td><td colspan="2">For manufacturer setting</td></tr> <tr> <td>x ___</td><td></td><td>0h</td></tr> <tr> <td></td><td></td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	__ x x	Analog monitor 1 output selection Refer to table 5.7 for settings.	00h	_ x __	For manufacturer setting		x ___		0h			0h																					
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Table 5.7 Analog monitor setting value																																						
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Note. Encoder pulse unit																																						
PC10	MOD2	Analog monitor 2 output Select a signal to output to MO2 (Analog monitor 2). Refer to app. 2 (3) for detection point of output selection.		Refer to Name and function column.																																		
		<table border="1"> <thead> <tr> <th>Setting digit</th><th>Explanation</th><th>Initial value</th></tr> </thead> <tbody> <tr> <td>__ x x</td><td>Analog monitor 2 output selection Refer to [Pr. PC09] for settings.</td><td>01h</td></tr> <tr> <td>_ x __</td><td colspan="2">For manufacturer setting</td></tr> <tr> <td>x ___</td><td></td><td>0h</td></tr> </tbody> </table>	Setting digit	Explanation	Initial value	__ x x	Analog monitor 2 output selection Refer to [Pr. PC09] for settings.	01h	_ x __	For manufacturer setting		x ___		0h																								
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_ x __	For manufacturer setting																																					
x ___		0h																																				
PC11	MO1	Analog monitor 1 offset This is used to set the offset voltage of MO1 (Analog monitor 1).	0 [mV]	-999 to 999																																		
PC12	MO2	Analog monitor 2 offset This is used to set the offset voltage of MO2 (Analog monitor 2).	0 [mV]	-999 to 999																																		
PC13	MOSDL	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 (Analog monitor 2). Monitor output standard position = [Pr. PC14] setting \times 10000 + [Pr. PC13] setting	0 [pulse]	-9999 to 9999																																		
PC14	MOSDH	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 (Analog monitor 2). Monitor output standard position = [Pr. PC14] setting \times 10000 + [Pr. PC13] setting	0 [10000 pulses]	-9999 to 9999																																		

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No.	Symbol	Name and function	Initial value [unit]	Setting range													
PC17	**COP4	<p>Function selection C-4</p> <p>This is used to select a home position setting condition.</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>___ x</td> <td>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</td> <td>0h</td> </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> </tbody> </table>	Setting digit	Explanation	Initial value	___ 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 _	For manufacturer setting	0h	_ x __	0h	x ___	0h	Refer to Name and function column.	
Setting digit	Explanation	Initial value															
___ 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 _	For manufacturer setting	0h															
_ x __		0h															
x ___		0h															
PC18	*COP5	<p>Function selection C-5</p> <p>This is used to select an occurring condition of [AL. E9 Main circuit off warning].</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <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>[AL. E9 Main circuit off warning] selection 0: Detection with ready-on and servo-on command 1: Detection with servo-on command</td> <td>0h</td> </tr> </tbody> </table>	Setting digit	Explanation	Initial value	___ x	For manufacturer setting	0h	__ x _	0h	_ x __	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	Refer to Name and function column.	
Setting digit	Explanation	Initial value															
___ x	For manufacturer setting	0h															
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_ x __		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															
PC20	*COP7	<p>Function selection C-7</p> <p>This is used to select [AL. 10 undervoltage] detection method.</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>___ x</td> <td>This is set when FR-RC or FR-CV is used and if [AL. 10 undervoltage] occurs due to distorted power supply voltage waveform. 0: When [AL. 10] does not occur 1: When [AL. 10] occurs</td> <td>0h</td> </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> </tbody> </table>	Setting digit	Explanation	Initial value	___ x	This is set when FR-RC or FR-CV is used and if [AL. 10 undervoltage] occurs due to distorted power supply voltage waveform. 0: When [AL. 10] does not occur 1: When [AL. 10] occurs	0h	__ x _	For manufacturer setting	0h	_ x __	0h	x ___	0h	Refer to Name and function column.	
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__ x _	For manufacturer setting	0h															
_ x __		0h															
x ___		0h															
PC21	*BPS	<p>Alarm history clear</p> <p>Used to clear the alarm history.</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>___ x</td> <td>Alarm history clear selection 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.</td> <td>0h</td> </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> </tbody> </table>	Setting digit	Explanation	Initial value	___ x	Alarm history clear selection 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 __	0h	x ___	0h	Refer to Name and function column.	
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__ x _	For manufacturer setting	0h															
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x ___		0h															

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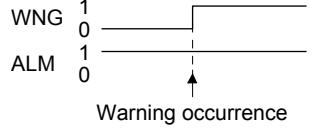
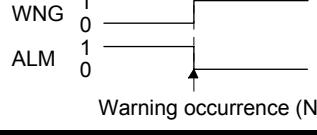
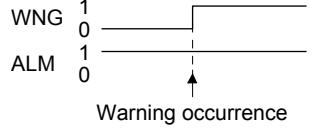
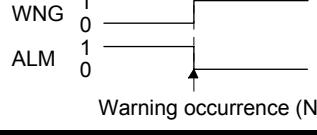
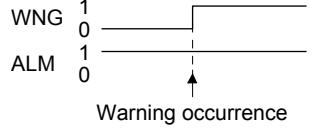
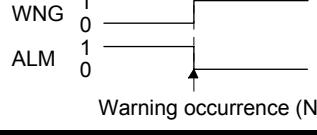
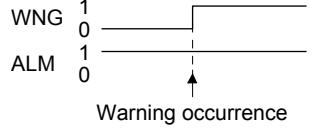
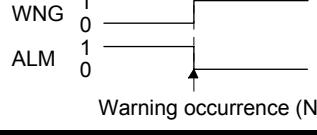
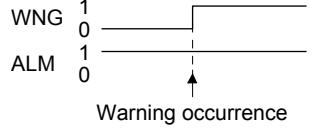
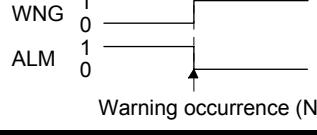
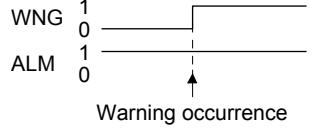
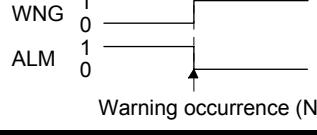
No.	Symbol	Name and function	Initial value [unit]	Setting range
PC24	RSBR	<p>Forced stop deceleration time constant This is used to set deceleration time constant when you use the forced stop deceleration function. Set the time per ms from the rated speed to 0 r/min.</p> <p>[Precautions]</p> <ul style="list-style-type: none"> 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 at quick stop of the controller. If a shorter time is set, [AL. 52 Error excessive] may occur. 	100 [ms]	0 to 20000
PC31	RSUP1	<p>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.</p> <ol style="list-style-type: none"> 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. PC16]. 	0 [0.0001 rev]	-25000 to 25000

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5.2.4 I/O setting parameters ([Pr. PD_ _])

No.	Symbol	Name and function	Initial value [unit]	Setting range																																													
PD02	*DIA2	<p>Input signal automatic on selection 2 When disabling (releasing) FLS and RLS with this parameter, preset "Upper limit" and "Lower limit" of [Pr. 22 Input signal selection] to negative logic.</p> <table border="1"> <thead> <tr> <th colspan="2">Setting digit</th> <th rowspan="2">Explanation</th> <th rowspan="2">Initial value</th> </tr> <tr> <th>HEX.</th> <th>BIN.</th> </tr> </thead> <tbody> <tr> <td>---</td> <td>x</td> <td>FLS (Upper stroke limit) selection 0: Disabled 1: Enabled</td> <td rowspan="2">0h</td> </tr> <tr> <td>__</td> <td>x _</td> <td>RLS (Lower stroke limit) selection 0: Disabled 1: Enabled</td> </tr> <tr> <td>_x _ _</td> <td></td> <td>For manufacturer setting</td> <td rowspan="3">0h</td> </tr> <tr> <td>x _ _ _</td> <td></td> <td>For manufacturer setting</td> </tr> <tr> <td>__x _</td> <td></td> <td></td> </tr> <tr> <td>_x _ _</td> <td></td> <td></td> <td>0h</td> </tr> <tr> <td>x _ _ _</td> <td></td> <td></td> <td>0h</td> </tr> </tbody> </table> <p>Convert the setting value into hexadecimal as follows.</p> <table border="1"> <thead> <tr> <th colspan="2">Signal name</th> <th>Initial value</th> </tr> <tr> <th>BIN</th> <th>HEX</th> <th></th> </tr> </thead> <tbody> <tr> <td>FLS (Upper stroke limit) selection</td> <td>0</td> <td rowspan="4">0</td> </tr> <tr> <td>RLS (Lower stroke limit) selection</td> <td>0</td> </tr> <tr> <td></td> <td>0</td> </tr> <tr> <td></td> <td>0</td> </tr> </tbody> </table> <p>BIN 0: Use for an external input signal. BIN 1: Automatic on.</p>	Setting digit		Explanation	Initial value	HEX.	BIN.	---	x	FLS (Upper stroke limit) selection 0: Disabled 1: Enabled	0h	__	x _	RLS (Lower stroke limit) selection 0: Disabled 1: Enabled	_x _ _		For manufacturer setting	0h	x _ _ _		For manufacturer setting	__x _			_x _ _			0h	x _ _ _			0h	Signal name		Initial value	BIN	HEX		FLS (Upper stroke limit) selection	0	0	RLS (Lower stroke limit) selection	0		0		0	Refer to Name and function column.
Setting digit		Explanation	Initial value																																														
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PD07	*DO1	<p>Output device selection 1 You can assign any output device to the CN3-13 pin. As the initial value, MBR (Electromagnetic brake interlock) is assigned to the pin.</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>__x x</td> <td>Device selection Refer to table 5.8 for settings.</td> <td>05h</td> </tr> <tr> <td>_x _ _</td> <td>For manufacturer setting</td> <td>0h</td> </tr> <tr> <td>x _ _ _</td> <td></td> <td>0h</td> </tr> </tbody> </table> <p>Table 5.8 Selectable output devices</p> <table border="1"> <thead> <tr> <th>Setting value</th> <th>Output device</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>Always off</td> </tr> <tr> <td>02</td> <td>RD (Ready)</td> </tr> <tr> <td>03</td> <td>ALM (Malfunction)</td> </tr> <tr> <td>04</td> <td>INP (In-position)</td> </tr> <tr> <td>05</td> <td>MBR (Electromagnetic brake interlock)</td> </tr> <tr> <td>07</td> <td>TLC (Limiting torque)</td> </tr> <tr> <td>08</td> <td>WNG (Warning)</td> </tr> <tr> <td>09</td> <td>BWNG (Battery warning)</td> </tr> <tr> <td>11</td> <td>ABSV (Absolute position undetermined)</td> </tr> <tr> <td>17</td> <td>MTTR (During tough drive)</td> </tr> </tbody> </table>	Setting digit	Explanation	Initial value	__x x	Device selection Refer to table 5.8 for settings.	05h	_x _ _	For manufacturer setting	0h	x _ _ _		0h	Setting value	Output device	00	Always off	02	RD (Ready)	03	ALM (Malfunction)	04	INP (In-position)	05	MBR (Electromagnetic brake interlock)	07	TLC (Limiting torque)	08	WNG (Warning)	09	BWNG (Battery warning)	11	ABSV (Absolute position undetermined)	17	MTTR (During tough drive)	Refer to Name and function column.												
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No.	Symbol	Name and function	Initial value [unit]	Setting range																				
PD08	*DO2	<p>Output device selection 2</p> <p>You can assign any output device to the CN3-9 pin. INP (In-position) is assigned as the initial value.</p> <p>The devices that can be assigned and the setting method are the same as in [Pr. PD07].</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>__x x</td> <td>Device selection Refer to table 5.8 in [Pr. PD07] for settings.</td> <td>04h</td> </tr> <tr> <td>_x __</td> <td rowspan="2">For manufacturer setting</td> <td>0h</td> </tr> <tr> <td>x __ __</td> <td>0h</td> </tr> </tbody> </table>	Setting digit	Explanation	Initial value	__x x	Device selection Refer to table 5.8 in [Pr. PD07] for settings.	04h	_x __	For manufacturer setting	0h	x __ __	0h		Refer to Name and function column.									
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PD09	*DO3	<p>Output device selection 3</p> <p>You can assign any output device to the CN3-15 pin. ALM (Malfunction) is assigned as the initial value.</p> <p>The devices that can be assigned and the setting method are the same as in [Pr. PD07].</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>__x x</td> <td>Device selection Refer to table 5.8 in [Pr. PD07] for settings.</td> <td>03h</td> </tr> <tr> <td>_x __</td> <td rowspan="2">For manufacturer setting</td> <td>0h</td> </tr> <tr> <td>x __ __</td> <td>0h</td> </tr> </tbody> </table>	Setting digit	Explanation	Initial value	__x x	Device selection Refer to table 5.8 in [Pr. PD07] for settings.	03h	_x __	For manufacturer setting	0h	x __ __	0h		Refer to Name and function column.									
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PD14	*DOP3	<p>Function selection D-3</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>___x</td> <td>For manufacturer setting</td> <td>0h</td> </tr> <tr> <td>__x _</td> <td> <p>Selection of output device at warning occurrence Select WNG (Warning) and ALM (Malfunction) output status at warning occurrence.</p> <p>Servo amplifier output</p> <table border="1"> <thead> <tr> <th>Setting value</th> <th>(Note 1) Device status</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>  <p>WNG 1 0 _____ _____ ALM 1 0 _____ _____↑ Warning occurrence</p> </td> </tr> <tr> <td>1</td> <td>  <p>WNG 1 0 _____ _____ ALM 1 0 _____ _____↑ Warning occurrence (Note 2)</p> </td> </tr> </tbody> </table> <p>Note 1. 0: Off 1: On 2. Although ALM is turned off upon occurrence of the warning, the forced stop deceleration is performed.</p> </td><td>0h</td> </tr> <tr> <td>_x __</td> <td rowspan="2">For manufacturer setting</td> <td>0h</td> </tr> <tr> <td>x __ __</td> <td>0h</td> </tr> </tbody> </table>	Setting digit	Explanation	Initial value	___x	For manufacturer setting	0h	__x _	<p>Selection of output device at warning occurrence Select WNG (Warning) and ALM (Malfunction) output status at warning occurrence.</p> <p>Servo amplifier output</p> <table border="1"> <thead> <tr> <th>Setting value</th> <th>(Note 1) Device status</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>  <p>WNG 1 0 _____ _____ ALM 1 0 _____ _____↑ Warning occurrence</p> </td> </tr> <tr> <td>1</td> <td>  <p>WNG 1 0 _____ _____ ALM 1 0 _____ _____↑ Warning occurrence (Note 2)</p> </td> </tr> </tbody> </table> <p>Note 1. 0: Off 1: On 2. Although ALM is turned off upon occurrence of the warning, the forced stop deceleration is performed.</p>	Setting value	(Note 1) Device status	0	 <p>WNG 1 0 _____ _____ ALM 1 0 _____ _____↑ Warning occurrence</p>	1	 <p>WNG 1 0 _____ _____ ALM 1 0 _____ _____↑ Warning occurrence (Note 2)</p>	0h	_x __	For manufacturer setting	0h	x __ __	0h		Refer to Name and function column.
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5.2.5 Extension setting 2 parameters ([Pr. PE_ _])

No.	Symbol	Name and function	Initial value [unit]	Setting range													
PE41	EOP3	<p>Function selection E-3</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>___x</td> <td> Robust filter selection 0: Disabled 1: Enabled When you select "Enabled" of this digit, the machine resonance suppression filter 5 set in [Pr. PB51] is not available. </td> <td>0h</td> </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> </tbody> </table>	Setting digit	Explanation	Initial value	___x	Robust filter selection 0: Disabled 1: Enabled When you select "Enabled" of this digit, the machine resonance suppression filter 5 set in [Pr. PB51] is not available.	0h	__x_	For manufacturer setting	0h	_x__	0h	x___	0h		Refer to Name and function column.
Setting digit	Explanation	Initial value															
___x	Robust filter selection 0: Disabled 1: Enabled When you select "Enabled" of this digit, the machine resonance suppression filter 5 set in [Pr. PB51] is not available.	0h															
__x_	For manufacturer setting	0h															
_x__		0h															
x___		0h															

5.2.6 Extension setting 3 parameters ([Pr. PF_ _])

No.	Symbol	Name and function	Initial value [unit]	Setting range																							
PF06	*FOP5	<p>Function selection F-5</p> <table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>___x</td> <td> Electronic dynamic brake selection 0: Automatic (enabled only for specified servo motors) 2: Disabled Refer to the following table for the specified servo motors. <table border="1"> <thead> <tr> <th>Series</th> <th>Servo motor</th> </tr> </thead> <tbody> <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> </tbody> </table> </td> <td>0h</td> </tr> <tr> <td></td> <td>For manufacturer setting</td> <td>0h</td> </tr> <tr> <td></td> <td></td> <td>0h</td> </tr> <tr> <td></td> <td></td> <td>0h</td> </tr> </tbody> </table>	Setting digit	Explanation	Initial value	___x	Electronic dynamic brake selection 0: Automatic (enabled only for specified servo motors) 2: Disabled Refer to the following table for the specified servo motors. <table border="1"> <thead> <tr> <th>Series</th> <th>Servo motor</th> </tr> </thead> <tbody> <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> </tbody> </table>	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	0h		For manufacturer setting	0h			0h			0h		Refer to Name and function column.
Setting digit	Explanation	Initial value																									
___x	Electronic dynamic brake selection 0: Automatic (enabled only for specified servo motors) 2: Disabled Refer to the following table for the specified servo motors. <table border="1"> <thead> <tr> <th>Series</th> <th>Servo motor</th> </tr> </thead> <tbody> <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> </tbody> </table>	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	0h																	
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HG-SR	HG-SR51/HG-SR52																										
	For manufacturer setting	0h																									
		0h																									
		0h																									
PF12	DBT	Electronic dynamic brake operating time Set a operating time for the electronic dynamic brake.	2000 [ms]	0 to 10000																							
PF21	DRT	<p>Drive recorder switching time setting This is used to set a drive recorder switching time. When a USB communication is cut during using a graph function, the function will be changed to the drive recorder function after the setting time of this parameter. When a value from "1" to "32767" is set, it will switch after the setting value. However, when "0" is set, it will switch after 600 s. When "-1" is set, the drive recorder function is disabled.</p>	0 [s]	-1 to 32767																							
PF23	OSCL1	<p>Vibration tough drive - Oscillation detection level This is used to set a filter readjustment sensitivity of [Pr. PB13 Machine resonance suppression filter 1] and [Pr. PB15 Machine resonance suppression filter 2] while the vibration tough drive is enabled. Example: When you set "50" to the parameter, the filter will be readjusted at the time of 50% or more oscillation level.</p>	50 [%]	0 to 100																							

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No.	Symbol	Name and function	Initial value [unit]	Setting range														
PF24	*OSCL2	Vibration tough drive function selection		Refer to Name and function column.														
		<table border="1"> <thead> <tr> <th>Setting digit</th> <th>Explanation</th> <th>Initial value</th> </tr> </thead> <tbody> <tr> <td>___ x</td> <td>Oscillation detection alarm selection 0: [AL. 54 Oscillation detection] will occur at oscillation detection. 1: [AL. F3.1 Oscillation detection warning] will occur at oscillation detection. 2: Oscillation detection function disabled Select alarm or warning when a oscillation continues at a filter readjustment sensitivity level of [Pr. PF23]. The digit is continuously enabled regardless of the vibration tough drive in [Pr. PA20].</td> <td>0h</td> </tr> <tr> <td>__ x _</td> <td>For manufacturer setting</td> <td>0h</td> </tr> <tr> <td>_ x __</td> <td></td> <td>0h</td> </tr> <tr> <td>x ___</td> <td></td> <td>0h</td> </tr> </tbody> </table>	Setting digit	Explanation	Initial value	___ x	Oscillation detection alarm selection 0: [AL. 54 Oscillation detection] will occur at oscillation detection. 1: [AL. F3.1 Oscillation detection warning] will occur at oscillation detection. 2: Oscillation detection function disabled Select alarm or warning when a oscillation continues at a filter readjustment sensitivity level of [Pr. PF23]. The digit is continuously enabled regardless of the vibration tough drive in [Pr. PA20].	0h	__ x _	For manufacturer setting	0h	_ x __		0h	x ___		0h	
Setting digit	Explanation	Initial value																
___ x	Oscillation detection alarm selection 0: [AL. 54 Oscillation detection] will occur at oscillation detection. 1: [AL. F3.1 Oscillation detection warning] will occur at oscillation detection. 2: Oscillation detection function disabled Select alarm or warning when a oscillation continues at a filter readjustment sensitivity level of [Pr. PF23]. The digit is continuously enabled regardless of the vibration tough drive in [Pr. PA20].	0h																
__ x _	For manufacturer setting	0h																
_ x __		0h																
x ___		0h																
PF25	CVAT	SEMI-F47 function - Instantaneous power failure detection time Set the time of the [AL. 10.1 Voltage drop in the control circuit power] occurrence. To disable the parameter, select "Disabled (_ 0 __)" of "SEMI-F47 function selection" in [Pr. PA20].	200 [ms]	30 to 200														
PF31	FRIC	<p>Machine diagnosis function - Friction judgement speed Set a servo motor speed to divide a friction estimation area into high and low for the friction estimation process of the machine diagnosis. However, setting "0" will be the value half of the rated speed. When your operation pattern is under rated speed, we recommend that you set half value to the maximum speed with this.</p>	0 [r/min]	0 to permissible speed														

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5.2.7 Option setting parameters ([Pr. Po_ _])

No.	Symbol	Name and function	Initial value [unit]	Setting range								
Po02	*STNO	<p>CC-Link IE communication station number selection Use this parameter to set a station No. of the servo amplifier. Station Nos. of the servo amplifier will be set in the following order of priority.</p> <table border="1"> <thead> <tr> <th>Priority order</th><th>Prior station No.</th></tr> </thead> <tbody> <tr> <td>1</td><td>Station No. specified with master station</td></tr> <tr> <td>2</td><td>Station No. 1 to 120 specified with [Pr. Po02] (Note)</td></tr> <tr> <td>3</td><td>Station No.set with the station number setting rotary switch and auxiliary station number setting switches when [Pr. Po02] is "0"</td></tr> </tbody> </table> <p>Note. Set a station No. with [Pr. Po02] within the range of 1 to 120. Setting over the range will trigger [AL. 37 Parameter error].</p> <p>Cautions for connecting the CC-Link IE Field simple motion QD77GF16 to the servo amplifier</p> <ul style="list-style-type: none"> • Be sure to set a station No. from 1 to 16. • When you set [Pr. Po02] to "0", the station number setting rotary switch to "0", and both of the auxiliary station number setting switches SW2-3/SW2-4 to "OFF", the servo amplifier will be in a stand-by state for station No. setting from the master station. However, a communication will not be made because QD77GF16 does not execute a station No. specification. 	Priority order	Prior station No.	1	Station No. specified with master station	2	Station No. 1 to 120 specified with [Pr. Po02] (Note)	3	Station No.set with the station number setting rotary switch and auxiliary station number setting switches when [Pr. Po02] is "0"	0	0 to 120
Priority order	Prior station No.											
1	Station No. specified with master station											
2	Station No. 1 to 120 specified with [Pr. Po02] (Note)											
3	Station No.set with the station number setting rotary switch and auxiliary station number setting switches when [Pr. Po02] is "0"											
Po03	*NWNO	<p>CC-Link IE communication network number Use this parameter to set the network number of the servo amplifier. The number is "1" at the initial value of "0". The maximum setting value for the network number is 239. A value higher than the maximum value will trigger [AL.37 parameter error]. If a station No. is set with master station automatically in [Pr.Po02] and with the station number setting rotary switch (SW1), this parameter setting is ignored. Instead, the network number transmitted from the master station is used. When the network number of controller and that of servo amplifier are different, the network number of servo amplifier cannot be changed via the controller. The network number of servo amplifier should be changed using MR Configurator2 which is directly connected to the servo amplifier with USB cable.</p>	0	0 to 239								

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MEMO

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POINT
●Refer to "MELSERVO-J4 Servo Amplifier Instruction Manual (Troubleshooting)" for details of alarms and warnings.
●As soon as an alarm occurs, make the Servo-off status and interrupt the main circuit power.

6.1 Alarm and warning list

When an error occurs during operation, the corresponding alarm or warning is displayed. When the alarm or the warning occurs, refer to "MELSERVO-J4 Servo Amplifier Instruction Manual (Troubleshooting)" to remove the failure. When an alarm occurs, ALM will turn off.

After its cause has been removed, the alarm can be deactivated in any of the methods marked ○ in the alarm deactivation column in the following table. Warnings are automatically canceled after the cause of occurrence is removed.

For the alarms and warnings in which "SD" is written in the stop method column, the axis stops with the dynamic brake after forced stop deceleration. For the alarms and warnings in which "DB" or "EDB" is written in the stop method column, the axis stops with the dynamic brake without forced stop deceleration.

Alarm	No.	Name	Detail display	Detail name	Stop method (Note 3, 4)	Alarm reset		
						Error reset	CPU reset	Power off → on
10	Undervoltage	10.1	Voltage drop in the control circuit power	EDB	○	○	○	
		10.2	Voltage drop in the main circuit power	SD	○	○	○	
12	Memory error 1 (RAM)	12.1	RAM error 1	DB	/	/	/	○
		12.2	RAM error 2	DB	/	/	/	○
		12.3	RAM error 3	DB	/	/	/	○
		12.4	RAM error 4	DB	/	/	/	○
		12.5	RAM error 5	DB	/	/	/	○
13	Clock error	13.1	Clock error 1	DB	/	/	/	○
		13.2	Clock error 2	DB	/	/	/	○
14	Control process error	14.1	Control process error 1	DB	/	/	/	○
		14.2	Control process error 2	DB	/	/	/	○
		14.3	Control process error 3	DB	/	/	/	○
		14.4	Control process error 4	DB	/	/	/	○
		14.5	Control process error 5	DB	/	/	/	○
		14.6	Control process error 6	DB	/	/	/	○
		14.7	Control process error 7	DB	/	/	/	○
		14.8	Control process error 8	DB	/	/	/	○
		14.9	Control process error 9	DB	/	/	/	○
		14.A	Control process error 10	DB	/	/	/	○
15	Memory error 2 (EEP-ROM)	15.1	EEP-ROM error at power on	DB	/	/	/	○
		15.2	EEP-ROM error during operation	DB	/	/	/	○

6. TROUBLESHOOTING

	No.	Name	Detail display	Detail name	Stop method (Note 3, 4)	Alarm reset		
						Error reset	CPU reset	Power off → on
Alarm	16	Encoder initial communication error 1	16.1	Encoder initial communication - Receive data error 1	DB	/	/	O
			16.2	Encoder initial communication - Receive data error 2	DB	/	/	O
			16.3	Encoder initial communication - Receive data error 3	DB	/	/	O
			16.5	Encoder initial communication - Transmission data error 1	DB	/	/	O
			16.6	Encoder initial communication - Transmission data error 2	DB	/	/	O
			16.7	Encoder initial communication - Transmission data error 3	DB	/	/	O
			16.A	Encoder initial communication - Process error 1	DB	/	/	O
			16.B	Encoder initial communication - Process error 2	DB	/	/	O
			16.C	Encoder initial communication - Process error 3	DB	/	/	O
			16.D	Encoder initial communication - Process error 4	DB	/	/	O
			16.E	Encoder initial communication - Process error 5	DB	/	/	O
			16.F	Encoder initial communication - Process error 6	DB	/	/	O
	17	Board error	17.1	Board error 1	DB	/	/	O
			17.3	Board error 2	DB	/	/	O
			17.4	Board error 3	DB	/	/	O
	19	Memory error 3 (Flash-ROM)	19.1	Flash-ROM error 1	DB	/	/	O
			19.2	Flash-ROM error 2	DB	/	/	O
	1A	Servo motor combination error	1A.1	Servo motor combination error	DB	/	/	O
			1A.2	Servo motor control mode combination error	DB	/	/	O
	1E	Encoder initial communication error 2	1E.1	Encoder malfunction	DB	/	/	O
			1F.1	Incompatible encoder	DB	/	/	O
	20	Encoder normal communication error 1	20.1	Encoder normal communication - Receive data error 1	EDB	/	/	O
			20.2	Encoder normal communication - Receive data error 2	EDB	/	/	O
			20.3	Encoder normal communication - Receive data error 3	EDB	/	/	O
			20.5	Encoder normal communication - Transmission data error 1	EDB	/	/	O
			20.6	Encoder normal communication - Transmission data error 2	EDB	/	/	O
			20.7	Encoder normal communication - Transmission data error 3	EDB	/	/	O
			20.9	Encoder normal communication - Receive data error 4	EDB	/	/	O
			20.A	Encoder normal communication - Receive data error 5	EDB	/	/	O
	21	Encoder normal communication error 2	21.1	Encoder data error 1	EDB	/	/	O
			21.2	Encoder data update error	EDB	/	/	O
			21.3	Encoder data waveform error	EDB	/	/	O
			21.5	Encoder hardware error 1	EDB	/	/	O
			21.6	Encoder hardware error 2	EDB	/	/	O
			21.9	Encoder data error 2	EDB	/	/	O
	24	Main circuit error	24.1	Ground fault detected by hardware detection circuit	DB	/	/	O
			24.2	Ground fault detected by software detection function	DB	O	O	O
	25	Absolute position erased	25.1	Servo motor encoder - Absolute position erased	DB	/	/	O

6. TROUBLESHOOTING

	No.	Name	Detail display	Detail name	Stop method (Note 3, 4)	Alarm reset		
						Error reset	CPU reset	Power off → on
Alarm	30	Regenerative error (Note 1)	30.1	Regeneration heat error	DB	O (Note 1)	O (Note 1)	O (Note 1)
			30.2	Regeneration signal error	DB	O (Note 1)	O (Note 1)	O (Note 1)
			30.3	Regeneration feedback signal error	DB	O (Note 1)	O (Note 1)	O (Note 1)
	31	Overspeed	31.1	Abnormal motor speed	SD	O	O	O
	32	Overcurrent	32.1	Overcurrent detected at hardware detection circuit (during operation)	DB	/	/	O
			32.2	Overcurrent detected at software detection function (during operation)	DB	O	O	O
			32.3	Overcurrent detected at hardware detection circuit (during a stop)	DB	/	/	O
			32.4	Overcurrent detected at software detection function (during a stop)	DB	O	O	O
	33	Overvoltage	33.1	Main circuit voltage error	EDB	O	O	O
	35	Command frequency error	35.1	Command frequency error	SD	O	O	O
	37	Parameter error	37.1	Parameter setting range error	DB	/	O	O
			37.2	Parameter combination error	DB	/	O	O
	3A	Inrush current suppression circuit error	3A.1	Inrush current suppression circuit error	EDB	/	/	O
	3E	Operation mode error	3E.1	Operation mode error	DB	/	/	O
	45	Main circuit device overheat (Note 1)	45.1	Main circuit device overheat error	SD	O (Note 1)	O (Note 1)	O (Note 1)
	46	Servo motor overheat (Note 1)	46.1	Abnormal temperature of servo motor 1	SD	O (Note 1)	O (Note 1)	O (Note 1)
			46.5	Abnormal temperature of servo motor 3	DB	O (Note 1)	O (Note 1)	O (Note 1)
			46.6	Abnormal temperature of servo motor 4	DB	O (Note 1)	O (Note 1)	O (Note 1)
	47	Cooling fan error	47.1	Cooling fan stop error	SD	/	/	O
			47.2	Cooling fan speed reduction error	SD	/	/	O
	50	Overload 1 (Note 1)	50.1	Thermal overload error 1 during operation	SD	O (Note 1)	O (Note 1)	O (Note 1)
			50.2	Thermal overload error 2 during operation	SD	O (Note 1)	O (Note 1)	O (Note 1)
			50.3	Thermal overload error 4 during operation	SD	O (Note 1)	O (Note 1)	O (Note 1)
			50.4	Thermal overload error 1 during a stop	SD	O (Note 1)	O (Note 1)	O (Note 1)
			50.5	Thermal overload error 2 during a stop	SD	O (Note 1)	O (Note 1)	O (Note 1)
			50.6	Thermal overload error 4 during a stop	SD	O (Note 1)	O (Note 1)	O (Note 1)
	51	Overload 2 (Note 1)	51.1	Thermal overload error 3 during operation	DB	O (Note 1)	O (Note 1)	O (Note 1)
			51.2	Thermal overload error 3 during a stop	DB	O (Note 1)	O (Note 1)	O (Note 1)
	52	Error excessive	52.1	Excess drop pulse 1	SD	O	O	O
			52.3	Excess drop pulse 2	SD	O	O	O
			52.4	Error excessive during 0 torque limit	SD	O	O	O
			52.5	Excess drop pulse 3	EDB	O	O	O
	54	Oscillation detection	54.1	Oscillation detection error	EDB	O	O	O
	56	Forced stop error	56.2	Over speed during forced stop	EDB	O	O	O
			56.3	Estimated distance over during forced stop	EDB	O	O	O
			63.1	STO1 off	DB	O	O	O
	63	STO timing error	63.2	STO2 off	DB	O	O	O
			74.1	Option card error 1	DB	/	/	O
	74	Option card error 1	74.2	Option card error 2	DB	/	/	O
			74.3	Option card error 3	DB	/	/	O
			74.4	Option card error 4	DB	/	/	O
			74.5	Option card error 5	DB	/	/	O

6. TROUBLESHOOTING

	No.	Name	Detail display	Detail name	Stop method (Note 3, 4)	Alarm reset		
						Error reset	CPU reset	Power off → on
Alarm	75	Option card error 2	75.3	Option card connection error	EDB	/	/	O
			75.4	Option card disconnected	DB	/	/	O
	8A	USB communication time-out error	8A.1	USB communication time-out error	SD	O	O	O
			8D.1	CC-Link IE communication error 1	SD	O	O	O
			8D.2	CC-Link IE communication error 2	SD	O	O	O
			8D.3	Master station setting error 1	DB	O	O	O
			8D.5	Master station setting error 2	DB	/	O	O
			8D.6	CC-Link IE communication error 3	SD	O	O	O
			8D.7	CC-Link IE communication error 4	SD	O	O	O
			8D.8	CC-Link IE communication error 5	SD	O	O	O
			8D.9	Synchronization error 1	SD	/	O	O
			8D.A	Synchronization error 2	SD	/	O	O
8E	8E	USB communication error	8E.1	USB communication receive error	SD	O	O	O
			8E.2	USB communication checksum error	SD	O	O	O
			8E.3	USB communication character error	SD	O	O	O
			8E.4	USB communication command error	SD	O	O	O
			8E.5	USB communication data number error	SD	O	O	O
	888	Watchdog	88._	Watchdog	DB	/	/	O

- Note
1. Leave for about 30 minutes of cooling time after removing the cause of occurrence.
 2. In some controller communication status, the alarm factor may not be removed.
 3. Stop method indicates as follows:
 - DB: Stops with dynamic brake. (Coasts for the servo amplifier without dynamic brake.)
 - EDB: Stops with electronic dynamic brake for 600 W or less servo amplifiers
Stops with dynamic brake for 700 W or more servo amplifiers
 - SD: Forced stop deceleration
 4. This is applicable when [Pr. PA04] is set to the initial value. The stop system of SD can be changed to DB using [Pr. PA04].

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	No.	Name	Detail display	Detail name	Stop method (Note 2, 3)
Warning	91	Servo amplifier overheat warning (Note 1)	91.1	Main circuit device overheat warning	
	92	Battery cable disconnection warning	92.1	Encoder battery cable disconnection warning	
			92.3	Battery degradation	
	95	STO warning	95.1	STO1 off detection	DB
			95.2	STO2 off detection	DB
	96	Home position setting warning	96.1	In-position warning at home positioning	
			96.2	Command input warning at home positioning	
	9D	CC-Link IE warning 1	9D.1	Station number switch change warning	
			9D.2	Master station setting warning	
			9D.3	Overlapping station number warning	
			9D.4	Mismatched station number warning	
	9E	CC-Link IE warning 2	9E.1	CC-Link IE communication warning	
	9F	Battery warning	9F.1	Low battery	
	E0	Excessive regeneration warning (Note 1)	E0.1	Excessive regeneration warning	
	E1	Overload warning 1 (Note 1)	E1.1	Thermal overload warning 1 during operation	
			E1.2	Thermal overload warning 2 during operation	
			E1.3	Thermal overload warning 3 during operation	
			E1.4	Thermal overload warning 4 during operation	
			E1.5	Thermal overload error 1 during a stop	
			E1.6	Thermal overload error 2 during a stop	
			E1.7	Thermal overload error 3 during a stop	
			E1.8	Thermal overload error 4 during a stop	
	E3	Absolute position counter warning	E3.2	Absolute position counter warning	
			E3.5	Encoder absolute positioning counter warning	
	E4	Parameter warning	E4.1	Parameter setting range error warning	
	E6	Servo forced stop warning	E6.1	Forced stop warning	SD
	E7	Controller forced stop warning	E7.1	Controller forced stop warning	SD
	E8	Cooling fan speed reduction warning	E8.1	Decreased cooling fan speed warning	
			E8.2	Cooling fan stop	
	E9	Main circuit off warning	E9.1	Servo-on signal on during main circuit off	DB
			E9.2	Bus voltage drop during low speed operation	DB
			E9.3	Ready-on signal on during main circuit off	DB
	EC	Overload warning 2 (Note 1)	EC.1	Overload warning 2	
	ED	Output watt excess warning	ED.1	Output watt excess warning	
	F0	Tough drive warning	F0.1	SEMI-F47 operation warning	
			F0.3	Vibration tough drive warning	
	F2	Drive recorder - Miswriting warning	F2.1	Drive recorder - Area writing time-out warning	
			F2.2	Drive recorder - Data miswriting warning	
	F3	Oscillation detection warning	F3.1	Oscillation detection warning	

Note 1. Leave for about 30 minutes of cooling time after removing the cause of occurrence.

2. Stop method indicates as follows:

- DB: Stops with dynamic brake. (Coasts for the servo amplifier without dynamic brake.)
 - SD: Decelerates to a stop

3. This is applicable when [Pr. PA04] is set to the initial value. The stop system of SD can be changed to DB using [Pr. PA04].

6. TROUBLESHOOTING

6.2 Troubleshooting at power on

When an error occurs at the power supply of the controller or servo amplifier, improper boot of the servo amplifier might be the cause. Check the display of the servo amplifier, and take actions according to this section.

Display	Description	Cause	Checkpoint	Action
AA	The power of the simple motion module was turned off.	The power of the simple motion module was turned off.	Review the power of the simple motion module.	Turn on the power of the simple motion module.
		A CC-Link IE cable was disconnected.	"AA" is displayed in the corresponding station and following stations.	Replace the CC-Link IE cable of the corresponding station.
			Check if the connectors (CN10A, CN10B) are unplugged.	Connect it correctly.
Ab	Initialization communication with the controller has not completed.	The setting of the station No. is incorrect.	Check that a device is not assigned to the same station No.	Set it correctly.
		The station No. of the simple motion module is not matched.	Check the settings and station No. of the simple motion module.	Set it correctly.
		A CC-Link IE cable was disconnected.	"Ab" is displayed in the corresponding station and following stations.	Replace the CC-Link IE cable of the corresponding station.
		The power of the servo amplifier was turned on while the power of the simple motion module was off.	Review the power of the simple motion module.	Turn on the power of the simple motion module.
		MR-J3-T10 is malfunctioning.	"Ab" is displayed in the corresponding station and following stations.	Replace the MR-J3-T10.
		The servo amplifier is malfunctioning.	"Ab" is displayed in the corresponding station and following stations.	Replace the servo amplifier.
		The simple motion module is malfunctioning.	Replace the simple motion module and check the repeatability.	Replace the simple motion module.
Ab.	The initialization of the servo amplifier has not completed.	A CC-Link IE cable was disconnected.	"Ab." is displayed in the corresponding station and following stations.	Replace the CC-Link IE cable of the corresponding station.
		The power of the servo amplifier was turned on while the power of the simple motion module was off.	Review the power of the simple motion module.	Turn on the power of the simple motion module.
		MR-J3-T10 is malfunctioning.	"Ab." is displayed in the corresponding station and following stations.	Replace the MR-J3-T10.
		The servo amplifier is malfunctioning.	"Ab." is displayed in the corresponding station and following stations.	Replace the servo amplifier.
		The simple motion module is malfunctioning.	Replace the simple motion module and check the repeatability.	Replace the simple motion module.
		Communication cycle does not match.	Check the communication cycle on the simple motion module side. Number of using stations is 8 or less: 0.888 ms Number of using stations is 16 or less: 1.777 ms	Set it correctly.

6. TROUBLESHOOTING

Display	Description	Cause	Checkpoint	Action
AC	The synchronous communications by specified cycle could not be made.	MR-J3-T10 is malfunctioning.	"AC" is displayed in the corresponding station and following stations.	Replace the MR-J3-T10.
		The servo amplifier is malfunctioning.	"AC" is displayed in the corresponding station and following stations.	Replace the servo amplifier.
		The simple motion module is malfunctioning.	Replace the simple motion module and check the repeatability.	Replace the simple motion module.
b##. C##. d##. (Note)	The system has been in the test operation mode.	Test operation mode has been enabled.	Test operation setting switch (SW2-1) is turned on.	Turn off the test operation setting switch (SW2-1).
off	Operation mode for manufacturer setting is set.	Operation mode for manufacturer setting is enabled.	Check that the test operation select switch (SW2-1) and manufacturer setting switch (SW2-2) are not on.	Set the auxiliary station number setting switches (SW2) correctly.

Note. ## indicates axis No.

6. TROUBLESHOOTING

MEMO

7. DIMENSIONS

7. DIMENSIONS

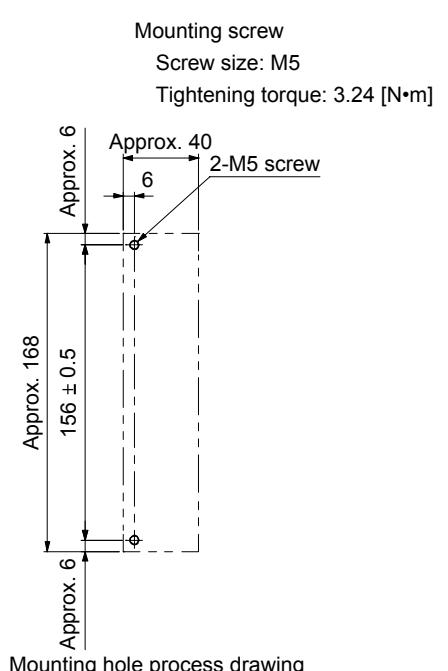
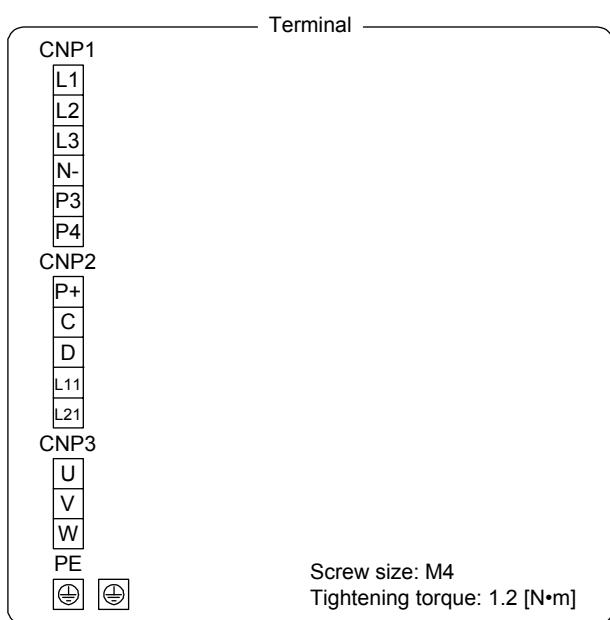
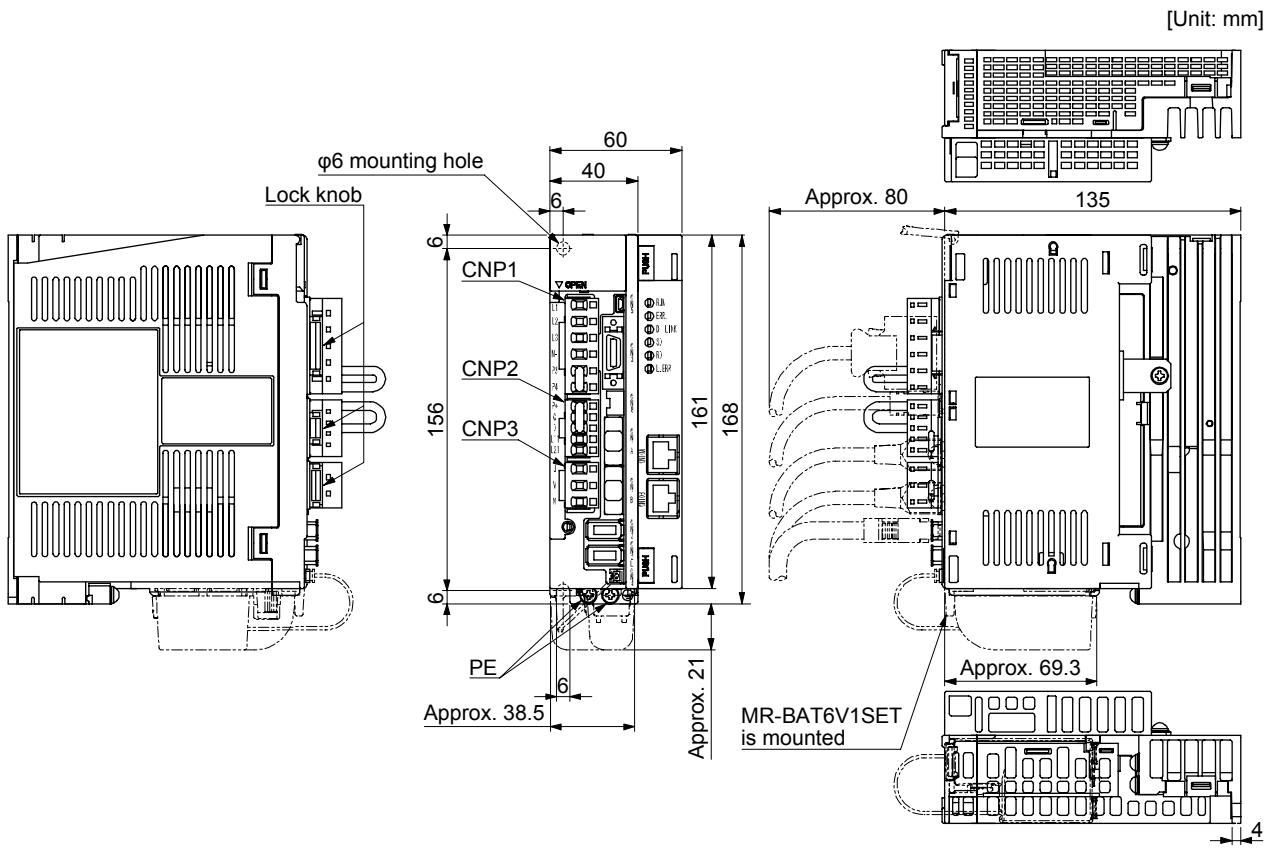
The following item is the same as MR-J4-_B servo amplifiers. For details of the items, refer to each chapter/section of the detailed description field.

Item	Detailed explanation
Connector	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 9.2

7. DIMENSIONS

7.1 Servo amplifier

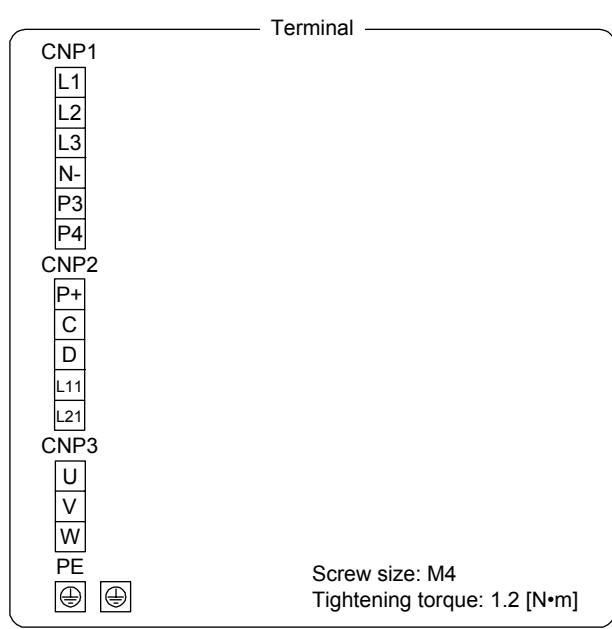
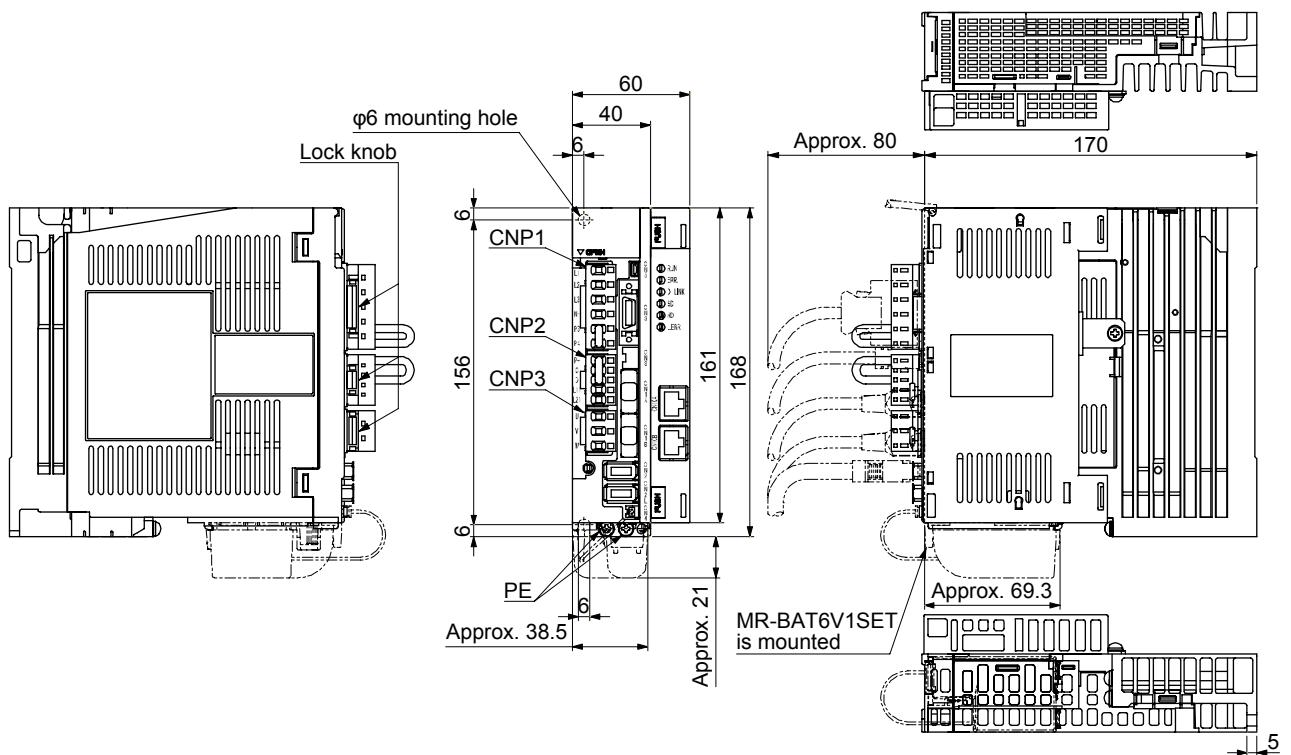
(1) MR-J4-10B-RJ010/MR-J4-20B-RJ010



7. DIMENSIONS

(2) MR-J4-40B-RJ010/MR-J4-60B-RJ010

[Unit: mm]

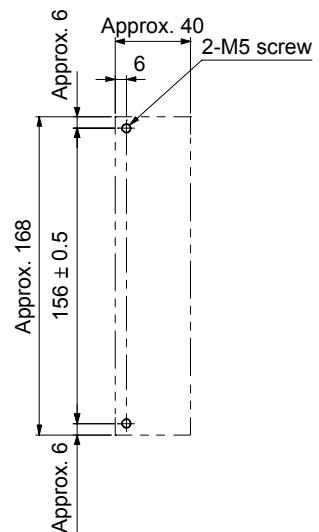


Mass: 1.0 [kg] (servo amplifier only)

Mounting screw

Screw size: M5

Tightening torque: 3.24 [N·m]

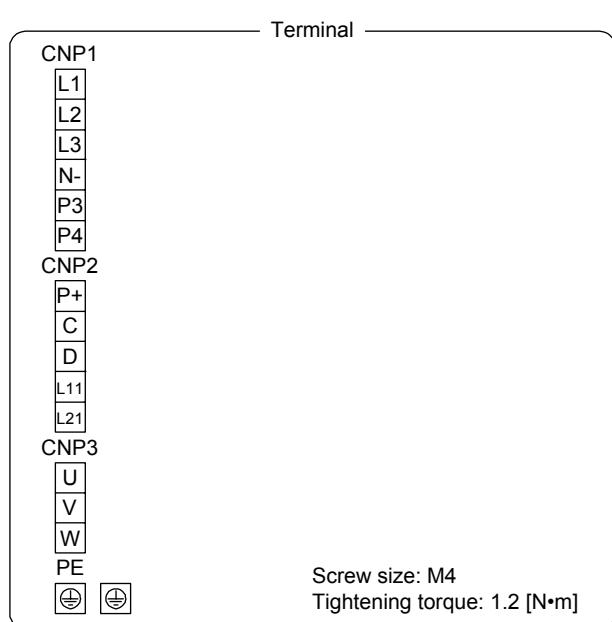
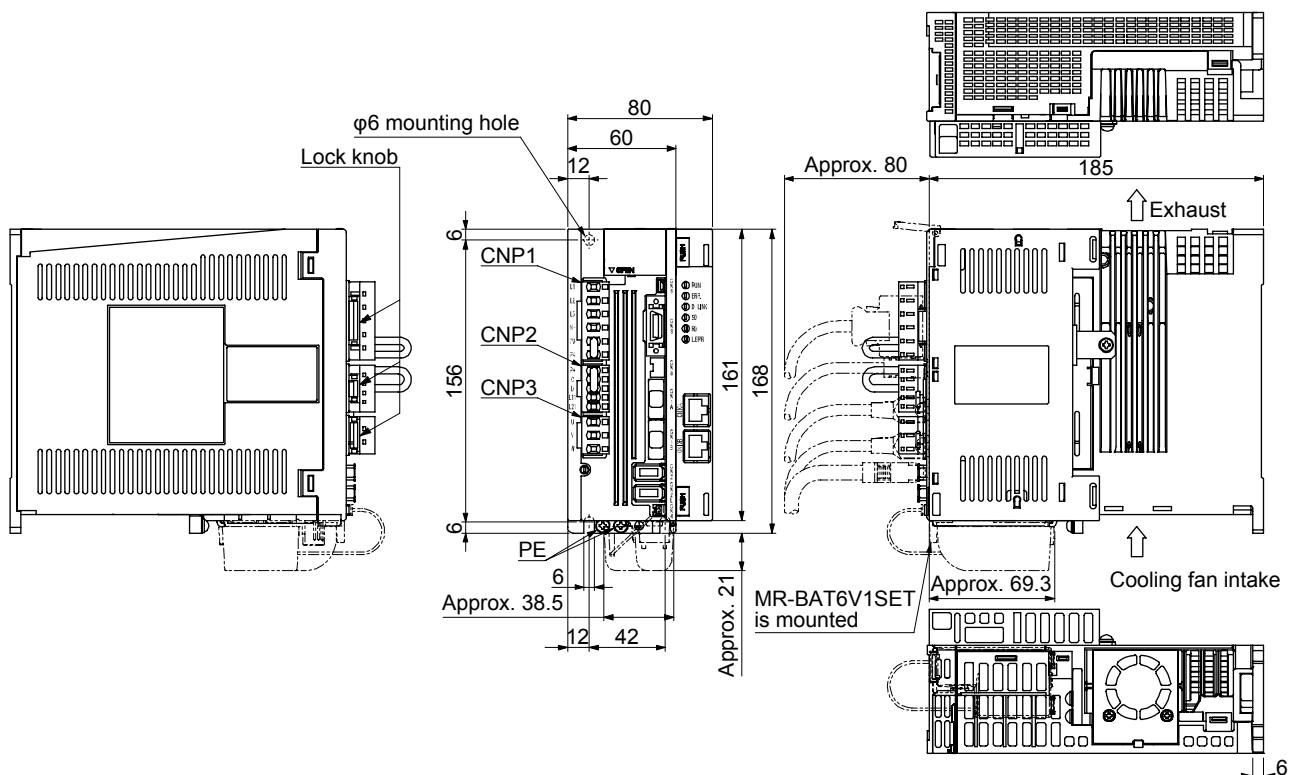


Mounting hole process drawing

7. DIMENSIONS

(3) MR-J4-70B-RJ010/MR-J4-100B-RJ010

[Unit: mm]

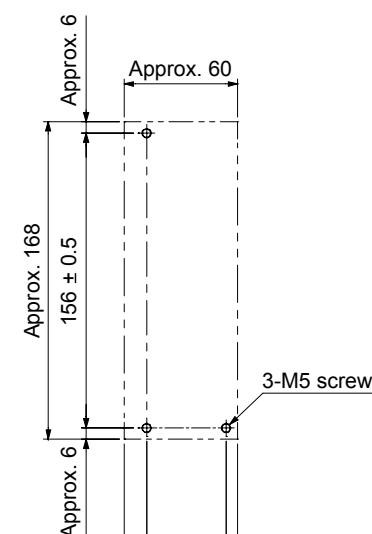


Mass: 1.4 [kg] (servo amplifier only)

Mounting screw

Screw size: M5

Tightening torque: 3.24 [N·m]

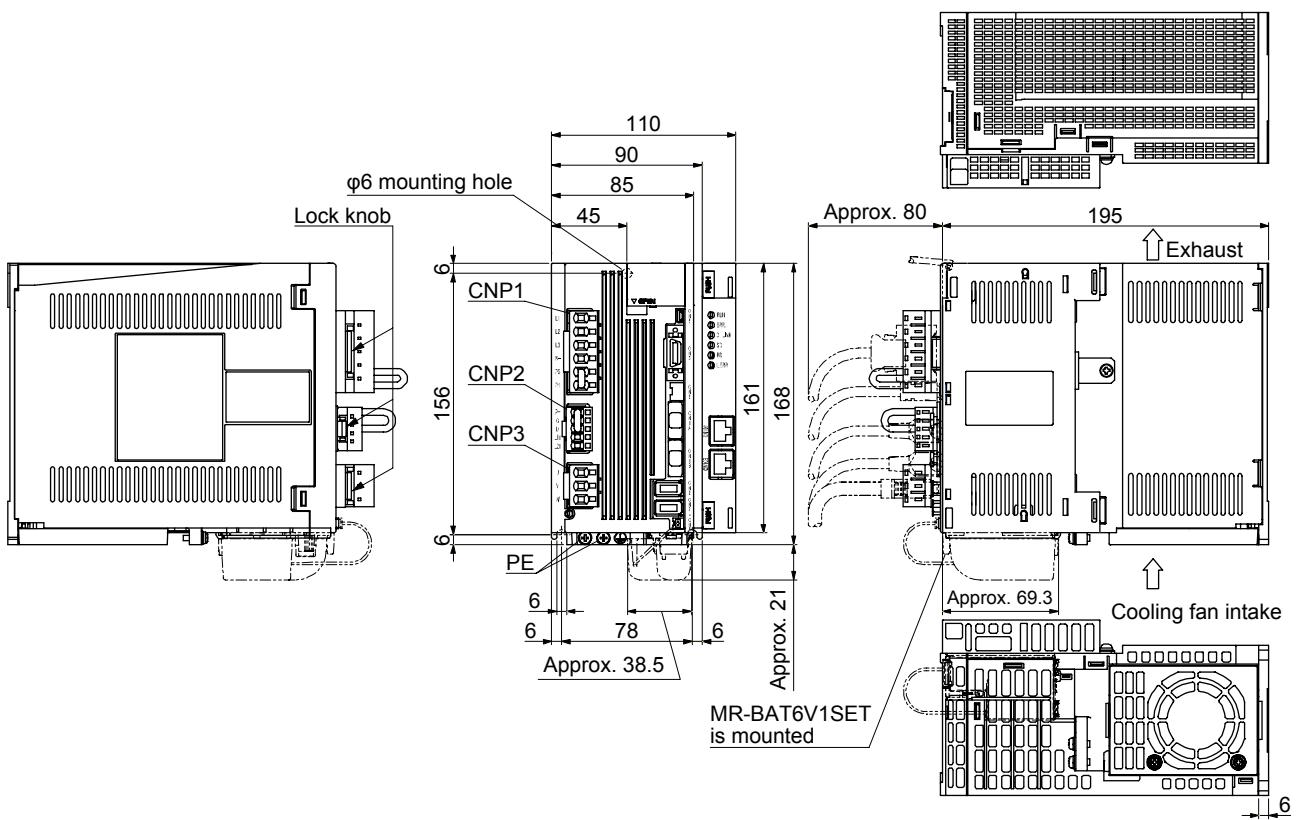


Mounting hole process drawing

7. DIMENSIONS

(4) MR-J4-200B-RJ010

[Unit: mm]

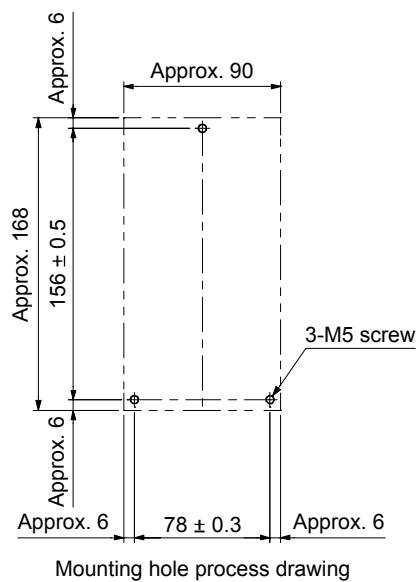
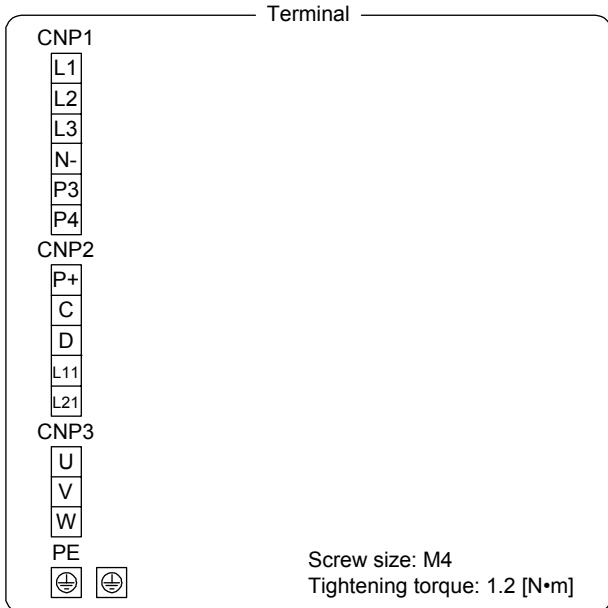


Mass: 2.1 [kg] (servo amplifier only)

Mounting screw

Screw size: M5

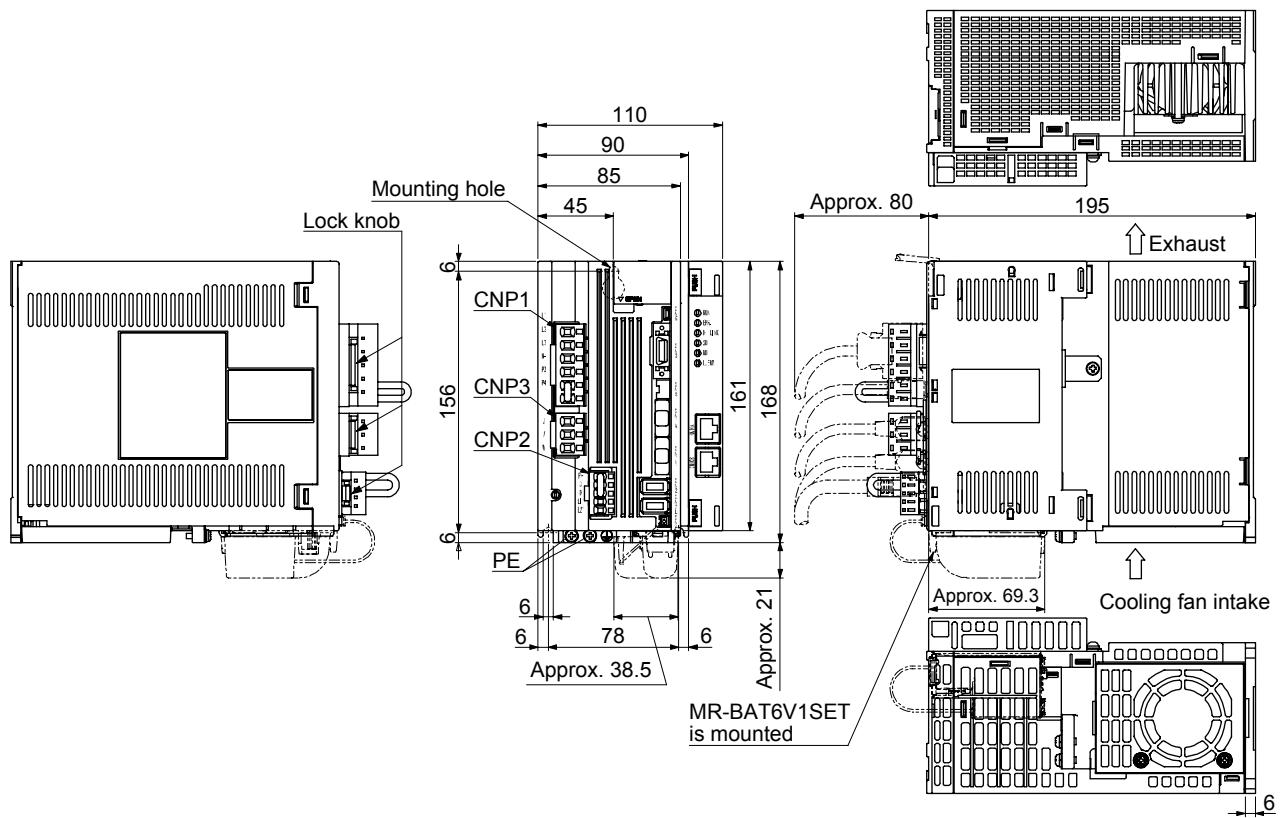
Tightening torque: 3.24 [N·m]



7. DIMENSIONS

(5) MR-J4-350B-RJ010

[Unit: mm]

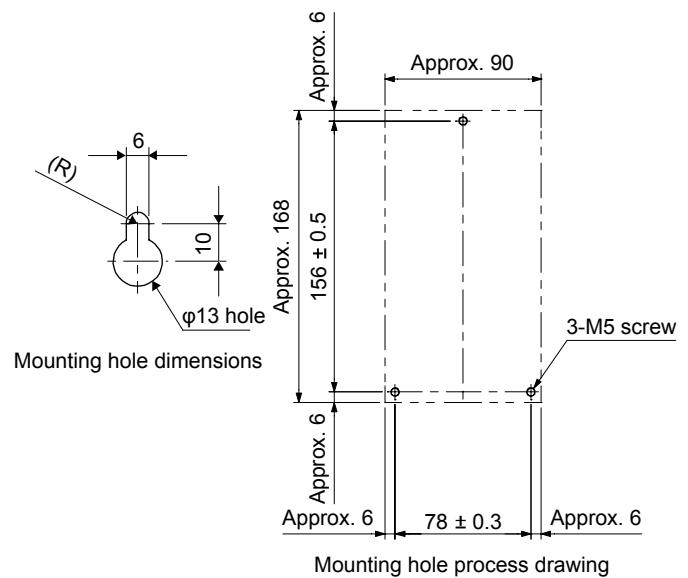


Terminal

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

Screw size: M4
Tightening torque: 1.2 [N·m]

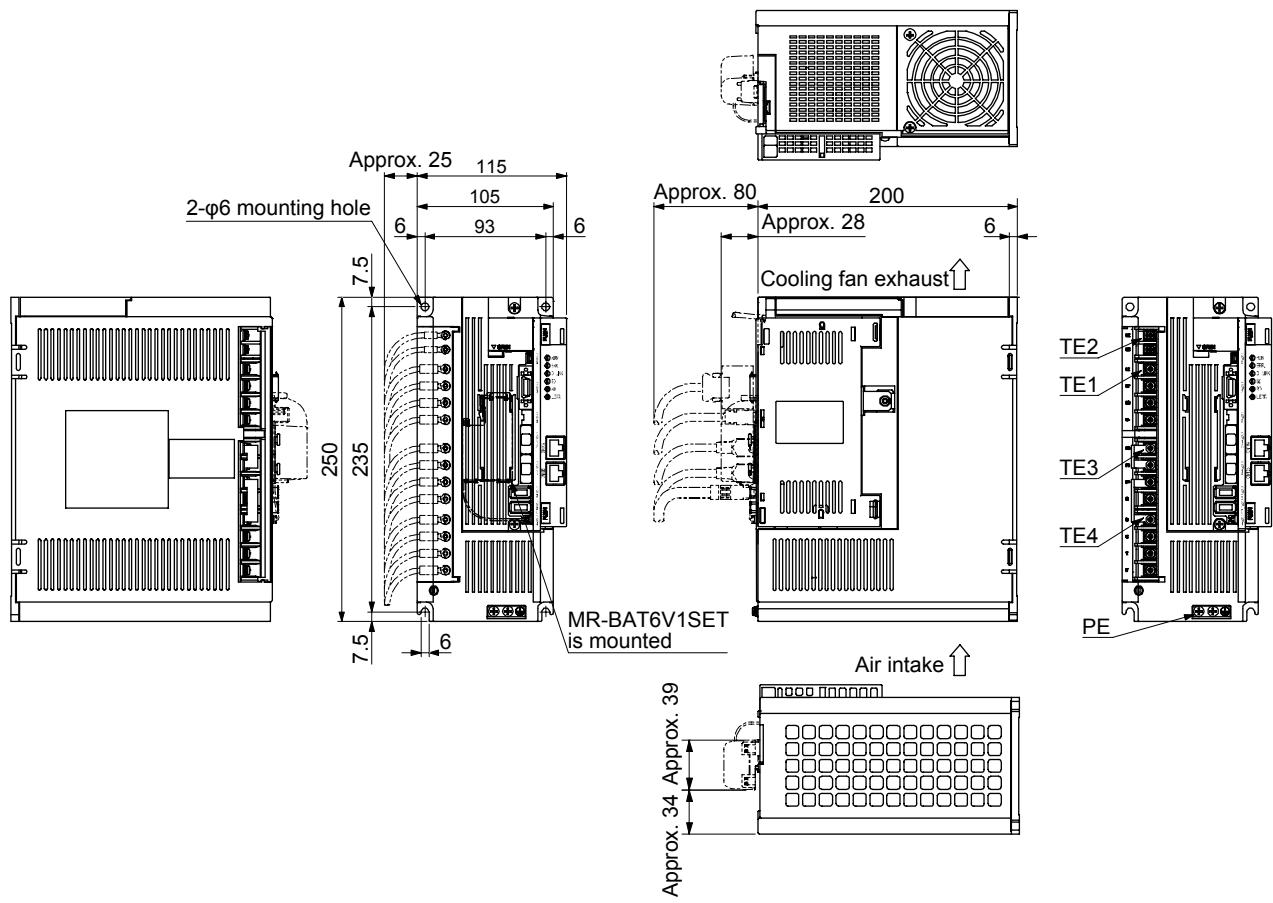
Mass: 2.3 [kg] (servo amplifier only)
Mounting screw
Screw size: M5
Tightening torque: 3.24 [N·m]



7. DIMENSIONS

(6) MR-J4-500B-RJ010

[Unit: mm]



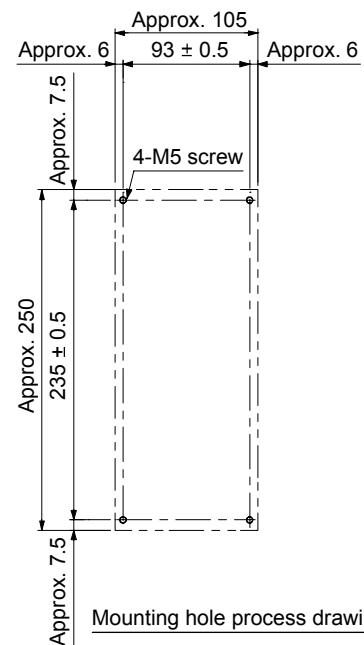
Terminal		
TE2	L11 L21	TE2 Screw size: M3.5 Tightening torque: 0.8 [N·m]
TE1	L1 L2 L3 N-	TE1 Screw size: M4 Tightening torque: 1.2 [N·m]
TE3	P3 P4 P+ C	TE3 Screw size: M4 Tightening torque: 1.2 [N·m]
TE4	D U V W	TE4 Screw size: M4 Tightening torque: 1.2 [N·m]
PE		PE Screw size: M4 Tightening torque: 1.2 [N·m]

Mass: 4.0 [kg] (servo amplifier only)

Mounting screw

Screw size: M5

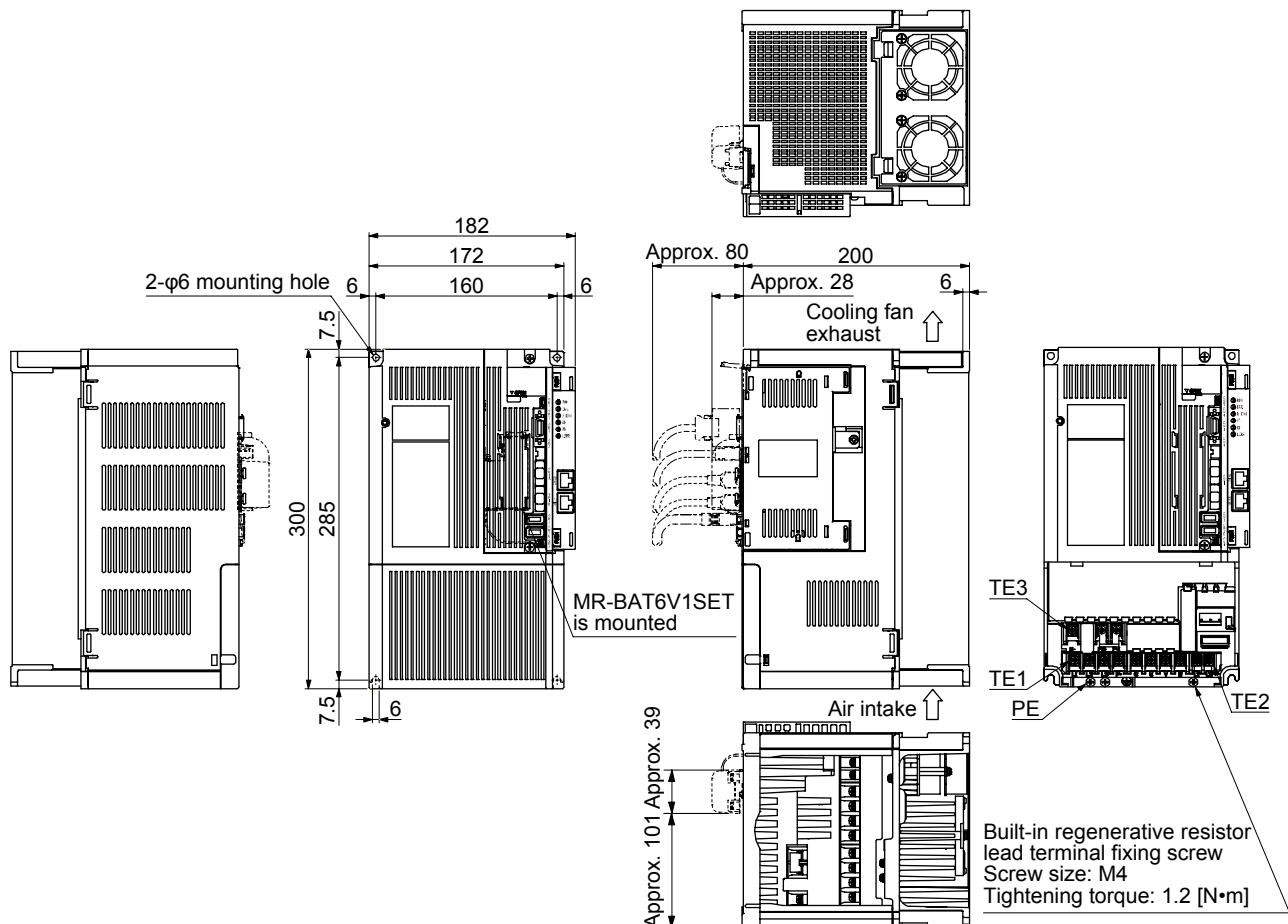
Tightening torque: 3.24 [N·m]



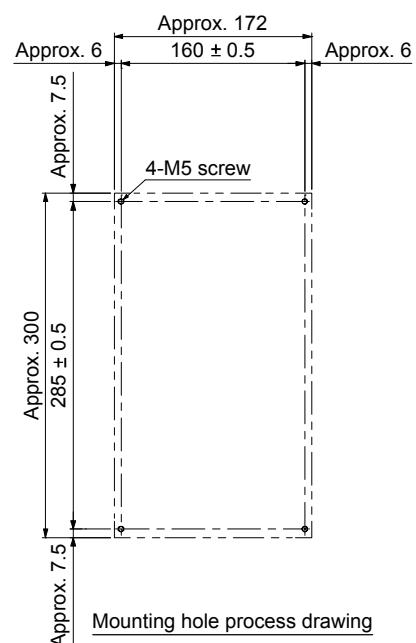
7. DIMENSIONS

(7) MR-J4-700B-RJ010

[Unit: mm]



Terminal	
TE3	N-P3 P4
TE1	L1 L2 L3 P+ C U V W
PE	⏚ ⊕
TE2	L11 L21
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]

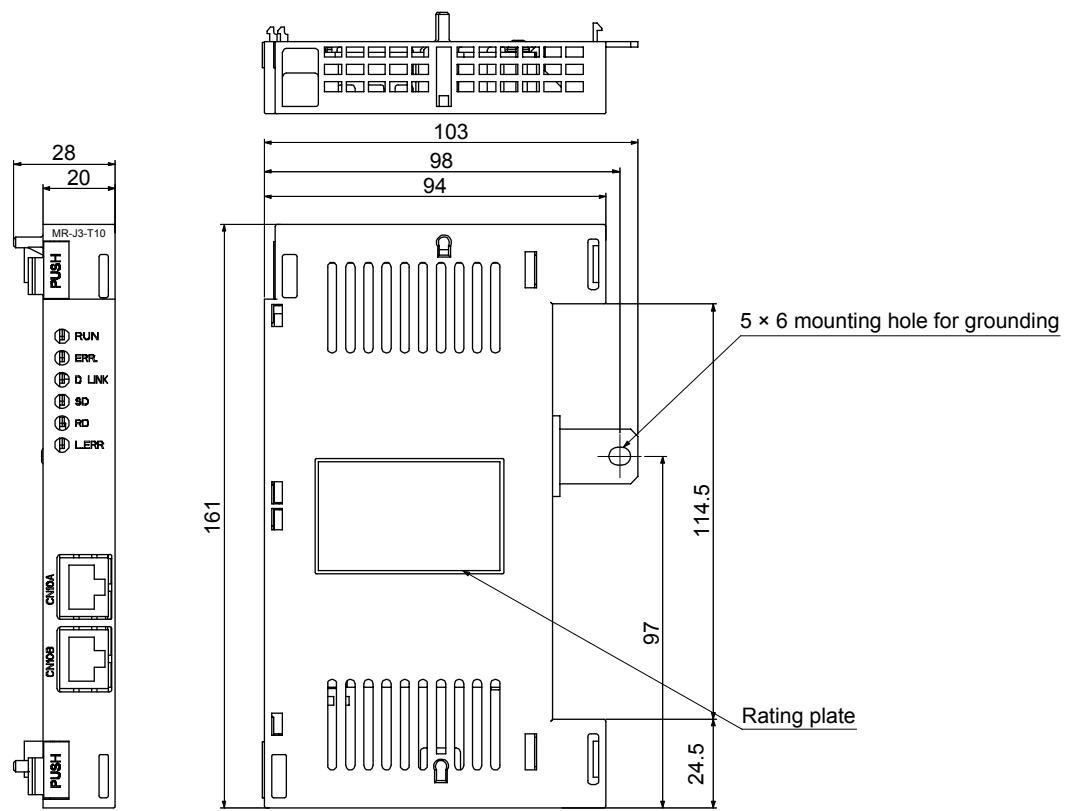


Mounting hole process drawing

7. DIMENSIONS

7.2 MR-J3-T10 CC-Link IE Field Network interface unit

[Unit: mm]



Mass: 0.15 [kg]

7. DIMENSIONS

MEMO

8. OPTIONS AND PERIPHERAL EQUIPMENT

8. OPTIONS AND PERIPHERAL EQUIPMENT



● Before connecting any option or peripheral equipment, 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.



● Use the specified peripheral equipment and options to prevent a malfunction or a fire.

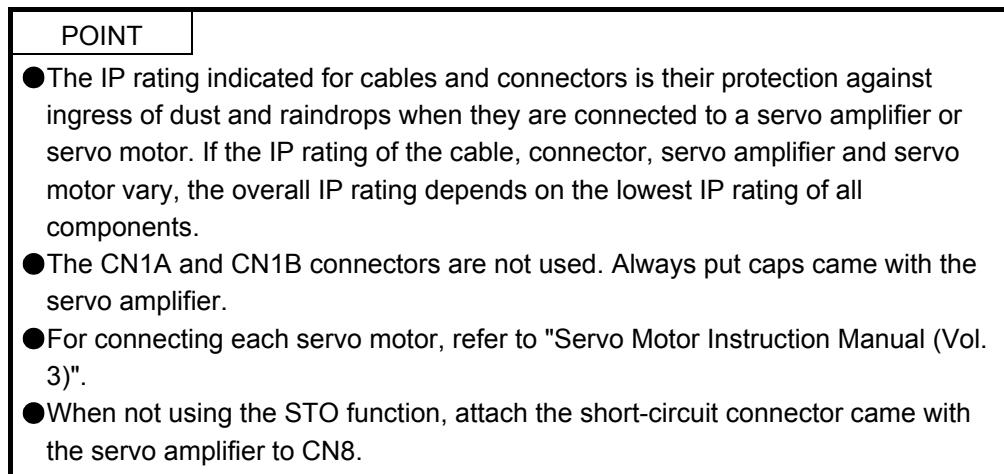
The following item is the same as MR-J4-_B servo amplifiers. For details of the items, refer to each chapter/section of the detailed description field.

Item	Detailed explanation
Regenerative option	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.2
FR-BU2 brake unit	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.3
FR-RC power regenerative converter	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.4
FR-CV power regenerative common converter	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.5
Junction terminal block PS7DW-20V14B-F (recommended)	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.6
MR Configurator2 (Note)	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.7
Battery	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.8
Selection example of wires	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.9
Molded-case circuit breakers, fuses, magnetic contactors (recommended)	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.10
Power factor improving DC reactor	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.11
Power factor improving AC reactor	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.12
Relay (recommended)	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.13
Noise reduction techniques	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.14
Earth-leakage current breaker	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.15
EMC filter (recommended)	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual section 11.16

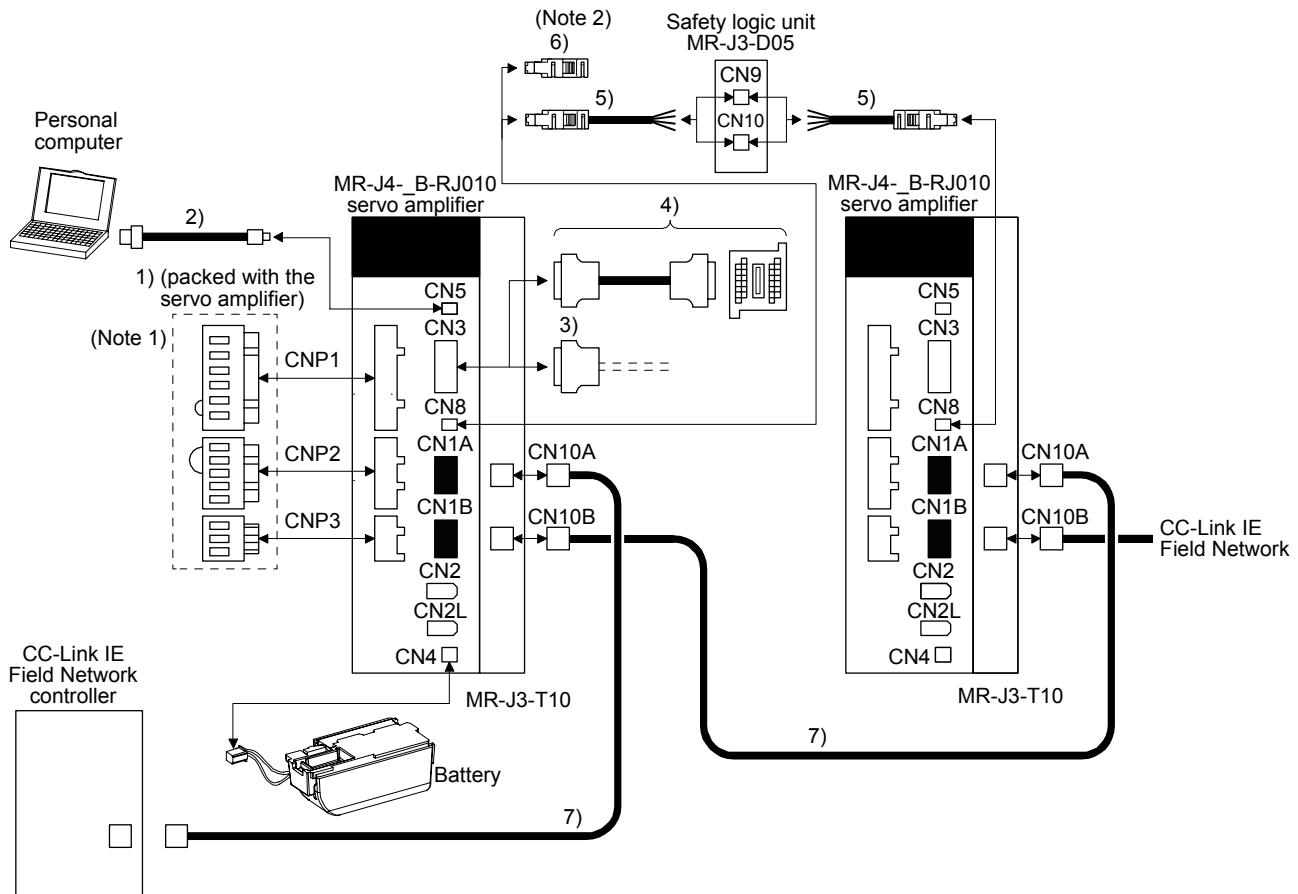
Note. Use MR Configurator2 of software version 1.19V or later for the MR-J4-_B-RJ010 servo amplifier.

8. OPTIONS AND PERIPHERAL EQUIPMENT

8.1 Combinations of cable/connector sets



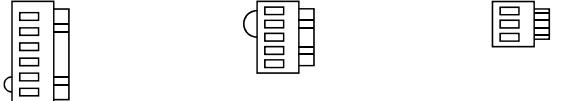
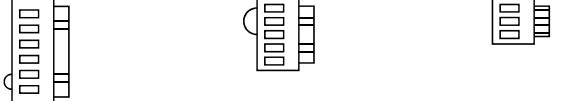
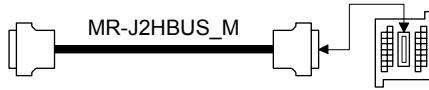
Please purchase the cable and connector options indicated in this section.



Note 1. Connectors for 3.5 kW or less. For 5 kW or more, it is a terminal block.

2. When not using the STO function, attach the short-circuit connector (7) came with a servo amplifier.

8. OPTIONS AND PERIPHERAL EQUIPMENT

No.	Product name	Model	Description	Application
1)	Servo amplifier power connector set		 <p>For CNP1 Connector: 06JFAT-SAXGDK-H7.5 (JST) Applicable wire size: 0.8 mm² to 2.1 mm² (AWG 18 to 14) Insulator OD: to 3.9 mm</p> <p>For CNP2 Connector: 05JFAT-SAXGDK-H5.0 (JST) Applicable wire size: 0.8 mm² to 2.1 mm² (AWG 18 to 14) Insulator OD: to 3.9 mm</p> <p>For CNP3 Connector: 03JFAT-SAXGDK-H7.5 (JST) Open tool J-FAT-OT (JST)</p>	Supplied with servo amplifiers of 1 kW or less
			 <p>For CNP1 Connector: 06JFAT-SAXGFK-XL (JST) (For CNP1 and CNP3) Applicable wire size: 1.25 mm² to 5.5 mm² (AWG 16 to 10) Insulator OD: to 4.7 mm</p> <p>For CNP2 Connector: 05JFAT-SAXGDK-H5.0 (JST) (For CNP2) Applicable wire size: 0.8 mm² to 2.1 mm² (AWG 18 to 14) Insulator OD: to 3.9 mm</p> <p>For CNP3 Connector: 03JFAT-SAXGFK-XL (JST) Open tool Quantity: 1 Model: J-FAT-OT-EXL (JST)</p>	Supplied with servo amplifiers of 2 kW and 3.5 kW
2)	USB cable	MR-J3USBCBL3M Cable length: 3 m	<p>Connector for CN5 mini-B connector (5 pins)</p>  <p>Personal computer connector A connector</p>	For connection with PC-AT compatible personal computer
3)	Connector set	MR-CCN1	 <p>Connector: 10120-3000PE Shell kit: 10320-52F0-008 (3M or equivalent)</p>	
4)	Junction terminal block (recommended)		 <p>PS7DW-20V14B-F (Yoshida Electric industry)</p> <p>MR-J2HBUS_M</p> <p>Junction terminal block PS7DW-20V14B-F is not option. For using the junction terminal block, option MR-J2HBUS_M is necessary. For details, refer to section 11.6 of "MR-J4-_B-(RJ) Servo Amplifier Instruction Manual".</p>	
5)	STO cable	MR-D05UDL3M-B (Refer to "MR-J4-_B-(RJ) Servo Amplifier Instruction Manual" section 11.1.2.)	 <p>Connector set: 2069250-1 (TE Connectivity)</p>	Connection cable for the CN8 connector
6)	Short-circuit connector			Supplied with servo amplifier
7)	Shielded twisted pair cable (Refer to section 8.2.)		<p>Shielded twisted pair cable (Category 5e)</p>  <p>The shielded twisted pair cable is not an option.</p>	For CC-Link IE Field Network

8. OPTIONS AND PERIPHERAL EQUIPMENT

8.2 Cable for CC-Link IE Field Network

For the wiring of CC-Link IE Field Network, use the following wiring tools recommended by the CC-Link Partner Association. The CC-Link IE controller network cable cannot be used for the CC-Link IE Field Network.

Item	Description
Cable type	Shielded twisted pair cable (Category 5e)
Standard	One of the following standards must be met. <ul style="list-style-type: none">▪ IEEE802.3 1000BASE-T▪ ANSI/TIA/EIA-568-B (Category 5e)
Connector	Category 5e or more RJ-45 plug

A product example on the market is as follows. For the latest product information, contact the manufacturer.

Model	Manufacturer	Contact
SC-E5EW(-L) (Note)	Mitsubishi Electric System & Service	email: oss-ip@melsc.jp

Note. The SC-E5EW cable is for in-enclosure and indoor uses. The SC-E5EW-L cable is for outdoor use.

APPENDIX

The following item is the same as MR-J4-_B servo amplifiers. For details of the items, refer to each chapter/section of the detailed description field.

Item	Detailed explanation
Handling of AC servo amplifier batteries for the United Nations Recommendations on the Transport of Dangerous Goods	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual app. 2
Symbol for the new EU Battery Directive	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual app. 3
Compliance with overseas standards	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual app. 4
MR-J3-D05 Safety logic unit	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual app. 5
EC declaration of conformity	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual app. 6
How to replace servo amplifier without magnetic pole detection	MR-J4-_B(-RJ) Servo Amplifier Instruction Manual app. 7

App. 1 Peripheral equipment manufacturer (for reference)

Names given in the table are as of February 2013.

Manufacturer	Contact information
JST	JST
3M	3M
TE Connectivity	TE Connectivity
Mitsubishi Cable Industries	Mitsubishi Cable Industries, LTD

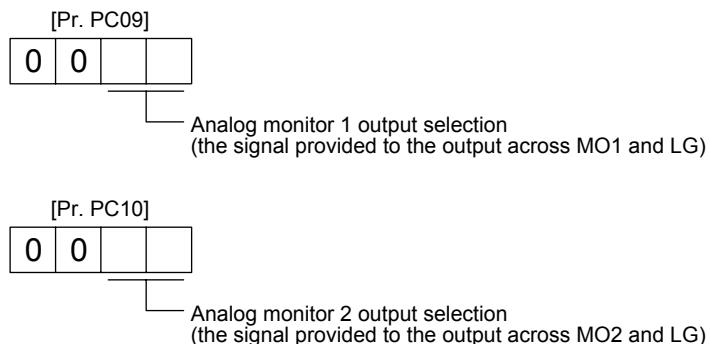
App. 2 Analog monitor

POINT	
●	A voltage of analog monitor output may be irregular at power-on.

The servo status can be output to two channels in terms of voltage.

(1) Setting

Change the following digits of [Pr. PC09] and [Pr. PC10].



[Pr. PC11] and [Pr. PC12] can be used to set the offset voltages to the analog output voltages. Setting value is -999 mV to 999 mV.

Parameter	Description	Setting range [mV]
PC11	This is used to set the offset voltage of MO1 (Analog monitor 1).	-999 to 999
PC12	This is used to set the offset voltage of MO2 (Analog monitor 2).	

APPENDIX

(2) Setting

The servo amplifier is factory-set to output the servo motor speed to MO1 (Analog monitor 1) and the torque to MO2 (Analog monitor 2). The setting can be changed by setting in [Pr. PC09] and [Pr. PC10] as follows.

Refer to (3) for the detection point.

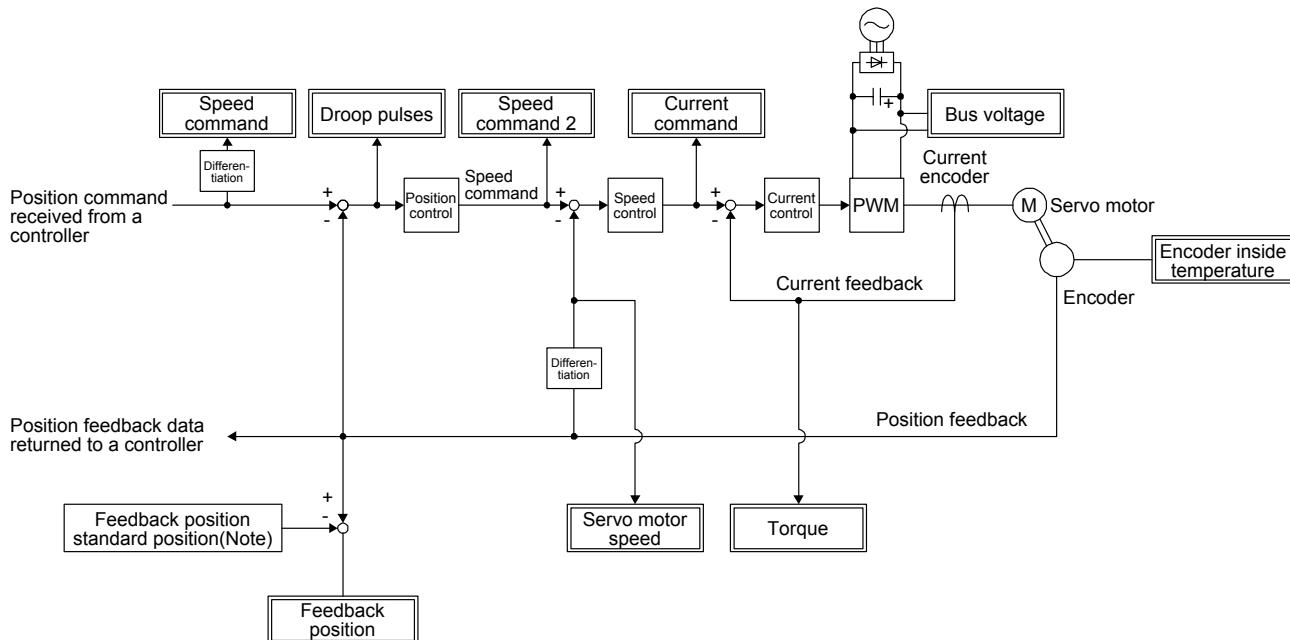
Setting value	Output item	Description	Setting value	Output item	Description
00	Servo motor speed		01	Torque	
02	Servo motor speed		03	Torque	
04	Current command		05	Speed command	
06	Servo motor-side droop pulses (Note 1) (± 10 V/100 pulses)		07	Servo motor-side droop pulses (Note 1) (± 10 V/1000 pulses)	
08	Servo motor-side droop pulses (Note 1) (± 10 V/10000 pulses)		09	Servo motor-side droop pulses (Note 1) (± 10 V/100000 pulses)	
0A	Feedback position (Note 1, 2) (± 10 V/1 Mpulses)		0B	Feedback position (Note 1, 2) (± 10 V/10 Mpulses)	

APPENDIX

Setting value	Output item	Description	Setting value	Output item	Description
0C	Feedback position (Note 1, 2) (± 10 V/100 Mpulses)		0D	Bus voltage	
0E	Speed command 2		17	Encoder inside temperature (± 10 V/ ± 128 °C)	

- Note 1. Encoder pulse unit
2. Available in position control mode

(3) Analog monitor block diagram



Note. The feedback position is output based on the position data passed between controller and servo amplifier. [Pr. PC13] and [Pr. PC14] can set up the standard position of feedback position that is output to analog monitor in order to adjust the output range of feedback position. The setting range is between -9999 pulses and 9999 pulses.

$$\text{Standard position of feedback position} = [\text{Pr. PC14}] \text{ setting value} \times 10000 + [\text{Pr. PC13}] \text{ setting value}$$

Parameter	Description	Setting range
PC13	Sets the lower-order four digits of the standard position of feedback position	-9999 to 9999 [pulse]
PC14	Sets the higher-order four digits of the standard position of feedback position	-9999 to 9999 [10000 pulses]

REVISIONS

*The manual number is given on the bottom left of the back cover.

Print Data	*Manual Number	Revision
Feb. 2013	SH(NA)030117-A	First edition

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Singapore	Mitsubishi Electric Asia Pte, Ltd. 307 Alexandra Road #05-01/02, Mitsubishi Electric Building Singapore 159943	Tel : +65-6470-2460 Fax : +65-6476-7439

Warranty

1. Warranty period and coverage

We will repair any failure or defect hereinafter referred to as "failure" in our FA equipment hereinafter referred to as the "Product" arisen during warranty period at no charge due to causes for which we are responsible through the distributor from which you purchased the Product or our service provider. However, we will charge the actual cost of dispatching our engineer for an on-site repair work on request by customer in Japan or overseas countries. We are not responsible for any on-site readjustment and/or trial run that may be required after a defective unit are repaired or replaced.

[Term]

The term of warranty for Product is twelve (12) months after your purchase or delivery of the Product to a place designated by you or eighteen (18) months from the date of manufacture whichever comes first ("Warranty Period"). Warranty period for repaired Product cannot exceed beyond the original warranty period before any repair work.

[Limitations]

- (1) You are requested to conduct an initial failure diagnosis by yourself, as a general rule.
It can also be carried out by us or our service company upon your request and the actual cost will be charged. However, it will not be charged if we are responsible for the cause of the failure.
- (2) This limited warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are set forth in the instruction manual and user manual for the Product and the caution label affixed to the Product.
- (3) Even during the term of warranty, the repair cost will be charged on you in the following cases:
 - (i) a failure caused by your improper storing or handling, carelessness or negligence, etc., and a failure caused by your hardware or software problem
 - (ii) a failure caused by any alteration, etc. to the Product made on your side without our approval
 - (iii) a failure which may be regarded as avoidable, if your equipment in which the Product is incorporated is equipped with a safety device required by applicable laws and has any function or structure considered to be indispensable according to a common sense in the industry
 - (iv) a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and replaced
 - (v) any replacement of consumable parts (battery, fan, smoothing capacitor, etc.)
 - (vi) a failure caused by external factors such as inevitable accidents, including without limitation fire and abnormal fluctuation of voltage, and acts of God, including without limitation earthquake, lightning and natural disasters
 - (vii) a failure generated by an unforeseeable cause with a scientific technology that was not available at the time of the shipment of the Product from our company
 - (viii) any other failures which we are not responsible for or which you acknowledge we are not responsible for

2. Term of warranty after the stop of production

- (1) We may accept the repair at charge for another seven (7) years after the production of the product is discontinued. The announcement of the stop of production for each model can be seen in our Sales and Service, etc.
- (2) Please note that the Product (including its spare parts) cannot be ordered after its stop of production.

3. Service in overseas countries

Our regional FA Center in overseas countries will accept the repair work of the Product. However, the terms and conditions of the repair work may differ depending on each FA Center. Please ask your local FA center for details.

4. Exclusion of responsibility for compensation against loss of opportunity, secondary loss, etc.

Whether under or after the term of warranty, we assume no responsibility for any damages arisen from causes for which we are not responsible, any losses of opportunity and/or profit incurred by you due to a failure of the Product, any damages, secondary damages or compensation for accidents arisen under a specific circumstance that are foreseen or unforeseen by our company, any damages to products other than the Product, and also compensation for any replacement work, readjustment, start-up test run of local machines and the Product and any other operations conducted by you.

5. Change of Product specifications

Specifications listed in our catalogs, manuals or technical documents may be changed without notice.

6. Application and use of the Product

- (1) For the use of our General-Purpose AC Servo, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in General-Purpose AC Servo, and a backup or fail-safe function should operate on an external system to General-Purpose AC Servo when any failure or malfunction occurs.
- (2) Our General-Purpose AC Servo is designed and manufactured as a general purpose product for use at general industries. Therefore, applications substantially influential on the public interest for such as atomic power plants and other power plants of electric power companies, and also which require a special quality assurance system, including applications for railway companies and government or public offices are not recommended, and we assume no responsibility for any failure caused by these applications when used.

In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatments, railway service, incineration and fuel systems, man-operated material handling equipment, entertainment machines, safety machines, etc. are not recommended, and we assume no responsibility for any failure caused by these applications when used. We will review the acceptability of the abovementioned applications, if you agree not to require a specific quality for a specific application. Please contact us for consultation.

MODEL	MR-J4-B-RJ010 MR-J3-T10 INSTRUCTION
MODEL CODE	1CW810

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BLDG MARUNOUCHI TOKYO 100-8310