

マシンコントローラ MP3000シリーズ CPUユニット 取扱説明書

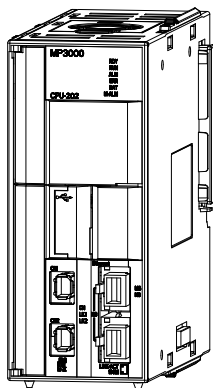
形式：JEPMC-CP3201-E, -CP3202-E

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また、本書をお手元に保管していただくとともに、最終的に本製品をご使用になるユーザー様のお手元に確実に届けられるよう、お取り計らい願います。

Machine Controller MP3000 Series CPU Unit INSTRUCTIONS

Model: JEPMC-CP3201-E, -CP3202-E

To properly use the product, read this manual thoroughly and retain for easy reference, inspection, and maintenance. Ensure the end user receives this manual.



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Safety Precautions

The following signal words and marks are used to indicate safety precautions in this manual.

Information marked as shown below is important for safety. Always read this information and heed the precautions that are provided.



Indicates precautions that, if not heeded, could possibly result in loss of life or serious injury.



Indicates precautions that, if not heeded, could result in relatively serious or minor injury, or property damage.

If not heeded, even precautions classified as cautions ( CAUTION) can lead to serious results depending on circumstances.



Indicates prohibited actions. For example,  indicates prohibition of open flame.



Indicates mandatory actions. For example,  indicates that grounding is required.

The following precautions are for storage, transportation, installation, wiring, operation, maintenance, inspection, and disposal. These precautions are important and must be observed.

◆ General Precautions



WARNING

- The installation must be suitable and it must be performed only by an experienced technician.
There is a risk of electrical shock or injury.
- Before connecting the machine and starting operation, make sure that an emergency stop procedure has been provided and is working correctly.
There is a risk of injury.
- Do not approach the machine after a momentary interruption to the power supply. When power is restored, the Machine Controller and the device connected to it may start operation suddenly. Provide safety measures in advance to ensure human safety when operation restarts.
There is a risk of injury.
- Do not touch anything inside the Machine Controller.
There is a risk of electrical shock.
- Do not remove the front cover, cables, connector, or options while power is being supplied.
There is a risk of electrical shock, malfunction, or damage.
- Do not damage, pull on, apply excessive force to, place heavy objects on, or pinch the cables.
There is a risk of electrical shock, operational failure of the product, or burning.
- Do not attempt to modify the Machine Controller in any way.
There is a risk of injury or device damage.

◆ Storage and Transportation



CAUTION

- Do not store the Machine Controller in any of the following locations.
 - Locations that are subject to direct sunlight
 - Locations that are subject to ambient temperatures that exceed the storage conditions
 - Locations that are subject to ambient humidity that exceeds the storage conditions
 - Locations that are subject to rapid temperature changes and condensation
 - Locations that are subject to corrosive or inflammable gas
 - Locations that are subject to excessive dust, dirt, salt, or metallic powder
 - Locations that are subject to water, oil, or chemicals
 - Locations that are subject to vibration or shockThere is a risk of fire, electrical shock, or device damage.
- Hold onto the main body of the Machine Controller when transporting it.

Holding the cables or connectors may damage them or result in injury.
- Do not overload the Machine Controller during transportation. (Follow all instructions.)

There is a risk of injury or an accident.
- Never subject the Machine Controller to an atmosphere containing halogen (fluorine, chlorine, bromine, or iodine) during transportation.

There is a risk of malfunction or damage.



CAUTION

- If disinfectants or insecticides must be used to treat packing materials such as wooden frames, pallets, or plywood, the packing materials must be treated before the product is packaged, and methods other than fumigation must be used.

Example: Heat treatment, where materials are kiln-dried to a core temperature of 56°C for 30 minutes or more.

If the electronic products, which include stand-alone products and products installed in machines, are packed with fumigated wooden materials, the electrical components may be greatly damaged by the gases or fumes resulting from the fumigation process. In particular, disinfectants containing halogen, which includes chlorine, fluorine, bromine, or iodine can contribute to the erosion of the capacitors.

◆ Installation



CAUTION

- Do not install the Machine Controller in any of the following locations.
 - Locations that are subject to direct sunlight
 - Locations that are subject to ambient temperatures that exceed the operating conditions
 - Locations that are subject to ambient humidity that exceeds the operating conditions
 - Locations that are subject to rapid temperature changes and condensation
 - Locations that are subject to corrosive or inflammable gas
 - Locations that are subject to excessive dust, dirt, salt, or metallic powder
 - Locations that are subject to water, oil, or chemicals
 - Locations that are subject to vibration or shockThere is a risk of fire, electrical shock, or device damage.
- Never install the Machine Controller in an atmosphere containing halogen (fluorine, chlorine, bromine, or iodine).
There is a risk of malfunction or damage.
- Do not step on the Machine Controller or place heavy objects on the Machine Controller.
There is a risk of injury or an accident.
- Do not block the air exhaust ports on the Machine Controller. Do not allow foreign objects to enter the Machine Controller.
There is a risk of internal element deterioration, malfunction, or fire.



CAUTION

- Always mount the Machine Controller in the specified orientation.

There is a risk of malfunction.

- Leave the specified amount of space between the Machine Controller, and the interior surface of the control panel and other devices.

There is a risk of fire or malfunction.

- Do not subject the Machine Controller to strong shock.

There is a risk of malfunction.

- Suitable battery installation must be performed and it must be performed only by an experienced technician.

There is a risk of electrical shock, injury, or device damage.

- Do not touch the electrodes when installing the Battery.

Static electricity may damage the electrodes.

◆ Wiring



CAUTION

- Check the wiring to be sure it has been performed correctly.
There is a risk of motor run-away, injury, or accidents.
- Always use a power supply of the specified voltage.
There is a risk of fire or accident.
- In places with poor power supply conditions, ensure that the input power is supplied within the specified voltage range.
There is a risk of device damage.
- Install breakers and other safety measures to provide protection against shorts in external wiring.
There is a risk of fire.
- Provide sufficient shielding when using the Machine Controller in the following locations.
 - Locations that are subject to noise, such as from static electricity
 - Locations that are subject to strong electromagnetic or magnetic fields
 - Locations that are subject to radiation
 - Locations that are near power linesThere is a risk of device damage.



CAUTION

- Configure the circuits to turn ON the power supply to the CPU Unit before the 24-V I/O power supply.

If the power supply to the CPU Unit is turned ON after the external power supply, e.g., the 24-V I/O power supply, the outputs from the CPU Unit may momentarily turn ON when the power supply to the CPU Unit turns ON. This can result in unexpected operation that may cause injury or device damage.

- Provide emergency stop circuits, interlock circuits, limit circuits, and any other required safety measures in control circuits outside of the Machine Controller.

There is a risk of injury or device damage.

- If you use MECHATROLINK I/O Modules, use the establishment of MECHATROLINK communications as an interlock output condition.

There is a risk of device damage.

- Connect the Battery with the correct polarity.

There is a risk of battery damage or explosion.

- Suitable battery replacement must be performed and it must be performed only by an experienced technician.

There is a risk of electrical shock, injury, or device damage.

- Do not touch the electrodes when replacing the Battery.

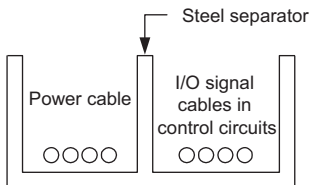
Static electricity may damage the electrodes.

CAUTION

- Select the I/O signal wires for external wiring to connect the Machine Controller to external devices based on the following criteria:
 - Mechanical strength
 - Noise interference
 - Wiring distance
 - Signal voltage
- Separate the I/O signal cables for control circuits from the power cables both inside and outside the control panel to reduce the influence of noise from the power cables.

If the I/O signal lines and power lines are not separated properly, malfunction may occur.

Example of Separated Cables



◆ Operation



CAUTION

- Follow the procedures and instructions in the user's manuals for the relevant products to perform normal operation and trial operation.

Operating mistakes while the Servomotor and machine are connected may damage the machine or even cause accidents resulting in injury or death.

- Implement interlock signals and other safety circuits external to the Machine Controller to ensure safety in the overall system even if the following conditions occur.
 - Machine Controller failure or errors caused by external factors
 - Shutdown of operation due to Machine Controller detection of an error in self-diagnosis and the subsequent turning OFF or holding of output signals
 - Holding of the ON or OFF status of outputs from the Machine Controller due to fusing or burning of output relays or damage to output transistors
 - Voltage drops from overloads or short-circuits in the 24-V output from the Machine Controller and the subsequent inability to output signals
 - Unexpected outputs due to errors in the power supply, I/O, or memory that cannot be detected by the Machine Controller through self-diagnosis.

There is a risk of injury, device damage, or burning.

◆ Maintenance and Inspection



CAUTION

- Do not attempt to disassemble or repair the Machine Controller.
There is a risk of electrical shock, injury, or device damage.
- Do not change any wiring while power is being supplied.
There is a risk of electrical shock, injury, or device damage.
- Do not forget to perform the following tasks when you replace the CPU Unit:
 - Back up all programs and parameters from the CPU Unit that is being replaced.
 - Transfer all saved programs and parameters to the new CPU Unit.

If you operate the CPU Unit without transferring this data, unexpected operation may occur. There is a risk of injury or device damage.

◆ Disposal



CAUTION

- Dispose of the Machine Controller as general industrial waste.



CAUTION

- Observe all local laws and ordinances when you dispose of used Batteries.

◆ Other General Precautions

Observe the following general precautions to ensure safe application.

- The products shown in the illustrations in this manual are sometimes shown without covers or protective guards. Always replace the cover or protective guard as specified first, and then operate the products in accordance with the manual.
- The illustrations that are presented in this manual are typical examples and may not match the product you received.
- If the manual must be ordered due to loss or damage, inform your nearest Yaskawa representative or one of the offices listed on the back of this manual.

Warranty

◆ Details of Warranty

■ Warranty Period

The warranty period for a product that was purchased (hereinafter called “delivered product”) is one year from the time of delivery to the location specified by the customer or 18 months from the time of shipment from the Yaskawa factory, whichever is sooner.

■ Warranty Scope

Yaskawa shall replace or repair a defective product free of charge if a defect attributable to Yaskawa occurs during the warranty period above. This warranty does not cover defects caused by the delivered product reaching the end of its service life and replacement of parts that require replacement or that have a limited service life.

This warranty does not cover failures that result from any of the following causes.

- Improper handling, abuse, or use in unsuitable conditions or in environments not described in product catalogs or manuals, or in any separately agreed-upon specifications
- Causes not attributable to the delivered product itself
- Modifications or repairs not performed by Yaskawa
- Abuse of the delivered product in a manner in which it was not originally intended

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- Causes that were not foreseeable with the scientific and technological understanding at the time of shipment from Yaskawa
 - Events for which Yaskawa is not responsible, such as natural or human-made disasters

◆ Limitations of Liability

- Yaskawa shall in no event be responsible for any damage or loss of opportunity to the customer that arises due to failure of the delivered product.
- Yaskawa shall not be responsible for any programs (including parameter settings) or the results of program execution of the programs provided by the user or by a third party for use with programmable Yaskawa products.
- The information described in product catalogs or manuals is provided for the purpose of the customer purchasing the appropriate product for the intended application. The use thereof does not guarantee that there are no infringements of intellectual property rights or other proprietary rights of Yaskawa or third parties, nor does it construe a license.
- Yaskawa shall not be responsible for any damage arising from infringements of intellectual property rights or other proprietary rights of third parties as a result of using the information described in catalogs or manuals.

◆ Suitability for Use

- It is the customer's responsibility to confirm conformity with any standards, codes, or regulations that apply if the Yaskawa product is used in combination with any other products.
- The customer must confirm that the Yaskawa product is suitable for the systems, machines, and equipment used by the customer.
- Consult with Yaskawa to determine whether use in the following applications is acceptable. If use in the application is acceptable, use the product with extra allowance in ratings and specifications, and provide safety measures to minimize hazards in the event of failure.
 - Outdoor use, use involving potential chemical contamination or electrical interference, or use in conditions or environments not described in product catalogs or manuals
 - Nuclear energy control systems, combustion systems, railroad systems, aviation systems, vehicle systems, medical equipment, amusement machines, and installations subject to separate industry or government regulations
 - Systems, machines, and equipment that may present a risk to life or property
 - Systems that require a high degree of reliability, such as systems that supply gas, water, or electricity, or systems that operate continuously 24 hours a day
 - Other systems that require a similar high degree of safety

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- Never use the product for an application involving serious risk to life or property without first ensuring that the system is designed to secure the required level of safety with risk warnings and redundancy, and that the Yaskawa product is properly rated and installed.
 - The circuit examples and other application examples described in product catalogs and manuals are for reference. Check the functionality and safety of the actual devices and equipment to be used before using the product.
 - Read and understand all use prohibitions and precautions, and operate the Yaskawa product correctly to prevent accidental harm to third parties.

◆ Specifications Change

The names, specifications, appearance, and accessories of products in product catalogs and manuals may be changed at any time based on improvements and other reasons. The next editions of the revised catalogs or manuals will be published with updated code numbers. Consult with your Yaskawa representative to confirm the actual specifications before purchasing a product.

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1

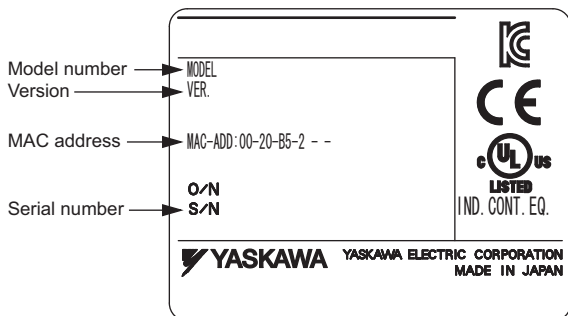
Confirmations Upon Delivery

Please confirm the following items as soon as you receive the Machine Controller.

Item	Confirmation Method
Have you received the correct Machine Controller as ordered?	Check the model number on the nameplate on the side of the Machine Controller. Check all accessories as well.
Is the Machine Controller damaged in any way?	Check the appearance of the entire Machine Controller for any damage that might have occurred during shipment.

If you find any problems with the above items, contact the place of purchase or your Yaskawa representative immediately.

Nameplate



2 Installation

Refer to the following manual for details on installing the Machine Controller.

📖 *MP2000/MP3000 Series Machine Controller System Setup Manual*
(Manual No.: SIEP C880725 00)

Precautions for the installation location are given in the following table.

Installation Condition	Installation Precautions
Installation in a control panel	• Design the control panel size, Machine Controller location, and cooling method so that the ambient temperature around the Machine Controller does not exceed 55°C. • If you install Machine Controllers side by side, install a cooling fan above them. • Provide gaps above and below the Machine Controller.
Installation near heat-generating objects	Suppress temperature increases due to radiant heat or convection from the heat-generating object so that the ambient temperature around the Machine Controller does not exceed 55°C.
Installation near sources of vibration	Install a vibration-absorbing device on the installation surface for the Machine Controller to prevent vibration from reaching the Machine Controller.

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Installation Condition	Installation Precautions
Installation in locations subject to corrosive gas	Take measures to prevent corrosive gas from entering the Machine Controller. Although the Machine Controller would not be affected immediately, the Machine Controller or contact devices may fail in the future if exposed to corrosive gas.
Others	• Do not install the Machine Controller in locations that are subject to high temperatures or high humidity, or subject to excessive amounts of dust, dirt, or iron powder. • Do not subject the Machine Controller to freezing or condensation. • For long-term reliability, use the Machine Controller at an ambient temperature of 45°C or less.

3

Wiring

Refer to the following manual for details on connecting the Machine Controller.

📖 *MP2000/MP3000 Series Machine Controller System Setup Manual*
(Manual No.: SIEP C880725 00)

Wiring Precautions

Wiring precautions are given below.



CAUTION

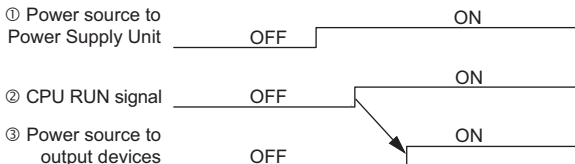
- Configure the circuits to turn ON the power supply to the CPU Unit before the 24-V I/O power supply.
If the power supply to the CPU Unit is turned ON after the external power supply, e.g., the 24-V I/O power supply, the outputs from the CPU Unit may momentarily turn ON when the power supply to the CPU Unit turns ON. This can result in unexpected operation that may cause injury or device damage.
- If you use MECHATROLINK I/O Modules, use the establishment of MECHATROLINK communications as an interlock output condition. There is a risk of device damage.

A power-ON sequence and an example circuit configuration are given below.

◆ Outputs Connected to Relays or Solenoids

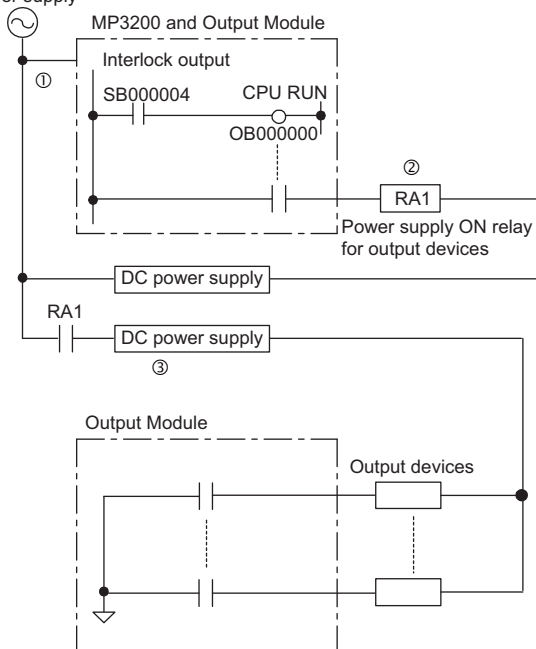
Configure circuits that will turn ON the power supply to the output devices (relays, solenoids, etc.) only after the CPU RUN output (interlock output) from the CPU Unit turns ON.

<Power-ON Sequence>



<Example Circuit Configuration>

Power supply



SB000004: Always ON Coil

(ON while the CPU Unit is operating normally.)

OB000000: Interlock output

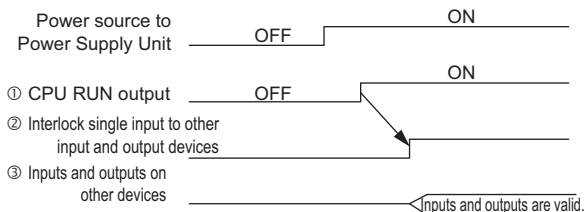
Note: The MP3200 includes the Power Supply Unit, CPU Unit, and Base Unit.

The circuit configuration example is for an Output Module added to the MP3200.

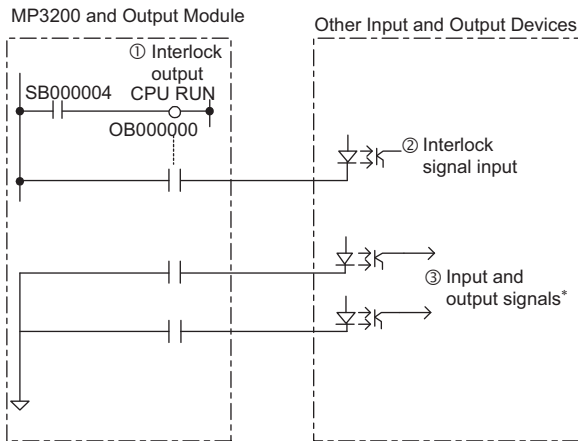
◆ Outputs Connected to Other Input and Output Devices

Connect the CPU RUN output (interlock output) from the CPU Unit to other input and output devices as an interlock signal, and confirm that the CPU RUN output from the CPU Unit is ON before using inputs and outputs on other devices. The other inputs and outputs are not valid until the CPU RUN output turns ON.

<Power-ON Sequence>



<Example Circuit Configuration>



SB000004: Always ON Coil

(ON while the CPU Unit is operating normally.)

OB000000: Interlock output

* Design the circuits so that input and output signals from other input and output devices are used only after the interlock signal turns ON.

Note: The MP3200 includes the Power Supply Unit, CPU Unit, and Base Unit.

The circuit configuration example is for an Output Module added to the MP3200.

4 Inspections

Perform inspections and part replacements according to the information that is provided in this section.

Daily Inspections

The daily inspection items are given in the following table.

Inspection Item	Description	Criteria	Correction
Installation condition	Loose screws or covers	All screws and covers must be secure.	Tighten the screws.
Connection conditions	Loose terminal screws	Screws must not be loose.	Tighten the terminal screws.
	Connectors	Connectors must not be loose.	Tighten the lock screws on the connectors.
	Separation between crimped terminals	Suitable gaps must be maintained.	Correct the gaps.

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Inspection Item		Description	Criteria	Correction
Indicators	RDY indicator	Check the status.	Must be lit. (Otherwise, there is an error.)	Refer to the relevant manual.*
	RUN indicator	Check the status in RUN mode.	Must be lit. (Otherwise, there is an error.)	
	ALM indicator	Check the status.	Must not be lit. (Otherwise, there is an error.)	
	ERR indicator	Check the status.	Must not be lit. (Otherwise, there is an error.)	
	BAT indicator	Check the status.	Must not be lit. (Otherwise, the battery is low.)	Replace the Battery.
	M_ALM indicator	Check the status.	Must not be lit. (Otherwise, there is an axis alarm.)	Refer to the relevant manual.*

*  *MP3000-series MP3200/MP3300 Troubleshooting Manual*
(Manual No.: SIEP C880725 01)

Periodic Inspections

Perform the following inspections at least once a year.

Inspection Item		Inspection Period	Description	Correction
Ambient conditions	Ambient temperature*	At least 1 or 2 times every 6 to 12 months	Measure the temperature and humidity with a hydrometer and thermometer and measure corrosive gas. They must be within specifications.	Remove sources of contamination or improve the installation environment.
	Ambient humidity			
	Atmosphere			
Visual exterior inspection		At least 1 time a year	There must be no dirt, dust, oil, or other foreign matter on the Machine Controller.	Clean the Machine Controller with air or a cloth.
Loose screws			There must be no looseness in terminal screws or connector lock screws.	Tighten the screws.

* If the Machine Controller is installed in a panel, the temperature inside the panel is the ambient temperature.

Replacement Guidelines for Machine Controller Parts

Electrical and electronic parts have a limited service life due to mechanical wear and deterioration over time. Perform periodic inspections for preventive maintenance.

Contact your Yaskawa representative for replacements based on the standard replacement periods that are given in the following table. Yaskawa will inspect your Machine Controller and determine if part replacement is required.

Yaskawa will initialize the settings of all parameters to the default values in Machine Controllers that are returned for overhaul. Before you start operation again, make sure that you reset the parameters that are required for operation.

Part Name	Standard Replacement Period	Application Conditions
Relays	–	Ambient temperature: 45°C or less
Aluminum electrolytic capacitors on PCBs	5 years	Ambient temperature: 45°C or less
Battery	3 years*	- Ambient temperature: 45°C or less - Operation: 12 hours/day
	2 years*	- Ambient temperature: 45°C or less - Operation: 8 hours/day

* Replace the Battery when the total time that the Controller is not in operation reaches 1 year (8,760 hours).

5

EMC Standard Compliance

The Machine Controller complies with the following EMC standards: EN 55011 group 1 class A, EN 61000-6-2, and EN 61000-6-4. However, the Machine Controller is an electric device that is used as part of a machine or manufacturing equipment. Therefore, the EMC performance will also depend on the configuration of the actual system, wiring conditions, and other conditions. It is the user's responsibility to confirm EMC standard compliance for the overall machine or equipment.

Revision History

The revision dates and numbers of the revised manuals are given on the bottom of the back cover.

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Published in Japan February 2014 11-12 ◇-1

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February 2014		1	Front cover	Addition: Model JEPMC-CP3202-E
			Preface	Revision: DANGER → WARNING
			1	Revision: Nameplate
			5	Addition: EMC standard (EN 61000-6-4)
			Back cover	Revision: Address
January 2013		0	Preface	Addition: Warranty
			Safety Precautions	Addition: Precautions on battery installation.
			Back cover	Revision: Address
December 2011	—	—	—	First edition

Machine Controller MP3000 Series

CPU Unit

INSTRUCTIONS

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YASKAWA ELECTRIC CORPORATION

In the event that the end user of this product is to be the military and said product is to be employed in any weapons systems or the manufacture thereof, the export will fall under the relevant regulations as stipulated in the Foreign Exchange and Foreign Trade Regulations. Therefore, be sure to follow all procedures and submit all relevant documentation according to any and all rules, regulations and laws that may apply. Specifications are subject to change without notice for ongoing product modifications and improvements.

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한국 전파법에 관한 주의사항

韓国電波法に関連する注意事項

Precautions for Korean Radio Waves Act

针对韩国电波法的注意事项

사용자 안내문

기종별	사용자 안내문
A 급 기기 (업무용 방송 통신기 자재)	이 기기는 업무용 (A 급) 전자파 적합 기기로서 판매자 또는, 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.