MITSUBISHI Mitsubishi Electric AC Servo System

MELSERVO SYSTEM MR-J5 Servo amplifier

iviodei		
MR-J5-10 to MF		
MR-J5-60_4_ to	MR-J5-25K_4_	
MR-J5W2-22_to	MR-J5W2-7070_	
MR-J5W3-222_,	MR-J5W3-444_	1
Safety In:	structions and Precautions for AC Servos	r
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MITSUBISHI ELECTRIC CORPORATION HEAD OFFIC

IB(NA)-0300391ENG-K(2410)

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Contents of the package Unpack the product and check the rating plate to see if the servo amplifier is as you ordered Quantity Servo amplifier MELSERVO-J5 Series Safety Instructi Rating plate Regulation/legislation marking The following shows an example of rating plate for explanation An example of regulation/legislation marking is shown of each item. AC SERVO (E 🛛 🕅 Model March Second Part MODEL MR-15-100 Second Part POWER 100W Part Part MPUL Model 200V Date Part MULTIC 200V Date Part Part</t ⊕ MITSUBISHI ELECTRIC CORPORATION - Date of manuf Warning plate Model The following shows an example of warning plate. The following describes what each block of a model name indicates Not all combinations of the symbols are available. MR - J 5 W2 - 22 G Series Number of axes Symbol Number MR - J 5 W2 - 22 G Number of axes WARNING 警告 一本 · FEXCELECTION SHOCK CONDITION-CHINE UNIT OF FENSION AS MEETINED AFTER CONSISTENCES.OFT FENSION FAMILY STATEMENTS FOR CONSISTENCES.OFT L Software special specification Blank, Jn, Sn, Un, Nn, etc. ALSO AND A CONCELECTIONE OF INSTOLICHER LYWPUPCA CORLAGE LISTE APPERLA MEE FORSTENSION LE TENSION Hardware special specification Blank or 2 to 5 digit alphanume (RJ, ED, PX, RU, RZ, etc.) Power supply Symbol Power supply None 3-phase or 1-phase 200 V AC to 240 V A 4 3-phase 380 V AC to 480 V AC ▲ -SELLS LES DESIDICTELRS RCD DE TYPE B SONT AUTORISES. ▲ ·有動电的危险、电空切断后请勿立刻触摸模块及端· 都。电容弱放电雾要15分钟。 Rated codput Rated codput WH 10 0.1 Symbol Rated codput HWI 20 0.2 22 0.2 0.2 40 0.4 70 0.75 0.75 70 0.75 1071 1 1 100 1 22 0.2 0.2 0.2 20 0.2 0.2 0.2 0.2 0.2 40 0.4 70 0.75 1071 1 100 1 22 0.2 0.2 0.2 200 2 444 0.4 0.4 0.4 A General-purpose inte G Network B SSCNET III/H CLASS EQUIPMENT CONNECT PROTECTING EASTHIPFI, APPAREL DE CLASSE L'ICULIURS INCOURCEN LE CONJUCTEURO APPAREL DE CLASSE L'ICULIURS INCOURCEN LE CONJUCTEURO



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

- MELSERVO-05 relevant manuals
 MELSERVO-05 relevant manuals
 This installation guide explains how to mount MR-J5 servo amplifiers. You can also check it with our website for free. http://www.misubshielectric.com/fa/
- http://www.mistubishielectric.com/fa/ If you have any questions about the operation and 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

Purpose of this guide

- 1.2 Furpose or 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 61800-5-2:2016 4.2.3.2 STO.) The MR-J5 servo amplifiers have the STO function. The STO STO function (Reter to IEC 61600-5-220164; Sto 32.53 (C)) The MR-35 SerVo ampliners have time 51 O 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 amplifiers without the CN8 connector do not support this function. STO function does not support Stop category 1 and 2 for IEC/EW 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.
ACALITICN	Indicates that incorrect handling may cause however, conditions, you thing is madium as clight initial

CAUTION Indicates that incorrect handling may cause hazardous conditions, resulting in me In this installation guide, cautionary items such as precautions that may lead to property damages, and instructions for other functions are classified as "POINT".

- 2.1 Professional engineers
 2.1 Professional engineers
 3.1 Professional engineers
- (2) 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 syster 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.
- AWARNING •Risk of electrical shock. Do not touch drive unit and terminals immediately after power-off. Allow approx. 15 minutes for capacitor to discharge.

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.

- (I) Power supply This servo amplifier can be supplied from star-connected supply with grounded neutral point of overvoltage category III. For the interface power supply, use an external 24 V DC power supply with reinforced insulation on U/O terminals.
- (2) G
- I/O terminals. Grounding To prevent an electric shock, always connect the protective earth (PE) of the cabinet. Do not connect two grounding cables to the same protective earth (PE) terminal. Always connect cables to the terminals

This product can cause a DC current in the protective earthing conductor. To protect direct/indirect contact using an earth-leakage current breaker (RCD), only an RCD of type B can be used for the power supply side of the

(3) Motor overload and Over temperature protection

(4) Power Wiring (local wiring and crimping tool)

labl	e 1. Recon	nmended wi	res			Table 2. Recomm		ninals			
Servo amplifier "2	75 °C stranded wire [AWG] "4					Servo amplifi term					
Servo ampliner -	L1/L2/L3	L11/L21	P+/C	U/V/W/E "1	Symbol	Crimp terminal "2	Applicable tool	Manufacture			
MR-J5-10_/MR-J5-20_/					а	R2-4	YHT-2210				
//R-J5-40_/MR-J5-60_(4)_/					b	3.5-R4	YHT-2210				
MR-J5-70_/MR-J5-100_(4)_/ MR-J5-200_(4)_ (T)/ MR-J5-350_4	14: a " ³			14: a " ³	с	R5.5-4	YHT-2210				
MR-J5-200_(S)	12: b " ³	14	14		d	8-4NS, R8-5	YHT-8S, YA-4				
MR-J5-350_	12: D -			12: b *3	е	FVD22-6	YF-1				
MR-J5-500_	10: c *3			8: d *3	f '1	38-6	YF-1				
MR-J5-700_	8: d *3			6: d -	g	FVD8-6	YF-1	JST (J.S.T. Mfg			
MR-J5-12K_	4:e		12: i	4:e	h	FVD14-6	YF-1	Co., Ltd.)			
MR-J5-17K_	2: f	14: k	14: k	14: k	14: k	10: i	2: f	i	FVD5.5-6	YNT-1210S	. , ,
MR-J5-25K_	1/0: j		10: I	2/0: o	1'1	R60-8	YF-1				
MR-J5-500_4_	14: a "3			12: b ^{*3}	k	FVD2-4	YNT-1614				
MR-J5-700_4_	12: b ^{*3}	14	14	14	10: c *3	1	FVD5.5-8	YNT-1210S			
MR-J5W	14: a " ³			14	m	FVD2-6	YNT-1614				
/R-J5-12K_4_	8: g		14: m	8: g	n '1	R22-8	YF-1				
/IR-J5-17K_4_	6: h	14: k	12: i	6: h	0 "	CB70-S8	YF-1				
IR-J5-25K 4	4: n		12: I	4: n	*1 Coat t	he crimping part v	vith an insulation	tube			

Co., Ltd. are available. The wire sizes can be selected based on the rated current of the servo motors. The values in the table are sizes based on rated output of the servo or equivalent ones.

ampliners. "(S)" means 1-phase 200 V AC power input and "(T)" means 3-phase 200 V AC power input in the table. 3 The crimo terminals are used only for grounding

C - inclusion in the table.
 The crimp terminals are used only for grounding.
 The alphabetical letters in the table inclusion the symbols of the recommended crimp terminals. Refer to Table 2 for recommended crimp terminals.

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Tel - +81_3_3218_2111

The minimized register is table 2 in the under inherity of the recommended chimp terminals. Recommended of the treatminute chimp terminals.
 Selection example of MCCB and semiconductor fuse or molded-case circuit breaker (UL 489 Listed MCCB) as the following table. The semiconductor fuses or molded-case circuit breakers in the table are selection examples based on rated I/O of the servo amplifiers and are suitable for output servo motor conductor protection. The maximum rating of the servo motor branch short-circuit/ground-fault protective device can be selected based on the rated input current of the servo amplifier. When you select a smaller capacity servo motor concort it to the servo amplifier. When you select 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) "	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)
//R-J5-60_ (S)///R-J5-70_ (S) ///R-J5-100_ (T)///R-J5W2-22_ (S)/ //R-J5W2-44_ (T)///R-J5W3-222_ (T)	NF125-SVU-15A (125 A frame 15 A)	170M1409 (16 A)
<pre>//R-J5-100_(S)/MR-J5-200_(T)/MR-J5W2-44_(S)/MR-J5W2-77_(T)/ //R-J5W2-1010_/MR-J5W3-222_(S)/MR-J5W3-444_(T)</pre>	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)
//R-J5-700_	NF125-SVU-40A (125 A frame 40 A) ^{*2}	170M1416 (80 A)
MR-J5-12K_	NF125-SVU-75A (125 A frame 75 A) ^{*2}	170M1418 (125 A)
MR-J5-17K_	NF125-SVU-100A (125 A frame 100 A) 12	170M1419 (160 A)
//R-J5-25K_	NF250-SVU-150A (250 A frame 150 A) 2	170M1421 (250 A)

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

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) 11	170M1408 (10 A)
MR-J5-200_4_	NF125-SVU-15A (125 A frame 15 A) 1	170M1409 (16 A)
MR-J5-350_4_	NF125-SVU-15A (125 A frame 15 A) ¹	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)
MR-J5-12K_4_	NF125-SVU-40A (125 A frame 40 A) ¹¹	170M1416 (80 A)
MR-J5-17K_4_	NF125-SVU-50A (125 A frame 50 A) ¹¹	170M1418 (125 A)
MR-15-25K 4	NE125-SV/L754 (125 A frame 75 A) 1	170M1418 (125 A)

For the use under the conditions of UL Listed, select a semiconductor fuse

2.3.2 Europe/UK compliance to call and a serie a semication loss.
2.3.2 Europe/UK compliance to 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

(1) EMC requirement

Jos. EMC requirement IMR-J5 serve amplifiers comply with EN/BS EN IEC 61800-3. As for I/O wires (max. length 10 m), motor cables and encoder cables (max. length 50 m), use shielded wires and ground the shields. Install the surge protector on the primary side of the EMC filter. In addition, use a line noise filter BRE series for inputs and outputs of the 12 kW and 17 kW of 200 V class serve amplifiers. The recommended products are as follows: EMC filter: COSEL FSB Series or Soshin Electric HF3000C-S2B series Surge protector: Okaya Electric Industries RSPD series or Soshin Electric LT-CS-WS series Line noise filter: Mitsubishi Electric FR-BIF, Kitagawa Industries BRE Series MR-J5 Series are not intended to be used on a low-voltage network which supplies domestic premises; electromagnetic interference 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 crosstalk to signal cables, the installation nstructions shall either recommend that the power interface cable be segregated from signal cables. Install the D cower supply for I/O signals of the serve amplifiers in the same cabinet. Do not connect the other electric devices to the DC power supply.

(2)

electric devices to the DC power supply. For Declaration of Conformity (DoC) We declare that the serve amplifiers are in compliance with EC directives (Machinery directive (2006/42/EC), EMC directive (2014/30/EU), Low-voltage directive (2014/35/EU), and RoHS directive (2011/65/EU, (EU) 2015/653)) and applicable regulations of the UK. For the copy of Declaration of Conformity, contact your local sales office. 3 USA/Canada compliance servo amplifier is designed in compliance with UL 61800-5-1 and CSA C22.2 No. 274. Installation

- 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 connection, use copper wires.

category shown in table in section 8.1. The servo amplifier needs to be instance at or berrow portubor begives and connection, use copper wires. 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-JS User's Manual (Hardware)". For installation in United States, branch circuit protection must be provided, in accordance with the National Electrical Crode and any annicable locate codes.

- to inisialation in one of states, brainford of the provided in must be provided, in accordance with the National Electrical Code and any applicable provided. Jode and any applicable provincial codes.

2.3.4 South Korea compliance Products that been the KC mark comply with the Radio Wave Law. Please note the following to use the product. 이 기기는 입무량 (A급) 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

(The product is for business use (Class A) and meets the electromagnetic compatibility requirements. The selier and t 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. The self-declaration of conformity for the applicable models can be checked on the website at the address where the "KC number" of the rated nameplate is in the "KC number" field of the URL below. https://www.rra.go.kr/selform/KC number

24 General caultors for safety protection and protective measures Observe the following items to ensure proper use of the MR-J5 servo amplifiers. (1) Only qualified personnel and professional engineers should perform the installation of safety components and

- systems.
 When mounting, installing, and using the MR-J5 servo amplifier, always observe the standards and directives applicable in the respective countries.
- 2.5 Residual risk
- 2.5 Residual risk
 2.5 Residual risk
 2.5 Residual risk
 2.6 Residual risk
 2.7 Be sure that all safely related switches, relays, sensors, etc., meet the required safety standards,
 2.9 Perform all risk assessments and safety level certification to the machine or the system as a whole.
 3.1 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.
 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 wring for safety sub-function from other signal wrings. (ISO 13849-1:2015 Table F. 1 No. 1)
 (6) Protect the cables write happropriate 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)

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 (IMR-BATGV1SET, IMR-BATGV1SETA, and MR-BATGV1) are assembled batteries from two batteries (lithium metal battery CR17335A) which are not subject to the dangerous goods (Class 9) of the UN Recommendations. 3. Mounting/dismounting

Installation direction and clearance

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 IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree IP54 in the correct vertical direction to maintain pollution degree direction to maintain pollution degree direction to maintain direction to maintain direction dir

The IP rating of the regenerative resistor supplied with the servo amplifier of 12 kW to 25 kW is IP00. Take appropriate safety measures according to the device configuration.



4. Electrical Installation and configuration diagram

• The installation complies with IEC/EN 60204-1. The voltage supply to machines must be 20 ms or more of tolerance 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 When the wire sizes of L1 and L1 are the same. MCCB or semiconductor fuse is not required.
 '2 For 1-phase 200 V AC sance amplifiers, connect the lines to L1 and L3.
 '3 For 400 V class, 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

(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 that the connectors are securely connected to the servo motor. 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 usual 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.

Total number of po Approximately 2

Battery line * 0 Journal of the second secon

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.

7. Environment Transport the products correctly according to their 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.

5 %RH to 95 %RH (no

Transportation -25 °C to 70 °C (non-freezing) Class 2K12 (IEC 60721-3-2)

immable gas, oil mist or dust

transportation, or transporting by an airplane whose cargo compartment is preservized to 200 b Do or bishor

2 Hz to 9 Hz, displacement amplitude (single amplitude) 7.5 mm 9 Hz to 200 Hz, acceleration amplitude

MR-J5-350_/MR-J5-500_/ MR-J5-700_/MR-J5-12K_/ MR-J5-17K_/MR-J5-25K_/ MR-J5W2-1010

se 200 V AC to 2 50 Hz/60 Hz

R-J5-60G4-Hn to MR-J5-350G4-Hn, MR-J5-12K, MR-J5-17K, and MR-J5-25K is IP

lass 2M3 (IEC 60721-3-2)

1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz V DC (required current capacity: MR-J5-_A_, 500 mA; MR-J5W3-_G_, 450 mA; MR-J5-_B_, 300 mA; MR-J5

ions on the use of this product at altitude exceeding 1000 m, refer to MR-J5 User's Manual (Hardwai

MR-J5-10 /MR-J5-20 /MR-J5-40 MR-J5-60 7/MR-J5-70 7/MR-J5-100 MR-J5-200 //MR-J5W2-22 / MR-J5W2-22 //MR-J5W2-77 / MR-J5W2-44 //MR-J5W2-77 /

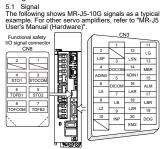
3-phase or 1-phase

EM2 Forced stop 2

OFF OFF ON (S

5. Signals

5.2 I/O device



FCOM TOFCOM signal in STO state TOFB1 Monitor output signal in STO1 state CN8 6 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) or off (opened). TOFB2 M

Output de

Input devic

inal for input sign

2 Monitoring STC 1 ST

 Tightening torque [N•m]

 L1
 L2
 L3
 N P3
 P4
 P4A
 P+
 C
 D
 L11
 L21
 U
 V
 W
 (-1)

10 years

1.2

-25 °C to 70 °C (non-freezi Class 1K4 (IEC 60721-3-1)

Atmospheric pressure: 700 hPa to 1060 hPa (Equivalent to altitudes from -400 m

PHz to 9 Hz, displacement amplitude) single amplitude) 1.5 mm Hz to 200 Hz, acceleration amplitude

MR-J5-200 4 /MR-J5-350 4 MR-J5-200 4 /MR-J5-350 4 MR-J5-500 4 /MR-J5-700 4

300 mA; MR-J5W2-_G_, 350 mA; MR-J5W3- B , 450 mA

380 V AC to 480 V AC

lass 1M2 (IEC 60721-3-1)

1_nhaee

5 %RH to 95 %RH (

6 Maintenance service and trouble shooting

Servo amplifier

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)

J5-12K_(4)_/MF

6.2 Parts having service life

Smoothing capacitor

7. Environment

8. Specifications

8.1 MR-J5 servo amplifie

Item

nterface (SELV)

n circuit (line voltage

ntrol circuit (line volta

Operation °C to 60 °C (non-freezin

Class 3K3 (IEC 60721-3-3)

ltitude: Max 2000 m *1

ndoors (no direct sunlight); no corre

der intermittent vibration: Hz to 57 Hz, displacement amplitude 75 mm Hz to 150 Hz, acceleration amplitude

a m/s² lass 3M1 (IEC 60721-3-3) nder continuous vibration (X, Y, Z axes): 0 Hz to 55 Hz. acceleration amplitude 5.9

5 %RH to 95 %RH (n

Only qualified personnel should attempt inspections. For repair and parts replacement, contact your local sales office

6.1 Inspection items
 It is recommended that the following points periodically be checked
 (1) Check for loose terminal block screws. Retighten any loose science.

8.2 Functional safety

Item		Specifications					
		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-function		STO (IEC/EN 61800-5-2)					
	Standards	EN ISO 13849-1:2015 Category 3 PL e, EC 61508 SIL 3, EN IEC 62061:2021 maximum SIL 3. EN 61800-5-2 EN IEC 62061:2021 maximum SIL 3. EN 61800-5-2					
	Response performance	8 ms or less (STO input off → energy shut off)					
Safety	Test pulse input (STO) "1	Test pulse interval: 1 Hz to 25 Hz, 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]				
	Mission time (T.,) 2	T., = 20	[unam]				

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 ² The performance of special proof tests within the mission time of the product is regarded as not necessary, however, the diagnostic interva suggested as at least one test per three months for Category 3P Let SIL 3 on IEC 61005-5:2016.

83 Dim inting hole process drawing

	Consist annulifiers	Varia			
	Servo amplifier	W	Н	D	Mass [kg]
	MR-J5-10_/MR-J5-20_/MR-J5-40_	40	172	135	0.8
nt Side	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
D.	MR-J5-700_	170	300	200	6.2
	MR-J5-12K_/MR-J5-17K_	220	400	260	12.7
	MR-J5-25K_	260	400	260	18.1
	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
	MR-J5-12K_4_/MR-J5-17K_4_	220	400	260	12.7
	MR-J5-25K 4	260	400	260	18.1

¢		_¶ f
b		
°‡	⊖ a_d	

a1	Servo amplifier MR-J5-10_/MR-J5-20_/MR-J5-40_/	Variable dimensions [mm]						Screw size
		а	a1	b	с	d	d1	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
<u> </u>	MR-J5W2-22_/MR-J5W2-44_	6	6	156 ± 0.5	6	/	/	M5
d →	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
	MR-J5-12K_(4)_/MR-J5-17K_(4)_	12	12	380 ± 0.5	10	196 ± 0.5	196 ± 0.5	M5
	MR-15-25K (4)	12	12	376 + 0.5	12	236 + 0.5	236 + 0.5	M10

9. Check list for user documentation



MR-J5 installation checklist for manufacturer/installer

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?
 Yes
 I. No

 2. Is directive/standard contained in Declaration of Conformity (DoC)?
 Yes
 I. No

 3. Does the protection instrument conform to the category required?
 Yes
 I. No

 4. Are electric shock protective measures (protective class) effective?
 Yes
 I. No

 5. Is the STO function checked (test of all the shut-of wining)?
 Yes
 I. No
- king the items will not be instead of the first test operation or periodic ins

Warranty

Warranty period and coverage

onal engineer

- Term) For terms of warranty, please contact your original place of purchase
- Imitations] 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 five 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 Pro
- to the Product. (3) Even during the term of warranty, the repair cost will be charged on you in the following cases; 1. a faiture caused by your improper storing or handling, carelessness or negligence, etc., and a failure caused by your hardware or software problem 2. a faiture scaused by any alteration, etc. to the Product made on your side without our approval 3. a faiture 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 indispensible according to a common sense in the industry 4. a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and replaced 5. any replacement of consumable parts (battery, fan, smoothing capacitor, ret.) 6. a failure caused by eaternal factors such as inervisible accidents, including without limitation fire and abnormal fluctuation of voltage, and acts of God, including without limitation earthquake, lightning and natural disasters 7. 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 , e not responsible for or which you acknowledge we are not resp

- any other natives which we are not responsible to do which you advisively we are not responsible for a second secon

- (2) release hole mat the Product (including its spare pairs) cannot be ordered after its slop of producaon.
 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. Bease ask your local FA center of details.

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- (2) Dos in Opportunity, lost profils inclured to the deel by railores to instabutish products. (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products. (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

(4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks. 5. <u>Change of Product specifications</u> 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 AC Servo is applications should be those that may not result in a serious damage even if any failure or malfunction occurs in AC Servo, and a backup or fail-safe function should operate on an external system to AC Servo when any

Insultation occurs for the derivative sector of the set function and operate of an existing system on or derivative and failure or mallanction occurs. 9 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 rankwy compan and government or public offices are not recommended, and we assume no responsibility for any failure caused by these

application when used. In addition, applications when used. In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatme railway service, incineration and fuel systems, man-operated material handling equipment, entertainment machines, sately machines, etc. are not recommended, and we assume no responsibility for any failure caused by these applications when use We will review the acceptability for the abovementicmed applications, it you agree not to require a specific quality for a specific We will review the acceptability or use auvernmenter oppression application. Please contact us for consultation.
 (3) Mitsubiah Electric shall have no responsibility or lability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.