MITSUBISHI ELECTRIC

General-Purpose AC Servo

MITSUBISHI SERVO AMPLIFIERS & MOTORS

MELSERVO

EXTENSION IO UNIT

MR-J3-D01

INSTALLATION GUIDE

C

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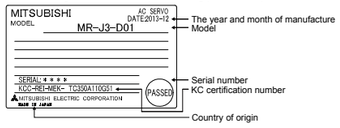
Rating plate

The following shows an example of rating plate for explanation of each item.



1. About this installation guide

1.1 Manual

This installation guide explains how to mount MR-J3-D01.
If you have any questions about the operation 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 required.

1.2 Purpose of this guide

This installation guide explains for engineers of machinery manufacturers and machine operators. For details of servo amplifiers on which MR-J3-D01 is mounted, refer to each instruction manual or specification of the servo amplifiers.

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

2.1 Professional engineer

Only professional engineers should mount MR-J3-D01.
Here, professional engineers are persons who have taken proper engineering training.
Check if applicable technical training is available at your local Mitsubishi Electric office. Contact your local sales office for schedules and locations.

2.2 Correct use

Always use MR-J3-D01 within specifications (voltage, temperature, etc. Refer to chapter 7 of this installation guide for details.).
Mitsubishi Electric Co. accepts no claims for liability if the equipment is used in any other way or if modifications are made to the device, even in the context of mounting and installation.

2.2.1 Selection of peripheral equipment and wire

For details of MCCB, fuses, and wire selections of servo amplifiers on which MR-J3-D01 is mounted, refer to each instruction manual or specification of the servo amplifiers.
MR-J3-D01 has a part for grounding on the frame (FG). Fix the metal part FG of MR-J3-D01 with a screw to ground.

2.2.2 EU compliance

The servo amplifiers on which MR-J3-D01 is mounted 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).

(1) EMC requirement

The servo amplifiers on which MR-J3-D01 is mounted comply with category C3 in accordance with IEC/EN 61800-3. As for I/O wires (max. length 10 m) and encoder cables (max. length 50 m), use shielded wires and ground the shields. Use an EMC filter and surge protector on the primary side. The following shows recommended products.
EMC filter: Soshin Electric HF3000A-UN series
Surge protector: Okaya Electric Industries RSPD-250-U4 series
- MELSERVO 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.

2.2.3 USA/Canada compliance

The servo amplifiers on which MR-J3-D01 is mounted are designed in compliance with UL 508C and CSA C22.2 No.14.

(1) Installation

The minimum cabinet size is 150% of each MR-J4 servo amplifier's volume including MR-J3-D01. Also, design the cabinet so that the ambient temperature in the cabinet is 55 °C or less. MR-J3-D01 and servo amplifier must be installed in a metal cabinet. For environment, the units should be used in open type (UL 50) and overvoltage category III or lower. MR-J3-D01 and servo amplifier needs to be installed at or below of pollution degree 2. For connection, use only copper wires.

(2) Short-circuit current rating (SCCR)

Each servo amplifier on which MR-J3-D01 is mounted has checked with a short-circuit test.

(3) Overload protection characteristics

The servo amplifier on which MR-J3-D01 is mounted has servo motor overload protective function. (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. Integral thermal protection(s) is necessary for motor and refer to chapter 4 for the proper connection.

(5) Capacitor discharge

It takes 15 minutes for capacitor discharging of the servo amplifier on which MR-J3-D01 is mounted. 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 Electrical Code and any applicable local codes.
For installation in Canada, branch circuit protection must be provided, in accordance with the Canada Electrical Code and any applicable provincial codes.

2.2.4 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) 전자파적합기기로서 판 매자 또는 사용자는 이 점을 주의하시기 바라며 , 가정외의 지역에서 사용하는 것을 목적으 로 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. In addition, use a ferrite core and line noise filter for inputs and outputs.)

2.3 General cautions for safety protection and protective measures

Observe the following items to ensure proper use of the servo amplifiers on which MR-J3-D01 is mounted.

(1) Only qualified personnel and professional engineers should perform system installation.

(2) When mounting, installing, and using them, always observe standards and directives applicable in the country.

(3) They fulfill the requirements to conducted emissions at the main connections in the frequency range from 150 kHz to 30 MHz. (Bases for the evaluation: Product standard IEC/EN 61800, adjustable speed electrical power drive systems, Part 3: EMC)

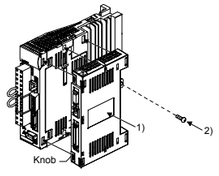
2.4 Disposal

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)

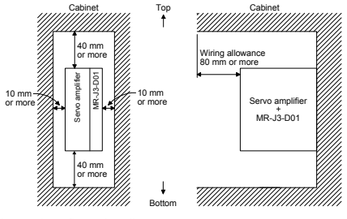
3. Mounting/dismounting

⚠ CAUTION
- The devices must be installed in the specified direction. Not doing so may cause a malfunction.
- Mount the servo amplifier on a cabinet which meets IP54 in the correct vertical direction to maintain pollution degree 2.

The following shows an example of mounting procedures of a 200 V class 100 W servo amplifier. For details of other servo amplifiers, refer to each instruction manual or specification of the servo amplifiers on which MR-J3-D01 is mounted.



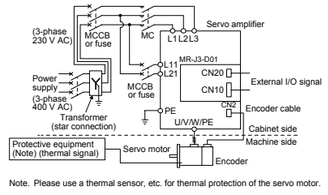
1) Remove the cap of CN7 connector of the servo amplifier, and push the four corners of the side of MR-J3-D01 simultaneously to the servo amplifier until the four knobs click so that CN7 is connected straight.
2) Tighten the metal part FG with the enclosed installing screw (M4 × 6).



4. Electrical Installation and configuration diagram

⚠ WARNING
- Turn off the molded-case circuit breaker (MCCB) to avoid electrical shocks or damages to the product before starting the installation or wiring.

The following shows a representative configuration example. The control circuit connectors described by rectangles are safely separated from the main circuits described by circles.
For 3-phase 230 V AC input



Note. Please use a thermal sensor, etc. for thermal protection of the servo motor.

5. Maintenance and service

This chapter explains servo amplifiers on which MR-J3-D01 is mounted.

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

5.1 Inspection items

It is recommended that the following points periodically be checked.

(1) Check for loose terminal screws of the servo amplifier. Retighten any loose screws.

(2) Check 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 conditions.

(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 amplifier.

(8) Check the servo motor shaft and coupling for connection.

5.2 Parts having service lives

MR-J3-D01 has no parts for replacement.

6. Transportation and storage

⚠ CAUTION
- Transport the products correctly according to their mass.
- Stacking in excess of the limited number of product packages is not allowed.
- Install the equipment in a load-bearing place in accordance with each instruction manual or specification of the servo amplifiers on which MR-J3-D01 is mounted.
- Do not get on or put heavy load on the equipment.

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

Item			Environment
Ambient temperature	Operation	[°C]	0 to 55 Class 3K3 (IEC/EN 60721-3-3)
	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% to 90 %RH
Vibration resistance	Test condition		10 Hz to 57 Hz with amplitude of 0.075 mm 57 Hz to 150 Hz with constant acceleration of 9.8 m/s² to IEC/EN 61800-5-1 (Test Fc of IEC 60068-2-6)
	Operation		5.9 m/s²
	Transportation (Note)		Class 2M3 (IEC/EN 60721-3-2)
	Storage		Class 1M2 (IEC/EN 60721-3-2)
Pollution degree			2
IP rating			Mounted on a servo amplifier: IP20 (IEC/EN 60529) MR-J3-D01 (single): IP00 (IEC/EN 60529)
			Open type (UL 50)
Altitude	Operation, storage		1000 m or less above sea level
	Transportation		10000 m or less above sea level

Note. In regular transport packaging

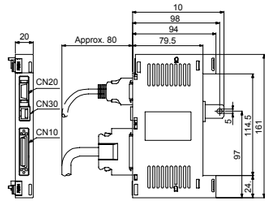
7. Technical data

7.1 MR-J3-D01

Item	Description
Model	MR-J3-D01
Function	Additional digital input/output, additional analog input/output, external digital display connection
Digital input	Photocoupler insulator 24 V DC (external supply) Sink/source compatible, internal limit resistor: 5.6 kΩ
Digital output	16 points, photocoupler insulator, open collector 24 V DC (external supply) Sink/source compatible, permissible current: 40 mA or less, inrush current: 100 mA or less
Analog input	2 channel input voltage: -10 V to +10 V DC, internal resistor: 12 kΩ, resolution: 12 bits
Analog output	2 channel input voltage: -12 V to +12 V DC, maximum output current: 1 mA, resolution: 12 bits
+15 V output for analog input signal	Available as analog input signal power supply Output voltage: +15 V, permissible current: 30 mA
Accessory	Fixing screw (M4) × 1
Mass [g]	140

7.2 Dimensions

[Unit: mm]



[Warranty]

1. Warranty period and coverage

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

[Term]

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

[Limitations]

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

2. Term of warranty after the stop of production

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

3. Service in overseas countries

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

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

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

5. Change of Product specifications

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

6. Application and use of the Product

(1) For the use of our General-Purpose AC Servo, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in General-Purpose AC Servo, and a backup or fail-safe function should operate on an external system to General-Purpose AC Servo when any failure or malfunction occurs.
(2) Our General-Purpose AC Servo is designed and manufactured as a general purpose product for use at general industries. Therefore, applications substantially influential on the public interest for such as atomic power plants and other power plants of electric power companies, and also which require a special quality assurance system, including applications for railway companies and government or public offices are not recommended, and we assume no responsibility for any failure caused by these applications when used.
In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatments, railway service, incineration and fuel systems, man-operated material handling equipment, entertainment machines, safety machines, etc. are not recommended, and we assume no responsibility for any failure caused by these applications when used.
We will review the acceptability of the abovementioned applications, if you agree not to require a specific quality for a specific application. Please contact us for consultation.