

Mitsubishi Electric AC Servo System MELSERI/O-MR-J5 Servo amplifier Model MR-J5-10_10 MR-J5-700_ MR-J5-80_4_10 MR-J5-700_4 MR-J5W2-22_10 MR-J5W2-3014_ MR-J5W3-222_1 MR-J5W3-444_

Safety Instructions and Precautions for AC Servos

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MITSUBISHI ELECTRIC CORPORATION

Specifications are subject to change without notice. Compliance with the indicated global standards and regulations is current as of the release date of this installation guide. The original instructions for Europe are in English.

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Contents of the package

IB(NA)-0300391-1/2401)MEE

Unpack the product and check the rating plate to see if the servo amplifier is as you ordered.						
Contents	Quantity					
Servo amplifier	1					
MELSERVO-J5 Series Safety Instructions and Precautions for AC Servos (This guide)	1					

Rating plate
The following shows an example of rating plate for explanation

Regulation/legislation marking
An example of regulation/legislation marking is shown

of each item.	
CLUNCE TON CREE BY A SENSOR MODEL MR15-100 ST. SAMPLEON POWER 15-100 WIND MR. SAMPLEON POWER 1500 ST. SAMPLEON POWER 1500 ST	CC-Link IE TSN Class Serial number Model Capacity Applicable power supply Rated output Standard, manual numb Ambient temperature IP rating KC number
Marriage plate	- Date of manufacture - Country of origin



ning plate

Model
following shows an example of warning plate. The following describes what each block of a model name indicates

The felletting cherre all example of t	anning plate. The lenewing december mat each block of a meder hame	
WARNING WE	Not all combinations of the symbols are available.	
WARNING 管信 ・ では、またが、このでは、このでは、このでは、このでは、このでは、このでは、このでは、このでは	MR - J S W2 - 2 2 G Solves Number of saes Pyroof Names Spring Rated odget Spring Spring	ply / AC to o 480 1
□ ・	200 2 444 0.4	

1. About the manuals

To use the MELSERVO-J5 series safely, read MR-J5 User's Manual carefully.

1.1 MELSERVO-J5 relevant manuals
This installation guide explain common MR-J5 servo amplifiers. You can also check it with our website for free.

http://www.mitsubishielectric.com/fa/
If you have any questions about the operation and programming of the equipment described in this guide, contact your ocal sales office. 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-J5 servo amplifiers for engineers of machinery manufacturers and machine operators. This installation guide does not explain how to operate machines in which safe servo system is, or will be integrated. For detailed information of the products, refer to MR-J5 User's Manual.

1.3. Terms related to safety
1.3.1 IEC 61800-5-2 Stop function
STO function (Refer to IEC 61800-5-22016 4.2.3.2 STO.) The MR-J5 servo amplifiers have the STO function. The STO function shuts down energy to servo motors, thus removing forque. This function electronically cuts off power supply in the servo amplifier. The servo amplifier without the CN8 connector do not support this function. STO function does not support Stop category 1 and 2 for IEC/EN 60204-1.

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.

	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.
In this installation guid	le, cautionary items such as precautions that may lead to property damages, and instructions for

other functions are classified as "POINT"

2.1 Professional engineer
Only professional engineers should mount MR-J5 servo amplifiers.
Here, professional engineers should meet all the conditions below.
(1) Persons who took a proper training of related work of electrical equipment or persons who can avoid risk based on nast experience.

past experience.

Persons who have read and familiarized himself/herself with this installation guide and operating manuals for the protective devices (e.g. light curtain) connected to the safety control system.

2.2 Applications of the devices MR-J5 servo amplifiers are used to drive servo motors, and comply with the standards shown below. - IEC/EN 61800-5-1/GB 12668.501, IEC/EN 61800-3/GB 12668.3/KN 61800-3 (KS C 9800-3), IEC/EN 60204-1 (Stop.

category)

ISO/EN ISO 13849-1:2015 Category 3 PL e, IEC/EN IEC 62061:2021 maximum SIL 3, IEC/EN 61800-5-2 (STO)

2.3 Correct use Use the MR-J5 servo amplifiers within specifications. Refer to MR-J5 User's Manual for specifications such as voltage, temperature, etc. 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.

WARNING PRisk of electrical shock. Do not touch drive unit and terminals immediately after power-off. Allow approx. 15 minutes for capacitor to discharge.

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2.3.1 Peripheral device and power wiring
The followings are selected based on IEC/EN/UL 61800-5-1, and CSA C22.2 No. 274.

(1) Power Wiring (local wiring and crimping tool)
The following table shows the stranded wire sizes [AWG] and the crimp terminal symbols rated at 75 °C.

THE TONOTHING LUDIO	0110110 1110	ou an aoa mi	o oizoo į, i	rroj ana mo	ormip tom	mid oyinboid	ratea at re	٠.						
Tabl	e 1. Recor	mmended wir	es		Tabl	e 2. Recomm	ended crimp	terminals						
Servo amplifier *2		75 °C stranded	d wire [AWG]	1"4		Servo amplif term								
Servo ampillier	L1/L2/L3	L11/L21	P+/C	U/V/W/E "1	Symbol	Crimp terminal	Applicable tool	Manufacturer						
MR-J5-10_/MR-J5-20_/					a	R2-4	YHT-2210							
MR-J5-40_/MR-J5-60_(4)_/ MR-J5-70_/MR-J5-100_(4)_/	14: a "3					b	3.5-R4	YHT-2210	JST (J.S.T. Mfa.					
MR-J5-200 (4) (T)/	14. d				14: a *3	С	R5.5-4	YHT-2210	Co., Ltd.)					
MR-J5-350_4_]	l		d	8-4NS, R8-5	YHT-8S, YA-4	,,						
MR-J5-200_(S)	40. h 3	14	12: b " ³ 14 1											
MR-J5-350_	12: D -			14 14	12: b *3									
MR-J5-500_	10: c *3		l	8: d "3										
MR-J5-700_	8: d *3	1												
MR-J5-500_4_	14: a ¹³	1		12: b *3										
MR-J5-700_4_	12: b ^{*3}		l	10: c *3										

terminals. Refer to Table 2 for recommended crimp terminals.

(2) Selection example of MCCB and semiconductor fuse
Use UL recognized semiconductor fuses or molded-case circuit breaker (UL 489 Listed MCCB) as the following
table. The semiconductor 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 semiconductor fuses or molded-case circuit breaker than those listed
in the table. To select different semiconductor fuses and molded-case circuit breakers from those listed in the
table, and for selection of the motor circuit breaker (Type E combination motor controller), refer to "MR-J5 User's
Manual (Hardware)".

Servo amplifier (200 V class) *1	Molded-case circuit breaker (240 V AC) SCCR 50 kA	Semiconductor fuse (700 V) SCCR 100 kA
MR-J5-10_/MR-J5-20_/MR-J5-40_/MR-J5-60_(T)/MR-J5-70_(T)/MR-J5W2-22_(T)	NF125-SVU-15A (125 A frame 15 A)	170M1408 (10 A)
MR-J5-60_ (S)/MR-J5-70_ (S) /MR-J5-100_ (T)/MR-J5W2-22_ (S)/ MR-J5W2-44_ (T)/MR-J5W3-222_ (T)	NF125-SVU-15A (125 A frame 15 A)	170M1409 (16 A)
MR-J5-100_(S)/MR-J5-200_(T)/MR-J5W2-44_(S)/MR-J5W2-77_(T)/ MR-J5W2-1010_/MR-J5W3-222_(S)/MR-J5W3-444_(T)	NF125-SVU-15A (125 A frame 15 A)	170M1412 (32 A)
MR-J5-200_ (S)/MR-J5-350_/MR-J5W2-77_ (S)/MR-J5W3-444_ (S)	NF125-SVU-20A (125 A frame 20 A)	170M1413 (40 A)
MR-J5-500_	NF125-SVU-30A (125 A frame 30 A) *2	170M1415 (63 A)
MR-J5-700_	NF125-SVU-40A (125 A frame 40 A) *2	170M1416 (80 A)

*1 "(S)" means 1-phase 200 V AC power input and "(T)" means 3-phase 200 V AC power input in the table.
*2 For the use under the conditions of UL Listed, select a semiconductor fuse.

Servo amplifier (400 V class)	Molded-case circuit breaker (480 V AC) SCCR 30 kA	Semiconductor fuse (700 V) SCCR 100 kA
MR-J5-60_4_/MR-J5-100_4_	NF125-SVU-15A (125 A frame 15 A) *1	170M1408 (10 A)
MR-J5-200_4_	NF125-SVU-15A (125 A frame 15 A) 11	170M1409 (16 A)
MR-J5-350_4_	NF125-SVU-15A (125 A frame 15 A) 11	170M1412 (32 A)
MR-J5-500_4_	NF125-SVU-20A (125 A frame 20 A) 11	170M1413 (40 A)
MR-J5-700_4_	NF125-SVU-30A (125 A frame 30 A) 11	170M1414 (50 A)

*1 For the use under the conditions of LIL Listed, select a semiconductor fuse



product.
(5) Motor overload and Over temperature protection
The overload protection of the servo motor does not include a thermal memory function, and is not speed
sensitive. The servo amplifier cannot detect overheating of the servo motor. The servo motors are protected by the
servo motor overheat protection function of the servo amplifiers (a protection characteristic based on 120 % of the
rated current). To provide the servo motor with overheat protection, use a magnetic contactor (electromagnetic
switch) with a thermal relay. Alternatively, install al thermal sensor or equivalent equipment near the rating plate of
the servo motor to check that the servo motor temperature is under 105 °C with sensing device. (Refer to Chapter
4)

2.3.2 Europe/UK compliance The CE/UKCA marking proves the compliance of the servo product with the essential requirements specified in the relevant EU Directives and UK Regulations, and this marking also applies to machines and equipment incorporating.

Services Consider the Constitution of the Cons

Line noise filter. Misubishi Electric FR-8IF

MR-JS Series are not intended to be used on a low-voltage network which supplies domestic premises; electromagnetic interderence is expected if used on such a network. The installer shall provide a guide for installation and use, including recommended mitigation devices. To avoid the risk of crosstatik to signal cables, the installation instructions shall either recommend that the power interface cable be segregated from signal cables. Install the DC power supply for I/O signals of the servo amplifiers on the same cabinet. Do not connect the other electric devices to the DC power supply.

[2] For Declaration of Conformity (DoC)

We declaration of Conformity (DoC).

We declare that the servo amplifiers are in compliance with EC directives (Machinery directive (2006/42/EC), EMC directive (2014/36/EU), Low-voltage directive (2014/35/EU), and RoHS directive (2011/65/EU, (EU) 2015/663)) and applicable regulations of the UK. 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 61800-5-1 and CSA C22.2 No. 274.

servo amplifier is designed in compliance with UL 5180U-5-1 and CSA CZ2.2 No. 2/4. Installation The minimum cabinet size is 150 % of each MR-J5 servo amplifier's volume. Also, design the cabinet so that the ambient temperature in the cabinet is 60 °C or less. The servo amplifier must be installed in the metal cabinet. Additionally, mount the servo amplifier on a cabinet that the protective earth based on the standard of IEC/EN 60204-1 is correctly connected. For environment, the units should be used in open type (UL 50) and overvoltage category shown in table in section 8.1. The servo amplifier needs to be installed at or below pollution degree 2. For

category strong in Table in section 6.1. The servo ampline needs to be installed at or below 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, 240 Volts Maximum for 200 V AC servo amplifiers, or Not More Than 100 kA rms Symmetrical Amperes, 480 Volts Maximum for 400 V AC servo amplifiers, For SCCR (25 kA and 50 kA) when using a motor circuit breaker (Type E combination motor controller), refer to "MR-J5 User's Manual (Hardware)".

[3] Branch circuit protection
For installation in United States, branch circuit protection must be provided, in accordance with the National Electrical Code and any amplicable level codes.

Electrical Code and any applicable local codes.

To dea and any applicable local codes.

To installation in Canada, branch circuit protection must be provided, in accordance with the Canadian Electrical Code and any applicable provincial codes.

2.34 South Korea compliance
Products that bear the KC mark comply with the Radio Wave Law. Please note the following to use the product.
이 기기는 업무용 (A) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정의의 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.)
In addition, use an EMC filter, surge protector, ferrite core, and line noise filter on the primary side for inputs. Use a ferrite core and line noise filter for outputs.

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

(1) Only qualified personnel and professional engineers should perform the installation of safety components and (2) When mounting, installing, and using the MR-J5 servo amplifier, always observe the standards and directives applicable in the respective countries.

applicable in the respective countries. Residual risk. Be sure that all safety related switches, relays, sensors, etc., meet the required safety standards. Perform all risk assessments and safety level certification to the machine or the system as a whole. If the upper and lower power module in the servo amplifier are shorted and damaged simultaneously, the servo motor may make a half revolution at a maximum.

waste disposal regulations. (example: European waste 16 02 14)

2.7. Lithium battery transportation

To transport lithium batteries, take actions to comply with the instructions and regulations such as the United Nations
(UN), the International Civil Aviation Organization (ICAO), and the International Maritime Organization (IMO)

The batteries (MR-BAT6V1SET, MR-BAT6V1SETA, and MR-BAT6V1) are assembled batteries from two batteries
(lithium metal battery CR17335A) which are not subject to the dangerous goods (Class 9) of the UN Recommendations.

*1 For MR-J5-500 4 or MR-J5-700 4 , keep 70 mm or more for wiring

3. Mounting/dismounting

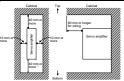
(4) Only qualified personnel are authorized to install, start-up, repair or service the machines in which these components are installed. Only trained engineers should install and operate the equipment. (ISO 13849-1:2015 Table F. 1 No. 5)
 (5) Separate the wiring for safety sub-function from other signal wirings. (ISO 13849-1:2015 Table F.1 No. 1)
 (6) Protect the cables with appropriate ways (routing them in a cabinet, using a cable guard, etc.).
 (7) Keep the required clearance/creepage distance depending on voltage you use.

2.6 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)

Installation direction and clearances
POINT

To prevent malfunction, install the servo amplifier in the specified direction.

Mount the servo amplifier on a cabinet which meets IP54 in the correct vertical direction to maintain pollution degree



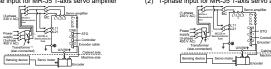
4. Electrical Installation and configuration diagram

POINT

The installation complies with IEC/EN 60204-1. The voltage supply to machines must be 20 ms or more of tolerand against instantaneous power failure as specified in IEC/EN 60204-1.

●To prevent unexpected movement of the servo motor, securely connect the wire with the specified method and torque.

The following shows representative configuration examples to conform to the IEC/EN/UL/CSA standards. The connectors described by rectangles are safely separated from the main circuits described by circles. (1) 3-phase input for MR-J5 1-axis servo amplifier (2) 1-phase input for MR-J5 1-axis servo amplifier



1 When the wire sizes of L1 and L11 are the same, MCCB or semiconduc 2 For 1-phase 200 V AC servo amplifiers, connect the lines to L1 and L3. 3 For 400 V class, a step-down transformer is not required.

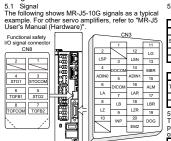
"3- for 4 ut) v cass, a step-down transformer is not required.

Connectable motors are limited as follows:

(1) Servo motors manufactured by Mitsubishi Electric (HK/LM/TM series)

(2) Other servo motors complying with IEC 60034-1 which are used with a Mitsubishi Electric serial interface-compatible encoder or with an A/B/Z-phase differential output type encoder

5. Signals



5.3 Signals and STO state
The following table shows the STO1 and STO2 states when the power is on in normal state and STO1 and STO2 are on (closed)

6 Maintenance service and trouble shooting

Only qualified personnel should attempt inspections.

For repair and parts replacement, contact your local sales office.

Inspection items
recommended that the following points periodically be checked
Check for loose terminal block screws. Retighten any loose so

Servo amplifier						Tig	ghtenir	g torq	ue [N•	m]					
		L2	L3	N-	P3	P4	P+	С	D	L11	L21	U	٧	W	⊕
MR-J5-10 /MR-J5-20 /MR-J5-40 /MR-J5-60 (4) / MR-J5-70 /MR-J5-100 (4) /MR-J5-200 (4) / MR-J5-350 (4) /MR-J5-500 (4) /MR-J5-700 (4)								1.2							
MR-J5W															

(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

Check the causes africa are line for solutions of solutions.

Check that the wires are not coming out from the connector.

Check that the wires are not coming out from the connector.

Check for dust accumulation on the servo amplifier.

Check for unusual noise generated from the servo amplifier.

Check the servo motor shaft and coupling for connection.

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

6.2 Parts having service life
Service life of the following parts is listed below. However, the service life varies depending on operation and
environment. If any fault is found in the parts, they must be replaced immediately regardless of their service life. For
parts replacement, please contact your local sales office.

oothing capacitor Total number of power-ons, stops by a dynamic brake, and forced stops: 100,000 time 50,000 hours to 70,000 hours (7 years to 8 years) Approximately 20,000 hours (equipment power supply: off, ambient temperature: 20 °C 5 years from date of manufacture

When MR-J5 1-axis servo amplifier is being used in combination with a rotary servo motor that requires battery to configure an absolute position detection system, and if being used with either MR-BAT6V1SET or MR-BAT6V1SET-A. For details and other battery backup time, refer to "MR-J5" User's Manual (Hardware).

2 Quality of the batteries degrades by the storage condition. The battery life is 5 years from the production date regarded not be connection status. If a 3-phase power supply is used, the service life of the capacitor is 10 years under continuous operation in air-conditioned environments (ambient temperatures of 40 °C or less at altitudes of up to 1000 m and 30 °C or less at altitudes of over 1000 m.). The characteristic of smoothing capacitor is deteriorated due to ripple currents, etc. The service life of the capacitor greatly varies depending on ambient temperatures and operating conditions.

an under the repeated and operating continuous.

6.3 Trouble shooting for STO
When the input signals status (STO1 / STO2) do not same, and the fault detected by the diagnostic function, the alarm number [AL. 068 STO diagnosis error] is displayed on the LED of the servo amplifier.

Transport the products correctly according to their mass.

Transport are products correctly according to mer mass.

For detailed information on transportation and handling of the battery, refer to "MR-J5 User's Manual (Hardware)".

Install the product in a load-bearing place of servo amplifier and servo motor in accordance with the User's manual.

Do not put excessive load on the machine.

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

	Operation	Transportation	Storage
Ambient temperature	0 °C to 60 °C (non-freezing) Class 3K3 (IEC 60721-3-3)	-25 °C to 70 °C (non-freezing) Class 2K12 (IEC 60721-3-2)	-25 °C to 70 °C (non-freezing) Class 1K4 (IEC 60721-3-1)
Ambient humidity	5 %RH to 95 %RH (non-condensing)	5 %RH to 95 %RH (non-condensing)	5 %RH to 95 %RH (non-condensing)
Ambience	Indoors (no direct sunlight); no corrosive gar		
Altitude/ atmospheric pressure	Altitude: Max. 2000 m *1	Transportation conditions: Overland/sea transportation, or transporting by an airplane whose cargo compartment is pressurized at 700 hPa or higher	Atmospheric pressure: 700 hPa to 1060 hPa (Equivalent to altitudes from -400 m to 3000 m)
Vibration resistance	Under intermittent vibration: 10 Hz to 57 Hz, displacement amplitude 0.075 mm 57 Hz to 150 Hz, acceleration amplitude 9.08 ms 9.08 ms 9.08 ms 10 Hz (IEC 60721-3-3) Under continuous vibration (X, Y, Z axes): 10 Hz to 55 Hz, acceleration amplitude 5.9 ms/s	2 Hz to 9 Hz, displacement amplitude (single amplitude) 7.5 mm 9 Hz to 200 Hz, acceleration amplitude 20 m/s ² Class 2M3 (IEC 60721-3-2)	2 Hz to 9 Hz, displacement amplitude (single amplitude) 1.5 mm 9 Hz to 200 Hz, acceleration amplitude 5 m/s ² Class 1M2 (IEC 60721-3-1)

*1 For the restrictions on the use of this product at altitude exceeding 1000 m, refer to MR-J5 User's Manual (Hardware)

8. Specifications

0.1 1	in t-00 Sci vo amplino								
Item		MR-J5-10 /MR-J5-20 /MR-J5-40 / MR-J5-60 7MR-J5-70 7MR-J5-100 / MR-J5-200 /MR-J5W2-22 / MR-J5W2-44 /MR-J5W2-77 / MR-J5W3-222 /MR-J5W3-444 _	MR-J5-350 /MR-J5-500 / MR-J5-700_/MR-J5W2-1010_	MR-J5-60_4_/MR-J5-100_4_/ MR-J5-200_4_/MR-J5-350_4_/ MR-J5-500_4_/MR-J5-700_4_					
Main circuit (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	3-phase 380 V AC to 480 V AC, 50 Hz/60 Hz					
Power supply	Control circuit (line voltage)	1-phase 200 V AC to 2-	40 V AC, 50 Hz/60 Hz	1-phase 380 V AC to 480 V AC, 50 Hz/60 Hz					
	Interface (SELV)	24 V DC (required current capacity: MR-J5- A _ 500 mA; MR-J5- G _ 300 mA; MR-J5W2- G _ 350 mA; MR-J5W3- G _ 450 mA; MR-J5- B _ 300 mA; MR-J5W2- B _ 350 mA; MR-J5W3- B _ 450 mA)							
Contro	l method	Sine-wave PWM control, current control method							
Pollutio	on degree	2 (IEC/EN 60664-1)							
Overvo	oltage category	III (IEC/EN 60664-1)							
Protect	tive class	I (IEC/EN 61800-5-1)							
Enclos	ure	Open type, IP20 (The IP rating of the terminal block for the MR-J5-500_ and MR-J5-700_ is IP10.)							
Short-c	circuit current rating (SCCR)	100 kA							

8.2 Functional safety

		Specifications							
	Item	MR-J5G(4)_/MR-J5A(4)_/MR-J5A(4)-RJ_/ MR-J5B(4)_/MR-J5B(4)-RJ_/MR-J5WB_	MR-J5G(4)-RJ_/MR-J5WG_						
Safety sub-fu	nction	STO (IEC/EN 61800-5-2)							
	Standards	EN ISO 13849-1:2015 Category 3 PL e, IEC 61508 SIL 3, EN IEC 62061:2021 maximum SIL 3, EN 61800-5-2	EN ISO 13849-1:2015 Category 4 PL e, IEC 61508 SIL 3, EN IEC 62061:2021 maximum SIL 3, EN 61800-5-2						
	Response performance	8 ms or less (STO inpu	t off → energy shut off)						
Safety	Test pulse input (STO) "1	Test pulse interval: 1 Hz to 25 H	z, test pulse off time: Up to 1 ms						
performance	Mean time to dangerous failure (MTTFd)	MTTFd ≥ 100 [years] (314a)	MTTFd ≥ 100 [years] (750a)						
	Diagnostic coverage (DC)	DC = Medium, 97.6 [%]	DC = Medium, 96.5 [%]						
	Probability of dangerous Failure per Hour (PFH)	PFH = 6.4 × 10 ⁻⁹ [1/h]	PFH = 3 × 10 ⁻⁹ [1/h]						
1	Mission time (T _M) "2	T _M = 20 [years]							

1 A test pulse is a signal which instantaneously turns off a signal to the servo amplifier at a constant period for external circuit to selfdiagnose.

12 The performance of special proof tests within the mission time of the product is regarded as not necessary, however, the diagnostic interval is erformance of special proof tests within the mission time of the product is regarded as not nec ested as at least one test per three months for Category 3 PL e, SIL 3 on IEC 61800-5-2:2016.

Servo amplifier	Varia	[mm]	Mass [kg]	
Servo ampillier	W	Н	D	iviass [kg]
MR-J5-10_/MR-J5-20_/MR-J5-40_	40	172	135	0.8
MR-J5-60_	40	172	170	1.0
MR-J5-70_/MR-J5-100_	60	172	185	1.4
MR-J5-200_/MR-J5-350_	90	172	195	2.2
MR-J5-500_	105	250	200	3.7
MR-J5-700_	170	300	200	6.2
MR-J5W2-22_/MR-J5W2-44_	60	172	195	1.5
MR-J5W2-77_/MR-J5W2-1010_	85	172	195	1.9
MR-J5W3-222_/MR-J5W3-444_	75	172	195	1.8
MR-J5-60_4_/MR-J5-100_4_	60	172	195	1.6
MR-J5-200_4_	90	172	195	2.2
MR-J5-350_4_	90	172	195	2.3
MR-J5-500_4_	130	250	200	5.2
MR-J5-700 4	130	250	200	5.4



,	Servo amplifier	Variable dimensions [mm]						Screw size
		а	a1	b	С	d	d1	f
f	MR-J5-10_/MR-J5-20_/MR-J5-40_/ MR-J5-60_	6	6	156 ± 0.5	6			M5
	MR-J5-60_4_/MR-J5-70_/ MR-J5-100_(4)_	12	12	156 ± 0.5	6	42 ± 0.3		M5
	MR-J5-200_(4)_/MR-J5-350_(4)_	6	6	156 ± 0.5	6	78 ± 0.3		M5
	MR-J5W2-22_/MR-J5W2-44_	6	6	156 ± 0.5	6			M5
_	MR-J5W2-77_/MR-J5W2-1010_	6	6	156 ± 0.5	6	73 ± 0.3		M5
	MR-J5W3-222_/MR-J5W3-444_	6	6	156 ± 0.5	6	63 ± 0.3		M5
	MR-J5-500_	6	6	235 ± 0.5	7.5	93 ± 0.5	93 ± 0.5	M5
	MR-J5-700_	5	5	285 ± 0.5	7.5	160 ± 0.5	160 ± 0.5	M5
	MR-J5-500_4_/MR-J5-700_4_	6	6	235 ± 0.5	7.5	118 ± 0.5	118 ± 0.5	M5
r user documentation								

9. Check list for user do

MITSUBISHI

The following items must be satisfied by the initial test operation at least. The manufacturer/installer must be responsible for checking the standards in the items. Maintain and keep this checklist with related documents of machines to use this for periodic inspection.

1. Is it based on directive/standard applied to the machine?

2. Is directive/standard contained in Declaration of Conformity (DoC)?

3. Does the protection instrument conform to the category required?

4. Are electric shock protective measures (protective class) effective?

5. Is the STO function checked (test of all the shut-off wiring)?

Checking the items will not be instead of the first test operation or periodic inspection by professional engineer

Warranty I. 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 outsomer 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]
For terms of warranty, please contact your original place of purchase.
[Limitations]

[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 Produ

to the Product.

(3) Even during the term of warranty, the repair cost will be charged on you in the following cases;

1. a failure caused by your improper storing or handling, carelessness or negligence, etc., and a failure caused by your hardware or software problem

2. a failure caused by any alteration, etc. to the Product made on your side without our approval

3. 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

device required by applicable laws and has any function or structure considered to be industry
asses in the industry
a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained
and replaced
any replacement of consumable parts (battery, fan, smoothing capacitor, etc.)
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 initiation earthquake, fightning and natural dissaters

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.

any other failures which we are not responsible for or which you acknowledge we are not responsible for

8. any other failures which we are not responsible un or writion you acknowled to the second of the product of the form of production.

(1) We may accept the repair at charge for another seven (7) years after the production of the product is disconlinued. The anonouncement of the stop of production for sead 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

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 loss in opportunity and secondary loss from warranty liability

Regardless of the grats warranty term, Misubish shall not be liable for compensation to:

(1) Damages caused by any cause found not to be the responsibility of Misubish.

(2) Loss in opportunity, lost profits incurred to the user by Failures of Misubish products.

(3) Special damages and secondary damages whether foreseeable or not, compensation for damages to products other than Misubishi products.

ent by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Change of Product specifications

6. Application and use of the Product

Application and use of the Product
 10 For the use of our AC Servo, its applications should be those that may not result in a serious damage even if any failure or mafunction occurs in AC Servo, and a backup or falk-safe function should operate on an external system to AC Servo when any failure or maffunction occur and influenction occur.
 20 Our 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 s when used, applications which may be substantially influential to human lives or properties for such as airlines, medical treatments

In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatment 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. Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.