

MR-JE Servo amplifier MR-JE-10A to MR-JE-300A

Instructions and Cautions for Safe Use of AC Servos

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MITSUBISHI ELECTRIC CORPORATION

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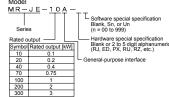
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Contents of the package Unpack the product and check the rating plate to see if the servo motor is as you ordered.

Contents	Quantity
Servo amplifier	1
Open tool for servo amplifier power supply connector	1
MR-JE Servo amplifier Instructions and Cautions for Safe Use of AC Servos (This guide)	1

A CS SERVO MODEL MR_JE-10.A SER \$33001001 MODEL MR_JE-10.A SER \$33001001 MODEL MR_JE-10.A SER \$33001001 MODEL MR_JE-10.A SER \$3001001 MODEL MR_JE-10.A SER \$3001001 MODEL MR_JE-10.A SER \$3001001 MODEL MR_JE-10.A SER \$3001001 MODEL MR_JE-10.A SER \$3001001001 MODEL MR_JE-10.A SER \$3001001 MODEL MR_JE-10.A SE	Serial number Model Capacity Applicable power supply Rafed output current Standard, Manual number Ambient temperature IP rating KC certification number, The year and month of manufacture Country of origin
Warning plate	Model





1. About the manuals

1.1 MELSERVO MR-JE relevant manuals
This installation guide explains how to mount MR-JE servo amplifiers.
If you have any questions about the operation or programming of the equipment described in this guide, contact your local sales office. In addition, when you mount a protective device, specific technical skills which are not detailed in the guide will be

1.2 Purpose of this guide
This installation guide explains the safe operation of MR-JE servo amplifiers for engineers of machinery manufacturers and machine operators. For detailed information of the products, refer to "MR-JE-A Servo Amplifier Instruction Manual"

2. About safety

This chapter explains safety of users and machine operators. Please read the chapter carefully before mounting the equipment. In this installation guide, the specific warnings and cautions levels are classified as follows.

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

Only professional engineers should mount MR-JE servo amplifiers. Here, professional engineers are persons who have taken proper engineering training qualified persons who are engaged in electrical equipment. Please not

2.2 Applications of the devices MR-JE servo amplifiers comply with the following safety standards IEC/EN 61800-5-1, IEC/EN 61800-3

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2.3 Correct use MR-JE servo amplifiers within specifications (voltage, temperature, etc. Refer to "MR-JE-_A Servo Amplifier Instruction Manual" for details.). Mitsubish Electric Co. accepts no claims for liability if the equipment is used in any lifer way or if modifications are made to.

WARNING •It takes 15 minutes for capacitor discharging. Do not touch the unit and terminals immediately after power off.

2.3.1 Peripheral device and power wiring
 (1) Local wiring
 Use only copper wires rated at 75 °C for wiring. The following table shows the wire sizes [AWG] symbols rated at 75 °C.

		Wire [AWG]			
Servo amplifier	(Note 2) L1/L2/L3/⊕	P+/C	(Note 1,2) U/V/W/⊕		
MR-JE-10A/MR-JE-20A/MR-JE-40A/MR-JE-70A/MR-JE-100A/ MR-JE-200A/MR-JE-300A	14	14	14		

Select wire sizes depending on the rated output of the servo motors. In evamplifiers.

amplifiers.

Screw size: M4
Tightening torque: 1.2 [N-m]
Recommended crimp terminals record by JST)
Crimping too: VFT-60-21 (Manufactured by JST)

(2) Selection example of MCCB and fuse When a servo amplifier is protected by T class fuses or circuit breaker having an interrupting rating not less than 300 A effective value and 240 V maximum, use T class fuses or molded-case circuit breaker (UL489 Listed MCCB) as the following table. The T class fuses and molded-case circuit breakers in the table are selected examples based on rated I/O of the servo amplifiers. When you select a smaller capacity servo motor to connect it to the servo amplifier, you can also use smaller capacity T class fuses or molded-case circuit breaker than ones in the table. For selecting once other than Class T fuses and molded-case circuit breakers below, refer to "MR-JE-_A Servo Amplifier instruction Manual".

•		
Servo amplifier	Molded-case circuit breaker (240 V AC)	Fuse (300 V)
MR-JE-10A/MR-JE-20A/MR-JE-40A/MR-JE-70A	NF50-SWU-5A (50 A frame 5 A)	10 A
MR-JE-70A (Note)/MR-JE-100A	NF50-SWU-10A (50 A frame 10 A)	15 A
MR-JE-200A/MR-JE-300A	NF50-SWU-15A (50 A frame 15 A)	30 A

Note. For 1-phase 200 V AC power input

(3) Power supply This servo amplifier can be supplied from star-connected supply with grounded neutral point of overvoltage category III set forth in IEC/EN 60664-1. However, when you use the neutral point for single phase supply, a reinforced insulating transformer is required in the power input section. For the interface power supply, use an external 24 V DC power supply with reinforced insulation on I/O terminals.



2.3.2 EU compliance
The MR-JE servo amplifiers are designed to comply with the following directions to meet requirements for mounting, using, and periodic technical inspections: EMC directive (2004/108/EC), and Low-voltage directive (2006/95/EC).

EMC requirement MR.JE servo amplifiers comply with category C3 in accordance with IEC/EN 61800-3. Use a EMC filter and surge protector on the primary side. As for I/O signal wires (max. length 10 m) and encoder cables (max. length 50 m) connect them to a shielded grounding. However, when the encoder cable length is longer than 30 m for MR.JE-70A and MR.JE-100A, set a radio noise filter (FR-BIF) to the input power supply side of the servo amplifier. The

70A and MR-JE-100A, set a radio noise filter (FR-BIF) to the input power supply side of the servo amplifier. The following shows recommended products. EMC filter: Soshin Electric HF3000A-UN series Surge protector: Okaya Electric Industries RSPD-250-U4 series Radio noise filter: Mitsubishi Electric FR-BIF - MR-JE Series are not intended to be used on a low-voltage public network which supplies domestic premises; - radio frequency interference is expected if used on such a network. The installer shall provide a guide for Installation and use, including recommended mitigation devices.

(2) For Declaration of Conformity (DoC) Hereby, MITSUBISHI ELECTRIC EUROPE B.V., declares that the servo amplifiers are in compliance with the necessary requirements and standards (2004/108/EC and 2006/95/EC). For the copy of Declaration of Conformity, contact your local sales office.

2.3.3 USA/Canada compliance
This servo amplifier is designed in compliance with UL 508C and CSA C22.2 No.14.

(1) Installation
The minimum cabinet size is 150% of MR-JE servo amplifier's volume. Also, design the cabinet so that the ambient temperature in the cabinet is 55°C or less. The servo amplifier must be installed in the metal cabine environment, the units should be used in open type (UL 50) and overvoltage category III or lower. The servo amplifier needs to be installed at or below of pollution degree 2. For connection, use copper wires.

(2) Short-circuit current rating (SCCR)
Suitable For Use On A Circuit Capable Of Delivering Not More Than 100 kA rms Symmetrical Amperes, 500 Volts

(3) Overload protection characteristics
The MR-JE servo amplifiers have solid-state servo motor overload protection. (It is set on the basis (full load current) of 120% rated current of the servo amplifier.)

(4) Over-temperature protection for motor Motor Over temperature sensing is not provided by the drive.

(5) Capacitor discharge It takes 15 minutes for capacitor discharging. Do not touch the unit and terminals immediately after power off.

(6) Branch circuit protection
For installation in United States, branch circuit protection must be provided, in accordance with the National To literation of the Control of the

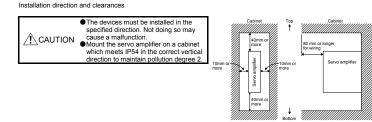
2.3.4 South Korea compliance
This product complies with the Radio Wave Law (KC mark). Please note the following to use the product.
이 기기는 업무용 (A급) 전자파직함기기로서 판 매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의
지역에서 사용하는 것을 목적으로 합니다.
(The product is for business use (Class A) and meets the electromagnetic compatibility requirements. The seller and the user must note the above point, and use the product in a place except for home.)

2.4 General cautions for safety protection and protective measures Observe the following items to ensure proper use of the MELSERVO MR-JE servo amplifiers

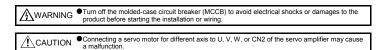
- (1) For installing systems, only qualified personnel and professional engineers should perform.
- (2) When mounting, installing, and using the MELSERVO MR-JE servo amplifier, always observe standards and directives applicable in the country.

2.5 Disposal Disposal of unusable or irreparable devices should always occur in accordance with the applicable country-specific waste disposal regulations. (Example: European Waste 16 02 14)

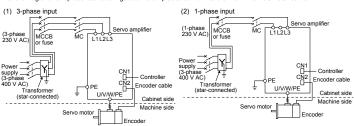
3. Mounting/dismounting



4. Electrical Installation and configuration diagram



The following shows representative configuration examples to conform to the IEC/EN/UL/CSA standards



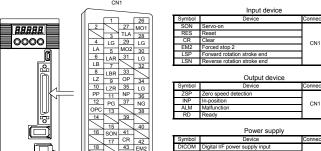
The control circuit connectors described by rectangles are safely separated from the main circuits described by circles. The connected motors will be limited as follows.

5.2 I/O device
The following shows typical I/O devices. For the other devices, refer to "MR-JE-_A Servo Amplifier Instruction Manual":

HF-KN/HF-SN series servo motors (Mfg.: Mitsubishi Electric)

5. Signals

5.1 Signal
The following shows CN1 connector signals as a typical
example. For the other connector details, refer to "MR-JE_A Servo Amplifier Instruction Manual".



This is in position control mode

6. Maintenance and service

WARNING To avoid an electric shock, only qualified personnel should attempt inspections. For repair and parts replacement, contact your local sales office.

 Do not perform insulation resistance test on the servo amplifier. Otherwise, it may cause a malfunction.
 Do not disassemble and/or repair the equipment on customer side. **!**CAUTION

It is recommended that the following points periodically be checked.

- (1) Check for loose screws on the protective earth (PE) terminal. Retighten any loose screws. (tightening torque: 1.2
- (2) Servo motor bearings, brake section, etc. for unusual noise.
- (3) Check the cables and the like for scratches or cracks. Perform periodic inspection according to operating
- (4) Check that the connectors are securely connected to the servo motor
- (5) Check that the wires are not coming out from the connector
- (6) Check for dust accumulation on the servo amplifier
- (7) Check for unusual noise generated from the servo amplified (8) Check the servo motor shaft and coupling for connection.

6.2 Parts having service lives

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Trice lives of the following parts are listed below. However, the service lives vary depending on operation and vironment. If any fault is found in the parts, they must be replaced immediately regardless of their service lives. For ts replacement, please contact your local sales office.

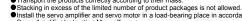
Part name	Life guideline
Smoothing capacitor	(Note) 10 years
Relay	Number of power-on and forced stop times: 100 000 times
Cooling fan	50,000 hours to 70,000 hours (7 years to 8 years)

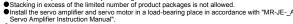
Note. The characteristic of smoothing capacitor is deteriorated due to ripple currents, etc. The life of the capacitor greatly depends on ambient temperature and operating conditions. The capacitor will reach the end of its life in 10 years of continuous operation in normal air-condit environment (40 °C surrounding air temperature or less).

7. Transportation and storage

Transport the products correctly according to their mass.

When you keep or use it, please fulfill the following environment.





Do not get on or put heavy load on the equipment.
 Do not hold the lead of the built-in regenerative resistor when carrying the servo amplifier.

Item			Environment		
A bi 4	Operation [°C]		0 to 55 Class 3K3 (IEC/EN 60721-3-3)		
Ambient temperature	Transportation (Note)	[°C]	-20 to 65 Class 2K4 (IEC/EN 60721-3-2)		
	Storage (Note)	[°C]	-20 to 65 Class 1K4 (IEC/EN 60721-3-1)		
Ambient humidity	Operation, transportation, storage		5 %RH to 90 %RH		
	Test values		10 Hz to 57 Hz with constant deviation of 0.075 mm 57 Hz to 150 Hz with constant acceleration of 9.8 m/s² (1 g) to IEC/EN 61800-5-1 (Test Fc· IEC 60068-2-6)		
Vibration load	Operation		5.9 m/s ² (0.6 g)		
	Transportation (Note)		Class 2M3 (IEC/EN 60721-3-2)		
	Storage		Class 1M2 (IEC/EN 60721-3-2)		
Pollution degree			2		
IP rating			IP20 (IEC/EN 60529)		
ii raung			Open type (UL 50)		
Altitude	Operation, storage		Max. 1000 m above sea level		
Ailitude	Transportation		May 10000 m abous see lovel		

8 Technical data

Item		MR-JE-10A/MR-JE-20A/MR-JE-40A/MR-JE-70A	MR-JE-100A/MR-JE-200A/MR-JE-300A			
Power supply	Line voltage	3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz /60 Hz	3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz			
опри	Interface (SELV)		24 V DC, (required current capacity: 300 mA)			
Control method		Sine-wave PWM control, current control method				
Pollution de		2 (IEC/EN 60664-1)				
Overvoltage category		III (IEC/EN 60664-1)				
Protection of		I (IEC/EN 61800-5-1)				
Short-circuit	t current rating (SCCR)	100 kA				

8.2 Servo amplifier dimensions

Side

Servo amplifier	Variabl	Mass [kg]		
Oct to diffpillion	W	Н	D	Middo [Ng]
MR-JE-10A/MR-JE-20A/MR-JE-40A	50	168	135	0.8
MR-JE-70A/MR-JE-100A	70	168	185	1.5
MR-JE-200A/MR-JE-300A	90	168	195	2.1

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[Warranty]

Warranty period and coverage

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

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

.imitations]

You are requested to conduct an initial failure diagnosis by yourself, as a general rule. It can also be carried out by us or our service company upon your request and the actual cost will be charged. However, it will not be charged if we are responsible for the cause of the failure.

This limited warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are set forth in the instruction manual and user manual for the Product and the caution label affixed to the Product.

Seven during the term of warranty, the repair cost will be charged on you in the following cases.

(a) a failure caused by your improper storing or handling, carelessness or regilgence, etc., and a failure caused by your hardware or software problem.

(i) a failure caused by your improper storing of handling, carefessness or negligence, etc., and a failure caused by your hardware or software problem and a salive caused by any alteration, etc. to the Product made on your side without our approval.

(iii) a failure which may be regarded as avoidable, if your equipment in which the Product is incorporated is equipped with a safety device required by applicable leaves and has any function or structure considered to be indispensable according to a common sense in the industry (iv) a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and replaced (v) any replacement of consumable parts (battery, fan, smoothing capacitor, etc.)

(v) a failure caused by external factors such as inevitable accidents, including without limitation fire and abnormal fluctuation of voltage, and consumer than the cause of the product limitation entirequake, lightning and natural disasters

(vii) a failure company in the introseceable cause with a scientific technology that was not available at the time of the shipment of the Product from our company.

(wii) a failure generated by an unforeseeable cause with a scientific technology that was not available at the tile from our company(viii) any other failures which we are not responsible for or which you acknowledge we are not responsible for Term of warranty after the stop of production

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

Service in overseas countries

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

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

Change of Product specifications

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

Application and use of the Product

Application and use of the Product
) For the use of our General-Purpose AC Servo, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in General-Purpose AC Servo, and a backup or fail-safe function should operate on an external system to General-Purpose AC Servo when any failure or malfunction occurs.

Our General-Purpose AC Servo is designed and manufactured as a general purpose product for use at general industries. Therefore, applications substantially influential on the public interest for such as atomic power plants and other power plants of electric power companies, and also which require a special quality assurance system, including applications for rallway companies and government or public offices are not recommended, and we assume no responsibility for any failure caused by these applications when used.

In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatments, railway service, incineration and fuel systems, man-operated material handling equipment, entertainment machines, safety machines, etc. are not recommended, and we assume no responsibility for any failure caused by these applications when used.

We will review the acceptability of the abovementioned applications, if you agree not to require a specific quality for a specific application. Please contact us for consultation.