MITSUBISHI General-Purpose AC Servo MELSERIO-J4 MR-J4-DU30K_/MR-J4-DU37K MR-J4-DU30K_4 to MR-J4-DU55K_4 MR-CR55K/MR-CR55K4

Instructions and Cautions for Safe Use of AC Servos

| | | В |
|----------------|---|--|
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| Korea | MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD. 7F-9F, Gangseo Hangang Xi-tower A, 401, Yangcheon-ro, Gangseo-Gu, Seoul 157-801, Korea | Tel : +82-2-3660-9510 Fax: +82-2-3664-8372/8335 |

STO function (Refer to IEC 61800-5-2: 2007 4.2.2.2 STO.) MR-J4 servo amplifiers have the STO function. The STO function shuts down energy to servo motors, thus removing torque. This function electronically cuts off power supply in the servo amplifier. 2. About safety

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

| WARNING | Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury. | |
|------------------|--|--|
| ≜ CAUTION | Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight injury to personnel or may cause physical damage. | |

2.1 Professional engineer Only professional engineers should mount MR-J4 servo amplifiers.

- Professional engineers should meet the all conditions below. Persons who took a proper engineering training or qualified persons who are engaged in electrical equipment. Check if applicable technical training is available at your local Mitsubishi Electric office. Contact your local sales Crieck in applicable learning and analysis available at your local missions in electric once. Contract your local sair 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.
- 2.2 Applications of the devices

A pupilications or the vertices MR-J4 serve amplifiers comply with the following standards. ISO/EN 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, IEC/EN 61800-3, IEC/EN 60204-1 In addition, MR-J4 serve 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). 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 It takes 20 minutes for capacitor discharging. Do not touch the unit and terminals immediate after power off.

2.3.1 Selection of peripheral equipment and wire The followings are selected based on IEC/EN 61800-5-1, UL 508C, and CSA C22.2 No.14.

(i) Local writing and crimping tool Use only copper vires or cooper bus bars for writing. The following table shows the stranded wire sizes [AWG] and the crimp terminal symbols rated at 75 °C/60 °C.

| | Table | 1. Recomm | nended wire | | | Tab | e 2. Recomm | ended crimp te | rminal | | | |
|---------------------------|--|---------------------------------------|---------------------|---------------|-----------------------------------|----------------|----------------------------|--|------------------|-----------------------|-----------------------|----------------------|
| | Converter | 75 °C/60 °C stranded wire [AWG] (Note | | | 0 °C stranded wire [AWG] (Note 2) | | | fier-side crimp ninals | Manufactu | | | |
| Drive unit | unit | L1/L2/L3 | L11/L21 | P2/C | U/V/W/ (Note 3) | Symbol | Crimp terminal (Note 2) | Applicable tool | rer | | | |
| MR-J4-DU30K_ (Note 1) | MR-CR55K | 1: c/1/0: - | | | 2/0: d/2/0: - | a b | FVD5.5-10 FVD22-10 | YNT-1210S YF-1/E-4 | | | | |
| MR-J4-DU37K_ (Note 1) | MK-CROOK | 2/0: d/2/0: - | 14: g/14: g 10: a/1 | 14: g/14: g 1 | 14: g/14: g | | | 2/0: d/-: - | C (Note 1) | R38-10 | YPT-60-21 YF-1/E-4 | JST |
| MR-J4-DU30K_4 (Note 1) | | 4: e/3: f | | | | 14:g 10:a/10:a | | 3: f/2: f | d (Note 1) | R60-10 | YPT-60-21 YF-1/E-4 | (J.S.T. Mfg. Co., |
| MR-J4-DU37K_4 (Note 1) | | 2: f/1: c | | | | | 2: f/1: c | e f | FVD22-8 R38-8 | YF-1/E-4 YPT-60-21 | Etd.) | |
| MR-J4-DU45K_4 (Note 1) | MR-CR55K4 | 2: c/2: - | | | 1/0: d/1/0: - | (Note 1) | FVD2-4 | YF-1/E-4 YNT-1614 | | | | |
| MR-J4-DU55K_4 (Note 1) | | 2: c/1/0: - | | | 1/0: d/2/0: - | | | g part with an insu rminals may not | | | | |
| | 1 To connect these models to a terminal block, be sure to use the screws that come with the terminal block 2 Some crime terminal screws that the terminal block | | | | | | | | | | | |

come with the terminal block. 2. Alphabets in the table indicate crimping tools. For crimp terminals and applicable tools, refer to table 2. 3. Select wire sizes depending on the rated output of the servo motors. The values in the table are sizes based on rated output of the servo amplifiers.

Values in the table are sizes based on rated output of the server amplinets. (2) Selection example of MCCB and fuse Use a fuse (T class) or the molded-case circuit breaker (UL 489 Listed MCCB) indicated in the table below. 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.

| Converter unit | Drive unit | Molded-case circuit breaker (240 V AC) | Fuse (300 V) |
|----------------|---------------|--|--------------|
| MR-CR55K | MR-J4-DU30K_ | NF225-CWU-150A (225 A frame 150 A) | 250 A |
| MIC-ORGON | MR-J4-DU37K_ | NF225-CWU-175A (225 A frame 175 A) | 300 A |
| | | | |
| Converter unit | Drive unit | Molded-case circuit breaker (480 V AC) | Fuse (600 V) |
| | MR-J4-DU30K_4 | NF100-HRU-75A (100 A frame 75 A) | 125 A |
| MR-CR55K4 | MR-J4-DU37K_4 | NF100-HRU-100A (100 A frame 100 A) | 150 A |
| WIR-CROOK4 | MR-J4-DU45K_4 | NF100-HRU-100A (100 A frame 100 A) | 175 A |
| | MR-J4-DU55K 4 | NF125-SVU-125A (125 A frame 125 A) | 200 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.
 (4) Grounding To prevent an electric shock, always connect the protective earth (PE) therminal (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 an earth-laakance current breaker, always ground the protective earth (PE) terminal of the servo amplifier to the serve an earth-laakance current breaker.

earu (rt:) terminal. Always connect cables to the terminals one-to-one. If using an earth-leakage current breaker, always ground the protective earth (PE) terminal of the servo amplifier to prevent an electric shock. This product can cause a DC current in the protective earthing conductor. Where a residual current-operated protective (RC) earth-leakage current breaker) device is used for protection in case of direct or indirect contact, only an RCD of Type B is allowed on the supply side of this product. 2.3.2 EU compliance

- 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).
 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), use shielded wires and ground the shields. Install an EMC filter and surge protector on the primary side of the servo amplifier. In addition, use a line noise filter for outputs of the servo amplifiers. The following shows recommended products.
 - EMC filter: Soshin Electric HF3000A-UN series (200 V class), TF3000C-TX series (400 V class)
 - Surge protector: Okaya Electric Industries RSPD-250-U4 series
 - Line noise filter: Mitsubishi Electric ER-BIE

MR-J4 Series are not intended to be used on a low-voltage public network which supplies domestic premises; Radio frequency interference is expected if used on such a network. The installer shall provide a guide for Installation and use, including recommended mitigation devices. To avoid the risk of crosstalk to signal cables, the installation instructions shall either recommend that the power interface cable be segregated from signal cables.

Installation instructions shall entitle recommend that the power interface cable be segregated from signal cables. (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). For the copy of Declaration of Conformity, contact your local sales office.

2.3.3 USA/Canada compliance This servo amplifier is designed in compliance with UL 508C and CSA C22.2 No.14. (1) Installation

- 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 a 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 chapter 8. The servo amplifier needs to be installed at or below of pollution degree 2. For connection, use only copper wires. Soln-circuit current rating (SCCR) Suitable For Use On A Circuit Capable Of Delivering Not More Than 100 kA rms Symmetrical Amperes, 500 Volts Maximum. (2) 5

30 Overload protection characteristics
 31 Overload protection characteristics
 32 Overload protection characteristics
 33 The MR-J4 servo amplifiers have servo motor overload protective function. (It is set on the basis (full load current) of 120% rated current of the servo amplifier.)
 33 Overload protection (S) is not provided by the drive.
 34 Overload protection(S) is necessary for motor and refer to chapter 4 for the proper connection.
 35 Branch circuit protection
 36 Branch circuit protection (S) is necessary for motor and refer to chapter 4 for the proper connection.
 37 Branch circuit protection
 38 Branch circuit protection (S) is necessary for motor and refer to chapter 4 for the proper connection.
 39 Branch circuit protection
 30 Branch circuit protection (S) is necessary for motor and refer to chapter 4 for the proper connection.
 30 Branch circuit protection (S) is necessary for motor and refer to chapter 4 for the proper connection.
 30 Branch circuit protection and protection must be provided, in accordance with the National Electrical Code and any applicable local codes.
 34 South Korea commiliance

2.3.4 South Korea complicate This product complies with the Radio Wave Law (KC mark) Please note the following to use the product. 이 기기는 업무용 (요금) 전소과 책상기로서 한 폐자 또는 사용자는 이 점을 주의하시기 바라며, 가정의의 지역에서 사용하는 것을 약적으로 합니다. (The product is for business use (Class A) and meets the electromagnetic compatibility requirements. The seller and the The product is for lossings due (class r) and meets are encoding interforming interforming requirements. The senier and 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. Use a distance greater than 30 m between the product and third party

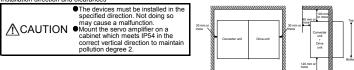
- 2.4 General cautions for safety protection and protective measures
 Observe the following items to ensure proper use of the MELSERVO MR-J4 servo amplifiers.
 (1) For safety components and installing systems, only qualified personnel and professional engineers should perform.
- perform. (2) When mounting, installing, and using the MELSERVO MR-J4 servo amplifier, always observe standards and directives applicable in the country. (3) The item about noises of the test notices in the manuals should be observed.
- 2.5 Residual risk
 (1) Be sure that all safety related switches, relays, sensors, etc., meet the required safety standards.
 (2) Perform all risk assessments and safety level certification to the machine or the system as a whole

If the upper and lower power modules in the servo amplifier are shorted and damaged simultaneously, the servo
motor may make a half revolution at a maximum.
 Only qualified personnel are authorized to install, start-up, repair or adjust the machines in which these
components are installed. Only trained engineers should install and operate the equipment. (ISO 13849-1 Table

- -.1 No.5) F:1 No.5) Separate the wiring for safety observation 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.
- (5) (6) (7)
- 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 batteries (MR-BATEV15ET, MR-BATEV1, and MR-BATEV1BJ) 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 clearar

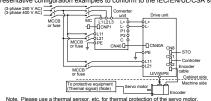


4. Electrical Installation and configuration diagram

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

CAUTION
The installation complies with IEC/EN 60204-1. The voltage supply to machines must be 20
ms or more of immunity to instantaneous power failures as specified in IEC/EN 60204-1.
Connecting a servo motor of the wrong axis to U, V, W, or CN2_of the servo amplifier may
cause a malfunction.

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. The connected motors will be limited as follows. (1) HG/HF/HC/HA series servo motors (Mfg: Mitsubishi Electric) (2) Using a servo motor compiled with IEC 60034-1 and Mitsubishi Electric encoder (OBA, OSA)

| Using a servo | motor com | plied with IE |
|---------------|-----------|---------------|
|---------------|-----------|---------------|

5. Signals 5.1 Signal The following shows typical example. For each servo amplifier

STO I/O signal connector CN8

2 1

4 3 STO1 STOCO 6 5 TOFB1 STO2

8 7 TOFCOM TOFB2

5.2 I/O device

| MR-J4-DU30KB signals as a other servo amplifiers, refer to | | | | | | Input device | | | | | | | |
|---|----------|------------|--------|-----------|--------|---|-----------|---------|--|--|--|--|--|
| instruction ma | mplifier | s, re | ter to | | Symbol | Device | Connector | Pin No. | | | | | |
| instruction ma | anuai. | | | | EM2 | Forced stop 2 | CN3 | 20 | | | | | |
| \square (| | CN | 13 | 11 | STOCOM | Common terminal for input signals STO1/STO2 | 0110 | 3 | | | | | |
| | 2 | 1 | 12 | | ST01 | STO1 state input | CN8 | 4 | | | | | |
| | DI1 | LG | DI2 | LG | STO2 | STO2 state input | | 5 | | | | | |
| | | 3 | 14 | 13 | | Output device | | | | | | | |
| ועים | M01 | OCOM | MO2 | MBR | Symbol | Device | Connector | Pin No. | | | | | |
| | | 5 DICOM | 16 | 15 ALM | TOFCOM | Common terminal for monitor output signal in STO state | CN8 | 8 | | | | | |
| | LA - | 7 | LAR | 17 | TOFB1 | Monitor output signal in STO1 state | CN8 | 6 | | | | | |
| | 8 | | 18 | | TOFB2 | Monitor output signal in STO2 state | | 7 | | | | | |
| | LZ - | LB | LZR | LBR 19 | | Power supply | | | | | | | |
| | 10 | INP | 20 | DI3 | Symbol | Device | Connector | Pin No. | | | | | |
| | DICOM | INP | EM2 | DIS | DICOM | Digital I/F power supply input | | 5, 10 | | | | | |
| | | l | | | DOCOM | Digital I/F common | CN3 | 3 | | | | | |
| | | - | - | | SD | Shield | | Plate | | | | | |
| | | | | | | | | | | | | | |

6. Maintenance and service

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

6.1 Inspection items It is recommended that the following points periodically be checked.

| Check for loose terminal block screws. Retighten any loose screws. | | | | | | | | | | | | | | |
|--|--|--------------------------|----|----|----|---|----|----|-----|-----|---|----|----|------|
| Drive unit/converter unit | | Tightening torque: [N•m] | | | | | | | | | | | | |
| | | L2 | L3 | P1 | P2 | С | L+ | L- | L11 | L21 | U | ٧ | W | PE |
| MR-J4-DU30K_/MR-J4-DU37K_/MR-J4-DU45K_4/ MR-J4-DU55K_4 | | / | / | _ | | | | • | | | | 12 | .0 | |
| R-J4-DU30K_/MR-J4-DU37K_4 | | | | | _ | / | 3. | 0 | 1. | 2 | | 6. | 0 | |
| MP- M-CP55K(A) | | | 12 | 0 | | | | | | | | | | 12.0 |

(2) Check servo motor bearings, brake section, etc. for unusual noise.
 (3) Check the cables and the like for scratches or cracks. Perform periodic inspection according to operating

- (a) Check the cancer and the fire for scraces of clacks. Ferrom periods conditions.
 (4) Check that the connectors are securely connected to the servo motor.
 (5) Check that the wires are not coming out from the connector.
 (6) Check for dust accumulation on the servo amplifier.
 (7) Check for unusual noise generated from the servo amplifier.
 (8) Check the servo motor shaft and coupling for connection.

6.2 Parts having service lives Service lives of the following parts are listed below. However, the service life varies depending on operating methods 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 sales 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: 100,000 times |
| Cooling tan | 10,000 hours to 30,000 hours (2 years to 3 years) |
| (Note 1) 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 |
| Note 1 The time is for using MR-14 1-axis servo am | plifier with a rotary serve motor using MR-BAT6V1SET or MR-BAT6V1B. For details and |

- The time is for using MR-4 1-axis serve amplifier with a rotery serve motor using MR-BAT6V1SET or MR-BAT6V1SL. For details and other battery backup time, refer to each institution manual.
 Cuality 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 ripple currents, etc. The life of the capacitor greatly depends on ambient temperature and operating conditions. The capacitor will be the ned of its life in 10 years of confluxions operation in air conditioned environment (40 °C surrounding air temperature or less for use at the maximum 1000 m above sea level, 30 °C or less for over 1000 m to 2010 m.

7. Transportation and storage

| ∕∆са∪т | Stacking in exi Do not hold th For detailed in amplifier instru Install the proc | uct in a load-bearing place of servo amplifier and servo motor in accordance |
|------------------------|--|--|
| Vhen you keep | or use it, please fulfill the | |
| | Item | Environment |
| | | C] 0 to 55 Class 3K3 (IEC/EN 60721-3-3) |
| Ambient temperature | Transportation (Note) [° | C] -20 to 65 Class 2K4 (IEC/EN 60721-3-2) |
| | | C] -20 to 65 Class 1K4 (IEC/EN 60721-3-1) |
| Ambient humidity | Operation, transportation, stora | ge 5 %RH to 90 %RH |
| /ibration | | 10 Hz to 57 Hz with constant amplitude of 0.075 mm 57 Hz to 150 Hz with constant acceleration of 9.8 m/s ² to 1EC/EN 61800-5-1 (Test Fc of IEC 60068-2-6) |
| resistance | Operation | 5.9 m/s ² |
| - | Transportation (Note) | Class 2M3 (IEC/EN 60721-3-2) |
| | Storage | Class 1M2 (IEC/EN 60721-3-2) |
| Pollution degree | | 2 |
| | | IP20 (IEC/EN 60529). Terminal block IP00 |

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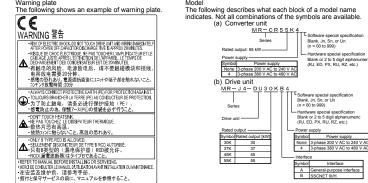
Contents of the package Unpack the product and check the rating plate to see if the servo amplifier is as you ordered.

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| Contents | Quantity |
|---|-------------------------|
| Converter unit | 1 |
| Eyebolt | 2 |
| MR-J4-DU/MR-CR Instructions and Cautions for Safe Use of AC Servos (this guide) | 1 |
| | |
| (2) Drive unit | Quantity |
| Contents | Quantity |
| Drive unit | Quantity 1 |
| Contents | Quantity 1 2 |
| Drive unit | Quantity 1 2 2 |

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

| Converter unit | | Drive unit | |
|---|--|---|---|
| CONTRACTOR SER ASSETTOR SER ASSETTOR MODEL, MR-CR55K POVER: 58W NPUT: 3A230.240V 191.3A 594.2404H SER ASSETTOR SER ASSETTO | Applicable power supply Applicable power supply Rated output current Standard, Manual number Ambient temperature IP rating KC certification number | Kurner Ser, ASS6507 MODEL, JANN MACH-DUJOKB MOLAUJAN MACH-DUJOKB MOLAUJAN MO | arial number odel apacity pplicable power supply ated output current andard, Manual number mbient temperature rating C certification number e year and month of manu ountry of origin |



. About the manuals

 A DOUG the manuals
 Converter units and drive units are written as servo amplifiers in this guide under certain circumstances.
 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.
 bt///www misubishiederic com/fa/ http://www.mitsubishielectric.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 required.

1.2 Purpose of this guide

1.3 Terms related to safety 1.3.1 JEC 61800-5-2 Stop function

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 safety servo system is, or will be integrated. For detailed information of the products, refer to each servo amplifier instruction manual.

8.Technical data

| 6. I CON | verter unit | | | | | | |
|--------------------------|-----------------------------------|--|--|--|--|--|--|
| | Item | MR-CR55K | MR-CR55K4 | | | | |
| 0 | Rated voltage | 270 V DC to 324 V DC | 513 V DC to 648 V DC | | | | |
| Output Rated current [A] | | 215.9 | 113.8 | | | | |
| | Main circuit (line voltage) | 3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz, 191.3 A | 3-phase 380 V AC to 480 V AC, 50 Hz/60 Hz, 100.7 A | | | | |
| Power supply | Control circuit (line voltage) | 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz, 0.2 A | 1-phase 380 V AC to 480 V AC, 50 Hz/60 Hz, 0.2 A | | | | |
| | Interface (SELV) | 24 V DC ± 10% (required current capacity: 130 mA) | | | | | |
| Pollution | degree | 2 (IEC/EN 60664-1) | | | | | |
| Overvolta | ige category | 3-phase 200 V AC/400 V AC: III (IEC/EN 60664-1) | | | | | |
| Protective | e class | I (IEC/EN | 61800-5-1) | | | | |
| Short-circ | cuit current rating | 100 | 1 44 | | | | |

8.2 Drive unit

| 0.2 Drive | e unit | | | | | | | | | |
|---|-----------------------------------|--|------------------------------|--|---------------|---------------|---------------|--|--|--|
| Item | | MR-J4-DU30K_ | MR-J4-DU37K_ | MR-J4-DU30K_4 | MR-J4-DU37K_4 | MR-J4-DU45K_4 | MR-J4-DU55K_4 | | | |
| Output | Rated voltage | 3-phase 170 V AC, 360 Hz | | 3-phase 323 V AC, 360 Hz | | | | | | |
| | Rated current [A] | 174 | 204 | 87 | 102 | 131 | 143 | | | |
| Power supply | Main circuit | | ne converter unit. | | | | | | | |
| | Control circuit (line voltage) | 1-phase 200 V 50 Hz/60 | AC to 240 V AC, Hz, 0.2 A | 1-phase 380 V AC to 480 V AC, 50 Hz/60 Hz, 0.2 A | | | | | | |
| | Interface (SELV) | 24 V DC ± 10% (required current capacity: MR-J4-DU_A_, 500 mA; MR-J4-DU_B_, 300 mA) | | | | | | | | |
| Control method | | Sine-wave PWM control, current control method | | | | | | | | |
| Safety observation function (STO) IEC/EN 61800-5-2 | | EN ISO 13849-1 category 3 PL d, IEC 61508 SIL 2, EN 62061 SIL CL 2, and EN 61800-5-2 SIL 2 | | | | | | | | |
| 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 | | TM = 20 [years] | | | | | | | | |
| Response performance | | 8 ms or less (STO input off → energy shut off) | | | | | | | | |
| Pollution degree | | 2 (IEC/EN 60664-1) | | | | | | | | |
| Overvoltage category | | 3-phase 200 V AC/400 V AC: III (IEC/EN 60664-1) | | | | | | | | |
| Protective class | | I (IEC/EN 61800-5-1) | | | | | | | | |
| Short-circuit current rating (SCCR) | | 100 kA | | | | | | | | |

8.3 Dimensions

| Ť | | | Converter unit/drive unit | Variable dimension table [mm] | | | Mass [kg] |
|---|-------|------|-----------------------------|-------------------------------|-----|-----|------------|
| | | | | W | Н | D | widoo [kg] |
| н | Front | | MR-CR55K(4) | 300 | 380 | 300 | 22 |
| | | Side | MR-J4-DU30K_/MR-J4-DU37K_ | 300 | 380 | 300 | 21 |
| | | 0.00 | MR-J4-DU30K_4/MR-J4-DU37K_4 | 240 | 380 | 300 | 16 |
| | | | MR-J4-DU45K_4/MR-J4-DU55K_4 | 300 | 380 | 300 | 21 |
| | | | | | | | |
| * | \A/ | | | | | | |
| | VV | | | | | | |

300

 260 ± 0.5

20

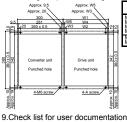
281

9.5

M6

Drive unit

8.4 Mounting hole process drawing



[Warranty]

Warranty period and coverage

Waining 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 engineen for an on-site repair work on request by customer in Japan or overseas countries. We are not responsible for any on-site readjustment and/or trial run that may be required after a defective unit are repaired or replaced.

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

[Limitations]

- Intautons] 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. You are requ
- for the cause of the failure.
 (2) This limited warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are set forth in the instruction manual and user manual for the Product and the caution label affixed to the Product.
 (3) Even during the term of warranty, the repair cost will be charged on you in the following cases.
 (4) a failure caused by your improper storing or handling, carelessness or negligence, etc., and a failure caused by your hardware or software or s
- in a failure caused by any alteration, etc. to the Product made on your side without our approval
 a failure which may be regarded as avoidable, if your equipment in which the Product is incorpotated is equipped with a safety device
 required by applicable laws and has any function or structure considered to be findspensable according to a common sense in the indu
 (v) a failure which may be regarded as avoidable, if cour equipment is designated in the instruction manual, etc. are duly maintained and
 (v) a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and a failure caused by any alteration, etc. to the Product made on your side without our approval
- a place of the second s (v) a movie curse or yearmine reduces such as internative accidents, including without limitation fire and abnormal fluctuation of voltage, and acts of Goal, including without limitation earthquake, lighting and natural disasters?
 (vii) a failure generated by an unforeseeable cause with a scientific technology that was not available at the time of the shipment of the Production of the production of the shipment of the Production.
- from our company (viii) any other failures which we are not responsible for or which you acknowledge we are not responsible for
- (m) any other landers which we are not responsible to or which you according we are not responsible to Term of warranty after the stop of production We may accept the repair at charge for another seven (7) years after the production of the product is discontinued. The announcement of the stop of production for each model can be seen in our Sales and Service, etc. Please note that the Product (including its spare parts) cannot be ordered after its stop of production.

Service in overseas countries

- Our regional FA Center in overseas countries will accept the repair work of the Product. However, the terms and conditions of the repair work may differ depending on each FA Center. Please ask your local FA center for details.
- the repair work may uniter depending on each FA Center. Please ask your local FA Center for details. Exclusion of responsibility for compensation against loss of opportunity, secondary loss, etc. Whether under or after the term of warranty, we assume no responsibility for any damages arisen from causes for which we are not responsibile, any losses of opportunity and/or profit incurred by you due to a failure of the Product, any damages, secondary damages or compensation for accidents arisen under a specific circumstance that are foreseen or unforeseen by our company, any damages to products other than the Product, and also compensation for any replacement work, readjustment, start-up test run of local machines and the Product and any other operations conducted by you.

Change of Product specifications

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

6. Application and use of the Product

- Application and use of the Product For the use of our General-Purpose AC Servo, its applications should be those that may not result in a serious damage even if any failure or mafunction 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 mafunction occurs. Therefore, applications substantially influential on the public interest for such as a domic 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 safety machines, etc. are not recommended, and we assume no responsibility for any failure as after 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 these applications when used.