MELSERVO

Servo Amplifiers and Motors

Beginners Manual

**MR-JE-A
MR-JE-B
MR-JE-BF
MR-JE-C**

MITSUBISHI ELECTRIC INDUSTRIAL AUTOMATION

Version check

About This Manual

The texts, illustration, diagrams and examples in this manual are provided for information purposes only. They are intended as aids to help explain the installation, operation, programming and use of the servo drives and amplifiers of the series MELSERVO JE-A, MELSERVO JE-B, MELSERVO JE-BF and MELSERVO JE-C.

If you have any questions about the installation and operation of any of the products described in this manual please contact your local sales office or distributor (see back cover). You can find the latest information and answers to frequently asked questions on our website at www.mitsubishi-automation.com.

MITSUBISHI ELECTRIC EUROPE BV reserves the right to make changes to this manual or the technical specifications of its products at any time without notice.

Beginners manual for servo amplifiers
series MR-JE-A, MR-JE-B, MR-JE-BF, MR-JE-C
Art. no.: 404049

	Version		Revisions/Additions/Corrections
A	08/2018	pdp - rw	—

Safety Guidelines

General safety information and precautions

For use by qualified staff only

This manual is only intended for use by properly trained and qualified electrical technicians who are fully acquainted with the relevant automation technology safety standards. All work with the hardware described, including system design, installation, configuration, maintenance, service and testing of the equipment, may only be performed by trained electrical technicians with approved qualifications who are fully acquainted with all the applicable automation technology safety standards and regulations. Any operations or modifications to the hardware and/or software of our products not specifically described in this manual may only be performed by authorised MITSUBISHI ELECTRIC staff.

Proper use of the products

The amplifiers of the MELSERVO JE series are only intended for the specific applications explicitly described in this manual. All parameters and settings specified in this manual must be observed. The products described have all been designed, manufactured, tested and documented in strict compliance with the relevant safety standards. Unqualified modification of the hardware or software or failure to observe the warnings on the products and in this manual may result in serious personal injury and/or damage to property. Only peripherals and expansion equipment specifically recommended and approved by MITSUBISHI ELECTRIC may be used in combination with amplifiers of the MELSERVO JE series.

All and any other uses or application of the products shall be deemed to be improper.

Relevant safety regulations

All safety and accident prevention regulations relevant to your specific application must be observed in the system design, installation, configuration, maintenance, servicing and testing of these products. The regulations listed below are particularly important in this regard.

This list does not claim to be complete, however; you are responsible for being familiar with and conforming to the regulations applicable to you in your location.

● VDE Standards

– VDE 0100
Regulations for the erection of power installations with rated voltages below 1000 V

– VDE 0105
Operation of power installations

– VDE 0113
Electrical installations with electronic equipment

– VDE 0160
Electronic equipment for use in power installations

– VDE 0550/0551
Regulations for transformers

– VDE 0700
Safety of electrical appliances for household use and similar applications

– VDE 0860
Safety regulations for mains-powered electronic appliances and their accessories for household use and similar applications.

● Fire safety regulations

● Accident prevention regulations

– VBG Nr.4
Electrical systems and equipment

Safety warnings in this manual

In this manual warnings that are relevant for safety are identified as follows:

DANGER:

Failure to observe the safety warnings identified with this symbol can result in health and injury hazards for the user.

WARNING:

Failure to observe the safety warnings identified with this symbol can result in damage to the equipment or other property.

Failure to observe notes can result in serious consequences too. To prevent injury of persons all safety and accident prevention regulations must be observed.

NOTES

means that incorrect handling can result in misoperation of servo amplifier and motor.
However failure to observe notes does not result in health and injury hazards for the user or damage to the equipment or other property.

Note also indicates a different setting of parameters, a different function or a different use or provides information about the use of peripherals and expansion equipment respectively

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Compliance with EC directives

EU directives exist to facilitate free trade within the EU. They lay down "fundamental protective regulations" to ensure the removal of technical barriers to trade between the EU member states. In the member states of the EU basic safety requirements and the qualifications for bearing the CE mark are regulated by the Machinery Directive (2006/42/EC), the EMC Directive (2014/30/EU), the Low Voltage Directive (2014/35/EU) and the RoHS directive (2011/65/EU).

Conformity with the EU directives is demonstrated with a declaration of conformity and displaying the CE mark on the product, its packaging or its operating manual.

The directives listed above apply to appliances, machinery and systems but not to individual components, unless the components perform a direct function for the end user. Since a servo amplifier must be installed together with a servo motor, a control device and other mechanical parts to perform a useful function for the end user, servo amplifiers cannot be said to perform such a direct function. This means that they can be declared as complex components for which a declaration of conformity and the CE mark are not required. This opinion is also upheld by CEMEP, the European Committee of Manufacturers of Electrical Machines and Power Electronics.

However, the servo amplifiers do fulfil the requirements for the CE mark for the machines or accessories in which the servo amplifiers are deployed, in accordance with the Low Voltage Directive. In order to help users ensure conformity with the EMC Directive Mitsubishi Electric has published a manual titled EMC Installation Guidelines (Art. no. 103944), which describes the proper installation of the servo amplifiers, construction of the switchgear cabinet and other important installation tasks. Please contact your dealer for this publication.

Specific safety information and precautions

The following safety precautions are intended as a general guideline for using PLC systems together with other equipment. These precautions must always be observed in the design, installation and operation of all control systems.

DANGER:

- *Observe all safety and accident prevention regulations applicable to your specific application. Always disconnect all power supplies before performing installation and wiring work or opening any of the assemblies, components and devices.*
- *Before installation, wiring and opening of modules, components and devices, switch power off and wait for more than 15 minutes. Then, confirm the voltage is safe with a voltage tester. Otherwise, you may get an electric shock.*
- *Take safety measures, e.g. provide covers, to prevent accidental contact of hands and parts (cables, etc.) with the servo amplifier heat sink, regenerative resistor, servo motor, etc. since they may be hot while power is on or for some time after power-off. Their temperatures may be high and you may get burnt or a parts may damaged.*
- *Assemblies, components and devices must always be installed in a shockproof housing fitted with a proper cover and fuses or circuit breakers.*
- *Devices with a permanent connection to the mains power supply must be integrated in the building installations with an all-pole disconnection switch and a suitable fuse.*
- *Ground the servo amplifier and servo motor securely.*
- *Check power cables and lines connected to the equipment regularly for breaks and insulation damage. If cable damage is found immediately disconnect the equipment and the cables from the power supply and replace the defective cabling.*
- *Before using the equipment for the first time check that the power supply rating matches that of the local mains power.*
- *EMERGENCY OFF facilities conforming to EN 60204/IEC 204 and VDE 0113 must remain fully operative at all times and in all PLC operating modes. The EMERGENCY OFF facility reset function must be designed so that it cannot ever cause an uncontrolled or undefined restart.*
- *Configure the electromagnetic brake circuit so that it is activated by the EMERGENCY OFF facility.*
- *Residual current protective devices pursuant to DIN VDE Standard 0641 Parts 1-3 are not adequate on their own as protection against indirect contact for installations with PLC systems. Additional and/or other protection facilities are essential for such installations.*
- *If your application requires by installation standards an RCD (residual current device) as up stream protection please select the type B according to DIN VDE 0100-530.*
- *During power-on or operation, do not open the front cover of the servo amplifier. You may get 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 or periodic inspection, do not remove the front cover even of the servo amplifier if the power is off. The servo amplifier is charged and you may get an electric shock.*
- *To avoid an electric shock, insulate the connections of the power supply terminals.*

Specific safety precautions

⚠ **WARNING:**

- *Install the servo equipment with full consideration of heat generation during operation. Leave specified clearances between the servo amplifier and control box inside walls or other equipment. Take measures to prevent the internal temperature of the control box from exceeding the environmental conditions.*

- *Do not install the servo amplifier, servo motor and regenerative resistor on or near combustibles. Otherwise a fire may cause.*

- *When using servo drives always ensure that all electrical and mechanical specifications and requirements are observed exactly.*

- *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. Otherwise, a regenerative transistor malfunction or the like may overheat the regenerative resistor, causing smoke or a fire.*

- *When you use a regenerative option with an MR-JE-40A to MR-JE-100A, MR-JE-40B to MR-JE-100B, MR-JE-40BF to MR-JE-100BF and MR-JE-40C to MR-JE-100C remove the built-in regenerative resistor and the associated wiring from the servo amplifier.*

- *When the servo amplifier, the servo motor or the regenerative option has become faulty, switch off the main servo amplifier power side. Continuous flow of a large current may cause a fire.*

- *Provide an external emergency stop circuit to ensure that operation can be stopped and power switched off immediately.*

- *Provide adequate protection to prevent screws and other conductive matter, oil and other combustible matter from entering the servo amplifier and servo motor.*

Structure

S001260E
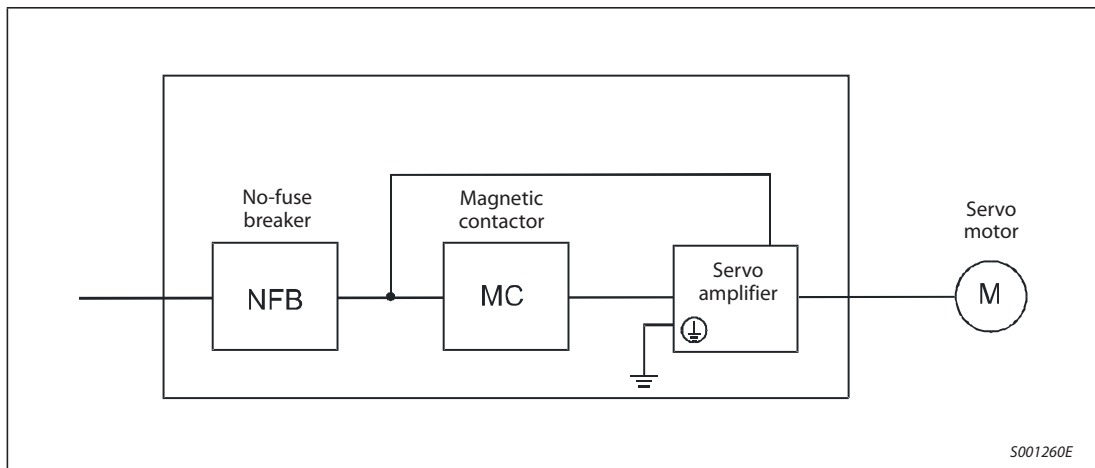
Environment

Operate the servo amplifier at or above the contamination level 2 set forth in IEC60664-1. For this purpose, install the servo amplifier in a control box which is protected against water, oil, carbon, dust, dirt, etc. (IP54).

Grounding

To prevent an electric shock, always connect the protective earth (PE) terminals of the servo amplifier to the protective earth (PE) of the control box. Do not connect two or more ground cables to the same protective earth (PE) terminal. Always connect the cables to the terminals one-to-one.

PE terminals   PE terminals

S001261E

Disposal of waste

Please dispose a servo amplifier and other options according to your local laws and regulations.

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Typographic Conventions

Use of notes

Notes containing important information are clearly identified as follows:

NOTE | Note text

Use of examples

Examples containing important information are clearly identified as follows:

Example ▽   Example text   △

Numbering in figures and illustrations

Reference numbers in figures and illustrations are shown with white numbers in a black circle and the corresponding explanations shown beneath the illustrations are identified with the same numbers, like this:

❶ ❷ ❸ ❹

Procedures

In some cases the setup, operation, maintenance and other instructions are explained with numbered procedures. The individual steps of these procedures are numbered in ascending order with black numbers in a white circle, and they must be performed in the exact order shown:

① Text.

② Text.

③ Text.

Footnotes in tables

Footnote characters in tables are printed in superscript and the corresponding footnotes shown beneath the table are identified by the same characters, also in superscript.

If a table contains more than one footnote, they are all listed below the table and numbered in ascending order with black numbers in a white circle, like this:

① Text

② Text

③ Text

Writing conventions and guidance notes

Keys or key-combinations are indicated in square brackets, such as [Enter], [Shift] or [Ctrl]. Menu names of the menu bar, of the drop-down menus, options of a dialogue screen and buttons are indicated in italic bold letters, such as the drop down menu *New* in the *Project* menu.

MITSUBISHI ELECTRIC

Table of Contents

MITSUBISHI ELECTRIC

MITSUBISHI ELECTRIC

MITSUBISHI ELECTRIC

1 Introduction

This english document is the original instruction.

1.1 What is a servo amplifier?

1.1.1 The servo amplifier in the motion control system

Servo amplifiers are components of a so-called motion control system. This concept represents different types of motion control such as single-axis positioning in micro-installations but also for the solution of sophisticated tasks like multiple-axis positioning in large-scale installations. With a motion control system you are able to solve different positioning applications from positioning with one axis in small production lines up to multi axis positioning in large-scale systems.

The Motion CPU controls different more or less complex motion sequences via the connected servo amplifiers and motors.

Typical applications of a motion control systems are:

● Plastics and textile processing,

● Packaging,

● Printing and paper converting,

● Forming,

● Wood and glass working,

● Production of semiconductors

The following diagram shows the components of a motion control system with CPUs, modules, servo amplifiers and motors.

qmc0001e
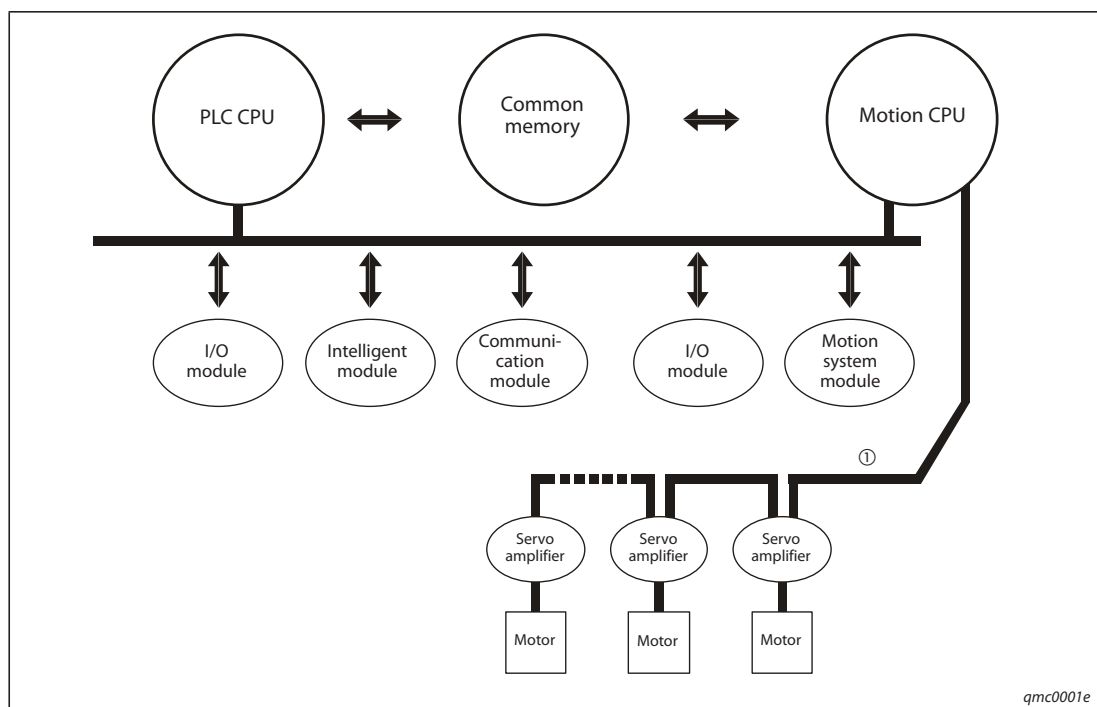
Fig. 1-1: *Block diagram of a motion control system*

① The bus system for control depends on the used servo amplifier series MR-JE-☐A, MR-JE-☐B, MR-JE-☐BF or MR-JE-☐C.

1.1.2   Function of a servo amplifier

Servo amplifiers are specially designed frequency inverters for driving servo motors for dynamic movements.

The block diagram in fig. 1-2 shows the two main components:

● the power rail (top) and

● the electronics for control and monitoring (bottom).

The power supply loads the capacitor C of the current source via the rectifier with a DC voltage U_z. The power inverter generates from this DC voltage U_z a 3-phase AC voltage with variable frequency to drive the servo motor. In the case, the drive works as a brake, the brake chopper inside the current source limits the voltage U_z and dissipates the braking energy via the resistor R by heat. If there is needed a higher dissipation of braking energy or if the brake events are more frequent, an external resistor R is used to remove a higher quantity of heat.
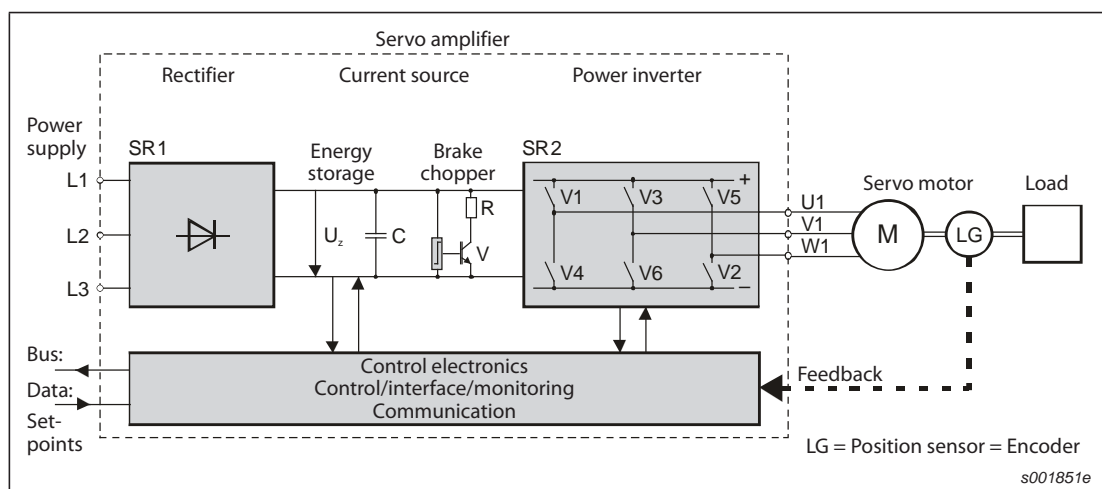
Fig. 1-2:   *Block diagram of a servo amplifier*

1.1.3   Servo motors

Today servo motors are generally used to execute high dynamic movements. The motors work on the principle of a synchronous machine, which is permanently magnetic excited (rotary servo motor).

The motors provide the torque or the power directly and are extremely effective in doing so. Driven by servo amplifiers they work at variable, process-optimizing speed and do precise positioning without delay for the machine. An encoder (position sensor) on the motor shaft reports the position of the rotor back to the servo amplifier. To fix the reached position even in the event of power failure, the motors are equipped with an optional electromagnetic brake. This ensures an perfect adaptation to every needed application (e.g. hanging loads).

The cabling of the power supply of the motor and of the encoder is done by pre-assembled cables. Most of the connections are done with connectors so that the cabling is easy, quick and safe.

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1.1.4   Features of servo amplifiers and motors of the MELSERVO JE series

The motion CPU controls the connected servo amplifiers which drive the servo motors for movement and position. The servo motor is tuned to a certain shaft position, direction of rotation, speed or a certain torque.

The Mitsubishi general-purpose AC servo MELSERVO-JE series have limited functions with keeping high performance based on MELSERVO-J4 series.

The MR-JE-A/MR-JE-C servo amplifier has position, speed, and torque control modes. In the position control mode, the maximum pulse train of 4 Mpulses/s is supported. Further, it can perform operation with the control modes switched, e.g. position/speed control, speed/torque control and torque/position control. Hence, it is applicable to a wide range of fields, not only precision positioning and smooth speed control of machine tools and general industrial machines but also line control and tension control.

MR-JE-A has a built-in positioning function, enabling positioning operation with point table method, etc. It is equipped with advanced functions such as simple cam and mark detection.

The MR-JE-B/MR-JE-BF servo amplifier is connected to controllers, including a servo system controller, on the highspeed synchronous network SSCNET III/H. The servo amplifier directly receives a command from a controller to drive a servo motor.

SSCNET III/H achieves high-speed communication of 150 Mbps full duplex with high noise tolerance due to the SSCNET III optical cables. Large amounts of data can be exchanged in real-time between the controller and the servo amplifier. Servo monitor information can be stored in the upper information system and used for control

The MR-JE-BF servo amplifier supports the Safe Torque Off (STO) function.

The MR-JE-C servo amplifier supports profile position/velocity/torque mode that drive motors with communication from the controller. By specifying target position, target speed, acceleration time constant, and deceleration time constant, a position command is created in the servo amplifier and the motor will be driven.

The MR-JE-C servo amplifier has an Ethernet interface and supports various open networks such as CC-Link IE Field Network Basic, SLMP, and Modbus®/TCP etc., for driving motors, monitoring, parameter setting, etc.

With one-touch tuning and real-time auto tuning, you can automatically adjust the servo gains according to the machine.

The tough drive function, drive recorder function, and preventive maintenance support function strongly support machine maintenance.

The servo amplifier has an USB communication interface. Therefore, you can connect the servo amplifier to the personal computer with MR Configurator2 installed to perform the parameter setting, test operation, gain adjustment, and others.

The MELSERVO-JE series servo motor is equipped with an incremental encoder (in combination with MR-JE-A)/absolute position encoder (in combination with MR-JE-B/MR-JE-BF/MR-JE-C) whose resolution is 131072 pulses/rev will enable a high-accuracy positioning.

1.2   Environmental conditions

Store and use the servo amplifier and servo motor in the following environmental conditions.

Environment		Conditions	
		Servo amplifier	Servo motor [1]
Ambient temperature	Operation	0 to +55 C (non-freezing)	0 to +40 C (non-freezing)
	Storage	−20 to +65 C (non-freezing)	−15 to +70 C (non-freezing)
Ambient humidity	Operation	5% to 90% (non-condensing)	max. 80% (non-condensing)
	Storage		max. 90% (With no dew condensation)
Atmosphere		Indoors (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, and dirt	
Altitude		max. 2000 m	
Protective structure		IP20	HG-KN	IP65 [2]
			HG-SN	IP67 [2]
Vibration		max. 5.9 m/s²	HG-KN	X, Y: 49 m/s²
			HG-SN52 to 152	X, Y: 24.5 m/s²
			HG-SN202 to 302	X: 24.5 m/s² Y: 49 m/s²

Tab. 1-1:   *Environmental conditions*

[1] In the environment where the servo motor is exposed to oil mist, oil, or water, the servo motor of the specifications in tab. 1-1 may not be usable. Please contact your local sales office.

[2] The shaft-through portion is excluded. IP classifies the degrees of protection provided against the intrusion of solid objects and water in electrical enclosures.

1.3   Terminology

The terms and abbreviations below are important for servo amplifiers and are used frequently in this guide.

Direction of rotation of electric motors

The direction (or sense) of rotation of electric motors is defined looking at the end of the motor shaft. If the motor has two shaft ends the direction is defined looking at the main drive shaft end, which is defined as the shaft end away from the end where the cooling fan or the brake are installed.

● Forward

   Counterclockwise (CCW)/ Left

● Reverse

   Clockwise (CW)/ Right

Safety Function

The servo amplifier series MR-JE-BF supports the Safe Torque Off (STO) function described in IEC/EN 61800-5-2. STO is a stop function used to shut down energy to motors which exert torque. The servo amplifier electronically cuts off the power output from the servo amplifier to the servo motor.

The purpose for this safety function is as follows.

– Uncontrolled stop according to stop category 0 of IEC 60204-1

– Designed to prevent unexpected start-up

Operating modes of the servo amplifier

The MR-JE-A/MR-JE-C servo amplifier can be set to different operating modes by parameter setting.

● Position control mode

   An up to 4 Mpps high-speed pulse train is used to control the speed and direction of a motor and execute precision positioning of 131,072 pulses/rev (14 bits) resolution.
   A torque limit is imposed on the servo amplifier by the clamp circuit to protect the power transistor in the main circuit from overcurrent due to sudden acceleration/deceleration or overload. This torque limit value can be changed to any value with an external analog input or the parameter.

● Speed control mode

   An external analog speed command (0–±10 V DC) or parameter-driven internal speed command (max. 7 speeds) is used to control the speed and direction of a servo motor smoothly. There are also the acceleration/deceleration time constant setting in response to speed command, the servo lock function at a stop time, and automatic offset adjustment function in response to external analog speed command.

● Torque control mode

   An external analog torque command (0–±8 V DC) or parameter-driven internal torque command is used to control the torque output by the servo motor.
   To protect misoperation under no load, the speed limit function (external or internal setting) is also available for application to tension control, etc.

● Positioning mode (only MR-JE-A)

   Automatic and manual positioning modes are supported by point table and program for normal operation as well as for home position return. Home position return can be done by different methods like dog type, count type, data set type, stopper type etc.

The MR-JE-C servo amplifier supports profile position mode, profile velocity mode and profile torque mode that drive motors with communication from the controller.

● Profile position mode (pp)

This is a positioning operation mode where an end position command is received to drive the servo motor in the synchronous or asynchronous communication with a controller.

● Profile velocity mode (pv)

This is a mode where a target speed command is received to drive the servo motor in the synchronous or asynchronous communication with a controller.

● Profile torque mode (tq)

This is a mode where a target torque command is received to drive the servo motor in the synchronous or asynchronous communication with a controller.

● Homing mode (hm)

This is a mode where the servo amplifier performs a home position return operation using the method directed by the controller.

2   Introduction of the devices

2.1   Servo amplifier series

2.1.1   MR-JE-A and MR-JE-B

MR-JE-100A or less   MR-JE-200A or more

MR-JE-100B or less   MR-JE-200B or more

Geräteansicht MR-JE-□A.eps, Geräteansicht MR-JE-□B.eps
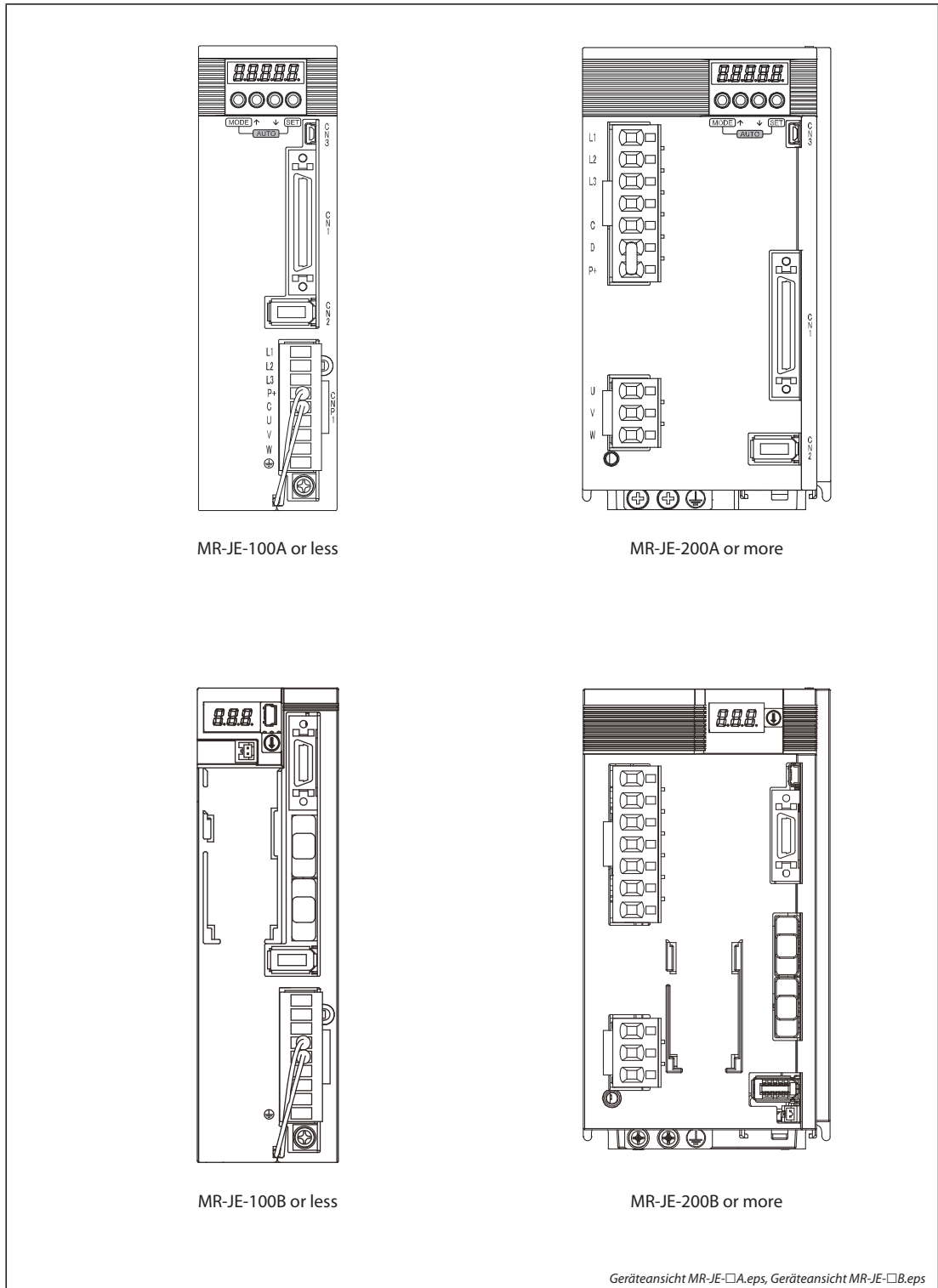
Fig. 2-1:   *Model overview of the servo amplifiers MR-JE-A and MR-JE-B*

2.1.2 MR-JE-BF and MR-JE-C

MR-JE-10BF to MR-JE-300BF

MR-JE-100C or less   MR-JE-200C or more

Geräteansicht MR-JE-□BF.eps, Geräteansicht MR-JE-□C.eps
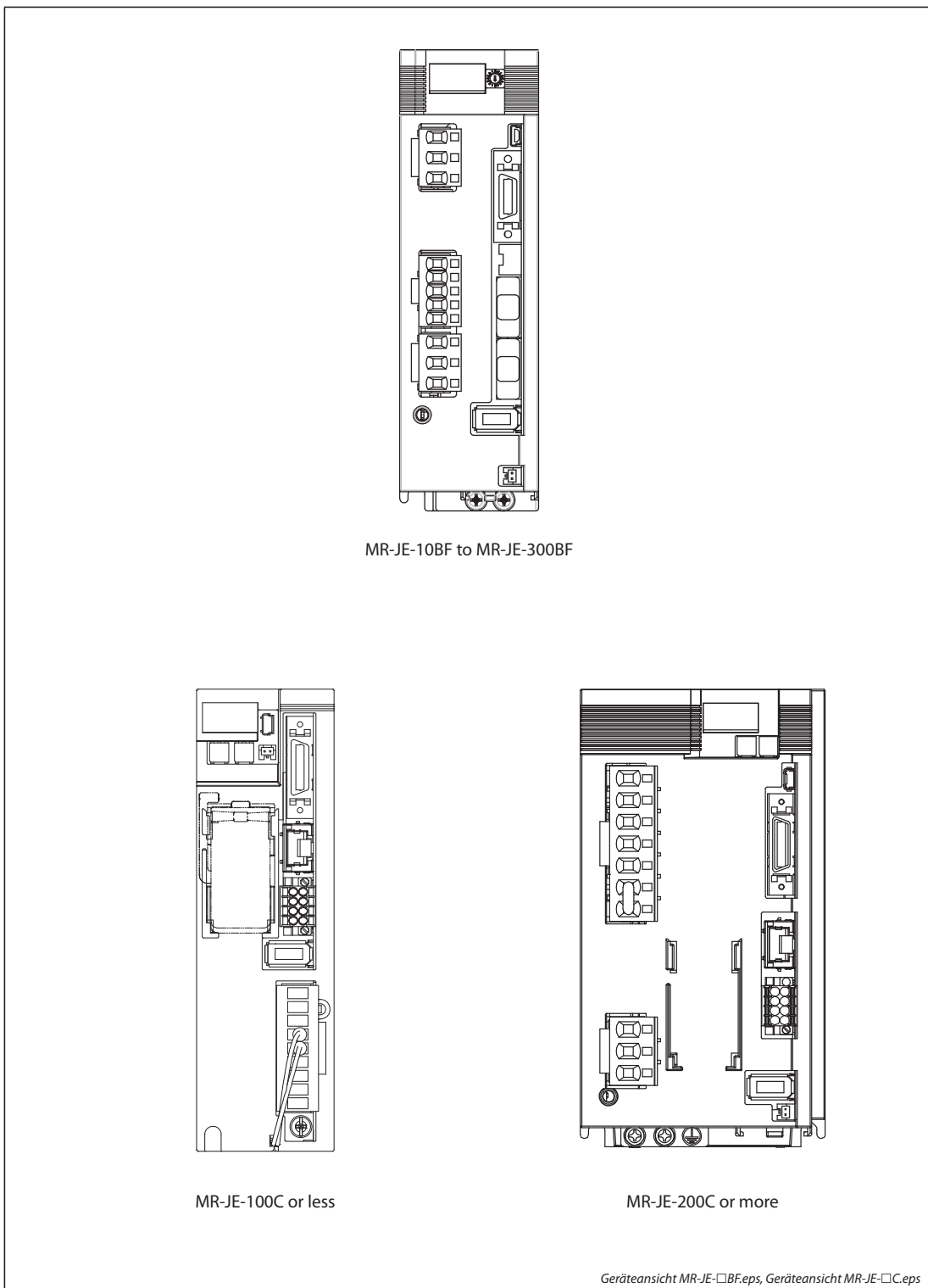
Fig. 2-2: *Model overview of the servo amplifiers MR-JE-BF and MR-JE-C*

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2.2   Model designation and output power
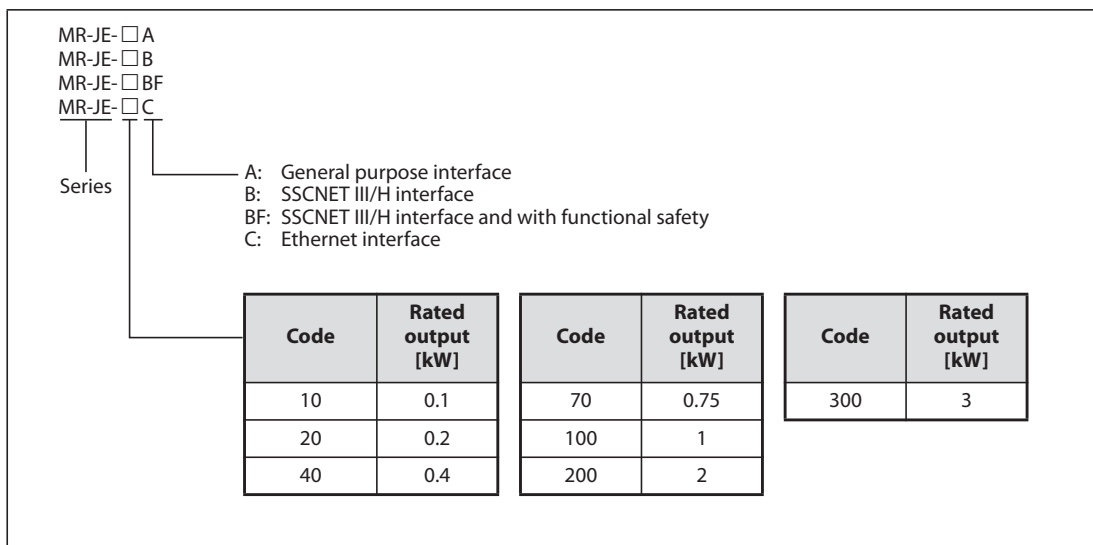
Fig. 2-3:   *Model designation and rated output of the servo amplifiers MR-JE*

2.3   Combinations of servo amplifiers and servo motors

The following tables show the possible combinations between the servo amplifier series MR-JE-A, MR-JE-B, MR-JE-BF and MR-JE-C and the rotary motors.

Servo amplifier	Servo motor HG-KN	Servo motor HG-SN
MR-JE-10A, MR-JE-10B, MR-JE-10BF, MR-JE-10C	HG-KN13	—
MR-JE-20A, MR-JE-20B, MR-JE-20BF, MR-JE-20C	HG-KN23	—
MR-JE-40A, MR-JE-40B, MR-JE-40BF, MR-JE-40C	HG-KN43	—
MR-JE-70A, MR-JE-70B, MR-JE-70BF, MR-JE-70C	HG-KN73	HG-SN52
MR-JE-100A, MR-JE-100B, MR-JE-100BF, MR-JE-100C	—	HG-SN102
MR-JE-200A, MR-JE-200B, MR-JE-200BF, MR-JE-200C	—	HG-SN152, HG-SN202
MR-JE-300A, MR-JE-300B, MR-JE-300BF, MR-JE-300C	—	HG-SN302

Tab. 2-1:   *Servo amplifier and motor combination*

2.4   Rating plate

The following shows two examples of the rating plate for explanation of each item.

| NOTE | Production year and month of the servo motor are indicated in a serial number on the rating plate. The year and month are indicated by the last two digits of the year and one digit of the month [1 to 9, X(10), Y(11), and Z(12)]. For January 2012, the Serial No. is like, "SER. _ _ _ _ _ _ _ _ _ 121" |

2.4.1   MR-JE-A, MR-JE-B, MR-JE-BF and MR-JE-C
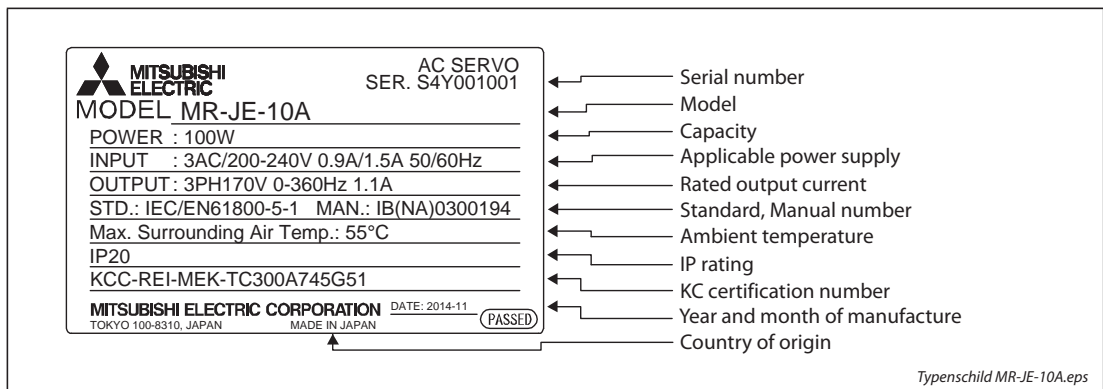
Fig. 2-4:   *Rating plate MR-JE-10A*

2.5   Servo motors

This section shows the servo motors that are available for the servo amplifier series MR-JE.

Refer to section 2.3. to get the recommended combinations of servo amplifiers and servo motors.

2.5.1   Model overview

Series HG-KN   Series HG-SN

Ansicht HG-□□.eps
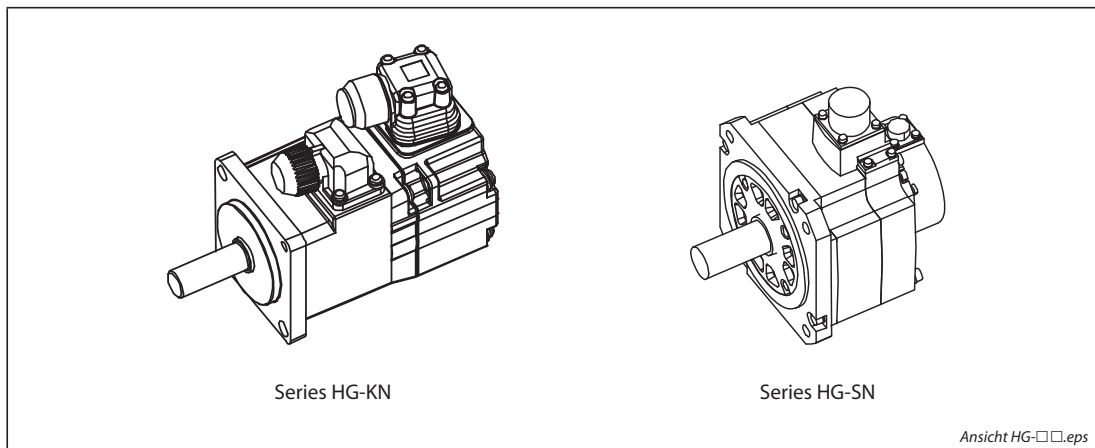
Fig. 2-5:   *Rotatory servo motors*

2.5.2   Rating plate

The rating plate of the servo motor HG-KN13J is shown below.
This rating plate is representative of all other servo motor models.

Model	→ HG-KN13J
Input power, rated current and rated output	→ 3AC 112 V 0.8 A 100W
Mass and insulation class	→ 0.57 kg Cl.B, A(UL) CONT
Rated speed	→ 3000 r/min 0-250 Hz
Induced voltage constant and maximum ambient temperature	→ 31 mV/min⁻¹ 40°C
Power factor and IP rating	→ P.F. 98% IP65
Serial number ①	→ SER.M00001234 15X
Country of origin and conforming standards	→ MADE IN JAPAN / FABRIQUÉ AU JAPON IEC60034-1 / IEC61800-3
Manufacturer	→ MITSUBISHI ELECTRIC CORPORATION / TOKYO 100-8310 JAPAN

Typenschild HG-KN13J.eps, Zertifikatskennzeichnung HG-KN13J.eps

Fig. 2-6:   *Rating plate HG-KN13J*

① Production year and month of the servo motor are indicated in a serial number on the rating plate.
The year and month are indicated by the last two digits of the year and one digit of the month [1 to 9, X(10), Y(11), and Z(12)].
For January 2012, the Serial No. is like, "SER. _ _ _ _ _ _ _ _ _ 121".

② Products approved by Certification Bodies are marked. The marks depends on the Certification Bodies.

NOTE | All rotary servo motors meet the standards CE, UL and CSA.

2.5.3 Servo motor series HG-KN and HG-SN

● Model HG-KN – Small capacity, low inertia

Low motor inertia moment makes this unit well suited for high-dynamic positioning operations with extra small cycle times.

Application example

– Inserters, mounters, bonders

– Printed board hole openers

– In-circuit testers

– Label printers

– Knitting and embroidery machinery

– Ultra-small robots and robot tips

● Model HG-SN – Medium capacity, medium inertia

Larger motor inertia moment makes this unit well suited for machines with fluctuating load inertia moment or machines with low rigidity such as conveyors.

Application example

– Conveyors

– Food preparation machinery

– Printers

– Small loaders and unloaders

– Small robots and component assembly devices

– Small X-Y tables

– Small press feeders

Model designation

HG-KN 1 3 B J □

Code	Shaft type
—	Standard (straight shaft)
K	Keyway shaft (with/without key) [1]
D	D cut shaft

Code	Oil seal
—	None
J	✔

Code	Electromagnetic brake
—	—
B	✔

Code	Rated speed [1/min]
2	2000 [2]
3	3000 [3]

Code	Rated output [W]
1 [3]	100
2 [3]	200
4 [3]	400
5 [2]	500
7 [3]	750
10 [2]	1000
15 [2]	1500
20 [2]	2000
30 [2]	3000

Series name	Feature
HG-KN	Low inertia/Small capacity
HG-SN	Medium inertia/Medium capacity
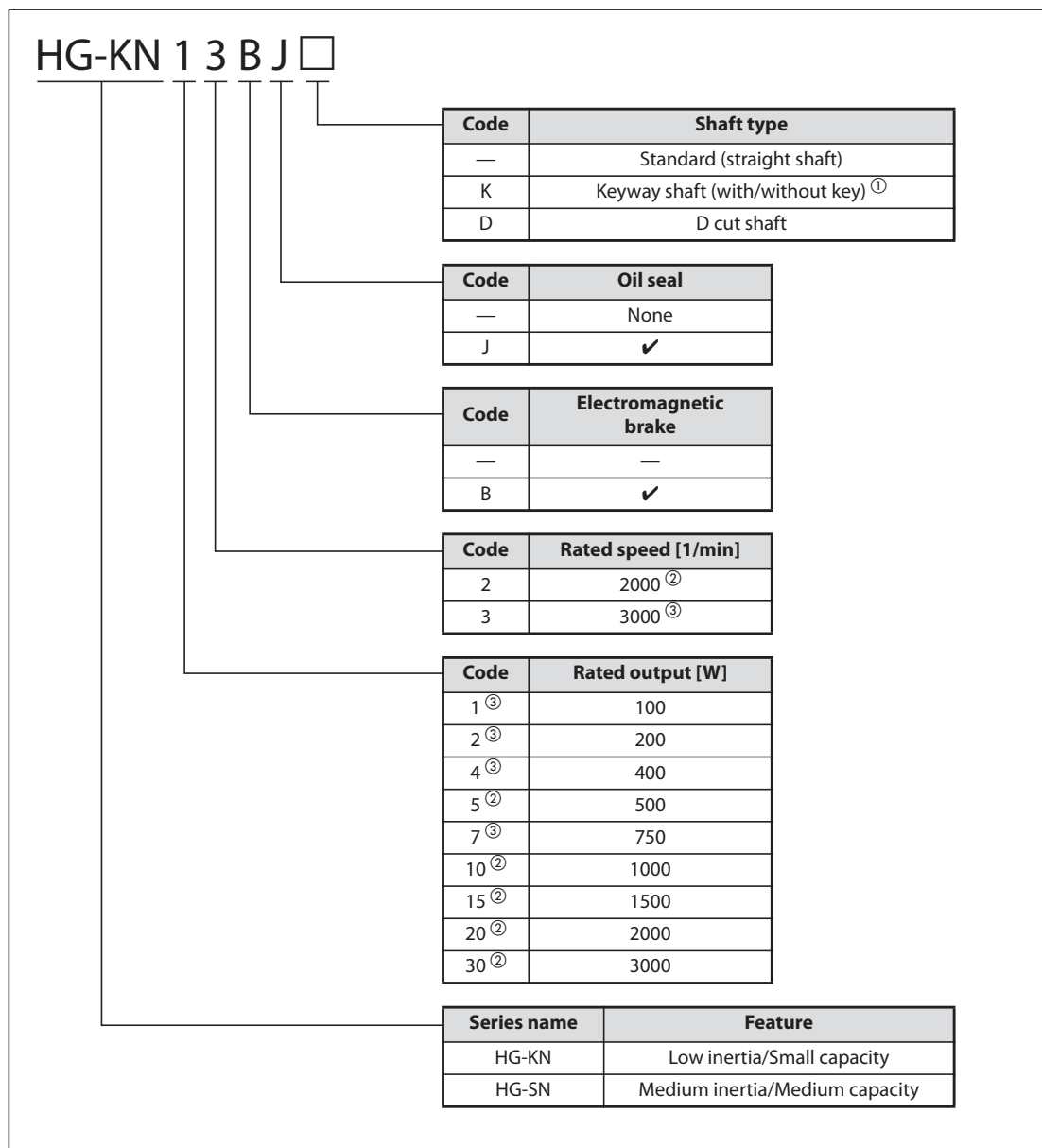
Fig. 2-7:   *Model designation of the servo motor series HG-KN and HG-SN*

[1] For the HG-SN series the key is not included

[2] Only for HG-SN series

[3] Only for HG-KN series
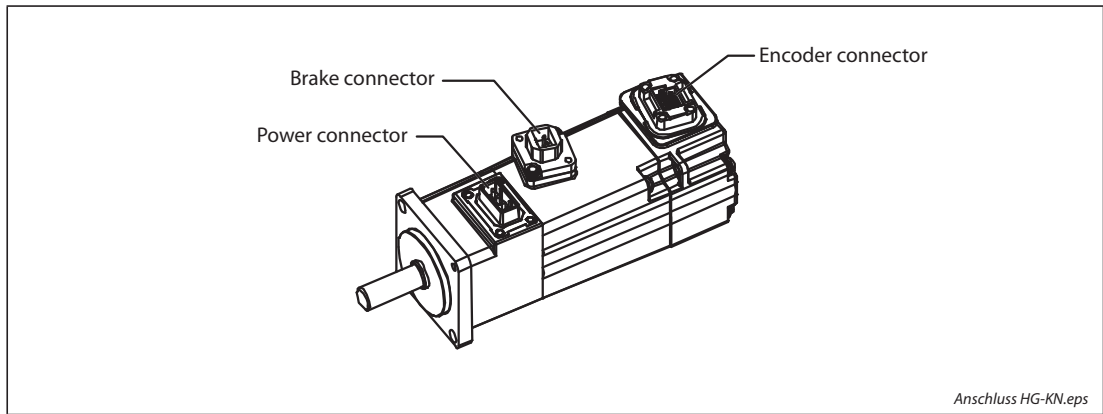
Fig. 2-8:   *Servo motor series HG-KN*
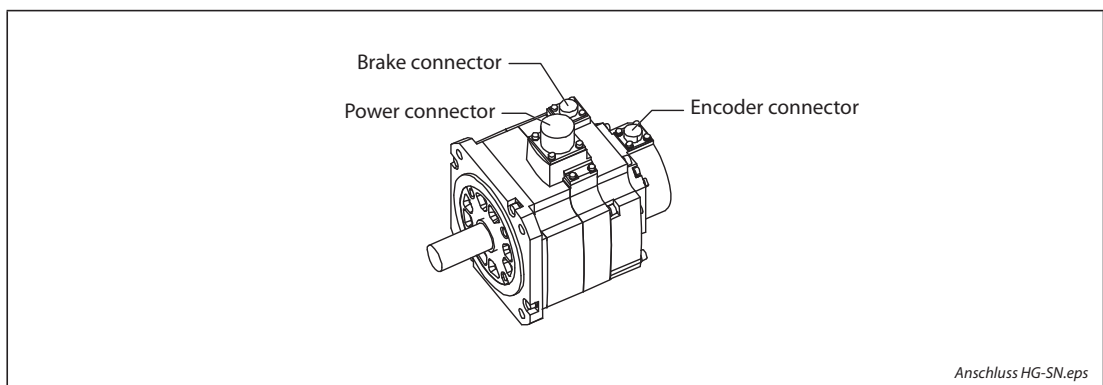
Fig. 2-9:   *Servo motor series HG-SN*

| NOTE | Servo motors without electromagnetic brake have no brake connector. |

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3   Installation and wiring

	DANGER:
⚡	**Before starting wiring, switch power off, then wait for more than 15 minutes, and after the charge lamp has gone off, make sure that the voltage is safe with a tester or like. Otherwise, you may get an electric shock.**

3.1   Wiring of power supply, motor and PE terminal

The power supply of some models of the servo amplifier series MR-JE can either be 1-phase or 3-phase AC voltage, while others can only be powered by 3-phase power supply.

Power supply of MR-JE-10A–100A/MR-JE-10B–100B/MR-JE-10BF–200BF/MR-JE-10C–100C

Item	1-phase ①	3-phase
Power supply or Main circuit power supply	L1, L3	L1, L2, L3
Control circuit power supply ②	L11, L21	
Voltage	200–240 V AC	
Permissible voltage fluctuation	170–264 V AC	
Frequency	50 Hz/60 Hz ±5%	

Power supply of MR-JE-200A/MR-JE-200B/MR-JE-200C

Item	1-phase ①	3-phase
Power supply	L1, L2	L1, L2, L3
Voltage	200–240 V AC	
Permissible voltage fluctuation	170–264 V AC	
Frequency	50 Hz/60 Hz ±5%	

Power supply of MR-JE-300A/MR-JE-300B/MR-JE-300BF/MR-JE-300C

Item	3-phase ③
Power supply or Main circuit power supply	L1, L2, L3
Control circuit power supply ②	L11, L21
Voltage	200–240 V AC
Permissible voltage fluctuation	170–264 V AC
Frequency	50 Hz/60 Hz ±5%

① When using 1-phase 200 V AC to 240 V AC power supply, operate the servo amplifier MR-JE-100A, MR-JE-200A, MR-JE-100B, MR-JE-200B, MR-JE-100BF, MR-JE-200BF, MR-JE-100C or MR-JE-200C at 75% or smaller effective load ratio.

② Only for MR-JE-BF series:
The power supply of the control circuit is connected to L11 and L21. For 3-phase connection of the main circuit power supply L11 should be in phase with L1 and L21 in phase with L2, for 1-phase connection L11 should be in phase with L1 and L21 in phase with L3.

③ It is not possible, to connect these models only to one phase.

The power supply with 1-phase is connected to the terminals L1 and L3 or L1 and L2, with 3-phase to terminals L1, L2 and L3.

The motor is connected to terminals U, V and W.

Additionally the servo amplifier must be grounded via the PE terminal (Protective Earth).

NOTE	Even if the servo amplifier is supplied with an 1-phase AC voltage of 200 to 240 V the servo motor is connected in the same way to the output of the servo amplifier as with a 3-phase power supply. The power supply from the servo amplifier to the servo motor is always 3 phase.

WARNING:

- *Do not connect AC power supply directly to the output terminals U, V and W of the servo amplifier. Permanent damage of the servo amplifier as well as an immediate danger to the operator would be the consequence.*
- *When a 1-phase 200 V AC to 240 V AC power supply is used, the connection destination differs depending on the servo amplifier.*
- *Connect the 1-phase 200 V AC to 240 V AC power supply to L1 and L3. For the MR-JE-200A, MR-JE-200B and MR-JE-200C servo amplifier connect it to L1 and L2.*
- *You can use the neutral point of a 3-phase 400 V AC class power supply to input a 1-phase 200 V AC class power supply to the servo amplifier.*
- *Alarm switch for MR-JE-B/MR-JE-BF:*
  Configure the power supply circuit that turns off the magnetic contactor after an alarm occurs on the controller side.

MR-JE Spannungsversorgung 1-phasig_L1_L3
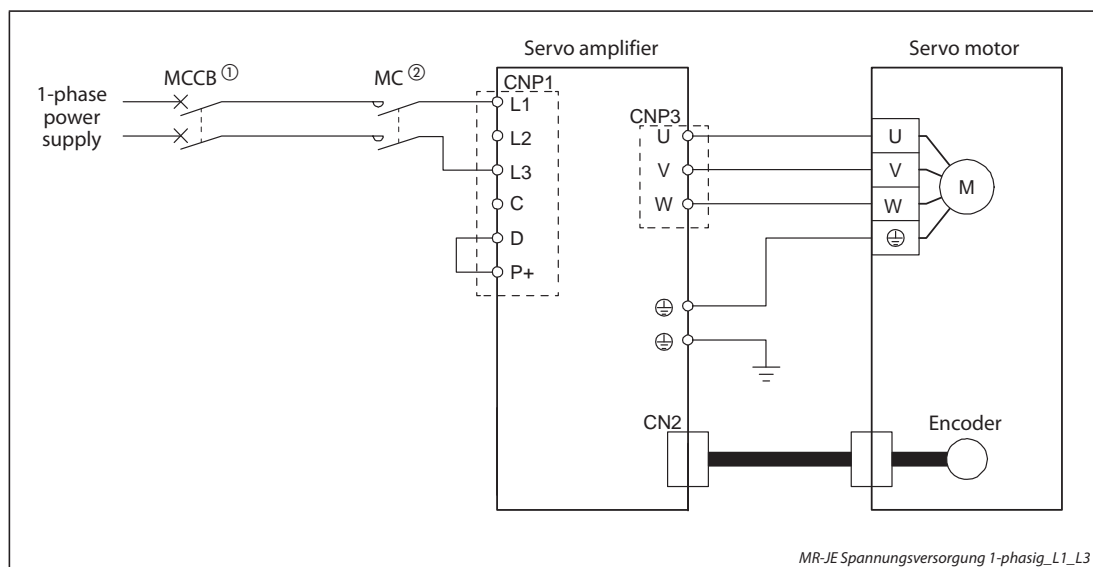
Fig. 3-1:   *Wiring of the power inputs and outputs of the servo amplifier*
           (1-phase power supply to L1 and L3)

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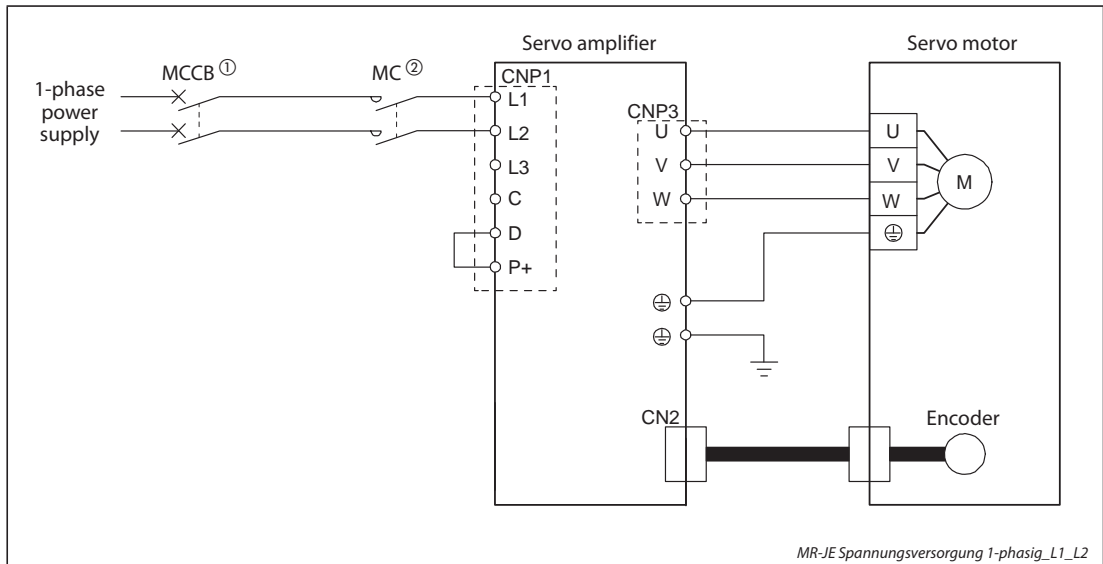
Fig. 3-2: Wiring of the power inputs and outputs of the servo amplifier
(1-phase power supply to L1 and L2)
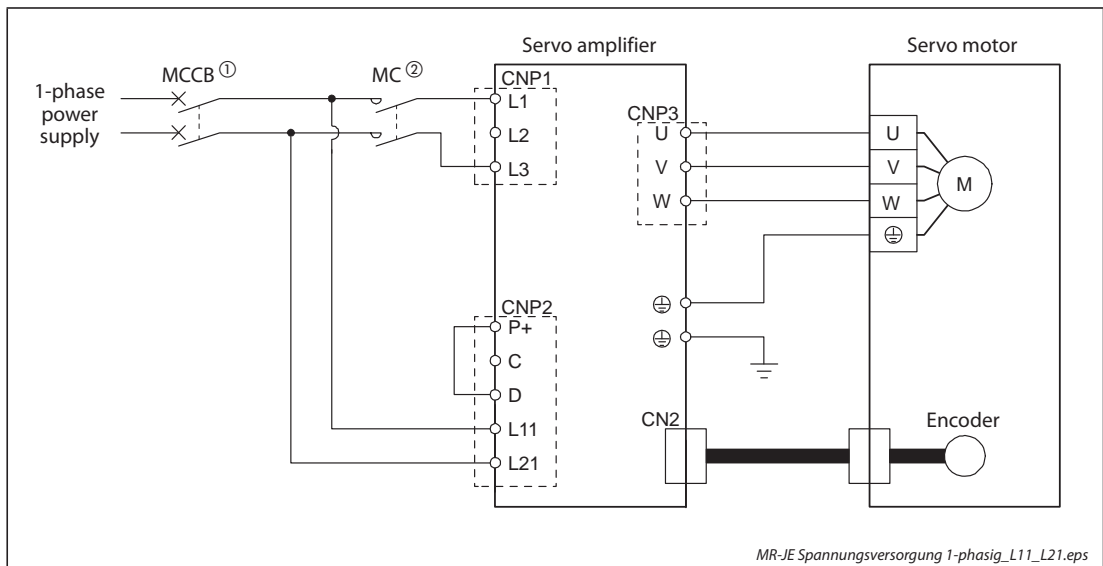
Fig. 3-3: Wiring of the power inputs (main/control circuit) and outputs of the servo amplifier
(1-phase power supply to L1/L11 and L3/L21)
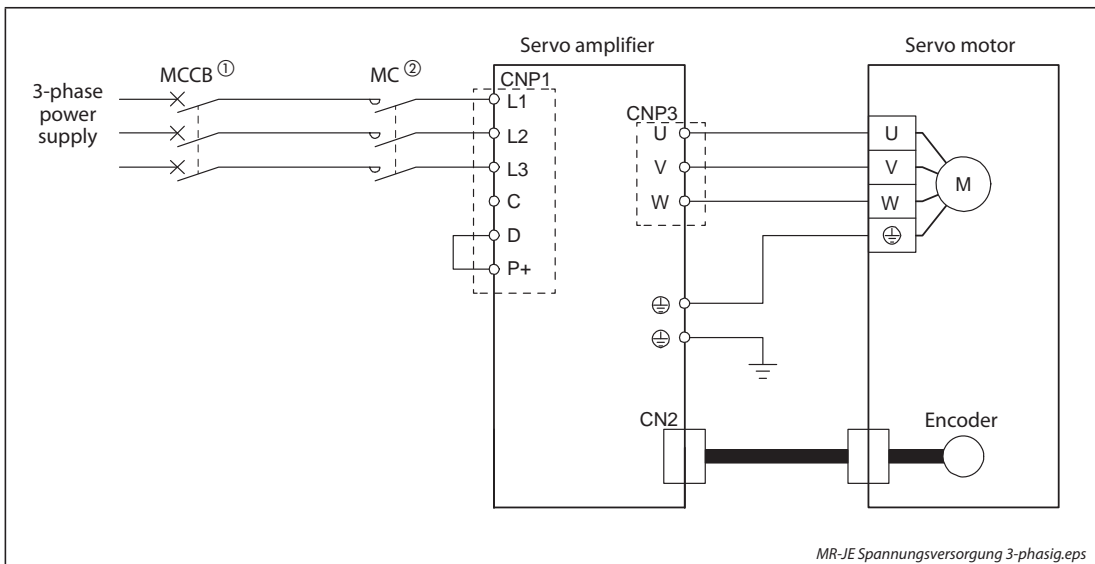
Fig. 3-4: *Wiring of the power inputs and outputs of the servo amplifier (3-phase power supply)*
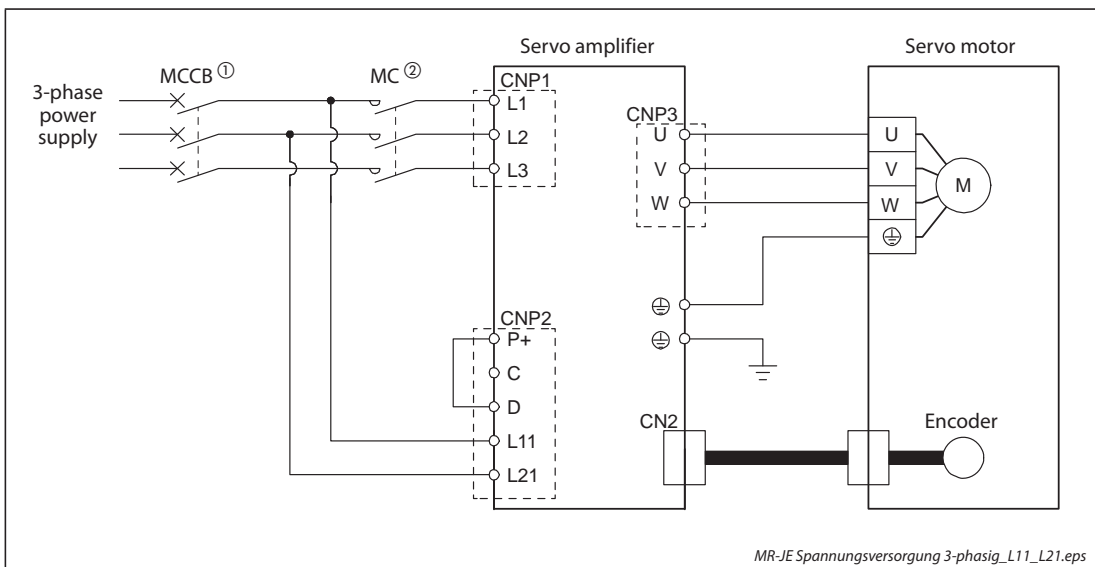
Fig. 3-5: *Wiring of the power inputs (main/control circuit) and outputs of the servo amplifier (3-phase power supply)*

[1] MCCB = Molded-case circuit breaker

[2] MC = Magnetic contactor

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Abbreviation	Terminals	Description	
L1, L3 (L1, L2) [1]	Power supply (Main circuit power supply [2]) (1-phase)	Power supply of the servo amplifier	
L1, L2, L3	Power supply (Main circuit power supply [2]) (3-phase)		
U, V, W	Servo motor power output	Voltage output of the servo amplifier	
L11, L21 [2]	Control circuit power supply	Power supply of the control circuit	
P+, C, D	Regenerative option	MR-JE-100A/-100B/-100C or less: MR-JE-20BF or less:	When using a servo amplifier built-in regenerative resistor, connect P+ and C.
		MR-JE-200A/-200B/-200C or more: MR-JE-40BF or more:	When using a servo amplifier built-in regenerative resistor, connect P+ and D. (factory-wired) When using regenerative option, disconnect the P+ and D terminals and connect the regenerative option to P+ terminal and C terminal.
N–	—	This terminal is for manufacturer adjustment. Leave this open.	
⏚	Protective earth (PE)	Connect it to the grounding terminal of the servo motor and to the protective earth (PE) of the cabinet for grounding.	

Tab. 3-1:   *Power terminals of the servo amplifier*

[1] Depending on the model

[2] Only for MR-JE-BF series

NOTE | Please refer to the respective instruction manual of the servo amplifier series MR-JE-A, MR-JE-B, MR-JE-BF and MR-JE-C for details about different terminal designations of specific servo amplifier models.

3.2   Connectors and signal arrangements

Apart from the terminals of the power unit for supply voltage and motor, a servo amplifier is equipped with even more terminals for controlling the servo amplifier. These additional terminals are used for the safety function (STO), to connect an optional PC, to connect an optional battery and for monitoring, diagnosis and so on.

3.2.1   Servo amplifier series MR-JE-A

The shown front view is that of the servo amplifier MR-JE-40A or less. For all models of the MR-JE-A series the terminal configuration is the same.
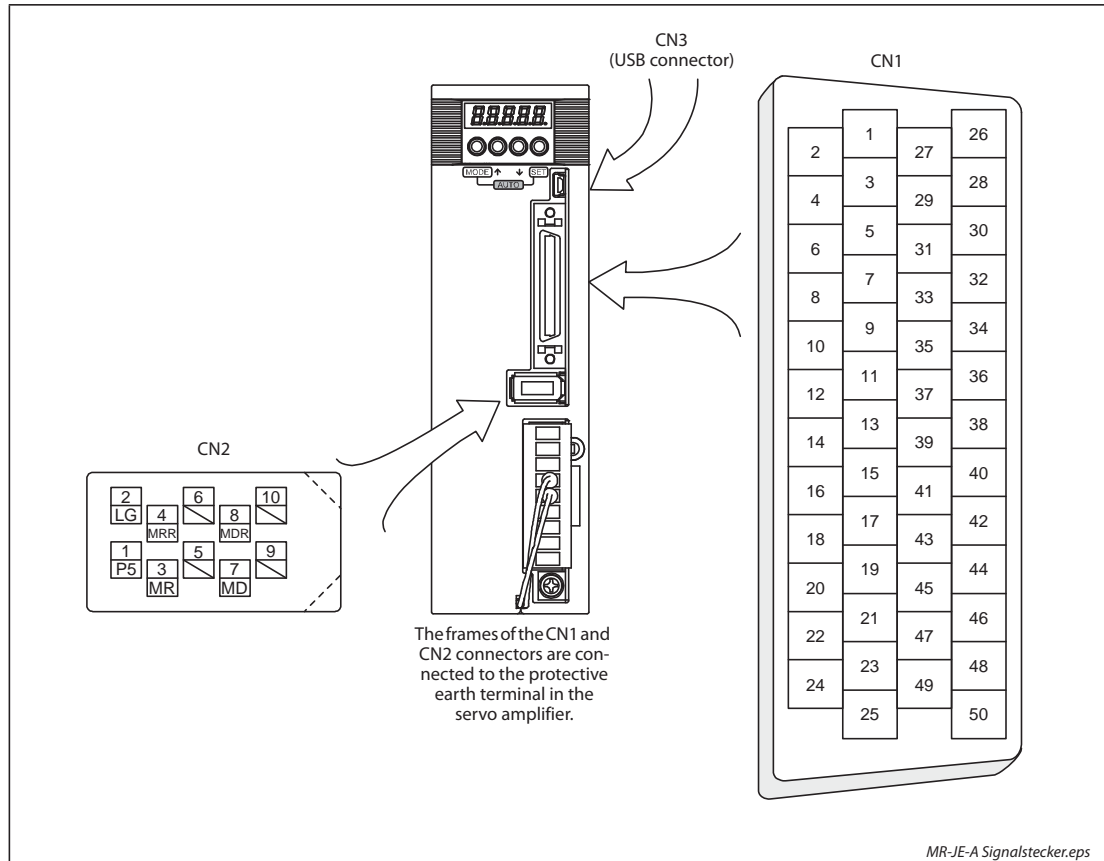
Fig. 3-6:   *MR-JE-A signal arrangement*

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Signal assignment

Connector	Name	Description
CN1	I/O devices	Control interface (see tab. 3-3)
CN2	Encoder connector	Connector for the servo motor encoder
CN3	Communication (USB)	Connector for a personal computer (PC)

Tab. 3-2: *Description of CN1, CN2, and CN3*

Signal arrangement of CN1

The device assignment of the CN1 connector pins changes depending on the control mode. For the pins which are given parameters in the related parameter column, their devices will be changed using those parameters.

Pin No.	Signal I/O [1]	I/O signals in control modes [2]								Pr.
		P	P/S	S	S/T	T	T/P	CP	CL	
1	—	—	—	—	—	—	—	—	—	—
2	I	—	—/VC	VC	VC/VLA	VLA	VLA/—	VC	VC	—
3	—	LG	LG	LG	LG	LG	LG	LG	LG	—
4	O	LA	LA	LA	LA	LA	LA	LA	LA	—
5	O	LAR	LAR	LAR	LAR	LAR	LAR	LAR	LAR	—
6	O	LB	LB	LB	LB	LB	LB	LB	LB	—
7	O	LBR	LBR	LBR	LBR	LBR	LBR	LBR	LBR	—
8	O	LZ	LZ	LZ	LZ	LZ	LZ	LZ	LZ	—
9	O	LZR	LZR	LZR	LZR	LZR	LZR	LZR	LZR	—
10	I	PP	PP/—	[5]	[5]	[5]	—/PP	[5]	[5]	PD43/PD44 [4]
11	I	PG	PG/—	—	—	—	—/PG	PG	PG	—
12	—	OPC	OPC/—	—	—	—	—/OPC	OPC	OPC	—
13	O	SDP	SDP	SDP	SDP	SDP	SDP	SDP	SDP	—
14	O	SDN	SDN	SDN	SDN	SDN	SDN	SDN	SDN	—
15	I	SON	SON	SON	SON	SON	SON	SON	SON	PD03/PD04
16	—	—	—	—	—	—	—	—	—	—
17	—	—	—	—	—	—	—	—	—	—
18	—	—	—	—	—	—	—	—	—	—
19	I	RES	RES/ST1	ST1	ST1/RS2	RS2	RS2/RES	DI0	DI0	PD11/PD12
20	—	DICOM	DICOM	DICOM	DICOM	DICOM	DICOM	DICOM	DICOM	—
21	—	DICOM	DICOM	DICOM	DICOM	DICOM	DICOM	DICOM	DICOM	—
22	—	—	—	—	—	—	—	—	—	—
23	O	ZSP	ZSP	ZSP	ZSP	ZSP	ZSP	ZP [8]	ZP [8]	PD24
24	O	INP	INP/SA	SA	SA/—	—	—/INP	INP	INP	PD25
25	—	—	—	—	—	—	—	—	—	—
26	O	MO1	MO1	MO1	MO1	MO1	MO1	MO1	MO1	PC14
27	I	TLA	TLA [3]	TLA [3]	TLA/TC [3]	TC	TC/TLA [3]	TLA [3]	TLA [3]	—
28	—	LG	LG	LG	LG	LG	LG	LG	LG	—
29	O	MO2	MO2	MO2	MO2	MO2	MO2	MO2	MO2	PC15
30	—	LG	LG	LG	LG	LG	LG	LG	LG	—
31	I	TRE	TRE	TRE	TRE	TRE	TRE	TRE	TRE	—
32	—	—	—	—	—	—	—	—	—	—
33	O	OP	OP	OP	OP	OP	OP	OP	OP	—
34	—	LG	LG	LG	LG	LG	LG	LG	LG	—

Tab. 3-3: *Signal arrangement of CN1 in MR-JE-A (1)*

Pin No.	Signal I/O [1]	I/O signals in control modes [2]								Pr.
		P	P/S	S	S/T	T	T/P	CP	CL	
35	I	NP	NP/—	[5]	[5]	[5]	—/NP	[5]	[5]	PD43/PD44 [4]
36	I	NG	NG/—	—	—	—	—/NG	NG	NG	—
37 [7]	I	PP2	PP2/—	[6]	[6]	[6]	—/PP2	[6]	[6]	PD43/PD44 [4]
38 [7]	I	NP2	NP2/—	[6]	[6]	[6]	—/NP2	[6]	[6]	PD45/PD46 [4]
39	I	RDP	RDP	RDP	RDP	RDP	RDP	RDP	RDP	—
40	I	RDN	RDN	RDN	RDN	RDN	RDN	RDN	RDN	—
41	I	CR	CR/ST2	ST2	ST2/RS1	RS1	RS1/CR	DI1	DI1	PD13/PD14
42	I	EM2	EM2	EM2	EM2	EM2	EM2	EM2	EM2	—
43	I	LSP	LSP	LSP	LSP/—	—	—/LSP	LSP	LSP	PD17/PD18
44	I	LSN	LSN	LSN	LSN/—	—	—/LSN	LSN	LSN	PD19/PD20
45	—	—	—	—	—	—	—	—	—	—
46	—	DOCOM	DOCOM	DOCOM	DOCOM	DOCOM	DOCOM	DOCOM	DOCOM	—
47	—	DOCOM	DOCOM	DOCOM	DOCOM	DOCOM	DOCOM	DOCOM	DOCOM	—
48	O	ALM	ALM	ALM	ALM	ALM	ALM	ALM	ALM	—
49	O	RD	RD	RD	RD	RD	RD	RD	RD	PD28
50	—	—	—	—	—	—	—	—	—	—

Tab. 3-3: *Signal arrangement of CN1 in MR-JE-A (2)*

[1] I: Input signal, O: Output signal

[2] P: Position control mode, S: Speed control mode, T: Torque control mode, P/S: Position/speed control change mode, S/T: Speed/torque control change mode, T/P: Torque/position control change mode, CP: Positioning mode (point table method), CL: Positioning mode (program method)

[3] TLA will be available when TL (External torque limit selection) is enabled with parameters PD03,PD11, PD13, PD17, and PD19 (for positioning mode: PD04, PD12, PD14, PD18, PD20, and PD44).

[4] This is available with servo amplifiers with software version B7 or later.

[5] This is available as an input device of sink interface. Input devices are not assigned by default. Assign the input devices with parameters PD43 to PD46 (for positioning mode: PD44 and PD46) as necessary. In addition, supply + of 24 V DC to the CN1-12 pin. This is available with servo amplifiers with software version B7 or later.

[6] This is available as an input device of source interface. Input devices are not assigned by default. Assign the input devices with parameters PD43 to PD46 (for positioning mode: PD44 and PD46) as necessary.

[7] These pins are available with servo amplifiers having software version B7 or later, and manufactured in May 2015 or later.

[8] Assign the following output device to CN1-23 pin with parameter PD24.
CN1-23: ZP (Home position return completion)

MITSUBISHI ELECTRIC

Meaning of the symbols

The most important signals are explained in the table below. You will find detailed information about all signals in the instruction manual of the respective servo amplifier.

Signal		Symbol	Name	Description	
Control terminals	Signal inputs	RES	Reset	Turn RES on for more than 50 ms to reset the alarm. Some alarms cannot be deactivated by RES (Reset).	
		LSP	Forward rotation stroke end	To start the Servo motor in both directions of rotation both inputs must be switched on. Turn it off to bring the motor to a sudden stop and make it servo-locked. If one input switches off because the limit switch has been reached, rotary movement is possible only in the opposite direction of the activated limit switch.	
		LSN	Reverse rotation stroke end		
		SON	Servo-on	Turn SON on to power on the main circuit and make the servo amplifier ready to operate (servo-on). Turn it off to shut off the base circuit and coast the servo motor.	
		ST1	Forward rotation start	If terminal ST1 is switched on, the motor turns in counter-clockwise rotation.	If both ST1 and ST2 are switched on or off during operation, the servo motor will be decelerated to a stop (servo-lock).
		ST2	Reverse rotation start	If terminal ST2 is switched on, the motor turns in clockwise rotation.	
		EM2	Forced stop 2	Turn off EM2 (open between commons) to decelerate the servo motor to a stop with commands. Turn EM2 on (short between commons) in the forced stop state to reset that state. EM2 and EM1 are mutually exclusive. EM2 has the same function as EM1 in the torque control mode.	
		EM1	Forced stop 1	When EM1 is turned off (open between commons), the base circuit shuts off, and the dynamic brake operates to decelerate the servo motor to a stop. The forced stop will be reset when EM1 is turned on (short between commons).	
		SP1	Speed selection 1	Select the command speed for operation in speed control mode. Select the limited speed for operation in torque control mode.	
		SP2	Speed selection 2		
		SP3	Speed selection 3		
	Signal outputs	ALM	Malfunction	When an alarm occurs, ALM will turn off. When an alarm does not occur, ALM will turn on after 2.5 s to 3.5 s after power-on.	
		RD	Ready	RD turns on when the servo is switched on and the servo amplifier is ready to operate.	
		INP	In position	INP turns on when the number of droop pulses is in the preset in-position range. INP turns on when servo-on turns on.	
		WNG	Warning	When warning has occurred, WNG turns on. When a warning is not occurring, turning on the power will turn off WNG after 2.5 s to 3.5 s.	
		ACD0 ACD1 ACD2	Alarm code	The alarm code is output as a 3-Bit signal depending on the alarm that occurs. The output of the alarm code has to be activated by parameter PD34.	
		MBR	Electromagnetic brake interlock	When using the device, set operation delay time of the electromagnetic brake in parameter PC16. When a servo-off status or alarm occurs, MBR will turn off.	

Tab. 3-4:   *Selection of the most important input and output signals of CN1 (1)*

Signal		Symbol	Name	Description	
Analog terminals	Command inputs	TLA	Analog torque limit	When TLA is enabled, torque is limited in the full servo motor output torque range. Apply 0 V to +10 V DC between TLA and LG. Connect the positive terminal of the power supply to TLA. The maximum torque is generated at +10 V. Resolution: 10 bits	
		TC	Analog torque command	This is used to control torque in the full servo motor output torque range. Apply 0 V to ±8 V DC between TC and LG. The maximum torque is generated at ±8 V. The speed at ±8 V can be changed with parameter PC13.	
		VC	Analog speed command	Apply 0 V to ±10 V DC between VC and LG. Speed set in parameter PC12 is provided at ±10 V. Resolution: 14 bits or equivalent	
		VLA	Analog speed limit	Apply 0 V to ±10 V DC between VLA and LG. Speed set in parameter PC12 is provided at ±10 V.	
	Analog outputs	MO1	Analog monitor 1	Used to output the data set in parameter PC14 to across MO1–LG in terms of voltage.	Output voltage: ±10 V Resolution: 10 bits or equivalent
		MO2	Analog monitor 2	Used to output the data set in parameter No. PC15 to across MO2–LG in terms of voltage.	
Communication		SDP	RS-422/RS-485 I/F	These are terminals for RS-422/RS-485 communication.	
		SDN			
		RDP			
		RDN			
		TRE			
Power supply	Common	DICOM	Digital I/F power supply input	For sink interface, connect + of 24 V DC external power supply.	Input 24 V DC (± 10%, 300 mA) to I/O interface
				For source interface, connect – of 24 V DC external power supply.	
		OPC	Open-collector sink interface power supply input	When inputting a pulse train in the open-collector type with sink interface, supply this terminal with the positive (+) power of 24 V DC.	
		DOCOM	Digital I/F common	For sink interface, connect – of 24 V DC external power supply.	Common terminal of input signal such as EM2 of the servo amplifier. This is separated from LG.
				For source interface, connect + of 24 V DC external power supply.	
		LG		This is a common terminal for TLA, TC, VC, VLA, FPA, FPB, OP, MO1, and MO2 CN1-3, CN1-28, CN1-30, CN1-34 are connected internally.	
		SD		Shielding, housing Connect the external conductor of the shielded wire.	

Tab. 3-4: *Selection of the most important input and output signals of CN1 (2)*

3.2.2 Servo amplifier series MR-JE-B

The shown front view is that of servo amplifier MR-JE-40B or less. The terminal configuration is the same for all models of the MR-JE-B series.
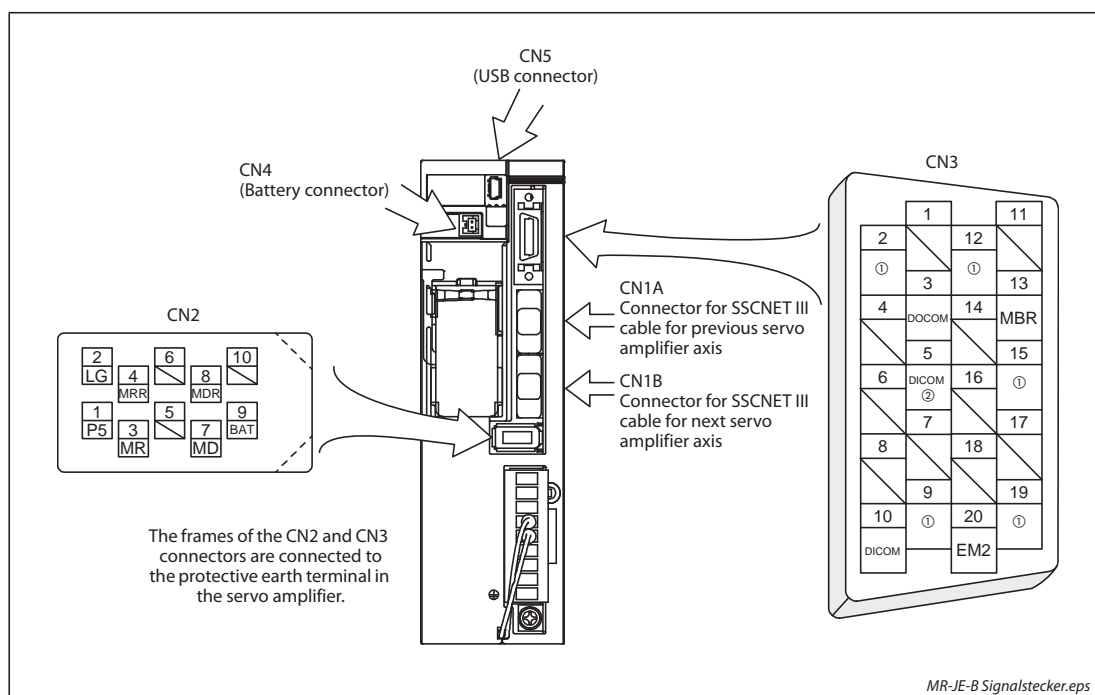
Fig. 3-7:   *MR-JE-B signal arrangement*

① No device is assigned to these pins by default. You can assign any input device to CN3-2, CN3-12, and CN3-19 pins with parameters PD03 to PD05. You can also assign any output device to CN3-9 and CN3-15 pins with parameters PD08 and PD09. These pins are available with servo amplifiers having software version C5 or later, and manufactured in May 2016 or later.

② The CN3-5 pin is available with servo amplifiers having software version C5 or later, and manufactured in May 2016 or later.

Signal assignment

Connector	Name	Description
CN1A	Connector for SSCNET III cable for previous servo amplifier axis	Used for connection with the controller or the servo amplifier of the previous axis.
CN1B	Connector for SSCNET III cable for next servo amplifier axis	Used for connection with the servo amplifier of the next axis. Put a cap on the CN1B connector of the final axis.
CN2	Encoder connector	Connector for the servo motor encoder
CN3	I/O devices	Control interface (see tab. 3-6)
CN4	Battery terminal	For connecting the battery (MR-BAT6V1SET-A) to store the data of the absolute position detection (observe the following note). When you want to connect the battery, disconnect the power supply of the main circuit and wait for more than 15 minutes, after the charge lamp has gone off. Replacing a battery will erase the absolute position data.
CN5	Communication (USB)	Connector for a personal computer (PC)

Tab. 3-5:   *Description of CN1A, CN1B, CN2, CN3, CN4, and CN5*

Signal arrangement of CN3

Pin No.	Signal I/O	Symbol of I/O signal	Assignment with parameter [1]	Pin No.	Signal I/O	Symbol of I/O signal	Assignment with parameter [1]
1	—	—	—	11	—	—	—
2	I	—[2]	PD03	12	I	—[2]	PD04
3	—	DOCOM	—	13	O	MBR[3]	PD07
4	—	—	—	14	—	—	—
5	—	DICOM	—	15	O	—[2]	PD09
6	—	—	—	16	—	—	—
7	—	—	—	17	—	—	—
8	—	—	—	18	—	—	—
9	O	—[2]	PD08	19	I	—[2]	PD05
10	—	DICOM	—	20	I	EM2	—

Tab. 3-6:   *Signal arrangement of CN3 in MR-JE-B*

[1] Assignable symbols:
FLS	RLS	DOG	RD	ALM
INP	MBR	TLC	WNG	BWNG
ZSP	CDPS	ABSV	SA	MTTR

[2] Not assigned (always off)

[3] Symbol of initial setting

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Meaning of symbols

The most important signals are explained in the table below. You will find detailed information about all signals in the instruction manual of the respective servo amplifier.

Signal		Symbol	Name	Description	
Control terminals	Signal input	EM2	Forced stop 2	Turn off EM2 (open between commons) to decelerate the servo motor to a stop with commands. Turn EM2 on (short between commons) in the forced stop state to reset that state. EM2 and EM1 are mutually exclusive. EM2 has the same function as EM1 in the torque control mode.	
		EM1	Forced stop 1	When EM1 is turned off (open between commons), the base circuit shuts off, and the dynamic brake operates to decelerate the servo motor to a stop. The forced stop will be reset when EM1 is turned on (short between commons).	
	Signal outputs	ALM	Alarm	When the protective circuit is activated to shut off the base circuit, ALM will turn off. When an alarm does not occur, ALM will turn on after 2.5 s to 3.5 s after power-on.	The signal must first be assigned to a certain output terminal of plug CN3 via parameter setting PD07–PD09.
		RD	Ready	RD turns on when the servo is switched on and the servo amplifier is ready to operate.	
		INP	In position	INP turns on when the number of droop pulses is in the preset in-position range. The device cannot be used in the speed control mode, torque control mode, and for continuous operation to torque control mode.	
		WNG	Warning	When warning has occurred, WNG turns on. When a warning is not occurring, turning on the power will turn off WNG after 2.5 s to 3.5 s.	
		MBR	Electromagnetic brake interlock	When using the device, set operation delay time of the electromagnetic brake in parameter PC02. When a servo-off status or alarm occurs, MBR will turn off.	
Power supply	Common	DICOM	Digital I/F power supply input	For sink interface, connect + of 24 V DC external power supply.	Input 24 V DC (± 10%, 300 mA) to I/O interface
				For source interface, connect – of 24 V DC external power supply.	
		DOCOM	Digital I/F common	For sink interface, connect – of 24 V DC external power supply.	Common terminal of input signal such as EM2 of the servo amplifier. This is separated from LG.
				For source interface, connect + of 24 V DC external power supply.	
		SD		Shielding, housing Connect the external conductor of the shielded wire.	

Tab. 3-7:   *Selection of the most important input and output signals of CN3*

3.2.3   Servo amplifier series MR-JE-BF

The shown front view is that of servo amplifier MR-JE-40BF or less. The terminal configuration is the same for all models of the MR-JE-BF series.
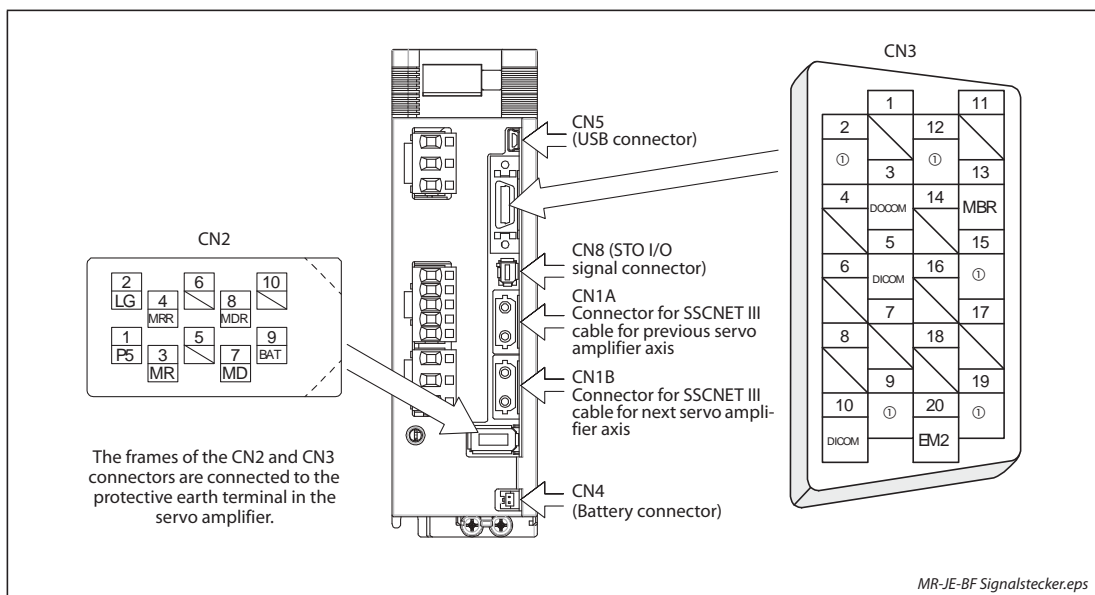
Fig. 3-8:   MR-JE-BF signal arrangement

① No device is assigned to these pins by default. You can assign any input device to CN3-2, CN3-12, and CN3-19 pins with parameters PD03 to PD05. You can also assign any output device to CN3-9 and CN3-15 pins with parameters PD08 and PD09.

Signal assignment

Connector	Name	Description
CN1A	Connector for SSCNET III cable for previous servo amplifier axis	Used for connection with the controller or the servo amplifier of the previous axis.
CN1B	Connector for SSCNET III cable for next servo amplifier axis	Used for connection with the servo amplifier of the next axis. Put a cap on the CN1B connector of the final axis.
CN2	Encoder connector	Connector for the servo motor encoder
CN3	I/O devices	Control interface (see tab. 3-9)
CN4	Battery terminal	For connecting the battery (MR-BAT6V1SET-A) to store the data of the absolute position detection (observe the following note). When you want to connect the battery, disconnect the power supply of the main circuit and wait for more than 15 minutes, after the charge lamp has gone off. When replacing the battery, leave the power supply of the control circuit on and disconnect only the supply voltage of the main circuit. Otherwise, the absolute position data will be lost.
CN5	Communication (USB)	Connector for a personal computer (PC)
CN8	STO connector	Connector for safety function (Safe Torque Off)

Tab. 3-8:   Description of CN1A, CN1B, CN2, CN3, CN4, CN5 and CN8

Signal arrangement of CN3

Pin No.	Signal I/O	Symbol of I/O signal	Assignment with parameter [1]	Pin No.	Signal I/O	Symbol of I/O signal	Assignment with parameter [1]
1	—	—	—	11	—	—	—
2	I	—[2]	PD03	12	I	—[2]	PD04
3	—	DOCOM	—	13	O	MBR[3]	PD07
4	—	—	—	14	—	—	—
5	—	DICOM	—	15	O	—[2]	PD09
6	—	—	—	16	—	—	—
7	—	—	—	17	—	—	—
8	—	—	—	18	—	—	—
9	O	—[2]	PD08	19	I	—[2]	PD05
10	—	DICOM	—	20	I	EM2	—

Tab. 3-9:   *Signal arrangement of CN3 in MR-JE-BF*

[1] Assignable symbols:

FLS	RLS	DOG	RD	ALM
INP	MBR	TLC	WNG	BWNG
ZSP	CDPS	ABSV	SA	MTTR

[2] Not assigned (always off)

[3] Symbol of initial setting

Meaning of symbols

The most important signals are explained in the table below. You will find detailed information about all signals in the instruction manual of the respective servo amplifier.

Signal		Symbol	Name	Description	
Control terminals	Signal inputs	EM2	Forced stop 2	Turn off EM2 (open between commons) to decelerate the servo motor to a stop with commands. Turn EM2 on (short between commons) in the forced stop state to reset that state. EM2 and EM1 are mutually exclusive. EM2 has the same function as EM1 in the torque control mode.	
		EM1	Forced stop 1	When EM1 is turned off (open between commons), the base circuit shuts off, and the dynamic brake operates to decelerate the servo motor to a stop. The forced stop will be reset when EM1 is turned on (short between commons).	
	Signal outputs	ALM	Alarm	When the protective circuit is activated to shut off the base circuit, ALM will turn off. When an alarm does not occur, ALM will turn on after 2.5 s to 3.5 s after power-on.	The signal must first be assigned to a certain output terminal of plug CN3 via parameter setting PD07–PD09.
		RD	Ready	RD turns on when the servo is switched on and the servo amplifier is ready to operate.	
		INP	In position	INP turns on when the number of droop pulses is in the preset in-position range. The device cannot be used in the speed control mode, torque control mode, and for continuous operation to torque control mode.	
		WNG	Warning	When warning has occurred, WNG turns on. When a warning is not occurring, turning on the power will turn off WNG after 2.5 s to 3.5 s.	
		MBR	Electromagnetic brake interlock	When using the device, set operation delay time of the electromagnetic brake in parameter PC02. When a servo-off status or alarm occurs, MBR will turn off.	

Tab. 3-10:   *Selection of the most important input and output signals of CN3 (1)*

Signal		Symbol	Name	Description	
Power supply	Common	DICOM	Digital I/F power supply input	For sink interface, connect + of 24 V DC external power supply.	Input 24 V DC (± 10%, 300 mA) to I/O interface
				For source interface, connect – of 24 V DC external power supply.	
		DOCOM	Digital I/F common	For sink interface, connect – of 24 V DC external power supply.	Common terminal of input signal such as EM2 of the servo amplifier. This is separated from LG.
				For source interface, connect + of 24 V DC external power supply.	
		SD	Shielding, housing Connect the external conductor of the shielded wire.		

Tab. 3-10: *Selection of the most important input and output signals of CN3 (2)*

3.2.4   Servo amplifier series MR-JE-C

The shown front view is that of servo amplifier MR-JE-40C or less. The terminal configuration is the same for all models of the MR-JE-C series.
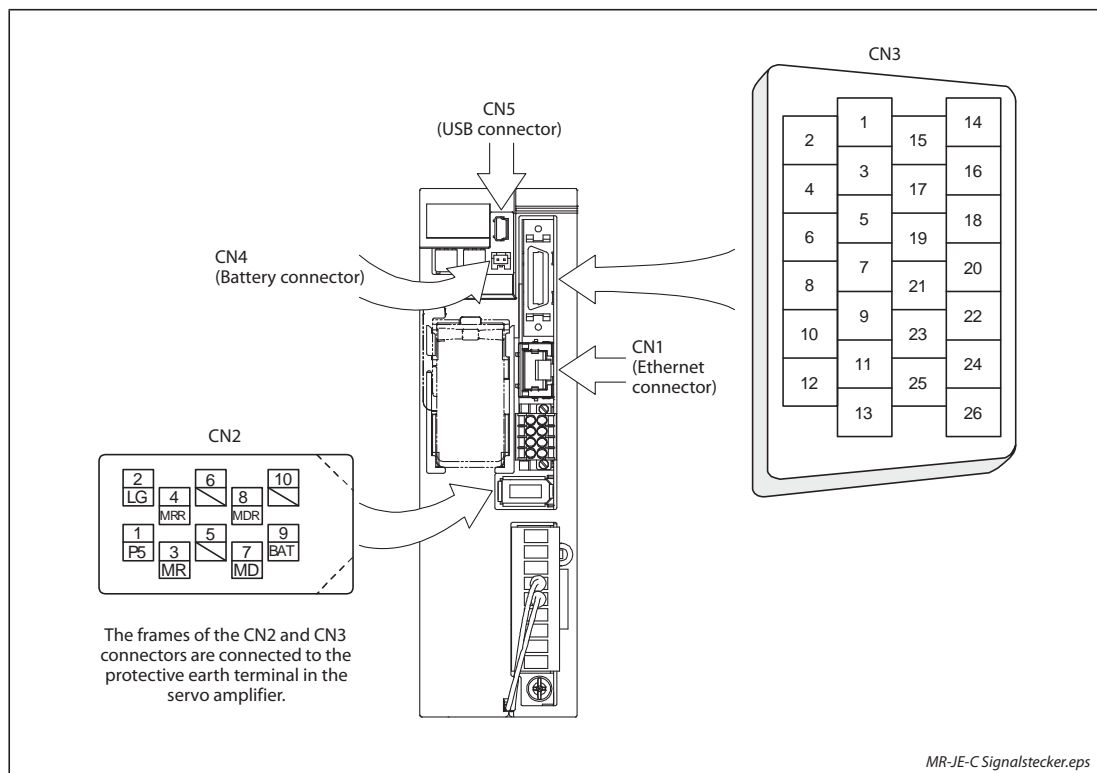
Fig. 3-9:   *MR-JE-C signal arrangement*

Signal assignment

Connector	Name	Description
CN1	Ethernet cable connector	For the wiring of CC-Link IE Field Network Basic and Modbus®/TCP.
CN2	Encoder connector	Connector for the servo motor encoder
CN3	I/O devices	Control interface (see tab. 3-12)
CN4	Battery terminal	For connecting the battery (MR-BAT6V1SET-A) to store the data of the absolute position detection (observe the following note). When you want to connect the battery, disconnect the power supply of the main circuit and wait for more than 15 minutes, after the charge lamp has gone off. Replacing a battery will erase the absolute position data.
CN5	Communication (USB)	Connector for a personal computer (PC)

Tab. 3-11:   *Description of CN1, CN2, CN3, CN4, and CN5*

Signal arrangement of CN3

The device assignment of the CN3 connector pins changes depending on the control mode. For the pins which are given parameters in the related parameter column, their devices will be changed using those parameters.

Pin No.	Signal I/O [1]	I/O signals in control modes [2]						Pr.
		P	P/S	S	S/T	T	T/P	
1	I	EM2	EM2	EM2	EM2	EM2	EM2	—
2	I	SON	SON	SON	SON	SON	SON	PD05/PD06
3	I	LSP	LSP	LSP	LSP	LSP	LSP	PD08/PD09
4	I	LSN	LSN	LSN	LSN	LSN	LSN	PD11/PD12
5	—	DICOM	DICOM	DICOM	DICOM	DICOM	DICOM	—
6	I	PP	PP/—	[5]	[5]	[5]	—/PP	PD23/PD24
7	I	PG	PG/—	—	—	—	—/PG	—
8	I	RES	RES/ST1	ST1	ST1/RS2	RS2	RS2/RES	PD14/PD15
9	I	TLA	TLA/TLA [3]	TLA [3],[4]	TLA/TC [3],[4]	TC [4]	TC/TLA [4]	PC29
		—	-/VC [6]	VC [6]	—	—	—	
10	—	LG	LG	LG	LG	LG	LG	—
11	O	LA	LA	LA	LA	LA	LA	—
12	O	LB	LB	LB	LB	LB	LB	—
13	O	LZ	LZ	LZ	LZ	LZ	LZ	—
14	O	RD	RD	RD	RD	RD	RD	PD29
15	O	ALM	ALM	ALM	ALM	ALM	ALM	PD30
16	O	OP	OP	OP	OP	OP	OP	PD31/PD38
17	—	DOCOM	DOCOM	DOCOM	DOCOM	DOCOM	DOCOM	—
18	—	OPC	OPC/—	—	—	—	—/OPC	—
19	I	NP	NP/—	[5]	[5]	[5]	—/NP	PD26/PD27
20	I	NG	NG/—	—	—	—	—/NG	—
21	I	CR	CR/ST2	ST2	ST2/RS1	RS1	RS1/CR	PD17/PD18
22	O	INP	INP/SA	SA	SA/-	—	-/INP	PD32
23	—	LG	LG	LG	LG	LG	LG	—
24	O	LAR	LAR	LAR	LAR	LAR	LAR	—
25	O	LBR	LBR	LBR	LBR	LBR	LBR	—
26	O	LZR	LZR	LZR	LZR	LZR	LZR	—

Tab. 3-12:   Signal arrangement of CN3 in MR-JE-C

[1] I: input signal, O: output signal

[2] P: Position control mode, S: Speed control mode, T: Torque control mode, P/S: Position/speed control change mode, S/T: Speed/torque control change mode, T/P: Torque/position control change mode

[3] Set the speed command in speed control mode with parameters PC05 to PC11

[4] Set the speed limit value in torque control mode with parameters PC05 to PC11

[5] This is available as an input device of sink interface. Input devices are not assigned by default. Assign the input devices with parameters PD23, PD24, PD26, and PD27 as necessary. In addition, supply + of 24 V DC to the CN3-18 pin of OPC (Power input for open-collector sink interface).

[6] Set parameter PC29 to "VC setting (1□□□)". For details, refer to the MR-JE-C instruction manual.

MITSUBISHI ELECTRIC

Meaning of symbols

The most important signals are explained in the table below. You will find detailed information about all signals in the instruction manual of the respective servo amplifier.

Signal		Symbol	Name	Description	
Control terminals	Signal inputs	RES	Reset	Turn RES on for more than 50 ms to reset the alarm. Some alarms cannot be deactivated by RES (Reset).	
		LSP	Forward rotation stroke end	To start the operation, turn on LSP and LSN. Turn it off to bring the servo motor to a slow stop and make it servo-locked. When LSP or LSN is turned off, AL. 99 (Stroke limit warning) occurs. It can be used during the magnetic pole detection in the linear servo motor control mode and the DD motor control mode. Also, when the magnetic pole detection in the torque mode is completed, this signal will be disabled.	
		LSN	Reverse rotation stroke end		
		SON	Servo-on	Turn SON on to power on the main circuit and make the servo amplifier ready to operate (servo-on). Turn it off to shut off the base circuit and coast the servo motor.	
		ST1	Forward rotation start	If terminal ST1 is switched on, the motor turns in counter-clockwise rotation.	If both ST1 and ST2 are switched on or off during operation, the servo motor will be decelerated to a stop (servo-lock).
		ST2	Reverse rotation start	If terminal ST2 is switched on, the motor turns in clockwise rotation.	
		EM2	Forced stop 2	Turn off EM2 (open between commons) to decelerate the servo motor to a stop with commands. Turn EM2 on (short between commons) in the forced stop state to reset that state. EM2 and EM1 are mutually exclusive. EM2 has the same function as EM1 in the torque control mode.	
		EM1	Forced stop 1	When EM1 is turned off (open between commons), the base circuit shuts off, and the dynamic brake operates to decelerate the servo motor to a stop. The forced stop will be reset when EM1 is turned on (short between commons).	
		SP1	Speed selection 1	Select the command speed for operation in speed control mode. Select the limited speed for operation in torque control mode	
		SP2	Speed selection 2		
		SP3	Speed selection 3		
	Signal outputs	ALM	Malfunction	When the protective circuit is activated to shut off the base circuit, ALM will turn off. When an alarm does not occur, ALM will turn on after 2.5 s to 3.5 s after power-on.	
		RD	Ready	RD turns on when the servo is switched on and the servo amplifier is ready to operate.	
		INP	In position	INP turns on when the number of droop pulses is in the preset in-position range. INP turns on when servo-on turns on.	
		WNG	Warning	When warning has occurred, WNG turns on. When a warning is not occurring, turning on the power will turn off WNG after 2.5 s to 3.5 s.	
		ACD0 ACD1 ACD2	Alarm code	The alarm code is output as a 3-Bit signal depending on the alarm that occurs. The output of the alarm code has to be activated by parameter PD39.	
		MBR	Electromagnetic brake interlock	When using the device, set operation delay time of the electromagnetic brake in parameter PC16. When a servo-off status or alarm occurs, MBR will turn off.	

Tab. 3-13:   *Selection of the most important input and output signals of CN3 (1)*

Signal		Symbol	Name	Description	
Analog terminals	Analog inputs	TLA	Analog torque limit	When TLA is enabled, torque is limited in the full servo motor output torque range. Apply 0 V to +10 V DC between TLA and LG. Connect the positive terminal of the power supply to TLA. The maximum torque is generated at +10 V. Resolution: 10 bits	
		TC	Analog torque command	This is used to control torque in the full servo motor output torque range. Apply 0 V to ±8 V DC between TC and LG. The maximum torque is generated at ±8 V. The speed at ±8 V can be changed with parameter PC13.	
		VC	Analog speed command	Apply 0 V to ±10 V DC between VC and LG. Speed set in parameter PC12 is provided at ±10 V. Resolution: 14 bits or equivalent	
Power supply	Common	DICOM	Digital I/F power supply input	For sink interface, connect + of 24 V DC external power supply.	Input 24 V DC (± 10%, 300 mA) to I/O interface
				For source interface, connect – of 24 V DC external power supply.	
		OPC	Open-collector sink interface power supply input	When inputting a pulse train in the open-collector type with sink interface, supply this terminal with the positive (+) power of 24 V DC.	
		DOCOM	Digital I/F common	For sink interface, connect – of 24 V DC external power supply.	Common terminal of input signal such as EM2 of the servo amplifier. This is separated from LG.
				For source interface, connect + of 24 V DC external power supply.	
		LG		Common terminal of TLA/TC/VC/OP CN3-10, CN3-23 are connected internally.	
		SD		Shielding, housing Connect the external conductor of the shielded wire.	

Tab. 3-13: *Selection of the most important input and output signals of CN3 (2)*

MITSUBISHI ELECTRIC

3.3 Wiring the interfaces

3.3.1 I/O interfaces in negative logic (sink type)

Digital input interface DI-1

This is an input circuit whose photocoupler cathode side is the input terminal. Transmit signals from sink (open-collector) type transistor output, relay switch, etc. The following is a connection diagram for sink input.
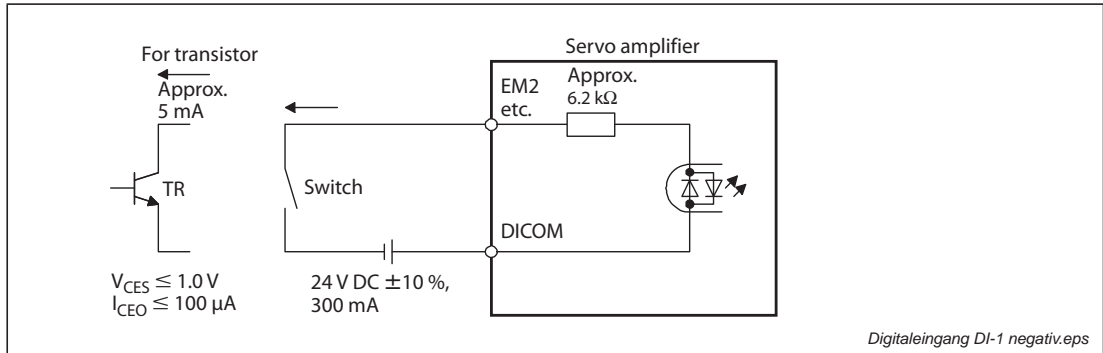
Fig. 3-10: *Example*

The following shows when the CN1-10 pin and the CN1-35 pin for MR-JE-A or the CN3-6 pin and the CN3-19 pin for MR-JE-C are used as digital input interface:
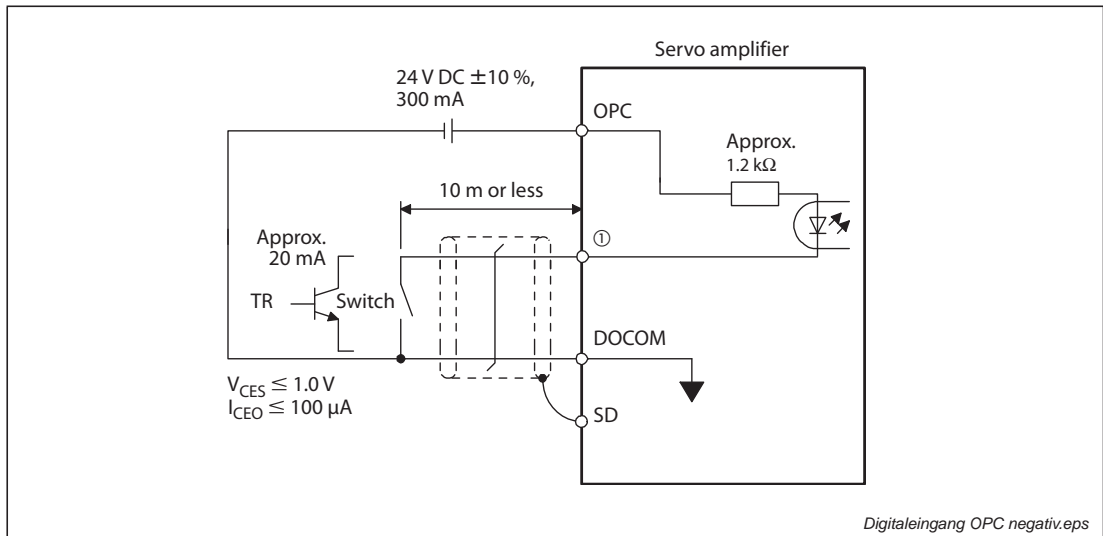
Fig. 3-11: *Example*

① MR-JE-A: CN1-10, CN1-35
  MR-JE-C: CN3-6, CN3-19

Digital output interface DO-1

This is a circuit of collector output terminal of the output transistor. When the output transistor is turned on, collector terminal current will be applied for the output.

A lamp, relay or photocoupler can be driven. Install a diode (D) for an inductive load, or install an inrush current suppressing resistor (R) for a lamp load.

(Rated current: 40 mA or less, maximum current: 50 mA or less, inrush current: 100 mA or less)
A maximum of 2.6 V voltage drop occurs in the servo amplifier.
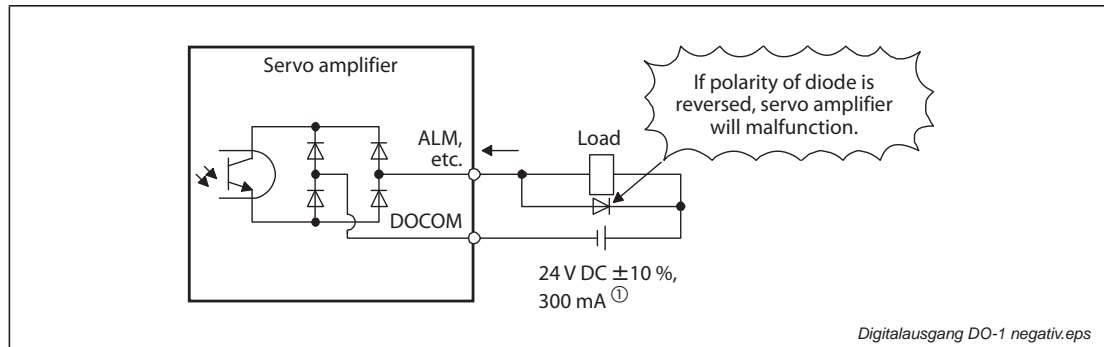
Fig. 3-12:   *Example*

[1] If the voltage drop (maximum of 2.6 V) interferes with the relay operation, apply high voltage (maximum of 26.4 V) from external source.

WARNING:

When connecting an inductive load, please observe the right polarity of the recovery diode. Wrong polarity of the diode can damage the servo amplifier.

3.3.2 I/O interfaces in positive logic (source type)

In this servo amplifier, source type I/O interfaces can be used.

Digital input interface DI-1

This is an input circuit whose photocoupler anode side is the input terminal. Transmit signals using source (open-collector) type transistor output, relay switch, etc.
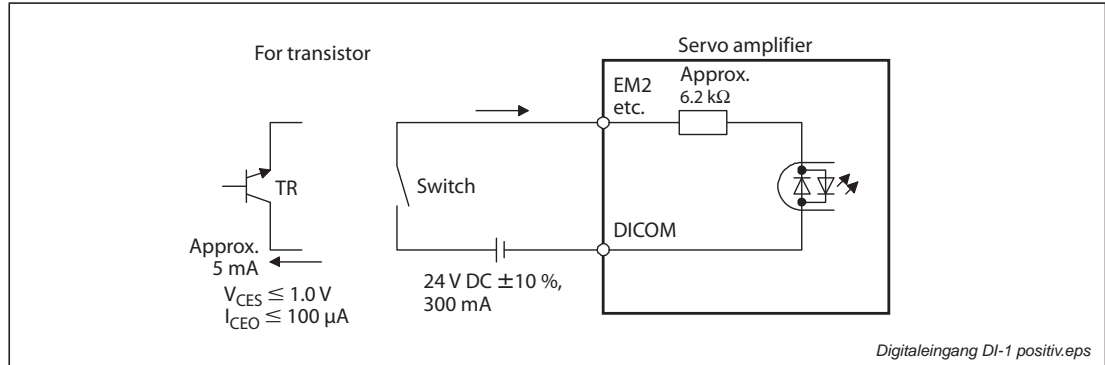
Fig. 3-13:   *Example*

Digital output interface DO-1

This is a circuit in which the emitter side of the output transistor is the output terminal. When the output transistor is turned on, the current flows from the output terminal to a load.
A maximum of 2.6 V voltage drop occurs in the servo amplifier.
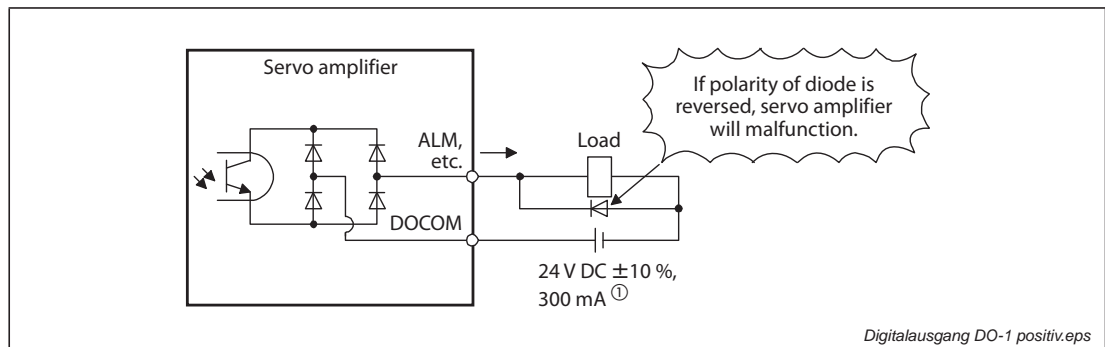
Fig. 3-14:   *Example*

[1] If the voltage drop (maximum of 2.6 V) interferes with the relay operation, apply high voltage (maximum of 26.4 V) from external source.

⚠ **WARNING:**

When connecting an inductive load, please observe the right polarity of the recovery diode. Wrong polarity of the diode can damage the servo amplifier.

3.3.3 Analog interfaces

Analog input (only MR-JE-A, MR-JE-C)

Input impedance
10–12 kΩ

Servo amplifier

VC, etc.

Approx.
10 kΩ

LG

SD

MR-JE Analogeingang.eps
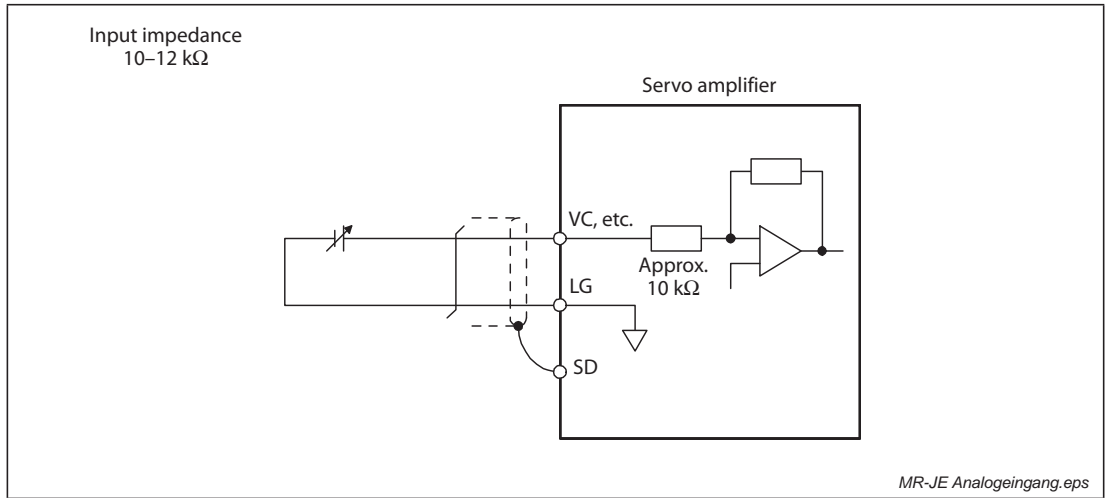
Fig. 3-15:   *Example*

Analog output (only MR-JE-A)

Servo amplifier

MO1
(MO2)

Output voltage: ±10 V [1]
Maximum output current: 1 mA
Resolution: 10 bits or equivalent

LG

Analogausgang.eps
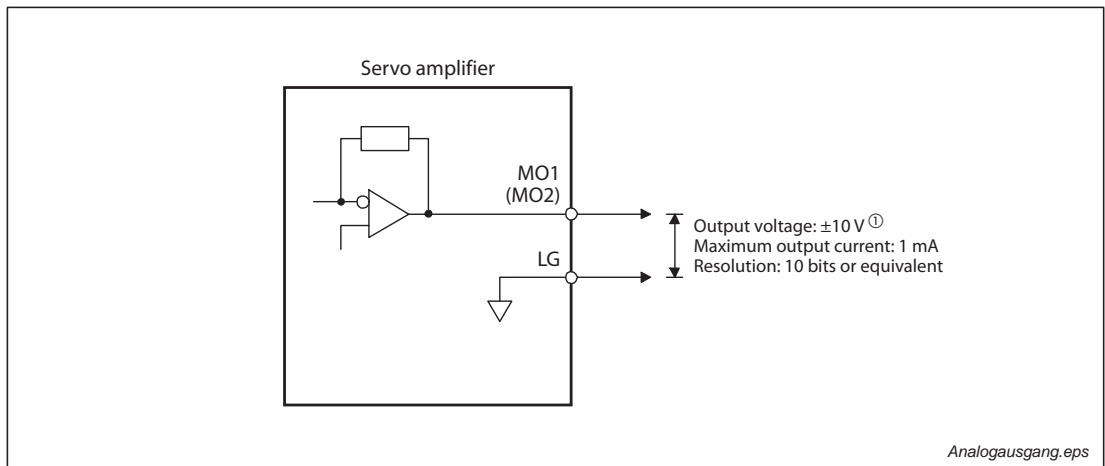
Fig. 3-16:   *Example*

[1] Output voltage range varies depending on the monitored signal.

3.4   Communication function

NOTES   The USB communication function and the RS-422 communication function are mutually exclusive functions. They cannot be used together.

Refer to the instruction manual for precautions using RS422/USB communication function and communication specifications.

3.4.1   Serial interface RS-422 (only MR-JE-A)

NOTE   The RS-422 serial communication function is supported by servo amplifiers manufactured in December 2013 or later. Refer to section 2.4.1 for the year and month of manufacture.

You can operate servo driving, parameter change, monitor function, etc. using Mitsubishi Electric general-purpose AC servo protocol (RS-422 serial communication) with the servo amplifier.

Configuration diagram

● Diagrammatic sketch

Up to 32 axes of servo amplifiers from stations 0 to 31 can be operated on the same bus.
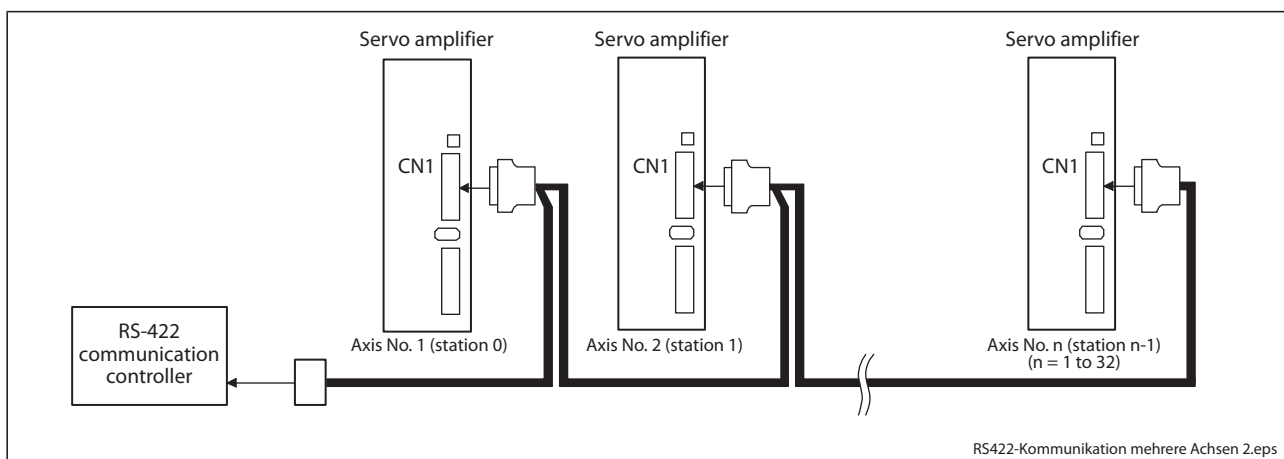
Fig. 3-17:   *System configuration with the RS-422 interface for operation with multiple axes*

● Cable connection diagram

RS422-Kommunikation - Verdrahtung mehrerer Achsen.eps
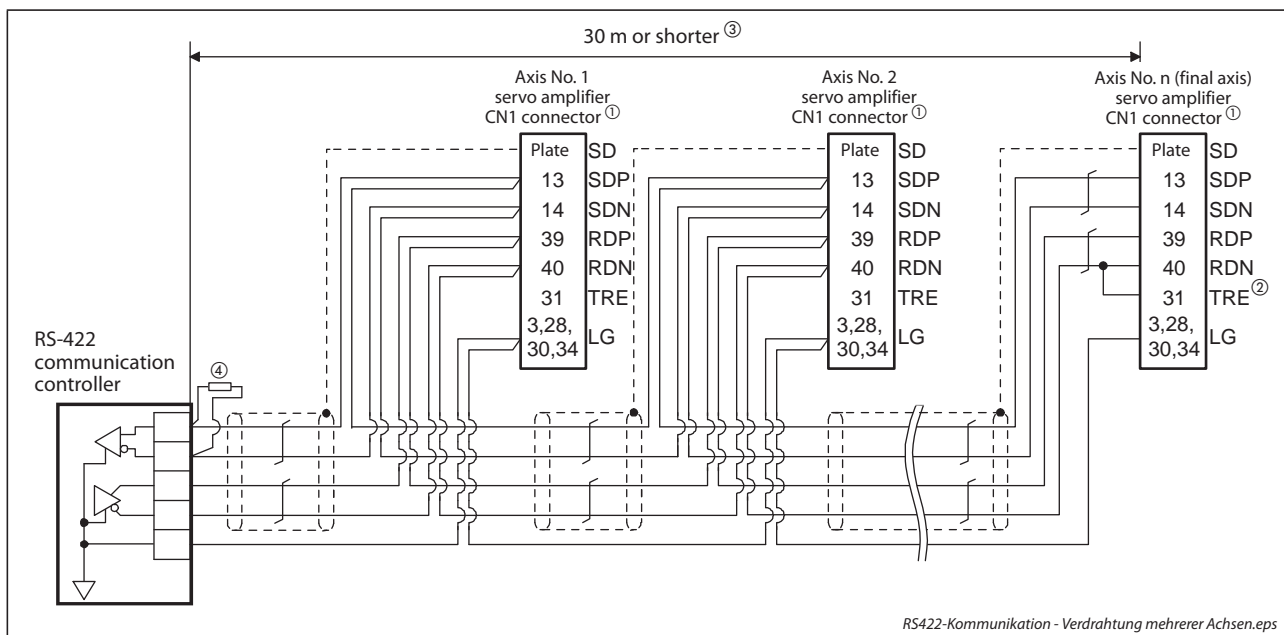
Fig. 3-18:   *Wiring of the cables*

① Connector set MR-J3CN1 (3M or equivalent)
   Connector: 10150-3000PE   Shell kit: 10350-52F0-008

② Connect between TRE and RDN of the final axis servo amplifier.

③ The overall length is 30 m or less in low-noise environment.

④ If the RS-422 communication controller does not have a termination resistor, terminate it with a 150 Ω resistor.

3.4.2   USB interface

The servo amplifiers of the MR-JE series have an USB communication interface. Therefore, you can connect the servo amplifier to the personal computer with MR Configurator2 installed to perform the parameter setting, test operation, gain adjustment, and others.

USB-Kommunikation 2.eps
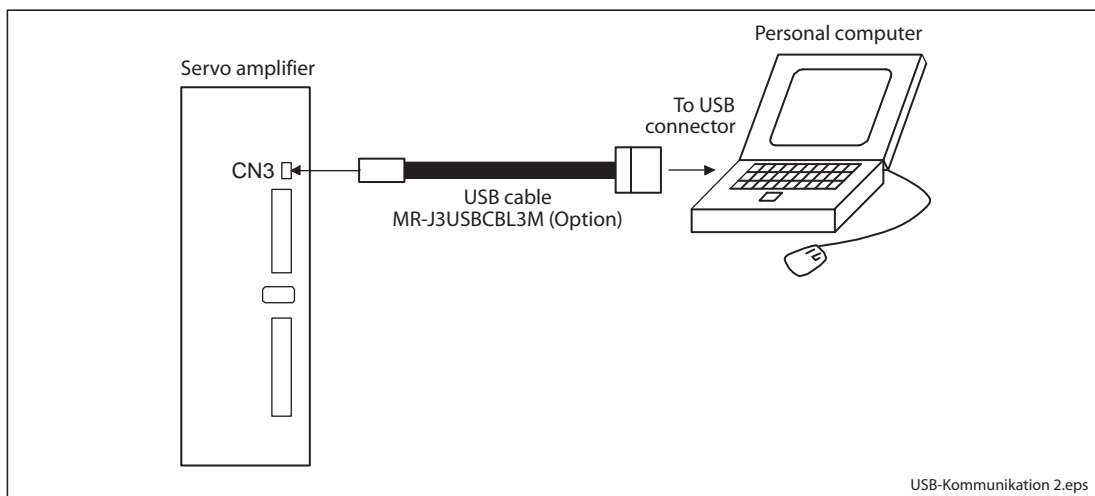
Fig. 3-19:   *Connection for USB communication*

Note that using the USB communication function prevents the RS-422 communication function from being used, and vice versa. They cannot be used together.

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3.5　　　　Optical interface SSCNET III (only MR-JE-B and MR-JE-BF)

The servo amplifiers MR-JE-B and MR-JE-BF have an optical interface SSCNET III (CN1A, CN1B). Operation and monitoring of the servo amplifier can be done by the motion CPU.

> **WARNING:**
>
> *Do not see directly the light generated from CN1A and CN1B connector of servo amplifier or the end of SSCNET III cable. When the light gets into eye, may feel something is wrong for eye. (The light source of SSCNET III complies with class1 defined in JIS C6802 or IEC60825-1.)*

The SSCNET III cable of the HOST controller (motion CPU) or of the preceding servo amplifier is plugged into connector CN1A. The SSCNET III cable to the next servo amplifier is plugged into terminal CN1B. For CN1B connector of the final axis, put the cap on, which came with the servo amplifier.
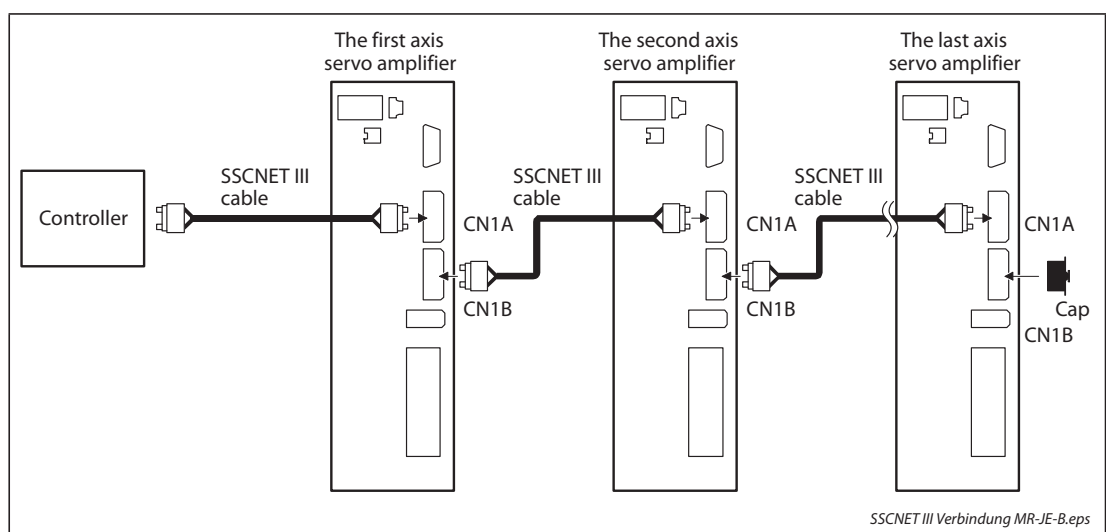
Fig. 3-20:　*SSCNET III cable connection for MR-JE-B*
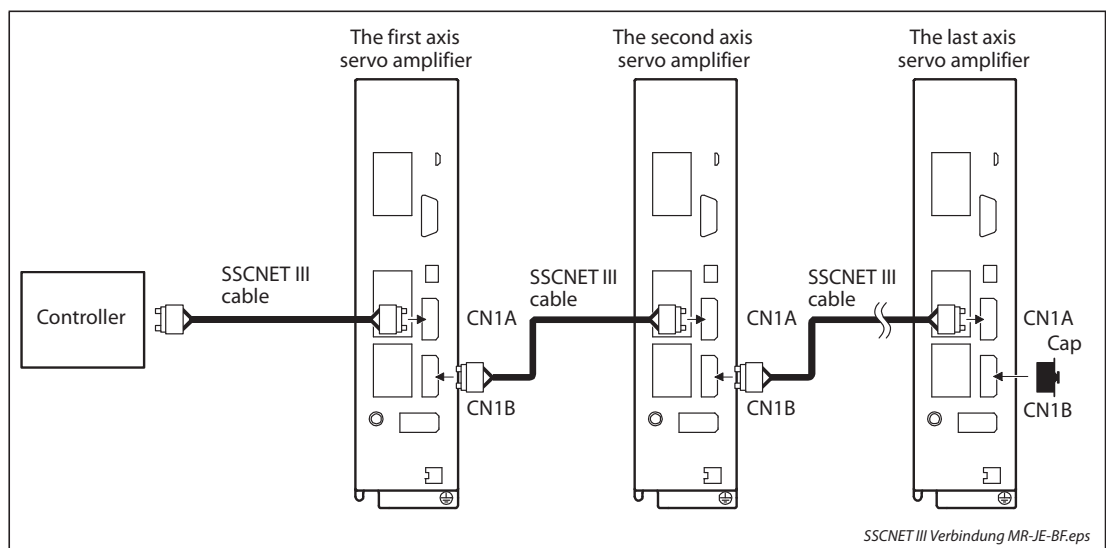
Fig. 3-21:　*SSCNET III cable connection for MR-JE-BF*

NOTES

Put a cap on CN1A and CN1B connector to protect the light device inside the connector from dust. For this reason, do not remove a cap until just before mounting the SSCNET III cable. Then, when removing SSCNET III cable, make sure to put a cap on.

Keep the cap for CN1A and CN1B connector and the tube for protecting the end of SSCNET III cable in a plastic bag with a zipper to prevent them from becoming dirty.
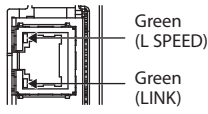
When asking repair of servo amplifier for some troubles, make sure to put a cap on CN1A and CN1B connector. When the connector is not protected by a cap, the light device may be damaged at the transit. In this case, exchange and repair of light device is required.

SSCNET III cable with open ends (e.g. after disassembly of a defective servo amplifier) should be covered immediately with the protective tube to prevent damage.

MITSUBISHI ELECTRIC

3.6   Ethernet interface (only MR-JE-C)

Ethernet status display LED

The following shows the Ethernet status display LED

Connector CN1	LED	Name	Lighting status	Description
Green (L SPEED) — Green (LINK)	L SPEED	100 Mbps communication status	Lit	During 100 Mbps communication
			Off	Communication speed error or disconnection
	LINK	Link status	Lit	Linking up
			Flickering	During data transfer
			Off	Link unestablished

Tab. 3-14:   *LED indication list*

3.7 Setting the control axis number (only MR-JE-B and MR-JE-BF)

The control axis No. can be set with switches on the servo amplifier.

3.7.1 Axis selection rotary switch (SW1)

The control axis No. can be set in the range of 1 to 16 with the axis selection rotary switch. If the same numbers are set to different control axes in a single communication system, the system will not operate properly. The control axes may be set independently of the SSCNET III cable connection sequence. Tab. 3-15 shows control axis numbers corresponding to the axis selection rotary switch to set the control axis number.

⚠️ **WARNING:**

● *When switching the axis selection rotary switch (SW1), use 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.*

● *For setting the axis selection 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.*

NOTES   The control axis No. set to the axis selection rotary switch (SW1) should be the same as the one set to the servo system controller. The number of the axes you can set depends on the servo system controller.

Cycling the power supply enables the setting of the switch.
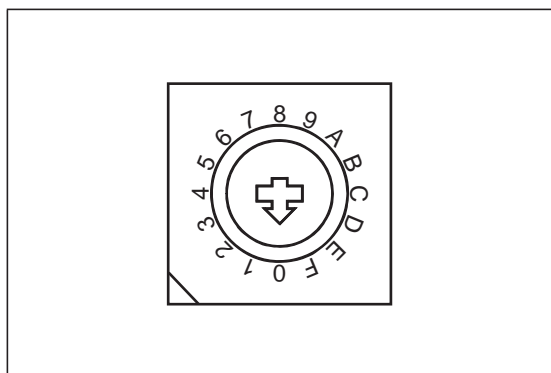
Fig. 3-22:
Rotary switch (SW1)

Rotary switch SW1.eps

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Axis selection rotary switch (SW1)	Control axis No.
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15
G	16

Tab. 3-15:
Switch combination list for the control axis No. setting

3.8   Servo motor

3.8.1   Connecting the servo motor

> **WARNING:**
>
> ● *Ground the servo amplifier and servo motor securely. To prevent an electric shock, always connect the protective earth (PE) terminal (terminal marked with ⏚) of the servo amplifier with the protective earth (PE) of the control box.*
>
> ● *Connect the wires to the correct phase terminals (U, V, W) of the servo amplifier and servo motor. Otherwise, the servo motor will operate improperly.*
>
> ● *Do not connect AC power supply directly to the servo motor. Otherwise, a fault may occur.*

The servo amplifier switches the power transistor on-off to supply power to the servo motor. Depending on the wiring and ground cable routing, the servo amplifier may be affected by the switching noise (due to di/dt and dv/dt) of the transistor. To prevent such a fault, refer to the following diagram and always ground.

To conform to the EMC Directive, refer to the EMC Installation Guidelines (IB(NA)67310).

Erdung MR-JE-A_B_C..eps
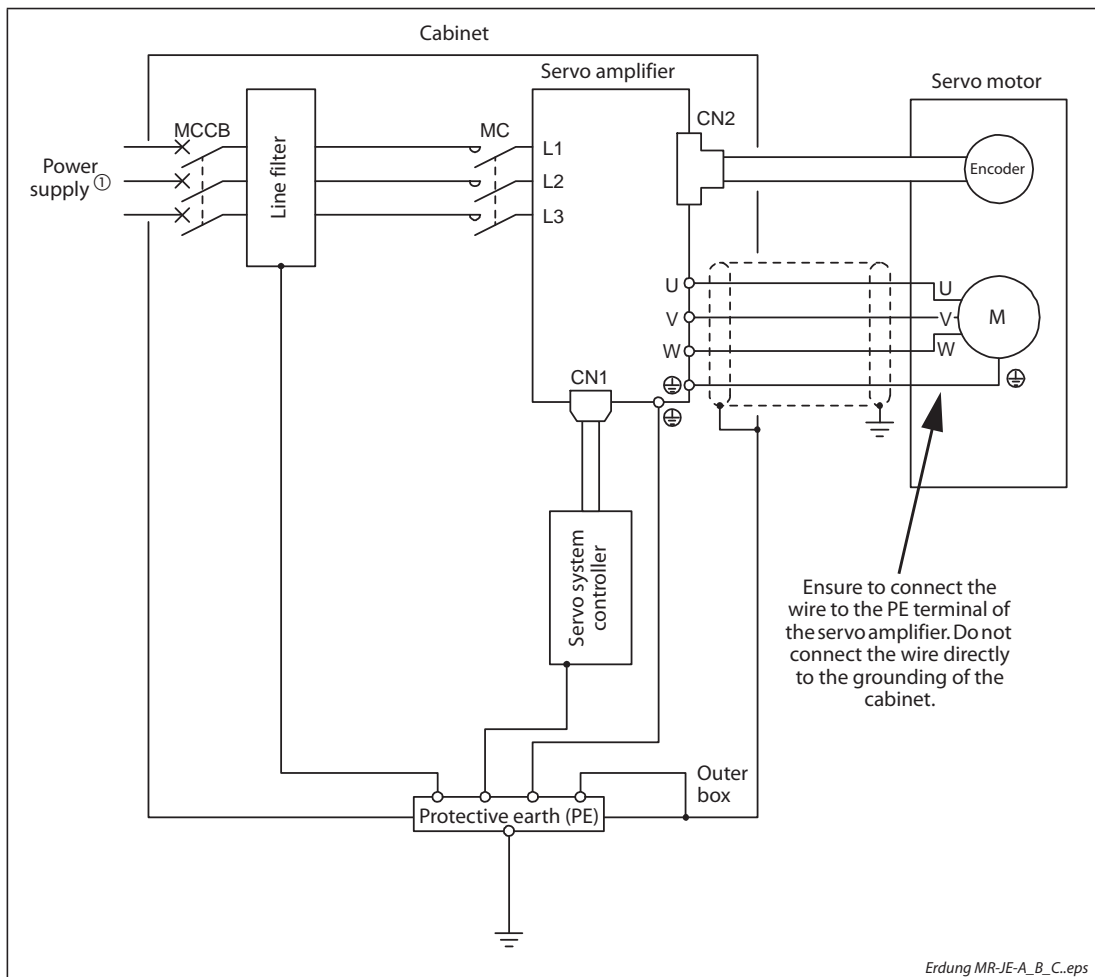
Fig. 3-23:   *Grounding of the servo amplifier MR-JE-A, MR-JE-B or MR-JE-C*

① For 1-phase 200 V AC to 240 V AC, connect the power supply to L1 and L3. Leave L2 open.
(Only for MR-JE-200A/MR-JE-200B/MR-JE-200C connect it to L1 and L2. Leave L3 open.)
Refer to section 3.1 for power supply specifications.

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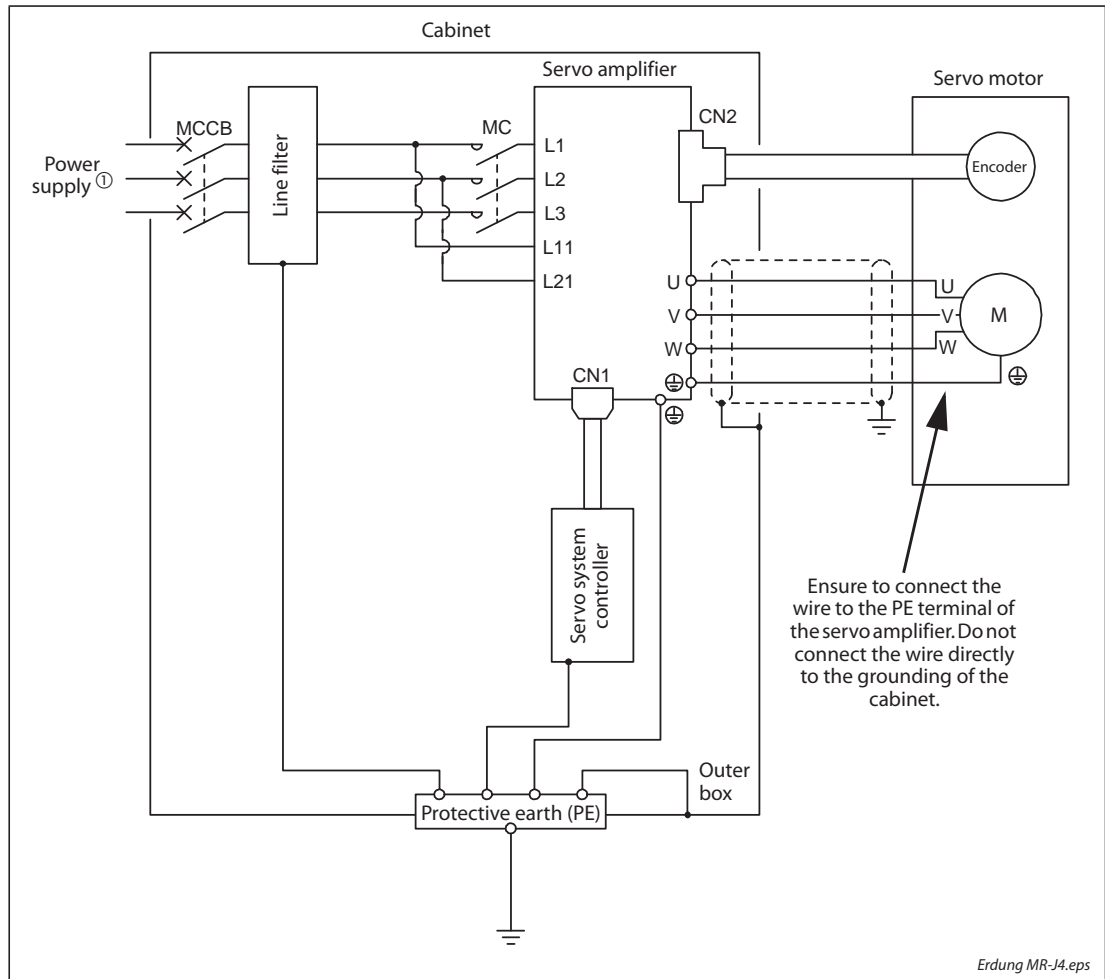
Fig. 3-24: *Grounding of the servo amplifier MR-JE-BF*
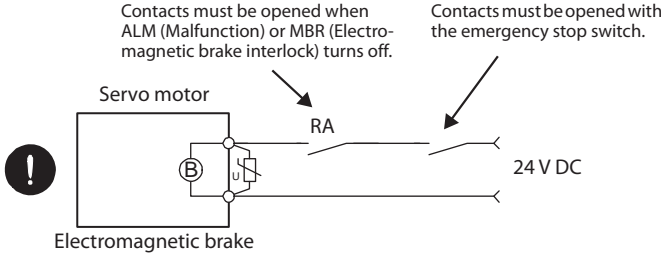
① For 1-phase 200 V AC to 240 V AC, connect the power supply to L1 and L3. Leave L2 open.
   For power supply specifications, refer to section 3.1.

3.8.2   Servo motor with electromagnetic brake

WARNING:

● *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 emergency stop switch.

● *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.*

● *When using EM2 (Forced stop 2), use MBR (Electromagnetic brake interlock) for operating the electromagnetic brake. Operating the electromagnetic brake without using MBR during deceleration to a stop will saturate servo motor torques at the maximum value due to brake torques of the electromagnetic brake and can result in delay of the deceleration to a stop from a set value.*

MR-JE-A and MR-JE-C

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 The status is base circuit shut-off during RES (Reset) on. When you use the motor in vertical axis system, use MBR (Electromagnetic brake interlock).

③ Turn off SON (Servo-on) after the servo motor stopped.

– Connection diagram
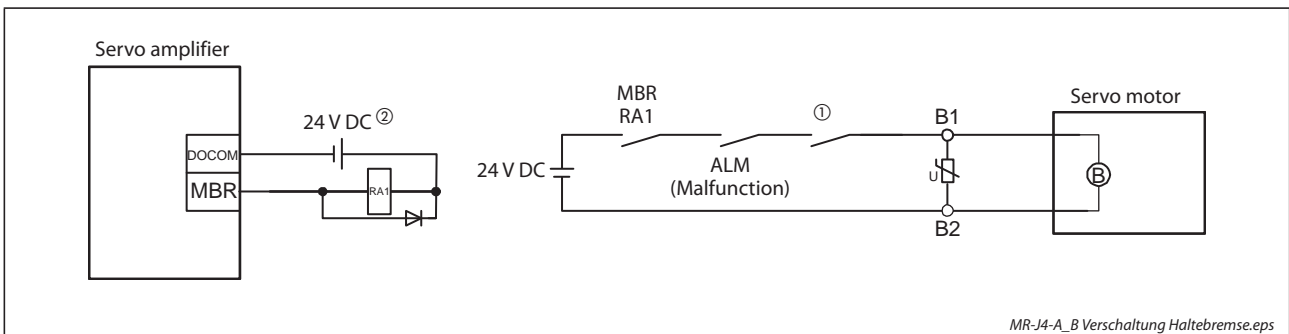
Fig. 3-25:   *Wiring of the electromagnetic brake for MR-JE-A and MR-JE-C*

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.

MR-JE-B

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 SON (Servo-on) after the servo motor stopped.

– Connection diagram

MR-J4-A_B Verschaltung Haltebremse.eps
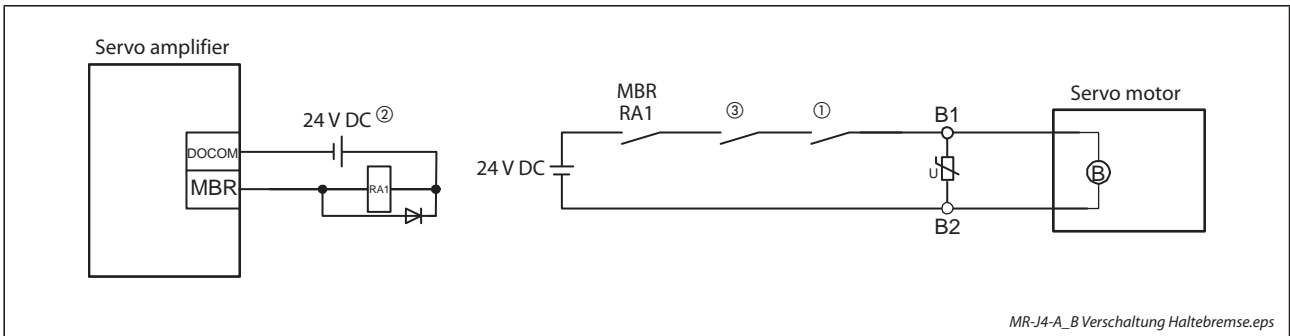
Fig. 3-26:   Wiring of the electromagnetic brake for MR-JE-B

MR-JE-BF

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 SON (Servo-on) after the servo motor stopped.

● When not using ALM (Malfunction)

| NOTE | When not using ALM (Malfunction), create a circuit that shuts off the main circuit by being inter-locked with an alarm detected by the controller. |

MR-J4-A_B Verschaltung Haltebremse.eps
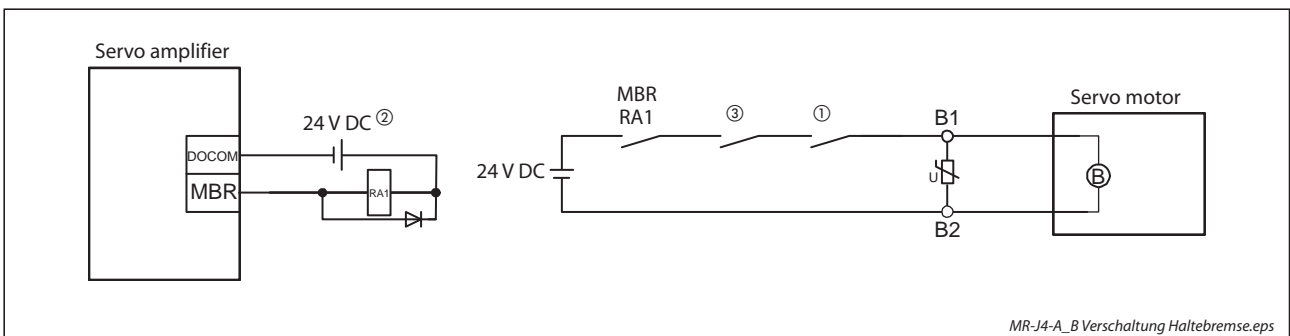
Fig. 3-27:   Wiring of the electromagnetic brake for MR-JE-BF (without using ALM)

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.

③ Create the circuit in order to shut off by interlocking with an alarm detected by the controller.

● When using ALM (Malfunction)

You can assign ALM (Malfunction) to pins CN3-9, CN3-13 and CN3-15 with parameters PD07 to PD09.
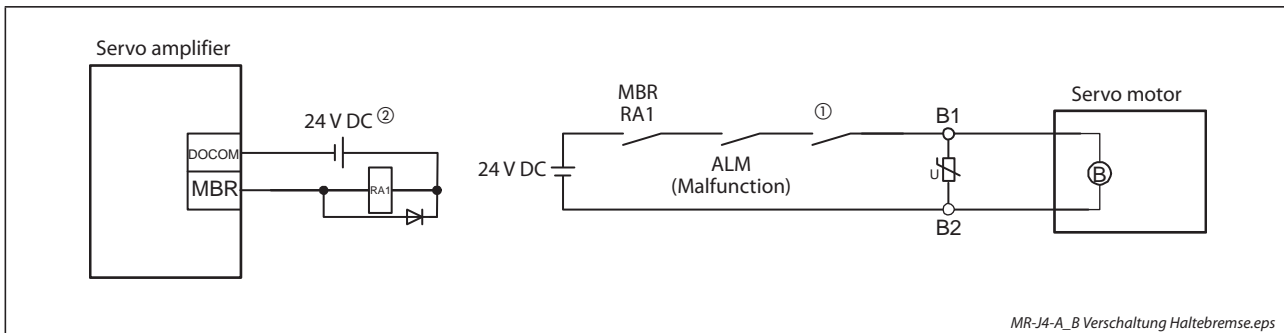
Fig. 3-28: *Wiring of the electromagnetic brake for MR-JE-BF (using ALM)*

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.

3.9   Forced stop

| **NOTES** | When alarms not related to the forced stop function occur, control of motor deceleration can not be guaranteed. |

When SSCNET III/H communication shut-off occurs, forced stop deceleration will operate (only MR-JE-B and MR-JE-BF).

In the torque control mode, the forced stop deceleration function is not available.

Disable the forced stop deceleration function for a machine in which multiple axes are connected together, such as a tandem structure. If an alarm occurs with the forced stop deceleration function disabled, the servo motor will stop with the dynamic brake.

3.9.1   Forced stop deceleration function

When EM2 is turned off, dynamic brake will start to stop the servo motor after forced stop deceleration. During this sequence, the display shows AL. E6 "Servo forced stop warning".

During normal operation, do not use EM2 (Forced stop 2) to alternate stop and drive. The servo amplifier life may be shortened.
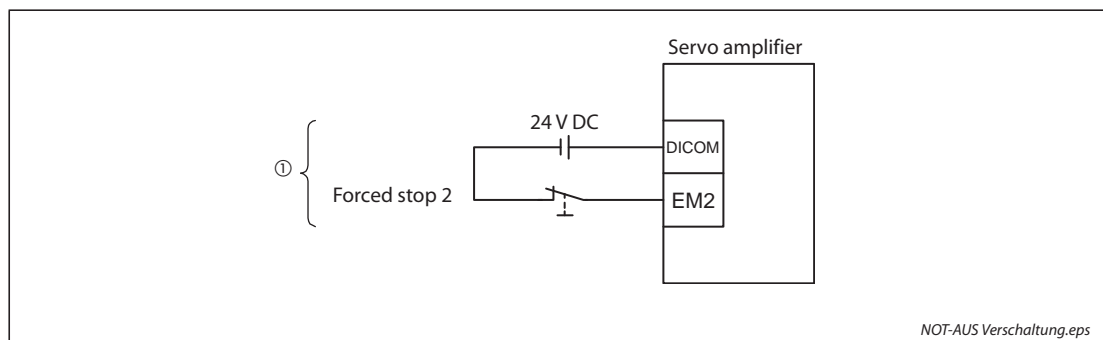
Fig. 3-29:   *Emergency switch*

① This diagram is for sink I/O interface. For source I/O interface, refer to section 3.3.2.

3.10   Wiring examples

Wire the power supply/main circuit as shown below. Connect the 1-phase 200 V AC to 240 V AC power supply to L1 and L3, for MR-JE-200A, MR-JE-200B or MR-JE-200C connect it to L1 and L2.

Configure the wirings so that the main circuit power supply is shut off and SON (Servo-on) is turned off after deceleration to a stop due to an alarm occurring, enabled servo forced stop, etc. A molded-case circuit breaker (MCCB) must be used with the input cables of the main circuit power supply.

NOTE	One model of the servo amplifier series MR-JE-A, MR-JE-B, MR-JE-BF and MR-JE-C is only shown in the wiring examples. Please refer to the respective user manual for the wiring of other servo amplifier models.

3.10.1   Servo amplifier series MR-JE-A and MR-JE-C

MR-JE-A_Anschluss_3 phasig_1.eps

Fig. 3-30:   *Wiring of servo amplifier MR-JE-A and MR-JE-C*

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① Always connect between P+ and D terminals (factory-wired). When using the regenerative option, refer to the instruction manual.

② For the encoder cable, use of the option cable is recommended. For selecting cables, refer to "HG-KN/HG-SN Servo Motor Instruction Manual".

③ This diagram shows sink I/O interface. For source I/O interface, refer to section 3.3.2.

④ For connecting servo motor power wires, refer to "HG-KN/HG-SN Servo Motor Instruction Manual"

⑤ Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. Depending on the power supply 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.

⑥ Configure a circuit to turn off EM2 when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.

⑦ Connecting a servo motor of the wrong axis to U, V, W, or CN2 of the servo amplifier may cause a malfunction.

⑧ 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.

⑨ CN3 for MR-JE-C

MR-JE-A_Systemkonfiguration_3 phasig_1.eps
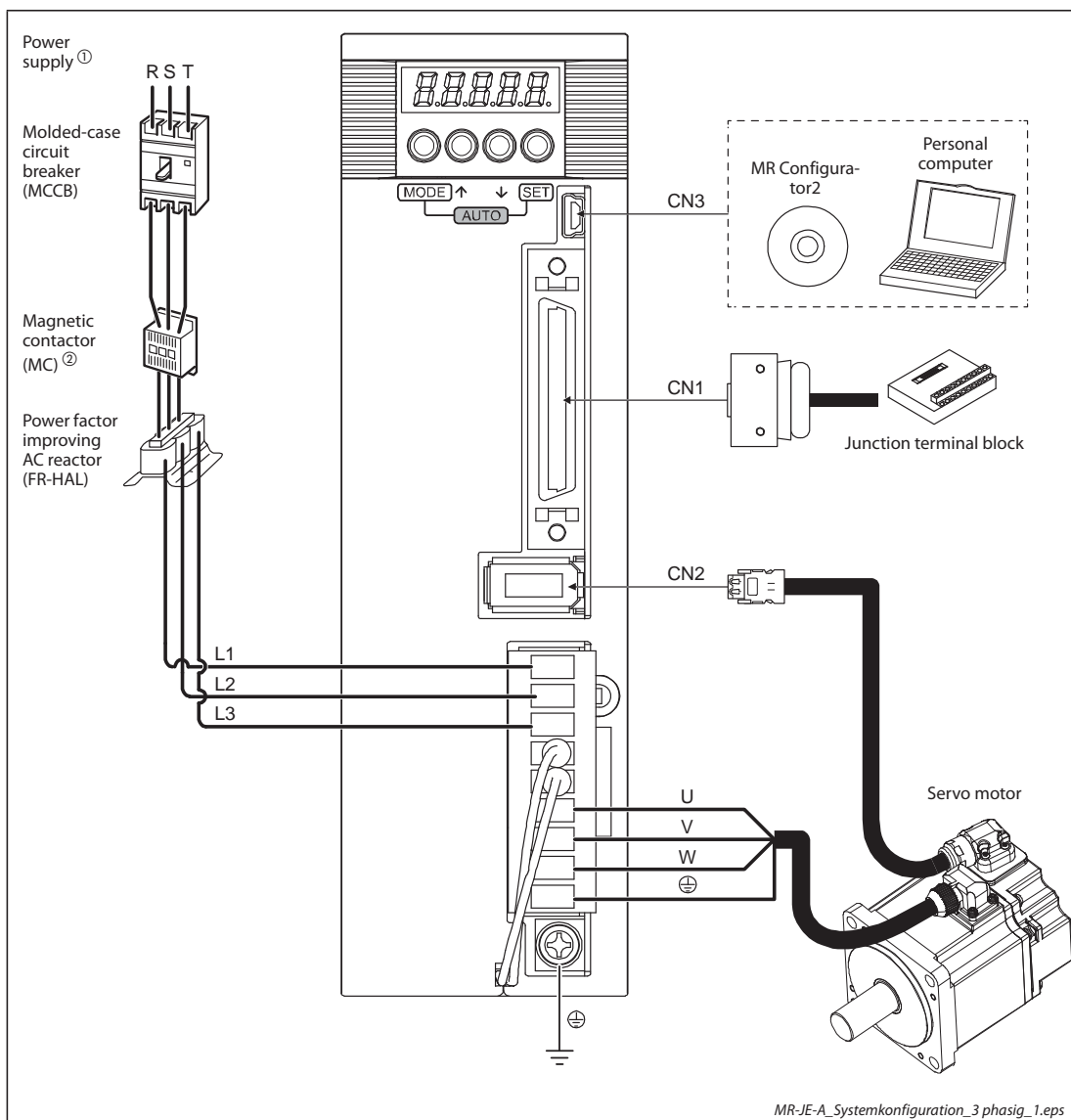
Fig. 3-31: *System configuration for MR-JE-40A*

① For 1-phase 200 V AC to 240 V AC, connect the power supply to L1 and L3. Leave L2 open. For the power supply specifications, refer to section 3.1.

② Depending on the power supply 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.

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

Fig. 3-32:   *System configuration for MR-JE-10C*

① For 1-phase 200 V AC to 240 V AC, connect the power supply to L1 and L3. Leave L2 open. For the power supply specifications, refer to section 3.1.

② Depending on the power supply 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.

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

3.10.2 Servo amplifier series MR-JE-B
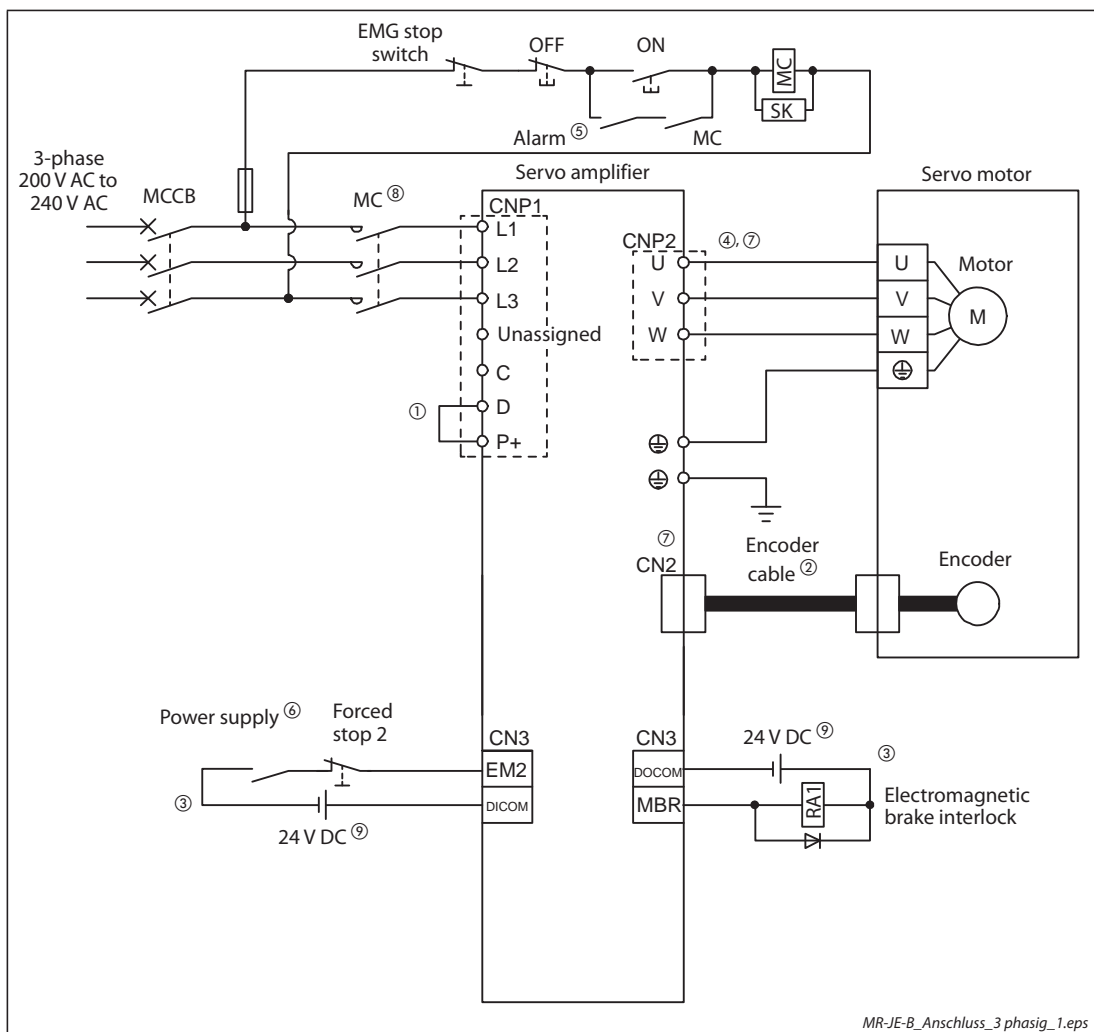
Fig. 3-33: *Wiring of servo amplifier MR-JE-B*

① Always connect between P+ and D terminals. (factory-wired) When using the regenerative option, refer to the instruction manual.

② For the encoder cable, use of the option cable is recommended. For selecting cables, refer to "HG-KN_/HG-SN_ Servo Motor Instruction Manual".

③ This diagram is for sink I/O interface. For source I/O interface, refer to section 3.3.2.

④ For connecting servo motor power wires, refer to "HG-KN_/HG-SN_ Servo Motor Instruction Manual".

⑤ Configure the power supply circuit that turns off the magnetic contactor after an alarm occurs on the controller side. To assign ALM (Malfunction) to a pin of the CN3 connector, set parameter PD08 or parameter PD09 to "☐☐03".

⑥ Configure a circuit to turn off EM2 when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.

⑦ Connecting a servo motor of the wrong axis to U, V, W, or CN2 of the servo amplifier may cause a malfunction.

⑧ Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. Depending on the power supply 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.

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⑨ 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.

MR-JE-B_Systemkonfiguration_3 phasig_1.eps
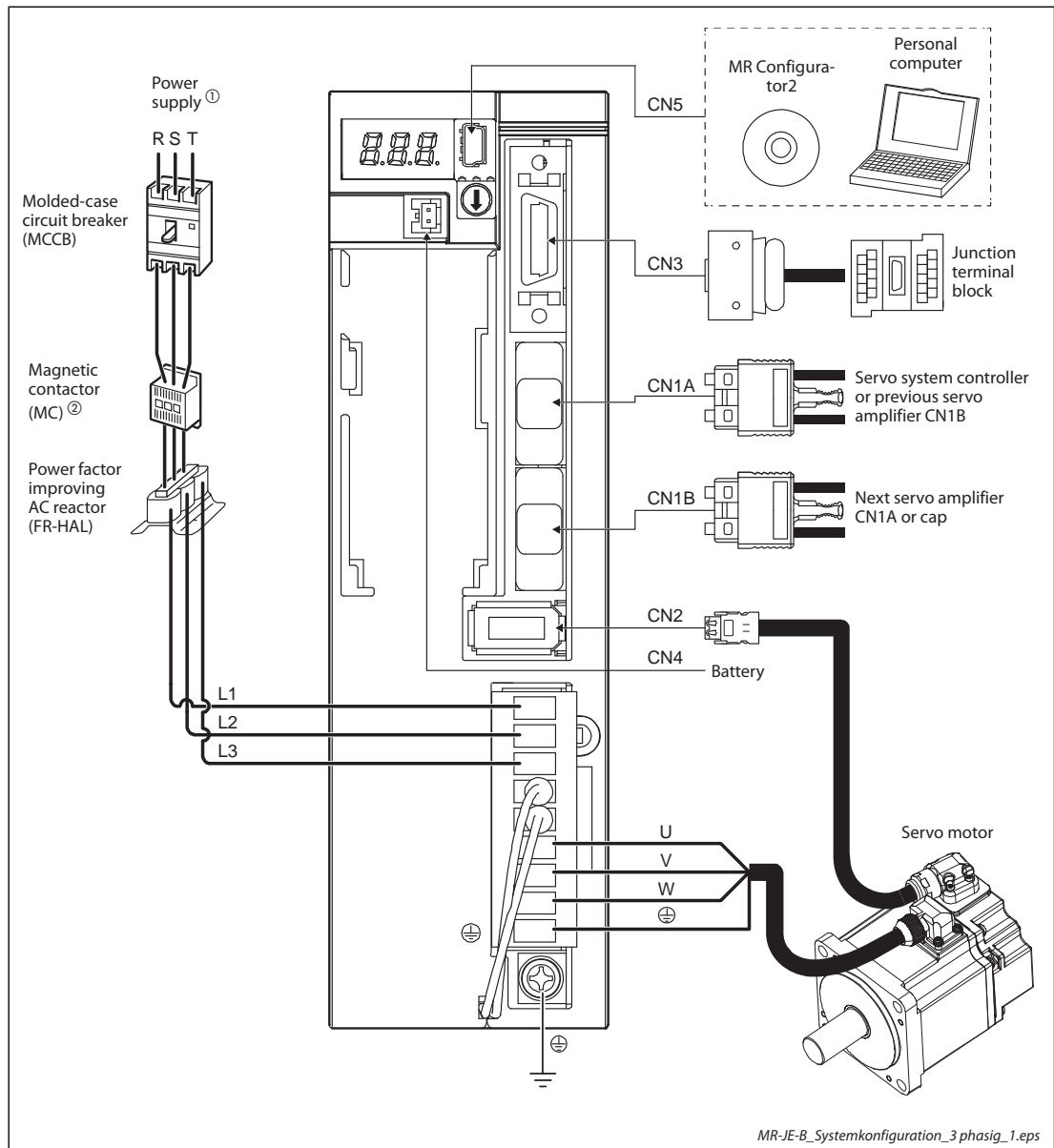
Fig. 3-34:   *System configuration for MR-JE-40B*

① For 1-phase 200 V AC to 240 V AC, connect the power supply to L1 and L3. Leave L2 open. Refer to section 3.1 for the power supply specifications.

② Depending on the power supply 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.

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

3.10.3 Servo amplifier series MR-JE-BF

Fig. 3-35: *Wiring of servo amplifier MR-JE-10BF to MR-JE-300BF*

① Always connect between P+ and D terminals. (factory-wired). When using the regenerative option, refer to the instruction manual.

② For the encoder cable, use of the option cable is recommended. For selecting cables, refer to "HG-KN_/HG-SN_ Servo Motor Instruction Manual".

③ This diagram is for sink I/O interface. For source I/O interface, refer to section 3.3.2.

④ For connecting servo motor power wires, refer to "HG-KN_/HG-SN_ Servo Motor Instruction Manual".

⑤ Configure up a circuit to turn off EM2 when the main circuit power is turned off to prevent an unexpected restart of the servo amplifier.

⑥ When not using the STO function, attach a short-circuit connector supplied with a servo amplifier.

⑦ When wires used for L11 and L21 are thinner than wires used for L1, L2, and L3, use a molded-case circuit breaker (refer to the instruction manual).

⑧ Connecting a servo motor of the wrong axis to U, V, W, or CN2 of the servo amplifier may cause a malfunction.

⑨ Use a magnetic contactor with an operation delay time (interval between current being applied to the coil until closure of contacts) of 80 ms or less. Depending on the main circuit voltage and operation pattern, bus voltage decreases, and that may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.

⑩ 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.

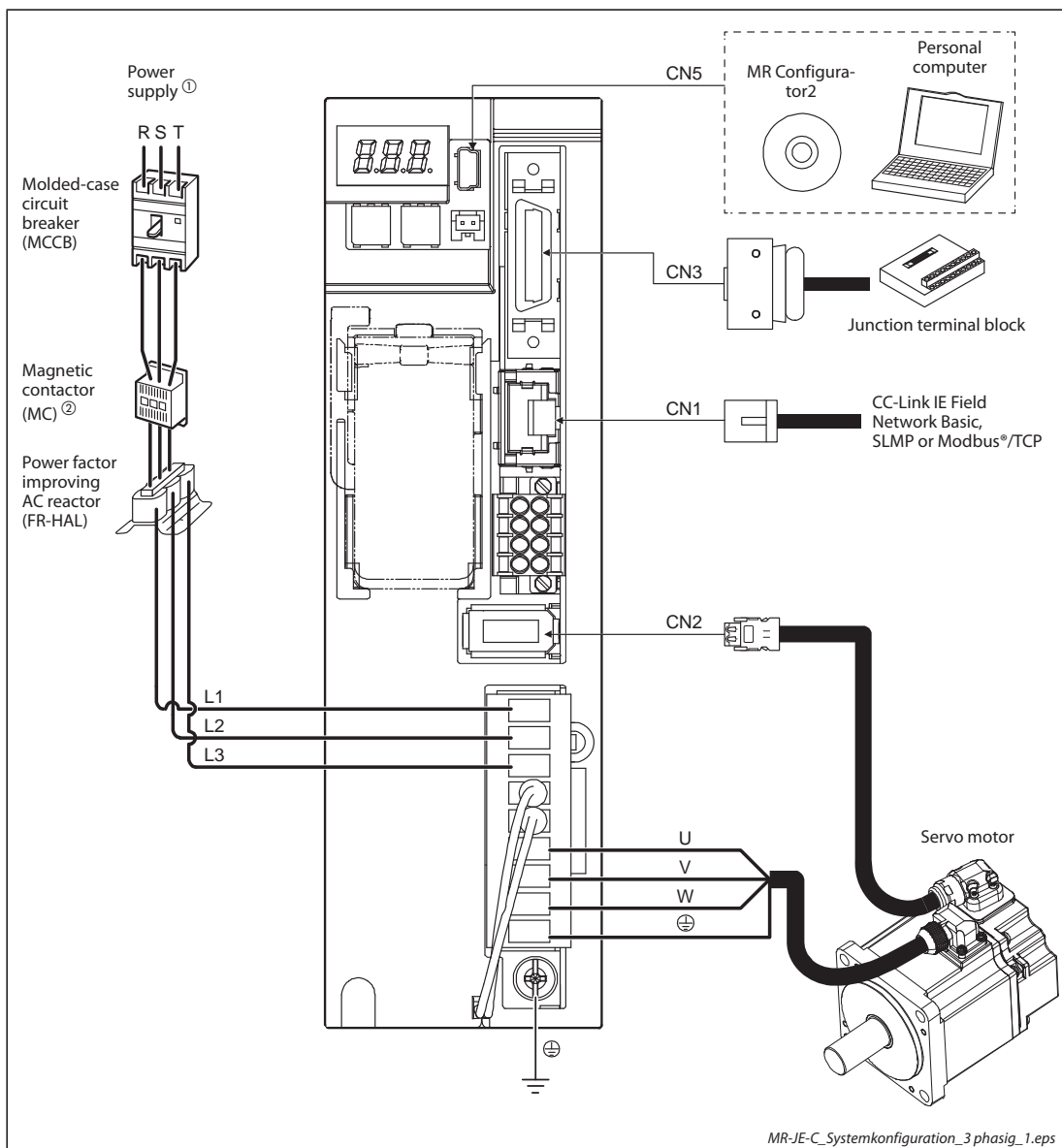**Fig. 3-36:**   *System configuration for MR-JE-20BF*

[1] A 1-phase 200 V AC to 240 V AC power supply may be used with the servo amplifier of MR-JE-200BF or less. In this case, connect the power supply to L1 and L3. Leave L2 open. Refer to section 3.1 for the power supply specifications.

[2] Depending on the main circuit voltage and operation pattern, bus voltage decreases, and that may cause the forced stop deceleration to shift to the dynamic brake deceleration. When dynamic brake deceleration is not required, slow the time to turn off the magnetic contactor.

[3] Always connect between P+ and D terminals. When using the regenerative option, refer to the instruction manual of the servo amplifier.

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

3.11 EM-Compatible Installation

Fast switching of electrical currents and voltages, which naturally also occurs when servo amplifiers are used, generates radio frequency interference (RF noise) that can be propagated both along cables and through the air. The power and signal cables of the servo amplifier can act as noise transmission antennas. Because of this the cabling work needs to be performed with the utmost care. The cables connecting the servo amplifier and the motor are a particularly powerful source of potential interference.

In the European Union several EMC (electromagnetic compatibility) directives have been passed with regulations for the limitation of interference generated by variable-speed drive systems. To conform to these regulations you must observe some basic guidelines when you are planning, installing and wiring your systems:

● To reduce noise radiation install the equipment in a closed and properly earthed switchgear cabinet made of metal.

● Ensure that everything is properly earthed.

● Use shielded cables.

● Install sensitive equipment as far away as possible from interference sources or install the interference sources in a separate switchgear cabinet.

● Keep signal and power cables separate. Avoid routing interference-suppressed cables (e.g. power supply cables) and interference-prone cables (e.g. shielded motor cables) together for more than short distances.

3.11.1 EM-compatible switchgear cabinet installation

The design of the switchgear cabinet is critical for compliance with the EMC directives. Please follow the following guidelines:

● Use an earthed cabinet made of metal.

● Use conductive seals between the cabinet door and chassis and connect the door and the chassis with a thick, braided earth cable.

● If an EMC filter is installed make sure that it has a good electrically conductive connection to the installation panel (remove paint etc). Ensure that the base on which the equipment is installed is also properly connected to the switchgear cabinet earth.

● All cabinet plates should be welded or screwed together not more than 10 cm apart to limit transparency to RF noise. The diameters of any openings and cable glands in the cabinet should not exceed 10 cm and there should not be any unearthed components anywhere in the cabinet. If larger openings are required they must be covered with wire mesh. Always remove paint etc. between all metal-on-metal contacts to ensure good conductivity for example between the wire mesh covers and the cabinet.

● If servo amplifiers and controllers must be installed in the same cabinet they should be kept as far away from one another as possible. It is better to use separate cabinets if possible. If you must install everything in a single cabinet you can separate the servo amplifiers and controllers with a metal panel.

● Earth the installed equipment with short, thick earth conductors or suitable earthing strips. Earthing strips with a large surface area are better for earthing RFI signals than equipotential bonding conductors with large cross-sections.

3.11.2 Wiring

All analog and digital signal cables should be shielded or routed in metal cable conduits.

At the entrance point to the chassis run the cable through a metal cable gland or fasten it with a P or U type cable clamp, connecting the shielding to the earth either with the gland or the clamp (see illustration below). If you use a cable clamp install it as near as possible to the cable entry point to keep the distance to the earthing point as short as possible. To keep the unshielded portion of the cable (RFI transmission antenna!) as short as possible ensure that the end of the motor cable shielding is as close as possible to the connection terminal without causing a risk of earth faults or short circuits.

When using a P or U clamp make sure that the clamp is installed cleanly and that it does not pinch the cable more than necessary.

Abschirmklemmen P-U.eps
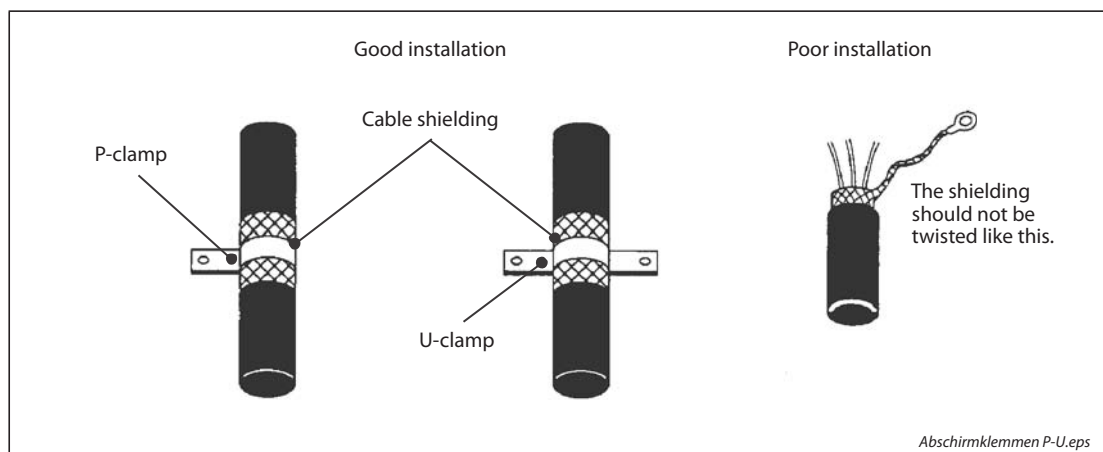
Route control signal cables at least 30 cm away from all power cables. Do not route the power supply cables or the cables connecting the servo amplifier and the motor in parallel to control signal cables, telephone cables or data cables.

If possible, all control signal cables to and from the servo amplifier should only be routed inside the earthed switchgear cabinet. If routing control signal cables outside the cabinet is not possible always use shielded cables, as signal cables can also function as antennas. The shielding of the cables must always be earthed. To prevent corruption of sensitive analog signals (e.g. the 0–5 V analog frequency setting signal) by currents circulating in the earthing system it may be necessary to earth only one end of the cable shielding. In such cases always earth the shielding at the servo amplifier end of the cable.

Installation of standard ferrite cores on the signal cables can further improve RFI suppression. The cable should be wound around the core several times and the core should be installed as close to the servo amplifier as possible.

Motor connection cables should always be as short as possible. Long cables can sometimes trigger earth fault protection mechanisms. Avoid unnecessarily long cables and always use the shortest possible route for the cables.

It should go without saying that the motor itself should also be properly earthed.

3.11.3 Optional EMC filters

EMC filters (mains RFI suppression filters) significantly reduce interference. They are installed between the mains power supply and the servo amplifier of the MR-JE series.

Wiring 1-phase
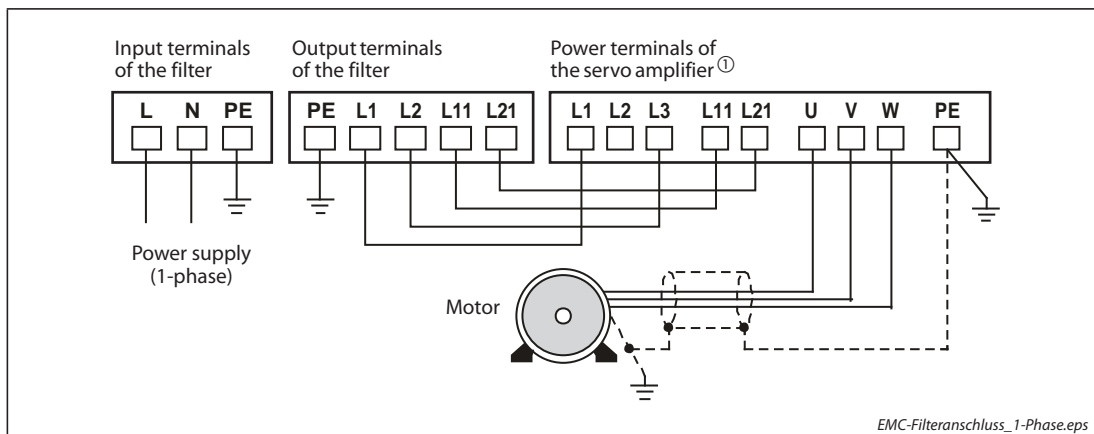
Fig. 3-37: *Wiring of the EMC filter with the servo amplifier for one phase power supply*

[1] Only the servo amplifier MR-JE-BF has the control circuit terminals L11 and L21. When wiring the other servo amplifiers leave the output terminals L11 and L21 of the filter open. For the power supply specifications, refer to section 3.1.

● MR-JE-200A, MR-JE-200B and MR-JE-200C
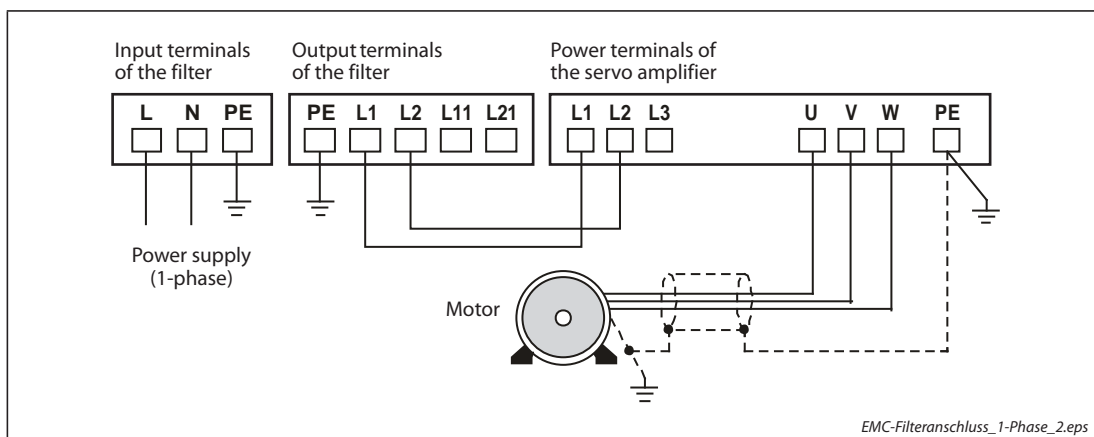
Fig. 3-38: *Wiring of the EMC filter with the servo amplifier for one phase power supply of MR-JE-200A, MR-JE-200B and MR-JE-200C*

Wiring 3-phase
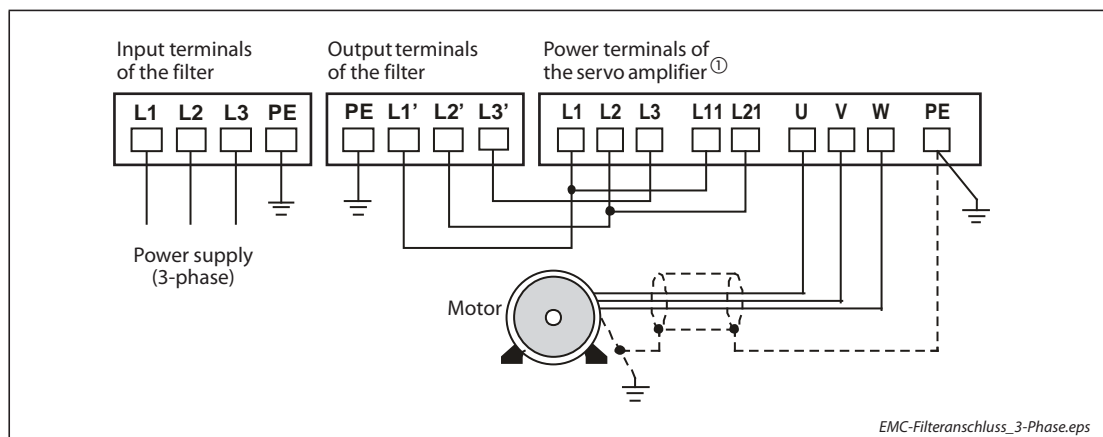
Fig. 3-39:   *Wiring of the EMC filter with the servo amplifier for three phase power supply*

① Only the servo amplifier MR-JE-BF has the control circuit terminals L11 and L21. The other servo amplifiers don't have the terminals L11 and L21 and the wiring of these terminals has to be omitted. For the power supply specifications, refer to section 3.1.

WARNING:

● *These filters are NOT designed for use in power networks (IT type). When the noise filters are operated leakage currents are discharged to earth. This can trigger upstream protective devices (as RCDs), particularly when there are unbalanced mains voltages, mains phase failures or switching activities on the input side of the filter.*
For further information please refer to the Mitsubishi manual for servo amplifiers and the EMC Installation Guidelines which contain detailed information about EM-compatible installation.

● *When a 1-phase 200 V AC to 240 V AC power supply is used, the connection destination differs depending on the servo amplifier.*

● *Connect the 1-phase 200 V AC to 240 V AC power supply to L1 and L3. For the MR-JE-200A, MR-JE-200B and MR-JE-200C servo amplifier connect it to L1 and L2.*

---

4   Startup

4.1   Preparations

Before switching on the servo amplifier for the first time

Check all the following points carefully before switching on a servo amplifier for the first time:

● Has all the wiring been performed correctly? Check the power supply connections particularly carefully: Single-phase to L1 and L3 or L1 and L2, 3-phase to L1, L2 and L3.

● Double-check for damaged cables and insufficiently insulated terminals to eliminate any possibility of short circuits.

● Is the servo amplifier properly earthed? Double-check for possible earth faults and short circuits in the output circuit.

● Check that all screws, connection terminals and other cable connections are connected correctly and firmly.

Cable routing

● The wiring cables are free from excessive force.

● The encoder cable should not be used in excess of its flex life.

● The connector part of the servo motor should not be strained.

Environment

Check the following point before initial startup:

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

Parameters

Check the setting of parameters by the display of the controller or setup software.

DANGER:

● *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 prevent accidental contact of hands and parts (cables, etc.) with them.*

● *During operation, never touch the rotor of the servo motor. Otherwise, it may cause injury.*

WARNING:

● *Incorrect parameter settings can damage or (in extreme cases) even destroy the connected motor. Take great care when you are setting the parameters and double check the electrical and mechanical specifications of the motor, your entire drive system and the connected machine before proceeding.*

● *Connect the servo motor with a machine after confirming that the servo motor operates properly alone.*

4.2 Startup of servo amplifier series MR-JE-A

4.2.1 Power on and off the servo amplifier

Procedure in position control mode.

Power on

Switch power on in the following procedure. Always follow this procedure at power-on.

① Switch off SON (Servo-on).

② Make sure that a command pulse train is not input.

③ Switch on the power supply.
When power is switched on, the display shows "C" (Cumulativefeedback pulses), and in 2 s later, shows data.
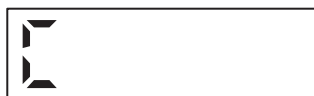
Power off

① Make sure that a command pulse train is not input.

② Switch off SON (Servo-on).

③ Switch off the power supply.

| NOTES | The power on and off procedure for the operating modes speed control and torque control are not described here. For details about this please refer to the respective instruction manuals of the servo amplifier series. |

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4.2.2 Stop of operation

If any of the following situations occurs, the servo amplifier suspends the running of the servo motor and brings it to a stop. Refer to the instruction manual for the servo motor with an electromagnetic brake.

Operation/command	Stopping condition
Switch off SON (Servo-on)	The base circuit is shut off and the servo motor coasts.
Alarm occurrence	The servo motor decelerates to a stop with the command. With some alarms, however, the dynamic brake operates to bring the servo motor to a stop. (See note)
EM2 (Forced stop 2) off	The servo motor decelerates to a stop with the command. AL. E6 (Servo forced stop warning) occurs. EM2 has the same function as EM1 in the torque control mode. Refer to the instruction manual for EM1.
LSP (Forward rotation stroke end) of LSN (Reverse rotation stroke end) off	It will bring the motor to a sudden stop and make it servo-locked. It can be run in the opposite direction.

Tab. 4-1:   *Stop of operation by the servo amplifier*

NOTE | Refer to "MELSERVO-JE Servo Amplifier Instruction Manual (Troubleshooting)" for details of alarms and warnings.

4.2.3 Test operation

Before starting actual operation, perform test operation to make sure that the machine operates normally. Refer to section 4.2.1 for the power on and off methods of the servo amplifier.

Test operation of the servo motor alone in JOG operation of test operation mode	In this step, confirm that the servo amplifier and servo motor operate normally. With the servo motor disconnected from the machine, use the test operation mode and check whether the servo motor correctly rotates at the slowest speed. Refer to section "test operation mode" of the respective instruction manual.
Test operation of the servo motor alone by commands	In this step, confirm that the servo motor correctly rotates at the slowest speed under the commands from the controller. Make sure that the servo motor rotates in the following procedure. ● Switch on EM2 (Forced stop 2) and SON (Servo-on). When the servo amplifier is put in a servo-on status, RD (Ready) switches on. ● Switch on LSP (Forward rotation stroke end) and LSN (Reverse rotation stroke end). ● When a pulse train is input from the controller, the servo motor starts rotating. Give a low speed command at first and check the rotation direction, etc. of the servo motor. If the machine does not operate in the intended direction, check the input signal.
Test operation with the servo motor and machine connected	In this step, connect the servo motor with the machine and confirm that the machine operates normally under the commands from the controller. Make sure that the servo motor rotates in the following procedure. ● Switch on EM2 (Forced stop 2) and SON (Servo-on). When the servo amplifier is put in a servo-on status, RD (Ready) switches on. ● Switch on LSP (Forward rotation stroke end) and LSN (Reverse rotation stroke end). ● When a pulse train is input from the controller, the servo motor starts rotating. Give a low speed command at first and check the operation direction, etc. of the machine. If the machine does not operate in the intended direction, check the input signal. In the status display, check for any problems of the servo motor speed, command pulse frequency, load ratio, etc. ● Then, check automatic operation with the program of the controller.

Tab. 4-2:   *Test operation of the servo amplifier MR-JE-A at position control*

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4.2.4 Parameter setting

> ⚠ **WARNING:**
>
> *Change settings and parameters only in small steps and make afterwards at first sure whether the desired effect occurs before doing any more changes. Excessive adjustment or change of parameter setting must not be made as it will make operation unstable.*

In the position control mode, the servo amplifier can be used by merely changing the basic setting parameters (PA□□) mainly.

As necessary, set other parameters:

- Gain/filter setting parameters (PB□□)
- Extension setting parameters (PC□□)
- I/O setting parameters (PD□□)
- Extension setting 2 parameters (PE□□)
- Extension setting 3 parameters (PF□□)
- Position control parameters (PT□□) (Positioning mode)

4.2.5 Actual operation

Start actual operation after confirmation of normal operation by test operation and completion of the corresponding parameter settings. Perform a home position return as necessary.

NOTE | If there are any problems during startup, refer to the chapter "troubleshooting" in section 7.1 and in the instruction manual of the respective servo amplifier.

4.3   Startup of servo amplifier series MR-JE-B and MR-JE-BF

4.3.1   Power on and off the servo amplifier

Power on

When the power supply is turned on, "b01" (for the first axis) appears on the servo amplifier display.

Parameter setting

Set the parameters according to the structure and specifications of the machine. Refer to chapter 6 and the instruction manual for details.

After setting the above parameters, turn power off as necessary. Then switch power on again to enable the parameter values.

Servo-on

Enable the servo-on with the following procedure.

① Switch on the power supply for the MR-JE-B.
   Switch on the main circuit power supply and control circuit power supply for the MR-JE-BF.

② Transmit the servo-on command with the controller.

When the servo-on status is enabled, the servo amplifier is ready to operate and the servo motor is locked.

Home position return

Always perform home position return before starting positioning operation.

NOTES	The power on and off procedure for the operating modes speed control and torque control are not described here. For details about this please refer to the respective instruction manuals of the servo amplifier series.
	When the absolute position detection system is used in a rotary servo motor, first power-on results in AL. 25 (Absolute position erased) and the servo system cannot be switched on. The alarm can be deactivated by then switching power off once and on again.
	Also, if power is switched on at the servo motor speed of 3000 1/min or higher, position mismatch may occur due to external force or the like. Power must therefore be switched on when the servo motor is at a stop.

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4.3.2   **Stop of operation**

Turn off the servo-on command after the servo motor has stopped, and then switch the power off.

If any of the following situations occurs, the servo amplifier suspends the running of the servo motor and brings it to a stop.

Refer to the instruction manual for the servo motor with an electromagnetic brake.

Triggered by	Operation/command	Stopping condition
Servo system controller	Servo-off command	The base circuit is shut off and the servo motor coasts.
	Ready-off command	The base circuit is shut off and the dynamic brake operates to bring the servo motor to a stop.
	Forced stop command	The servo motor decelerates to a stop with the command. AL. E7 (Controller forced stop warning) occurs.
Servo amplifier	Alarm occurrence	The servo motor decelerates to a stop with the command. With some alarms, however, the dynamic brake operates to bring the servo motor to a stop. (See note)
	EM2 (Forced stop 2) off	The servo motor decelerates to a stop with the command. AL. E6 (Servo forced stop warning) occurs. EM2 has the same function as EM1 in the torque control mode. Refer to the instruction manual for EM1.
	STO (STO1, STO2) off [1]	The base circuit is shut off and the dynamic brake operates to bring the servo motor to a stop.

Tab. 4-3:   *Stop of operation by servo system controller or servo amplifier*

[1] Safe Torque Off (STO function) only for the MR-JE-BF

NOTE	Refer to "MELSERVO-JE Servo Amplifier Instruction Manual (Troubleshooting)" for details of alarms and warnings.

4.3.3 Test operation

Before starting actual operation, perform test operation to make sure that the machine operates normally. Refer to section 4.3.1 for the power on and off methods of the servo amplifier.

NOTE | If necessary, verify controller program by using motor-less operation. Refer to section 5.2.5 for the motor-less operation

Test operation of the servo motor alone in JOG operation of test operation mode	In this step, confirm that the servo amplifier and servo motor operate normally. With the servo motor disconnected from the machine, use the test operation mode and check whether the servo motor correctly rotates at the slowest speed. Refer to section "test operation mode" of the respective instruction manual.
Test operation of the servo motor alone by commands	In this step, confirm that the servo motor correctly rotates at the slowest speed under the commands from the controller. Give a low speed command at first and check the rotation direction, etc. of the servo motor. If the machine does not operate in the intended direction, check the input signal.
Test operation with the servo motor and machine connected	In this step, connect the servo motor with the machine and confirm that the machine operates normally under the commands from the controller. Give a low speed command at first and check the operation direction, etc. of the machine. If the machine does not operate in the intended direction, check the input signal. Check any problems with the servo motor speed, load ratio, and other status display items with MR Configurator2. Then, check automatic operation with the program of the controller.

Tab. 4-4: *Test operation of the servo amplifier MR-JE-B*

NOTE | If there are any problems during startup, refer to the chapter "troubleshooting" in section 7.2 and in the instruction manual of the respective servo amplifier.

4.4 Startup of servo amplifier series MR-JE-C

4.4.1 Power on and off the servo amplifier

Procedure in position control mode.

Power on

Switch power on in the following procedure. Always follow this procedure at power-on.

① Switch off SON (Servo-on).

② Make sure that a command pulse train is not input.

③ Switch on the power supply.
When power is switched on, the display shows "C01" (when the identification No. is 01).

Power off

① Make sure that a command pulse train is not input.

② Switch off SON (Servo-on).

③ Switch off the power supply.

NOTES	When the absolute position detection system is used in a rotary servo motor, first power-on results in AL. 25 (Absolute position erased) and the servo system cannot be switched on. The alarm can be deactivated by then switching power off once and on again.
	Also, if power is switched on at the servo motor speed of 3000 1/min or higher, position mismatch may occur due to external force or the like. Power must therefore be switched on when the servo motor is at a stop.

4.4.2 Stop of operation

Turn off SON (Servo-on) after the servo motor has stopped, and then switch the power off.

If any of the following situations occurs, the servo amplifier suspends the running of the servo motor and brings it to a stop.

Refer to the instruction manual for the servo motor with an electromagnetic brake.

Operation/command	Stopping condition
Switch off SON (Servo-on)	The base circuit is shut off and the servo motor coasts.
Alarm occurrence	The servo motor decelerates to a stop with the command. With some alarms, however, the dynamic brake operates to bring the servo motor to a stop. (See note)
EM2 (Forced stop 2) off	The servo motor decelerates to a stop with the command. AL. E6 (Servo forced stop warning) occurs. EM2 has the same function as EM1 in the torque control mode. Refer to the instruction manual for EM1.
LSP (Forward rotation stroke end) of LSN (Reverse rotation stroke end) off	It will bring the motor to a sudden stop and make it servo-locked. It can be run in the opposite direction.

Tab. 4-5: *Stop of operation by the servo amplifier*

NOTE	Refer to "MELSERVO-JE Servo Amplifier Instruction Manual (Troubleshooting)" for details of alarms and warnings.

4.4.3 Test operation

Before starting actual operation, perform test operation to make sure that the machine operates normally. Refer to section 4.4.1 for the power on and off methods of the servo amplifier.

Test operation of the servo motor alone in JOG operation of test operation mode	In this step, confirm that the servo amplifier and servo motor operate normally. With the servo motor disconnected from the machine, use the test operation mode and check whether the servo motor correctly rotates at the slowest speed. Refer to section "test operation mode" of the respective instruction manual.
Test operation of the servo motor alone by commands	In this step, confirm that the servo motor correctly rotates at the slowest speed under the commands from the controller. Make sure that the servo motor rotates in the following procedure. • Switch on EM2 (Forced stop 2) and SON (Servo-on). When the servo amplifier is put in a servo-on status, RD (Ready) switches on. • Switch on LSP (Forward rotation stroke end) and LSN (Reverse rotation stroke end). • When a pulse train is input from the controller, the servo motor starts rotating. Give a low speed command at first and check the rotation direction, etc. of the servo motor. If the machine does not operate in the intended direction, check the input signal.
Test operation with the servo motor and machine connected	In this step, connect the servo motor with the machine and confirm that the machine operates normally under the commands from the controller. Make sure that the servo motor rotates in the following procedure. • Switch on EM2 (Forced stop 2) and SON (Servo-on). When the servo amplifier is put in a servo-on status, RD (Ready) switches on. • Switch on LSP (Forward rotation stroke end) and LSN (Reverse rotation stroke end). • When a pulse train is input from the controller, the servo motor starts rotating. Give a low speed command at first and check the operation direction, etc. of the machine. If the machine does not operate in the intended direction, check the input signal. In the status display, check for any problems of the servo motor speed, command pulse frequency, load ratio, etc. • Then, check automatic operation with the program of the controller.

Tab. 4-6:   *Test operation of the servo amplifier MR-JE-C at position control*

NOTE	For the CC-Link IE Field Network Basic initial communication setting of the MR-JE-C refer to the instruction manual (CC-Link IE Field Network Basic).

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4.4.4   Parameter setting

> ⚠ **WARNING:**
>
> *Change settings and parameters only in small steps and make afterwards at first sure whether the desired effect occurs before doing any more changes. Excessive adjustment or change of parameter setting must not be made as it will make operation unstable.*

In the position control mode, the servo amplifier can be used by merely changing the basic setting parameters (PA□□) mainly.

As necessary, set other parameters:

● Gain/filter setting parameters (PB□□)

● Extension setting parameters (PC□□)

● I/O setting parameters (PD□□)

● Extension setting 2 parameters (PE□□)

● Extension setting 3 parameters (PF□□)

● Positioning control parameters (PT□□) (Profile mode)

● Network setting parameters (PN□□) (Ethernet communication)

4.4.5   Actual operation

Start actual operation after confirmation of normal operation by test operation and completion of the corresponding parameter settings. Perform a home position return as necessary.

NOTE

If there are any problems during startup, refer to the chapter "troubleshooting" in section 7.1 and in the instruction manual of the respective servo amplifier.

5   Operation and Settings

5.1   Display and operation section of MR-JE-A series

The MR-JE-A servo amplifier has the display section (5-digit, 7-segment LED) and operation section (4 push buttons) for servo amplifier status display, alarm display, parameter setting, etc. Also, press the "MODE" and "SET" buttons at the same time for 3 s or more to switch to the one-touch tuning mode.

5.1.1   Overview

The operation section and display data are described below.

5-digit, 7-segment LED
Displays data

MODE	Display mode change Low/High switching
↑	Display/data scrolling (UP)
↓	Display/data scrolling (DOWN)
SET	Display/data determination Data clear
AUTO	To the one-touch tuning mode

Decimal LED Displays the decimal points, alarm presence/absence, etc.

Lit to indicate the decimal point.

Decimal

Lit to indicate a negative when "-" (negative) cannot be displayed.

Flickers to indicate alarm occurrence.

Flickers to indicate the test operation mode.

MR-J4-A Anzeige_Bedienelemente.eps

Fig. 5-1:   *Display and push buttons of MR-JE-A*

5.1.2   Display flowchart MR-JE-A

Press the "MODE" button once to shift to the next display mode. Refer to section 5.1.3 and later for the description of the corresponding display mode.

To refer to and set the gain/filter parameters, extension setting parameters and I/O setting parameters, enable them with parameter PA19 (Parameter writing inhibit).

Display mode transition	Initial screen	Function	Refer to
Status display	C	Servo status display. C appears at power-on. [1]	Fig. 5-2
One-touch tuning	AUTo	One-touch tuning Select this when performing the one-touch tuning.	Instruction manual
Diagnosis	rd-oF	Sequence display, external signal display, output signal (DO) forced output, test operation, software version display, VC automatic offset, servo motor series ID display, servo motor type ID display, servo motor encoder ID display, drive recorder enabled/disabled display.	Instruction manual
Alarms	AL--.-	Current alarm display, alarm history display, parameter error number display.	Section 5.1.6
Basic setting parameters	P A01	Display and setting of basic setting parameters.	Section 5.1.7
Gain/filter parameters	P b01	Display and setting of gain/filter parameters.	
Extension setting parameters	P C01	Display and setting of extension setting parameters.	
I/O setting parameters	P d01	Display and setting of I/O setting parameters.	
Extension setting 2 parameters	P E01	Display and setting of extension setting 2 parameters.	
Extension setting 3 parameters	P F01	Display and setting of extension setting 3 parameters.	

Button ● MODE

Tab. 5-1:   *MR-JE-A – Display sequence via activation of the MODE button*

[1] When the axis name is set to the servo amplifier using MR Configurator2, the axis name is displayed and the servo status is then displayed.

Display flowchart MR-JE-A (positioning mode)

Display mode transition	Initial screen	Function	Refer to
Status display	PoS	Servo status display. For the point table method and program method, "PoS" is displayed at power-on. [1]	Fig. 5-3
One-touch tuning	AUTo	One-touch tuning Select this when performing the one-touch tuning.	Instruction manual
Diagnosis	rd-oF	Sequence display, external signal display, output signal (DO) forced output, test operation, software version display, VC automatic offset, servo motor series ID display, servo motor type ID display, servo motor encoder ID display, drive recorder enabled/disabled display.	Instruction manual
Alarms	AL--.-	Current alarm display, alarm history display, parameter error number display.	Section 5.1.6
Point table setting	Po001	Display and setting of point table data. This is displayed only in the point table method, not in other control modes.	Instruction manual
Basic setting parameters	P A01	Display and setting of basic setting parameters.	
Gain/filter parameters	P b01	Display and setting of gain/filter parameters.	
Extension setting parameters	P C01	Display and setting of extension setting parameters.	
I/O setting parameters	P d01	Display and setting of I/O setting parameters.	Section 5.1.7
Extension setting 2 parameters	P E01	Display and setting of extension setting 2 parameters.	
Extension setting 3 parameters	P F01	Display and setting of extension setting 3 parameters.	
Positioning control parameters	P r01	Display and setting of positioning control parameters.	

Button MODE

Tab. 5-2: *MR-JE-A – Display sequence via activation of the MODE button (positioning mode)*

[1] When the axis name is set to the servo amplifier using MR Configurator2, the axis name is displayed and the servo status is then displayed.

5.1.3 Status display mode MR-JE-A

The servo status during operation is shown on the 5-digit, 7-segment LED display. Press the "UP" or "DOWN" button to change display data as desired. When the required data is selected, the corresponding symbol is displayed. Press the "SET" button to display that data. At only power-on, however, data appears after the symbol of the status display selected in Parameter PC36 has been shown for 2 s.

Display transition

After selecting the status display mode with the "MODE" button, pressing the "UP" or "DOWN" button changes the display as shown below.

Symbol	Description
C	Cumulative feedback pulses
r	Servo motor speed
E	Droop pulses
P	Cumulative command pulses
n	Command pulse frequency
F	Analog speed command voltage / Analog speed limit voltage
U	Analog torque limit voltage / Analog torque command voltage
L	Regenerative load ratio
J	Effective load ratio
b	Peak load ratio
T	Instantaneous torque
CY1	Within one-revolution position (1 pulse unit)
CY2	Within one-revolution position (1000 pulse unit)
LS	ABS counter [1]
dC	Load to motor inertia ratio
Pn	Bus voltage
ETH	Internal temperature of encoder
ST	Settling time
oF	Oscillation detection frequency
rd	Number of tough drive operations
PC1	Unit power consumption 1 (1 W unit)
PC2	Unit power consumption 2 (1 kW unit)
TP1	Unit total power consumption 1 (1 Wh unit)
TP2	Unit total power consumption 2 (100 kWh unit)

Fig. 5-2:   *MR-JE-A – Display transition of status display (standard control mode)*

[1] Travel distance from power on is displayed by counter value.

Display transition in positioning mode

Main axis one cycle current position

Left column (top to bottom):
- Cumulative feedback pulses
- Servo motor speed
- Droop pulses
- Cumulative command pulses
- Command pulse frequency
- Analog speed command voltage / Analog speed limit voltage
- Analog torque limit voltage / Analog torque command voltage
- Regenerative load ratio
- Effective load ratio
- Peak load ratio
- Instantaneous torque
- Within one-revolution position (1 pulse unit)
- Within one-revolution position (1000 pulse unit)
- ABS counter
- Load to motor inertia ratio
- Bus voltage
- Internal temperature of encoder
- Settling time
- Oscillation detection frequency

UP / DOWN

Right column (top to bottom):
- Number of tough drive operations
- Unit power consumption 1 (increment of 1 W)
- Unit power consumption 2 (increment of 1 kW)
- Unit total power consumption 1 (increment of 1 Wh)
- Unit total power consumption 2 (increment of 100 kWh)
- Current position
- Command position
- Command remaining distance
- Point table/program No.
- Step No.
- Analog override voltage
- Override level
- Cam axis one cycle current value
- Cam standard position
- Cam axis feed current value
- Cam No. in execution
- Cam stroke amount in execution
- Main axis current value
- Main axis one cycle current value

Cumulative feedback pulses

MR-JE-A_Flussdiagramm Statusanzeige.eps

Fig. 5-3:   MR-JE-A – Display transition of status display (Positioning mode)

5.1.4   Display examples

Item	State	Displayed data
		Servo amplifier display
Servo motor speed	Forward rotation at 2500 min^{-1}	(display: 2500)
	Reverse rotation at 3000 min^{-1}	(display: -3000) Reverse rotation is indicated by "–".
Load to motor inertia ratio	7.00 times	(display: 7.00)
Cumulative feedback pulses	11252 pulses	(display: 11252)
	-12566 pulses	(display: 12566 with lit decimal points) Negative value is indicated by the lit decimal points in the upper four digits.

Tab. 5-3:   *Display examples of status display MR-JE-A*

5.1.5   Changing the status display screen

The status display item of the servo amplifier display shown at power-on can be changed by changing Parameter PC36 settings. The item displayed in the initial status changes with the control mode as follows.

Control mode	Status display
Position	Cumulative feedback pulses
Position/speed	Cumulative feedback pulses/servo motor speed
Speed	Servo motor speed
Speed/torque	Servo motor speed/analog torque command voltage
Torque	Analog torque command voltage
Torque/position	Analog torque command voltage/cumulative feedback pulses
Positioning (point table method/ program method) [1]	Current position

Tab. 5-4:   *Display of initial status MR-JE-A*

[1] Only positioning mode

5.1.6 Alarm mode

The current alarm, past alarm history and parameter error are displayed. The lower 2 digits on the display indicate the alarm number that has occurred or the parameter number in error.

Name	Display [1]	Description
Current alarm	AL	Indicates no occurrence of an alarm.
	AL33.1	Indicates the occurrence of AL. 33.1 (Main circuit voltage error). Flickers at alarm occurrence.
Alarm history	A050.1	Indicates that the last alarm is AL. 50.1 (Thermal overload error 1 during operation).
	A133.1	Indicates the second last alarm is AL. 33.1 (Main circuit voltage error).
	A210.1	Indicates the third last alarm is AL. 10.1 (Voltage drop in the control circuit power).
	⋮	⋮
	A9	Indicates that there is no tenth alarm in the past.
	AA	Indicates that there is no eleventh alarm in the past.
	Ab	Indicates that there is no twelfth alarm in the past.
	⋮	⋮
	AF	Indicates that there is no sixteenth alarm in the past.
Parameter error No. [2]	E	This indicates no occurrence of AL. 37 (Parameter error).
	E A12	The data content error of Parameter PA12 (Reverse rotation torque limit).
Point table error No. [3]	E.002d	The value of the point table is over the setting range. The error point table No. (intermediate digit "2") and item (lower digit "d") are displayed. The following shows the items. P: position data, d: motor speed, A: acceleration time constant, b: deceleration time constant, n: dwell, H: sub function, M: M code

Tab. 5-5: *Alarm examples*

[1] If a parameter error and point table error occur simultaneously, the display shows the parameter error (only positioning mode).

[2] The display shows only when the current alarm is AL. 37 (Parameter error).

[3] Only positioning mode

NOTES   Any mode screen displays the current alarm.

Even during alarm occurrence, the other screen can be viewed by pressing the button in the oper-ation area. At this time, the decimal point in the fourth digit remains flickering.

For any alarm, remove its cause and clear it in any of the following methods. (Refer to chapter 7 for the alarms that can be cleared.)
– Switch power off, then on.
– Push the "SET" button on the current alarm screen.
– Turn on RES (Reset).

Use Parameter PC18 to clear the alarm history.

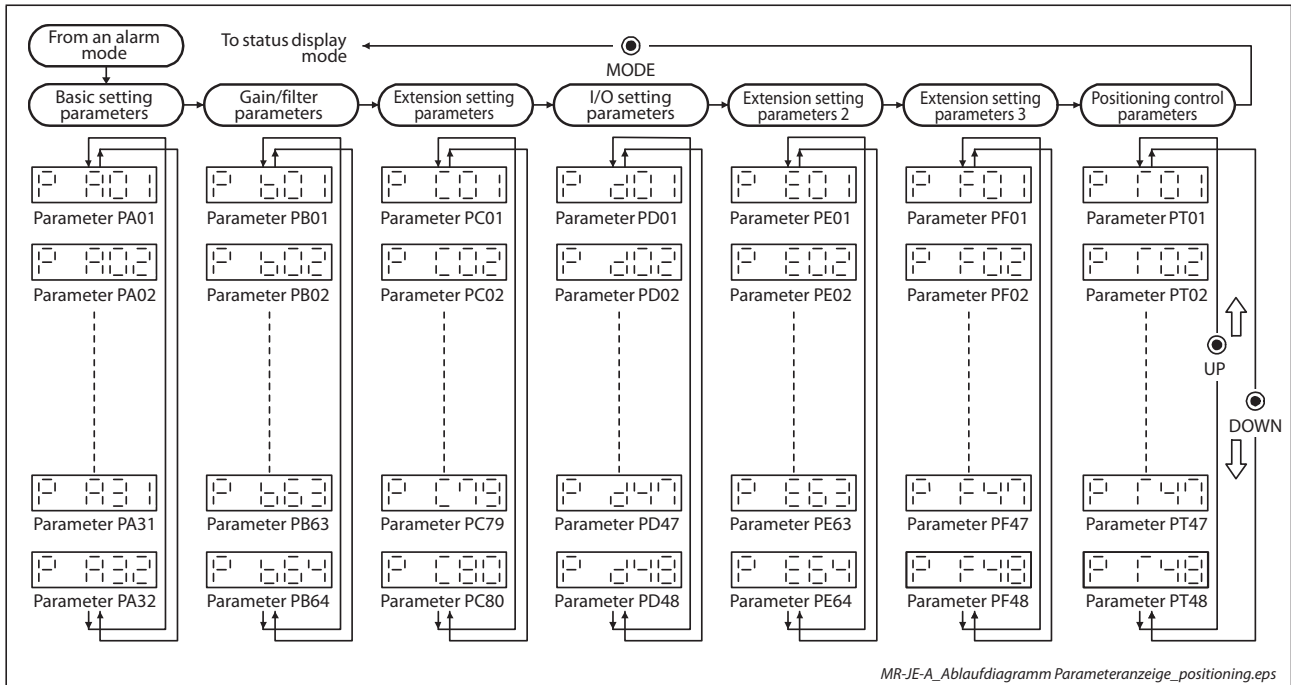Push "UP" or "DOWN" to move to the next history.

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5.1.7 Parameter mode

Parameter mode transition

After selecting the corresponding parameter mode with the "MODE" button, pushing the "UP" or "DOWN" button changes the display as shown below.
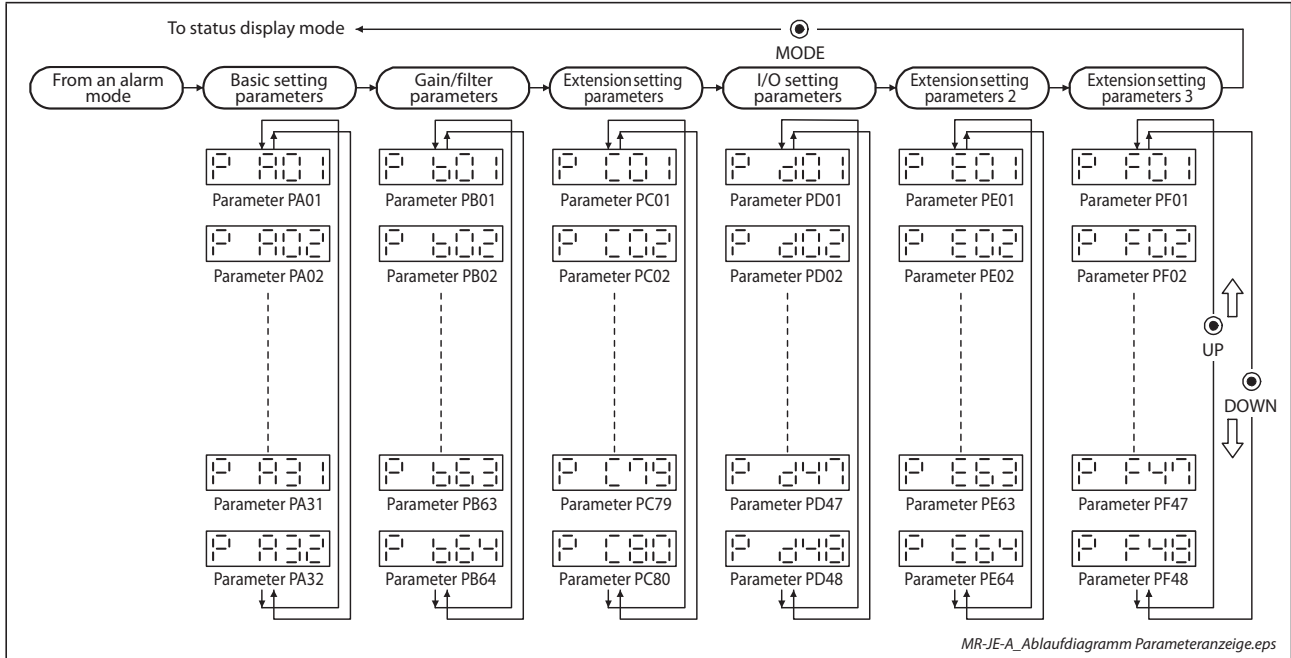
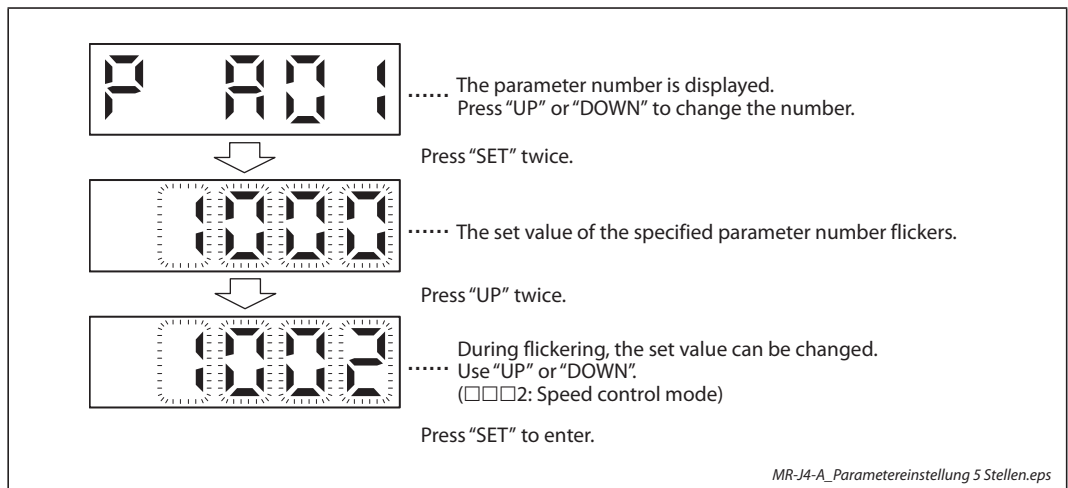**Fig. 5-4:** *MR-JE-A – Parameter display selection*

Fig. 5-5: *MR-JE-A – Parameter display selection (positioning mode)*

Operation example

● Parameters of 5 or less digits

The following example shows the operation procedure performed after power-on to change the control mode to the speed control mode with Parameter PA01 (Operation mode). Press "MODE" to switch to the basic setting parameter screen.

The parameter number is displayed.
Press "UP" or "DOWN" to change the number.

Press "SET" twice.

The set value of the specified parameter number flickers.

Press "UP" twice.

During flickering, the set value can be changed.
Use "UP" or "DOWN".
(□□□2: Speed control mode)

Press "SET" to enter.

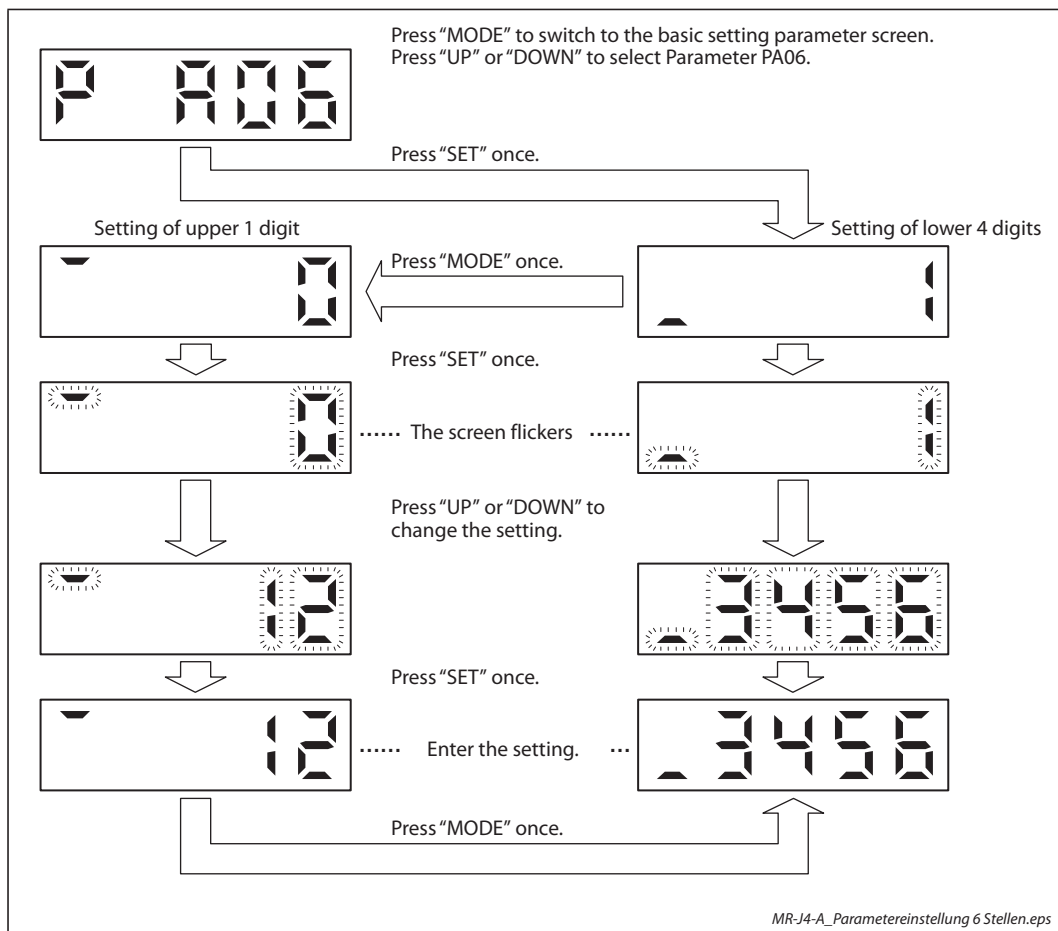*MR-J4-A_Parametereinstellung 5 Stellen.eps*

Fig. 5-6:   *Changing PA01 from "Position control mode" to "Speed control mode"*

To shift to the next parameter, press the "UP" or "DOWN" button.

When changing the parameter PA01 setting, change its set value, then switch power off once and switch it on again to enable the new value.

● Parameters of 6 or more digits

The following example gives the operation procedure to change the electronic gear numerator to "123456" with parameter PA06 (Electronic gear numerator).

Press "MODE" to switch to the basic setting parameter screen.
Press "UP" or "DOWN" to select Parameter PA06.

Press "SET" once.

Setting of upper 1 digit   Setting of lower 4 digits

Press "MODE" once.

Press "SET" once.

······ The screen flickers ······

Press "UP" or "DOWN" to change the setting.

Press "SET" once.

······ Enter the setting. ···

Press "MODE" once.

MR-J4-A_Parametereinstellung 6 Stellen.eps

Fig. 5-7:   *Changing the setting of PA06 to "123456"*

5.1.8 Test operation mode

⚠ **WARNING:**
- *The test operation mode is designed for checking servo operation. Do not use it for actual operation.*
- *If the servo motor operates unexpectedly, use EM2 (Forced stop 2) to stop it.*

NOTES

MR Configurator2 is required to perform positioning operation.

Test operation cannot be performed if SON (Servo-on) is not turned off.

For single-step feed of the servo amplifier MR-JE-A with the point table No. or the program No. refer to the instruction manual (positioning mode).

Mode switching

Call the display screen shown after power-on. Select JOG operation or motor-less operation in the following procedure. Using the "MODE" button, show the diagnostic screen.
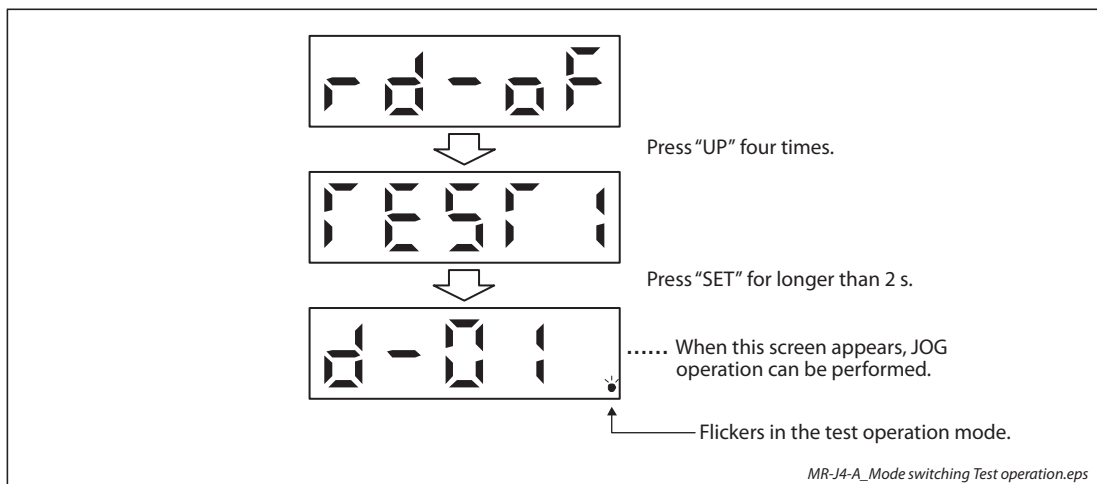
Fig. 5-8:   *Mode switching for JOG operation or motor-less operation*

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JOG operation

| NOTE | When performing JOG operation, turn on EM2, LSP and LSN. LSP and LSN can be set to automatic on by setting Parameter PD01 to "□C□□". |

JOG operation can be performed when there is no command from the controller.

● Operation

The servo motor rotates while holding down the "UP" or the "DOWN" button. The servo motor stops rotating by releasing the button. The operation condition can be changed using MR Configurator2. The initial operation condition and setting range for operation are listed below.

Item	Initial setting	Setting range
Speed [1/min]	200	0 to instantaneous permissible speed
Acceleration/deceleration time constant [ms]	1000	0 to 50000

Tab. 5-6: *Initial settings for operation*

The following table shows how to use the buttons.

Button	Description
"UP"	Press to start CCW rotation. Release to stop.
"DOWN"	Press to start CW rotation. Release to stop.

Tab. 5-7:
Use of the buttons

If the USB cable is disconnected during JOG operation using the MR Configurator2, the servo motor decelerates to a stop.

● Status display

Press the "MODE" button in the JOG operation-ready status to call the status display screen. When the JOG operation is performed using the "UP" or "DOWN" button, the servo status is displayed during the JOG operation. Every time the "MODE" button is pushed, the next status display screen appears. When one cycle of the screen display is complete, it returns to the JOG operation-ready status screen. Refer to section 5.1.3 for details of status display. Note that the status display screen cannot be changed by the "UP" or "DOWN" button during the JOG operation.

● Termination of JOG operation

To end the JOG operation, shut the power off once, or press the "MODE" button to switch to the next screen, and then hold down the "SET" button for 2 s or longer.
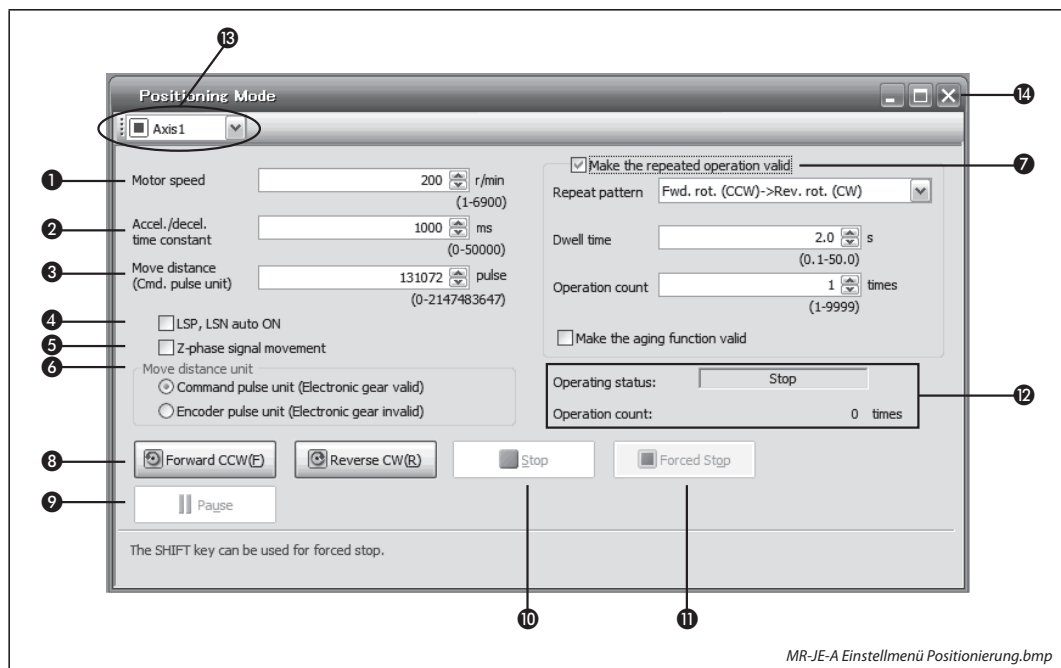
Positioning operation

| NOTES | MR Configurator2 is required to perform positioning operation. |

Turn on EM2 (forced stop 2) when performing positioning operation.

For positioning operation of the servo amplifier MR-JE-A in positioning mode with the point table method or program method refer to the instruction manual.

Positioning operation can be performed when there is no command from a controller.

● Operation

Fig. 5-9:   Setting menu of setup software for positioning

❶ Motor speed [1/min]
Enter the servo motor speed into the "Motor speed" input field.

❷ Acceleration/deceleration time constant [ms]
Enter the acceleration/deceleration time constant into the "Accel/decel time" input field.

❸ Travel distance [pulse]
Enter the travel distance into the "Travel distance" input field.

❹ LSP/LSN are automatically turned on
When setting the external stroke signal to automatic on, click the check box to enable it. When it is not selected, turn on LSP and LSN externally.

❺ Move till Z-phase signal
Travel is made until the travel distance is reached and the first Z-phase signal in the travelling direction turns on.

❻ Travel distance unit selection
Select with the option buttons whether the travel distance set in ❸ is in the command pulse unit or in the encoder pulse unit.
When the command input pulse unit is selected, the value, which is the set travel distance multiplied by the electronic gear, will be the command value. When the encoder pulse unit is selected, the travel distance is not multiplied by the electronic gear.

❼ Enable repeat operation
To perform repeat operation, click the check. The initial setting and setting range for the repeat operation are listed in the following table.

Item	Initial setting	Setting range
Repeat pattern	Fwd. rot. (CCW) to rev. rot. (CW)	Fwd. rot. (CCW) to rev. rot. (CW) Fwd. rot. (CCW) to fwd. rot. (CCW) Rev. rot. (CW) to fwd. rot. (CCW) Rev. rot. (CW) to rev. rot. (CW)
Dwell time [s]	2.0	0.1 to 50.0
Number of operations [times]	1	1 to 9999

Tab. 5-8:   *Initial settings for repeat operation*

To perform continuous operation with the repeat pattern and dwell time settings, which are set by referring to the above table, click the check box of "Make the aging function enabled".

❽ Forward/reverse the servo motor
Click the "Forward CCW" button to rotate the servo motor in the forward rotation direction.
Click the "Reverse CW" button to rotate the servo motor in the reverse rotation direction.

❾ Pause the servo motor
Click the "Pause" button during servo motor rotation to temporarily stop the servo motor. This button is enabled during servo motor rotation.

❿ Stop the servo motor
Click the "Stop" button during servo motor rotation to stop the servo motor.

⓫ Forced stop
Click the "Forced stop" button during servo motor rotation to make a sudden stop. This button is enabled during servo motor rotation.

⓬ Operation status
The operation status during the repeat operation, and the number of operations are displayed.

⓭ Axis No.
Axis No. in operation is displayed.

⓮ Termination of positioning operation window
Click the close button "X" to cancel the positioning operation mode and close the window.

● Status display

The status display can be monitored during positioning operation.

Motor-less operation

Without connecting the servo motor, output signals or status display can be provided in response to the input device as if the servo motor is actually running. This operation can be used to check the sequence of a controller or the like.

● Start of motor-less operation
  After setting "□□□1" in Parameter PC60, cycle the power. After that, perform external operation as in ordinary operation.

● Termination of motor-less operation
  To terminate the motor-less operation, set Parameter PC60 to "□□□0" and then turn the power off.

Program operation

Positioning operation can be performed in two or more operation patterns combined, without using a controller. Use this operation with the forced stop reset. This operation may be used independently of whether servo-on or servo-off and whether a controller is connected or not.

Exercise control on the program operation screen of MR Configurator2. For full information, refer to the MR Configurator2 Installation Guide

Operation	Screen control
Start	Click the "Operation start" button.
Stop	Click the "Stop" button.
Forced stop	Click the "Forced stop" button.

Tab. 5-9:
Buttons for program operation

Output signal (DO) forced output

Output signals can be switched on/off forcibly independently of the servo status. This function is used for output signal wiring check, etc. Exercise control on the DO forced output screen of MR Configurator2.

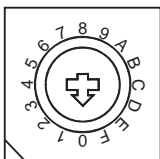## 5.2   Display and operation section of MR-JE-B/BF series

On the servo amplifier display (three-digit, seven-segment LED), check the status of communication with the servo system controller at power-on, and the axis number, and diagnose a malfunction at occurrence of an alarm.

The control axis No. can be set with a switch on the servo amplifier.

5.2.1   Overview

MR-JE-B_Front_controls.eps
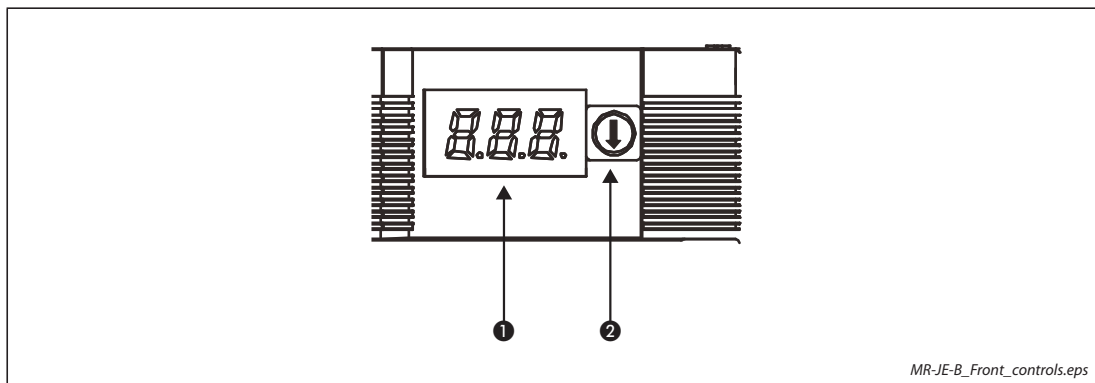
Fig. 5-10:   *Display and controls of MR-JE-B and MR-JE-BF*

No.	Name		Description	Refer to
❶	Display		The 3-digit, seven-segment LED shows the servo status and alarm number	section 5.2.2 section 5.2.3
❷		SW1: Axis selection rotary switch	Used to set the axis number of the servo amplifier. (Axis No. 1–16)	section 3.7.1

Tab. 5-10:   *Controls and function*

5.2.2   Scrolling display

Normal display

When there is no alarm, the axis No. and blank are displayed in rotation.
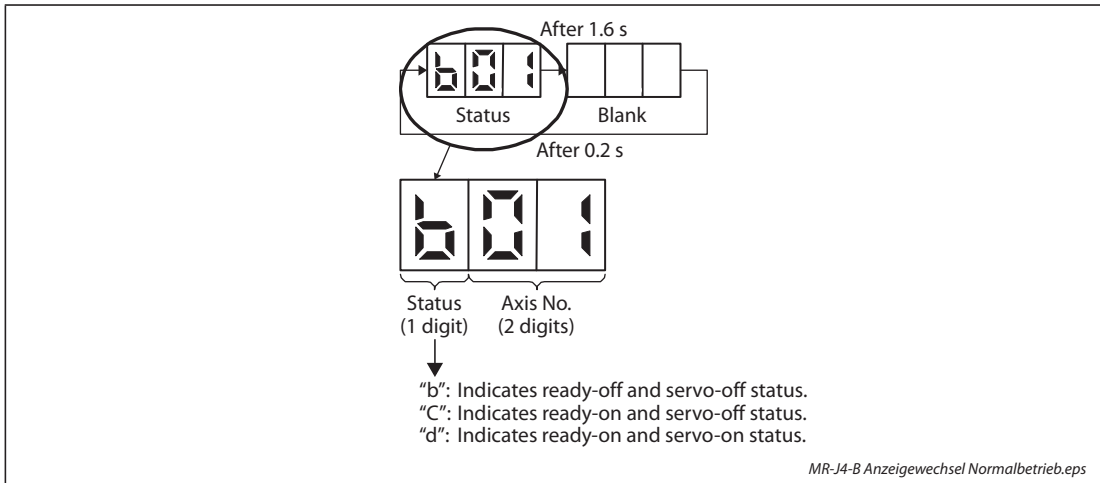
Fig. 5-11:   *Alternating display in normal operation*

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.
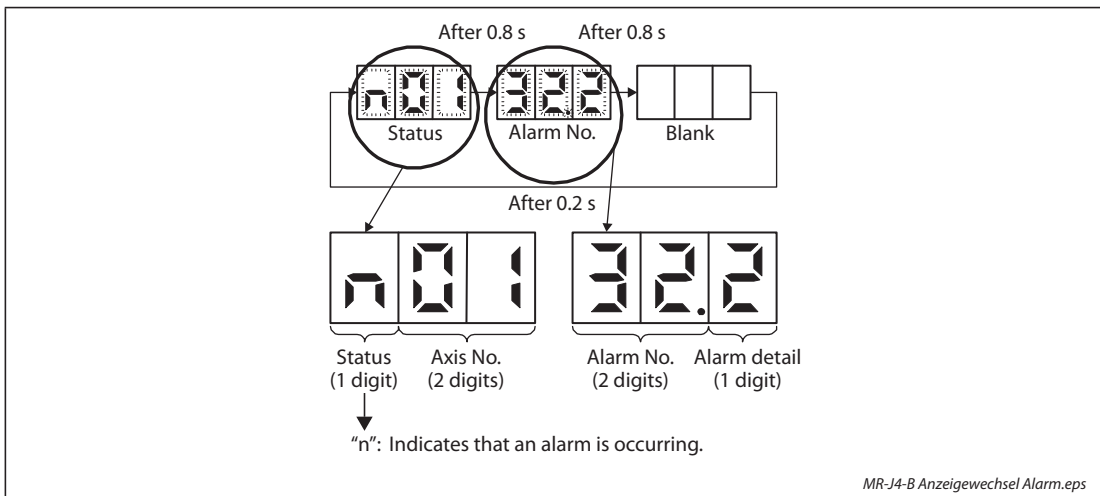
Fig. 5-12:   *Alternating display when alarm occurs*

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5.2.3 Display sequence
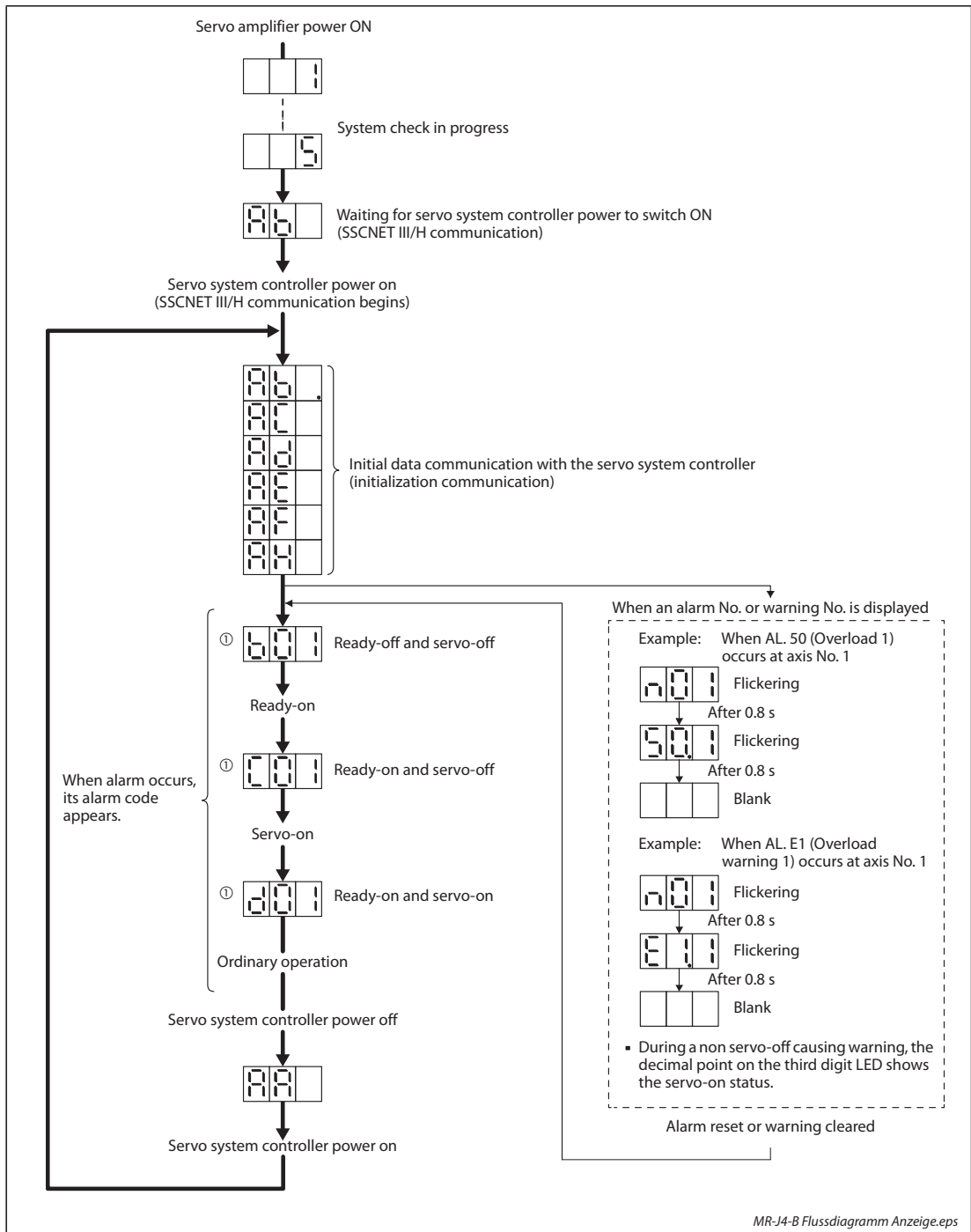
Fig. 5-13:   *Status display of an axis*

① The segment of the last 2 digits shows the axis number.

Axis No. 1   Axis No. 2 … Axis No. 16

5.2.4   Test operation mode

⚠	**WARNING:** ● ***The test operation mode is designed for checking servo operation. It is not for checking machine operation. Do not use this mode with the machine. Always use the servo motor alone.*** ● ***If the servo motor operates abnormally, use EM2 (Forced stop 2) to stop it.***

By using a personal computer and MR Configurator2, you can execute JOG operation, positioning operation, output signal (DO) forced output program operation without connecting the servo system controller.

NOTES	The content described in this section indicates that the servo amplifier and a personal computer are directly connected.

For full information, refer to the MR Configurator2 Installation Guide.

Test operation mode in MR Configurator2

NOTES	When "□□1□" is set in parameter PC05 to enable the test operation mode, the SSCNET III/H communication for the servo amplifier in the test operation mode and the following servo amplifiers is blocked.

When setting parameter PC05 to "□□1□", set it via CN5 (USB connector). When setting it, disconnect the SSCNET III cable or turn off the power supply of the controller.

● JOG operation

JOG operation can be performed without using the servo system controller. Use this operation with the forced stop reset. This operation may be used independently of whether the servo is on or off and whether the servo system controller is connected or not.
Exercise control on the JOG operation screen of MR Configurator2.

Item	Initial setting	Setting range
Speed [1/min]	200	0 to max. speed
Acceleration/deceleration time constant [ms]	1000	0 to 50000

Tab. 5-11:   *Operation pattern for JOG operation*

Operation method

Operation	Screen control
Forward rotation start	Keep pressing the "Forward CCW" button.
Reverse rotation start	Keep pressing the "Reverse CW" button.
Stop	Release the "Forward CCW" or "Reverse CW" button.
Forced stop	Click the "Forced stop" button.

Tab. 5-12:

When the check box of "Rotation only while the CCW or CW button is being pushed." is checked.

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Operation	Screen control
Forward rotation start	Click the "Forward CCW" button.
Reverse rotation start	Click the "Reverse CW" button.
Stop	Click the "Stop" button.
Forced stop	Click the "Forced stop" button.

Tab. 5-13:
When the check box of "Rotation only while the CCW or CW button is being pushed." is not checked.

● Positioning operation

Positioning operation can be performed without using the servo system controller. Use this operation with the forced stop reset. This operation may be used independently of whether the servo is on or off and whether the servo system controller is connected or not.
Exercise control on the positioning operation screen of MR Configurator2.

Item	Initial setting	Setting range
Travel distance [pulse]	4000	0 to 99999999
Speed [1/min]	200	0 to max. speed
Acceleration/deceleration time constant [ms]	1000	0 to 50000
Repeat pattern	Fwd. rot. (CCW) to rev. rot. (CW)	Fwd. rot. (CCW) to rev. rot. (CW) Fwd. rot. (CCW) to fwd. rot. (CCW) Rev. rot. (CW) to fwd. rot. (CCW) Rev. rot. (CW) to rev. rot. (CW)
Dwell time [s]	2.0	0.1 to 50.0
Number of operations [times]	1	1 to 9999

Tab. 5-14: *Operation pattern for positioning operation*

Operation	Screen control
Forward rotation start	Click the "Forward CCW" button.
Reverse rotation start	Click the "Reverse CW" button.
Pause	Click the "Pause" button.
Stop	Click the "Stop" button.
Forced stop	Click the "Forced stop" button.

Tab. 5-15:
Operation method for positioning operation

● Program operation

Positioning operation can be performed in two or more operation patterns combined, without using the servo system controller. Use this operation with the forced stop reset. This operation may be used independently of whether the servo is on or off and whether the servo system controller is connected or not.
Exercise control on the program operation screen of MR Configurator2. For details, refer to Help of MR Configurator2.

Operation	Screen control
Start	Click the "Start" button.
Pause	Click the "Pause" button.
Stop	Click the "Stop" button.
Forced stop	Click the "Forced stop" button.

Tab. 5-16:
Operation method for program operation

● Output signal (DO) forced output

Output signals can be switched on/off forcibly independently of the servo status. Use this function for output signal wiring check, etc. Exercise control on the DO forced output screen of MR Configurator2.

Operation procedure

① Set "□□1□" in parameter PC05 and cycle the power.

When initialization is completed, the decimal point on the first digit will flicker.

When an alarm or warning also occurs during the test operation, the decimal point on the first digit will flicker as follows.

② Start operation with the personal computer.

5.2.5   Motor-less operation in the controller
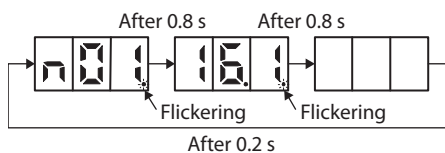
Use motor-less operation which is available by making the servo system controller parameter setting.

Connect the servo system controller to the servo amplifier before the motor-less operation.

Motor-less operation

Without connecting the servo motor to the servo amplifier, output signals or status displays can be provided in response to the servo system controller commands as if the servo motor is actually running. This operation may be used to check the servo system controller sequence. Use this operation with the forced stop reset. Use this operation with the servo amplifier connected to the servo system controller.

To stop the motor-less operation, set the motor-less operation selection to "Disable" in the servo parameter setting of the servo system controller. When the power supply is turned on next time, motorless operation will be disabled.

● Load conditions

Load item	Condition
Load torque	0
Load to motor inertia ratio	Parameter PB06 (Load to motor inertia ratio)

Tab. 5-17:
Load conditions for motor-less operation

● Alarms

The following alarms and warnings do not occur. However, the other alarms and warnings occur as when the servo motor is connected.

– AL. 16 (Encoder initial communication error 1)

– AL. 1E (Encoder initial communication error 2)

– AL. 1F (Encoder initial communication error 3)

– AL. 20 (Encoder normal communication error 1)

– AL. 21 (Encoder normal communication error 2)

– AL. 25 (Absolute position erased)

– AL. 92 (Battery cable disconnection warning)

– AL. 9F (Battery warning)

Operation procedure

① Set the servo amplifier to the servo-off status.

② Set Parameter PC05 to "□□01" and cycle the power.

③ Start the motor-less operation with the servo system controller.

The display shows the following screen.

The decimal point flickers.
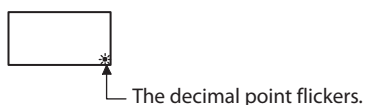
5.3   Display and operation section of MR-JE-C series

On the servo amplifier display (3-digit, 7 segment LED), check the identification No. and carry out failure diagnosis when alarms occur. The communication status can be checked with the CN1 connector LED. For Ethernet status display LED refer to section 3.6.

The identification No. can be set with switches on the servo amplifier.

| NOTES | MR-JE_C displays the identification No. on the right two digits of the 3-digit, 7- segment LED. |

For CC-Link IE Field Network Basic, SLMP, and Modbus®/TCP, the identification No. will be shown on the fourth octet of the IP address.

When CC-Link IE Field Network Basic, SLMP, and Modbus®/TCP communication is not executed, the identification No. will be the setting value of the identification number setting rotary switch.
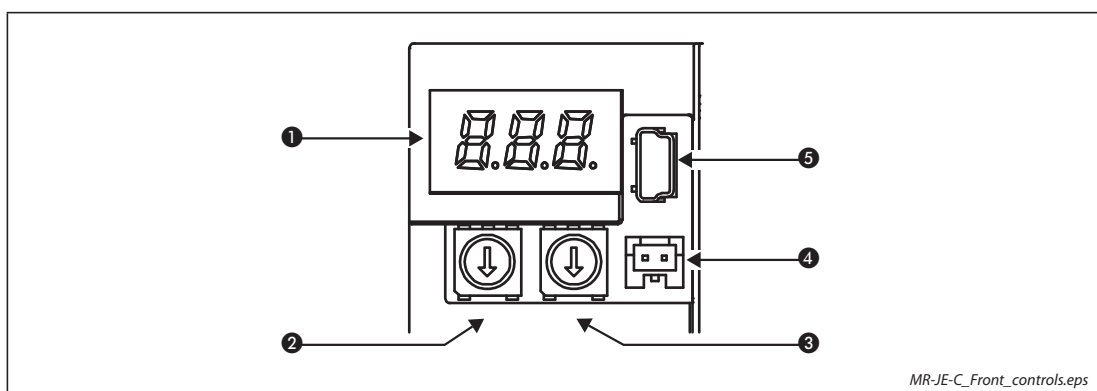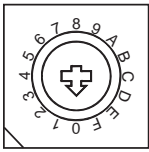
5.3.1   Overview

MR-JE-C_Front_controls.eps

Fig. 5-14:   *Display and controls of MR-JE-C*

No.	Name		Description	Refer to
❶	Display		The 3-digit, seven-segment LED shows the servo status and alarm number	section 5.3.2 section 5.3.3
❷		SW1: Identification number setting rotary switch (upper)	Used to set the identification number of the servo amplifier. Set the identification number of the servo amplifier in hexadecimal.	"MR-JE-C Servo Amplifier Instruction Manual (CC-Link IE Field Network Basic)."
❸		SW2: Identification number setting rotary switch (lower)		
❹	Battery connector (CN4)		Connect the battery for absolute position data backup.	tab. 3-11
❺	USB connector (CN5)		Connect with PC for communication	section 3.4.2

Tab. 5-18:   *Controls and function*

⚠ **WARNING:**

When switching the identification number setting rotary switch (SW1/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.

| NOTE | The identification number setting rotary switch (SW1/SW2) setting becomes enabled after cycling the power. |

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5.3.2   Scrolling display

Identification number will be displayed in hexadecimal.

Normal display

When there is no alarm, the identification number is displayed.

Status   Identification No.
(1 digit)   (2 digits)

"b": Indicates ready-off and servo-off status.
"C": Indicates ready-on and servo-off status.
"d": Indicates ready-on and servo-on status.

MR-J4-GF Anzeige Normalbetrieb.eps
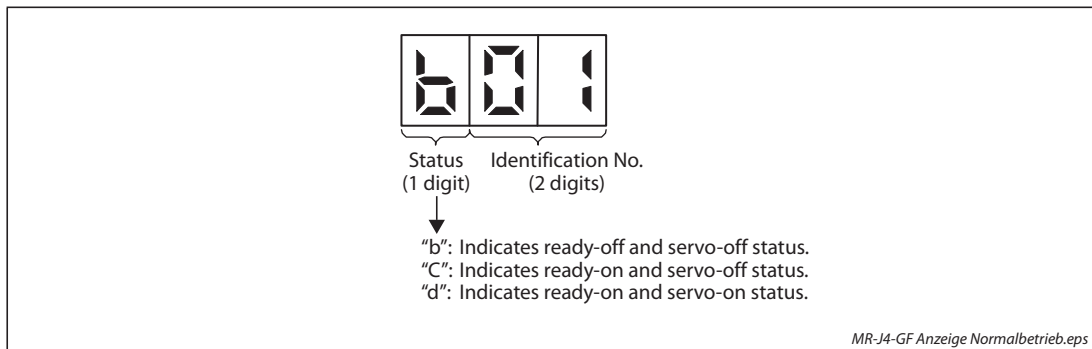
Fig. 5-15:   *Display in normal operation*

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.

After 0.8 s   After 0.8 s

Status   Alarm No.   Blank

After 0.2 s

Status   Identification No.   Alarm No.   Alarm detail
(1 digit)   (2 digits)   (2 digits)   (1 digit)

"n": Indicates that an alarm is occurring.

MR-J4-B Anzeigewechsel Alarm.eps
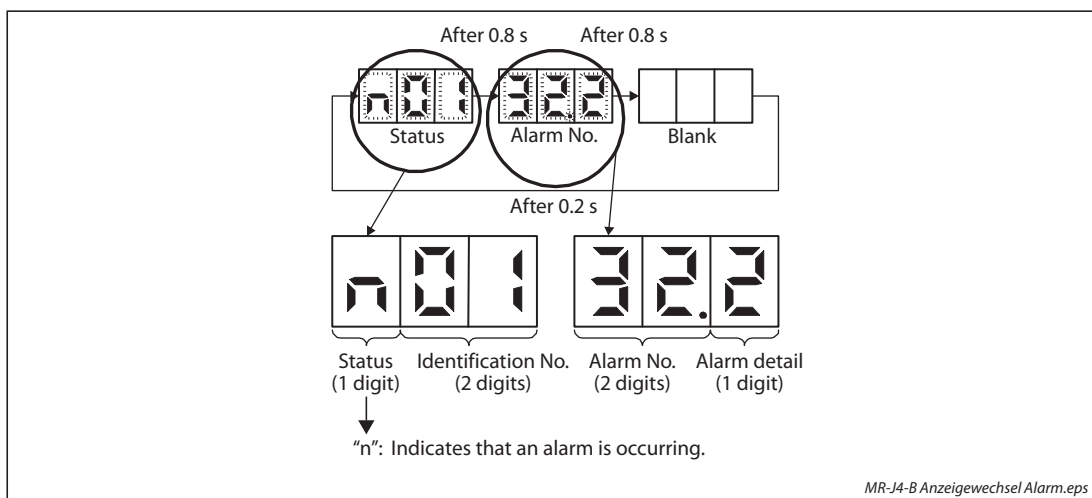
Fig. 5-16:   *Alternating display when alarm occurs*

If an alarm occurs during initial communication through a network, the status, the alarm number (two digits) and alarm detail (one digit), and the network initial communication status are displayed, in that order. For example, the following shows when AL. 16.1 (Encoder initial communication - Receive data error 1) is occurring.
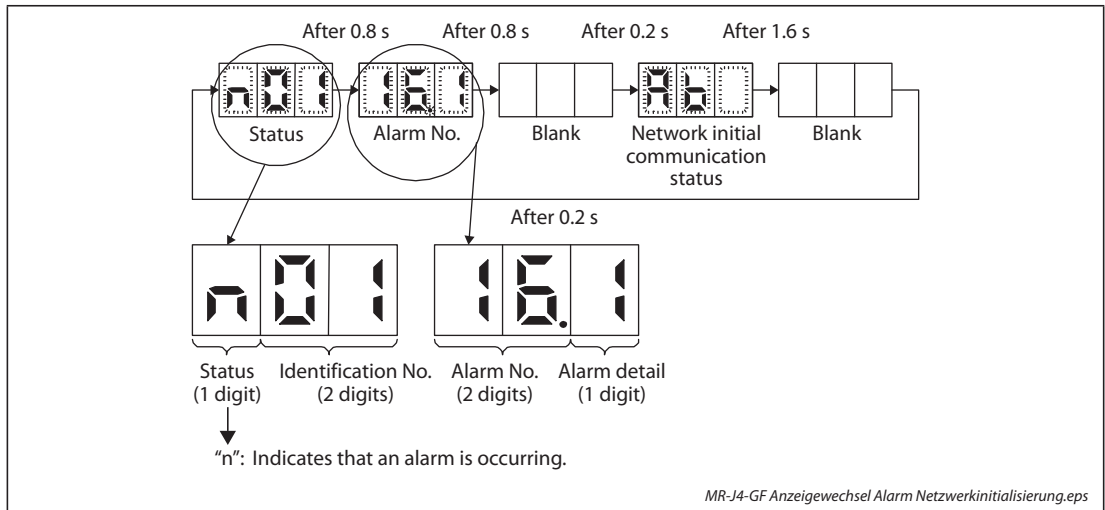
Fig. 5-17: *Alternating display when alarm occurs during initial communication through a network*

5.3.3 Display sequence
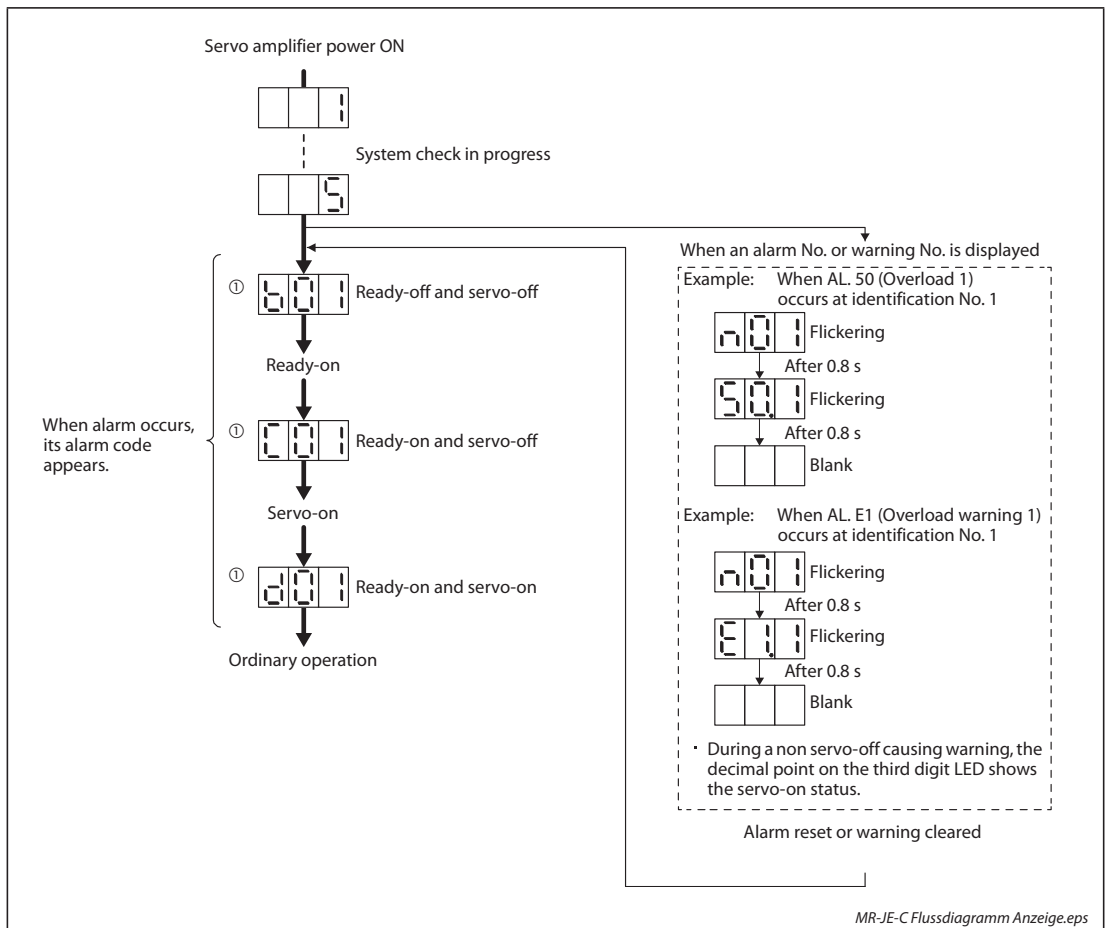
Fig. 5-18: *Status display of the identification No. 1*

① The segment of the last 2 digits shows the identification number.

5.3.4   Test operation mode

> ⚠️ **WARNING:**
> - ***The test operation mode is designed for checking servo operation. It is not for checking machine operation. Do not use this mode with the machine. Always use the servo motor alone.***
> - ***If the servo motor operates abnormally, use EM2 (Forced stop 2) to stop it.***

By using a personal computer and MR Configurator2, you can execute JOG operation, positioning operation, output signal (DO) forced output program operation without connecting the servo system controller.

NOTES

The content described in this section indicates that the servo amplifier and a personal computer are directly connected.

For full information, refer to the MR Configurator2 Installation Guide.

Test operation mode in MR Configurator2

NOTES

MR Configurator2 is required to perform positioning operation.

Test operation cannot be performed unless SON (Servo-on) is not turned off.

When performing JOG operation, turn on EM2, LSP and LSN. LSP and LSN can be set to automatic on by setting parameter PD01 to "□C□□".

- JOG operation

    JOG operation can be performed without using the servo system controller. Use this operation with the forced stop reset. This operation may be used independently of whether the servo is on or off and whether the servo system controller is connected or not.
    Exercise control on the JOG operation screen of MR Configurator2.

Item	Initial setting	Setting range
Speed [1/min]	200	0 to max. speed
Acceleration/deceleration time constant [ms]	1000	0 to 50000

Tab. 5-19: *Operation pattern for JOG operation*

Operation method

Operation	Screen control
Forward rotation start	Keep pressing the "Forward CCW" button.
Reverse rotation start	Keep pressing the "Reverse CW" button.
Stop	Release the "Forward CCW" or "Reverse CW" button.
Forced stop	Click the "Forced stop" button.

Tab. 5-20:

When the check box of "Rotation only while the CCW or CW button is being pushed." is checked.

Operation	Screen control
Forward rotation start	Click the "Forward CCW" button.
Reverse rotation start	Click the "Reverse CW" button.
Stop	Click the "Stop" button.
Forced stop	Click the "Forced stop" button.

Tab. 5-21:
When the check box of "Rotation only while the CCW or CW button is being pushed." is not checked.

● Positioning operation

Positioning operation can be performed without using the servo system controller. Use this operation with the forced stop reset. This operation may be used independently of whether the servo is on or off and whether the servo system controller is connected or not.
Exercise control on the positioning operation screen of MR Configurator2.

Item	Initial setting	Setting range
Travel distance [pulse]	4000	0 to 99999999
Speed [1/min]	200	0 to max. speed
Acceleration/deceleration time constant [ms]	1000	0 to 50000
Repeat pattern	Fwd. rot. (CCW) to rev. rot. (CW)	Fwd. rot. (CCW) to rev. rot. (CW) Fwd. rot. (CCW) to fwd. rot. (CCW) Rev. rot. (CW) to fwd. rot. (CCW) Rev. rot. (CW) to rev. rot. (CW)
Dwell time [s]	2.0	0.1 to 50.0
Number of operations [times]	1	1 to 9999

Tab. 5-22:   *Operation pattern for positioning operation*

Operation	Screen control
Forward rotation start	Click the "Forward CCW" button.
Reverse rotation start	Click the "Reverse CW" button.
Stop	Click the "Stop" button.
Forced stop	Click the "Forced stop" button.

Tab. 5-23:
Operation method for positioning operation

● Program operation

Positioning operation can be performed in two or more operation patterns combined, without using the servo system controller. Use this operation with the forced stop reset. This operation may be used independently of whether the servo is on or off and whether the servo system controller is connected or not.
Exercise control on the program operation screen of MR Configurator2. For details, refer to Help of MR Configurator2.

Operation	Screen control
Start	Click the "Start" button.
Pause	Click the "Pause" button.
Stop	Click the "Stop" button.
Forced stop	Click the "Forced stop" button.

Tab. 5-24:
Operation method for positioning operation

● Output signal (DO) forced output

Output signals can be switched on/off forcibly independently of the servo status. Use this function for output signal wiring check, etc. Exercise control on the DO forced output screen of MR Configurator2.

Operation procedure

① Set "□□10" in parameter PC60 and cycle the power.

When initialization is completed, the decimal point on the first digit will flicker.
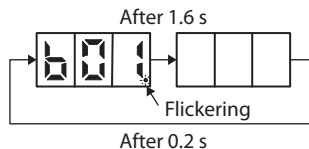
When an alarm or warning also occurs during the test operation, the decimal point on the first digit will flicker as follows.

② Start operation with the personal computer.

5.3.5   Motor-less operation in the controller

| **NOTES** | Use motor-less operation which is available by making the servo system controller parameter setting. |

Connect the servo system controller to the servo amplifier before the motor-less operation.

Motor-less operation

Without connecting the servo motor to the servo amplifier, output signals or status displays can be provided in response to the servo system controller commands as if the servo motor is actually running. This operation may be used to check the servo system controller sequence. Use this operation with the forced stop reset. Use this operation with the servo amplifier connected to the servo system controller.
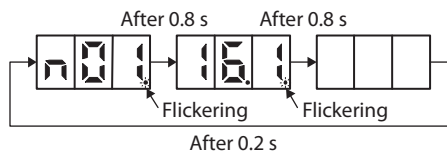
To stop the motor-less operation, set the motor-less operation selection to "Disable" in the servo parameter setting of the servo system controller. When the power supply is turned on next time, motorless operation will be disabled.

● Load conditions

Load item	Condition
Load torque	0
Load to motor inertia ratio	Parameter PB06 Load to motor inertia ratio

Tab. 5-25:
Load conditions for motor-less operation

● Alarms

The following alarms and warnings do not occur. However, the other alarms and warnings occur as when the servo motor is connected.

– AL. 16 (Encoder initial communication error 1)

– AL. 1E (Encoder initial communication error 2)

– AL. 1F (Encoder initial communication error 3)

– AL. 20 (Encoder normal communication error 1)

– AL. 21 (Encoder normal communication error 2)

– AL. 25 (Absolute position erased)

– AL. 92 (Battery cable disconnection warning)

– AL. 9F (Battery warning)

Operation procedure

① Set the servo amplifier to the servo-off status.

② Set "□□01" in parameter PC60 and cycle the power.

③ Start the motor-less operation with the servo system controller.

The display shows the following screen.

└─ The decimal point flickers.

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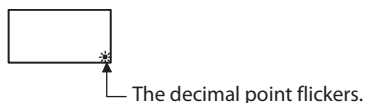
6   Parameters

> WARNING:
> ● **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 a value other than the described values to each parameter.**

6.1   MR-JE-A

6.1.1   Basic setting parameters

NOTES

To enable a parameter whose symbol is preceded by *, turn off the power for 1 s or more after setting and turn it on again. However, the time will be longer depending on a setting value of parameter PF25 (instantaneous power failure tough drive - detection time) when "Instantaneous power failure tough drive selection" is enabled in parameter PA20.

The symbols in the control mode column mean as follows.

- P: Position control mode

- S: Speed control mode

- T: Torque control mode

- CP: Positioning mode (point table method)

- CL: Positioning mode (program method)

The positioning mode is available with the servo amplifier MR-JE-A with the software version B7 or later.

To enable the parameters PA06 (Electronic gear numerator (command pulse multiplication numerator) and PA07 (Electronic gear denominator (command pulse multiplication denominator) in the positioning mode, turn off the power for 1 s or more after setting and turn it on again. However, the time will be longer depending on a setting value of parameter PF25 (Instantaneous power failure tough drive - Detection time) when "instantaneous power failure tough drive selection" is enabled in parameter PA20.

Parameters PA05 (Number of command input pulses per revolution) and PA28 (Function selection A-6) cannot be used in the positioning mode.

Setting a value out of the setting range in each parameter will trigger AL. 37 (Parameter error).

Parameters PA□□

No.	Symbol	Name	Initial value	Standard mode				Positioning mode		
				Unit	Control mode			Unit	Control mode	
					P	S	T		CP	CL
PA01	*STY	Operation mode	1000H	—	✔	✔	✔	—	✔	✔
PA02	*REG	Regenerative option	0000H	—	✔	✔	✔	—	✔	✔
PA03	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PA04	*AOP1	Function selection A-1	2000H	—	✔	✔	—	—	✔	✔
PA05	*FBP	Number of command input pulses per revolution ①	10000	—	✔	—	—	—	—	—
PA06	(*)CMX	Electronic gear numerator (command pulse multiplication numerator)	1	—	✔	—	—	—	✔	✔
PA07	(*)CDV	Electronic gear denominator (command pulse multiplication denominator)	1	—	✔	—	—	—	✔	✔
PA08	ATU	Auto tuning mode	0001H	—	✔	✔	—	—	✔	✔
PA09	RSP	Auto tuning response	16	—	✔	✔	—	—	✔	✔
PA10	INP	In-position range	100	pulse	✔	—	—	µm 10^{-4} inch 10^{-3} degree pulse	✔	✔
PA11	TLP	Forward rotation torque limit	100.0	%	✔	✔	✔	%	✔	✔
PA12	TLN	Reverse rotation torque limit	100.0	%	✔	✔	✔	%	✔	✔
PA13	*PLSS	Command pulse input form	0100H	—	✔	—	—	—	✔	✔
PA14	*POL	Rotation direction selection	0	—	✔	—	—	—	✔	✔
PA15	*ENR	Encoder output pulses	4000	pulse/rev	✔	✔	✔	pulse/rev	✔	✔
PA16	*ENR2	Encoder output pulses 2	1	—	✔	✔	✔	—	✔	✔
PA17	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PA18	—		0000H	—	—	—	—	—	—	—
PA19	*BLK	Parameter writing inhibit	00AAH	—	✔	✔	✔	—	✔	✔
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	*AOP5	Function selection A-5	0000H	—	✔	✔	—	—	✔	✔
PA27	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PA28	*AOP6	Function selection A-6 ①	0000H	—	✔	✔	✔	—	—	—
PA29	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PA30	—		0000H	—	—	—	—	—	—	—
PA31	—		0000H	—	—	—	—	—	—	—
PA32	—		0000H	—	—	—	—	—	—	—

Tab. 6-1:   *List of basic setting parameters for MR-JE-A*

① For manufacturer setting in positioning mode

Description of basic setting parameters

Number	Symbol	Initial value	Unit	Setting range	Control mode

PA01 | *STY | 1000ʜ | | Refer to text | P S T/CP CL

Operation mode

```
┌─┬─┬─┬─┐
│1│0│0│ │
└─┴─┴─┴─┘
```

Control mode selection (standard mode)
- 0: Position control
- 1: Position and speed control
- 2: Speed control
- 3: Speed and torque control
- 4: Torque control
- 5: Torque and position control

Control mode selection (positioning mode)
- 6: Point table method
- 7: Program method

For manufacturer setting
- 100: Manufacturer setting

PA02 | *REG | 0000ʜ | | Refer to text | P S T/CP CL

Regenerative option

```
┌─┬─┬─┬─┐
│0│0│ │ │
└─┴─┴─┴─┘
```

Select the regenerative option.
- 00: Regenerative option is not used.
  - For the servo amplifier of 200 W or less, a regenerative resistor is not used.
  - For the servo amplifier of 0.4 kW to 3 kW, the built-in regenerative resistor is used.

- 02: MR-RB032/MR-RFH75-40
- 03: MR-RB12/MR-RFH75-40
- 04: MR-RB32/MR-RFH220-40
- 05: MR-RB30/MR-RFH400-13
- 06: MR-RB50 (Cooling fan is required.)/MR-RFH400-13

For manufacturer setting
- 00: Manufacturer setting

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.

PA04 | *AOP1 | 2000ʜ | | Refer to text | P S/CP CL

Function selection A-1

```
┌─┬─┬─┬─┐
│ │0│0│0│
└─┴─┴─┴─┘
```

For manufacturer setting
- 000: Manufacturer setting

Forced stop deceleration function selection
- 0: Forced stop deceleration function disabled (with EM1)
- 2: Forced stop deceleration function enabled (with EM2)

Refer to the following table for details.

Setting value	EM2/EM1	Deceleration method	
		EM2 or EM1 is off	Alarm occurred
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□□□	EM2	MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.	MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.

Tab. 6-2: *Detailed overview of parameters PA for MR-JE-A (1)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA05	***FBP**	**10000**		**1000–1000000**	**P**

Number of command input pulses per revolution

The servo motor rotates based on set command input pulses.
To enable the parameter value, set "Electronic gear selection" to "Number of command input pulses per revolution (1□□□)" in parameter PA21.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA06	**CMX**	**1**		**1–16777215**	**P**

Electronic gear numerator (command pulse multiplication numerator)

Set the numerator of the electronic gear.

To enable the parameter, set "Electronic gear selection" to "Electronic gear (0□□□)" in parameter PA21.

The following shows a standard of the setting range of the electronic gear.

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

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

Always set the electronic gear with servo-off state to prevent unexpected operation due to improper setting.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA06	***CMX**	**1**		**1–16777215**	**CP CL**

Electronic gear numerator (command pulse multiplication numerator)

Set an electronic gear numerator. (Refer to the instruction manual (positioning mode).)

To enable the parameter value in the positioning mode, turn off the power for 1 s or more after setting and turn it on again. However, the time will be longer depending on a setting value of parameter PF25 (Instantaneous power failure tough drive - Detection time) when "instantaneous power failure tough drive selection" is enabled in parameter PA20.

To enable the parameter, set "Electronic gear selection" to "Electronic gear (0□□□)" in parameter PA21.

Set the electronic gear within the following range. Setting out of the range will trigger AL. 37 (Parameter error.

1/27649 < CMX/CDV < 8484

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA07	**CDV**	**1**		**1–16777215**	**P**

Electronic gear denominator (command pulse multiplication denominator)

Set the denominator of the electronic gear.

To enable the parameter, set "Electronic gear selection" to "Electronic gear (0□□□)" in parameter PA21.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA07	***CDV**	**1**		**1–16777215**	**CP CL**

Electronic gear denominator (command pulse multiplication denominator)

Set an electronic gear denominator. (Refer to the instruction manual (positioning mode).)

To enable the parameter value in the positioning mode, turn off the power for 1 s or more after setting and turn it on again. However, the time will be longer depending on a setting value of parameter PF25 (Instantaneous power failure tough drive - Detection time) when "instantaneous power failure tough drive selection" is enabled in parameter PA20.

To enable the parameter, set "Electronic gear selection" to "Electronic gear (0□□□)" in parameter PA21.

Set the electronic gear within the range of parameter PA06.

Setting out of the range will trigger AL. 37 (Parameter error).

Tab. 6-2: *Detailed overview of parameters PA for MR-JE-A (2)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA08	**ATU**	**0001ₕ**		**Refer to text**	**P S/CP CL**

Auto tuning mode
Gain adjustment mode selection

```
┌─┬─┬─┬─┐
│0│0│0│ │
└─┴─┴─┴─┘
```

Select the gain adjustment mode.
0: 2 gain adjustment mode 1 (interpolation mode)
1: Auto tuning mode 1
2: Auto tuning mode 2
3: Manual mode
4: 2 gain adjustment mode 2

Refer to the following table for details.

For manufacturer setting
000: Manufacturer setting

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

Tab. 6-2:   *Detailed overview of parameters PA for MR-JE-A (3)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA09	**RSP**	**16**		**1–40**	**P S/CP CL**

Auto tuning response
Set a response of the auto tuning.

Setting value	Machine characteristic		Setting value	Machine characteristic	
	Response	Guideline for machine resonance frequency [Hz]		Response	Guideline for machine resonance frequency [Hz]
1	low	2.7	21	middle	67.1
2		3.6	22		75.6
3		4.9	23		85.2
4		6.6	24		95.9
5		10.0	25		108.0
6		11.3	26		121.7
7		12.7	27		137.1
8		14.3	28		154.4
9		16.1	29		173.9
10		18.1	30		195.9
11		20.4	31		220.6
12		23.0	32		248.5
13		25.9	33		279.9
14		29.2	34		315.3
15		32.9	35		355.1
16		37.0	36		400.0
17		41.7	37		446.6
18		47.0	38		501.2
19		52.9	39		571.5
20	middle	59.6	40	high	642.7

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA10	**INP**	**100**	**pulse**	**0–65535**	**P**

In-position range
Set an in-position range per command pulse.
To change it to the servo motor encoder pulse unit, set parameter PC24.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA10	**INP**	**100**		**0–65535**	**CP CL**

In-position range
Set an in-position range in a command unit.
To change it to the servo motor encoder pulse unit, set parameter PC24.

Parameter PA01	In-position setting range
□□□6 (Positioning mode (point table method))	The range where MEND (Travel completion), PED (Position end) and INP (Inposition) are output
□□□7 (Positioning mode (program method))	

When parameter PC24 is set to "□□□0", the unit can be changed to [µm], 10^{-4} [inch], 10^{-3} [degree], or [pulse] with the setting of parameter PT01. When parameter PC24 is set to "□□□1", the unit is fixed to [pulse].

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA11	**TLP**	**100.0**	**%**	**0.0–100.0**	**P S T/CP CL**

Forward rotation torque limit
You can limit the torque generated by the servo motor. Set the parameter referring to the instruction manual.

When you output torque with the analog monitor output, the larger value of parameter PA11 (Forward rotation torque limit) or PA12 (Reverse rotation torque limit) will be the maximum output voltage (8 V).

Set the parameter on the assumption that the maximum torque is 100.0 [%].

The parameter is for limiting the torque of the servo motor in the CCW power running or CW regeneration. Set this parameter to "0.0" to generate no torque.

Tab. 6-2: *Detailed overview of parameters PA for MR-JE-A (4)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA12	TLN	100.0	%	0.0–100.0	P S T/CP CL

Reverse rotation torque limit

You can limit the torque generated by the servo motor. Set the parameter referring to the instruction manual.

When you output torque with the analog monitor output, the larger value of parameter PA11 (Forward rotation torque limit) or PA12 (Reverse rotation torque limit) will be the maximum output voltage (8 V).

Set the parameter on the assumption that the maximum torque is 100.0 [%].

The parameter is for limiting the torque of the servo motor in the CW power running or CCW regeneration. Set this parameter to "0.0" to generate no torque.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA13	*PLSS	0100H		Refer to text	P/CP CL

Command pulse input form

Command input pulse train form selection
0:   Forward/reverse rotation pulse train
1:   Signed pulse train
2:   A-phase/B-phase pulse train (The servo amplifier imports input pulses after multiplying by four.)

When connecting the manual pulse generator MR-HDP01 in the positioning mode, set "2" to this digit.

Refer to the following table for settings.

Pulse train logic selection
0:   Positive logic
1:   Negative logic
Select the same one as a logic of command pulse train from controller to connect. Refer to the following note for logic of MELSEC iQ-R/MELSEC-Q/MELSEC-L/MELSEC-F series.

When connecting the manual pulse generator MR-HDP01 in the positioning mode, set "0" to this digit.

Refer to the following table for settings.

Setting value	Pulse train form		Forward rotation command	Reverse rotation command
□□10H	Negative logic	Forward rotation pulse train / Reverse rotation pulse train		
□□11H		Pulse train + sign		
□□12H		A-phase pulse train / B-phase pulse train		
□□00H	Positive logic	Forward rotation pulse train / Reverse rotation pulse train		
□□01H		Pulse train + sign		
□□02H		A-phase pulse train / B-phase pulse train		

Arrows in the table indicate the timing of importing pulse trains. A-phase and B-phase pulse trains are imported after they have been multiplied by 4.

hen connecting the manual pulse generator MR-HDP01 in the positioning mode, set "□□02H".

Tab. 6-2:   *Detailed overview of parameters PA for MR-JE-A (5)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA13	*PLSS	0100H		Refer to text	P/CP CL

Command pulse input form (continued)

Command input pulse train filter selection
Selecting proper filter enables to enhance noise immunity.
0:   Command input pulse train is 4 Mpulses/s or less.
1:   Command input pulse train is 1 Mpulse/s or less.
2:   Command input pulse train is 500 kpulses/s or less.
3:   Command input pulse train is 200 kpulses/s or less

1 Mpulse/s or lower commands are supported by "1". When inputting commands over 1 Mpulse/s and 4 Mpulses/s or lower, set "0".

When connecting the manual pulse generator MR-HDP01 in the positioning mode, set "2" or "3" to this digit.

Incorrect setting may cause the following malfunctions.
–   Setting a value higher than actual command will lower noise immunity.
–   Setting a value lower than actual command will cause a position mismatch.

For manufacturer setting
0:   Manufacturer setting

NOTE:
Adjust the logic of a positioning module and command pulse as follows.
• MELSEC iQ-R series/MELSEC-Q series/MELSEC-L series positioning module

Signal type	Command pulse logic setting	
	Positioning module Pr. 23 setting	MR-JE-A servo amplifier parameter PA13 setting
Open-collector type	Positive logic	Positive logic (□□0□)
	Negative logic	Negative logic (□□1□)
Differential line driver type	Positive logic [1]	Negative logic (□□1□)
	Negative logic [1]	Positive logic (□□0□)

[1] For MELSEC iQ-R series/MELSEC-Q series/MELSEC-L series, reverse the input pulse logic of the servo amplifier.

• MELSEC-F series positioning module

Signal type	Command pulse logic setting	
	Positioning module (fixed)	MR-JE-A servo amplifier parameter PA13 setting
Open-collector type Differential line driver type	Negative logic	Negative logic (□□1□)
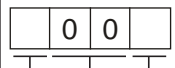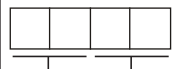
Tab. 6-2:   *Detailed overview of parameters PA for MR-JE-A (6)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA14	***POL**	**0**		**0, 1**	**P**

Rotation direction selection

Select the servo motor rotation direction relative to the input pulse train.

Servo motor rotation direction

Forward rotation (CCW)

Reverse rotation (CW)

Setting value	Servo motor rotation direction	
	When forward rotation pulse is input	**When reverse rotation pulse is input**
0	CCW	CW
1	CW	CCW

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA14	***POL**	**0**		**0, 1**	**CP CL**

Rotation direction selection

Select the servo motor rotation direction when ST1 (Forward rotation start) or ST2 (Reverse rotation start) is switched on.

Servo motor rotation direction

Forward rotation (CCW)

Reverse rotation (CW)

Setting value	Servo motor rotation direction	
	When positioning address increases	**When positioning address decreases**
0	CCW	CW
1	CW	CCW

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA15	***ENR**	**4000**	**pulse/rev**	**1–4194304**	**P S T/CP CL**

Encoder output pulses

Set the encoder output pulses from the servo amplifier by using the number of output pulses per revolution, dividing ratio, or electronic gear ratio (after multiplication by 4).

To set a numerator of the electronic gear, select "A-phase/B-phase pulse electronic gear setting (□□3□)" of "Encoder output pulse setting selection" in parameter PC19.

The maximum output frequency is 4.6 Mpulses/s. Set the parameter within this range.

Select "Output pulse setting" or "Dividing ratio setting" in parameter PC19.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA16	***ENR2**	**1**		**1–4194304**	**P S T/CP CL**

Encoder output pulses 2

Set a denominator of the electronic gear for the A/B-phase pulse output.

To set a denominator of the electronic gear, select "A-phase/B-phase pulse electronic gear setting (□□3□)" of "Encoder output pulse setting selection" in parameter PC19.

When "Encoder output pulse setting selection" is set to "Disabled (□□1□)" in parameter PC19, the setting value of this parameter will be disabled.

Tab. 6-2:   *Detailed overview of parameters PA for MR-JE-A (7)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA19	*BLK	00AA$_H$		Refer to text	P S T/CP CL

Parameter writing inhibit
Select a reference range and writing range of the parameter.
For the positioning mode, set parameter PA19 to "00AB" to enable read/write the positioning control parameters (parameter PT□□).
Refer to the following table for settings.

PA19	Setting operation	PA	PB	PC	PD	PE	PF	PT [1]
Other than below	Reading	✔	—	—	—	—	—	—
	Writing	✔	—	—	—	—	—	—
000A$_H$	Reading	Only 19	—	—	—	—	—	—
	Writing	Only 19	—	—	—	—	—	—
000B$_H$	Reading	✔	✔	✔	—	—	—	—
	Writing	✔	✔	✔	—	—	—	—
000C$_H$	Reading	✔	✔	✔	✔	—	—	—
	Writing	✔	✔	✔	✔	—	—	—
00AA$_H$ (initial value)	Reading	✔	✔	✔	✔	✔	✔	—
	Writing	✔	✔	✔	✔	✔	✔	—
00AB$_H$	Reading	✔	✔	✔	✔	✔	✔	✔
	Writing	✔	✔	✔	✔	✔	✔	✔
100B$_H$	Reading	✔	—	—	—	—	—	—
	Writing	Only 19	—	—	—	—	—	—
100C$_H$	Reading	✔	✔	✔	✔	—	—	—
	Writing	Only 19	—	—	—	—	—	—
10AA$_H$	Reading	✔	✔	✔	✔	✔	✔	—
	Writing	Only 19	—	—	—	—	—	—
10AB$_H$	Reading	✔	✔	✔	✔	✔	✔	✔
	Writing	Only 19	—	—	—	—	—	—

[1] Positioning control parameters PT□□ only for positioning mode

Tab. 6-2: *Detailed overview of parameters PA for MR-JE-A (8)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA20	*TDS	0000H		Refer to text	P S (T)/ CP CL

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 the pins CN1-23, CN1-24 and CN1-49 with parameters PD24, PD25 and PD28.

For manufacturer setting
0□□0: Manufacturer setting

Vibration tough drive selection
0: Disabled
1: Enabled

Selecting "1" enables to suppress vibrations by automatically changing setting values of parameters PB13 (Machine resonance suppression filter 1) and PB15 (Machine resonance suppression filter 2) in case that the vibration exceed the value of the oscillation level set in parameter PF23.
To output the oscillation detection alarm as a warning, set parameter PF24 (Vibration tough drive function selection).
Refer to the instruction manual for details.

Instantaneous power failure tough drive selection
0: Disabled
1: Enabled

Selecting "1" enables to avoid occurring AL. 10 (Undervoltage) using the electrical energy charged in the capacitor in case that an instantaneous power failure occurs during operation. In parameter PF25 (Instantaneous power failure tough drive - Detection time), set the time period until the occurrence of AL. 10.1 (Voltage drop in the power).

When the digit is enabled, the power should be off for the setting value of parameter. PF25 + 1 s or more before cycling the power to enable a parameter whose symbol is preceded by "*".

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA21	*AOP3	0001H		Refer to text	P (S)/CP CL

Function selection A-3

One-touch tuning function selection
0: Disabled
1: Enabled

When the digit is "0", the one-touch tuning is not available.

For manufacturer setting
00: Manufacturer setting

Electronic gear selection (only position control mode)
0: Electronic gear (Parameters PA06 and PA07)
1: Number of command input pulses per revolution (Parameter PA05)
   Not used for positioning mode. Setting this will trigger AL. 37(Parameter error).

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA23	DRAT	0000H		Refer to text	P S T/CP CL

Drive recorder arbitrary alarm trigger setting

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.

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.

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".
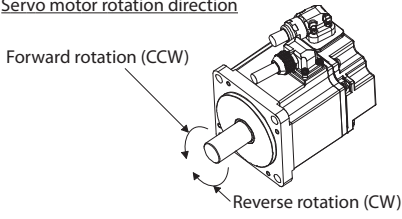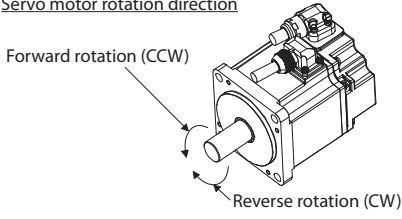
Tab. 6-2:   *Detailed overview of parameters PA for MR-JE-A (9)*

Number	Symbol	Initial value	Unit	Setting range	Control mode

PA24	AOP4	0000H		Refer to text	P S/CP CL

Function selection A-4

```
0  0  0  [ ]
```

— Vibration suppression mode selection
  0: Standard mode
  1: 3 inertia mode
  2: Low response mode

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.

Before changing the control mode during the 3 inertia mode or low response mode, stop the motor.

— For manufacturer setting
  000: Manufacturer setting

PA25	OTHOV	0	%	0–100	P S/CP CL

One-touch tuning - Overshoot permissible level
Set a permissible value of overshoot amount for one-touch tuning as a percentage of the in-position range.
Setting "0" will be 50%.

PA26	*AOP5	0000H		Refer to text	P S/CP CL

Function selection A-5

```
0  0  0  [ ]
```

— Torque limit function selection at instantaneous power failure (instantaneous power failure tough drive selection)
  0: Disabled
  1: Enabled

Selecting "1" for this digit will limit torques to save electric energy when an instantaneous power failure occurs during operation and will make AL. 10 (Undervoltage) less likely to occur.

The torque limit function at instantaneous power failure is enabled when "Instantaneous power failure tough drive selection" in parameter PA20 is "Enabled (□1□□)".

— For manufacturer setting
  000: Manufacturer setting

PA28	*AOP6	0000H		Refer to text	P S T

Function selection A-6
Selection of the HG-KN series servo motor maximum speed.

```
0  0  0  [ ]
```

— Select the maximum speed of the HG-KN series servo motor.
  0: A maximum speed of 5000 1/min
  1: A maximum speed of 6000 1/min

This digit is disabled when a servo motor other than HG-KN series is connected.
This digit is available with servo amplifier with software version C5 or later.

— For manufacturer setting
  000: Manufacturer setting

Tab. 6-2:   *Detailed overview of parameters PA for MR-JE-A (10)*

6.2   MR-JE-B and MR-JE-BF

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

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

6.2.1   Basic setting parameters

NOTES   The parameter whose symbol is preceded by * is enabled with the following conditions:

– *:   To enable the parameter value, power off the servo amplifier for 1 s or longer and power on the amplifier or reset the controller after setting the parameter. However, the time will be longer depending on a setting value of parameter PF25 (Instantaneous power failure tough drive - Detection time) [1] when "instantaneous power failure tough drive selection" is enabled in parameter PA20.

– **:   To enable the parameter value, power off the servo amplifier for 1 s or longer and power on the amplifier. However, the time will be longer depending on a setting value of parameter PF25 (Instantaneous power failure tough drive - Detection time) [1] when "instantaneous power failure tough drive selection" is enabled in parameter PA20.

[1] For MR-JE-BF: PF 25 (SEMI-F47 function - Instantaneous power failure detection time)
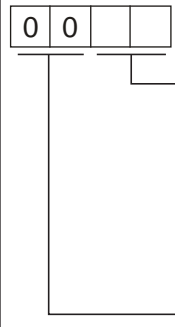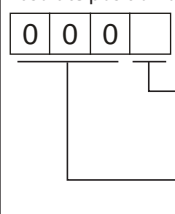
Parameters PA□□

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	100	pulse
PA11	—	For manufacturer setting	1000.0	—
PA12	—		1000.0	—
PA13	—		0000H	—
PA14	*POL	Rotation direction selection/travel direction selection	0	—
PA15	—	For manufacturer setting	0	—
PA16	—		0	—
PA17	—		0000H	—
PA18	—		0000H	—
PA19	*BLK	Parameter writing inhibit	00AAH	—
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	*AOP5	Function selection A-5	0000H	—
PA27	*HTL	Hot line forced stop function [1]	0000H	—
PA28	**AOP6	Function selection A-6	0000H	—
PA29	—	For manufacturer setting	0000H	—
PA30	—		0000H	—
PA31	—		0000H	—
PA32	—		0000H	—

Tab. 6-3:   *List of basic setting parameters for MR-JE-B/MR-JE-BF*

[1] This parameter is for the MR-JE-BF not available (For manufacturer setting)

Description of basic setting parameters

Number	Symbol	Initial value	Unit	Setting range
PA02	****REG**	**0000**H		**Refer to text**

Regenerative option

```
┌──┬──┬──┬──┐
│0 │0 │  │  │
└──┴──┴──┴──┘
```

Select the regenerative option.
00: Regenerative option is not used.
  - For the servo amplifier of 200 W or less, a regenerative resistor is not used.
  - For the servo amplifier of 0.4 kW to 3 kW, the built-in regenerative resistor is used.
02: MR-RB032/MR-RFH75-40
03: MR-RB12/MR-RFH75-40
04: MR-RB32/MR-RFH220-40
05: MR-RB30/MR-RFH400-13
06: MR-RB50 (Cooling fan is required.)/MR-RFH400-13

For manufacturer setting
00: Manufacturer setting

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.

Number	Symbol	Initial value	Unit	Setting range
PA03	***ABS**	**0000**H		**Refer to text**

Absolute position detection system

```
┌──┬──┬──┬──┐
│0 │0 │0 │  │
└──┴──┴──┴──┘
```

Absolute position detection system selection
0: Disabled (used in incremental system)
1: Enabled (used in absolute position detection system)

For manufacturer setting
000: Manufacturer setting

Set this parameter when using the absolute position detection system.

Tab. 6-4:   *Detailed overview of parameters PA for MR-JE-B/BF (1)*

Number	Symbol	Initial value	Unit	Setting range
PA04	***AOP1**	**2000ₕ**		**Refer to text**

Function selection A-1

This is used to select the forced stop input and forced stop deceleration function.

```
        0  0
```

— For manufacturer setting
  00: Manufacturer setting

— Servo forced stop selection
  0:    Enabled (The forced stop input EM2 or EM1 is used.)
  1:    Disabled (The forced stop input EM2 and EM1 are not used.)
  Refer to the following table for details.

— Forced stop deceleration function selection
  0:    Forced stop deceleration function disabled (with EM1)
  2:    Forced stop deceleration function enabled (with EM2)
  Refer to the following table for details.

Setting value	EM2/EM1	Deceleration method	
		EM2 or EM1 is off	**The controller forced stop is enabled or an alarm occurs**
00□□	EM1	MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.	MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.
20□□	EM2	MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.	MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.
01□□	Not using EM2 or EM1	—	MBR (Electromagnetic brake interlock) turns off without the forced stop deceleration.
21□□	Not using EM2 or EM1	—	MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.

Tab. 6-4:   *Detailed overview of parameters PA for MR-JE-B/BF (2)*

Number	Symbol	Initial value	Unit	Setting range
PA08	**ATU**	**0001H**		**Refer to text**

Auto tuning mode
Gain adjustment mode selection

```
0 0 0 ☐
```

Select the gain adjustment mode.
0:   2 gain adjustment mode 1 (interpolation mode)
1:   Auto tuning mode 1
2:   Auto tuning mode 2
3:   Manual mode
4:   2 gain adjustment mode 2
Refer to the following table for details.

For manufacturer setting
000:   Manufacturer setting

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

Tab. 6-4:   *Detailed overview of parameters PA for MR-JE-B/BF (3)*

Number	Symbol	Initial value	Unit	Setting range
PA09	**RSP**	**16**		**1–40**

Auto tuning response
Set a response of the auto tuning.

Setting value	Machine characteristic		Setting value	Machine characteristic	
	Response	Guideline for machine resonance frequency [Hz]		Response	Guideline for machine resonance frequency [Hz]
1	low	2.7	21	middle	67.1
2		3.6	22		75.6
3		4.9	23		85.2
4		6.6	24		95.9
5		10.0	25		108.0
6		11.3	26		121.7
7		12.7	27		137.1
8		14.3	28		154.4
9		16.1	29		173.9
10		18.1	30		195.9
11		20.4	31		220.6
12		23.0	32		248.5
13		25.9	33		279.9
14		29.2	34		315.3
15		32.9	35		355.1
16		37.0	36		400.0
17		41.7	37		446.6
18		47.0	38		501.2
19		52.9	39		571.5
20	middle	59.6	40	high	642.7

Number	Symbol	Initial value	Unit	Setting range
PA10	**INP**	**100**	**pulse**	**0–65535**

In-position range
Set an in-position range per command pulse.
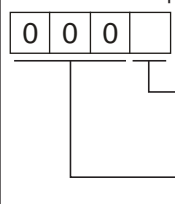
Tab. 6-4: *Detailed overview of parameters PA for MR-JE-B/BF (4)*

Number	Symbol	Initial value	Unit	Setting range
PA14	***POL**	**0**		**0, 1**

Rotation direction selection
Select the rotation direction of command input pulses.

Servo motor rotation direction

Forward rotation (CCW)

Reverse rotation (CW)

Setting value	Servo motor rotation direction	
	Positioning address increase	**Positioning address decrease**
0	CCW	CW
1	CW	CCW

PA19	***BLK**	**00AA$_H$**		**Refer to text**

Parameter writing inhibit
Select a reference range and writing range of the parameter.
Refer to the following table for settings.

PA19	Setting operation	PA	PB	PC	PD	PE	PF
Other than below	Reading	✔	—	—	—	—	—
	Writing	✔	—	—	—	—	—
000A$_H$	Reading	Only 19	—	—	—	—	—
	Writing	Only 19	—	—	—	—	—
000B$_H$	Reading	✔	✔	✔	—	—	—
	Writing	✔	✔	✔	—	—	—
000C$_H$	Reading	✔	✔	✔	✔	—	—
	Writing	✔	✔	✔	✔	—	—
000F$_H$	Reading	✔	✔	✔	✔	✔	—
	Writing	✔	✔	✔	✔	✔	—
00AA$_H$ (initial value)	Reading	✔	✔	✔	✔	✔	✔
	Writing	✔	✔	✔	✔	✔	✔
100B$_H$	Reading	✔	—	—	—	—	—
	Writing	Only 19	—	—	—	—	—
100C$_H$	Reading	✔	✔	✔	✔	—	—
	Writing	Only 19	—	—	—	—	—
100F$_H$	Reading	✔	✔	✔	✔	✔	—
	Writing	Only 19	—	—	—	—	—
10AA$_H$	Reading	✔	✔	✔	✔	✔	✔
	Writing	Only 19	—	—	—	—	—

Tab. 6-4:   *Detailed overview of parameters PA for MR-JE-B/BF (5)*

Number	Symbol	Initial value	Unit	Setting range
PA20	***TDS**	**0000H**		**Refer to text**

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) for the MR-JE-BF to the pins CN3-9, CN3-13 and CN3-15 with parameters PD07 to PD09 and for the MR-JE-B to the pin CN3-13 with parameter PD07.

0			0

For manufacturer setting
0□□0: Manufacturer setting

Vibration tough drive selection
0: Disabled
1: Enabled

Selecting "1" enables to suppress vibrations by automatically changing setting values of parameters PB13 (Machine resonance suppression filter 1) and PB15 (Machine resonance suppression filter 2) in case that the vibration exceeds the value of the oscillation level set in parameter PF23.
Refer to the instruction manual for details.

Instantaneous power failure tough drive selection (only MR-JE-B)
0: Disabled
1: Enabled

Selecting "1" enables to avoid occurring AL. 10 (Undervoltage) using the electrical energy charged in the capacitor in case that an instantaneous power failure occurs during operation. In parameter PF25 (Instantaneous power failure tough drive - Detection time), set the time period until the occurrence of AL. 10.1 (Voltage drop in the power).

When the digit is enabled, the power should be off for the setting value of parameter. PF25 + 1 s or more before cycling the power to enable a parameter whose symbol is preceded by "*" or "**".

SEMI-F47 function selection (only MR-JE-BF)
0: Disabled
1: Enabled

Selecting "1" enables to avoid occurring AL. 10 (Undervoltage) using the electrical energy charged in the capacitor in case that an instantaneous power failure occurs during operation. In parameter PF25 (SEMI-F47 function - Instantaneous power failure detection time), set the time period until the occurrence of AL. 10.1 (Voltage drop in the control circuit power).

PA21	***AOP3**	**0001H**		**Refer to text**

Function selection A-3

0	0	0	

One-touch tuning function selection
0: Disabled
1: Enabled

When the digit is "0", the one-touch tuning with MR Configurator2 will be disabled.

For manufacturer setting
000: Manufacturer setting

PA23	**DRAT**	**0000H**		**Refer to text**

Drive recorder arbitrary alarm trigger setting

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.

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.

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".

Tab. 6-4:   *Detailed overview of parameters PA for MR-JE-B/BF (6)*

Number	Symbol	Initial value	Unit	Setting range

PA24	AOP4	0000H		Refer to text

Function selection A-4

```
┌───┬───┬───┬───┐
│ 0 │ 0 │ 0 │   │
└───┴───┴───┴─┬─┘
```

└──── 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.
Before changing the control mode with the controller during the 3 inertia mode or low response mode, stop the motor.

└──── For manufacturer setting
   000:   Manufacturer setting

PA25	OTHOV	0	%	0–100

One-touch tuning - Overshoot permissible level

Set a permissible value of overshoot amount for one-touch tuning as a percentage of the in-position range.
Setting "0" will be 50%.

PA26	*AOP5	0000H		Refer to text

Function selection A-5

```
┌───┬───┬───┬───┐
│ 0 │ 0 │ 0 │   │
└───┴───┴─┬─┴─┬─┘
```

└──── Torque limit function selection at instantaneous power failure (instantaneous power failure tough drive selection)
   0:   Disabled
   1:   Enabled

   • For MR-JE-B:
     When an instantaneous power failure occurs during operation, the torque at acceleration is limited to save electric energy charged in the capacitor in the servo amplifier and the time until AL. 10.2 (Bus voltage drop) occurs is extended with the instantaneous power failure tough drive function. Consequently, you can set a longer time in parameter PF25 (Instantaneous power failure tough drive - Detection time). The torque limit function at instantaneous power failure is enabled when "instantaneous power failure tough drive selection" in parameter PA20 is "Enabled (□1□□)"
   • For MR-JE-BF:
     When an instantaneous power failure occurs during operation, the torque at acceleration is limited to save electric energy charged in the capacitor in the servo amplifier and the time until AL. 10.2 (Voltage drop in the main circuit power) occurs is extended with the instantaneous power failure tough drive function. Consequently, you can set a longer time in parameter PF25 (SEMI-F47 function - Instantaneous power failure detection time). The torque limit function at instantaneous power failure is enabled when "SEMI-F47 function selection" in parameter PA20 is "Enabled (□1□□)".

└──── For manufacturer setting
   000:   Manufacturer setting

PA27	*HTL	0000H		Refer to text

Hot line forced stop function (only for MR-JE-B)

```
┌───┬───┬───┬───┐
│ 0 │ 0 │ 0 │   │
└───┴───┴─┬─┴─┬─┘
```

└──── Hot line forced stop function selection
   0:   Enabled
   1:   Disabled

└──── For manufacturer setting
   000:   Manufacturer setting

Tab. 6-4:   *Detailed overview of parameters PA for MR-JE-B/BF (7)*

Number	Symbol	Initial value	Unit	Setting range
PA28	***AOP6**	**0000H**		**Refer to text**

Function selection A-6

Selection of the HG-KN series servo motor maximum speed.

```
┌───┬───┬───┬───┐
│ 0 │ 0 │ 0 │   │
└───┴───┴───┴───┘
```

Select the maximum speed of the HG-KN series servo motor.
0:   A maximum speed of 5000 1/min
1:   A maximum speed of 6000 1/min

This digit is disabled when a servo motor other than HG-KN series is connected.
For the MR-JE-B servo amplifier is this digit only available with software version C4 or later.

For manufacturer setting
000:   Manufacturer setting

Tab. 6-4:   *Detailed overview of parameters PA for MR-JE-B/BF (8)*

Number	Symbol	Initial value	Unit	Setting range

MITSUBISHI ELECTRIC

6.3   MR-JE-C

6.3.1   Basic setting parameters

NOTES   To enable a parameter whose symbol is preceded by *, turn off the power for 1 s or more after setting and turn it on again. However, the time will be longer depending on a setting value of parameter PF25 (instantaneous power failure tough drive - detection time) when "Instantaneous power failure tough drive selection" is enabled in parameter PA20.

The symbols in the control mode column mean as follows.

– P: Position control mode

– S: Speed control mode

– T: Torque control mode

– pp/pv/tq: Profile mode

The following parameters cannot be used in the profile mode.

– PA05 (Number of command input pulses per revolution)

– PA13 (Command pulse input form)

Parameters PA□□
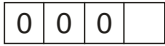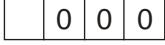
No.	Symbol	Name	Initial value	Unit	Control mode			
					Standard mode			Profile mode
					P	S	T	pp/pv/tq
PA01	*STY	Operation mode	1000H	—	✔	✔	✔	✔
PA02	*REG	Regenerative option	0000H	—	✔	✔	✔	✔
PA03	*ABS	Absolute position detection system	0000H	—	✔	—	—	✔
PA04	*AOP1	Function selection A-1	2000H	—	✔	✔	—	✔
PA05	*FBP	Number of command input pulses per revolution	10000	—	✔	—	—	—
PA06	CMX	Electronic gear numerator (command pulse multiplication numerator)	1	—	✔	—	—	✔
PA07	CDV	Electronic gear denominator (command pulse multiplication denominator)	1	—	✔	—	—	✔
PA08	ATU	Auto tuning mode	0001H	—	✔	✔	—	✔
PA09	RSP	Auto tuning response	16	—	✔	✔	—	✔
PA10	INP	In-position range	100	pulse	✔	—	—	✔
PA11	TLP	Forward rotation torque limit	1000.0	%	✔	✔	✔	✔
PA12	TLN	Reverse rotation torque limit	1000.0	%	✔	✔	✔	✔
PA13	*PLSS	Command pulse input form	0100H	—	✔	—	—	—
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	—	For manufacturer setting	0000H	—	—	—	—	—
PA19	*BLK	Parameter writing inhibit	00AAH	—	✔	✔	✔	✔
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	*AOP5	Function selection A-5	0000H	—	✔	✔	—	✔
PA27	—	For manufacturer setting	0000H	—	—	—	—	—
PA28	*AOP6	Function selection A-6	0000H	—	✔	✔	✔	✔
PA29	—	For manufacturer setting	0000H	—	—	—	—	—
PA30	—	For manufacturer setting	0000H	—	—	—	—	—
PA31	—	For manufacturer setting	0000H	—	—	—	—	—
PA32	—	For manufacturer setting	0000H	—	—	—	—	—

Tab. 6-5: *List of basic setting parameters for MR-JE-C*

MITSUBISHI ELECTRIC

Description of basic setting parameters

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA01	*STY	1000H		Refer to text	P S T pp/pv/tq

Operation mode

1	0	0	

Control mode selection (standard mode)
- 0: Position control (P)
- 1: Position and speed control (P/S)
- 2: Speed control (S)
- 3: Speed and torque control (S/T)
- 4: Torque control (T)
- 5: Torque and position control (T/P)

Control mode selection (profile mode)
- 9: Profile mode (pp/pv/tq)

For manufacturer setting
- 100: Manufacturer setting

Setting a value for the control mode of "6", "7", or "8" will trigger AL. 37.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA02	*REG	0000H		Refer to text	P S T pp/pv/tq

Regenerative option

0	0		

Select the regenerative option.
- 00: Regenerative option is not used.
  - For the servo amplifier of 200 W or less, a regenerative resistor is not used.
  - For the servo amplifier of 0.4 kW to 3 kW, the built-in regenerative resistor is used.

- 02: MR-RB032/MR-RFH75-40
- 03: MR-RB12/MR-RFH75-40
- 04: MR-RB32/MR-RFH220-40
- 05: MR-RB30/MR-RFH400-13
- 06: MR-RB50 (Cooling fan is required.)/MR-RFH400-13

For manufacturer setting
- 00: Manufacturer setting

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.

The setting value is available with servo amplifier with software version A3 or later.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA03	*ABS	0000H		Refer to text	P

Absolute position detection system

0	0	0	

Absolute position detection system selection
- 0: Disabled (used in incremental system)
- 2: Enabled (absolute position detection system by communication)

For manufacturer setting
- 000: Manufacturer setting

Setting "1" will trigger AL.37.

Tab. 6-6:   *Detailed overview of parameters PA for MR-JE-C (1)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA03	*ABS	0000H		Refer to text	pp/pv/tq

Absolute position detection system

```
┌───┬───┬───┬───┐
│ 0 │ 0 │ 0 │   │
└───┴───┴───┴───┘
```

Absolute position detection system selection
0: Disabled (used in incremental system)
2: Enabled (absolute position detection system)

For manufacturer setting
000: Manufacturer setting

Setting "1" will trigger AL.37.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA04	*AOP1	2000H		Refer to text	P S pp/pv/tq

Function selection A-1

```
┌───┬───┬───┬───┐
│   │ 0 │ 0 │ 0 │
└───┴───┴───┴───┘
```

For manufacturer setting
000: Manufacturer setting

Forced stop deceleration function selection
0: Forced stop deceleration function disabled (with EM1)
2: Forced stop deceleration function enabled (with EM2)

Refer to the following table for details.

Setting value	EM2/EM1	Deceleration method	
		EM2 or EM1 is off	Alarm occurred
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□□□	EM2	MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.	MBR (Electromagnetic brake interlock) turns off after the forced stop deceleration.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA05	*FBP	10000		1000–1000000	P

Number of command input pulses per revolution

The servo motor rotates based on set command input pulses.
To enable the parameter value, set "Electronic gear selection" to "Number of command input pulses per revolution (1□□□)" in parameter PA21.

Tab. 6-6: *Detailed overview of parameters PA for MR-JE-C (2)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA06	**CMX**	**1**		**1–16777215**	**P**

Electronic gear numerator (command pulse multiplication numerator)
Set the numerator of the electronic gear.
To enable the parameter, set "Electronic gear selection" to "Electronic gear (0□□□)" in parameter PA21.
The following shows a standard of the setting range of the electronic gear.

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

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

Always set the electronic gear with servo-off state to prevent unexpected operation due to improper setting.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA06	**CMX**	**1**		**1–16777215**	**pp/pv/tq**

Electronic gear numerator (command pulse multiplication numerator)
Set the numerator of the electronic gear.
To enable the parameter, set "Electronic gear selection" to "Electronic gear (0□□□)" in parameter PA21.
In the profile mode, cycle the power to enable the parameter.
The following shows a standard of the setting range of the electronic gear.

$$\frac{1}{27649} < \frac{CMX}{CDV} < 8484$$

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

Always set the electronic gear with servo-off state to prevent unexpected operation due to improper setting.
This parameter corresponds to "Motor revolutions (Index: 6091$_H$, Sub: 1)". When this parameter is mapped to the link device of CC-Link IE Field Network Basic, the value written with MR Configurator2 is overwritten by the controller. Thus, do not write a value with MR Configurator2.

Tab. 6-6:   *Detailed overview of parameters PA for MR-JE-C (3)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA07	CDV	1		1–16777215	P

Electronic gear denominator (command pulse multiplication denominator)
Set the denominator of the electronic gear.
To enable the parameter, set "Electronic gear selection" to "Electronic gear (0□□□)" in parameter PA21.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA07	CDV	1		1–16777215	pp/pv/tq

Electronic gear denominator (command pulse multiplication denominator)
Set the denominator of the electronic gear.
To enable the parameter, set "Electronic gear selection" to "Electronic gear (0□□□)" in parameter PA21.
In the profile mode, cycle the power to enable the parameter.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA08	ATU	0001$_H$		Refer to text	P S pp/pv/tq

Auto tuning mode
Gain adjustment mode selection

```
┌─┬─┬─┬─┐
│0│0│0│ │
└─┴─┴─┴─┘
```

Select the gain adjustment mode.
0:   2 gain adjustment mode 1 (interpolation mode)
1:   Auto tuning mode 1
2:   Auto tuning mode 2
3:   Manual mode
4:   2 gain adjustment mode 2
Refer to the following table for details.

For manufacturer setting
000:   Manufacturer setting

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

Tab. 6-6:   *Detailed overview of parameters PA for MR-JE-C (4)*

MITSUBISHI ELECTRIC

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA09	RSP	16		1–40	P S pp/pv/tq

Auto tuning response
Set a response of the auto tuning.

Setting value	Machine characteristic		Setting value	Machine characteristic	
	Response	Guideline for machine resonance frequency [Hz]		Response	Guideline for machine resonance frequency [Hz]
1	low	2.7	21	middle	67.1
2		3.6	22		75.6
3		4.9	23		85.2
4		6.6	24		95.9
5		10.0	25		108.0
6		11.3	26		121.7
7		12.7	27		137.1
8		14.3	28		154.4
9		16.1	29		173.9
10		18.1	30		195.9
11		20.4	31		220.6
12		23.0	32		248.5
13		25.9	33		279.9
14		29.2	34		315.3
15		32.9	35		355.1
16		37.0	36		400.0
17		41.7	37		446.6
18		47.0	38		501.2
19		52.9	39		571.5
20	middle	59.6	40	high	642.7

PA10	INP	100	pulse	0–65535	P

In-position range
Set an in-position range per command pulse.
To change it to the servo motor encoder pulse unit, set parameter PC24.

PA10	INP	100		0–65535	pp/pv/tq

In-position range
Set an in-position range per command pulse.
To change it to the servo motor encoder pulse unit, set parameter PC06.
When parameter PC06 is set to "□□□0" in the profile mode, the unit can be changed to 10^{-3} [degree] or [pulse] with the setting of parameter PT01.

PA11	TLP	1000.0	%	0.0–1000.0	P S T

Forward rotation torque limit
You can limit the torque generated by the servo motor. Set the parameter referring to the instruction manual.
Set the rated torque to 100.0 [%]. Set the parameter to limit the torque of the servo motor in the CW power running or CCW regeneration. The polarity of the torque limit changes depending on the parameter PA14 setting. Set this parameter to "0.0" to generate no torque.
If a value larger than the servo motor's maximum torque is set, that value will be limited to the servo motor's maximum torque value.

Tab. 6-6:   *Detailed overview of parameters PA for MR-JE-C (5)*
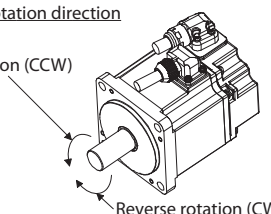
Number	Symbol	Initial value	Unit	Setting range	Control mode
PA11	TLP	1000.0	%	0.0–1000.0	pp/pv/tq

Forward rotation torque limit

You can limit the torque generated by the servo motor.

Set the parameter on the assumption that the rated torque is 100.0 [%]. Set the parameter to limit the torque of the servo motor in the CW power running or CCW regeneration. The polarity of the torque limit changes depending on the parameter PA14 setting. Set this parameter to "0.0" to generate no torque.

If a value larger than the maximum torque of the servo motor is set, the value will be limited to the maximum torque of the servo motor.

This parameter corresponds to "Positive torque limit value (Index: 60E0$_H$)". When this parameter is mapped to the link device of CC-Link IE Field Network Basic, the value written with MR Configurator2 is overwritten by the controller. Thus, do not write a value with MR Configurator2.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA12	TLN	1000.0	%	0.0–1000.0	P S T

Reverse rotation torque limit

You can limit the torque generated by the servo motor. Set the parameter referring to the instruction manual.

Set the rated torque to 100.0 [%]. Set this parameter when limiting the torque of the servo motor in the CW power running or CCW regeneration. The polarity of the torque limit changes depending on the parameter PA14 setting. Set this parameter to "0.0" to generate no torque.

If a value larger than the servo motor's maximum torque is set, that value will be limited to the servo motor's maximum torque value.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA12	TLN	1000.0	%	0.0–1000.0	pp/pv/tq

Reverse rotation torque limit

You can limit the torque generated by the servo motor.

Set the parameter on the assumption that the rated torque is 100.0 [%]. Set this parameter when limiting the torque of the servo motor in the CW power running or CCW regeneration. The polarity of the torque limit changes depending on the parameter PA14 setting. Set this parameter to "0.0" to generate no torque.

If a value larger than the maximum torque of the servo motor is set, the value will be limited to the maximum torque of the servo motor.

This parameter corresponds to "Negative torque limit value (Index: 60E1$_H$)". When this parameter is mapped to the link device of CC-Link IE Field Network Basic, the value written with MR Configurator2 is overwritten by the controller. Thus, do not write a value with MR Configurator2.

Tab. 6-6: *Detailed overview of parameters PA for MR-JE-C (6)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA13	*PLSS	0100н		Refer to text	P

Command pulse input form

Command input pulse train form selection
0: Forward/reverse rotation pulse train
1: Signed pulse train
2: A-phase/B-phase pulse train (The servo amplifier imports input pulses after multiplying by four.)

Refer to the following table for settings.

Pulse train logic selection
0: Positive logic
1: Negative logic
Select the same one as a logic of command pulse train from controller to connect. Refer to the following note for logic of MELSEC iQ-R/MELSEC-Q/MELSEC-L/MELSEC-F series.

Refer to the following table for settings.

Setting value	Pulse train form		Forward rotation command	Reverse rotation command
□□10н	Negative logic	Forward rotation pulse train / Reverse rotation pulse train		
□□11н		Pulse train + sign		
□□12н		A-phase pulse train / B-phase pulse train		
□□00н	Positive logic	Forward rotation pulse train / Reverse rotation pulse train		
□□01н		Pulse train + sign		
□□02н		A-phase pulse train / B-phase pulse train		

Arrows in the table indicate the timing of importing pulse trains. A-phase and B-phase pulse trains are imported after they have been multiplied by 4.

Tab. 6-6: *Detailed overview of parameters PA for MR-JE-C (7)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA13	*PLSS	0100ₕ		Refer to text	P

Command pulse input form (continued)

0			

Command input pulse train filter selection
Selecting proper filter enables to enhance noise immunity.
0:    Command input pulse train is 4 Mpulses/s or less.
1:    Command input pulse train is 1 Mpulse/s or less.
2:    Command input pulse train is 500 kpulses/s or less.
3:    Command input pulse train is 200 kpulses/s or less

1 Mpulse/s or lower commands are supported by "1". When inputting commands over 1 Mpulse/s and 4 Mpulses/s or lower, set "0".

Incorrect setting may cause the following malfunctions.
–   Setting a value higher than actual command will lower noise immunity.
–   Setting a value lower than actual command will cause a position mismatch.

For manufacturer setting
0:    Manufacturer setting

NOTE:
Adjust the logic of a positioning module and command pulse as follows.
• MELSEC iQ-R series/MELSEC-Q series/MELSEC-L series positioning module

Signal type	Command pulse logic setting	
	Positioning module Pr. 23 setting	MR-JE-C servo amplifier parameter PA13 setting
Open-collector type	Positive logic	Positive logic (□□0□)
	Negative logic	Negative logic (□□1□)
Differential line driver type	Positive logic [1]	Negative logic (□□1□)
	Negative logic [1]	Positive logic (□□0□)

[1] For MELSEC iQ-R series/MELSEC-Q series/MELSEC-L series, reverse the input pulse logic of the servo amplifier.

• MELSEC-F series positioning module

Signal type	Command pulse logic setting	
	Positioning module (fixed)	MR-JE-C servo amplifier parameter PA13 setting
Open-collector type Differential line driver type	Negative logic	Negative logic (□□1□)

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA14	*POL	0		0, 1	P

Rotation direction selection
Select the servo motor rotation direction relative to the input pulse train.

Servo motor rotation direction

Forward rotation (CCW)

Reverse rotation (CW)

Setting value	Servo motor rotation direction	
	When forward rotation pulse is input	When reverse rotation pulse is input
0	CCW	CW
1	CW	CCW

Tab. 6-6:   Detailed overview of parameters PA for MR-JE-C (8)

MITSUBISHI ELECTRIC

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA14	***POL**	**0**		**0, 1**	**pp/pv/tq**

Rotation direction selection

Select a rotation direction or travel direction

The torque polarity changes depending on the combination of this parameter and parameter PC29 (POL reflection selection at torque mode).

- In the profile position mode/profile velocity mode

Servo motor rotation direction

Forward rotation (CCW)

Reverse rotation (CW)

Setting value	Servo motor rotation direction	
	Position mode/Positioning address:	
	Increase	**Decrease**
	Velocity mode/Speed command:	
	Positive	**Negative**
0	CCW	CW
1	CW	CCW

- In the profile torque mode

Setting value		Servo motor rotation direction	
		Torque mode/Torque command:	
PA14	**PC29**	**Forward**	**Reverse**
0	0□□□: Enabled	CCW	CW
	1□□□: Disabled	CCW	CW
1	0□□□: Enabled	CW	CCW
	1□□□: Disabled	CCW	CW

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA15	***ENR**	**4000**	**pulse/rev**	**1–4194304**	**P S T pp/pv/tq**

Encoder output pulses

Set the encoder output pulses from the servo amplifier by using the number of output pulses per revolution, dividing ratio, or electronic gear ratio (after multiplication by 4).

To set a numerator of the electronic gear, select "A-phase/B-phase pulse electronic gear setting (□□3□)" of "Encoder output pulse setting selection" in parameter PC19.

The maximum output frequency is 4.6 Mpulses/s. Set the parameter within this range.

Select "Output pulse setting" or "Dividing ratio setting" in parameter PC19.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA16	***ENR2**	**1**		**1–4194304**	**P S T pp/pv/tq**

Encoder output pulses 2

Set a denominator of the electronic gear for the A/B-phase pulse output.

To set a denominator of the electronic gear, select "A-phase/B-phase pulse electronic gear setting (□□3□)" of "Encoder output pulse setting selection" in parameter PC19.

When "Encoder output pulse setting selection" is set to "Disabled (□□1□)" in parameter PC19, the setting value of this parameter will be disabled.

Tab. 6-6:   *Detailed overview of parameters PA for MR-JE-C (9)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA19	***BLK**	**00AA**H		**Refer to text**	**P S T** pp/pv/tq

Parameter writing inhibit
Select a reference range and writing range of the parameter.
Refer to the following table for settings.

PA19	Setting operation	PA	PB	PC	PD	PE	PF	PT [1]	PN [2]
Other than below	Reading	✔	—	—	—	—	—	—	—
	Writing	✔	—	—	—	—	—	—	—
000AH	Reading	Only 19	—	—	—	—	—	—	—
	Writing	Only 19	—	—	—	—	—	—	—
000BH	Reading	✔	✔	✔	—	—	—	—	—
	Writing	✔	✔	✔	—	—	—	—	—
000CH	Reading	✔	✔	✔	✔	—	—	—	—
	Writing	✔	✔	✔	✔	—	—	—	—
00AAH (initial value)	Reading	✔	✔	✔	✔	✔	✔	✔	✔
	Writing	✔	✔	✔	✔	✔	✔	✔	✔
100BH	Reading	✔	—	—	—	—	—	—	—
	Writing	Only 19	—	—	—	—	—	—	—
100CH	Reading	✔	✔	✔	✔	—	—	—	—
	Writing	Only 19	—	—	—	—	—	—	—
10AAH	Reading	✔	✔	✔	✔	✔	✔	✔	✔
	Writing	Only 19	—	—	—	—	—	—	—

[1] For details, refer to "MR-JE-C Servo Amplifier Instruction Manual (Profile Mode)".

[2] For details, refer to "MR-JE-C Servo Amplifier Instruction Manual (CC-Link IE Field Network Basic)".

Tab. 6-6: *Detailed overview of parameters PA for MR-JE-C (10)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA20	*TDS	0000н		Refer to text	P S (T)/ pp/pv/tq

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 the pins CN3-14 to CN3-16 and CN3-22 with parameters PD29 to PD32.

For manufacturer setting
0□□0: Manufacturer setting

Vibration tough drive selection
0:   Disabled
1:   Enabled

Selecting "1" enables to suppress vibrations by automatically changing setting values of parameters PB13 (Machine resonance suppression filter 1) and PB15 (Machine resonance suppression filter 2) in case that the vibration exceed the value of the oscillation level set in parameter PF23.
To output the oscillation detection alarm as a warning, set parameter PF24 (Vibration tough drive function selection).
Refer to the instruction manual for details.

Instantaneous power failure tough drive selection
0:   Disabled
1:   Enabled

Selecting "1" enables to avoid occurring AL. 10 (Undervoltage) using the electrical energy charged in the capacitor in case that an instantaneous power failure occurs during operation. In parameter PF25 (Instantaneous power failure tough drive - Detection time), set the time period until the occurrence of AL. 10.1 (Voltage drop in the power).

When the digit is enabled, the power should be off for the setting value of parameter. PF25 + 1 s or more before cycling the power to enable a parameter whose symbol is preceded by "*".

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA21	*AOP3	0001н		Refer to text	P (S) pp/pv/tq

Function selection A-3

One-touch tuning function selection
0:   Disabled
1:   Enabled

When the digit is "0", the one-touch tuning is not available.

For manufacturer setting
00: Manufacturer setting

Electronic gear selection (only position control mode)
0:   Electronic gear (Parameters PA06 and PA07)
1:   Number of command input pulses per revolution (Parameter PA05)

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA23	DRAT	0000н		Refer to text	P S T pp/pv/tq

Drive recorder arbitrary alarm trigger setting

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.

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.

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".

Tab. 6-6:   *Detailed overview of parameters PA for MR-JE-C (11)*

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA24	AOP4	0000ʜ		Refer to text	P S pp/pv/tq

Function selection A-4

| 0 | 0 | 0 | |

Vibration suppression mode selection
0:   Standard mode
1:   3 inertia mode
2:   Low response mode

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.

Before changing the control mode during the 3 inertia mode or low response mode, stop the motor.

For manufacturer setting
000:   Manufacturer setting

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA25	OTHOV	0	%	0–100	P S pp/pv/tq

One-touch tuning - Overshoot permissible level
Set a permissible value of overshoot amount for one-touch tuning as a percentage of the in-position range.
Setting "0" will be 50%.

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA26	*AOP5	0000ʜ		Refer to text	P S pp/pv/tq

Function selection A-5

| 0 | 0 | 0 | |

Torque limit function selection at instantaneous power failure (instantaneous power failure tough drive selection)
0:   Disabled
1:   Enabled

Selecting "1" for this digit will limit torques to save electric energy when an instantaneous power failure occurs during operation and will make AL. 10 (Undervoltage) less likely to occur.

The torque limit function at instantaneous power failure is enabled when "Instantaneous power failure tough drive selection" in parameter PA20 is "Enabled (□1□□)".

For manufacturer setting
000:   Manufacturer setting

Number	Symbol	Initial value	Unit	Setting range	Control mode
PA28	*AOP6	0000ʜ		Refer to text	P S T pp/pv/tq

Function selection A-6
Selection of the HG-KN series servo motor maximum speed.

| 0 | 0 | 0 | |

Select the maximum speed of the HG-KN series servo motor.
0:   A maximum speed of 5000 1/min
1:   A maximum speed of 6000 1/min

This digit is disabled when a servo motor other than HG-KN series is connected.

For manufacturer setting
000:   Manufacturer setting

Tab. 6-6:   *Detailed overview of parameters PA for MR-JE-C (12)*

6.4   Other parameters

Only the basic setting parameters PA□□ are described in this manual for beginners.

The Appendix shows more tables about

● Gain/filter parameters PB□□ (Section A.1.3, section A.2.3 or section A.3.3)

● Extension setting parameters PC□□ (Section A.1.4, section A.2.4, section A.3.4)

● I/O setting parameters PD□□ (Section A.1.5, section A.2.5 or section A.3.5)

● Extension 2 setting parameters PE□□ (Section A.1.6, section A.2.6 or section A.3.6)

● Extension 3 setting parameters PF□□ (Section A.1.7, section A.2.7 or section A.3.7)

● Positioning control parameters PT□□ (Section A.1.8 or section A.3.8)

● Network setting parameters PN□□ (Section A.3.9)

Please refer to the respective instruction manuals of the servo amplifier series MR-JE-A, MR-JE-B, MR-JE-BF or MR-JE-C for more detailed settings and descriptions of these parameters.

MITSUBISHI ELECTRIC

7   Troubleshooting

7.1   Alarm and warning list MR-JE-A and MR-JE-C

Refer to "MELSERVO JE Servo Amplifier Instruction Manual (Troubleshooting)" for details of alarms and warnings.

As soon as an alarm occurs, turn SON (Servo-on) off and interrupt the power.

AL. 37 (Parameter error) and warnings (except AL. F0 (Tough drive warning)) are not recorded in the alarm history.

When an error occurs during operation, the corresponding alarm and warning are displayed. When the alarm or the warning occurs, refer to "MELSERVO JE Servo Amplifier Instruction Manual (Trouble-shooting)" to remove the failure. When an alarm occurs, ALM will turn off.

7.1.1   Explanation of the lists

● No./Name/Detail No./Detail name

Indicates each No./Name/Detail No./Detail name of alarms or warnings.

● Stop method

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 servo motor stops with the dynamic brake without forced stop deceleration.

● Alarm deactivation

After its cause has been removed, the alarm can be deactivated in any of the methods marked ✔ in the alarm deactivation column. Warnings are automatically cancelled after the cause of occurrence is removed. Alarms are deactivated with alarm reset or cycling the power.

Alarm deactivation	Explanation
Alarm reset	1. Turning on RES (Reset) with input device
	2. For MR-JE-A: Pushing the "SET" button while the display of the servo amplifier is the current alarm display status For MR-JE-C: Error reset command from the controller
	3. Pushing the "Occurring Alarm Reset" button in the "Alarm Display" window of MR Configurator2
Cycling the power	Turning off the power, check that the 5/3-digit, 7-segment LED display is off, and then turn on the power.

Tab. 7-1:   *Methods of alarm deactivation*

● Alarm code

To output alarm codes, set parameter PD34 for the MR-JE-A or PD39 for the MR-JE-C to "□□□1". Alarm codes are outputted by on/off of bit 0 to bit 2.
Warnings (AL. 90 to AL. F3) do not have alarm codes. The alarm codes in the following table will be output when they occur. The alarm codes will not be output in normal condition.

	No.	ACD2 (Bit 2)	ACD1 (Bit 1)	ACD0 (Bit 0)	Name	Detail number	Detail name	Stop method ②, ③	Alarm reset	CPU reset ④	Cycling the power
		Alarm code ⑤							Alarm deactivation		
Alarm	10	0	1	0	Undervoltage	10.1	Voltage drop in the power	EDB	✔	✔	✔
						10.2	Bus voltage drop	SD	✔	✔	✔
	12	0	0	0	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	—	—	✔
						12.6	RAM error 6	DB	—	—	✔
	13	0	0	0	Clock error	13.1	Clock error 1	DB	—	—	✔
						13.2	Clock error 2	DB	—	—	✔
						13.3	Clock error 3	DB	—	—	✔
	14	0	0	0	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	—	—	✔
						14.C	Control process error 12	DB	—	—	✔
						14.D	Control process error 13	DB	—	—	✔
	15	0	0	0	Memory error 2 (EEP-ROM)	15.1	EEP-ROM error at power on	DB	—	—	✔
						15.2	EEP-ROM error during operation	DB	—	—	✔
						15.4	Home position information read error	DB	—	—	✔
	16	1	1	0	Encoder initial communication error 1	16.1	Encoder initial communication - Receive data error 1	DB	—	—	✔
						16.2	Encoder initial communication - Receive data error 2	DB	—	—	✔
						16.3	Encoder initial communication - Receive data error 3	DB	—	—	✔
						16.5	Encoder initial communication - Transmission data error 1	DB	—	—	✔
						16.6	Encoder initial communication - Transmission data error 2	DB	—	—	✔
						16.7	Encoder initial communication - Transmission data error 3	DB	—	—	✔
						16.A	Encoder initial communication - Process error 1	DB	—	—	✔
						16.B	Encoder initial communication - Process error 2	DB	—	—	✔
						16.C	Encoder initial communication - Process error 3	DB	—	—	✔
						16.D	Encoder initial communication - Process error 4	DB	—	—	✔
						16.E	Encoder initial communication - Process error 5	DB	—	—	✔
						16.F	Encoder initial communication - Process error 6	DB	—	—	✔

Tab. 7-2:   *Alarm list of MR-JE-A and MR-JE-C (1)*

MITSUBISHI ELECTRIC

	No.	ACD2 (Bit 2)	ACD1 (Bit 1)	ACD0 (Bit 0)	Name	Detail number	Detail name	Stop method [2], [3]	Alarm reset	CPU reset [4]	Cycling the power
			Alarm code [5]							Alarm deactivation	
Alarm	17	0	0	0	Board error	17.1	Board error 1	DB	—	—	✔
						17.3	Board error 2	DB	—	—	✔
						17.4	Board error 3	DB	—	—	✔
						17.5	Board error 4	DB	—	—	✔
						17.6	Board error 5	DB	—	—	✔
						17.7	Board error 7	DB	—	—	✔
	19	0	0	0	Memory error 3 (FLASH-ROM)	19.1	FLASH-ROM error 1	DB	—	—	✔
						19.2	FLASH-ROM error 2	DB	—	—	✔
						19.4	FLASH-ROM error 4	DB	—	—	✔
						19.5	FLASH-ROM error 5	DB	—	—	✔
	1A	1	1	0	Servo motor combination error	1A.1	Servo motor combination error 1	DB	—	—	✔
						1A.4	Servo motor combination error 2	DB	—	—	✔
	1E	1	1	0	Encoder initial communication error 2	1E.1	Encoder malfunction	DB	—	—	✔
	1F	1	1	0	Encoder initial communication error 3	1F.1	Incompatible encoder	DB	—	—	✔
	20	1	1	0	Encoder normal communication error 1	20.1	Encoder normal communication - Receive data error 1	EDB	—	—	✔
						20.2	Encoder normal communication - Receive data error 2	EDB	—	—	✔
						20.3	Encoder normal communication - Receive data error 3	EDB	—	—	✔
						20.5	Encoder normal communication - Transmission data error 1	EDB	—	—	✔
						20.6	Encoder normal communication - Transmission data error 2	EDB	—	—	✔
						20.7	Encoder normal communication - Transmission data error 3	EDB	—	—	✔
						20.9	Encoder normal communication - Receive data error 4	EDB	—	—	✔
						20.A	Encoder normal communication - Receive data error 5	EDB	—	—	✔
	21	1	1	0	Encoder normal communication error 2	21.1	Encoder data error 1	EDB	—	—	✔
						21.2	Encoder data update error	EDB	—	—	✔
						21.3	Encoder data waveform error	EDB	—	—	✔
						21.5	Encoder hardware error 1	EDB	—	—	✔
						21.6	Encoder hardware error 2	EDB	—	—	✔
						21.9	Encoder data error 2	EDB	—	—	✔
	24	1	0	0	Main circuit error	24.1	Ground fault detected by hardware detection circuit	DB	—	—	✔
						24.2	Ground fault detected by software detection function	DB	✔	✔	✔
	25	—	—	—	Absolute position erased	25.1	Servo motor encoder - Absolute position erased	DB	—	—	✔
	30	0	0	1	Regenerative error	30.1	Regeneration heat error	DB	✔[1]	✔[1]	✔[1]
						30.2	Regeneration signal error	DB	✔[1]	✔[1]	✔[1]
						30.3	Regeneration feedback signal error	DB	✔[1]	✔[1]	✔[1]
	31	1	0	1	Overspeed	31.1	Abnormal motor speed	SD	✔	✔	✔

Tab. 7-2: *Alarm list of MR-JE-A and MR-JE-C (2)*

	Alarm code [5]						Stop method [2], [3]	Alarm deactivation		
	No.	ACD2 (Bit 2)	ACD1 (Bit 1)	ACD0 (Bit 0)	Name	Detail number	Detail name		Alarm reset	CPU reset [4]	Cycling the power
Alarm	32	1	0	0	Overcurrent	32.1	Overcurrent detected at hardware detection circuit (during operation)	DB	—	—	✔
						32.2	Overcurrent detected at software detection function (during operation)	DB	✔	✔	✔
						32.3	Overcurrent detected at hardware detection circuit (during a stop)	DB	—	—	✔
						32.4	Overcurrent detected at software detection function (during a stop)	DB	✔	✔	✔
	33	0	0	1	Overvoltage	33.1	Main circuit voltage error	EDB	✔	✔	✔
	34	—	—	—	SSCNET III receive error 1	34.1	SSCNET III receive data error	SD	✔	✔ [6]	✔
		—	—	—		34.2	SSCNET III connector connection error	SD	✔	✔	✔
		—	—	—		34.3	SSCNET III communication data error	SD	✔	✔	✔
		—	—	—		34.4	Hardware error signal detection	SD	✔	✔	✔
	35	1	0	1	Command frequency error	35.1	Command frequency error	SD	✔	✔	✔
	36	—	—	—	SSCNET III receive error 2	36.1	Continuous communication data error	SD	✔	✔	✔
	37	0	0	0	Parameter error	37.1	Parameter setting range error	DB	—	✔	✔
						37.2	Parameter combination error	DB	—	✔	✔
						37.3	Point table setting error	DB	—	—	✔
	39	0	0	0	Program error	39.1	Program error	DB	—	—	✔
						39.2	Instruction argument external error	DB	—	—	✔
						39.3	Register No. error	DB	—	—	✔
						39.4	Non-correspondence instruction error	DB	—	—	✔
	3A	0	0	0	Inrush current suppression circuit error	3A.1	Inrush current suppression circuit error	EDB	—	—	✔
	3E	—	—	—	Operation mode error	3E.1	Operation mode error	DB	—	✔	✔
		0	0	0		3E.6	Operation mode switch error	DB	—	—	✔
	45	0	1	1	Main circuit device overheat	45.1	Main circuit device overheat error 1	SD	✔ [1]	✔ [1]	✔ [1]
	46	0	1	1	Servo motor overheat	46.1	Abnormal temperature of servo motor 1	SD	✔ [1]	✔ [1]	✔ [1]
						46.5	Abnormal temperature of servo motor 3	DB	✔ [1]	✔ [1]	✔ [1]
						46.6	Abnormal temperature of servo motor 4	DB	✔ [1]	✔ [1]	✔ [1]
	47	0	1	1	Cooling fan error	47.2	Cooling fan speed reduction error	SD	—	—	✔
	50	0	1	1	Overload 1	50.1	Thermal overload error 1 during operation	SD	✔ [1]	✔ [1]	✔ [1]
						50.2	Thermal overload error 2 during operation	SD	✔ [1]	✔ [1]	✔ [1]
						50.3	Thermal overload error 4 during operation	SD	✔ [1]	✔ [1]	✔ [1]
						50.4	Thermal overload error 1 during a stop	SD	✔ [1]	✔ [1]	✔ [1]
						50.5	Thermal overload error 2 during a stop	SD	✔ [1]	✔ [1]	✔ [1]
						50.6	Thermal overload error 4 during a stop	SD	✔ [1]	✔ [1]	✔ [1]

Tab. 7-2:   *Alarm list of MR-JE-A and MR-JE-C (3)*

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		Alarm code [5]						Stop method [2], [3]	Alarm deactivation		
	No.	ACD2 (Bit 2)	ACD1 (Bit 1)	ACD0 (Bit 0)	Name	Detail number	Detail name		Alarm reset	CPU reset [4]	Cycling the power
Alarm	51	0	1	1	Overload 2	51.1	Thermal overload error 3 during operation	DB	✔ [1]	✔ [1]	✔ [1]
						51.2	Thermal overload error 3 during a stop	DB	✔ [1]	✔ [1]	✔ [1]
	52	1	0	1	Error excessive	52.1	Excess droop pulse 1	SD	✔	✔	✔
						52.3	Excess droop pulse 2	SD	✔	✔	✔
						52.4	Error excessive during 0 torque limit	SD	✔	✔	✔
						52.5	Excess droop pulse 3	EDB	✔	✔	✔
	54	0	1	1	Oscillation detection	54.1	Oscillation detection error	EDB	✔	✔	✔
	56	1	1	0	Forced stop error	56.2	Over speed during forced stop	EDB	✔	✔	✔
						56.3	Estimated distance over during forced stop	EDB	✔	✔	✔
	61	1	0	1	Operation error	61.1	Point table setting range error	DB	✔	—	✔
	69	1	0	1	Command error	69.1	Forward rotation-side software limit detection - Command excess error	SD	✔	✔	✔
						69.2	Reverse rotation-side software limit detection - Command excess error	SD	✔	✔	✔
						69.3	Forward rotation stroke end detection - Command excess error	SD	✔	✔	✔
						69.4	Reverse rotation stroke end detection - Command excess error	SD	✔	✔	✔
	86	0	0	0	Network communication error	86.1	Network communication error 1	SD	✔	—	✔
						86.4	Network communication error 4	SD	✔	—	✔
						86.5	Network communication error5	SD	✔	—	✔
	8A	0	0	0	USB communication time-out error/serial communication time-out error/Modbus®/RTU communication time-out error	8A.1	USB communication time-out error/serial communication time-out error	SD	✔	✔	✔
						8A.2	Modbus®/RTU communication time-out error	SD	✔	✔	✔
	8C	0	0	0	Network module communication error	8C.1	Network module communication error 1	SD	—	—	✔
						8C.2	Network module communication error 2	SD	—	—	✔
						8C.3	Network module communication error 3	SD	—	—	✔
						8C.4	Network module communication error 4	SD	—	—	✔
						8C.5	Network module communication error 5	SD	—	—	✔
						8C.6	Network module communication error 6	SD	—	—	✔
						8C.7	Network module communication error 7	SD	—	—	✔

Tab. 7-2:   *Alarm list of MR-JE-A and MR-JE-C (4)*

		Alarm code [5]						Stop method [2] [3]	Alarm deactivation		
	No.	ACD2 (Bit 2)	ACD1 (Bit 1)	ACD0 (Bit 0)	Name	Detail number	Detail name		Alarm reset	CPU reset [4]	Cycling the power
Alarm	8E	0	0	0	USB communication error/serial communication error/Modbus®/RTU communication error	8E.1	USB communication receive error/serial communication receive error	SD	✔	✔	✔
						8E.2	USB communication checksum error/serial communication checksum error	SD	✔	✔	✔
						8E.3	USB communication character error/serial communication character error	SD	✔	✔	✔
						8E.4	USB communication command error/serial communication command error	SD	✔	✔	✔
						8E.5	USB communication data number error/serial communication data number error	SD	✔	✔	✔
						8E.6	Modbus®/RTU communication receive error	SD	✔	✔	✔
						8E.7	Modbus®/RTU communication message frame error	SD	✔	✔	✔
						8E.8	Modbus®/RTU communication CRC error	SD	✔	✔	✔
	888/ 88888	—	—	—	Watchdog	88._/ 8888._	Watchdog	DB	—	—	✔

Tab. 7-2:   *Alarm list of MR-JE-A and MR-JE-C (5)*

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

[2] The following shows three stop methods of DB, EDB, and SD.
   DB: Stops with dynamic brake. (Coasts for the servo amplifier without dynamic brake.)
   EDB: Electronic dynamic brake stop (available with specified servo motors)
           Refer to the following table for the specified servo motors.
           The stop method for other than the specified servo motors will be DB.
           For MR-JE-A, setting parameter PF09 to "(□□□3)" enables the electronic dynamic brake.

Series	Servo Motor
HG-KN	HG-KN053/HG-KN13/HG-KN23/HG-KN43
HG-SN	HG-SN52

   SD: Forced stop deceleration

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

[4] Only for MR-JE-C

[5] Alarm codes are outputted from the MR-JE-A or MR-JE-C. Refer to the instruction manual for details.

[6] In some controller communication status, the alarm factor may not be removed.

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	No.	Name	Detail number	Detail name	Stop method [2], [3]
Warning	90	Home position return incomplete warning	90.1	Home position return incomplete	—
			90.2	Home position return abnormal termination	—
			90.5	Z-phase unpassed	—
	91	Servo amplifier overheat warning [1]	91.1	Main circuit device overheat warning	—
	92	Battery cable disconnection warning	92.1	Encoder battery cable disconnection warning	—
			92.3	Battery degradation	—
	96	Home position setting warning	96.1	In-position warning at home positioning	—
			96.2	Command input warning at home positioning	—
			96.3	Servo off warning at home positioning	—
	97	Positioning specification warning	97.1	Program operation disabled warning	—
	98	Software limit warning	98.1	Forward rotation-side software stroke limit reached	—
			98.2	Reverse rotation-side software stroke limit reached	—
	99	Stroke limit warning	99.1	Forward rotation stroke end off	[4]
			99.2	Reverse rotation stroke end off	[4]
	9B	Error excessive warning	9B.1	Excess droop pulse 1 warning	—
			9B.3	Excess droop pulse 2warning	—
			9B.4	Error excessive warning during 0 torque limit	—
	9F	Battery warning	9F.1	Low battery	—
	E0	Excessive regeneration warning	E0.1	Excessive regeneration warning	—
	E1	Overload warning 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	E3.1	Multi-revolution counter travel distance excess warning	—
			E3.2	Absolute position counter warning	—
			E3.4	Absolute positioning counter EEP-ROM writing frequency 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 input warning	SD
	E8	Cooling fan speed reduction warning	E8.1	Decreased cooling fan speed warning	—
	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	EC.1	Overload warning 2	—
	ED	Output watt excess warning	ED.1	Output watt excess warning	—
	F0	Tough drive warning	F0.1	Instantaneous power failure tough drive 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	—

Tab. 7-3: *Warning list of MR-JE-A and MR-JE-C (1)*

	No.	Name	Detail number	Detail name	Stop method ②, ③
Warning	F4	Positioning warning	F4.4	Target position setting range error warning	—
			F4.6	Acceleration time constant setting range error warning	—
			F4.7	Deceleration time constant setting range error warning	—
			F4.8	Control command input error warning	—
	F5	Simple cam function - Cam data mis-writing warning	F5.1	Cam data - Area writing time-out warning	—
			F5.2	Cam data - Area miswriting warning	—
			F5.3	Cam data checksum error	—
	F6	Simple cam function - Cam control warning	F6.1	Cam axis one cycle current value restoration failed	—
			F6.2	Cam axis feed current value restoration failed	—
			F6.3	Cam unregistered error	—
			F6.4	Cam control data setting range error	—
			F6.5	Cam No. external error	—
			F6.6	Cam control inactive	—

Tab. 7-3:   *Warning list of MR-JE-A and MR-JE-C (2)*

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

② The following shows two stop methods of DB and SD.
   DB: Stops with dynamic brake. (Coasts for the servo amplifier without dynamic brake.)SD:
   Forced stop deceleration

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

④ Quick stop or slow stop can be selected using parameter PD30 for the MR-JE-A or using parameter PD35 for the MR-JE-C (except in the profile mode).

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7.2 Alarm and warning list MR-JE-B and MR-JE-BF

Refer to "MELSERVO JE Servo Amplifier Instruction Manual (Troubleshooting)" for details of alarms and warnings.

As soon as an alarm occurs, turn SON (Servo-on) off and interrupt the power.

AL. 37 (Parameter error) and warnings (except AL. F0 (Tough drive warning)) are not recorded in the alarm history.

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

7.2.1 Explanation of the lists

● No./Name/Detail No./Detail name

Indicates each No./Name/Detail No./Detail name of alarms or warnings.

● Stop method

For the alarms and warnings in which "SD" is written in the stop method column, the servo motor 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 servo motor stops with the dynamic brake without forced stop deceleration.

● Alarm deactivation

After its cause has been removed, the alarm can be deactivated in any of the methods marked ✔ in the alarm deactivation column. Warnings are automatically cancelled after the cause of occurrence is removed. Alarms are deactivated with alarm reset, CPU reset, or cycling the power.

Alarm deactivation	Explanation
Alarm reset	1. Error reset command from controller
	2. Click "Occurring Alarm Reset" in the "Alarm Display" window of MR Configurator2
CPU reset	Resetting the controller itself
Cycling the power	Turning off the power, check that the 3-digit, 7-segment LED display is off, and then turn on the power

	No.	Name	Detail number	Detail name	Stop method ②, ③	Alarm deactivation		
						Alarm reset	CPU reset	Cycling the power
Alarm	10	Undervoltage	10.1	Voltage drop in the power	EDB	✔	✔	✔
			10.2	Bus voltage drop	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	—	—	✔
			12.6	RAM error 6	DB	—	—	✔
	13	Clock error	13.1	Clock error 1	DB	—	—	✔
			13.2	Clock error 2	DB	—	—	✔
			13.3	Clock error 3	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	—	—	✔
			14.C	Control process error 12	DB	—	—	✔
			14.D	Control process error 13	DB	—	—	✔
	15	Memory error 2 (EEP-ROM)	15.1	EEP-ROM error at power on	DB	—	—	✔
			15.2	EEP-ROM error during operation	DB	—	—	✔
			15.4	Home position information read error	DB	—	—	✔
	16	Encoder initial communication error 1	16.1	Encoder initial communication - Receive data error 1	DB	—	—	✔
			16.2	Encoder initial communication - Receive data error 2	DB	—	—	✔
			16.3	Encoder initial communication - Receive data error 3	DB	—	—	✔
			16.5	Encoder initial communication - Transmission data error 1	DB	—	—	✔
			16.6	Encoder initial communication - Transmission data error 2	DB	—	—	✔
			16.7	Encoder initial communication - Transmission data error 3	DB	—	—	✔
			16.A	Encoder initial communication - Process error 1	DB	—	—	✔
			16.B	Encoder initial communication - Process error 2	DB	—	—	✔
			16.C	Encoder initial communication - Process error 3	DB	—	—	✔
			16.D	Encoder initial communication - Process error 4	DB	—	—	✔
			16.E	Encoder initial communication - Process error 5	DB	—	—	✔
			16.F	Encoder initial communication - Process error 6	DB	—	—	✔

Tab. 7-4: *Alarm list of MR-JE-B and MR-JE-BF (1)*

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	No.	Name	Detail number	Detail name	Stop method ②, ③	Alarm deactivation		
						Alarm reset	CPU reset	Cycling the power
Alarm	17	Board error	17.1	Board error 1	DB	—	—	✔
			17.3	Board error 2	DB	—	—	✔
			17.4	Board error 3	DB	—	—	✔
			17.5	Board error 4	DB	—	—	✔
			17.6	Board error 5	DB	—	—	✔
			17.7	Board error 7	DB	—	—	✔
	19	Memory error 3 (FLASH-ROM)	19.1	FLASH-ROM error 1	DB	—	—	✔
			19.2	FLASH-ROM error 2	DB	—	—	✔
			19.4	FLASH-ROM error 4	DB	—	—	✔
			19.5	FLASH-ROM error 5	DB	—	—	✔
	1A	Servo motor combination error	1A.1	Servo motor combination error 1	DB	—	—	✔
			1.A.4	Servo motor combination error 2	DB	—	—	✔
	1E	Encoder initial communication error 2	1E.1	Encoder malfunction	DB	—	—	✔
	1F	Encoder initial communication error 3	1F.1	Incompatible encoder	DB	—	—	✔
	20	Encoder normal communication error 1	20.1	Encoder normal communication - Receive data error 1	EDB	—	—	✔
			20.2	Encoder normal communication - Receive data error 2	EDB	—	—	✔
			20.3	Encoder normal communication - Receive data error 3	EDB	—	—	✔
			20.5	Encoder normal communication - Transmission data error 1	EDB	—	—	✔
			20.6	Encoder normal communication - Transmission data error 2	EDB	—	—	✔
			20.7	Encoder normal communication - Transmission data error 3	EDB	—	—	✔
			20.9	Encoder normal communication - Receive data error 4	EDB	—	—	✔
			20.A	Encoder normal communication - Receive data error 5	EDB	—	—	✔
	21	Encoder normal communication error 2	21.1	Encoder data error 1	EDB	—	—	✔
			21.2	Encoder data update error	EDB	—	—	✔
			21.3	Encoder data waveform error	EDB	—	—	✔
			21.5	Encoder hardware error 1	EDB	—	—	✔
			21.6	Encoder hardware error 2	EDB	—	—	✔
			21.9	Encoder data error 2	EDB	—	—	✔
	24	Main circuit error	24.1	Ground fault detected by hardware detection circuit	DB	—	—	✔
			24.2	Ground fault detected by software detection function	DB	✔	✔	✔
	25	Absolute position erased	25.1	Servo motor encoder - Absolute position erased	DB	—	—	✔
	30	Regenerative error	30.1	Regeneration heat error	DB	✔ [1]	✔ [1]	✔ [1]
			30.2	Regeneration signal error	DB	✔ [1]	✔ [1]	✔ [1]
			30.3	Regeneration feedback signal error	DB	✔ [1]	✔ [1]	✔ [1]
	31	Overspeed	31.1	Abnormal motor speed	SD	✔	✔	✔

Tab. 7-4:   *Alarm list of MR-JE-B and MR-JE-BF (2)*

	No.	Name	Detail number	Detail name	Stop method ②, ③	Alarm reset	CPU reset	Cycling the power
Alarm	32	Overcurrent	32.1	Overcurrent detected at hardware detection circuit (during operation)	DB	—	—	✔
			32.2	Overcurrent detected at software detection function (during operation)	DB	✔	✔	✔
			32.3	Overcurrent detected at hardware detection circuit (during a stop)	DB	—	—	✔
			32.4	Overcurrent detected at software detection function (during a stop)	DB	✔	✔	✔
	33	Overvoltage	33.1	Main circuit voltage error	EDB	✔	✔	✔
	34	SSCNET III receive error 1	34.1	SSCNET III receive data error	SD	✔	✔ ④	✔
			34.2	SSCNET III connector connection error	SD	✔	✔	✔
			34.3	SSCNET III communication data error	SD	✔	✔	✔
			34.4	Hardware error signal detection	SD	✔	✔	✔
	35	Command frequency error	35.1	Command frequency error	SD	✔	✔	✔
	36	SSCNET III receive error 2	36.1	Continuous communication data error	SD	✔	✔	✔
	37	Parameter error	37.1	Parameter setting range error	DB	—	✔	✔
			37.2	Parameter combination error	DB	—	✔	✔
			37.3	Point table setting error	DB	—	—	✔
	39	Program error	39.1	Program error	DB	—	—	✔
			39.2	Instruction argument external error	DB	—	—	✔
			39.3	Register No. error	DB	—	—	✔
			39.4	Non-correspondence instruction error	DB	—	—	✔
	3A	Inrush current suppression circuit error	3A.1	Inrush current suppression circuit error	EDB	—	—	✔
	3E	Operation mode error	3E.1	Operation mode error	DB	—	✔	✔
			3E.6	Operation mode switch error	DB	—	—	✔
	45	Main circuit device overheat	45.1	Main circuit device overheat error 1	SD	✔①	✔①	✔①
	46	Servo motor overheat	46.1	Abnormal temperature of servo motor 1	SD	✔①	✔①	✔①
			46.5	Abnormal temperature of servo motor 3	DB	✔①	✔①	✔①
			46.6	Abnormal temperature of servo motor 4	DB	✔①	✔①	✔①
	47	Cooling fan error	47.2	Cooling fan speed reduction error	SD	—	—	✔
	50	Overload 1	50.1	Thermal overload error 1 during operation	SD	✔①	✔①	✔①
			50.2	Thermal overload error 2 during operation	SD	✔①	✔①	✔①
			50.3	Thermal overload error 4 during operation	SD	✔①	✔①	✔①
			50.4	Thermal overload error 1 during a stop	SD	✔①	✔①	✔①
			50.5	Thermal overload error 2 during a stop	SD	✔①	✔①	✔①
			50.6	Thermal overload error 4 during a stop	SD	✔①	✔①	✔①
	51	Overload 2	51.1	Thermal overload error 3 during operation	DB	✔①	✔①	✔①
			51.2	Thermal overload error 3 during a stop	DB	✔①	✔①	✔①
	52	Error excessive	52.1	Excess droop pulse 1	SD	✔	✔	✔
			52.3	Excess droop pulse 2	SD	✔	✔	✔
			52.4	Error excessive during 0 torque limit	SD	✔	✔	✔
			52.5	Excess droop pulse 3	EDB	✔	✔	✔

Tab. 7-4: Alarm list of MR-JE-B and MR-JE-BF (3)

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	No.	Name	Detail number	Detail name	Stop method [2], [3]	Alarm deactivation		
						Alarm reset	CPU reset	Cycling the power
Alarm	54	Oscillation detection	54.1	Oscillation detection error	EDB	✔	✔	✔
	56	Forced stop error	56.2	Over speed during forced stop	EDB	✔	✔	✔
			56.3	Estimated distance over during forced stop	EDB	✔	✔	✔
	61	Operation error	61.1	Point table setting range error	DB	✔	—	✔
	63 [5]	STO timing error	63.1	STO1 off	DB	✔	✔	✔
			63.2	STO2 off	DB	✔	✔	✔
	68 [5]	STO diagnosis error	68.1	Mismatched STO signal error	DB	—	—	✔
	69	Command error	69.1	Forward rotation-side software limit detection - Command excess error	SD	✔	✔	✔
			69.2	Reverse rotation-side software limit detection - Command excess error	SD	✔	✔	✔
			69.3	Forward rotation stroke end detection - Command excess error	SD	✔	✔	✔
			69.4	Reverse rotation stroke end detection - Command excess error	SD	✔	✔	✔
	86	Network communication error	86.1	Network communication error 1	SD	✔	—	✔
			86.4	Network communication error 4	SD	✔	—	✔
			86.5	Network communication error5	SD	✔	—	✔
	8A	USB communication time-out error/serial communication time-out error/Modbus®/RTU communication time-out error	8A.1	USB communication time-out error/serial communication time-out error	SD	✔	✔	✔
			8A.2	Modbus®/RTU communication time-out error	SD	✔	✔	✔
	8C	Network module communication error	8C.1	Network module communication error 1	SD	—	—	✔
			8C.2	Network module communication error 2	SD	—	—	✔
			8C.3	Network module communication error 3	SD	—	—	✔
			8C.4	Network module communication error 4	SD	—	—	✔
			8C.5	Network module communication error 5	SD	—	—	✔
			8C.6	Network module communication error 6	SD	—	—	✔
			8C.7	Network module communication error 7	SD	—	—	✔
	8E	USB communication error/serial communication error/Modbus®/RTU communication error	8E.1	USB communication receive error/serial communication receive error	SD	✔	✔	✔
			8E.2	USB communication checksum error/serial communication checksum error	SD	✔	✔	✔
			8E.3	USB communication character error/serial communication character error	SD	✔	✔	✔
			8E.4	USB communication command error/serial communication command error	SD	✔	✔	✔
			8E.5	USB communication data number error/serial communication data number error	SD	✔	✔	✔
			8E.6	Modbus®/RTU communication receive error	SD	✔	✔	✔
			8E.7	Modbus®/RTU communication message frame error	SD	✔	✔	✔
			8E.8	Modbus®/RTU communication CRC error	SD	✔	✔	✔
	888/ 88888	Watchdog	88._/ 8888._	Watchdog	DB	—	—	✔

Tab. 7-4: *Alarm list of MR-JE-B and MR-JE-BF (4)*

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

② The following shows three stop methods of DB, EDB, and SD.
    DB: Stops with dynamic brake. (Coasts for the servo amplifier without dynamic brake.)
    EDB: Electronic dynamic brake stop (available with specified servo motors)
            Refer to the following table for the specified servo motors.
            The stop method for other than the specified servo motors will be DB.
            For MR-JE-A, setting parameter PF09 to "(□□□3)" enables the electronic dynamic brake.

Series	Servo Motor
HG-KN	HG-KN053/HG-KN13/HG-KN23/HG-KN43
HG-SN	HG-SN52

    SD: Forced stop deceleration

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

④ In some controller communication status, the alarm factor may not be removed.

⑤ Only for MR-JE-BF

	No.	Name	Detail number	Detail name	Stop method [2], [3]
Warning	90	Home position return incomplete warning	90.1	Home position return incomplete	—
			90.2	Home position return abnormal termination	—
			90.5	Z-phase unpassed	—
	91	Servo amplifier overheat warning [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 [5]	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	—
			96.3	Servo off warning at home positioning	—
	97	Program operation disabled/next station position warning	97.1	Program operation disabled warning	—
	98	Software limit warning	98.1	Forward rotation-side software stroke limit reached	—
			98.2	Reverse rotation-side software stroke limit reached	—
	99	Stroke limit warning	99.1	Forward rotation stroke end off	[4]
			99.2	Reverse rotation stroke end off	[4]
	9B	Error excessive warning	9B.1	Excess droop pulse 1 warning	—
			9B.3	Excess droop pulse 2warning	—
			9B.4	Error excessive warning during 0 torque limit	—
	9F	Battery warning	9F.1	Low battery	—
	E0	Excessive regeneration warning	E0.1	Excessive regeneration warning	—
	E1	Overload warning 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	E3.1	Multi-revolution counter travel distance excess warning	—
			E3.2	Absolute position counter warning	—
			E3.4	Absolute positioning counter EEP-ROM writing frequency 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 input warning	SD
	E8	Cooling fan speed reduction warning	E8.1	Decreased cooling fan speed warning	—
	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	EC.1	Overload warning 2	—
	ED	Output watt excess warning	ED.1	Output watt excess warning	—
	F0	Tough drive warning	F0.1	Instantaneous power failure tough drive warning	—
			F0.3	Vibration tough drive warning	—

Tab. 7-5: *Warning list of MR-JE-B and MR-JE-BF (1)*

	No.	Name	Detail number	Detail name	Stop method [2], [3]
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	—
	F4	Positioning warning	F4.4	Target position setting range error warning	—
			F4.6	Acceleration time constant setting range error warning	—
			F4.7	Deceleration time constant setting range error warning	—
			F4.8	Control command input error warning	—
	F5	Simple cam function - Cam data miswriting warning	F5.1	Cam data - Area writing time-out warning	—
			F5.2	Cam data - Area miswriting warning	—
			F5.3	Cam data checksum error	—
	F6	Simple cam function - Cam control warning	F6.1	Cam axis one cycle current value restoration failed	—
			F6.2	Cam axis feed current value restoration failed	—
			F6.3	Cam unregistered error	—
			F6.4	Cam control data setting range error	—
			F6.5	Cam No. external error	—
			F6.6	Cam control inactive	—

Tab. 7-5:   *Warning list of MR-JE-B and MR-JE-BF (2)*

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

[2] The following shows two stop methods of DB and SD.
    DB: Stops with dynamic brake. (Coasts for the servo amplifier without dynamic brake.)
    SD: Forced stop deceleration

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

[4] Quick stop or slow stop can be selected using parameter PD30 for the MR-JE-A or using parameter PD35 for the MR-JE-C (except in the profile mode).

[5] Only for MR-JE-BF

7.3   Remedies for alarms

⚠️ **WARNING:**

● *When any alarm has occurred, eliminate its cause, ensure safety, and deactivate the alarm before restarting operation. Otherwise, it may cause injury.*

● *If AL. 25 (Absolute position erased) occurs, always make home position setting again. Otherwise, it may cause an unexpected operation.*

● *As soon as an alarm occurs, make the Servo-off status and interrupt the main circuit power.*

NOTES   When any of the following alarms has occurred, do not cycle the power repeatedly to restart. Doing so will cause a malfunction of the servo amplifier and the servo motor. Remove its cause and allow about 30 minutes for cooling before resuming the operation.

– AL. 30 (Regenerative error)

– AL. 45 (Main circuit device overheat

– AL. 46 (Servo motor overheat)

– AL. 50 (Overload 1)

– AL. 51 (Overload 2)

AL. 37 (Parameter error) is not recorded in the alarm history.

Remove the cause of the alarm in accordance with the "MELSERVO JE Servo Amplifier Instruction Manual (Troubleshooting)". Use MR Configurator2 to refer to the cause of alarm occurrence.

7.4   Remedies for warnings

> **WARNING:**
>
> *If AL. E3 (Absolute position counter warning) occurs, always make home position setting again. Otherwise, it may cause an unexpected operation.*

NOTES   When any of the following warnings has occurred, do not cycle the power of the servo amplifier repeatedly to restart. Doing so will cause a malfunction of the servo amplifier and the servo motor. If the power of the servo amplifier is switched off/on during the alarms, allow more than 30 minutes for cooling before resuming operation.

– AL. 91 (Servo amplifier overheat warning)

– AL. E0 (Excessive regeneration warning)

– AL. E1 (Overload warning 1)

– AL. E2 (Servo motor overheat warning)

– AL. EC (Overload warning 2)

Warnings (except AL. F0 (Tough drive warning)) are not recorded in the alarm history.

If AL. E6, AL. E7, or AL. E9 occurs, the servo-off status is established. If any other warning occurs, operation can be continued but an alarm may take place or proper operation may not be performed.

Use MR Configurator2 to refer to the cause of warning occurrence.

7.5   Trouble which does not trigger alarm/warning

For possible causes which do not trigger alarm or warning refer to "MELSERVO JE Servo Amplifier Instruction Manual (Troubleshooting)".

Remove each cause referring to the respective sections of the manuals.

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A   Appendix

A.1   Additional information about the series MR-JE-A

A.1.1   Status Display

Status display	Symbol	Unit	Description
Cumulative feedback pulses	C	pulse	Feedback pulses from the servo motor encoder are counted and displayed. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. Press the "SET" button to reset the display value to zero. The value of minus is indicated by the lit decimal points in the upper four digits.
Servo motor speed	r	1/min	The servo motor speed is displayed. It is displayed rounding off 0.1 1/min unit.
Droop pulses	E	pulse	The number of droop pulses in the deviation counter are displayed. The decimal points in the upper four digits are lit for reverse rotation pulses. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. The number of pulses displayed is in the encoder pulse unit.
Cumulative command pulses	P	pulse	Position command input pulses are counted and displayed. As the value displayed is not yet multiplied by the electronic gear (CMX/CDV), it may not match the indication of the cumulative feedback pulses. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. Press the "SET" button to reset the display value to zero. When the servo motor is rotating in the reverse direction, the decimal points in the upper four digits are lit.
Command pulse frequency	n	kpulse/s	The frequency of position command input pulses is counted and displayed. The value displayed is not multiplied by the electronic gear (CMX/CDV).

Analog speed command voltage
Analog speed limit voltage
	F	V	1) Torque control mode
			    Input voltage of VLA (Analog speed limit) voltage is displayed.
			2) Speed control mode
			    Input voltage of VC (Analog speed command) voltage is displayed

Analog torque command voltage
Analog torque limit voltage
	U	V	1) Position control mode and speed control mode
			    Voltage of TLA (Analog torque limit) voltage is displayed.
			2) Torque control mode
			    Voltage of TC (Analog torque command) voltage is displayed.

Regenerative load ratio	L	%	The ratio of regenerative power to permissible regenerative power is displayed in %.
Effective load ratio	J	%	The continuous effective load current is displayed. The effective value in the past 15 s is displayed relative to the rated current of 100 %.
Peak load ratio	b	%	The maximum occurrence torque is displayed. The highest value in the past 15 s is displayed relative to the rated current of 100 %.
Instantaneous torque	T	%	The instantaneous occurrence torque is displayed. The value of torque being occurred is displayed in real time considering a rated torque as 100 %.
Within one-revolution position (1 pulse unit)	Cy1	pulse	Position within one revolution is displayed in encoder pulses. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. When the servo motor rotates in the CCW direction, the value is added.
Within one-revolution position (1000 pulse unit)	Cy2	1000 pulses	The within one-revolution position is displayed in 1000 pulse increments of the encoder. When the servo motor rotates in the CCW direction, the value is added.
ABS counter	LS	rev	Travel distance from power on is displayed by counter value.

Tab. A-1:   *Status display list of MR-JE-A (1)*

Status display	Symbol	Unit	Description
Load to motor inertia ratio	dC	Multiplier	The estimated ratio of the load inertia moment to the servo motor shaft inertia moment is displayed.
Bus voltage	Pn	V	The voltage of main circuit converter is displayed.
Internal temperature of encoder	ETh	°C	Inside temperature of encoder detected by the encoder is displayed.
Settling time	ST	ms	Settling time is displayed. When it exceeds 1000 ms, "1000" will be displayed.
Oscillation detection frequency	oF	Hz	Frequency at the time of oscillation detection is displayed.
Number of tough drive operations	Td	times	The number of tough drive functions activated is displayed.
Unit power consumption 1 (1 W unit)	PC1	W	Unit power consumption is displayed by increment of 1 W. Positive value indicates power running, and negative value indicates regeneration. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits.
Unit power consumption 2 (1 kW unit)	PC2	kW	Unit power consumption is displayed by increment of 1 kW. Positive value indicates power running, and negative value indicates regeneration.
Unit total power consumption 1 (1 Wh unit)	TPC1	Wh	Unit total power consumption is displayed by increment of 1 Wh. Positive value is cumulated during power running and negative value during regeneration. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits.
Unit total power consumption 2 (100 kWh unit)	TPC2	100 kWh	Unit total power consumption is displayed by increment of 100 kWh. Positive value is cumulated during power running and negative value during regeneration.

Tab. A-1:   *Status display list of MR-JE-A (2)*

The status display item of the servo amplifier display shown at power-on can be changed by changing parameter PC36 settings.

Positioning mode

Status display	Symbol	Unit	Description	Control mode ①	
				CP	CL
Cumulative feedback pulses	C	pulse	Feedback pulses from the servo motor encoder are counted and displayed. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. Press the "SET" button to reset the display value to zero. The value of minus is indicated by the lit decimal points in the upper four digits.	✔	✔
Servo motor speed	r	1/min	The servo motor speed is displayed. It is displayed rounding off 0.1 1/min unit.	✔	✔
Droop pulses	E	pulse	The number of droop pulses in the deviation counter are displayed. The decimal points in the upper four digits are lit for reverse rotation pulses. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. The number of pulses displayed is in the encoder pulse unit.	✔	✔
Cumulative command pulses	P	pulse	Not used with the positioning mode. "0" is always displayed.	—	—
Command pulse frequency	n	kpulse/s	Not used with the positioning mode. "0" is always displayed.	—	—
Analog speed command voltage Analog speed limit voltage	F	V	Not used with the positioning mode. An applied voltage to the CN1 connector is displayed.	—	—
Analog torque command voltage	U	V	Not used with the positioning mode. An applied voltage to the CN1 connector is displayed.	—	—
Analog torque limit voltage			Voltage of TLA (Analog torque limit) voltage is displayed.	✔	✔
Regenerative load ratio	L	%	The ratio of regenerative power to permissible regenerative power is displayed in %.	✔	✔
Effective load ratio	J	%	The continuous effective load current is displayed. The effective value in the past 15 s is displayed relative to the rated current of 100 %.	✔	✔
Peak load ratio	b	%	The maximum occurrence torque is displayed. The highest value in the past 15 s is displayed relative to the rated current of 100 %.	✔	✔
Instantaneous torque	T	%	The instantaneous occurrence torque is displayed. The value of torque being occurred is displayed in real time considering a rated torque as 100 %.	✔	✔
Within one-revolution position (1 pulse unit)	Cy1	pulse	Position within one revolution is displayed in encoder pulses. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. When the servo motor rotates in the CCW direction, the value is added.	✔	✔
Within one-revolution position (1000 pulse unit)	Cy2	1000 pulses	The within one-revolution position is displayed in 1000 pulse increments of the encoder. When the servo motor rotates in the CCW direction, the value is added.	✔	✔
ABS counter	LS	rev	Travel distance from power on is displayed by counter value.	✔	✔
Load to motor inertia ratio	dC	Multiplier	The estimated ratio of the load inertia moment to the servo motor shaft inertia moment is displayed.	✔	✔
Bus voltage	Pn	V	The voltage of main circuit converter (between P+ and N-) is displayed.	✔	✔
Internal temperature of encoder	ETh	°C	Inside temperature of encoder detected by the encoder is displayed.	✔	✔
Settling time	ST	ms	Settling time is displayed. When it exceeds 1000 ms, "1000" will be displayed.	✔	✔
Oscillation detection frequency	oF	Hz	Frequency at the time of oscillation detection is displayed.	✔	✔
Number of tough drive operations	Td	times	The number of tough drive functions activated is displayed.	✔	✔

Tab. A-2:   *Status display list of MR-JE-A in positioning mode (1)*

Status display	Symbol	Unit	Description	Control mode [1]	
				CP	CL
Unit power consumption 1 (1 W unit)	PC1	W	Unit power consumption is displayed by increment of 1 W. Positive value indicates power running, and negative value indicates regeneration. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits.	✔	✔
Unit power consumption 2 (1 kW unit)	PC2	kW	Unit power consumption is displayed by increment of 1 kW. Positive value indicates power running, and negative value indicates regeneration.	✔	✔
Unit total power consumption 1 (1 Wh unit)	TPC1	Wh	Unit total power consumption is displayed by increment of 1 Wh. Positive value is cumulated during power running and negative value during regeneration. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits.	✔	✔
Unit total power consumption 2 (100 kWh unit)	TPC2	100 kWh	Unit total power consumption is displayed by increment of 100 kWh. Positive value is cumulated during power running and negative value during regeneration.	✔	✔
Current position	PoS	10^{STM}µm $10^{(STM-4)}$inch 10^{-3} degree pulse [2]	When "□□0□" (positioning display) is set in parameter PT26, the current position is displayed as machine home position is 0. When "□□1□" (roll feed display) is set in parameter PT26, the actual current position is displayed as start position is 0. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits.	✔	✔
Command position	CPoS	10^{STM}µm $10^{(STM-4)}$inch 10^{-3} degree pulse [2]	When "□□0□" (positioning display) is set in parameter PT26, the command current position is displayed as machine home position is 0. When "□□1□" (roll feed display) is set in parameter PT26, turning on the start signal starts counting from 0 and a command current position to the target position is displayed in the automatic mode. The command positions of the selected point table are displayed at a stop. At the manual mode, the command positions of the selected point table are displayed. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits.	✔	✔
Command remaining distance	rn	10^{STM}µm $10^{(STM-4)}$inch 10^{-3} degree pulse [2]	Indicates the remaining distance to the command position of the currently selected point table, program and station. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits.	✔	✔
Point table No./Program No.n	Pno	—	For the point table method and program method, the point table and program No. currently being executed are displayed. The selected number is displayed during a temporary stop or manual operation	✔	✔
Step No.	Sno	—	The step No. of the program currently being executed is displayed. At a stop, 0 is displayed.	—	✔
Analog override voltage	oru	V	The analog override voltage is displayed.	✔	✔
Override level	or	%	The setting value of the override is displayed. When the override is disabled, 100% is displayed.	✔	✔
Cam axis one cycle current value	CCyC	10^{STM}µm $10^{(STM-4)}$inch 10^{-3} degree pulse [3]	The current position in one cycle of CAM axis is displayed with the range of "0 to (cam axis one cycle length - 1)", the cam axis one cycle current value which is calculated from the travel distance input to the cam axis. When the simple cam function is disabled, 0 is always displayed. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. Refer to the instruction manual (positioning mode) for detecting point.	✔	✔
Cam standard position	CbAS	10^{STM}µm $10^{(STM-4)}$inch 10^{-3} degree pulse [2]	A feed current value which is the standard position of the cam operation is displayed. When the simple cam function is disabled, 0 is always displayed. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. Refer to the instruction manual (positioning mode) for detecting point.	✔	✔

Tab. A-2: *Status display list of MR-JE-A in positioning mode (2)*

MITSUBISHI ELECTRIC

Status display	Symbol	Unit	Description	Control mode [1]	
				CP	CL
Cam axis feed current value	CCMd	10^{STM}μm $10^{(STM-4)}$inch 10^{-3} degree pulse [2]	A feed current value during the cam axis control is displayed. When the simple cam function is disabled, 0 is always displayed. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. Refer to the instruction manual (positioning mode) for detecting point.		✔
Cam No. in execution	Cno	—	Cam No. in execution is displayed. When the simple cam function is disabled, 0 is always displayed. Refer to the instruction manual (positioning mode) for detecting point.	✔	✔
Cam stroke amount in execution	CSTK	10^{STM}μm $10^{(STM-4)}$inch 10^{-3} degree pulse [2]	Cam stroke amount in execution is displayed. When the simple cam function is disabled, 0 is always displayed. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. Refer to the instruction manual (positioning mode) for detecting point.	✔	✔
Main axis current value	MCMd	10^{STM}μm $10^{(STM-4)}$inch 10^{-3} degree pulse [3]	A current value of the input axis (synchronous encoder axis or servo input axis) is displayed. Unit is increment of input axis position. When the simple cam function is disabled, 0 is always displayed. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. Refer to the instruction manual (positioning mode) for detecting point.	✔	✔
Main axis one cycle current value	MCyC	10^{STM}μm $10^{(STM-4)}$inch 10^{-3} degree pulse [3]	The input travel amount of the input axis is displayed within the range of "0 and (cam axis one cycle length setting - 1)". Unit is an increment of cam axis one cycle. When the simple cam function is disabled, 0 is always displayed. The values in excess of ±99999 can be counted. However, the counter shows only the lower five digits of the actual value since the servo amplifier display is five digits. Refer to the instruction manual (positioning mode) for detecting point.	✔	✔

Tab. A-2:   *Status display list of MR-JE-A in positioning mode (3)*

[1] CP: Positioning mode (point table method)
CL: Positioning mode (program method)

[2] The unit can be changed to μm/Inch/Degree/pulse in parameter PT01.

[3] Depending on the setting of (Cam control data No. 30 Main shaft input axis selection), the parameters used to set the unit and feed length multiplication will change as follows. For details of each parameter, refer to the instruction manual (positioning mode).

Setting of (Cam control data No. 30)	Parameter for the unit setting	Parameter for the feed length multiplication setting
0 or 1	Pr. PT01	Pr. PT03
2	Cam control data No. 14	Cam control data No. 14

The status display item of the servo amplifier display shown at power-on can be changed by changing parameter PC36 settings.

A.1.2   Basic setting parameters (PA☐☐)

| No. | Symbol | Name | Initial value | Standard mode | | | | Positioning mode | | |
| | | | | Unit | Control mode | | | Unit | Control mode | |
					P	S	T		CP	CL
PA01	*STY	Operation mode	1000H	—	✔	✔	✔	—	✔	✔
PA02	*REG	Regenerative option	0000H	—	✔	✔	✔	—	✔	✔
PA03	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PA04	*AOP1	Function selection A-1	2000H	—	✔	✔	—	—	✔	✔
PA05	*FBP	Number of command input pulses per revolution [1]	10000	—	✔	—	—	—	—	—
PA06	(*)CMX	Electronic gear numerator (command pulse multiplication numerator)	1	—	✔	—	—	—	✔	✔
PA07	(*)CDV	Electronic gear denominator (command pulse multiplication denominator)	1	—	✔	—	—	—	✔	✔
PA08	ATU	Auto tuning mode	0001H	—	✔	✔	—	—	✔	✔
PA09	RSP	Auto tuning response	16	—	✔	✔	—	—	✔	✔
PA10	INP	In-position range	100	pulse	✔	—	—	μm/ 10^{-4} inch/ 10^{-3} degree/ pulse	✔	✔
PA11	TLP	Forward rotation torque limit	100.0	%	✔	✔	✔	%	✔	✔
PA12	TLN	Reverse rotation torque limit	100.0	%	✔	✔	✔	%	✔	✔
PA13	*PLSS	Command pulse input form	0100H	—	✔	—	—	—	✔	✔
PA14	*POL	Rotation direction selection	0	—	✔	—	—	—	✔	✔
PA15	*ENR	Encoder output pulses	4000	pulse/rev	✔	✔	✔	pulse/rev	✔	✔
PA16	*ENR2	Encoder output pulses 2	1	—	✔	✔	✔	—	✔	✔
PA17	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PA18	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PA19	*BLK	Parameter writing inhibit	00AAH	—	✔	✔	✔	—	✔	✔
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	*AOP5	Function selection A-5	0000H	—	✔	✔	—	—	✔	✔
PA27	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PA28	*AOP6	Function selection A-6 [1]	0000H	—	✔	✔	✔	—	—	—
PA29	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PA30	—		0000H	—	—	—	—	—	—	—
PA31	—		0000H	—	—	—	—	—	—	—
PA32	—		0000H	—	—	—	—	—	—	—

Tab. A-3:   *List of basic setting parameters for MR-JE-A*

[1] For manufacturer setting in positioning mode

NOTE	The following parameters cannot be used in the positioning mode.

     – PA05 (Number of command input pulses per revolution)

     – PA28 (Function selection A-6)

A.1.3 Gain/filter setting parameters (PB□□)

No.	Symbol	Name	Initial value	Standard mode				Positioning mode		
				Unit	Control mode			Unit	Control mode	
					P	S	T		CP	CL
PB01	FILT	Adaptive tuning mode (adaptive filter II)	0000н	—	✔	✔	✔	—	✔	✔
PB02	VRFT	Vibration suppression control tuning mode (advanced vibration suppression control II)	0000н	—	✔	—	—	—	✔	✔
PB03	PST	Position command acceleration/deceleration time constant (position smoothing)	0	ms	✔	—	—	ms	✔	✔
PB04	FFC	Feed forward gain	0	%	✔	—	—	%	✔	✔
PB05	—	For manufacturer setting	500	—	—	—	—	—	—	—
PB06	GD2	Load to motor inertia ratio	7.00	Multiplier	✔	✔	—	Multiplier	✔	✔
PB07	PG1	Model loop gain	15.0	rad/s	✔	✔	—	rad/s	✔	✔
PB08	PG2	Position loop gain	37.0	rad/s	✔	—	—	rad/s	✔	✔
PB09	VG2	Speed loop gain	823	rad/s	✔	✔	—	rad/s	✔	✔
PB10	VIC	Speed integral compensation	33.7	ms	✔	✔	—	ms	✔	✔
PB11	VDC	Speed differential compensation	980	—	✔	✔	—	—	✔	✔
PB12	OVA	Overshoot amount compensation	0	%	✔	—	—	%	✔	✔
PB13	NH1	Machine resonance suppression filter 1	4500	Hz	✔	✔	✔	Hz	✔	✔
PB14	NHQ1	Notch shape selection 1	0000н	—	✔	✔	✔	—	✔	✔
PB15	NH2	Machine resonance suppression filter 2	0000н	Hz	✔	✔	✔	Hz	✔	✔
PB16	NHQ2	Notch shape selection 2	0000н	—	✔	✔	✔	—	✔	✔
PB17	NHF	Shaft resonance suppression filter	0000н	—	✔	✔	✔	—	✔	✔
PB18	LPF	Low-pass filter setting	3141	rad/s	✔	✔	—	rad/s	✔	✔
PB19	VRF11	Vibration suppression control 1 - Vibration frequency	100.0	Hz	✔	—	—	Hz	✔	✔
PB20	VRF12	Vibration suppression control 1 - Resonance frequency	100.0	Hz	✔	—	—	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	0100н	—	✔	✔	✔	—	✔	✔
PB24	*MVS	Slight vibration suppression control	0000н	—	✔	—	—	—	✔	✔
PB25	*BOP1	Function selection B-1	0000н	—	✔	✔	—	—	✔	✔
PB26	*CDP	Gain switching function	0000н	—	✔	✔	—	—	✔	✔
PB27	CDL	Gain switching condition	10	kpulse/s pulse 1/min	✔	✔	—	kpulse/s pulse 1/min	✔	✔
PB28	CDT	Gain switching time constant	1	ms	✔	✔	—	ms	✔	✔
PB29	GD2B	Load to motor inertia ratio after gain switching	7.00	Multiplier	✔	✔	—	Multiplier	✔	✔
PB30	PG2B	Position loop gain after gain switching	0.0	rad/s	✔	—	—	rad/s	✔	✔
PB31	VG2B	Speed loop gain after gain switching	0	rad/s	✔	✔	—	rad/s	✔	✔
PB32	VICB	Speed integral compensation after gain switching	0.0	ms	✔	✔	—	ms	✔	✔
PB33	VRF1B	Vibration suppression control 1 - Vibration frequency after gain switching	0.0	Hz	✔	—	—	Hz	✔	✔
PB34	VRF2B	Vibration suppression control 1 - Resonance frequency after gain switching	0.0	Hz	✔	—	—	Hz	✔	✔
PB35	VRF3B	Vibration suppression control 1 - Vibration frequency damping after gain switching	0.00	—	✔	—	—	—	✔	✔
PB36	VRF4B	Vibration suppression control 1 - Resonance frequency damping after gain switching	0.00	—	✔	—	—	—	✔	✔

Tab. A-4: *List of gain/filter setting parameters for MR-JE-A (1)*

| No. | Symbol | Name | Initial value | Standard mode | | | | Positioning mode | | |
| | | | | Unit | Control mode | | | Unit | Control mode | |
					P	S	T		CP	CL
PB37	—	For manufacturer setting	1600	—	—	—	—	—	—	—
PB38	—		0.00	—	—	—	—	—	—	—
PB39	—		0.00	—	—	—	—	—	—	—
PB40	—		0.00	—	—	—	—	—	—	—
PB41	—		0000н	—	—	—	—	—	—	—
PB42	—		0000н	—	—	—	—	—	—	—
PB43	—		0000н	—	—	—	—	—	—	—
PB44	—		0.00	—	—	—	—	—	—	—
PB45	CNHF	Command notch filter	0000н	—	✔	—	—	—	✔	✔
PB46	NH3	Machine resonance suppression filter 3	4500	Hz	✔	✔	✔	Hz	✔	✔
PB47	NHQ3	Notch shape selection 3	0000н	—	✔	✔	✔	—	✔	✔
PB48	NH4	Machine resonance suppression filter 4	4500	Hz	✔	✔	✔	Hz	✔	✔
PB49	NHQ4	Notch shape selection 4	0000h	—	✔	✔	✔	—	✔	✔
PB50	NH5	Machine resonance suppression filter 5	4500	Hz	✔	✔	✔	Hz	✔	✔
PB51	NHQ5	Notch shape selection 5	0000н	—	✔	✔	✔	—	✔	✔
PB52	VRF21	Vibration suppression control 2 - Vibration frequency	100.0	Hz	✔	—	—	Hz	✔	✔
PB53	VRF22	Vibration suppression control 2 - Resonance frequency	100.0	Hz	✔	—	—	Hz	✔	✔
PB54	VRF23	Vibration suppression control 2 - Vibration frequency damping	0.00	—	✔	—	—	—	✔	✔
PB55	VRF24	Vibration suppression control 2 - Resonance frequency damping	0.00	—	✔	—	—	—	✔	✔
PB56	VRF21B	Vibration suppression control 2 - Vibration frequency after gain switching	0.0	Hz	✔	—	—	Hz	✔	✔
PB57	VRF22B	Vibration suppression control 2 - Resonance frequency after gain switching	0.0	Hz	✔	—	—	Hz	✔	✔
PB58	VRF23B	Vibration suppression control 2 - Vibration frequency damping after gain switching	0.00	—	✔	—	—	—	✔	✔
PB59	VRF24B	Vibration suppression control 2 - Resonance frequency damping after gain switching	0.00	—	✔	—	—	—	✔	✔
PB60	PG1B	Model loop gain after gain switching	0.0	rad/s	✔	✔	—	rad/s	✔	✔
PB61	—	For manufacturer setting	0.0	—	—	—	—	—	—	—
PB62	—		0000н	—	—	—	—	—	—	—
PB63	—		0000н	—	—	—	—	—	—	—
PB64	—		0000н	—	—	—	—	—	—	—

Tab. A-4:   *List of gain/filter setting parameters for MR-JE-A (2)*

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A.1.4 Extension setting parameters (PC□□)

No.	Symbol	Name	Initial value	Standard mode				Positioning mode		
				Unit	Control mode			Unit	Control mode	
					P	S	T		CP	CL
PC01	STA	Acceleration time constant	0	ms	—	✔	✔	ms	—	✔
PC02	STB	Deceleration time constant	0	ms	—	✔	✔	ms	—	✔
PC03	STC	S-pattern acceleration/deceleration time constant	0	ms	—	✔	✔	ms	✔	✔
PC04	TQC	Torque command time constant	0	ms	—	—	✔	—	—	—
PC05	SC1	Internal speed command 1 [①]	100	1/min	—	✔	—	—	—	—
		Internal speed limit 1 [①]			—	—	✔			
PC06	SC2	Internal speed command 2 [①]	500	1/min	—	✔	—	—	—	—
		Internal speed limit 2 [①]			—	—	✔			
PC07	SC3	Internal speed command 3 [①]	1000	1/min	—	✔	—	—	—	—
		Internal speed limit 3 [①]			—	—	✔			
PC08	SC4	Internal speed command 4	200	1/min	—	✔	—	1/min	—	—
		Internal speed limit 4			—	—	✔			
PC09	SC5	Internal speed command 5	300	1/min	—	✔	—	1/min	—	—
		Internal speed limit 5			—	—	✔			
PC10	SC6	Internal speed command 6	500	1/min	—	✔	—	1/min	—	—
		Internal speed limit 6			—	—	✔			
PC11	SC7	Internal speed command 7	800	1/min	—	✔	—	1/min	—	—
		Internal speed limit 7			—	—	✔			
PC12	VCM	Analog speed command - Maximum speed	0	1/min	—	✔	—	1/min	—	—
		Analog speed limit - Maximum speed			—	—	✔			
PC13	TLC	Analog torquecommand maximum output	100.0	%	—	—	✔	%	—	—
PC14	MOD1	Analog monitor 1 output	0000H	—	✔	✔	✔	—	✔	✔
PC15	MOD2	Analog monitor 2 output	0001H	—	✔	✔	✔	—	✔	✔
PC16	MBR	Electromagnetic brake sequence output	0	ms	✔	✔	✔	ms	✔	✔
PC17	ZSP	Zero speed	50	1/min	✔	✔	✔	1/min	✔	✔
PC18	*BPS	Alarm history clear	0000H	—	✔	✔	✔	—	✔	✔
PC19	*ENRS	Encoder output pulse selection	0000H	—	✔	✔	✔	—	✔	✔
PC20	*SNO	Station No. setting	0	station	✔	✔	✔	station	✔	✔
PC21	*SOP	RS-422 communication function selection	0000H	—	✔	✔	✔	—	✔	✔
PC22	*COP1	Function selection C-1	0000H	—	✔	✔	✔	—	✔	✔
PC23	*COP2	Function selection C-2	0000H	—	—	✔	✔	—	—	—
PC24	*COP3	Function selection C-3	0000H	—	✔	—	—	—	✔	✔
PC25	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PC26	*COP5	Function selection C-5	0000H	—	✔	✔	—	—	✔	✔
PC27	*COP6	Function selection C-6	0000H	—	✔	✔	✔	—	✔	✔
PC28	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PC29	—		0000H	—	—	—	—	—	—	—
PC30	STA2	Acceleration time constant 2	0	ms	—	✔	✔	ms	—	✔
PC31	STB2	Deceleration time constant 2	0	ms	—	✔	✔	ms	—	✔
PC32	CMX2	Command input pulse multiplication numerator 2	1	—	✔	—	—	—	—	—
PC33	CMX3	Command input pulse multiplication numerator 3	1	—	✔	—	—	—	—	—
PC34	CMX4	Command input pulse multiplication numerator 4	1	—	✔	—	—	—	—	—

Tab. A-5:   *List of extension setting parameters for MR-JE-A (1)*

No.	Symbol	Name	Initial value	Standard mode				Positioning mode		
				Unit	Control mode			Unit	Control mode	
					P	S	T		CP	CL
PC35	TL2	Internal torque limit 2	100.0	%	✔	✔	✔	%	✔	✔
PC36	*DMD	Status display selection	0000H	—	✔	✔	✔	—	✔	✔
PC37	VCO	Analog speed command offset	0	mV	—	✔	—	—	—	—
		Analog speed limit offset			—	—	✔			
		Analog override offset		—	—	—	—	mV	✔	✔
PC38	TPO	Analog torque command offset	0	mV	—	—	✔	mV	—	—
		Analog torque limit offset			—	✔	—		✔	✔
PC39	MO1	Analog monitor 1 offset	0	mV	✔	✔	✔	mV	✔	✔
PC40	MO2	Analog monitor 2 offset	0	mV	✔	✔	✔	mV	✔	✔
PC41	—	For manufacturer setting	0	—	—	—	—	—	—	—
PC42	—		0	—	—	—	—	—	—	—
PC43	ERZ	Error excessive alarm detection level	0	rev	✔	—	—	rev	✔	✔
PC44	—	For manufacturer setting	0000H	—	✔	—	—	—	—	—
PC45	—		0000H	—	✔	✔	✔	—	—	—
PC46	—		0	—	—	—	—	—	—	—
PC47	—		0	—	—	—	—	—	—	—
PC48	—		0	—	—	—	—	—	—	—
PC49	—		0	—	—	—	—	—	—	—
PC50	—		0000H	—	—	—	—	—	—	—
PC51	RSBR	Forced stop deceleration time constant	100	ms	✔	✔	—	ms	✔	✔
PC52	—	For manufacturer setting	0	—	—	—	—	—	—	—
PC53	—		0	—	—	—	—	—	—	—
PC54	RSUP1	Vertical axis freefall prevention compensation amount	0	0.0001rev	✔	—	—	0.0001rev	✔	✔
PC55	—	For manufacturer setting	0	—	—	—	—	—	—	—
PC56	—		100	—	—	—	—	—	—	—
PC57	—		0000H	—	—	—	—	—	—	—
PC58	—		0	—	—	—	—	—	—	—
PC59	—		0000H	—	—	—	—	—	—	—
PC60	*COPD	Function selection C-D	0000H	—	✔	✔	✔	—	✔	✔
PC61	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PC62	—		0000H	—	—	—	—	—	—	—
PC63	—		0000H	—	—	—	—	—	—	—
PC64	—		0000H	—	—	—	—	—	—	—
PC65	—		0000H	—	—	—	—	—	—	—
PC66	LPSPL	Mark detection range + (lower three digits) [2]	0	—	—	—	—	10^{STM} µm $10^{(STM-4)}$ inch 10^{-3} degree pulse	✔	✔
PC67	LPSPH	Mark detection range + (upper three digits) [2]	0	—	—	—	—	10^{STM} µm $10^{(STM-4)}$ inch 10^{-3} degree pulse	✔	✔
PC68	LPSNL	Mark detection range - (lower three digits) [2]	0	—	—	—	—	10^{STM} µm $10^{(STM-4)}$ inch 10^{-3} degree pulse	✔	✔

Tab. A-5:   *List of extension setting parameters for MR-JE-A (2)*

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No.	Symbol	Name	Initial value	Standard mode				Positioning mode		
				Unit	Control mode			Unit	Control mode	
					P	S	T		CP	CL
PC69	LPSNH	Mark detection range - (upper three digits) [2]	0	—	—	—	—	10^{STM} μm 10$^{(STM-4)}$ inch 10^{-3} degree pulse	✔	✔
PC70	*SNOM	~~Modbus RTU~~Modbus®/RTU communication station number setting [3]	0	—	✔	✔	✔	—	✔	✔
PC71	*COPF	Function selection C-F [3]	0040H	—	✔	✔	✔	—	(✔)	(✔)
PC72	*COPG	Function selection C-G [3]	0000H	—	✔	✔	✔	—	✔	✔
PC73	ERW	Error excessive warning level	0	rev	✔	—	—	rev	✔	✔
PC74	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PC75	—		0000H	—	—	—	—	—	—	—
PC76	—		0000H	—	—	—	—	—	—	—
PC77	—		0000H	—	—	—	—	—	—	—
PC78	—		0000H	—	—	—	—	—	—	—
PC79	—		0000H	—	—	—	—	—	—	—
PC80	—		0000H	—	—	—	—	—	—	—

Tab. A-5:   *List of extension setting parameters for MR-JE-A (3)*

[1] For manufacturer setting in positioning mode

[2] For manufacturer setting in standard mode

[3] For Modbus®/RTU communication

NOTES   The following parameters cannot be used in the positioning mode.

–   PC04 (Torque command time constant)

–   PC08 (Internal speed command 4/internal speed limit 4)

–   PC09 (Internal speed command 5/internal speed limit 5)

–   PC10 (Internal speed command 6/internal speed limit 6)

–   PC11 (Internal speed command 7/internal speed limit 7)

–   PC12 (Analog speed command - Maximum speed/Analog speed limit - Maximum speed)

–   PC13 (Analog torque command maximum output)

–   PC23 (Function selection C-2)

–   PC32 (Command input pulse multiplication numerator 2)

–   PC33 (Command input pulse multiplication numerator 3)

–   PC34 (Command input pulse multiplication numerator 4)

The following parameters are used for Modbus®/RTU communication. For details, refer to "MR-JE-A Servo Amplifier Instruction Manual (Modbus®/RTU communication)".

–   PC70 (Modbus®/RTU communication station number setting)

–   PC71 (Function selection C-F)

–   PC72 (Function selection C-G)

A.1.5 I/O setting parameters (PD□□)

No.	Symbol	Name	Initial value	Standard mode				Positioning mode		
				Unit	Control mode			Unit	Control mode	
					P	S	T		CP	CL
PD01	*DIA1	Input signal automatic on selection 1	0000H	—	✔	✔	✔	—	✔	✔
PD02	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PD03	*DI1L	Input device selection 1L	0202H	—	✔	✔	—	—	—	—
PD04	*DI1H	Input device selection 1H	0202H	—	—	—	✔	—	✔	✔
PD05	—		0000H	—	—	—	—	—	—	—
PD06	—		0000H	—	—	—	—	—	—	—
PD07	—		0000H	—	—	—	—	—	—	—
PD08	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PD09	—		0000H	—	—	—	—	—	—	—
PD10	—		0000H	—	—	—	—	—	—	—
PD11	*DI5L	Input device selection 5L	0703H	—	✔	✔	—	—	—	—
PD12	*DI5H	Input device selection 5H	3807H	—	—	—	✔	—	✔	✔
PD13	*DI6L	Input device selection 6L	0806H	—	✔	✔	—	—	—	—
PD14	*DI6H	Input device selection 6H	3908H	—	—	—	✔	—	✔	✔
PD15	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PD16	—		0000H	—	—	—	—	—	—	—
PD17	*DI8L	Input device selection 8L	0A0AH	—	✔	✔	—	—	—	—
PD18	*DI8H	Input device selection 8H	0700H	—	—	—	✔	—	✔	✔
PD19	*DI9L	Input device selection 9L	0B0BH	—	✔	✔	—	—	—	—
PD20	*DI9H	Input device selection 9H	0800H	—	—	—	✔	—	✔	✔
PD21	—		0000H	—	—	—	—	—	—	—
PD22	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PD23	—		0000H	—	—	—	—	—	—	—
PD24	*DO2	Output device selection 2	000CH	—	✔	✔	✔	—	✔	✔
PD25	*DO3	Output device selection 3	0004H	—	✔	✔	✔	—	✔	✔
PD26	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PD27	—		0003H	—	—	—	—	—	—	—
PD28	*DO6	Output device selection 6	0002H	—	✔	✔	✔	—	✔	✔
PD29	*DIF	Input filter setting	0004H	—	✔	✔	✔	—	✔	✔
PD30	*DOP1	Function selection D-1	0000H	—	✔	✔	✔	—	✔	✔
PD31	*DOP2	Function selection D-2 [1]	0000H	—	—	—	—	—	✔	✔
PD32	*DOP3	Function selection D-3	0000H	—	✔	—	—	—	✔	✔
PD33	*DOP4	Function selection D-4	0000H	—	✔	✔	✔	—	✔	✔
PD34	DOP5	Function selection D-5	0000H	—	✔	✔	✔	—	✔	✔
PD35	—		0000H	—	—	—	—	—	—	—
PD36	—		0000H	—	—	—	—	—	—	—
PD37	—		0000H	—	—	—	—	—	—	—
PD38	—	For manufacturer setting	0	—	—	—	—	—	—	—
PD39	—		0	—	—	—	—	—	—	—
PD40	—		0	—	—	—	—	—	—	—
PD41	*DIA3	Input signal automatic on selection 3 [1]	0000H	—	—	—	—	—	✔	✔
PD42	*DIA4	Input signal automatic on selection 4 [1]	0000H	—	—	—	—	—	✔	✔

Tab. A-6:   List of I/O setting parameters for MR-JE-A (1)

| No. | Symbol | Name | Initial value | Standard mode | | | | Positioning mode | | |
| | | | | Unit | Control mode | | | Unit | Control mode | |
					P	S	T		CP	CL
PD43	*DI11L	Input device selection 11L	0000H	—	—	✔	—	—	—	—
PD44	*DI11H	Input device selection 11H	2000H	—	—	—	✔	—	✔	✔
PD45	*DI12L	Input device selection 12L	0000H	—	—	✔	—	—	—	—
PD46	*DI12H	Input device selection 12H	2B00H	—	—	—	✔	—	✔	✔
PD47	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PD48	—		0000H	—	—	—	—	—	—	—

Tab. A-6:   *List of I/O setting parameters for MR-JE-A (2)*

① For manufacturer setting in standard mode

NOTE	The following parameters cannot be used in the positioning mode.

– PD03 (Input device selection 1L)

– PD11 (Input device selection 5L)

– PD13 (Input device selection 6L)

– PD17 (Input device selection 8L)

– PD19 (Input device selection 9L)

– PD43 (Input device selection 11L)

– PD45 (Input device selection 12L)

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A.1.6   Extension setting 2 parameters (PE□□)

No.	Symbol	Name	Initial value	Standard mode				Positioning mode		
				Unit	Control mode			Unit	Control mode	
					P	S	T		CP	CL
PE01	—		0000H	—	—	—	—	—	—	—
PE02	—		0000H	—	—	—	—	—	—	—
PE03	—		0000H	—	—	—	—	—	—	—
PE04	—		0	—	—	—	—	—	—	—
PE05	—		0	—	—	—	—	—	—	—
PE06	—		0	—	—	—	—	—	—	—
PE07	—		0	—	—	—	—	—	—	—
PE08	—		0	—	—	—	—	—	—	—
PE09	—		0000H	—	—	—	—	—	—	—
PE10	—		0000H	—	—	—	—	—	—	—
PE11	—		0000H	—	—	—	—	—	—	—
PE12	—		0000H	—	—	—	—	—	—	—
PE13	—		0000H	—	—	—	—	—	—	—
PE14	—		0111H	—	—	—	—	—	—	—
PE15	—		20	—	—	—	—	—	—	—
PE16	—		0000H	—	—	—	—	—	—	—
PE17	—		0000H	—	—	—	—	—	—	—
PE18	—		0000H	—	—	—	—	—	—	—
PE19	—		0000H	—	—	—	—	—	—	—
PE20	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PE21	—		0000H	—	—	—	—	—	—	—
PE22	—		0000H	—	—	—	—	—	—	—
PE23	—		0000H	—	—	—	—	—	—	—
PE24	—		0000H	—	—	—	—	—	—	—
PE25	—		0000H	—	—	—	—	—	—	—
PE26	—		0000H	—	—	—	—	—	—	—
PE27	—		0000H	—	—	—	—	—	—	—
PE28	—		0000H	—	—	—	—	—	—	—
PE29	—		0000H	—	—	—	—	—	—	—
PE30	—		0000H	—	—	—	—	—	—	—
PE31	—		0000H	—	—	—	—	—	—	—
PE32	—		0000H	—	—	—	—	—	—	—
PE33	—		0000H	—	—	—	—	—	—	—
PE34	—		0	—	—	—	—	—	—	—
PE35	—		0	—	—	—	—	—	—	—
PE36	—		0.0	—	—	—	—	—	—	—
PE37	—		0.00	—	—	—	—	—	—	—
PE38	—		0.00	—	—	—	—	—	—	—
PE39	—		0	—	—	—	—	—	—	—
PE40	—		0000H	—	—	—	—	—	—	—
PE41	EOP3	Function selection E-3	0000H	—	✔	✔	✔	—	✔	✔
PE42	—	For manufacturer setting	0	—	—	—	—	—	—	—
PE43	—		0.0	—	—	—	—	—	—	—

Tab. A-7:   *List of extension setting 2 parameters for MR-JE-A (1)*

| No. | Symbol | Name | Initial value | Standard mode | | | | Positioning mode | | |
| | | | | Unit | Control mode | | | Unit | Control mode | |
					P	S	T		CP	CL
PE44	LMCP	Lost motion compensation positive-side compensation value selection	0	0.01%	✔	—	—	0.01%	✔	✔
PE45	LMCN	Lost motion compensation negative-side compensation value selection	0	0.01%	✔	—	—	0.01%	✔	✔
PE46	LMFLT	Lost motion filter setting	0	0.1 ms	✔	—	—	0.1 ms	✔	✔
PE47	TOF	Torque offset	0	0.01%	✔	✔	✔	0.01%	✔	✔
PE48	*LMOP	Lost motion compensation function selection	0000H	—	✔	—	—		✔	✔
PE49	LMCD	Lost motion compensation timing	0	0.1 ms	✔	—	—	0.1 ms	✔	✔
PE50	LMCT	Lost motion compensation non-sensitive band	0	pulse kpulse	✔	—	—	pulse kpulse	✔	✔
PE51	—	For manufacturer setting	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	—	—	—	—	—	—	—

Tab. A-7:   *List of extension setting 2 parameters for MR-JE-A (2)*

MITSUBISHI ELECTRIC

A.1.7 Extension setting 3 parameters (PF□□)

No.	Symbol	Name	Initial value	Standard mode				Positioning mode		
				Unit	Control mode			Unit	Control mode	
					P	S	T		CP	CL
PF01	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PF02	—		0000H	—	—	—	—	—	—	—
PF03	—		0000H	—	—	—	—	—	—	—
PF04	—		0	—	—	—	—	—	—	—
PF05	—		0	—	—	—	—	—	—	—
PF06	—		0000H	—	—	—	—	—	—	—
PF07	—		1	—	—	—	—	—	—	—
PF08	—		1	—	—	—	—	—	—	—
PF09	*FOP5	Function selection F-5	0000H	—	✔	✔	✔	—	✔	✔
PF10	—	For manufacturer setting	0000H	—	—	—	—	—	—	—
PF11	—		0000H	—	—	—	—	—	—	—
PF12	—		10000	—	—	—	—	—	—	—
PF13	—		100	—	—	—	—	—	—	—
PF14	—		100	—	—	—	—	—	—	—
PF15	—		2000	—	—	—	—	—	—	—
PF16	—		0000H	—	—	—	—	—	—	—
PF17	—		10	—	—	—	—	—	—	—
PF18	—		0000H	—	—	—	—	—	—	—
PF19	—		0000H	—	—	—	—	—	—	—
PF20	—		0000H	—	—	—	—	—	—	—
PF21	DRT	Drive recorder switching time setting	0	s	✔	✔	✔	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	Instantaneous power failure tough drive - Detection time	200	ms	✔	✔	✔	ms	✔	✔
PF26	—	For manufacturer setting	0	—	—	—	—	—	—	—
PF27	—		0	—	—	—	—	—	—	—
PF28	—		0	—	—	—	—	—	—	—
PF29	—		0000H	—	—	—	—	—	—	—
PF30	—		0	—	—	—	—	—	—	—
PF31	FRIC	Machine diagnosis function - Friction judgement speed	0	1/min	✔	✔	✔	1/min	✔	✔
PF32	—	For manufacturer setting	50	—	—	—	—	—	—	—
PF33	—		0000H	—	—	—	—	—	—	—
PF34	—		0000H	—	—	—	—	—	—	—
PF35	—		0000H	—	—	—	—	—	—	—
PF36	—		0000H	—	—	—	—	—	—	—
PF37	—		0000H	—	—	—	—	—	—	—
PF38	—		0000H	—	—	—	—	—	—	—
PF39	—		0000H	—	—	—	—	—	—	—
PF40	—		0	—	—	—	—	—	—	—

Tab. A-8:   *List of extension setting 3 parameters for MR-JE-A (1)*

No.	Symbol	Name	Initial value	Standard mode				Positioning mode		
				Unit	Control mode			Unit	Control mode	
					P	S	T		CP	CL
PF41	—	For manufacturer setting	0	—	—	—	—	—	—	—
PF42	—		0	—	—	—	—	—	—	—
PF43	—		0	—	—	—	—	—	—	—
PF44	—		0	—	—	—	—	—	—	—
PF45	*FOP12	Function selection F-12 [1]	0000н	—	✔	✔	✔	—	✔	✔
PF46	MIC	Modbus®/RTU communication time out selection [1]	0	s	✔	✔	✔	s	✔	✔
PF47	—	For manufacturer setting	0000н	—	—	—	—	—	—	—
PF48	—		0000н	—	—	—	—	—	—	—

Tab. A-8:   *List of extension setting 3 parameters for MR-JE-A (2)*

[1] For Modbus®/RTU communication

NOTE	The following parameters are used for Modbus®/RTU communication. For details, refer to "MR-JE-A Servo Amplifier Instruction Manual (Modbus®/RTU communication)".

– PF45 (Function selection F-12)

– PF46 (Modbus®/RTU communication time out selection)

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A.1.8   Positioning control parameters (PT□□) (Only positioning mode)

No.	Symbol	Name	Initial value	Unit	Positioning mode	
					Control mode	
					CP	CL
PT01	*CTY	Command mode selection	0000H	—	✔	✔
PT02	*TOP1	Function selection T-1	0000H	—	✔	✔
PT03	*FTY	Feeding function selection	0000H	—	✔	✔
PT04	*ZTY	Home position return type	0010H	—	✔	✔
PT05	ZRF	Home position return speed	100	1/min	✔	✔
PT06	CRF	Creep speed	10	1/min	✔	✔
PT07	ZST	Home position shift distance	0	µm 10^{-4} inch 10^{-3} degree pulse	✔	✔
PT08	*ZPS	Home position return position data	0	10^{STM} µm $10^{(STM-4)}$ inch 10^{-3} degree pulse	✔	✔
PT09	DCT	Travel distance after proximity dog	1000	10^{STM} µm $10^{(STM-4)}$ inch 10^{-3} degree pulse	✔	✔
PT10	ZTM	Stopper type home position return stopper time	100	ms	✔	✔
PT11	ZTT	Stopper type home position return torque limit value	15.0	%	✔	✔
PT12	CRP	Rough match output range	0	10^{STM} µm $10^{(STM-4)}$ inch 10^{-3} degree pulse	✔	✔
PT13	JOG	JOG operation	100	1/min	✔	✔
PT14	*BKC	Backlash compensation	0	pulse	✔	✔
PT15	LMPL	Software limit +	0	10^{STM} µm $10^{(STM-4)}$ inch 10^{-3} degree pulse	✔	✔
PT16	LMPH					
PT17	LMNL	Software limit –	0	10^{STM} µm $10^{(STM-4)}$ inch 10^{-3} degree pulse	✔	✔
PT18	LMNH					
PT19	*LPPL	Position range output address +	0	10^{STM} µm $10^{(STM-4)}$ inch 10^{-3} degree pulse	✔	✔
PT20	*LPPH					
PT21	*LNPL	Position range output address –	0	10^{STM} µm $10^{(STM-4)}$ inch 10^{-3} degree pulse	✔	✔
PT22	*LNPH					
PT23	OUT1	OUT1 output setting time	0	ms	—	✔
PT24	OUT2	OUT2 output setting time	0	ms	—	✔
PT25	OUT3	OUT3 output setting time	0	ms	—	✔
PT26	*TOP2	Function selection T-2	0000H	—	✔	✔
PT27	—	For manufacturer setting	0000H	—	—	—
PT28	—		0000H	—	—	—

Tab. A-9:   *List of positioning control parameters for MR-JE-A (1)*

No.	Symbol	Name	Initial value	Positioning mode		
				Unit	Control mode	
					CP	CL
PT29	*TOP3	Function selection T-3	0000H	—	✔	✔
PT30	MSTL	Mark sensor stop travel distance	0	10^{STM} µm $10^{(STM-4)}$ inch	✔	✔
PT31	MSTH		0	10^{-3} degree pulse	✔	✔
PT32	—	For manufacturer setting	0000H	—	—	—
PT33	—		0000H	—	—	—
PT34	*PDEF	Point table/program default	0000H	—	✔	✔
PT35	*TOP5	Function selection T-5	0000H	—	✔	✔
PT36	—	For manufacturer setting	0000H	—	—	—
PT37	—		0000H	—	—	—
PT38	—		0000H	—	—	—
PT39	—		0000H	—	—	—
PT40	—		0000H	—	—	—
PT41	ORP	Home position return inhibit function selection	0000H	—	✔	✔
PT42	—	For manufacturer setting	0000H	—	—	—
PT43	—		0000H	—	—	—
PT44	—		0000H	—	—	—
PT45	*CZTY	Home position return type 2 [1]	0000H	—	—	—
PT46	—	For manufacturer setting	0000H	—	—	—
PT47	—		0000H	—	—	—
PT48	—		0000H	—	—	—

Tab. A-9:   *List of positioning control parameters for MR-JE-A (2)*

[1] For Modbus®/RTU communication

NOTE | The parameter PT45 (Home position return type 2) is used for Modbus®/RTU communication. For details, refer to "MR-JE-A Servo Amplifier Instruction Manual (Modbus®/RTU communication)".

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| NOTES | To enable a parameter whose symbol is preceded by *, cycle the power after setting it. |

To enable the following parameters, turn off the power for 1 s or more after setting and turn it on again. However, the time will be longer depending on a setting value of parameter PF25 (Instantaneous power failure tough drive - Detection time) when "instantaneous power failure tough drive selection" is enabled in parameter PA20.

– PA06 (Electronic gear numerator (command pulse multiplication numerator

– PA07 (Electronic gear denominator (command pulse multiplication denominator)

– PC03 (S-pattern acceleration/deceleration time constant in the positioning mode)

The symbols in the control mode column mean as follows.

– P: Position control mode

– S: Speed control mode

– T: Torque control mode

– CP: Positioning mode (point table method)

– CL: Positioning mode (program method)

Setting an out of range value to each parameter will trigger AL. 37 (Parameter error).

A.2 Additional information about the series MR-JE-B and MR-JE-BF

A.2.1 Status display

Display	Status	Description
▯▯I ⋮ ▯▯5	Initializing	System check in progress
Ab▯	Initializing	• Power of the servo amplifier was switched on at the condition that the power of the servo system controller is off. • The control axis No. set to the axis selection rotary switch (SW1) does not match the one set to the servo system controller. • A servo amplifier malfunctioned, or communication error occurred with the servo system controller or the previous axis servo amplifier. In this case, the indication changes as follows: "Ab", "AC", "Ad", and "Ab" • The servo system controller is malfunctioning.
Ab .	Initializing	During initial setting for communication specifications
AC▯	Initializing	Initial setting for communication specifications completed, and then it synchronized with servo system controller.
Ad▯	Initializing	During initial parameter setting communication with servo system controller
AE▯	Initializing	During the servo motor/encoder information and telecommunication with servo system controller
AF▯	Initializing	During initial signal data communication with servo system controller
AH▯	Initializing completion	The process for initial data communication with the servo system controller is completed.
AA▯	Initializing standby	The power supply of servo system controller is turned off during the power supply of servo amplifier is on.
b## [1]	Ready-off	The ready-off signal from the servo system controller was received.
d## [1]	Servo-on	The servo-on signal from the servo system controller was received.
C## [1]	Servo-off	The servo-off signal from the servo system controller was received.
* * * [2]	Alarm and warning	The alarm No. and the warning No. that occurred is displayed. [4]
8 8 8	CPU error	CPU watchdog error has occurred.
b # #. [1] d # #. C # #.	Test operation mode [3]	JOG operation, positioning operation, program operation, output signal (DO) forced output, or motor-less operation was set.

Tab. A-10:   Indication list of MR-JE-B/MR-JE-BF

[1] The meanings of ## are listed below.

##	Description
01	Axis No. 1
≀	≀
16	Axis No.16

[2] *** indicates the alarm No. and the warning No.

[3] Requires the MR Configurator2.

[4] Only a list of alarms and warnings is listed in section 7.2. Refer to "MELSERVO JE Servo Amplifier Instruction Manual (Troubleshooting)" for details of alarms and warnings.

A.2.2 Basic setting parameters (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	—		10000	—
PA06	—	For manufacturer setting	1	—
PA07	—		1	—
PA08	ATU	Auto tuning mode	0001H	—
PA09	RSP	Auto tuning response	16	—
PA10	INP	In-position range	100	pulse
PA11	—		1000.0	—
PA12	—	For manufacturer setting	1000.0	—
PA13	—		0000H	—
PA14	*POL	Rotation direction selection	0	—
PA15	—		0	—
PA16	—	For manufacturer setting	0	—
PA17	—		0000H	—
PA18	—		0000H	—
PA19	*BLK	Parameter writing inhibit	00AAH	—
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	*AOP5	Function selection A-5	0000H	—
PA27	*HTL	Hot line forced stop function [1]	0000H	—
PA28	**AOP6	Function selection A-6	0000H	—
PA29	—		0000H	—
PA30	—	For manufacturer setting	0000H	—
PA31	—		0000H	—
PA32	—		0000H	—

Tab. A-11:   *List of basic setting parameters for MR-JE-B/MR-JE-BF*

[1] This parameter is for the MR-JE-BF not available (For manufacturer setting)

A.2.3 Gain/filter setting parameters (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	TFBGN	Torque feedback loop gain	18000	rad/s
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	VDC	Speed differential compensation	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	*BOP1	Function selection B-1	0000H	—
PB26	*CDP	Gain switching function	0000H	—
PB27	CDL	Gain switching condition	10	kpulse/s pulse 1/min
PB28	CDT	Gain switching time constant	1	ms
PB29	GD2B	Load to motor inertia ratio after gain switching	7.00	Multiplier
PB30	PG2B	Position loop gain after gain switching	0.0	rad/s
PB31	VG2B	Speed loop gain after gain switching	0	rad/s
PB32	VICB	Speed integral compensation after gain switching	0.0	ms
PB33	VRF11B	Vibration suppression control 1 - Vibration frequency after gain switching	0.0	Hz
PB34	VRF12B	Vibration suppression control 1 - Resonance frequency after gain switching	0.0	Hz
PB35	VRF13B	Vibration suppression control 1 - Vibration frequency damping after gain switching	0.00	—
PB36	VRF14B	Vibration suppression control 1 - Resonance frequency damping after gain switching	0.00	—
PB37	—	For manufacturer setting	1600	—
PB38	—		0.00	—
PB39	—		0.00	—
PB40	—		0.00	—

Tab. A-12:   *List of gain/filter setting parameters for MR-JE-B/MR-JE-BF (1)*

MITSUBISHI ELECTRIC

No.	Symbol	Name	Initial value	Unit
PB41	—		0	—
PB42	—	For manufacturer setting	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
PB54	VRF23	Vibration suppression control 2 - Vibration frequency damping	0.00	—
PB55	VRF24	Vibration suppression control 2 - Resonance frequency damping	0.00	—
PB56	VRF21B	Vibration suppression control 2 - Vibration frequency after gain switching	0.0	Hz
PB57	VRF22B	Vibration suppression control 2 - Resonance frequency after gain switching	0.0	Hz
PB58	VRF23B	Vibration suppression control 2 - Vibration frequency damping after gain switching	0.00	
PB59	VRF24B	Vibration suppression control 2 - Resonance frequency damping after gain switching	0.00	—
PB60	PG1B	Model loop gain after gain switching	0.0	rad/s
PB61	—		0.0	—
PB62	—	For manufacturer setting	0000H	—
PB63	—		0000H	—
PB64	—		0000H	—

Tab. A-12:   *List of gain/filter setting parameters for MR-JE-B/MR-JE-BF (2)*

A.2.4   Extension setting parameters (PC□□)

No.	Symbol	Name	Initial value	Unit
PC01	ERZ	Error excessive alarm level	0	rev
PC02	MBR	Electromagnetic brake sequence output	0	ms
PC03	—	For manufacturer setting	0000н	—
PC04	**COP1	Function selection C-1	0020н	—
PC05	**COP2	Function selection C-2	0000н	—
PC06	*COP3	Function selection C-3	0000н	—
PC07	ZSP	Zero speed	50	1/min
PC08	OSL	Overspeed alarm detection level	0	1/min
PC09	—	For manufacturer setting	0000н	—
PC10	—		0000н	—
PC11	—		0	—
PC12	—		0	—
PC13	—		0	—
PC14	—		0	—
PC15	—		0	—
PC16	—		0000н	—
PC17	**COP4	Function selection C-4	0000н	—
PC18	*COP5	Function selection C-5	0000н	—
PC19	—	For manufacturer setting	0000н	—
PC20	*COP7	Function selection C-7	0000н	—
PC21	*BPS	Alarm history clear	0000н	—
PC22	—	For manufacturer setting	0	—
PC23	—		0000н	—
PC24	RSBR	Forced stop deceleration time constant	100	ms
PC25	—	For manufacturer setting	0	—
PC26	—		0000н	—
PC27	—		0000н	—
PC28	—		0000н	—
PC29	*COPB	Function selection C-B	0000н	—
PC30	—	For manufacturer setting	0	—
PC31	RSUP1	Vertical axis freefall prevention compensation amount	0	0.0001rev
PC32	—	For manufacturer setting	0000н	—
PC33	—		0	—
PC34	—		100	—
PC35	—		0000н	—
PC36	—		0000н	—
PC37	—		0000н	—
PC38	ERW	Error excessive warning level	0	rev
PC39	—	For manufacturer setting	0000н	—
PC40	—		0000н	—
PC41	—		0000н	—
PC42	—		0000н	—
PC43	—		0000н	—
PC44	—		0000н	—

Tab. A-13:   *List of extension setting parameters for MR-JE-B/MR-JE-BF (1)*

MITSUBISHI ELECTRIC

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

Tab. A-13:   *List of extension setting parameters for MR-JE-B/MR-JE-BF (2)*

A.2.5   I/O setting parameters (PD□□)

No.	Symbol	Name	Initial value	Unit
PD01	—	For manufacturer setting	0000н	—
PD02	*DIA2	Input signal automatic on selection 2	0000н	—
PD03	*DI1	Input device selection 1	0000н	—
PD04	*DI2	Input device selection 2	0000н	—
PD05	*DI3	Input device selection 2	0000н	—
PD06	—	For manufacturer setting	0000н	—
PD07	*DO1	Output device selection 1	0005н	—
PD08	*DO2	Output device selection 2	0000н	—
PD09	*DO3	Output device selection 3	0000н	—
PD10	—	For manufacturer setting	0000н	—
PD11	*DIF	Input filter setting [1]	0004н	ms
PD12	—	For manufacturer setting	0000н	—
PD13	*DOP2	Function selection D-2	0000н	—
PD14	*DOP3	Function selection D-3	0000н	—
PD15	—		0000н	—
PD16	—		0000н	—
PD17	—		0000н	—
PD18	—		0000н	—
PD19	—		0000н	—
PD20	—		0	—
PD21	—		0	—
PD22	—		0	—
PD23	—		0	—
PD24	—		0000н	—
PD25	—		0000н	—
PD26	—		0000н	—
PD27	—		0000н	—
PD28	—		0000н	—
PD29	—		0000н	—
PD30	—	For manufacturer setting	0	—
PD31	—		0	—
PD32	—		0	—
PD33	—		0000н	—
PD34	—		0000н	—
PD35	—		0000н	—
PD36	—		0000н	—
PD37	—		0000н	—
PD38	—		0000н	—
PD39	—		0000н	—
PD40	—		0000н	—
PD41	—		0000н	—
PD42	—		0000н	—
PD43	—		0000н	—
PD44	—		0000н	—
PD45	—		0000н	—

Tab. A-14:   *List of I/O setting parameters for MR-JE-B/MR-JE-BF (1)*

MITSUBISHI ELECTRIC

No.	Symbol	Name	Initial value	Unit
PD46	—		0000H	—
PD47	—	For manufacturer setting	0000H	—
PD48	—		0000H	—

Tab. A-14:   *List of I/O setting parameters for MR-JE-B/MR-JE-BF (2)*

① Refer to the servo system controller instruction manual for the setting.

A.2.6   Extension setting 2 parameters (PE□□)

No.	Symbol	Name	Initial value	Unit
PE01	—		0000н	—
PE02	—		0000н	—
PE03	—		0000н	—
PE04	—		0	—
PE05	—		0	—
PE06	—		0	—
PE07	—		0	—
PE08	—		0	—
PE09	—		0000н	—
PE10	—		0000н	—
PE11	—		0000н	—
PE12	—		0000н	—
PE13	—		0000н	—
PE14	—		0111н	—
PE15	—		20	—
PE16	—		0000н	—
PE17	—		0000н	—
PE18	—		0000н	—
PE19	—		0000н	—
PE20	—	For manufacturer setting	0000н	—
PE21	—		0000н	—
PE22	—		0000н	—
PE23	—		0000н	—
PE24	—		0000н	—
PE25	—		0000н	—
PE26	—		0000н	—
PE27	—		0000н	—
PE28	—		0000н	—
PE29	—		0000н	—
PE30	—		0000н	—
PE31	—		0000н	—
PE32	—		0000н	—
PE33	—		0000н	—
PE34	—		0	—
PE35	—		0	—
PE36	—		0.0	—
PE37	—		0.00	—
PE38	—		0.00	—
PE39	—		0	—
PE40	—		0000н	—
PE41	EOP3	Function selection E-3	0000н	—
PE42	—	For manufacturer setting	0	—
PE43	—		0.0	—
PE44	LMCP	Lost motion compensation positive-side compensation value selection	0	0.01%
PE45	LMCN	Lost motion compensation negative-side compensation value selection	0	0.01%

Tab. A-15:   *List of Extension setting 2 parameters for MR-JE-B/MR-JE-BF (1)*

MITSUBISHI ELECTRIC

No.	Symbol	Name	Initial value	Unit
PE46	LMFLT	Lost motion filter setting	0	0.1 ms
PE47	TOF	Torque offset	0	0.01%
PE48	*LMOP	Lost motion compensation function selection	0000н	—
PE49	LMCD	Lost motion compensation timing	0	0.1 ms
PE50	LMCT	Lost motion compensation non-sensitive band	0	pulse kpulse
PE51	—	For manufacturer setting	0000н	—
PE52	—		0000н	—
PE53	—		0000н	—
PE54	—		0000н	—
PE55	—		0000н	—
PE56	—		0000н	—
PE57	—		0000н	—
PE58	—		0000н	—
PE59	—		0000н	—
PE60	—		0000н	—
PE61	—		0.00	—
PE62	—		0.00	—
PE63	—		0.00	—
PE64	—		0.00	—

Tab. A-15:   *List of Extension setting 2 parameters for MR-JE-B/MR-JE-BF (2)*

A.2.7　　　Extension setting 3 parameters (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	0003H	—
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	**STOD	STO diagnosis error detection time [1]	0	s
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	For MR-JE-B: Instantaneous power failure tough drive - Detection time For MR-JE-BF: 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	1/min
PF32	—	For manufacturer setting	50	—
PF33	—		0000H	—
PF34	—		0000H	—
PF35	—		0000H	—
PF36	—		0000H	—
PF37	—		0000H	—
PF38	—		0000H	—
PF39	—		0000H	—
PF40	—		0000H	—
PF41	—		0000H	—

Tab. A-16:　　　*List of Extension setting 3 parameters for MR-JE-B/MR-JE-BF (1)*

No.	Symbol	Name	Initial value	Unit
PF42	—	For manufacturer setting	0000H	—
PF43	—		0000H	—
PF44	—		0	—
PF45	—		0000H	—
PF46	—		0000H	—
PF47	—		0000H	—
PF48	—		0000H	—

Tab. A-16: *List of Extension setting 3 parameters for MR-JE-B/MR-JE-BF (2)*

① This parameter is for the MR-JE-B not available (For manufacturer setting, initial value: 0000H)

NOTE

The parameter whose symbol is preceded by * is enabled with the following conditions:

– *: To enable the parameter value, power off the servo amplifier for 1 s or longer and power on the amplifier or reset the controller after setting the parameter. However, the time will be longer depending on a setting value of parameter PF25 (Instantaneous power failure tough drive - Detection time) ② when "instantaneous power failure tough drive selection" is enabled in parameter PA20.

– **: To enable the parameter value, power off the servo amplifier for 1 s or longer and power on the amplifier. However, the time will be longer depending on a setting value of parameter PF25 (Instantaneous power failure tough drive - Detection time) ② when "instantaneous power failure tough drive selection" is enabled in parameter Pr. PA20.

② For MR-JE-BF: PF 25 (SEMI-F47 function - Instantaneous power failure detection time)

A.3   Additional information about the series MR-JE-C

A.3.1   Status display

Display	Status	Description
⌐ ... ⌐5	Initializing	System check in progress
b # # [1]	Ready-off	The ready-off signal was received.
C # # [1]	Ready-on, servo-off	The servo-off signal was received.
d # # [1]	Ready-on, servo-on	The servo-on signal was received.
n # # [1]	Alarm occurring	An alarm or warning has occurred in the servo amplifier.
* * * [2]	Alarm and warning	The alarm No. and the warning No. that occurred is displayed. [4]
8 8 8	CPU error	CPU watchdog error has occurred.
b # #. [1] d # #. C # #.	Test operation mode [3]	During test operation JOG operation, positioning operation, program operation, output signal (DO) forced output, or motor-less operation was set.

Tab. A-17:   *Indication list of MR-JE-C*

[1] ## is displayed in hexadecimal. The following table shows the description.

    – For CC-Link IE Field Network Basic, SLMP, and Modbus/TCP

##	Description
01 ζ FF	Identification No. (fourth octet of the IP address)

    – No network connection

##	Description
01 ζ F7	Identification No. (Station No.)

[2] *** indicates the alarm No. and the warning No.

[3] Requires the MR Configurator2

[4] Only a list of alarms and warnings is listed in section 7.1. Refer to "MELSERVO JE Servo Amplifier Instruction Manual (Troubleshooting)" for details of alarms and warnings.

A.3.2   Basic setting parameters (PA☐☐)

No.	Symbol	Name	Initial value	Unit	Control mode			
					Standard mode			Profile mode
					P	S	T	pp/pv/tq
PA01	*STY	Operation mode	1000н	—	✔	✔	✔	✔
PA02	*REG	Regenerative option	0000н	—	✔	✔	✔	✔
PA03	*ABS	Absolute position detection system	0000н	—	✔	—	—	✔
PA04	*AOP1	Function selection A-1	2000н	—	✔	✔	—	✔
PA05	*FBP	Number of command input pulses per revolution ①	10000	—	✔	—	—	—
PA06	(*)CMX	Electronic gear numerator (command pulse multiplication numerator)	1	—	✔	—	—	✔
PA07	(*)CDV	Electronic gear denominator (command pulse multiplication denominator)	1	—	✔	—	—	✔
PA08	ATU	Auto tuning mode	0001н	—	✔	✔	—	✔
PA09	RSP	Auto tuning response	16	—	✔	✔	—	✔
PA10	INP	In-position range	100	pulse	✔	—	—	✔
PA11	TLP	Forward rotation torque limit	1000.0	%	✔	✔	✔	✔
PA12	TLN	Reverse rotation torque limit	1000.0	%	✔	✔	✔	✔
PA13	*PLSS	Command pulse input form	0100н	—	✔	—	—	—
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	0000н	—	—	—	—	—
PA18	—		0000н	—	—	—	—	—
PA19	*BLK	Parameter writing inhibit	00AAн	—	✔	✔	✔	✔
PA20	*TDS	Tough drive setting	0000н	—	✔	✔	✔	✔
PA21	*AOP3	Function selection A-3	0001н	—	✔	✔	—	✔
PA22	—	For manufacturer setting	0000н	—	—	—	—	—
PA23	DRAT	Drive recorder arbitrary alarm trigger setting	0000н	—	✔	✔	✔	✔
PA24	AOP4	Function selection A-4	0000н	—	✔	✔	—	✔
PA25	OTHOV	One-touch tuning – Overshoot permissible level	0	%	✔	✔	—	✔
PA26	*AOP5	Function selection A-5	0000н	—	✔	✔	—	✔
PA27	—	For manufacturer setting	0000н	—	—	—	—	—
PA28	*AOP6	Function selection A-6	0000н	—	✔	✔	✔	✔
PA29	—	For manufacturer setting	0000н	—	—	—	—	—
PA30	—		0000н	—	—	—	—	—
PA31	—		0000н	—	—	—	—	—
PA32	—		0000н	—	—	—	—	—

Tab. A-18:   *List of basic setting parameters for MR-JE-C*

NOTE   The following parameters cannot be used in the profile mode.

– PA05 (Number of command input pulses per revolution)

– PA13 (Command pulse input form)

A.3.3 Gain/filter setting parameters (PB□□)

No.	Symbol	Name	Initial value	Unit	Control mode			
					Standard mode			Profile mode
					P	S	T	pp/pv/tq
PB01	FILT	Adaptive tuning mode (adaptive filter II)	0000H	—	✔	✔	✔	✔
PB02	VRFT	Vibration suppression control tuning mode (advanced vibration suppression control II)	0000H	—	✔	—	—	✔
PB03	PST	Position command acceleration/deceleration time constant (position smoothing)	0	ms	✔	—	—	✔
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	VDC	Speed differential compensation	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	0000H	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	0100H	—	✔	✔	✔	✔
PB24	*MVS	Slight vibration suppression control	0000H	—	✔	—	—	✔
PB25	*BOP1	Function selection B-1	0000H	—	✔	✔	—	✔
PB26	*CDP	Gain switching function	0000H	—	✔	✔	—	✔
PB27	CDL	Gain switching condition	10	kpulse/s pulse 1/min	✔	✔	—	✔
PB28	CDT	Gain switching time constant	1	ms	✔	✔	—	✔
PB29	GD2B	Load to motor inertia ratio after gain switching	7.00	Multiplier	✔	✔	—	✔
PB30	PG2B	Position loop gain after gain switching	0.0	rad/s	✔	—	—	✔
PB31	VG2B	Speed loop gain after gain switching	0	rad/s	✔	✔	—	✔
PB32	VICB	Speed integral compensation after gain switching	0.0	ms	✔	✔	—	✔
PB33	VRF11B	Vibration suppression control 1 - Vibration frequency after gain switching	0.0	Hz	✔	—	—	✔
PB34	VRF12B	Vibration suppression control 1 - Resonance frequency after gain switching	0.0	Hz	✔	—	—	✔
PB35	VRF13B	Vibration suppression control 1 - Vibration frequency damping after gain switching	0.00	—	✔	—	—	✔
PB36	VRF14B	Vibration suppression control 1 - Resonance frequency damping after gain switching	0.00	—	✔	—	—	✔

Tab. A-19: *List of gain/filter setting parameters for MR-JE-C (1)*

No.	Symbol	Name	Initial value	Unit	Control mode			
					Standard mode			Profile mode
					P	S	T	pp/pv/tq
PB37	—	For manufacturer setting	1600	—	—	—	—	—
PB38	—		0.00	—	—	—	—	—
PB39	—		0.00	—	—	—	—	—
PB40	—		0.00	—	—	—	—	—
PB41	—		0000H	—	—	—	—	—
PB42	—		0000H	—	—	—	—	—
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	✔	—	—	✔
PB54	VRF23	Vibration suppression control 2 - Vibration frequency damping	0.00	—	✔	—	—	✔
PB55	VRF24	Vibration suppression control 2 - Resonance frequency damping	0.00	—	✔	—	—	✔
PB56	VRF21B	Vibration suppression control 2 - Vibration frequency after gain switching	0.0	Hz	✔	—	—	✔
PB57	VRF22B	Vibration suppression control 2 - Resonance frequency after gain switching	0.0	Hz	✔	—	—	✔
PB58	VRF23B	Vibration suppression control 2 - Vibration frequency damping after gain switching	0.00	—	✔	—	—	✔
PB59	VRF24B	Vibration suppression control 2 - Resonance frequency damping after gain switching	0.00	—	✔	—	—	✔
PB60	PG1B	Model loop gain after gain switching	0.0	rad/s	✔	✔	—	✔
PB61	—	For manufacturer setting	0.0	—	—	—	—	—
PB62	—		0000H	—	—	—	—	—
PB63	—		0000H	—	—	—	—	—
PB64	—		0000H	—	—	—	—	—

Tab. A-19:   *List of gain/filter setting parameters for MR-JE-C (2)*

A.3.4 Extension setting parameters (PC□□)

No.	Symbol	Name	Initial value	Unit	Standard mode P	Standard mode S	Standard mode T	Profile mode pp/pv/tq
PC01	STA	Acceleration time constant	0	ms	—	✔	✔	✔
PC02	STB	Deceleration time constant	0	ms	—	✔	✔	✔
PC03	STC	S-pattern acceleration/deceleration time constant	0	ms	—	✔	✔	✔
PC04	TQC	Torque command time constant/thrust command time constant	0	ms	—	—	✔	—
PC05	SC1	Internal speed command 1	100.00	1/mins	—	✔	—	—
		Internal speed limit 1			—	—	✔	—
PC06	SC2	Internal speed command 2	500.00	1/min	—	✔	—	—
		Internal speed limit 2			—	—	✔	—
PC07	SC3	Internal speed command 3	1000.00	1/min	—	✔	—	—
		Internal speed limit 3			—	—	✔	—
PC08	SC4	Internal speed command 4	200.00	1/min	—	✔	—	—
		Internal speed limit 4			—	—	✔	—
PC09	SC5	Internal speed command 5	300.00	1/min	—	✔	—	—
		Internal speed limit 5			—	—	✔	—
PC10	SC6	Internal speed command 6	500.00	1/min	—	✔	—	—
		Internal speed limit 6			—	—	✔	—
PC11	SC7	Internal speed command 7	800.00	1/min	—	✔	—	—
		Internal speed limit 7			—	—	✔	—
PC12	VCM	Analog speed command - Maximum speed	0	1/min	—	✔	—	—
PC13	TLC	Analog torque command maximum output	100.0	%	—	—	✔	—
PC14	—	For manufacturer setting	0000H	—	—	—	—	—
PC15	—		0000H	—	—	—	—	—
PC16	MBR	Electromagnetic brake sequence output	0	ms	✔	✔	✔	✔
PC17	ZSP	Zero speed	50	1/min	✔	✔	✔	✔
PC18	*BPS	Alarm history clear	0000H	—	✔	✔	✔	✔
PC19	*ENRS	Encoder output pulse selection	0000H	—	✔	✔	✔	✔
PC20	—	For manufacturer setting	0	—	—	—	—	—
PC21	*—		0000H	—	—	—	—	—
PC22	*COP1	Function selection C-1	0000H	—	✔	✔	✔	✔
PC23	*COP2	Function selection C-2	0000H	—	—	✔	✔	✔
PC24	*COP3	Function selection C-3	0000H	—	✔	—	—	✔
PC25	*COP4	Function selection C-4 [1]	0000H	—	—	—	—	✔
PC26	*COP5	Function selection C-5	0000H	—	✔	✔	—	✔
PC27	*COP6	Function selection C-6	0000H	—	✔	✔	✔	✔
PC28	—	For manufacturer setting	0000H	—	—	—	—	✔
PC29	*COP8	Function selection C-8	0120H	—	✔	✔	✔	✔
PC30	STA2	Acceleration time constant 2	0	ms	—	✔	✔	✔
PC31	STB2	Deceleration time constant 2	0	ms	—	✔	✔	✔
PC32	CMX2	Command input pulse multiplication numerator 2	1	—	✔	—	—	—
PC33	CMX3	Command input pulse multiplication numerator 3	1	—	✔	—	—	—
PC34	CMX4	Command input pulse multiplication numerator 4	1	—	✔	—	—	—
PC35	TL2	Internal torque limit 2	1000.0	%	✔	✔	✔	✔
PC36	—	For manufacturer setting	0000H	—	—	—	—	—

Tab. A-20: *List of extension setting parameters for MR-JE-C (1)*

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No.	Symbol	Name	Initial value	Unit	Control mode			
					Standard mode			Profile mode
					P	S	T	pp/pv/tq
PC37	VCO	Analog speed command offset	0	mV	—	✔	—	✔
		Analog speed limit offset [2]			—	—	—	✔
PC38	TPO	Analog torque command offset	0	mV	—	—	✔	✔
		Analog torque limit offset			—	✔	—	✔
PC39	—	For manufacturer setting	0	—	—	—	—	—
PC40	—		0	—	—	—	—	—
PC41	—		0	—	—	—	—	—
PC42	—		0	—	—	—	—	—
PC43	ERZ	Error excessive alarm detection level	0	rev	✔	—	—	✔
PC44	—	For manufacturer setting	0000H	—	—	—	—	—
PC45	—		0000H	—	—	—	—	—
PC46	—		0	—	—	—	—	—
PC47	—		0	—	—	—	—	—
PC48	—		0	—	—	—	—	—
PC49	—		0	—	—	—	—	—
PC50	—		0000H	—	—	—	—	—
PC51	RSBR	Forced stop deceleration time constant	100	ms	✔	✔	—	✔
PC52	—	For manufacturer setting	0	—	—	—	—	—
PC53	—		0	—	—	—	—	—
PC54	RSUP1	Vertical axis freefall prevention compensation amount	0	0.0001rev	✔	—	—	✔
PC55	—	For manufacturer setting	0	—	—	—	—	—
PC56	—		100	—	—	—	—	—
PC57	—		0000H	—	—	—	—	—
PC58	—		0	—	—	—	—	—
PC59	—		0000H	—	—	—	—	—
PC60	*COPD	Function selection C-D	0000H	—	✔	✔	✔	✔
PC61	—	For manufacturer setting	0000H	—	—	—	—	—
PC62	—		0000H	—	—	—	—	—
PC63	—		0000H	—	—	—	—	—
PC64	—		0000H	—	—	—	—	—
PC65	—		0000H	—	—	—	—	—
PC66	—		0	—	—	—	—	—
PC67	—		0	—	—	—	—	—
PC68	—		0	—	—	—	—	—
PC69	—		0	—	—	—	—	—
PC70	—		0	—	—	—	—	—
PC71	—		0040H	—	—	—	—	—
PC72	—		0000H	—	—	—	—	—
PC73	ERW	Error excessive warning level	0	rev	✔	—	—	✔
PC74	—	For manufacturer setting	0000H	—	—	—	—	—
PC75	FEWL	Following error output level [1]	0000H	10⁻³ degree pulse [3]	—	—	—	✔
PC76	FEWH		00C0H		—	—	—	✔
PC77	FEWF	Following error output filtering time [1]	10	ms [3]	—	—	—	✔

Tab. A-20: *List of extension setting parameters for MR-JE-C (2)*

No.	Symbol	Name	Initial value	Unit	Control mode			
					Standard mode			Profile mode
					P	S	T	pp/pv/tq
PC78	—		0000H	—	—	—	—	—
PC79	—	For manufacturer setting	0000H	—	—	—	—	—
PC80	—		0000H	—	—	—	—	—

Tab. A-20:   *List of extension setting parameters for MR-JE-C (3)*

① For manufacturer setting in standard mode

② Only for profile mode

③ The unit is only valid in profile mode (no unit in standard mode).

NOTES

The following parameters cannot be used in the profile mode.

– PC04 (Torque command time constant)

– PC05 (Internal speed command 1/internal speed limit 1)

– PC06 (Internal speed command 2/internal speed limit 2)

– PC07 (Internal speed command 3/internal speed limit 3)

– PC08 (Internal speed command 4/internal speed limit 4)

– PC09 (Internal speed command 5/internal speed limit 5)

– PC10 (Internal speed command 6/internal speed limit 6)

– PC11 (Internal speed command 7/internal speed limit 7)

– PC12 (Analog speed command - Maximum speed)

– PC13 (Analog torque command maximum output)

– PC32 (Command input pulse multiplication numerator 2)

– PC33 (Command input pulse multiplication numerator 3)

– PC34 (Command input pulse multiplication numerator 4)

A.3.5 I/O setting parameters (PD□□)

No.	Symbol	Name	Initial value	Unit	Standard mode P	Standard mode S	Standard mode T	Profile mode pp/pv/tq
PD01	*DIA1	Input signal automatic on selection 1	0000н	—	✔	✔	✔	✔
PD02	—		0000н	—	—	—	—	—
PD03	—	For manufacturer setting	0000н	—	—	—	—	—
PD04	—		0000н	—	—	—	—	—
PD05	*DI1L	Input device selection 1L	0202н	—	✔	✔	—	—
PD06	* DI1M	Input device selection 1M	0202н	—	—	—	✔	—
PD07	*DI1H	Input device selection 1H ①	002Bн	—	—	—	—	✔
PD08	* DI2L	Input device selection 2L	0A0Aн	—	✔	✔	—	—
PD09	* DI2M	Input device selection 2M	0700н	—	—	—	✔	—
PD10	*DI2H	Input device selection 2H ①	000Aн	—	—	—	—	✔
PD11	*DI3L	Input device selection 3L	0B0Bн	—	✔	✔	—	—
PD12	*DI3M	Input device selection 3M	0800н	—	—	—	✔	—
PD13	*DI3H	Input device selection 3H ①	000Bн	—	—	—	—	✔
PD14	*DI4L	Input device selection 4L	0703н	—	✔	✔	—	—
PD15	*DI4M	Input device selection 4M	3807н	—	—	—	✔	—
PD16	*DI4H	Input device selection 4H ①	0000н	—	—	—	—	✔
PD17	*DI5L	Input device selection 5L	0806н	—	✔	✔	—	—
PD18	*DI5M	Input device selection 5M	2008н	—	—	—	✔	—
PD19	*DI5H	Input device selection 5H ①	0000н	—	—	—	—	✔
PD20	—		0000н	—	—	—	—	—
PD21	—	For manufacturer setting	0000н	—	—	—	—	—
PD22	—		0000н	—	—	—	—	—
PD23	*DI7L	Input device selection 7L	0000н	—	✔	✔	—	—
PD24	*DI7M	Input device selection 7M	0000н	—	—	—	✔	—
PD25	*DI7H	Input device selection 7H ①	002Cн	—	—	—	—	✔
PD26	*DI8L	Input device selection 8L	0000н	—	✔	✔	—	—
PD27	*DI8M	Input device selection 8M	0000н	—	—	—	✔	—
PD28	*DI8H	Input device selection 8H ①	0000н	—	—	—	—	✔
PD29	*DO1	Output device selection 1	0002н	—	✔	✔	✔	✔
PD30	*DO2	Output device selection 2	0003н	—	✔	✔	✔	✔
PD31	*DO3	Output device selection 3	0000н	—	✔	✔	✔	✔
PD32	*DO4	Output device selection 4	0004н	—	✔	✔	✔	✔
PD33	—	For manufacturer setting	0000н	—	—	—	—	—
PD34	*DIF	Input filter setting	0004н	—	✔	✔	✔	✔
PD35	*DOP1	Function selection D-1	0101н	—	✔	✔	✔	✔
PD36	—	For manufacturer setting	0000н	—	—	—	—	—
PD37	*DOP3	Function selection D-3	0000н	—	✔	—	—	✔
PD38	*DOP4	Function selection D-4	3000н	—	✔	✔	✔	✔
PD39	DOP5	Function selection D-5	0000н	—	✔	✔	✔	✔

Tab. A-21: *List of I/O setting parameters for MR-JE-C (1)*

No.	Symbol	Name	Initial value	Unit	Control mode			
					Standard mode			Profile mode
					P	S	T	pp/pv/tq
PD40	—		0000ʜ	—	—	—	—	—
PD41	—		0000ʜ	—	—	—	—	—
PD42	—		0	—	—	—	—	—
DP43	—	For manufacturer setting	0000ʜ	—	—	—	—	—
PD44	—		0000ʜ	—	—	—	—	—
PD45	—		0000ʜ	—	—	—	—	—
PD46	—		0000ʜ	—	—	—	—	—
PD47	—	For manufacturer setting	0000ʜ	—	—	—	—	—
PD48	—	For manufacturer setting	0000ʜ	—	—	—	—	—

Tab. A-21:   *List of I/O setting parameters for MR-JE-C (2)*

① For manufacturer setting in standard mode

NOTE

The following parameters cannot be used in the profile mode.

– PD05 (Input device selection 1L)

– PD06 (Input device selection 1M)

– PD08 (Input device selection 2L)

– PD09 (Input device selection 2M)

– PD11 (Input device selection 3L)

– PD12 (Input device selection 3M)

– PD14 (Input device selection 4L)

– PD15 (Input device selection 4M)

– PD17 (Input device selection 5L)

– PD18 (Input device selection 5M)

– PD23 (Input device selection 7L)

– PD24 (Input device selection 7M)

– PD26 (Input device selection 8L)

– PD27 (Input device selection 8M)

⬥ MITSUBISHI ELECTRIC

A.3.6   Extension setting 2 parameters (PE□□)

No.	Symbol	Name	Initial value	Unit	Control mode			
					Standard mode			Profile mode
					P	S	T	pp/pv/tq
PE01	—		0000ʜ	—	—	—	—	—
PE02	—		0000ʜ	—	—	—	—	—
PE03	—		0000ʜ	—	—	—	—	—
PE04	—		0	—	—	—	—	—
PE05	—		0	—	—	—	—	—
PE06	—		0	—	—	—	—	—
PE07	—		0	—	—	—	—	—
PE08	—		0	—	—	—	—	—
PE09	—		0000ʜ	—	—	—	—	—
PE10	—		0000ʜ	—	—	—	—	—
PE11	—		0000ʜ	—	—	—	—	—
PE12	—		0000ʜ	—	—	—	—	—
PE13	—		0000ʜ	—	—	—	—	—
PE14	—		0111ʜ	—	—	—	—	—
PE15	—		20	—	—	—	—	—
PE16	—		0000ʜ	—	—	—	—	—
PE17	—		0000ʜ	—	—	—	—	—
PE18	—		0000ʜ	—	—	—	—	—
PE19	—		0000ʜ	—	—	—	—	—
PE20	—	For manufacturer setting	0000ʜ	—	—	—	—	—
PE21	—		0000ʜ	—	—	—	—	—
PE22	—		0000ʜ	—	—	—	—	—
PE23	—		0000ʜ	—	—	—	—	—
PE24	—		0000ʜ	—	—	—	—	—
PE25	—		0000ʜ	—	—	—	—	—
PE26	—		0000ʜ	—	—	—	—	—
PE27	—		0000ʜ	—	—	—	—	—
PE28	—		0000ʜ	—	—	—	—	—
PE29	—		0000ʜ	—	—	—	—	—
PE30	—		0000ʜ	—	—	—	—	—
PE31	—		0000ʜ	—	—	—	—	—
PE32	—		0000ʜ	—	—	—	—	—
PE33	—		0000ʜ	—	—	—	—	—
PE34	—		0	—	—	—	—	—
PE35	—		0	—	—	—	—	—
PE36	—		0.0	—	—	—	—	—
PE37	—		0.00	—	—	—	—	—
PE38	—		0.00	—	—	—	—	—
PE39	—		0	—	—	—	—	—
PE40	—		0000ʜ	—	—	—	—	—
PE41	EOP3	Function selection E-3	0000ʜ	—	✔	✔	✔	✔
PE42	—	For manufacturer setting	0	—	—	—	—	—
PE43	—		0.0	—	—	—	—	—

Tab. A-22:   *List of extension setting 2 parameters for MR-JE-C (1)*

No.	Symbol	Name	Initial value	Unit	Control mode			
					Standard mode			Profile mode
					P	S	T	pp/pv/tq
PE44	LMCP	Lost motion compensation positive-side compensation value selection	0	0.01%	✔	—	—	✔
PE45	LMCN	Lost motion compensation negative-side compensation value selection	0	0.01%	✔	—	—	✔
PE46	LMFLT	Lost motion filter setting	0	0.1 ms	✔	—	—	✔
PE47	TOF	Torque offset	0	0.01%	✔	✔	✔	✔
PE48	*LMOP	Lost motion compensation function selection	0000H	—	✔	—	—	✔
PE49	LMCD	Lost motion compensation timing	0	0.1 ms	✔	—	—	✔
PE50	LMCT	Lost motion compensation non-sensitive band	0	pulse kpulse	✔	—	—	✔
PE51	—	For manufacturer setting	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	—	—	—	—	—

Tab. A-22:   List of extension setting 2 parameters for MR-JE-C (2)

A.3.7 Extension setting 3 parameters (PF□□)

No.	Symbol	Name	Initial value	Unit	Standard mode			Profile mode
					P	S	T	pp/pv/tq
PF01	—	For manufacturer setting	0000H	—	—	—	—	—
PF02	—		0000H	—	—	—	—	—
PF03	—		0000H	—	—	—	—	—
PF04	—		0	—	—	—	—	—
PF05	—		0	—	—	—	—	—
PF06	—		0000H	—	—	—	—	—
PF07	—		1	—	—	—	—	—
PF08	—		1	—	—	—	—	—
PF09	*FOP5	Function selection F-5	0003H	—	✔	✔	✔	✔
PF10	—	For manufacturer setting	0000H	—	—	—	—	—
PF11	—		0000H	—	—	—	—	—
PF12	—		10000	—	—	—	—	—
PF13	—		100	—	—	—	—	—
PF14	—		100	—	—	—	—	—
PF15	—		2000	—	—	—	—	—
PF16	—		0000H	—	—	—	—	—
PF17	—		10	—	—	—	—	—
PF18	—		0000H	—	—	—	—	—
PF19	—		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	Instantaneous power failure tough drive - 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	1/min	✔	✔	✔	✔
PF32	—	For manufacturer setting	50	—	—	—	—	—
PF33	—		0000H	—	—	—	—	—
PF34	—		0000H	—	—	—	—	—
PF35	—		0000H	—	—	—	—	—
PF36	—		0000H	—	—	—	—	—
PF37	—		0000H	—	—	—	—	—
PF38	—		0000H	—	—	—	—	—
PF39	—		0000H	—	—	—	—	—
PF40	—		0	—	—	—	—	—
PF41	—		0	—	—	—	—	—
PF42	—		0	—	—	—	—	—

Tab. A-23: *List of extension setting 3 parameters for MR-JE-C (1)*

No.	Symbol	Name	Initial value	Unit	Control mode			
					Standard mode			Profile mode
					P	S	T	pp/pv/tq
PF43	—		0	—	—	—	—	—
PF44	—		0	—	—	—	—	—
PF45	—	For manufacturer setting	0000H	—	—	—	—	—
PF46	—		0	—	—	—	—	—
PF47	—		0000H	—	—	—	—	—
PF48	—		0000H	—	—	—	—	—

Tab. A-23:   *List of extension setting 3 parameters for MR-JE-C (2)*

A.3.8 Positioning control parameters (PT□□) (Only profile mode)

No.	Symbol	Name	Initial value	Unit	Profile mode pp/pv/tq
PT01	*CTY	Command mode selection	0300H	—	✔
PT02	—	For manufacturer setting	0001H	—	—
PT03	*FTY	Feeding function selection	0000H	—	✔
PT04	—	For manufacturer setting	0000H	—	—
PT05	ZRF	Home position return speed	100.00	1/min	✔
PT06	CRF	Creep speed	0.00	1/min	✔
PT07	ZST	Home position shift distance	0	10^{-3} degree pulse	✔
PT08	—	For manufacturer setting	0	—	—
PT09	DCT	Travel distance after proximity dog	0	10^{-3} degree pulse	✔
PT10	ZTM	Stopper type home position return stopper time	100	ms	✔
PT11	ZTT	Stopper type home position return torque limit value	15.0	%	✔
PT12	—	For manufacturer setting	0	—	—
PT13	—		100.00	—	—
PT14	—		0	—	—
PT15	LMPL	Software limit +	0000h	10^{-3} degree pulse	✔
PT16	LMPH				✔
PT17	LMNL	Software limit –	0000h	10^{-3} degree pulse	✔
PT18	LMNH				✔
PT19	—	For manufacturer setting	0000h	—	—
PT20	—				—
PT21	—		0000h	—	—
PT22	—				—
PT23	—		0	—	—
PT24	—		0	—	—
PT25	—		0	—	—
PT26	*TOP2	Function selection T-2	0000H	—	✔
PT27	—	For manufacturer setting	0000H	—	—
PT28	—		8	—	—
PT29	*TOP3	Function selection T-3	0000H	—	✔
PT30	—	For manufacturer setting	0	—	—
PT31	—		0	—	—
PT32	—		0000H	—	—
PT33	—		0000H	—	—
PT34	—		0000H	—	—
PT35	—		0000H	—	—
PT36	—		0000H	—	—
PT37	—		10	—	—
PT38	—		0000H	—	—
PT39	—		100	—	—
PT40	—		0	—	—
PT41	ORP	Home position return inhibit function selection	0000H	—	—

Tab. A-24: *List of positioning control parameters for MR-JE-C (profile mode) (1)*

No.	Symbol	Name	Initial value	Unit	Profile mode
					pp/pv/tq
PT42	—		0	—	—
PT43	—	For manufacturer setting	0	—	—
PT44	—		0000H	—	—
PT45	HMM	Home position return method	37	—	✔
PT46	—		0000H	—	—
PT47	—	For manufacturer setting	0000H	—	—
PT48	—		0000H	—	—
PT49	TQS	Torque slope	0.0	%/s	✔
PT50	PVC	Profile speed command	100.00	1/min	✔
PT51	MPVC	Maximum profile speed	20000.00	1/min	✔
PT52	VLMT	Speed limit	500.00	1/min	✔
PT53	—		0000H	—	—
PT54	—	For manufacturer setting	0000H	—	—
PT55	—		0000H	—	—
PT56	—		0000H	—	—
PT57	ZSTH	Home position shift distance (extension parameter)	0	10^{-3} degree pulse	✔
PT58	—	For manufacturer setting	0	—	—
PT59	DCTH	Travel distance after proximity dog (extension parameter)	0	10^{-3} degree pulse	✔
PT60	*TOP8	Function selection T-8	0000H	—	✔
PT61	HMA	Home position return acceleration time constant	0	ms	✔
PT62	HMB	Home position return deceleration time constant	0	ms	✔
PT63	ZSP2L	Zero speed 2 level	50.00	1/min	✔
PT64	ZSP2F	Zero speed 2 filtering time	10	ms	✔
PT65	INP2R	In-position 2 output range	100	10^{-3} degree pulse	✔
PT66	INP2F	In-position 2 output filtering time	10	ms	✔
PT67	SA2R	Speed reached 2 output range	20.00	1/min	✔
PT68	SA2F	Speed reached 2 output filtering time	10	ms	✔
PT69	—		0000H	—	—
PT70	—		0000H	—	—
PT71	—		0000H	—	—
PT72	—		0000H	—	—
PT73	—		0000H	—	—
PT74	—		0000H	—	—
PT75	—	For manufacturer setting	0000H	—	—
PT76	—		0000H	—	—
PT77	—		0000H	—	—
PT78	—		0000	—	—
PT79	—		0000	—	—
PT80	—		0000	—	—

Tab. A-24:   *List of positioning control parameters for MR-JE-C (profile mode) (2)*

A.3.9   Network setting parameters (Pr. PN□□) (Only Ethernet communication)

No.	Symbol	Name	Initial value	Unit
PN01	—	For manufacturer setting	0	—
PN02	CERT	Communication error detection time	1000	ms
PN03	—		0000H	—
PN04	—		0000H	—
PN05	—		0000H	%
PN06	—	For manufacturer setting	0000H	—
PN07	—		0000H	—
PN08	—		0000H	—
PN09	—		1	—
PN10	EIC	Ethernet communication time-out selection	0	s
PN11	*IPAD1	IP address setting 1	192	—
PN12	*IPAD2	IP address setting 2	168	—
PN13	*IPAD3	IP address setting 3	3	—
PN14	*IPAD4	IP address setting 4	0	—
PN15	*SNMK1	Subnet mask setting 1	255	—
PN16	*SNMK2	Subnet mask setting 2	255	—
PN17	*SNMK3	Subnet mask setting 3	255	—
PN18	*SNMK4	Subnet mask setting 4	0	—
PN19	DGW1	Default gateway setting 1	192	—
PN20	DGW2	Default gateway setting 2	168	—
PN21	DGW3	Default gateway setting 3	3	—
PN22	DGW4	Default gateway setting 4	1	—
PN23	*KAA	KeepAlive time	3600	s
PN24	*IPAF1	IP address filter 1	0	—
PN25	*IPAF2	IP address filter 2	0	—
PN26	*IPAF3	IP address filter 3	0	—
PN27	*IPAF4	IP address filter 4	0	—
PN28	IPFR2	IP address filter 2 range setting	256	—
PN29	IPFR3	IP address filter 3 range setting	256	—
PN30	IPFR4	IP address filter 4 range setting	256	—
PN31	*IPOA1	Operation specification IP address 1	0	—
PN32	*IPOA2	Operation specification IP address 2	0	—
PN33	*IPOA3	Operation specification IP address 3	0	—
PN34	*IPOA4	Operation specification IP address 4	0	—
PN35	*IPOR3	Operation specification IP address 3 range specification	256	—
PN36	*IPOR4	Operation specification IP address 4 range specification	256	—

Tab. A-25:   *List of network setting parameters for MR-JE-C (1)*

No.	Symbol	Name	Initial value	Unit
PN37	—	For manufacturer setting	0000H	—
PN38	—		0000H	—
PN39	—		0000H	—
PN40	—		0000H	—
PN41	—		0000H	—
PN42	—		0000H	—
PN43	—		0000H	—
PN44	—		0000H	—
PN45	—		0000H	—
PN46	—		0000H	—
PN47	—		0000H	—
PN48	—		0000H	—

Tab. A-25:   *List of network setting parameters for MR-JE-C (2)*

NOTE

The following parameters cannot be used with CC-Link IE Field Network Basic communication.

– PN10 (Ethernet communication time-out selection)

– PN23 (KeepAlive time)

NOTES

To enable a parameter whose symbol is preceded by *, turn off the power for 1 s or more after setting and turn it on again. However, the time will be longer depending on a setting value of Parameter PF25 (instantaneous power failure tough drive - detection time) when "Instantaneous power failure tough drive selection" is enabled in parameter PA20.

The symbols in the control mode column mean as follows.

– P: Position control mode

– S: Speed control mode

– T: Torque control mode

– pp/pv/tq: Profile mode

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Index

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