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Hitachi Compute Rack 220H
Getting Started Guide

Hitachi Data Systems

Contents

Preface

This document describes features, restrictions, and installation of the *Compute Rack 220H* (CR 220H).
Please read this document carefully, and maintain a copy for reference.

This preface includes the following information:

- [Intended Audience](#)
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Notice: The use of Compute Rack and all other Hitachi Data Systems products is governed by the terms of your agreement(s) with Hitachi Data Systems.

Intended Audience

This document is intended for the personnel who are involved in planning, managing, and performing the tasks to prepare your site for Compute Rack installation and to install the same.

This document assumes the following:

- The reader has a background in hardware installation of computer systems.

- The reader is familiar with the location where the Compute Rack will be installed, including knowledge of physical characteristics, power systems and specifications, and environmental specifications.

Product Version

This document revision applies to Compute Rack 220H version 0021R22500.

Release Notes

Read the release notes before installing and using this product. They may contain requirements or restrictions that are not fully described in this document or updates or corrections to this document.

Document Organization

The table below provides an overview of the contents and organization of this document. Click the chapter title in the left column to go to that chapter. The first page of each chapter provides links to the sections in that chapter.

Chapter	Description
Chapter 1, Before installing	Describes what you need to know before installing the system unit, for example, environmental requirements for installation, restrictions, and so on.
Chapter 2, Overview	Describes the names of the components of the system unit and how to use basic functions.
Chapter 3, Installation	Describes how to install the system unit and how to connect peripherals to the system unit.
Chapter 4, Powering on/off the system unit	Describes how to power on/off the system unit.
Chapter 5, Specifications	Describes the specifications of the system unit.

Referenced Documents

Compute Rack 220H (CR 220H) documents:

- Hitachi Compute Rack 220H User's Guide, MK-90CRH003

- Hitachi Compute Rack 220H CRU Replacement Guide, MK-90CRH005

- Hitachi Compute Rack 210H/220H Windows Installation Guide, MK-90CRH007

- Hitachi Compute Rack 210H/220H BIOS Guide, MK-90CRH008

- Hitachi Compute Rack 210H/220H Remote Management User's Guide, MK-90CRH006

- Hitachi Compute Blade Series / Hitachi Compute Rack Series OS Installation Guide for Windows Server, MK-99COM076

Document Conventions

The term "Compute Rack" refers to all Compute Rack models, unless otherwise noted.

This document uses the following typographic conventions:

Convention	Description
Regular text bold	In text: keyboard key, parameter name, property name, hardware labels, hardware button, hardware switch. In a procedure: user interface item
Italic	Variable, emphasis, reference to document title, called-out term
`Screen text`	Command name and option, drive name, file name, folder name, directory name, code, file content, system and application output, user input
< > (angled brackets)	Variable (used when italic is not enough to identify variable).
[ ] (square bracket)	Optional values
{ } braces	Required or expected value
| vertical bar	Choice between two or more options or arguments
_(underline)	Default value, for example, [a | b]

Convention for storage capacity values

Physical storage capacity values (for example, disk drive capacity) are calculated based on the following values:

Physical capacity unit	Value
1 kilobyte (KB)	1,000 (10^3) bytes
1 megabyte (MB)	1,000 KB or $1,000^2$ bytes
1 gigabyte (GB)	1,000 MB or $1,000^3$ bytes
1 terabyte (TB)	1,000 GB or $1,000^4$ bytes
1 petabyte (PB)	1,000 TB or $1,000^5$ bytes
1 exabyte (EB)	1,000 PB or $1,000^6$ bytes

Logical storage capacity values (for example, logical device capacity) are calculated based on the following values:

Logical capacity unit	Value
1 block	512 bytes
1 KB	1,024 (2^{10}) bytes
1 MB	1,024 KB or $1,024^2$ bytes
1 GB	1,024 MB or $1,024^3$ bytes
1 TB	1,024 GB or $1,024^4$ bytes
1 PB	1,024 TB or $1,024^5$ bytes
1 EB	1,024 PB or $1,024^6$ bytes

Getting Help

The Hitachi Data Systems customer support staff is available 24 hours a day, seven days a week. If you need technical support, log on to the Hitachi Data Systems Portal for contact information: https://portal.hds.com.

Comments

Please send us your comments on this document: doc.comments@hds.com. Include the document title and number including the revision level (for example, -07), and refer to specific sections and paragraphs whenever possible. All comments become the property of Hitachi Data Systems Corporation.

Thank you!

Safety guidelines

This section contains warnings and important safety guidelines for using a Hitachi Compute Rack System. Read and understand the information in this section before removing, replacing and installing system components.

This section includes the following key topics:

Safety information

This document uses the following symbols to emphasize certain information.

Symbol	Label	Description
⚠	WARNING	This indicates the presence of a potential risk that might cause death or severe injury.
⚠	CAUTION	This indicates the presence of a potential risk that might cause relatively mild or moderate injury.
NOTICE	NOTICE	This indicates the presence of a potential risk that might cause severe damage to the equipment and/or damage to surrounding properties.
Note	Note	This indicates notes not directly related to injury or severe damage to equipment.
Tip	Tip	This indicates advice on how to make the best use of the equipment.
🔥	Fire Hazard	This warns fire hazard. Take appropriate precautions to prevent the risk of catching a fire.
⚡	Electric Shock Hazard	This warns electric shock hazard. Failure to take appropriate precautions could result in serious injury or death.
♨	Hot Surface	Hot Surface indicates the risk of a serious burn by high temperature.
☢	Laser Hazard	This warns laser hazard. Failure to take appropriate precautions could result in invisible laser radiation.
🚫	General Prohibition Sign	This indicates the general prohibition.
🚫	Disassembly Prohibition Sign	This indicates not to allow customer to disassemble component.
❗	General Mandatory Sign	This indicates a general action to take. Action by following the instructions in this guide.
🔌	Unplug Power cord	This indicates unplugging the power cable from the outlet to avoid electric shock and fire.

Common precautions concerning safety

Please carefully read through these safety instructions to follow:

- When operating the equipment, follow the instructions and procedures provided in the manual.

- Be sure to follow notes, cautionary statements and advice indicated on the equipment or in the manual.

- Referring to manuals attached to other products which you install in or connect to the equipment, follow the instructions described in those manuals.

Failure to follow those instructions can cause injury, fire or damage to property including the equipment.

General safety precautions

Handling of power cables
Always use the power cables shipped with the equipment, and follow the instructions below: Failure to follow the correct handling practices lead to damaging the power cables to expose the copper wires and to overheat due to short-circuiting or partial disconnection, which may cause electric shock or fire.

- Do not place any object on the power cables.

- Do not use the power cables near heat-generating appliances.

- Do not heat the power cables.

- Do not bundle the power cables.

- Do not subject the power cables to ultraviolet or strong visible light continuously.

- Keep the power cables from contact with alkali, acid, fat and oil, or humidity.

- Do not use the power cables in a high-temperature environment.

- Do not use the power cables above their specified rating.

- Do not use the power cables for other devices.

- Do not touch the power plug with moistened hands.

- Do not place any objects around the electrical outlets in order to allow users to quickly unplug the power cables.

Poor contact and tracking

Comply with the following instructions when handling the power plug. Otherwise, tracking or poor contact may cause overheating and a fire.

- Make sure that the power plug is fully and securely inserted into the electrical outlet.

- Before inserting the power plug, confirm that there is no dust or a water droplet on the plug. If any dust or water droplet is found, wipe it off with a dry cloth and then insert it.

Requirements for power outlets

- Use a grounding 2-pole plug-in power outlet. Outlets of any other types would cause an electric shock or fire.

- In order to prevent an electric shock, connect the outlet's grounding electrode to a grounding terminal installed by a qualified electrician. Without connection to the grounding terminal, an electric shock can occur in the event of a failure in power supply.

Plugging and unplugging

When inserting the power plug into the electrical outlet or removing it, be sure to hold the plug section. Do not pull the cable; it can partially break the wire, overheat the broken part and lead to a fire.

Power supply

Since the power supply has a high-voltage area in it, do not open the cover. If you do, it can result in an electric shock or equipment failure.

Installing power supply slot cover

When removing a power supply, do not insert your hand or tool inside the power slot. After removing a power supply, install a power slot cover. Inside the power slot, some conductors are exposed. If you touch them with your hand or tool, it may cause electric shock or equipment failure.

Abnormal heat, smoke, abnormal noise, or abnormal smell
Should you find anything abnormal occurring, turn off the power and unplug all the power cables of the equipment (maximum of 2) from the electrical outlets.

Do not repair, remodel or disassemble
Do not attempt to repair, remodel or disassemble the equipment on your own, except for performing expansion work in accordance with the instructions in this manual. Work performed by unqualified persons can lead to an electric shock, fire, or burns. Especially it is hazardous if you touch areas inside the high-voltage power unit.

Removal of the cover or bracket
Do not remove the cover or bracket. It can result in an electric shock, burns or equipment failure.

High temperature at a power supply
When a power supply is in operation, the cover and handle get hot. Be careful when replacing a failed module. You can get burned.

Adding and replacing parts
The cover and internal parts are hot immediately after the power is turned off. You must wait for about 10 minutes before adding or removing internal parts unless otherwise specified in this manual. If not, the hot equipment causes you to get burned.

Installing internal component and connecting peripherals

- When you remove a cover for removing and installing components or connect peripherals, disconnect all the AC cables from electrical outlets and disconnect all signal cables from the system unit unless otherwise specified.
  Otherwise, you get injury or electric shock. Also malfunction of the system unit might result.

- Use peripherals, internal components, signal cables, and AC cables that the manual describes as supported.
  Otherwise, compatibility issues might occur and malfunction of the peripherals, internal component, and the system unit. Also burn, smoke, or fire might occur.

Laser beam

- On this product, a Class 1 laser product is installed. Do not look directly at the laser beam. Do not look at the laser beam using an optical instrument.

- Under the laser module cover, a laser beam is being emitted. Do not remove the cover of an unused board.

Requirements for the product

Install the product on a fixed rack. Do not lean against the product or stand on it. Do not install the product in a place with weak floors and walls.
Do not subject the product to excessive vibration. That can drop and fall the product, leading to failure.

Installing the equipment in a rack

To install or remove the system equipment in or from the rack cabinet, always get help from at least one other person or use tools. If the system equipment has to be installed on 31U and above of the rack cabinet or it is already installed there, call for maintenance personnel instead of attempting to install or remove it. Defective installation may cause the system equipment to fall, resulting in injury or equipment failure.

Using a rack cabinet

When using a rack cabinet, do not place anything on the system unit mounted on the cabinet and do not use the top of the system unit mounted on the cabinet as a work bench. A heavy object placed on top of the system unit on the cabinet may fall, resulting in injury.

Locking the rail into place

Be sure to pull out the equipment until it locks into place. If not, the equipment may move unexpectedly, which causes you to get injured such as your finger caught in the gap.

Contact with metal edges

When moving the equipment or adding parts, take care not to hurt yourself on the metal or plastic edges. You can wear cotton gloves to protect your hands.

Improper battery type

CAUTION: Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.

Handling of batteries

Since maintenance personnel should change batteries, do not change them yourself. Follow the instructions described below. Inappropriate handling can result in injury because the battery can overheat, burst, and catch fire.

- Do not put the battery on charge.

- Do not short out the battery.

- Do not disassemble the battery.

Storing batteries

When storing batteries, apply adhesive tape on the terminals for insulation. If the batteries are stored without insulation, the terminals can contact each other to cause a short-circuit and overheat or burst, leading to injury or fire.

Precautions against damage to equipment

Insertion of foreign objects into the equipment
Do not allow clips, pins or any other metal items or flammable items to enter the equipment through a vent or by any other means. Continuing to operate the equipment with foreign objects could cause failure.

Impact from falling
Do not fall the equipment or hit it against another object. It can cause internal deformation and deterioration. Operating the equipment under such defective conditions can cause failure.

Vent
A vent is used for preventing rise in temperature inside the equipment. Do not block the vent by placing or leaning an object. If you do, the temperature rises, which can cause failure. Check and clean ventilation holes periodically to keep the dust from gathering on them.

Contact with connection terminals
Do not touch connection terminals, such as a connector with your hand or any metal item. Do not insert any objects such as wire into them. Do not place the equipment in a place with metal pieces. If you do, a short circuit can be developed, causing equipment failure.

Moving between two locations with a temperature differential
When you move the equipment from one location to another, a significant temperature gap between the two locations may cause condensation on the surface or inside the equipment. Operating the equipment with condensation inside can cause a failure in equipment. Leave the equipment at the new location for several hours until the equipment temperature conforms to that of the new environment before you start using it. When you move the equipment from an environment with temperature 5 degrees Celsius to that with 25 degrees Celsius, for example, leave it for about two hours.

Adding and connecting to peripheral devices
Use only peripheral devices which are explicitly listed as supported in the manual, and always follow the instructions in the manual. Using devices other than those mentioned above would cause a failure in peripheral devices and equipment due to the difference in connection specifications.

Radio interference

When you install the equipment next to another electronic device, the radio waves may interfere with each other. In particular, a television set or a radio in the vicinity may make a noise.

Magnetism generator

Do not place a device that generates strong magnetism, such as a magnet or a speaker, near the equipment. Doing so can cause a system unit failure.

Handling HDD/SSD

An HDD/SSD is a precision instrument. Handle it carefully when you use it. Inappropriate handling could result in HDD/SSD failure.

Failed HDD/SSD

- If you attempt to replace failed HDD/SSD using an incorrect procedure or failed alternative disk, data on the disk array can be corrupted. Back up the data before replacing the drive.

- If you attempt to replace normal HDD/SSD, data on the disk array can be corrupted. Only replace the failed HDD/SSD.

- Replace the failed HDD/SSD with turning on the system unit. Otherwise, data on the disk array can be corrupted.

Static electricity

Discharge static electricity by touching metal door knob or wear cotton gloves whenever you handle a component. Otherwise, the device might fail.

Residual electric charge

When you change the configuration of the system unit (DIMM, fan, PCI card, or peripherals), disconnect all the power plugs and wait 30 seconds and more before the procedure. Otherwise, residual electric charge might cause malfunction.

Aluminum electrolytic capacitors

An aluminum electrolytic capacitor has a limited service life. Do not use it past its service life. Otherwise, leakage or depletion of the electrolyte may cause smoke or electric shock. To avoid such hazardous situations, replace limited-life parts once they are past their designated service life.

Distribution board

Install a distribution board close to an entrance/exit to protect the devices in your computer system and to serve as an emergency power breaker.

Signal cables

- Route cables not to trip over them. Tripping over cables could cause injury or failure of devices connected to the equipment, and also could cause loss of valuable data.

- Do not place heavy items on the cables. Avoid routing cables close to a thermal appliance. If you do, it could cause damage to cable sheaths, resulting in failure of the connected devices.

Before turning off the power

- Follow the prescribed procedure for power operation. Power input or output not according to the prescribed procedure may cause problems on the system equipment.

- Before turning off the power, confirm that all devices connected to the equipment stop. Turning off the power during operation of the equipment may cause equipment failure or data loss.

- When you are using an OS which requires the shut down procedure, be sure to finish the shut down procedure before turning off the power. Otherwise, data may be lost.

Rack Mount Safety Consideration

- Elevated Ambient Temperature

  If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Use care not to exceed the rated maximum ambient temperature of the unit.

- Reduced Air Flow

  Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.

- Mechanical Loading

  Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

- Circuit Overloading

  Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

- Reliable Earthing

  Reliable earthing of rack-mounted equipment should be maintained. Pay particular attention to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."

Safety and warning labels

The location and content of the warning and safety labels on the CR 220H are shown here.

_1_

Before installing

This chapter describes what you need to know before installing the system, for example, environmental requirements for installation, restrictions, and so on.

- ☐ [Check at the delivery](#)
- ☐ [Environmental requirements for installation](#)
- ☐ [Restrictions](#)
- ☐ [Overview of Installation](#)

Check at the delivery

This section describes what you need to check when the system unit is delivered.

Checking delivered items

After you unpack, go through the Check list for the delivered items to confirm all the items are delivered and no items are damaged. If you find any missing parts or any problems, contact the <sales partner>.

Environmental requirements for installation

For the detail of installation method for the system unit, see *Hitachi Compute Blade 2000/1000/320 and Hitachi Compute Rack 220/210 Site Planning Guide*.

Restrictions

This section describes restrictions regarding an operating environment of the system unit and peripherals and regarding how to use them.

Operating environment of the system unit and peripherals

- Use a genuine Hitachi rack mount kit and install the system unit in a Hitachi rack cabinet. Do not use the system unit without installing the system unit in a rack cabinet.

- In a hot or cold place, use an air conditioner for a while to stabilize the ambient temperature before using the system unit.

- Do not use the system unit in direct sunlight or near heat-generating devices such as stoves.

- Do not use the system unit in excessive dust.

- Do not use the system unit at extremely high or low temperature or in a place where the temperature changes rapidly.
  Do not use the system unit at extremely high humidity.

- If lightning occurs near the place where the system unit is used or the power from the electrical outlets is unstable, instantaneous power failure or voltage drop can occur, blacking out the display. When this situation happens, turn off the system unit and restart.

Handling of the system unit and peripherals

- If you turn off the power switch during system startup or while in operation, you may not be able to start up the system unit again. When this situation happens, contact the sales representative or talk to the maintenance personnel.

- If you install the system unit at the proximity of other electronic devices, interference may occur. Especially when a TV set or a radio is nearby, electrical noise can be generated. When this situation happens, do the following.

    – Put the TV set or the radio away from the system unit.

    – Change the direction of the antenna of the TV set or the radio.

    – Use different electrical outlets.

- A mouse is susceptible to exogenous electrical noise. When mouse malfunction occurs, we recommend getting power for the system unit and power for peripherals from the same OA tap with noise filter.

- If foreign or other objects get inside an optical sensor of a mouse, remove the objects. If this situation happens, a mouse cursor may not move smoothly.

- "Wait more than 10 seconds to turn on the system unit after turning off the system unit. If the AC supply to the system unit is shut down (for example, a circuit breaker at a switchboard is shut off or AC power from the UPS is shut off by a scheduling function of UPS), wait at least 30 seconds. For each case, the system unit may not start up, if you turn on the system unit earlier.

- For information about how to turn off the power, see Powering off system unit and follow the instruction."

- If the system unit is used in a room with carpets or you use, for example, a lap robe during operation of the system unit, static electricity can be generated depending on the type of the material and can affect the system unit and peripherals. Use the ones made of material that does not generate too much static electricity.

- Make sure the system unit does not hit anything when you move the system unit.

- The system unit and its internal devices need periodical maintenance. See *User's Guide* and *Appendix A Maintenance and supplies* and follow the instruction for maintenance.

- During system startup, do not perform keyboard reset by pressing (Ctrl + Alt + Delete). System error occurs.

- When you connect a USB device to the system unit, it may not be recognized by the operating system (OS) because of loose connection.
  In this case, remove and connect again a USB device.

- The noise level of this system unit is 62 dB or less.
  We recommend installing the system unit in a dedicated room. You may feel the noise annoying depending on the installation environment or location. If you install the system unit in an office room, be careful enough to the environment and location.
  The noise level of the equipment is measured in accordance with ISO 7779 standard (Environment temperature is 15 degrees Celsius or less / Position of measurement is 100 cm apart from the front of the equipment and at the height of 150 cm).
  Note that the rotational speed of the fans is controlled by the temperature inside the system unit. If the maximum load continues for an extended amount of time at high temperature, or one of the fans gets out of order, the noise level may exceed this standard level. Note also that on startup or reboot, the fans run at full speed and the noise level may exceed this standard level.

Electrical outlets

- Use only 100-120 VAC or 200-240 VAC as the power supply. Use electrical power plugs and electrical outlets that meet respective specifications.

- An electric outlet has Line (L), Neutral (N), and Ground (G) conductors. Before using the electric outlet, confirm the Neutral and the Ground have the same electrical potential.

Note	Do not connect both types of power sources, 100 VAC and 200 VAC to the system unit at the same time. The system unit does not support AC power supply at different multiple voltages.

Overview of Installation

This section describes precautions to be taken when you setup and also describes how to Installation.

Precautions

- Read Safety guidelines carefully before setup and be careful enough to safety when you installation.

- Read manuals other than this manual those are bundled with the system unit and peripherals. Make sure you fully understand the steps and process before installation.

- If any specific instructions are given in other manuals in addition to what is explained in this manual, follow those instructions during installation.

- If you experience any troubles during installation, contact the sales representative or talk to the maintenance personnel.

Installation procedure

```
         ┌──────────────────────┐
         │   Start Installation  │
         └──────────┬───────────┘
                    │
         ┌──────────▼───────────┐
         │ Preparation of the    │
         │    rack cabinet        │
         └──────────────────────┘
         ╱ Rack cabinet installation ╲ ──────►  ┌──────────────────────────┐
         ╲                            ╱         │ See "Hitachi Compute      │
         ╱ Determination of the system ╲ ─────► │ Blade 2000/1000/320 and   │
         ╲  unit mounting position     ╱        │ Hitachi Compute Rack      │
                    │                            │ 220/210 Site Planning     │
         ┌──────────▼───────────┐                │ Guide"                     │
         │ System Unit installation │            └──────────────────────────┘
         │   to the rack cabinet    │
         └──────────────────────┘
         ╱ Installation the system unit ╲
         ╲                              ╱
                    │
         ┌──────────▼───────────┐
         │  Cabling and power-on │
         └──────────────────────┘
         ╱ Connection to the system unit ╲
         ╲                               ╱
         ╱  Powering on system unit ╲
         ╲                          ╱
         ┌──────────▼───────────┐
         │ Check the indicator status │
         └──────────────────────┘
         ╱ Check the POWER LED of ╲
         ╲    power supply        ╱
         ╱ Check the POWER LED switch ╲
         ╲  of operational panel      ╱
                    │
         ┌──────────▼───────────┐
         │         End           │
         └──────────────────────┘
```

Figure 1-1: Installation procedure

2

Overview

This chapter describes the names of the system components and how to use basic functions.

☐ [Name of each component and its functions](#)

Name of each component and its functions

This section describes the name of each component and its functions.

Front side

With Front bezel (AU7705-Y/AU7705-R)
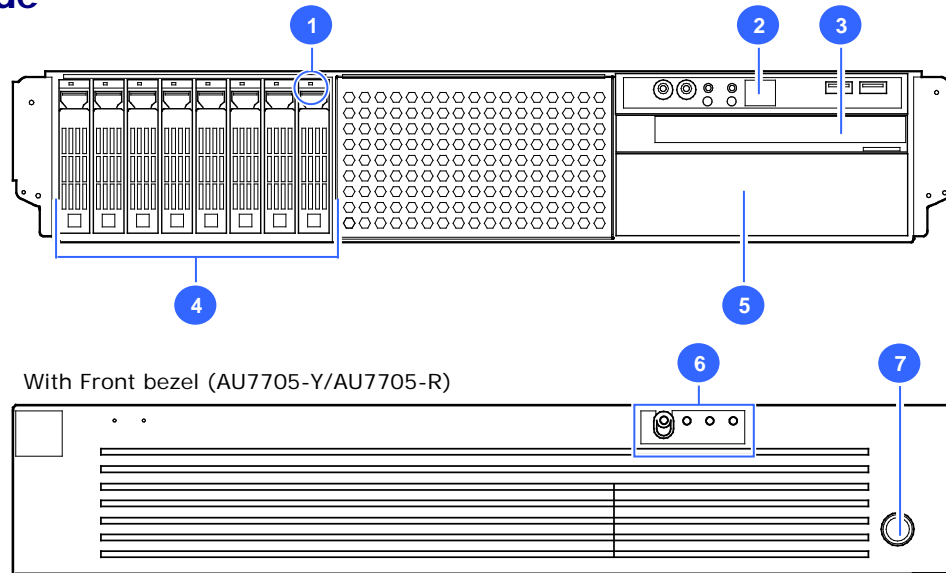
Figure 2-1: CR 220H front side Overview

Table 2-1: CR 220H front side components

Location	Name	State	Description
1	HDD status LED	**Green-On**	Accessing HDD/SSD.
		Amber-On	Error occurred.
		Amber-Blink[1]	On-going data rebuild.
2	Operation panel	-	The operation panel has switches to control the system unit and LEDs for the status of the system unit. See Operation panel on page 2-3
3	Extension storage bay	-	A DVD-ROM drive is pre-installed in this storage bay. See Internal DVD-ROM drive on page 2-7.
4	Extension storage bays (2.5-inch) 1-8[2]	-	An internal HDD/SSD (2.5-inch) can be installed to an extension storage bay (2.5-inch).
5	Extension storage bays (5-inch)	-	A removable device can be installed to an extension storage bay (5-inch).
6	Bezel indicator	-	Indicates the LEDs on the operation panel by lenses. See Operation panel on page 2-3.
7	Bezel lock	-	Locking the Front bezel by the lock key.

Notes:

1   The LED lights green while the HDD/SSD is being accessed for rebuilding.

2   A dummy tray is installed for an extension bay without an internal HDD/SSD.

Operation panel

With Front bezel (AU7705-Y/AU7705-R)
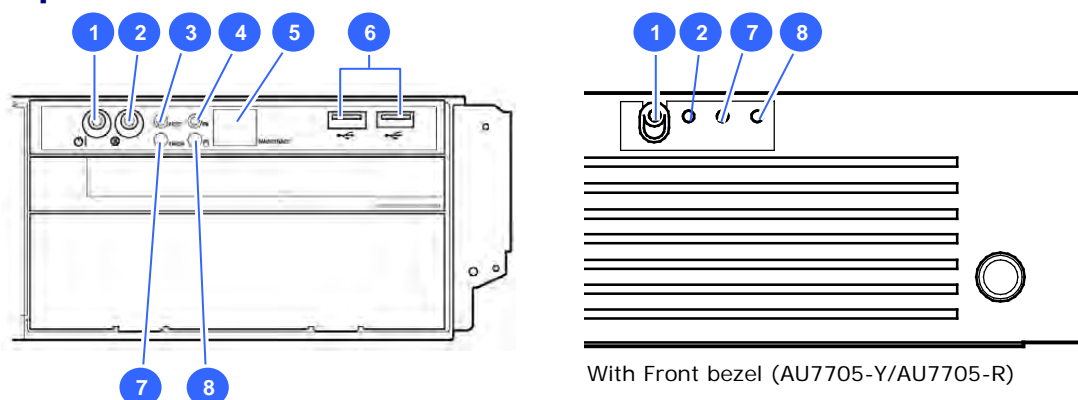
Figure 2-2: CR 220H operation panel overview

Table 2-2: Operation panel switches, indicators and connectors

Location	Name	State	Description
1	POWER switch with POWER LED	Green-On	Press the POWER switch to turn on/off the system unit. The POWER LED is turned on when the system unit is turned on by pressing the POWER switch. If you press the POWER switch continuously for 4 seconds or more, you can forcibly turn off the system unit.
2	SERVICE switch with SERVICE LED	Blue-On	The SERVICE LED turns on when a SERVICE switch either on the front side or the rear side is pressed.
3	RESET switch	-	Press this button to perform hard reset (restart) on the system unit. If you need to press the switch, use, for example, a ballpoint pen to press the switch.
4	FUNCTION switch	-	Not for use. Do not press this switch.
5	MAINTENANCE LEDs	Green-On	Display a 2-digit hex value indicating the operation status of the system unit.
6	USB connectors (front side)	-	USB devices can be connected.
7	ERROR LED	Amber-On	HDD errors, fan errors, power supply errors, or other hardware errors occur.
8	ACCESS LED	Green-On	Accessing HDD/SSD.
		Amber-On	Error occurred.
		Amber-Blink*	On-going data rebuild.
* The LED lights green while the HDD/SSD is being accessed for rebuilding.			

MAINTENANCE LEDs

MAINTENANCE
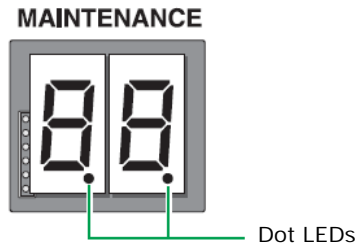
Dot LEDs

Figure 2-3: MAINTENANCE LEDs

MAINTENANCE LEDs can display the event code, the POST code or the power consumption, and you can select what to display on it by using the SERVICE switch.
A combination of ON/OFF selections of Dot LED (left), Dot LED (right), and SERVICE LED determines what is currently displayed.
A combination of ON/OFF selections of Dot LED (left), Dot LED (right), and the SERVICE LED determines what the MAINTENANCE LEDs indicate as follows:

Table 2-3: What the MAINTENANCE LEDs indicate

SERVICE LED	Dot LED (left)	Dot LED (right)	What the MAINTENANCE LEDs indicate
Off	Off	Off	Event code
On	On	Off	POST code
Off	On	On	Power consumption

- Event code

    The operation status of the system unit is displayed. Under normal operation, "00" is displayed. If an error occurs, the two-digit number corresponding to the component where the error occurred is indicated at LED.

Table 2-4: Event code indicate

MAINTENANCE LED	Where the error occurred	MAINTENANCE LED	Where the error occurred
00	Normal operation	10	PCI
01	Other hardware	20	Motherboard
02	Temperature	40	Memory
04	Fans	80	CPUs
08	Power / Voltage	(Other codes)	(Multiple locations)

- POST code

    The POST code of the system BIOS is displayed. If Power On Self Test (POST) is successful, "A.E" is displayed.

    | Tip | The MAINTENANCE LEDs keep the data of the POST code and the event code unless the AC power source is turned off. When the power of the system unit is turned on, the display gets cleared. |

- Power consumption

    The rough estimate of the current power consumption of the system unit (W) is displayed.
    The upper digit (left side) indicates the 100's digit, and the lower digit (right side) indicates the 10's digit.

    | Tip | The indicated power consumption value is not accurate. Use this value as a just reference. |

SERVICE switch

The SERVICE switch is used to switch what to display on the MAINTENANCE LEDs. Also the SERVICE switch is used to turn on the SERVICE LED. SERVICE LED is used as one of the information to show what kind of code is now on MAINTENANCE LEDs.
The ON/OFF status of this switch does not affect the operation of the system. Every time you press the SERVICE switch, the MAINTENANCE LEDs will change the code to display as follows.
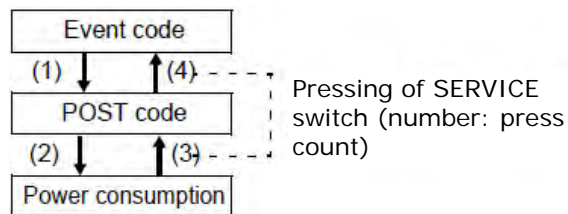
Figure 2-4: MAINTENANCE LEDs indicate pressing of SERVICE switch

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	When you intend to press a SERVICE switch, be careful not to press the POWER switch. The system will be shut down if the POWER switch is pressed.
	When an AC cable is connected and the system unit gets supplied with AC power, both SERVICE LEDs on the front side and on the rear side of the system unit blink for about 60 seconds. During this period, the MAINTENANCE LEDs are turned off. The system unit doesn't start unless the SERVICE LEDs finish blinking. So you will have to wait the system to start until the LEDs finish blinking if you press the POWER switch while the SERVICE LEDs are still blinking.

FUNCTION switch

	Do not press the FUNCTION switch and the SERVICE switch at the same time. NMI is issued and the system will be forcibly shut down.
	If you press the FUNCTION switch continuously for 10 seconds or more while the management interface is not connected to LAN, the system unit gets into the BMC maintenance mode and the ERROR LED will blink. BMC maintenance mode is used during maintenance work. Avoid this operation. When into this mode, you can release the system unit from the BMC maintenance mode by pressing the FUNCTION switch continuously for 10 seconds or more using, for example, a ballpoint pen. When BMC maintenance mode is canceled, the ERROR LED stops blinking.

Internal DVD-ROM drive
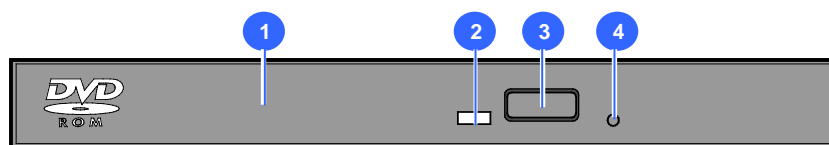
Figure 2-5: Internal DVD-ROM drive front panel

Table 2-5: Internal DVD-ROM drive front panel components

Location	Name	State	Description
1	Tray cover	-	Open/close cover of the tray to place a disc.
2	Busy indicator	Green-On	During startup.
		Green-Blink	Accessing disc.
3	Eject button	-	Open the tray.
4	Manual eject hole	-	This hole is used to forcibly eject the internal disc if it cannot be removed due to a failure of the drive. *
* Turn off the power, wait for about 15 seconds, and then insert a thin stick into the hole. Push the position in contact with the tip of the stick about 8 mm, and the tray opens slightly. Then draw the tray by hand and remove the disc. Use a durable stick (diameter: 1.0 to 1.4 mm, length: 30 mm or more). An unbent clip is used usually.			

> **Tip**
> The tray is opened or closed only when power is turned on. If ejection of a disc with this button is prohibited by the command, the disc cannot be ejected with the eject button.

Rear side
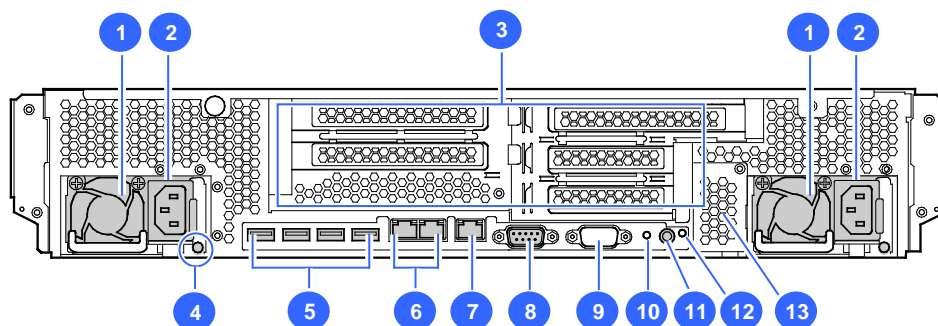
Figure 2-6: CR 220H rear side overview

Table 2-6: CR 220H rear side components

Location	Name	State	Description
1	Power supply slots	-	A power supply can be installed to a power supply slot. The slot numbers are 1, 2 from left to right.
2	AC connector	-	Connect an AC cable to the AC connector.
3	PCI slots	-	A PCI Express board can be installed to a PCI slot (PCI).
4	Power supply LED	Green-Blink	AC power is supplied / Stand-by state (AC cable is connected, POWER LED switch is OFF)
		Green-On	Power is ON / Normal operation (POWER LED switch is ON)
		Amber-Blink	Warning status (over-temperature)
		Amber-On	Errors occurred (Failure, AC cable has been disconnected, or other reason)
5	USB connectors (rear side)	-	Connect a keyboard and a mouse. You can also connect USB devices.
6	Network interface connectors 1, 2	-	Connectors to connect LAN cables. Network interface connector numbers are 1 and 2 from right to left.
7	Management interface connector	-	Connect the management interface connector to a system console terminal using a LAN cable when you use the remote management function. For the details of the remote management function, see *Remote Management User's Guide*.
8	Serial interface connector (COM0)	-	You can use this connector to connect a device such as a modem that uses a serial interface.
9	VGA connector	-	Connect a computer display to the VGA connector.
10	NMI switch	-	When you press the NMI switch, NMI is issued and the system will be forcibly shut down. Not for use. Do not press this switch.
11	SERVICE switch with SERVICE LED	Blue-On	The SERVICE LED turns on when a SERVICE switch either on the front side or the rear side is pressed.
12	Power LED	Green-On	Power is ON / Normal operation (POWER switch is ON)*

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Location	Name	State	Description
13	**Extension network interface connectors**	-	If you install an optional LAN mezzanine, you can add two network interface connectors. Network interface connector numbers are 3 and 4 from top to bottom.

* When the AC power supplied to the system unit, this LED may blink in amber.

PCI slots

The slot numbers are as follows.

PCI slot 2 — PCI slot 5
PCI slot 1 — PCI slot 4
PCI slot 3
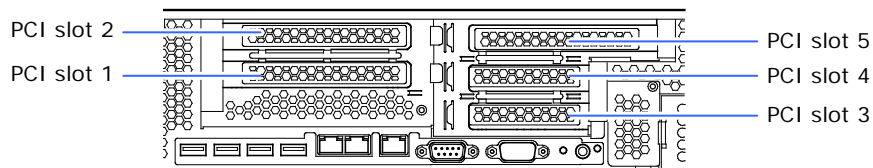
Figure 2-7: Location of PCI slot

Table 2-7: PCI slots specification

Slot	Specification
1	PCI Express 3.0 × 8 (8 lanes)
2	
3	PCI Express 3.0 × 4 (4 lanes) / Low profile
4	
5	PCI Express 3.0 × 8 (8 lanes)

Network interface connectors 1, 2

The status LEDs on the connector are explained as follows.
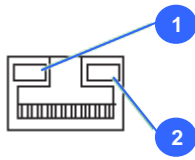
Figure 2-8: Network interface connectors status LED

Table 2-8: Network interface connectors status LED indicate

Location	Name	State	Description
1	Activity LED	Green-On	A link with a hub has been established.
		Green-Blink	Data is being transmitted or received.
		Off	A link with a hub has not been established.
2	Link LED	Amber-On*	A 1000BASE-T link with a hub has been established.
		Green-On*	A 100BASE-TX link with a hub has been established.
		Amber-Blink	A 1000BASE-T link with a hub is being established.
		Green-Blink	A 100BASE-TX or 10BASE-T link with a hub is being established.
		Off	A 10BASE-T link with a hub has been established or link with a hub has not been established. The Activity LED shows either case.

* AC power is still supplied even if the power of the system unit is turned off, but this LED will be turned off because only link by 10BASE-T can be established.

> **Tip**
> - Onboard LAN controllers (network interfaces) displayed by the device manager are as follows:
>   – Onboard LAN1: PCI bus 8, device 0, function 0
>   – Onboard LAN2: PCI bus 8, device 0, function 1
> - The number of the network adapter which is the network interface connector recognized by the device manager may not match to the network interface connector number.

Management interface connector

The status LEDs on the connector are explained as follows.
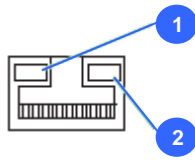
Figure 2-9: Management interface connector status LED

Table 2-9: Management interface connector status LED indicate

Location	Name	State	Description
1	Activity LED	Green-On	A link with a hub has been established.
		Green-Blink	Data is being transmitted or received.
		Off	A link with a hub has not been established.
2	Link LED	Green-On	A 100BASE-TX link with a hub has been established.
		Green-Blink	A 100BASE-TX or 10BASE-T link with a hub is being established.
		Off	A 10BASE-T link with a hub has been established or link with a hub has not been established.

Note	Do not directly connect between the management interface connector and a network interface connector 1 or 2 using a LAN cable. If you do, the system unit does not work properly.

Tip	• The link speed and duplex of the management interface are specified to auto-negotiation. Therefore, also specify auto-negotiation to the LAN ports both of a console, terminal and a switching hub which connected to the management interface.
	• We recommend you use the management interface at 100BASE-TX. If the links speed of the management interface is 10 Mbps (10BASE-T link established, the Link LED is OFF), malfunction may occur in communication. In this case you need to reconfigure the network connected to the management interface.
	• If you find the communication is unstable, turn off the system unit, shut down the AC power by, for example, disconnecting the AC cable, wait 30 seconds or more, and then reconnect AC power and turn on the system unit.

Extension network interface connectors

Different network interfaces are added depending on which LAN mezzanine is installed.

- LAN mezzanine (CN7M0T-Y/CN7M0T-R):
  1000BASE-T/100BASE-TX/10BASE-T
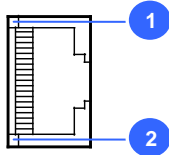
Figure 2-10: LAN mezzanine (CN7M0T-Y/CN7M0T-R) status LED

Table 2-10: LAN mezzanine (CN7M0T-Y/CN7M0T-R) status LED indicate

Location	Name	State	Description
1	Link LED	Amber-On*	A 1000BASE-T link with a hub has been established.
		Green-On*	A 100BASE-TX link with a hub has been established.
		Off	A 10BASE-T link with a hub has been established or link with a hub has not been established. The Activity LED shows either case.
2	Activity LED	Green-On	A link with a hub has been established.
		Green-Blink	Data is being transmitted or received.
		Off	A link with a hub has not been established.
* AC power is still supplied even if the power of the system unit is turned off, but this LED will be turned off because only link by 10BASE-T can be established.			

- LAN mezzanine (CN7M1T-Y/ CN7M1T-R):
  10GBASE-T/1000BASE-T
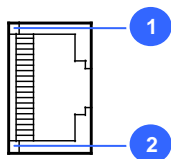
Figure 2-11: LAN mezzanine (CN7M1T-Y/ CN7M1T-R) status LED

Table 2-11: LAN mezzanine (CN7M1T-Y/ CN7M1T-R) status LED indicate

Location	Name	State	Description
1	Link LED	Amber-On	A 10GBASE-T link with a hub has been established.
		Green-On	A 1000BASE-TX link with a hub has been established.
		Off	A link with a hub has not been established.
2	Activity LED	Green-On	A link with a hub has been established.
		Green-Blink	Data is being transmitted or received.
		Off	A link with a hub has not been established.

- LAN mezzanine (CN7M1S-Y/ CN7M1S-R): 10GBASE-T SFP+
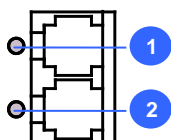
Figure 2-12: LAN mezzanine (CN7M1S-Y/ CN7M1S-R) status LED

Table 2-12: LAN mezzanine (CN7M1S-Y/ CN7M1S-R) status LED indicate

Location	Name	State	Description
1	Link LED	Green-On	A 10GBASE-T link with a hub has been established.
		Amber-On*	A 1000BASE-T link with a hub has been established.
		Off	A link with a hub has not been established or device driver has not been loaded.
2	Activity LED	Green-On	A link with a hub has been established.
		Green-Blink	Data is being transmitted or received.
		Off	A link with a hub has not been established or device driver has not been loaded.

	• Onboard LAN controllers of the optional LAN mezzanine displayed by the device manager are as follows:
Tip	– LAN controller 1: PCI bus 6, device 0, function 0
	– LAN controller 2: PCI bus 6, device 0, function 1

• The number of the network adapter which is the network interface connector recognized by the device manager may not match to the network interface connector number.

• LAN mezzanine (CN7M1T-Y/CN7M1T-R) interfaces support link speed is 10 Gbps and 1 Gbps (10GBASE-T and 1000BASE-T). If the links speed of the LAN mezzanine (CN7M1T-Y/CN7M1T-R) is 100 Mbps or 10 Mbps (100BASE-TX or 10BASE-T link established, the Link LED is lights solid amber), you need to reconfigure the network connected to the LAN mezzanine interface. In this case, the Link LED is lights solid amber as well as if the link speed is established with 1000 Mbps (1000BASE-T). Be careful because you cannot discriminate a linking speed (10 Mbps, 100 Mbps or 1000 Mbps) by lighting status the Link LED.

• LAN mezzanine (CN7M1S-Y/CN7M1S-R) interfaces support link speed is only 10 Gbps (10GBASE-SR). If the links speed of the LAN mezzanine interface is 1000 Mbps (1000BASE-SX link established, the Link LED is lights solid amber), you need to reconfigure the network connected to the LAN mezzanine interface.

3

Installation

This chapter describes how to install the system unit and how to connect peripherals to the system unit.

Installing the rack cabinet

For the detail of installation method for the rack cabinet, *see Hitachi Compute Blade 2000/1000/320 and Hitachi Compute Rack 220/210 Site Planning Guide*.

For more information about the rack cabinet, see Rack cabinet user's manual bundled with the rack cabinet.

Installing the system unit

This section describes how to install the system unit in a rack cabinet.

Installing the rack rail

When you mount the system unit to the rack cabinet, use the rack rails provided for exclusive use with the system unit. Use a Hitachi rack cabinet or an EIA standard rack.

The following describes the procedure to install the rack rails in a rack cabinet.

1. Slide out the inner rail from outer rail while pressing the button on the inner rail until the inner rail stops.

   Then the inner rail is locked by lock latch (White).

2. Further slide out the inner rail while pulling the lock latch (White) and disengage the inner rail.

Note	When you disengage the inner rail while pressing the lock latch (White), you need to pull the inner rail with a lot of force because the rail is tight. Be careful to the surroundings and make sure you do not hit anything.

Tip	• The rack rails have a distinction of right and left as follows:

– Left side (towards front of the system unit)
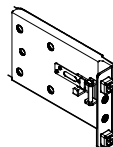
Outer rail Stamp "L" and arrow.
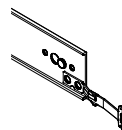
Inner rail Stamp "LEFT".

– Right side (towards front of the system unit)
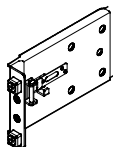
Outer rail Stamp "R" and arrow.
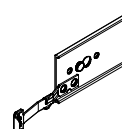
Inner rail Stamp "RIGHT".

• One step of the outer rail slides.
  In the whole rack rail, two steps slide including one step of slide of the inner rail.
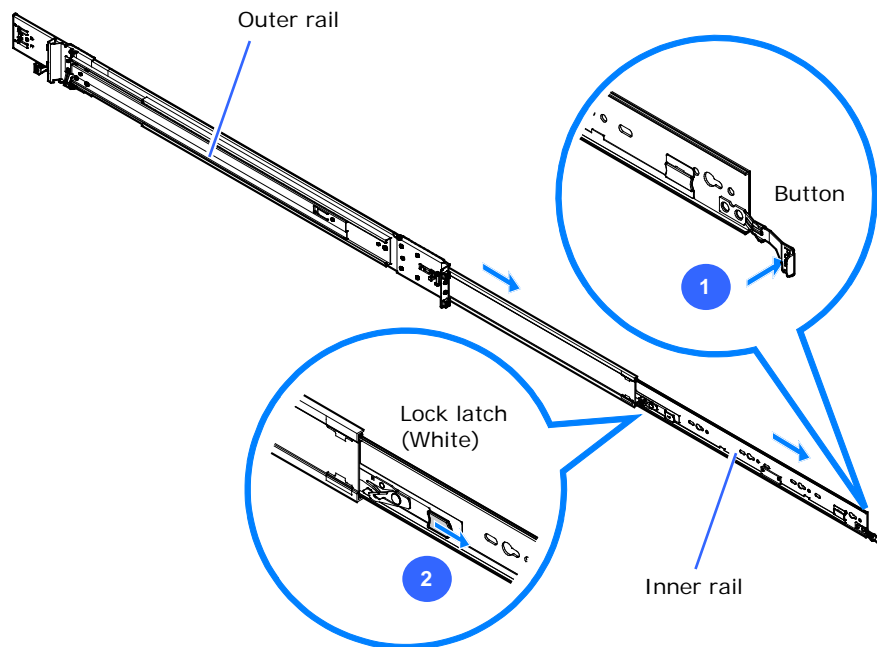
Figure 3-1: Disengage the inner rail from the outer rail

3. Slide the outer rail back while lifting the lock lever.
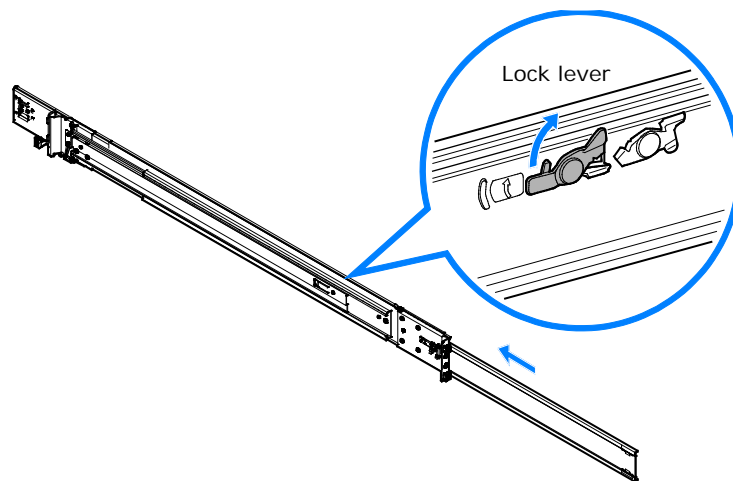
Figure 3-2: Slide back the outer rail

4. Align the guide at the front of the outer rail with the guide hole at the front of the rack cabinet and lock the guide into the hole.
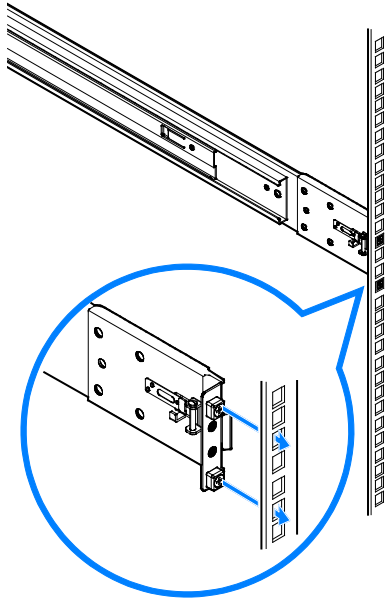
Figure 3-3: Guide of the outer rail into hole at front of the rack cabinet

5. Release the lock lever at the rear of the outer rail, align the guide with the guide hole at the rear of the rack cabinet.

6. Lock the guide into the hole, and engage the lock lever to fix the outer rail to the rack cabinet.
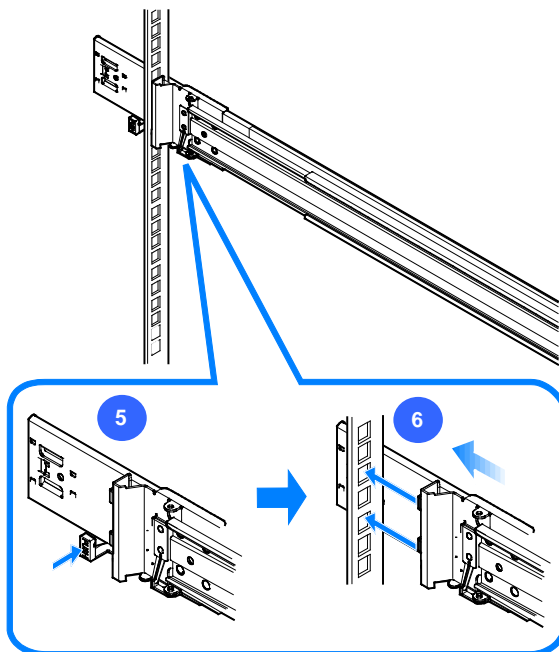
Figure 3-4: Lock the outer rail in the rack cabinet

7. Repeat with the other outer rail.

Mounting the system unit to the rack cabinet

The following describes the procedure to mount the system unit to the rack cabinet.

1. Align the hole of the inner rails to the tabs of the system unit.
   And then, put and slide the inner rails toward the rear of the system unit.
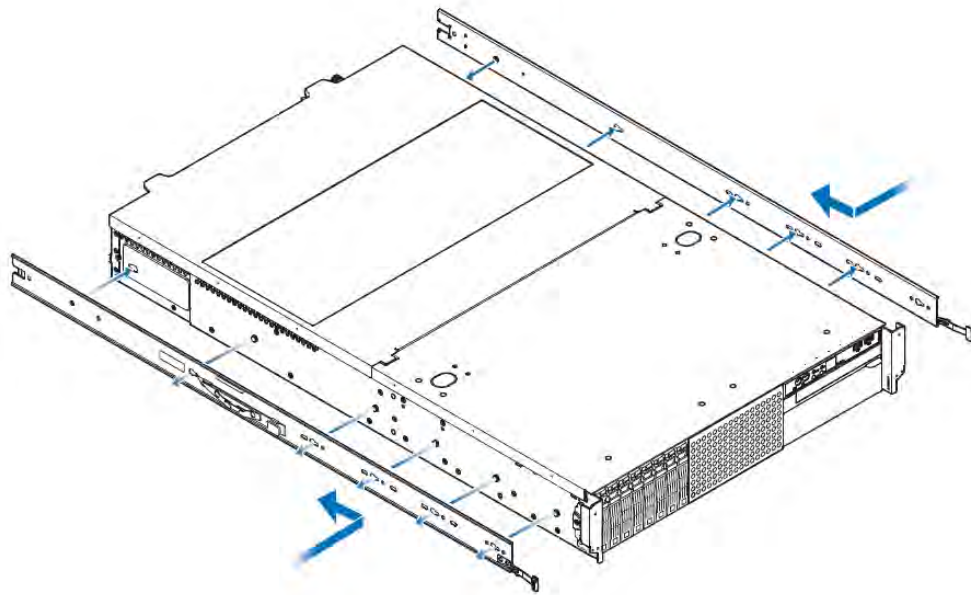
Figure 3-5: Put the inner rails to the system unit

2. Align the inner rails on either side of the system unit with the outer rails.

> **Tip** Slightly slide in one inner rail first, and then try the other inner rail.

3. Slide the inner rails into the outer rails until the inner rails stop and are locked by lock latches (White).

> **Note** When you slide the system unit into the rack cabinet, be careful against being caught the cable clamp of the power supply. The cable clamps may be damaged.

4. Pull the lock latches (Blue) and slide the inner rails all the way into the rack cabinet.

   Then the inner rails are locked by the buttons.

> **Note** • Slide in the system unit gently. Lift the front of the system unit slightly when sliding the system unit into the rack cabinet. Otherwise, the system unit can interfere with another unit installed below, which may cause those units to be deformed.

|	• When you slide in the system unit, you need to push the system unit with a lot of force because the rail is tight. Be careful to the surroundings and make sure you do not hit anything.
Note	• Do not push down the system unit while sliding out the system unit. If you do, the system unit may be deformed.
	• The inner rails are not locked by the buttons when making the right and left of the outer rails reverse and having attached to the rack cabinet. Remove and re-attach correctly the outer rails to the rack cabinet. For remove procedures, see <u>Removing the system unit</u>.
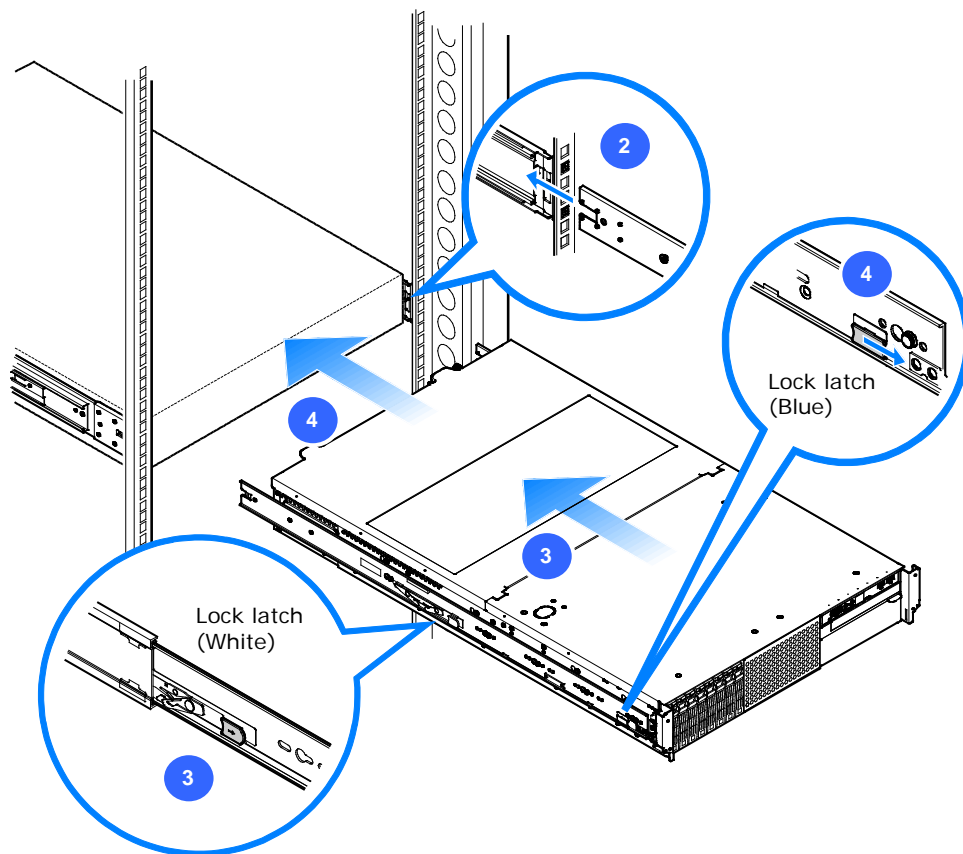
Figure 3-6: Mounting the system unit to the rack cabinet

Installing/removing a front bezel

This section describes how to install/remove a front bezel.

A front bezel (AU7705-Y/AU7705-R) is an optional product. Only when you purchase a front bezel separately, the front bezel is delivered in a separate package.

NOTICE	Do not auto eject or remote eject the disc while a front bezel is attached or the front door of the rack cabinet is closed. Do not attach a front bezel or close the front door of the rack cabinet while the tray is open.
	The tray can interfere with the front bezel or the front door and can cause a failure.

Installing a mounting bracket

Fix the mounting brackets with three screws to both the front tabs of the system unit.
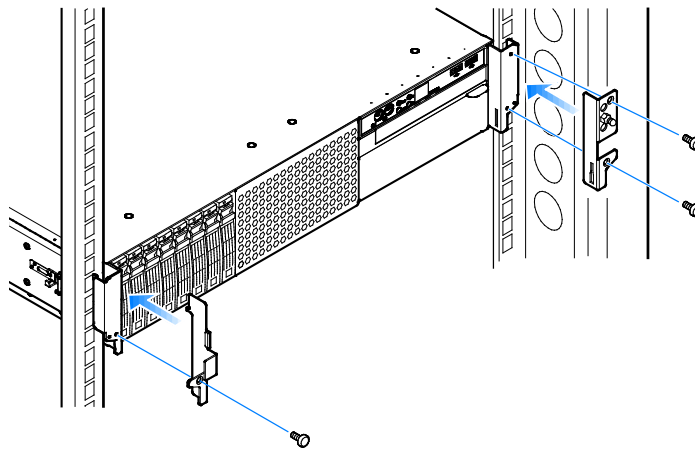
Figure 3-7: Fixing mounting bracket

Installing a front bezel

1. Hook the tab inside the front bezel to the guide on the left side mounting bracket.

2. Push in the other side of the front bezel all the way.

3. After pushing in, lock the front bezel with the bezel key.
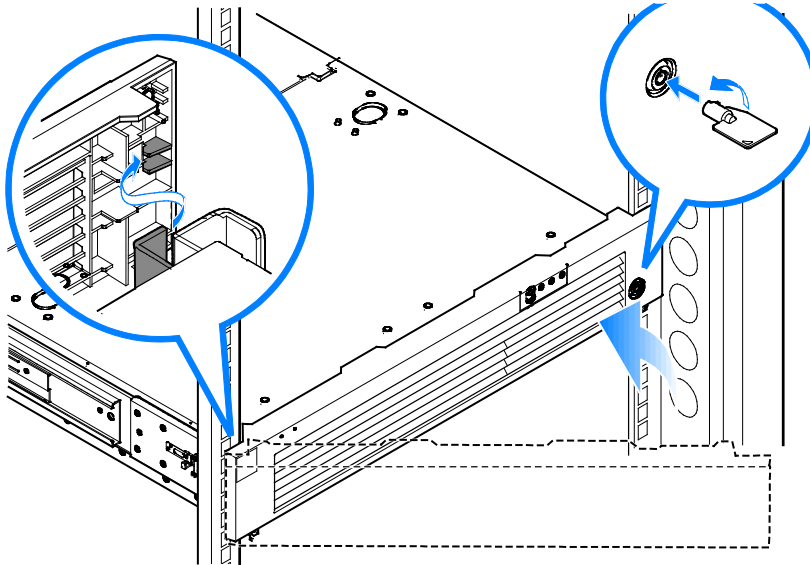
Figure 3-8: Installing the front bezel

Tip	A bezel key is fixed with adhesive tape inside the front bezel.

Removing a front bezel

Reverse the Installing a front bezel procedure.

Connecting to the system unit

This chapter describes how to connect peripherals to the system unit.

Computer display, keyboard, and mouse

Connect the computer display to the VGA connector on the rear side of the system unit using a display interface cable. Connect a keyboard and a mouse to the USB connectors (rear side). Then connect the power plug of the computer display to the electrical outlet box inside the rack cabinet or an uninterruptible power supply (UPS).

Tip	At the first startup after you change the configuration of the system unit, Windows loads new drivers and sets up new services. Because the USB driver is not loaded during this period, you cannot temporarily use a keyboard and a mouse for input.
	If you changed the configuration of the system unit, wait one or two minutes after startup and then use the keyboard or mouse for input.
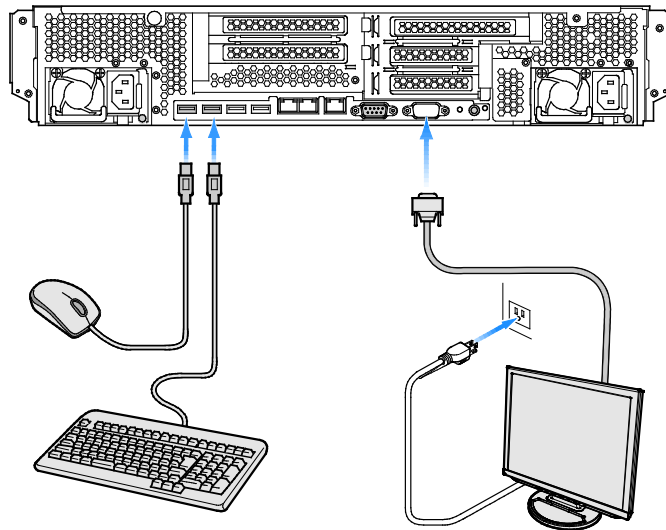
Figure 3-9: Connecting display, keyboard, and mouse

AC cable

Connect an AC cable to the AC connector of the system unit.
If you use an AC cable for 100 VAC, you need a 100VAC grounded two-pole electrical outlet with a ground terminal.
If you use an AC cable for 200 VAC, you need a 200VAC grounded two-pole electrical outlet with a ground terminal.
Connect the AC cable to the electrical outlet box inside the rack cabinet or an uninterruptible power supply (UPS).

If you connect AC cables to a UPS, see <u>Uninterruptible power supply (UPS)</u> on page 3-12.

Note	• Do not connect both types of power sources, 100 VAC and 200 VAC to the system unit at the same time. The system unit does not support AC power supply at different multiple voltages. • If you pull out a power plug from the system unit or an electrical outlet, wait 30 seconds or more and then reconnect a power plug. Otherwise the system unit may not start up.
Tip	• If an optional power supply (BP2361-Y/BP2361-R) is installed to achieve redundant configuration, you need two AC cables. • When an AC cable is connected and the system unit gets supplied with AC power, both SERVICE LEDs on the front side and the rear side of the system blinks for about 60 seconds. During this period, the MAINTENANCE LEDs are turned off. If you press the POWER switch while the SERVICE LEDs are blinking, you have to wait until the blink end to start the system unit. • When AC cables are connected and the system unit gets into stand-by mode, the fans inside the power supplies start running.
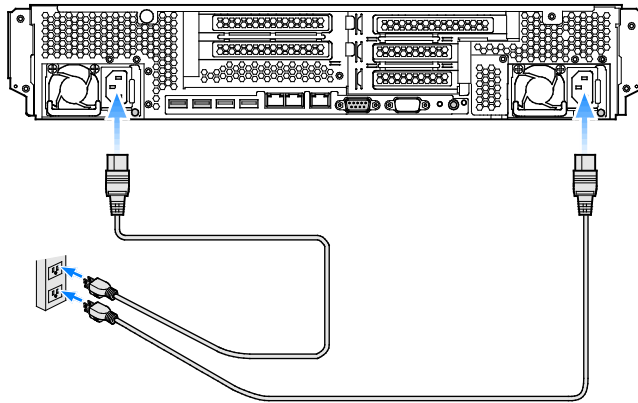
Figure 3-10: Connecting AC cable

After you connect an AC cable to the system unit, fix the AC cable using a cable clamp attached to the power supply in order to avoid disconnection. After the AC cable is fixed, push the cable clamp toward the power plug all the way.
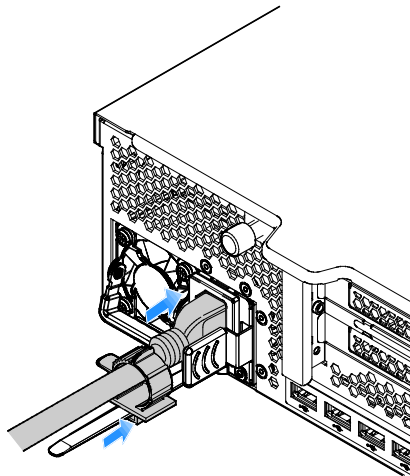
Figure 3-11: Fix AC cable using the cable clump

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Uninterruptible power supply (UPS)

An uninterruptible power supply (UPS) supplies AC power when a power failure occurs or a circuit breaker is shut off, stopping AC power for the system unit.

The UPS you use has to accommodate the type of AC cable used for the system unit. The UPS also has to support the OS used in the system unit.

For information about hardware settings of a UPS, see the manual of the UPS.

Note	If you use a UPS, the system unit will not automatically start even when AC power is resumed after shutdown caused by a power failure or other reason. In order for the system unit to automatically start, you need UPS management software. For details, contact the sales representative. You also need to change the settings of the system BIOS **Restore AC Power Loss** to Power On. See *Hitachi Compute Rack 210H/220H BIOS Guide*.
Tip	If you install a power supply (BP2361-Y/BP2361-R), you need two AC cables.
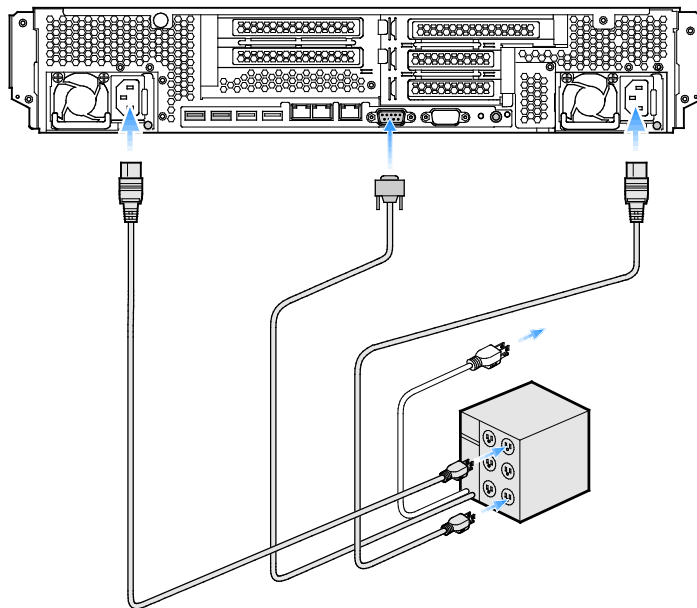
Figure 3-12: Connecting AC cable to UPS

LAN cable

In order to connect the system unit to a network such as a LAN or a WAN, connect a network interface connector on the rear side of the system unit to a switching hub by using a LAN cable.

The system unit has two network interface connectors as standard options.

- Network interface connector 1: Connects to onboard LAN1

- Network interface connector 2: Connects to onboard LAN2

If you install an optional LAN mezzanine (CN7M0T-Y/CN7M0T-R/CN7M1T-Y/ CN7M1T-R/CN7M1S-Y/CN7M1S-R), you can add two network interface connectors.

- Network interface connector 3: Connects to LAN mezzanine LAN1

- Network interface connector 4: Connects to LAN mezzanine LAN2

The onboard LAN controller of the system unit and the LAN controller of an optional LAN mezzanine (CN7M0T-Y/CN7M0T-R) support 1000BASE-T/100BASE-TX/10BASE-T. We recommend using enhanced category 5 LAN cables or better.

The LAN controller of an optional LAN mezzanine (CN7M1T-Y/CN7M1T-R) supports 10GBASE-T/1000BASE-T. We recommend using enhanced category 6A cables or better with 10GBASE-T, and using enhanced category 5 cables or better with 1000BASE-T.

The LAN controller of an optional LAN mezzanine (CN7M1S-Y/CN7M1S-R) supports 10GBASE-T Small Form-factor Pluggable+ (SFP+) Direct Attach. If you use 10GBASE-SR, use the LAN cable meeting the following specifications.

Table 3-1: Specification of LAN cable for LAN mezzanine (CN7M1S-Y/CN7M1S-R)

Items	Specification
Mode	Multimode optional fibre
Core diameter	50 µm
Cladding surface diameter	125 µm
Wavelength	850 nm
Transmission bandwidth	2000 MHz
Maximum cable length	300 m
Connector type	LC

	• When you connect LAN cables to network interface connector 1, 2, and extension network interface connectors of an optional LAN mezzanine (CN7M0T-Y/CN7M0T-R/CN7M1T-Y/CN7M1T-R), follow the following instructions. If you fail to do so, network interface connectors can be damaged and LAN cables can be damaged or disconnected.
Note	

- When you connect LAN cables to network interface connector 1, 2, and extension network interface connectors of an optional LAN mezzanine (CN7M0T-Y/CN7M0T-R/CN7M1T-Y/CN7M1T-R), follow the following instructions. If you fail to do so, network interface connectors can be damaged and LAN cables can be damaged or disconnected.
    - Use LAN cables with connectors in compliance with RJ45/ISO8877 standard.
    - Install the LAN cables in such a way that too much stress is not placed on the network interface connectors.
    - When you disconnect a LAN cable, keep pressing the tab on the cable connector and pull out the connector while keeping the connector evenly aligned with the connector on the system unit.
- When you connect LAN cables to extension network interface connectors of an optional LAN mezzanine (CN7M1T-Y/CN7M1T-R), follow the following instructions.
    - Do not enabling the spanning tree setting of the port connected the LAN cable to the switching HUB. Disable the spanning tree setting.
    - Do not setting the network port to 100 Mbps full-duplex mode or half-duplex mode. May cause the operation to become unstable.
- When you connect LAN cables to extension network interface connectors of an optional LAN mezzanine (CN7M1S-Y/CN7M1S-R), follow the following instructions. If you fail to do so, network interface connectors can be damaged and LAN cables can be damaged or disconnected.
    - Install LAN cables so that too much pressure is not placed on the SFP+ module of the network interface connectors.
    - When you disconnect a LAN cable, pull down the lever on the SFP+ module and pull out the connector while keeping the connector evenly aligned with the connector on the SFP+ module.
    - Do not connect a LAN cable between the LAN mezzanine (CN7M1S-Y/CN7M1S-R) and a Fiber type LAN network adapter directly. Use a switching hub. Otherwise, a network may not link up.
- Connect LAN cables to network interface connectors (include optional LAN mezzanine and LAN card) through a switching HUB. If you connect LAN cables to network interface connectors directly, a network may not link up.
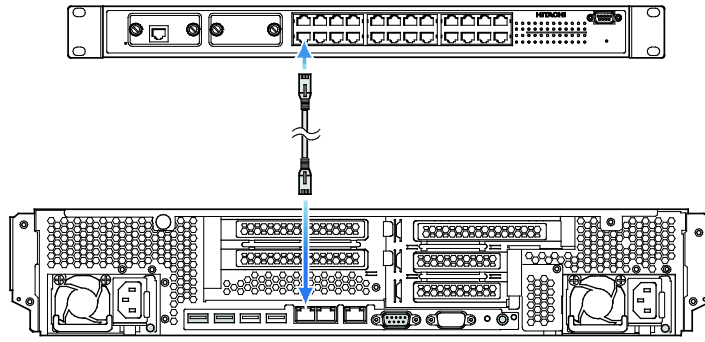
Figure 3-13: Connecting LAN cable

Other external optional devices

When you connect external optional devices other than basic peripherals such as computer display, keyboard, and mouse to the system unit, see the manual that comes with each external optional device.

Removing the system unit

This section describes how to remove the system unit from a rack cabinet.

Unmounting the system unit to the rack cabinet

The following describes the procedure to unmount the system unit to the rack cabinet.

1. Disconnect all the cables from the system unit.

   See Connecting to the system unit on page 3-9.

2. Remove an optional front bezel (AU7705–Y/AU7705-R) if any.

   See Removing a front bezel on page 3-8.

3. Slide out the system unit while pressing the buttons on the inner rails until the inner rails stop.

   Then the inner rails are locked by lock latches (White).

4. Further slide out the system unit while pulling the lock latches (White) and disengage the system unit.

![Note]	• Lift the front of the system unit slightly when sliding out the system unit. Otherwise, the system unit can interfere with another unit installed below, which may cause those units to be deformed.
	• Do not push down the system unit while sliding out the system unit. If you do, the system unit may be deformed.
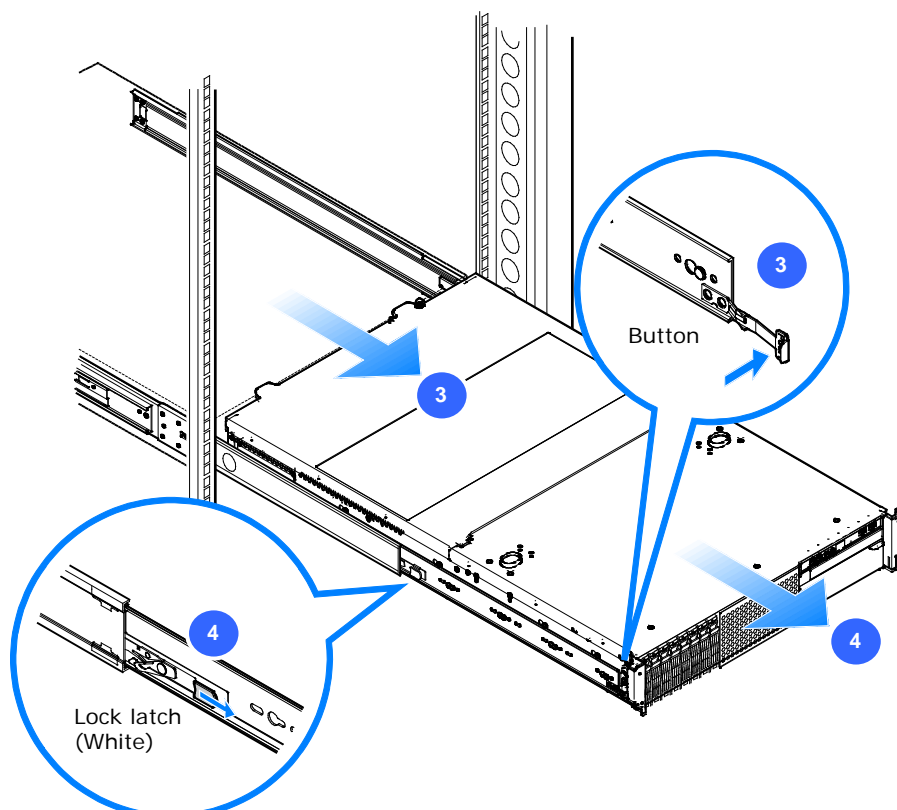
Figure 3-14: Unmounting the system unit from the rack cabinet

Removing the rack rail

The following describes the procedure to remove the rack rails in a rack cabinet.

1. Release the lock lever at the rear of the outer rail by pressing the lever.

2. Remove the guide from the guide hole at the rear of the rack cabinet.
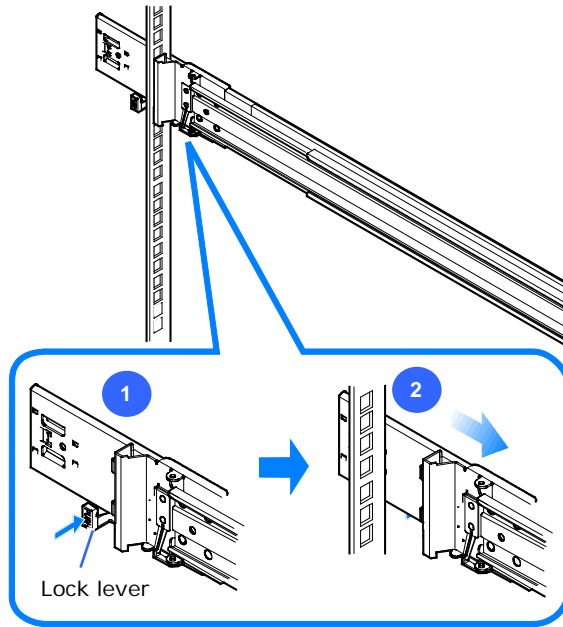
Figure 3-15: Remove the rear side of the outer rail from the rack cabinet

3. Then hold down the lock tab at the front of the outer rail and remove the guide from the guide hole at the front of the rack cabinet.
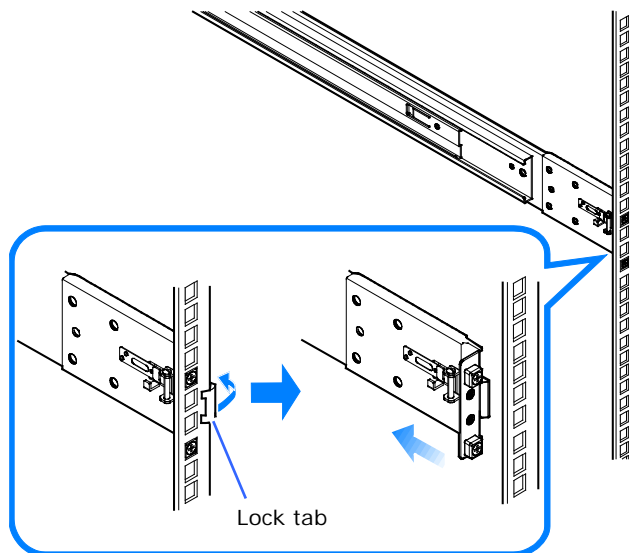
Figure 3-16: Remove the front side of the outer rail from the rack cabinet

4. Repeat with the other slide rail.

4

Powering on/off system unit

This chapter describes procedures to power on/off the system unit.

- [Powering on system unit](#)
- [Powering off system unit](#)
- [Shutting down the power forcibly](#)
- [Terminating an application and reset](#)

Powering on system unit

This section describes the procedures to powering on the system unit.

Before powering on the system unit, make sure that 100VAC or 200VAC, the selection of which is in accordance with the AC cable used, is supplied to the electrical outlets, the electrical outlet box, or a UPS.

Note	• Wait more than 10 seconds to turn on the system unit after turning off the system unit. If the AC power source to the system unit is shut down (for example, a circuit breaker at a switchboard is shut off or AC power from the UPS is shut off by a scheduling function of UPS), wait at least 30 seconds. The system unit may not start up, if you turn on the system unit earlier for each case. • Wait more than 10 seconds to powering off the system unit after powering on the system unit. After memory check in Power On Self Test (POST) started, do not turn off the power until the operating system (OS) starts. Otherwise the system unit may not start next time.
Tip	When an AC cable is connected and the system unit gets supplied with AC power, both SERVICE LEDs on the front side and the rear side of the system blinks for about 60 seconds. If you press the POWER switch while the SERVICE LEDs are blinking, you have to wait until the blink end to start the system unit.

1. Turn on the peripherals such as a computer display.

Note	Depending on a peripheral, you may need to turn on the peripheral after you turn on the system unit. For details, see the manual of each peripheral device.

2. Press the POWER switch on the front side of the system unit.

Tip	If the setting of system BIOS – **Restore AC Power Loss** is Power on, the system unit will be automatically turned on without pressing the POWER switch after the AC power source was recovered.

POWER switch

ACCESS LED
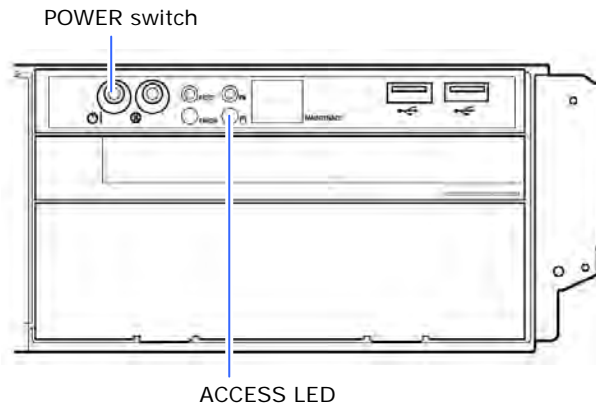
Figure 4-1: Turn on the POWER switch

3. The power for the system unit is turned on.

The green POWER LED on the front side of the system unit turns on.

Tip	• At the first startup after you change the configuration of the system unit, Windows loads new drivers and sets up new services. Because the USB driver is not loaded during this period, you cannot temporarily use a keyboard and a mouse for input. If you changed the configuration of the system unit, wait one or two minutes after startup and then use the keyboard or mouse for input. • Depending on the capacity of the memory boards in the system unit, you may need to wait a couple minutes the initial window will open.

Powering off system unit

This section describes the procedures to powering off the system unit.

1. Confirm that the devices and the peripherals connected to the system are not being accessed.

2. Confirm that the ACCESS LED is OFF.

3. Press the POWER switch on the front side of the system unit.

   The power for the system unit is turned off.

 | | |
   |---|---|
   | **Note** | Depending on a peripheral, you may need to turn off the peripheral before you turn off the system unit. For details, see the manual of each peripheral device. |
   | **Tip** | • If the power is automatically turned off when the operating system (OS) is shut down, you do not need to press the POWER switch.

• The power may not be turned off due to cache protection even if you press the POWER switch. In this case, wait until the power will be turned off.

• The fans inside the power supplies of the system unit continue running unless the AC power source is turned off. |

4. Turn off the peripherals.

Shutting down the power forcibly

The power may not be turned off even if you press the POWER switch when, for example, the operating system (OS) is not working properly.

In this case, if you press the POWER switch continuously for four seconds or more, you can forcibly turn off the system unit.

Do not perform this operation unless you cannot turn off the power with normal procedure.

After you shut down the power forcibly, the OS or applications may not work properly and integrity of the stored data may be compromised. If this situation happens, set up the OS or applications again or restore the data from the backup data.

Terminating an application and reset

If the system unit freezes while an application is running, you may recover the system unit by terminating the application running on the operating system (OS) forcibly or restarting (resetting) the OS forcibly. For details, see the manual of the OS.

If you use Windows OS, see *Hitachi Compute Rack 210H/220H Windows Installation Guide*.

After you terminate an application forcibly or resetting the OS, the OS or applications may not work properly and integrity of the stored data may be compromised. If this situation happens, set up the OS or applications again or restore the data from the backup data.

5

Specifications

This chapter describes the specifications of the system unit.

☐ [System Unit Specifications](#)

System Unit Specifications

Hitachi Compute Rack 220H

Items		Specifications
Chassis type		Rack type [2U]
Disk type		SAS/SATA RAID (2.5 inch)
CPU	Supported CPU (clock speed)	Intel® Xeon® processor(*1) E5-2690 (2.90 GHz) /E5-2670 (2.60 GHz)/E5-2640 (2.50 GHz) E5-2620 (2 GHz) /E5-2603 (1.80 GHz) /E5-2630L (2 GHz)

	Number of processors [Number of cores]	- Minimum 1 [8] / Maximum 2 [16]
		  (Xeon Processor E5-2690/E5-2670)
		- Minimum 1 [6] / Maximum 2 [12]
		  (Xeon Processor E5-2640/E5-2620/E5-2630L)
		- Minimum 1 [4] / Maximum 2 [8] (Xeon Processor E5-2603)

	L1 cache	32 KB + 32 KB per core
	L2 cache	256 KB per core
	L3 cache	- 20 MB (Xeon Processor E5-2670/E5-2690) - 15 MB (Xeon Processor E5-2620/E5-2640/E5-2630L) - 10 MB (Xeon Processor E5-2603)
Chipset		Intel® C602J
QuickPath Interconnect (QPI) speed		- 8.00 GT/s (Xeon Processor E5-2670/E5-2690) - 7.20 GT/s (Xeon Processor E5-2620/E5-2640/E5-2630L) - 6.40 GT/s (Xeon Processor E5-2603)

Main memory	Supported DIMM (*2)	- 2048 MB / 4096 MB / 8192 MB / 16384 MB
		  Low-voltage registered DIMM (DDR3 1333 SDRAM)
		- 2048 MB / 4096 MB / 8192 MB / 16384 MB
		  Wide range registered DIMM(DDR3 1600 SDRAM)

	Error correction	ECC As memory RAS features, SDDC, online spare memory, memory mirroring, lockstep, device tagging are supported.
	Number of slots	12 (1 CPU) / 24 (2 CPUs)
	Maximum memory	192 GB (1 CPU) / 384 GB (2 CPUs)
	Minimum memory	4 GB (1 CPU) / 8 GB (2 CPUs)
Graphics	Accelerator	Emulex Pilot3 [onboard]
	VRAM	32 MB
	Resolutions (Number of colors) (*3)	640 × 480 (16.77 M), 800 × 600 (16.77 M), 1024 × 768 (16.77 M), 1280 × 1024 (16.77 M)

Items			Specifications		
Disk array controller	Controller		LSI SAS 2208		
	Interface		SAS 2.0, SATA 2		
	Cache size		512 MB / 1024 MB (without / with cache backup module)		
	RAID levels		RAID 0, 1, 5, 6, 10, JBOD		
	Hot plug		supported		
	Hot spare		supported		
Device	DVD-ROM		SATA 8x (DVD-ROM read) thin type		
	HDD(*4)	Interface	SAS 2.0		
		Rotational Speed	10000 r/min	15000 r/min	
		Maximum capacity (internal) (*5) — RAID 0	7200 GB (900 GB × 8 HDD)	2400 GB (300 GB × 8 HDD)	
		Maximum capacity (internal) (*5) — RAID 5	6300 GB (900 GB × 8 HDD)	2100GB (300 GB × 8 HDD)	
		Supported capacity	300 GB, 450 GB, 600 GB, 900 GB	146 GB, 300 GB	
	SSD(*4)	Interface	SATA 2	SATA 3	SAS 3.0
		Maximum capacity (internal) (*5) — RAID 0	800 GB (100 GB × 8 SSD)	1600 GB (200 GB × 8 SSD)	3200 GB (400 GB × 8 SSD)
		Maximum capacity (internal) (*5) — RAID 5	700 GB (100 GB × 8 SSD)	1400GB (200 GB × 8 SSD)	2800 GB (400 GB × 8 SSD)
		Supported capacity	100 GB	200 GB	400 GB
Extension storage bay	2.5-inch bay		8		
	5-inch bay		1		
	5-inch bay (thin type)		1		
PCI slot	Slot		- PCI Express 3.0 x 8: 3(*6) - PCI Express 3.0 x 4: 2		
	Vacant slots		5(*5)		
Standard interfaces			Display (mini D-SUB 15 pins) × 1, Serial (D-SUB 9 pins)× 1, USB × 6 (front 2, rear 4) (*7)		
	LAN	Controller	- Broadcom BCM5718 × 1 [onboard] - Broadcom BCM5718 × 1 [Optional LAN mezzanine (CN7M0T-Y/CN7M0T-R)] - Broadcom BCM57810S × 1 [Optional LAN mezzanine (CN7M1T-Y/CN7M1T-R/CN7M1S-Y/CN7M1S-R)] - SMSC LAN8700C-AEZG × 1 [onboard: for remote management]		
		Interface	- Broadcom BCM5718: 1000BASE-T/100BASE-TX/10BASE-T × 2 (RJ-45) - Broadcom BCM57810S (CN7M1T-Y/CN7M1T-R): 10GBASE-T/1000BASE-T × 2 (RJ-45) - Broadcom BCM57810S (CN7M1S-Y/CN7M1S-R): 10GBASE-T SFP+ × 2 (SFP+) - SMSC LAN8700C-AEZG: 100BASE-TX/10BASE-T × 1(RJ-45)		
		Wake On LAN function	Supported		
Chassis dimensions (*8)			492 (W) × 777 (D) × 87.0 (H) mm		

Items		Specifications
Mass (*9)		20.8 kg (Maximum 30.4 kg)
Built-in clock precision		± 120 second / month
Power consumption in operation (*10)		100 VAC: 644 W / 200 VAC: 631 W
Maximum power consumption		100 VAC: 880 W / 200 VAC: 852 W
Noise sound power		62 dB or less (in accordance with ISO 7779) (*11)
Power supply	Voltage	100 VAC / 200 VAC 50 / 60 Hz
	Capacity	800 W
	Type of electrical outlet (Number of AC cables)	Grounded two-pole electrical outlet (1 (Standard) / 2 (When redundancy is enabled))
	Redundant power supply	Supported (1 (Standard) + 1 (Optional)) (hot plug supported)

Notes:

(*1) The following features are supported:
Intel Hyper-Threading Technology (except Xeon processor E5-2690/E5-2603) / Intel Virtualization Technology / Intel 64 / NX (Execute Disable Bit) / Enhanced Intel SpeedStep Technology / Intel Trusted Execution Technology / Intel Turbo Boost Technology (except Xeon processor E5-2690/E5-2603).

(*2) Wide range registered DIMM (DDR3 1600 SDRAM) and Low-voltage registered DIMM cannot be mounted together.

(*3) Actual resolutions / colors vary depending on the monitor used or the limitation of the OS.

(*4) 1 GB equals 10^9 bytes when referring to HDD/SSD capacity.

(*5) You can assign capacity larger than 2 TB (2199 GB) for the logical drive set as disk array but do not assign capacity larger than 2 TB for the logical drive the OS is installed to. Otherwise the OS cannot create a partition anymore. Use the RAID management utility or the RAID utility to reconstruct the disk arrays and the logical drives.

(*6) One of the PCI Express 3.0 x8 slots (PCI slot 5) can be used only when two CPUs are installed.

(*7) If an unsupported USB device is connected, operation of the system unit can be affected. Note that the USB ports are USB 2.0 compliant.

(*8) Including protrusion. As an exception, the cable clamp for an AC cable is not included.

(*9) Including the slide rails and inner rails (3.62 kg) used for installation to a rack cabinet.

(*10) Rough estimate of the power consumption in normal operation.

(*11) We recommend installing the system unit in a dedicated room.
You may feel the noise annoying depending on the installation environment or location. If you install the system unit in an office room, be careful enough to the environment and location.
Note that the rotational speed of the fans is controlled by the temperature inside the system unit.
If the maximum load continues for an extended amount of time at high temperature, or one of the fans gets out of order, the noise level may exceed this standard level. Note also that on startup or reboot, the fans run at full speed and the noise level may exceed this standard level.

Appendix

This chapter describes how to use the internal DVD-ROM drive.

☐ How to use the internal DVD drive

How to use the internal DVD drive

This section describes how to use the internal DVD-ROM installed in the system unit as standard equipment.
For how to use other optional devices, see the manuals supplied with respective optional devices.

Inserting/Removing a Disc

NOTICE	Observe the following instructions when inserting or removing a disc. Failure to do so may cause a failure of the drive.

- Do not turn off the power while the busy indicator is lit.
- Do not push or pull the tray forcibly.
- Do not insert a cracked or deformed disc into the drive.
- Do not put any foreign matter on the tray.
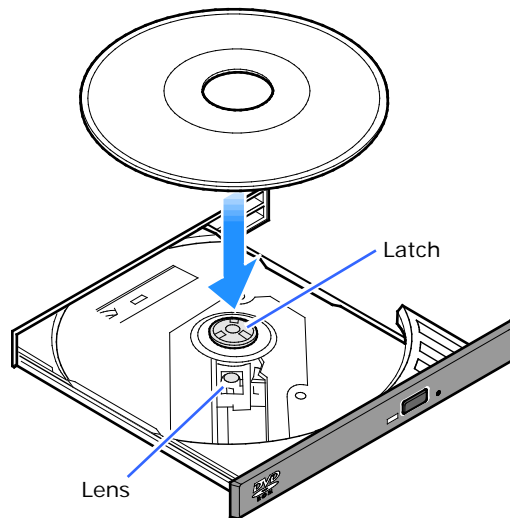- Use the manual eject hole only when the drive is broken.

Inserting a disc

1. Confirm that the busy indicator is off and then press the eject button to eject the tray.
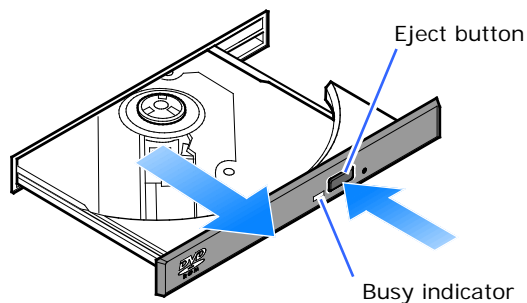
Figure A-1: Open the tray of internal DVD-ROM

2. Put a disc on the tray with the label side facing up.

3. Push the disc until the disc center hole fits with the latch of the tray with a click.

Figure A-2: Insert a disk to the tray of internal DVD-ROM

4. Push the tray to close it.

Note	• Do not touch the eject button when pushing the tray. If you touch the button, the tray cannot be closed. Push the tray straight. If the tray is pushed obliquely, it may not be closed. • Do not give vibration to the disc in use. It may prevent correct data read.
Tip	• Remove the disc before turning off the power of the system unit. If power is turned off by mistake with the disc remaining in the drive, turn on the power again, wait until the system unit starts up, and then remove the disc. • If the drive has been broken and the tray cannot be ejected with the eject button, turn off the power and insert a thin pin or the like into the manual eject hole to eject the tray and remove the disc. When you take manual eject, be careful dust does not invade through the hole.

Removing a disc

Reverse the [Inserting a disc](#) procedure.

NOTICE	Do not auto eject or remote eject the disc while a front bezel is attached or the front door of the rack cabinet is closed. Do not attach a front bezel or close the front door of the rack cabinet while the tray is open. The tray can interfere with the front bezel or the front door and can cause a failure.

About Disc

The following disc types are available.
Dedicated software programs are necessary depending on discs to be used.

- CD-DA (audio CD)
- CD-ROM (mode1, mode2)
- CD-ROM XA (form1, form2 of mode2)
- CD-R/RW
- DVD-ROM
- DVD-R/RW
- DVD-Video
- DVD+R/RW

Note	• Immediately after a disc is inserted into the drive, an error message such as "Not Ready" may appear to indicate that disc read or write operation has not been ready yet. In that case, wait until the busy indicator goes out. • Data of CD-R/RW, DVD-R/RW, and DVD+R/RW cannot be read depending on disc type or writing conditions.
Tip	• The drive does not support data write to CD-R/RW, DVD-R/RW, and DVD+R/RW. • Check that the disc to be used has no dirt, scratch, or deterioration due to ultraviolet rays.

Handling

Handling the drive

- The drive can be used at an ambient temperature of 10 to 35 degrees Celsius, but use it at an ambient temperature of 30 degrees Celsius or lower for long-period use.
- Do not impact the drive while it is operating.
- Open the tray of the drive only when inserting or removing a disc.
- When a media read error has occurred, clean the disc.
- The drive does not support data write to CD-R/RW, DVD-R/RW, DVD+R/RW and other writable disc.

Handling disc

- When maintaining a disc, clean it with a dry soft cloth in a radial manner from the center to the outer circumference of the disc. Do not use benzene, thinner, water, record cleaner, antistatic agent, or silicon cloth for cleaning.

- Do not use a blower to remove dust or water from the disc.

- Do not store discs in a hot place.

- Do not fold or bend discs.

- Do not write letters on the disc or scratch it.

- Do not attach a label to the disc.

Hitachi Data Systems

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