

## マシンコントローラ MP3000シリーズ MP3300 ベースユニット 取扱説明書

形式 : JEPMC-BU3301-E, -BU3302-E, -BU3303-E, -BU3304-E

製品を安全にお使いいただくために、本書を必ずお読みください。  
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 MP3300 Base Unit INSTRUCTIONS

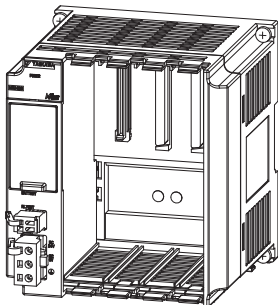
Model: JEPMC-BU3301-E, -BU3302-E, -BU3303-E, -BU3304-E

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

## Contrôleur de Machine Série MP3000 Unité de Base MP3300 INSTRUCTIONS

Modèle: JEPMC-BU3301-E, -BU3302-E, -BU3303-E, -BU3304-E

Pour utiliser correctement le produit, lisez attentivement ce manuel. Conservez-le comme références et pour les cas d'inspections et de maintenance. Assurez-vous que l'utilisateur final reçoive ce manuel.



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# Safety Precautions

## ◆ Safety Information

To prevent personal injury and equipment damage in advance, the following signal words are used to indicate safety precautions in this document. The signal words are used to classify the hazards and the degree of damage or injury that may occur if a product is used incorrectly. Information marked as shown below is important for safety. Always read this information and heed the precautions that are provided.



### **DANGER**

- Indicates precautions that, if not heeded, are likely to result in loss of life, serious injury, or fire.



### **WARNING**

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



### **CAUTION**

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

### **NOTICE**

- Indicates precautions that, if not heeded, could result in property damage.

## ◆ Safety Precautions That Must Always Be Observed

### ■ General Precautions



## WARNING

- Read and understand this manual to ensure the safe usage of the product.
- Keep this manual in a safe, convenient place so that it can be referred to whenever necessary. Make sure that it is delivered to the final user of the product.
- 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 product 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 product.  
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 product in any way.  
There is a risk of injury or device damage.

## ■ Storage and Transportation Precautions

### CAUTION

- Do not store the product 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 product when transporting it.  
Holding the cables or connectors may damage them or result in injury.
- Do not overload the product during transportation. (Follow all instructions.)  
There is a risk of injury or an accident.
- Never subject the product to an atmosphere containing halogen (fluorine, chlorine, bromine, or iodine) during transportation.  
There is a risk of malfunction or damage.
- 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 Precautions

### CAUTION

- **Do not install the product 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 shock  
There is a risk of fire, electrical shock, or device damage.
- **Never install the product in an atmosphere containing halogen (fluorine, chlorine, bromine, or iodine).**  
There is a risk of malfunction or damage.
- **Do not step on the product or place heavy objects on the product.**  
There is a risk of injury or an accident.
- **Do not block the air exhaust ports on the product. Do not allow foreign objects to enter the product.**  
There is a risk of internal element deterioration, malfunction, or fire.
- **Always mount the product in the specified orientation.**  
There is a risk of malfunction.
- **Leave the specified amount of space between the product, and the interior surface of the control panel and other devices.**  
There is a risk of fire or malfunction.
- **Do not subject the product 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 Precautions

### CAUTION

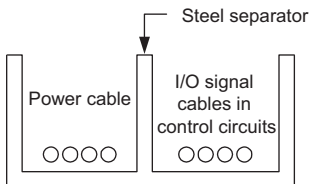
- Check the wiring to be sure it has been performed correctly.  
There is a risk of motor run-away, injury, or accidents.
- Always use a power supply of the specified voltage.  
There is a risk of fire or accident.
- In places with poor power supply conditions, ensure that the input power is supplied 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 product 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.
- Configure the circuits to turn ON the power supply to the CPU Module before the 24-V I/O power supply. Refer to the following manual for details on circuits.  
 MP3000 Series MP3300 CPU Module Instructions (Manual No.: TOMP C880725 23)  
If the power supply to the CPU Module is turned ON after the external power supply, e.g., the 24-V I/O power supply, the outputs from the CPU Module may momentarily turn ON when the power supply to the CPU Module 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 product.  
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 product 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 Precautions

## 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 product to ensure safety in the overall system even if the following conditions occur.
    - Product failure or errors caused by external factors
    - Shutdown of operation due to product 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 product 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 product 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 product through self-diagnosis
- There is a risk of injury, device damage, or burning.



## ■ Maintenance and Inspection Precautions

### CAUTION

- Do not attempt to disassemble or repair the product.  
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 Module:
  - Back up all programs and parameters from the CPU Module that is being replaced.
  - Transfer all saved programs and parameters to the new CPU Module.  
If you operate the CPU Module without transferring this data, unexpected operation may occur. There is a risk of injury or device damage.

## ■ Disposal Precautions

- Dispose of the product as general industrial waste.
- Observe all local laws and ordinances when you dispose of used Batteries.

## ■ Other General Precautions

- 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.

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# 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
- Use of the delivered product in a manner in which it was not originally intended
- 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.

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## ◆ 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
- 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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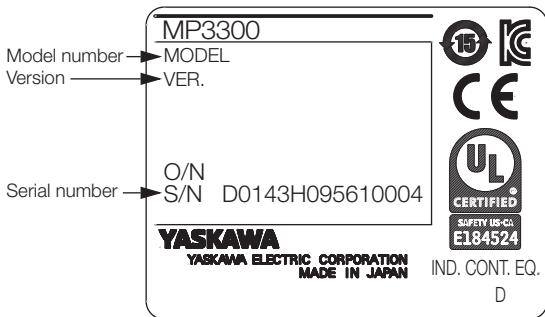
# 1 Confirmations Upon Delivery

Please confirm the following items as soon as you receive the product.

Item	Confirmation Method
Have you received the correct product as ordered?	Check the model number on the nameplate on the side of the product. Check all accessories as well.
Is the product damaged in any way?	Check the appearance of the entire product 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.

## 1.1 Nameplate



### Interpreting Manufacturing Year and Month

The manufacturing year and month are given as part of the serial number.

S/N D0143H095610004

3rd+4th  
digits

5th  
digit

3rd+4th  
digits

Manufacturing Year

The last two digits of the manufacturing year are given.

Example

15: 2015

16: 2016

5th  
digit


Manufacturing Month

The manufacturing month is given using the codes listed in the following table.

Code	Manufacturing Month
1	January
2	February
3	March
4	April
5	May
6	June
7	July
8	August
9	September
X	October
Y	November
Z	December

## 2 Installation

Refer to the following manual for details on installing the product.

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

### 2.1 Precautions for the Installation Location

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

Installation Condition	Installation Precautions
Installation in a control panel	<ul style="list-style-type: none"> <li>• Design the control panel size, product location, and cooling method so that the ambient temperature around the product does not exceed 55°C.</li> <li>• If you install products side by side, install a cooling fan above them.</li> <li>• Provide gaps above and below the product.</li> </ul>
Installation near heat-generating objects	<p>Suppress temperature increases due to radiant heat or convection from the heat-generating object so that the ambient temperature around the product does not exceed 55°C.</p>
Installation near sources of vibration	<p>Install a vibration-absorbing device on the installation surface for the product to prevent vibration from reaching the product.</p>
Installation in locations subject to corrosive gas	<p>Take measures to prevent corrosive gas from entering the product. Although the product would not be affected immediately, the product or contact devices may fail in the future if exposed to corrosive gas.</p>
Others	<ul style="list-style-type: none"> <li>• Do not install the product in locations that are subject to high temperatures or high humidity, or subject to excessive amounts of dust, dirt, or iron powder.</li> <li>• Do not subject the product to freezing or condensation.</li> <li>• For long-term reliability, use the product at an ambient temperature of 45°C or less.</li> </ul>

### 2.2 Control Panel Cooling Method

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The components that are used in the MP3300\* require the ambient operating temperature to be between 0 and 60°C. Use one of the methods described below to ensure adequate cooling in the control panel.

\* The MP3300 includes CPU Module and base Unit.



Note

If the ambient temperature exceeds 55°C, use forced-air cooling.

#### Control Panels with Natural Cooling

- Do not mount the MP3300 at the top of the control panel, where the hot air that is generated inside the panel collects.
- Leave sufficient space above and below the MP3300, and maintain adequate distances from other devices, cable ducts, and other objects to ensure suitable air circulation.
- Do not mount the MP3300 in any direction other than the specified direction.
- Do not mount the MP3300 on top of any device that generates a significant amount of heat.
- Do not subject the MP3300 to direct sunlight.



## Control Panels with Forced-air Cooling

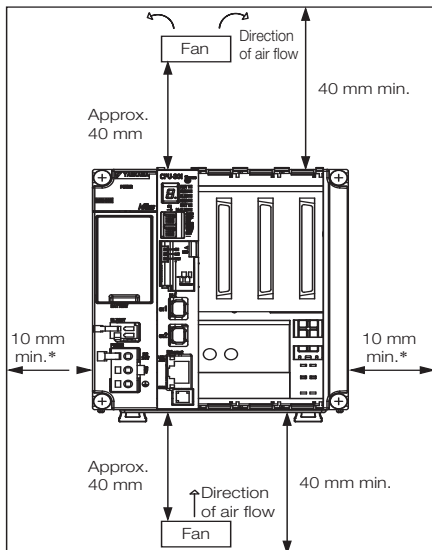
For either of the following methods, install a fan near the center of and at the top or bottom of the MP3300.

- Forced draft method (A fan or a similar device is used to circulate the air in the interior and the exterior of the panel.)
- Forced circulation method (A fan or a similar device is mounted to the airtight panel to circulate the air inside.)



Note


1. Use the following guideline when selecting the fan:
  - 80 × 80 mm min., Maximum air flow: 0.9 m<sup>3</sup>/min, Maximum static pressure: 26.5 Pa or higher
2. Adjust the fan installation location and the direction of air flow as shown in the following diagram.



\* For a control panel with natural cooling and any Base unit except for the JEPMC-BU3304-E Base Unit: 30 mm min.

## 3 Wiring

Refer to the following manual for details on connecting the product.

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


## 4 Inspections

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

### 4.1 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.
Indicators	POWER indicator	Check the status when power is ON.	Must be lit. (Otherwise, there is an error.)	Refer to the relevant manual.*

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

## 4.2 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 product.	Clean the product with air or a cloth.
Loose screws			There must be no looseness in terminal screws or connector lock screws.	Tighten the screws.

\* If the product is installed in a panel, the temperature inside the panel is the ambient temperature.

## 4.3 Replacement Guidelines for Product 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 product and determine if part replacement is required.

Yaskawa will initialize the settings of all parameters to the default values in products 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	100,000 power ON operations	—
Aluminum electrolytic capacitors on PCBs	10 years	Ambient temperature: 40°C or less

## 5 EMC Standard Compliance

The product complies with the following EMC standards: EN 55011 group 1 class A, EN 61000-6-2, and EN 61000-6-4. However, the product 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.

## 6 UL Standard Compliance

The product complies with the following UL standards: UL508 (E184524). The following table shows the product's UL certification for relay output (RLY OUT).

Use the table to find the certified relay output for the product.

UL Certification Mark:



File No.: E184524

RLY OUT Ratings (UL certified)

	DC Load		AC Load	
	resistive	inductive	resistive	inductive
24 Vdc 0.5 A resistive	0.5 A	–	–	–
24 Vdc 0.5 A general purpose	0.5 A	–	–	–
125 Vac 0.4 A resistive	–	–	0.4 A	–
125 Vac 0.2 A general purpose	–	–	–	0.2 A 0.75 PF
Pilot Duty Rating R150	–	1.0 A	–	–
Pilot Duty Rating D150	–	–	–	1.0 A Coil

# Revision History

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

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		Back cover	Revision: Address
February 2017	<5>	Back cover	Revision: Address
November 2016	<4>	Chapter 1	Addition: Interpreting Manufacturing Year and Month
		Last page of the manual	Addition: Information on hazardous substances in controllers
December 2015	<3>	Front cover	Revision: Format
		Back cover	Revision: Address and format
March 2015	<2>	Front cover	Addition: Base Unit models JEPMC-BU3301-E and JEPMC-BU3302-E
		2.2	Partly revised
October 2014	<1>	Back cover	Revision: Address
October 2014	-	-	First edition

# Machine Controller MP3000 Series

## MP3300 Base Unit

### INSTRUCTIONS

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## **YASKAWA**

**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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## 控制器中含有有害物质的信息

### コントローラの有害物質含有情報

#### Information on hazardous substances in controllers

本资料根据中国《电器电子产品有害物质限制使用管理办法》制定。

本資料は、中国「電器電子製品有害物質使用制限管理弁法」に基づいて記載しています。

This is based on the “Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products.”

产品中含有有害物质的名称及含量  
製品中の有害物質名称及び含有量  
Contents of hazardous substances in products

部件名称 部位名称 Parts Name	有害物质 有害物質 Hazardous substances					
	铅 鉛 Lead (Pb)	汞 水銀 Mercury (Hg)	镉 カドミ ウム Cadmium (Cd)	六价铬 6価クロム Hexavalent chromium (Cr VI)	多溴联苯 ポリ臭化 ビフェニル Polybromina ted biphenyls (PBB)	多溴二苯醚 ポリ臭化 ジフェニル エーテル Polybrominated diphenyl ethers (PBDE)
实装 基板 実装 基板 Circuit Board	×	○	○	○	○	○
外壳 ケース Case	○	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。

本表は SJ/T 11364 の規定により作成したものです。

This table has been prepared in accordance with the provisions outlined in SJ/T11364.

○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

×：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

- : 該当部品全ての均質材料による有害物質の含有量が GB/T 26572 に定める限度量の要求以下であることを示します。
- × : 該当部品中の少なくとも1種類の均質材料における当該有害物質の含有量が, GB/T 26572 に定める限度量を上回っていることを示します。
- : Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below or equal to the limit requirement of GB/T 26572.
- × : Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

注: 本產品符合歐洲的 RoHS 指令。

上表中的“×”表示含有歐盟 RoHS 指令豁免的有害物質。

注記: 本製品は欧州の RoHS 指令に適合しています。

上記表の“×”は, 欧州 RoHS 指令の適用除外である有害物質を含むことを示します。

Note : This product complies with EU RoHS directives.

In the above table, “×” indicates that hazardous substances that are exempt from EU RoHS directives are contained.

한국 전파법에 관한 주의사항

韓国電波法に關連する注意事項

Precautions for Korean Radio Waves Act

针对韩国电波法的注意事项

Précautions pour la Loi coréenne relative aux ondes radio

사용자 안내문

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이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다 .

( 주 ) 사용자 안내문은 “ 업무용 방송통신기자재 ” 에만 적용한다 .