

MR-J4 Servo amplifier MR-J4-60 4 to MR-J4-22K 4

Instructions and Cautions for Safe Use of AC Servos

Country/Region	Sales office	Tel/Fax
USA	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway, Vernon Hills, IL 60061, USA	Tel :+1-847-478-2100 Fax :+1-847-478-0327
Germany	Mitsubishi Electric Europe B.V. German Branch Gothaer Strasse 8, D-40880 Ratingen, Germany	Tel :+49-2102-486-0 Fax :+49-2102-486-112
Italy	Mitsubishi Electric Europe B.V. Italian Branch Viale Colleoni 7 1-20041 Agrate Brianza (Milano), Italy	Tel :+39-39-60531 Fax :+39-39-6053312
China	Mitsubishi Electric Automation (China) Ltd. 4F Zhi Fu Plazz, No. 80 Xin Chang Road Shanghai 200003, China	Tel :+86-21-6120-0808 Fax :+86-21-6121-2444
Taiwan	Setsuyo Enterprise Co., Ltd. 6F, No.105 Wu-Kung 3rd Rd, Wu-Ku Hsiang, Taipei Hsine, Taiwan	Tel :+886-2-2299-2499 Fax :+886-2-2299-2509
Korea	Mitsubishi Electric Automation Korea Co., Ltd. 3F, 1480-6, Gayang-dong, Gangseo-gu, Seoul 157-200, Korea	Tel :+82-2-3660-9552 Fax :+82-2-3664-8372
Singapore	Mitsubishi Electric Asia Pte, Ltd. 307 Alexandra Road #05-01/02, Mitsubishi Electric Building Singapore 159943	Tel :+65-6470-2460 Fax :+65-6476-7439

MITSUBISHI ELECTRIC CORPORATION

This guide uses recycled paper. Specifications subject to change without notice. IB(NA)0300197-A(1211)MEE Printed in Japan

Copyright©2012 Mitsubishi Electric Corporation All Right Reserved.
This installation guide does not guarantee the specifications and technical data.

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

MODEL MR-, 14-60B4 POWREI: 6000; NPUT: 3AC380-480V: 1.4A 5.080Hz OUTPUT: 9H323V 0-360Hz 15.05 STD. IECENS1800-51 MAN: IB(NA)3300197 MRS. SURD-MIGRA AT Term: 5570 F22 NC-RE-MRIC- TC300A744361 DATE: 2013-01 MISURBMERET CONFOUNDIN	Model Capacity Applicable power supply Rated output current Standard, Manual number Ambient temperature IP rating KC mark number, The year and month of manufacture Country of origin
Varning plate	Model The following describes what each block of a m

Max. Surrounding Air Temp.: 55°C IP20 KCC-REHMEK-TC300A744051 DATE: 2013-01 MTSUBSH ELECTRIC COPPORATION TOKYD 506510, AMMIL SURMAN	Standard, Manual number Ambient temperature IP rating KC mark number, The year and month of manufacture Country of origin
WARNING	Model The following describes what each block of a model name indicates. Not all combinations of the symbols are available MR - J 4 - 5 0 0 B 4 - Series Rated output 00 0.6 100 1 2000 2 3550 3.5 500 5 7 700 7 11K 11 15K 15 22K 22 Market and specification for each of the symbol properties of

1. About the manuals

1. MELSERVO MR-J4 relevant manuals

This installation guide explains how to mount MR-J4 servo amplifiers. You can also check it with our website for free. http://www.misubishielectric.com/fa/

If you have any questions about the operation or programming of the equipment described in this guide, contact your

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-J4 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 each servo amplifier instruction manual.

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 ndicates that incorrect handling may cause hazardous conditions, resulting in medium or slight injury to bersonnel or may cause physical damage. A CAUTION

Professional engineer
 Only professional engineers should mount MR-J4 servo amplifiers
 Here, professional engineers should meet the all conditions below

(1) A person who took a proper engineering training
Please note if you can take a proper engineering training at your local Mitsubishi Electric office. Contact your local
sales office for schedules and locations.

A person who can access to operating manuals for the protective devices (e.g. light curtain) connected to the safety control system. A person who have read and familiarized himself/herself with the manuals.

Applications of the devices

3.44 servo amplifiers comply with the following safety standards.

DIEN ISO 13849-1 Category 3 PL d, IEC/EN 62061 SIL CL 2, IEC/EN 61800-5-2 SIL 2 (STO), IEC/EN 61800-5-1,

JEN 61800-3, IEC/EN 60204-1 MR_J4 servo amplifiers comply with the university and the SEC EVEN 61800-5-2 SIL $_2$ (STO), IEC/EN 62061 SIL CL 2, IEC/EN 61800-5-2 SIL $_2$ (STO), IEC/EN 61800-3, IEC/EN 60204-1 in addition, MR_J4 servo amplifiers can be used with the MR_J3-D05 safety logic unit or safety PLCs.

2.3 Correct use Always use the MR-J4 servo amplifiers within specifications (voltage, temperature, etc. Refer to each instruction manual for details.), Mitsubish Electric Co. accepts no claims for liability if the equipment is used in any other way or if modifications are made to the device, eyen in the context of mounting and installation.

WARNING Of takes 15 minutes for capacitor discharging. Do not touch the unit and terminals immediately

2.3.1 Peripheral device and power wiring
(1) Local wiring and crimping tool
Use only copper wires rated at 60 °C/75 °C for wiring. The following table shows the wire sizes [AWG] and the

crimp terminar symbols rated at 75 °C.	_	Wire (A)	VG] (Note 2)	
Servo amplifier	L1/L2/L3	L11/L21	P+/C	U/V/W/(±) (Note 3)
MR-J4-60_4/MR-J4-100_4 MR-J4-200_4 MR-J4-350_4	14	14	14	14
MR-J4-500_4 (Note 1) MR-J4-700_4 (Note 1)	14: b 12: a		14: b	12: a 10: a
MR-J4-11K_4 (Note 1) MR-J4-15K_4 (Note 1)	10: d 8: f	14: b	14: e 12: d	8: f 6: c
MR-J4-22K_4 (Note 1)	6: g		12: h	4: i

rminal block, be sure to use the screws that come with the terminal block.

imping tools. Refer to the following table for the crimp terminals and crimping tools.

he rated output of the servo motors. The values in the table are sizes based on rated output of the servo

		Servo amplifier-s	ide crimp terminals		
Symbol	Crimp terminal (Note)		Manufacturer		
	Oming terminal (10te)	Body	Head	Dice	
а	FVD5.5-4	YNT-1210S	_		
b	FVD2-4	YNT-1614			
С	FVD14-6	YF-1	YNE-38	DH-122/DH-112	
d	FVD5.5-6	YNT-1210S			
e	FVD2-6	YNT-1614			JST
f	FVD8-6	YF-1	YNE-38	DH-121/DH-111	
g	FVD14-8	YF-1	YNE-38	DH-122/DH-112	
h	FVD5.5-8	YNT-1210S			
i	FVD22-8	YF-1	YNE-38	DH-123/DH-113	

Note. Some crimp terminals may not be mounted depending on the size. Make sure to use the recommended ones or equivalent ones

Note. Some crimp terminals may note the nounteed openanging in the size. Make sure to use the recommended ones or equivalent ones. (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 10 kA effective value and 480 V maximum, use T class fuses or molded-case circuit breaker (UL 489 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 ones other than Class T fuses and molded-case circuit breakers below, refer to each servo amplifier instruction manual.

ampliner instruction manual.		
Servo amplifier	Molded-case circuit breaker (480 V AC)	Fuse (600 V)
MR-J4-60_4	NF100-HRU-5A (100 A frame 5 A)	10 A
MR-J4-100_4	NF100-HRU-5A (100 A frame 5 A)	10 A
MR-J4-200_4	NF100-HRU-10A (100 A frame 10 A)	15 A
MR-J4-350_4	NF100-HRU-10A (100 A frame 10 A)	20 A
MR-J4-500_4	NF100-HRU-15A (100 A frame 15 A)	30 A
MR-J4-700_4	NF100-HRU-20A (100 A frame 20 A)	40 A
MR-J4-11K_4	NF100-HRU-30A (100 A frame 30 A)	60 A
MR-J4-15K_4	NF100-HRU-40A (100 A frame 40 A)	80 A
MR-J4-22K_4	NF100-HRU-60A (100 A frame 60 A)	125 A

(3) Power supply
This servo amplifier can be used on the condition of overvoltage category III set forth in IEC/EN 60664-1. For the
interface power supply, use an external 24 V DC power supply with reinforced insulation on I/O terminals.

Interlace power suppry, use an extension 2 T to post-forounding. To prevent an electric shock, always connect the protective earth (PE) terminal (marked ⊕) of the servo amplifier to 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 one-to-one. If using a leakage circuit breaker, always ground the protective earth (PE) terminal of the servo amplifier to prevent an electric shock. Only an RCD (earth-leakage current breaker) of type B can be used for the power supply side of

the product.

2.3.2 EU compliance
The MR-J4 servo amplifiers are designed to comply with the following directions to meet requirements for mounting, using, and periodic technical inspections: Machinery directive (2006/42/EC), EMC directive (2004/108/EC), and Low-voltage directive (2006/95/EC).

voltage directive (2006/95/EC).

(1) EMC requirement
MR-J4 servo amplifiers comply with category C3 in accordance with EN 61800-3. As for I/O wires (max. length 10
m. However, 3 m for STO cable for CN8.) and encoder cables (max. length 50 m), connect them to a shielded
grounding. Use a 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
(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 (2006/42/EC, 2004/108/EC and 2006/95/EC). You can obtain the copy of
Declaration of Conformity from our website.

2.3.3 USA/Canada compliance
This servo amplifier is designed in compliance with UL 508C and CSA C22.2 No.14 standards. Refer to MR-J4 Servo
Amplifier Instruction Manuals for details of UL/CSA standards.

Adjuster instituction invariates for because of Decas standards.

(1) Installation

The minimum cabinet size is 150% of each MR-J4 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 cabinet. Environment is open type 4. 501 and overvoltage category III. The servo amplifier needs to be installed at or experiment is open type 4. 501 and overvoltage category III. The servo amplifier needs to be installed at or capital content of the content of t

Overload protection characteristics
 The MR-J4 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
 This Drive Does Not Provide Motor Overtemperature Protection.

Inis Drive Does Not Fronce motor Overlanguation 1000 and a Capacitor discharge a Capacitor discharge it takes 15 minutes for capacitor discharging. Do not touch the unit and terminals immediately after power off. Branch circuit protection

For installation in United States, branch circuit protection must be provided, in accordance with the National For installation in Canada, branch circuit protection must be provided, in accordance with the Canada Electrical Code and any applicable provincial codes.

2.3.4 South Korea compliance

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 기가는 입무용 (A급) 전자파적합기기로서 판 매자 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.)

2.4 General cautions for safety protection and protective measures
Observe the following items to ensure proper use of the MELSERVO MR-J4 servo amplifiers.
(1) For safety components and installing systems, only qualified personnel and professional engineers should

Yol safety Components that installing systems (e.g., perform).
 When mounting, installing, and using the MELSERVO MR-J4 servo amplifier, always observe standards and directives applicable in the country.
 The item about noises of the test notices in the manuals should be observed.
 The MR-J4 servo amplifiers 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)

Be sure that all safety related switches, relays, sensors, etc., meet the required safety standards

De solution that is allevy leafued is an experiment of the machine or the system as a function.

2) Perform all risk assessments and safety level certification to the machine or the system as a whole of 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.

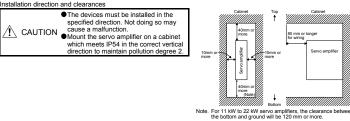
4) Only qualified personnel are authorized to install, start-up, repair or service the machines in which these components are installed. Only trained engineers should install and operate the equipment. (ISO 13849-1 Table

Separate the wiring for safety function from other signal wirings. (ISO 13849-1 Table F. 1 No.1) Protect the cables with appropriate ways (routing them in a cabinet, using a cable guard, etc.). 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)

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

3. Mounting/dismounting

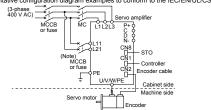


. Electrical Installation and configuration diagram WARNING Turn off the molded-case circuit breaker (MCCB) to avoid electrical shocks or damages to the product before starting the installation or wiring

The installation complies with IEC/EN 60204-1. The voltage supply to machines must be 20 ms of immunity to instantaneous power failures as specified in IEC/EN 60204-1.

Connecting a servo motor for different axis to U, V, W, or CN2_of the servo amplifier may caus a malfunction.

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



Note. When the wire sizes of L1 and L11 are the same, MCCB or fuse is not required.

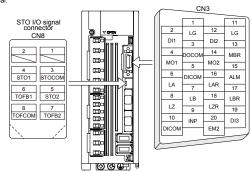
The control circuit connectors described by rectangles are safely separated from the main circuits described by circles The connected motors will be limited as follows.

(1) HG/HF/HC/HA series servo motors (Mig. Mitsubish Electric)

(2) Using a servo motor compiled with IEC60034-1 and Mitsubish Electric encoder (OBA, OSA)

5. Signals

5.1 Signal The following shows MR-J4-60B4 signals as a typical example. For other servo amplifiers, refer to each servo amplifier



5.2 I/O device

EM2	Forced stop 2	CN3	20
STOCOM	Common terminal for input signals STO1/STO2		3
STO1	STO1 state input	CN8	4
STO2	STO2 state input		5
	Output device		
Symbol	Device	Connector	Pin No.
TOFCOM	Common terminal for monitor output signal in STO state		8
TOFB1	Monitor output signal in STO1 state	CN8	6
TOFB2	Monitor output signal in STO2 state		7
	Power supply		
Symbol	Device	Connector	Pin No.
DICOM	Digital I/F power supply input		5, 10
DOCOM	Digital I/F common	CN3	2

6. Maintenance	and service
MARNING	• To avoid an electric shock, only qualified personnel should attempt inspections. For repair and parts replacement, contact your local sales office.
↑ CAUTION	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.

Inspection items recommended that the following points periodically be checked that the following points periodically be checked.

Check for loose terminal	block	screws	. Retig	ghten a	any loc	se scr	ews.							
Servo amplifier						Tig	htening 1	orque [l	N•m]					
COIVO diripinio	L1	L2	L3	N-	P3	P4	P+	С	L11	L21	U	٧	W	PE
MR-J4-60_4/MR-J4-100_4/ MR-J4-200_4/MR-J4-350_4														1.2
MR-J4-500_4				1	.2				0	.8		1	.2	
MR-J4-700_4				1	.2				0	.8		1	.2	
MR-J4-11K_4/MR-J4-15K_4				3	1.0				1	.2		3	.0	
MR-J4-22K_4				6	i.0				1	.2		6	.0	

- Servo motor bearings, brake section, etc. for unusual noise.
 Check the cables and the like for scratches or cracks. Perform periodic inspection according to operating conditions.
 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 unusual noise generated from the servo amplifier Check the servo motor shaft and coupling for connection.

6.2 Parts having service lives Service lives of the following pa 6.2 Fails faving service lives. Service lives Service lives of the following parts are listed below. However, the service lives vary depending on operation and environment. If any fault is found in the parts, they must be replaced immediately regardless of their service lives. For

parts replacement, please contact your local sale	es office.
Part name	Life guideline
Smoothing capacitor	(Note 3) 10 years
Relay	Number of power-on, forced stop and controller forced stop times: 100 000 times Number of on and off for STO: 1,000,000 times
Cooling fan	10,000 hours to 30,000 hours (2 years to 3 years)
(Note 1) Rotary servo motor battery backup time	Approximately 20,000 hours (equipment power supply: off, ambient temperature: 20 °C)
(Note 2) Battery life	5 years from date of manufacture

The data-holding time using a battery of MR-BAT6V1SET on condition that the power supply of the servo amplifier is off. Replace the batteries within three years since the operation start whether the power supply of the servo amplifier is on/off. If the battery is used out of specification, IAL 25 shoulds position erissed in any occur.

The power is the power is the service of the service of the batteries degrades by the storage condition. The battery life is 5 years from the production date regardless of the connection status.

The characteristic of smoothing capacitor is deteriorated due to highe 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-conditioned environment (40° Cs currounding air temperature or less).

7. Transportation and storage

Transport the products correctly according to their mass.
Stacking in excess of the limited number of product packages is not allowed.
On not hold the front cover to transport the servo amplifier. Otherwise, it may drop.
Install the servo amplifier and servo motor in a load-bearing place in accordance with the instruction Manual. CAUTION ●
 In
 CAUTION ●
 CAUTION ●
 In
 CAUTION ●
 CAUTION ●

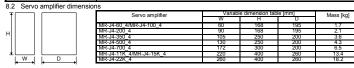
Do not get on or put heavy load on the equipment.
• For detailed information on the option battery's transportation and handing refer to the instruc-
manual.

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

on (°C) ortation (Note) (°C) ortation (Note) (°C) on, transportation, storage tues on	-20 to 65 Class 2K4 (IEC/EN 60721-3-2) -20 to 65 Class 1K4 (IEC/EN 60721-3-1) 5 %RH to 90 %RH 10 Hz to 57 Hz with constant deviation of 0.075 mm
r (Note) [°C] on, transportation, storage lues	-20 to 65 Class 1K4 (IEC/EN 60721-3-1) 5 %RH to 90 %RH 10 Hz to 57 Hz with constant devagling of 0.075 mm 10 Hz to 57 Hz with constant devagling of 0.075 mm 10 Hz to 50 Hz with constant devagling of 0.075 mm 10 Hz to 50 Hz with constant acceleration of 9.8 m/s' (1.9) to IEC/EN 61800-5-1 (Test Fo
on, transportation, storage lues	5 %RH to 90 %RH 10 Hz to 57 Hz with constant devayation of 0.075 mm 57 Hz to 150 Hz with constant acceleration of 9.8 m/s* (1 g) to IEC/EN 61800-5-1 (Test Fc of IEC 60068-2-6)
lues	7 Hz to 150 Hz with constant deviation of 0.075 mm 7 Hz to 150 Hz with constant deviation of 0.075 mm 67 Hz to 150 Hz with constant acceleration of 9.8 m/s² (1 g) to IEC/EN 61800-5-1 (Test Fo 5.9 m/s² (0.6 g)
on	57 Hz to 150 Hz with constant acceleration of 9.8 m/s² (1 g) to IEC/EN 61800-5-1 (Test Fc of IEC 60068-2-6) 5.9 m/s² (0.6 g)
ortotion (Moto)	
	Class 1M2 (IEC/EN 60721-3-2)
	2
	Except terminal block IP20 (IEC/EN 60529) and fan finger guard
	Open type (UL 50)
on, storage	Max. 1000 m above sea level
ortation	Max. 10000 m above sea level
	on, storage irtation ackaging

8. Technical data

	Item	MR-J4-60_4/MR-J4-100_4/MR-J4-200_4/MR-J4-350_4/MR-J4-500_4/MR-J4-700_4/ MR-J4-11K_4/MR-J4-15K_4/MR-J4-22K_4					
Power supply	Main circuit (line voltage)	3-phase 380 V AC to 480 V AC, 50 Hz/60 Hz					
	Control circuit (line voltage)	1-phase 380 V AC to 480 V AC, 50 Hz/60 Hz					
	Interface (SELV)	24 V DC, (required current capacity: 200 mA)					
Control method		Sine-wave PWM control, current control method					
Safety function (STO) IEC/EN 61800-5-2		EN ISO 13849-1 category 3 PL d, EN 61508 SIL 2, EN 62061 SIL CL 2, and EN 61800-5-2 SIL					
Mean time to dangerous failure		MTTFd ≥100 [years]					
Effectiveness of fault monitoring of a system or subsystem		DC = 90 [%]					
Average probability of dangerous failures per hour		PFH = 1.68 × 10 ⁻¹⁰ [1/h]					
Mission time		$T_M = 20$ [years]					
Response performance		8 ms or less (STO input off → energy shut off)					
Pollution degree		2 (IEC/EN 60664-1)					
Overvoltage category		III (IEC/EN 60664-1)					
Protection class		I (IEC/EN 61800-5-1)					
Short-circuit current rating (SCCR)		100 kA					



8.3 Mounting hole

, a1	0 "7	Variable dimensions [mm]						
****	Servo amplifier		a1	b	С	d	d1	Screw size
' ₽ a1	MR-J4-60_4/MR-J4-100_4	12	12	156 ± 0.5	6	42 ± 0.3		M5
 	MR-J4-200_4	6	45	156 ± 0.5	6	78 ± 0.3		M5
ы	MR-J4-350_4	6	6	235 ± 0.5	7.5	93 ± 0.5	93 ± 0.5	M5
ا ا	MR-J4-500_4	6	6	235 ± 0.5	7.5	118 ± 0.5	118 ± 0.5	M5
	MR-J4-700_4	6	6	285 ± 0.5	7.5	160 ± 0.5	160 ± 0.5	M5
e tlo ol	MR-J4-11K_4/MR-J4-15K_4	12	12	380 ± 0.5	10	196 ± 0.5	196 ± 0.5	M5
That d	MR-J4-22K_4	12	12	376 ± 0.5	12	236 ± 0.5	236 ± 0.5	M10
- a • ° - 								

Check list for user documentation

MITSUBISHI

MR-J4 installation checklist for manufacturer/installe

- 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 protection 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 poeration or periodic inspection by professional engineers.

Wall airly 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 readjustement and/or trial run that by by customer in Japan or overseas countries. We are not responsible for any on-site readjustement and/or trial run that by by customer in Japan or overseas countries. We 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]

Initiation of Sequested 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

conditions and instructions that are set forth in the instruction manual and user manual for the Product and the affixed to the Product. 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 ha

problem
(a) 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 indus (iv) a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and replaced

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, ighthing and natural disasters (vii) a failure generated by an undreseeable cause with a scientific technology that was not available at the time of the shipment of the Production of the P

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

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
amy damages or compensation for accidents arisen under a specific circumstance that are foreseen or unforeseen by our company,
amy damages to products other than the Product, and also compensation for any replacement work, readjustment, start-up test
un 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

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

Ineretore, 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 anolizations when used

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.