

FUJITSU Storage
ETERNUS DX60 S3
Disk storage system

Site Planning Guide

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Fujitsu would like to thank you for purchasing our FUJITSU Storage ETERNUS DX60 S3 Disk storage system (hereinafter referred to as ETERNUS DX).

The ETERNUS DX is designed to be connected to Fujitsu servers (Fujitsu M10, PRIMEQUEST, or PRIMERGY) or non-Fujitsu servers.

This manual describes the environmental requirements that are necessary to install and use the ETERNUS DX.

This manual is intended for use of the ETERNUS DX in regions other than Japan.

Please carefully review the information outlined in this manual.

Third Edition

October 2015

About This Manual

Organization

This manual is composed of the following two chapters:

- ["Chapter 1 ETERNUS DX Installation" \(page 10\)](#)

This chapter provides the installation specification of the ETERNUS DX.

- ["Chapter 2 Rack Installation Specifications" \(page 32\)](#)

This chapter provides the installation specification of racks.

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Naming Conventions

■ Product Names

- The following abbreviations are used for Microsoft® Windows Server®.

Product name	Abbreviation
Microsoft® Windows Server® 2008 Datacenter	Windows Server 2008
Microsoft® Windows Server® 2008 R2 Datacenter	
Microsoft® Windows Server® 2008 Enterprise	
Microsoft® Windows Server® 2008 R2 Enterprise	
Microsoft® Windows Server® 2008 Standard	
Microsoft® Windows Server® 2008 R2 Standard	
Microsoft® Windows Server® 2008 for Itanium-Based Systems	
Microsoft® Windows Server® 2008 R2 for Itanium-Based Systems	
Microsoft® Windows Server® 2008 HPC Edition	Windows Server 2012
Microsoft® Windows Server® 2008 R2 HPC Edition	
Microsoft® Windows Server® 2012 Datacenter	
Microsoft® Windows Server® 2012 R2 Datacenter	
Microsoft® Windows Server® 2012 Standard	
Microsoft® Windows Server® 2012 R2 Standard	
Microsoft® Windows Server® 2012 Essentials	
Microsoft® Windows Server® 2012 R2 Essentials	

- The following abbreviations are used for Red Hat Linux.

Product name	Abbreviation
Red Hat Enterprise Linux 5 (for x86)	Red Hat Enterprise Linux 5
Red Hat Enterprise Linux 5 (for Intel64)	
Red Hat Enterprise Linux 6 (for x86)	Red Hat Enterprise Linux 6
Red Hat Enterprise Linux 6 (for Intel64)	
Red Hat Enterprise Linux 7 (for Intel 64)	Red Hat Enterprise Linux 7

■ Symbols Used in This Manual

The following symbols are used throughout this manual:



This indicates information for the user to note when using the ETERNUS DX. Please be sure to read this information.



This indicates supplementary and reference information.

■ Abbreviations Used in This Manual

- "ETERNUS DX" refers to the FUJITSU Storage ETERNUS DX60 S3 Disk storage system.
- "CA" refers to a host interface module that is used in an ETERNUS DX to connect to a server.
- "Host Bus Adapter (HBA)" refers to an interface module that is normally used in a server to connect to ETERNUS DX storage systems.
- Trademark symbols such as ™ and ® are omitted in this document.

Warning Signs

Warning signs are shown throughout this manual in order to prevent injury to the user and/or material damage. These signs are composed of a symbol and a message describing the recommended level of caution. The following explains the symbol, its level of caution, and its meaning as used in this manual.



This symbol indicates the possibility of serious or fatal injury if the ETERNUS DX is not used properly.



This symbol indicates the possibility of minor or moderate personal injury, as well as damage to the ETERNUS DX and/or to other users and their property, if the ETERNUS DX is not used properly.

■ IMPORTANT This symbol indicates IMPORTANT information for the user to note when using the ETERNUS DX.

The following symbols are used to indicate the type of warnings or cautions being described.

Electric Shock



△ The triangle emphasizes the urgency of the WARNING and CAUTION contents. Inside the triangle and above it are details concerning the symbol (e.g. Electrical Shock).

No Disassembly



⊘ The barred "Do Not..." circle warns against certain actions. The action which must be avoided is both illustrated inside the barred circle and written above it (e.g. No Disassembly).

Unplug



● The black "Must Do..." circle indicates actions that must be taken. The required action is both illustrated inside the black disk and written above it (e.g. Unplug).

How Warnings are Presented in This Manual

A message is written beside the symbol indicating the caution level. This message is marked with a vertical ribbon in the left margin, to distinguish this warning from ordinary descriptions.

A display example is shown here.

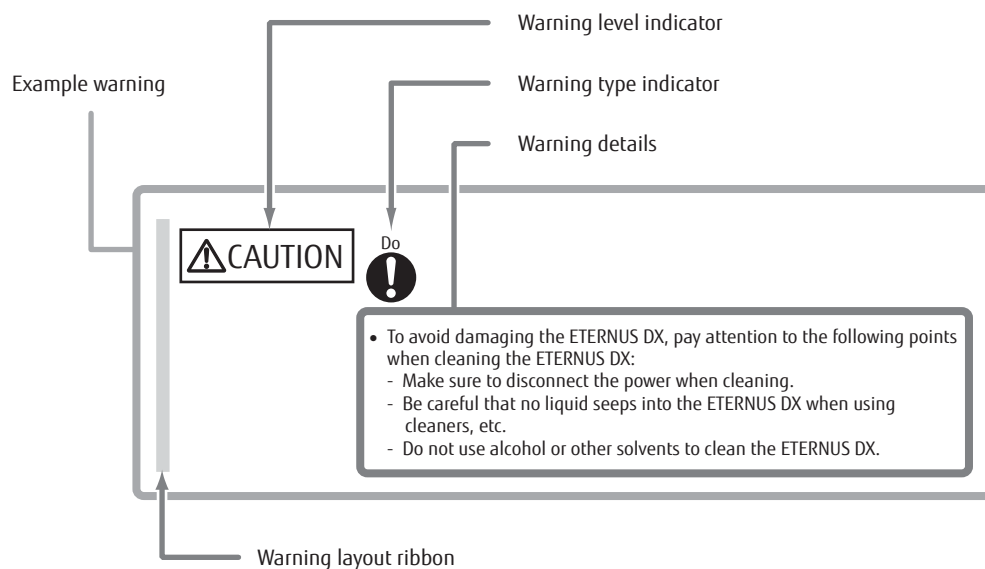


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Chapter 1

ETERNUS DX Installation

This chapter explains the installation of the ETERNUS DX.

1.1 Installation Specifications

The following table shows the installation specifications of the ETERNUS DX.

Table 1.1 Installation Specifications

Item				ETERNUS DX60 S3
Dimensions (W × D × H)	Controller enclosure	2.5" type		482 × 645 × 88mm (2U)
		3.5" type		482 × 670 × 88mm (2U)
	Drive enclosure	2.5" type		482 × 540 × 88mm (2U)
		3.5" type		482 × 560 × 88mm (2U)
	Power distribution unit	1U		435 × 148 × 38mm
		2U		(485 × 280 × 43mm) × 2 (*1)
Maximum weight (*2)	Controller enclosure	2.5" type		35kg
		3.5" type		35kg
	Drive enclosure	2.5" type		35kg
		3.5" type		35kg
	Power distribution unit	1U		2kg
		2U		(6kg) × 2 (*1)
Power	Voltage			AC 100 – 120V, AC 200 – 240V
	Phase			Single
	Frequency			50Hz/60Hz
Maximum power consumption (*2)	Controller enclosure	2.5" type	AC 100 – 120V	610W (620VA)
			AC 200 – 240V	600W (610VA)
		3.5" type	AC 100 – 120V	530W (540VA)
			AC 200 – 240V	530W (540VA)
	Drive enclosure	2.5" type	AC 100 – 120V	430W (440VA)
			AC 200 – 240V	430W (440VA)
		3.5" type	AC 100 – 120V	340W (350VA)
			AC 200 – 240V	340W (350VA)

Item				ETERNUS DX60 S3	
Maximum heat generation (*2)	Controller enclosure	2.5" type	AC 100 – 120V	2,200kj/h	
			AC 200 – 240V	2,200kj/h	
		3.5" type	AC 100 – 120V	2,000kj/h	
			AC 200 – 240V	2,000kj/h	
	Drive enclosure	2.5" type	AC 100 – 120V	1,600kj/h	
			AC 200 – 240V	1,600kj/h	
		3.5" type	AC 100 – 120V	1,300kj/h	
			AC 200 – 240V	1,300kj/h	
Maximum amount of exhaust air	Controller enclosure		2.5" type	4.0m³/min	
			3.5" type	4.0m³/min	
	Drive enclosure		2.5" type	4.0m³/min	
			3.5" type	4.0m³/min	
Environmental conditions	Temperature		Operating	10 – 40°C	
			Not operating	0 – 50°C	
			Shipping	-40 – 60°C	
	Temperature gradient			15°C/Hr or less	
	Humidity		Operating	20 – 80%RH	
			Not operating	8 – 80%RH	
			Shipping	8 – 90%RH	
	Humidity gradient			30%/day or less	
	Maximum wet bulb temperature			29°C	
	Altitude above sea level			0 – 3000m	
	Airborne dust			0.15mg/m³ or less	
	Gas concentration tolerance level			Cl₂: 3.4ppb or less, H₂S: 7.1ppb or less, SO₂: 37ppb or less, NH₃: 420ppb or less, NO₂: 52ppb or less, O₃: 5ppb or less, HCl: 6.6ppb or less, HF: 3.6ppb or less	
	Oil vapor			0.2mg/m³ or less	
	Seawater (salt corrosion)			If the ETERNUS DX is installed on the ocean or premises within 0.5km from the coast, necessary measures must be taken to prevent salt corrosion.	
Vibration limit	Operating			400gal	
	Not operating			1,000gal	
Noise emission (*3)	Sound pressure level			49dB (A)	
	Sound power level			6.7B	

***1:** A 2U power distribution unit is composed of two 1U power distribution units.

***2:** These values are for each drive enclosure when 24 drives are installed in a 2.5" type drive enclosure or 12 drives are installed in a 3.5" type drive enclosure.

***3:** These values are measured when a single controller enclosure and drive enclosure are configured in an environment in which the temperature is 23 ± 2°C.

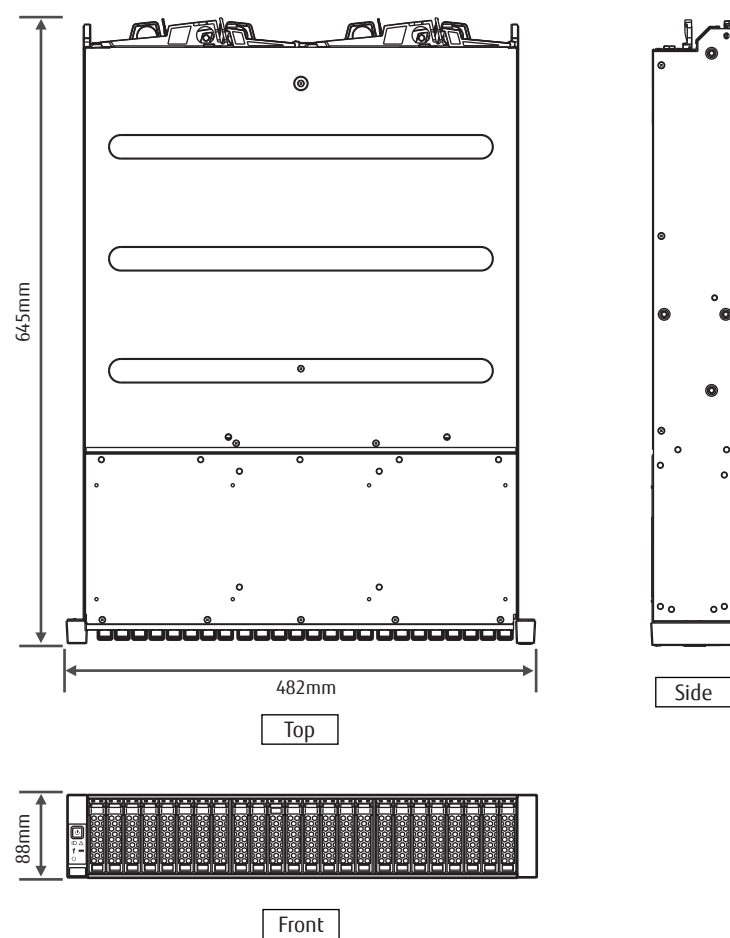
1.2 Storage System Dimensions

■ Controller Enclosure Dimensions

● 2.5" Type Controller Enclosure

The diagrams below show the dimensions of a 2.5" type controller enclosure. The dimension values do not include any protruding parts (approximation).

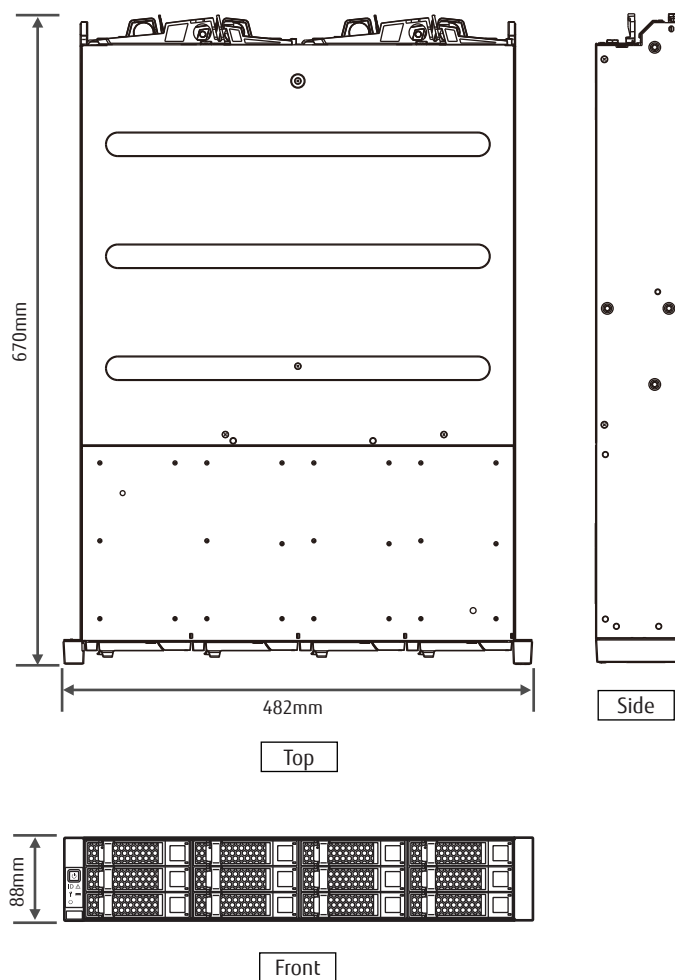
Figure 1.1 2.5" Type Controller Enclosure Dimensions



- 3.5" Type Controller Enclosure

The diagrams below show the dimensions of a 3.5" type controller enclosure. The dimension values do not include any protruding parts (approximation).

Figure 1.2 3.5" Type Controller Enclosure Dimensions



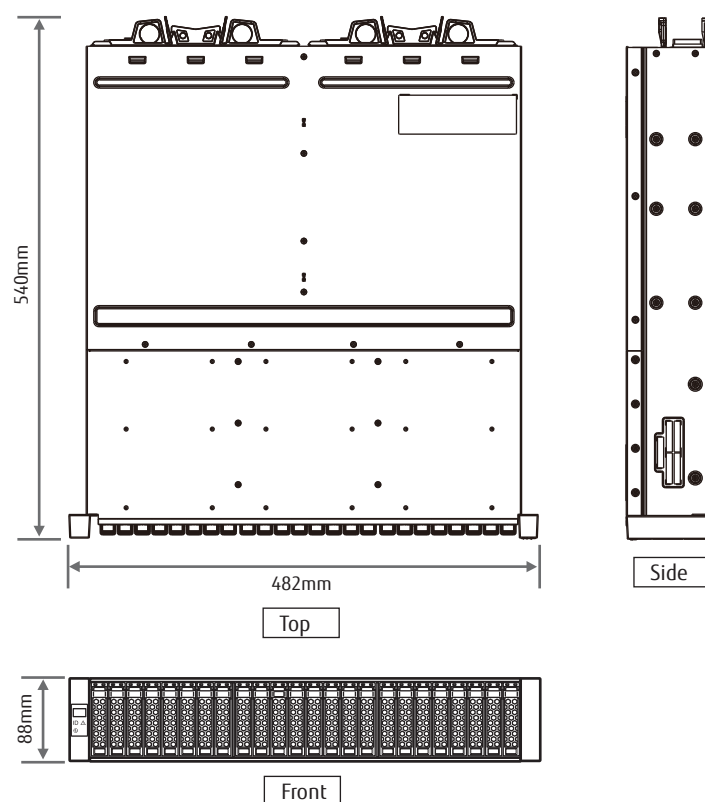
■ Drive Enclosure Dimensions

● 2.5" Type Drive Enclosure

The diagrams below show the dimensions of a 2.5" type drive enclosure.

The dimension values do not include any protruding parts (approximation).

Figure 1.3 2.5" Type Drive Enclosure Dimensions

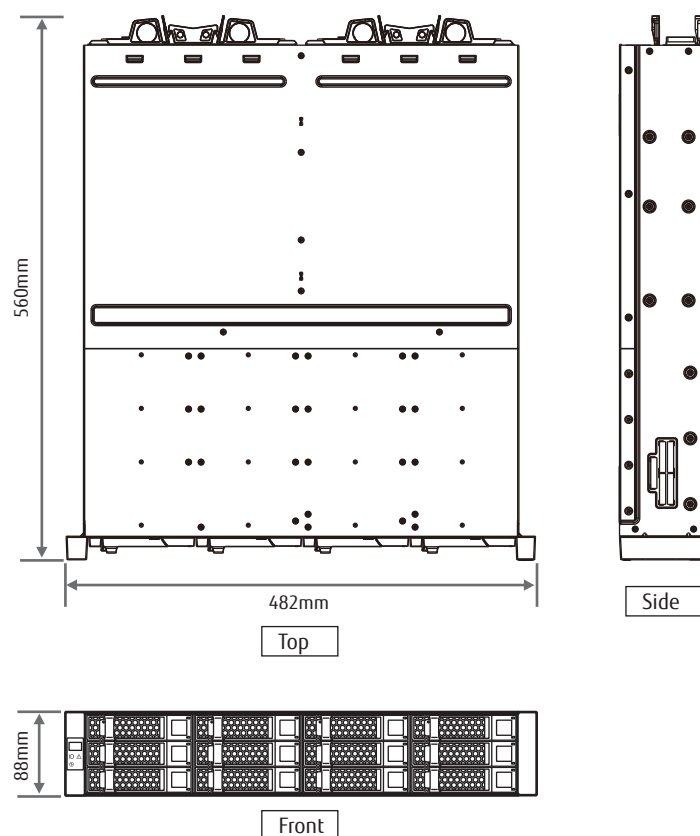


- 3.5" Type Drive Enclosure

The diagrams below show the dimensions of a 3.5" type drive enclosure.

The dimension values do not include any protruding parts (approximation).

Figure 1.4 3.5" Type Drive Enclosure Dimensions



1.3 Compliance Standards

- Compliance Standards

- Product safety

- UL60950-1, CSA-C22.2 No.60950-1, EN60950-1, IEC60950-1, TP TC 004/2011

- Electromagnetic Compatibility

- CNS13438 (C6357) Class A, FCC CFR47 part 15 Class A, ICES-003 Class A, EN55022 Class A, VCCI Class A, AS/NZS CISPR22 Class A, TP TC 020/2011

- Electromagnetic Immunity

- EN55024

- CE marking

- Electromagnetic Compatibility Directive 2004/108/EC

- Low Voltage Directive 2006/95/EC

- Environmental compliance

- RoHS-compliant (Restriction of hazardous substances)

- 2011/65/EU

- WEEE-compliant (Waste electrical and electronic equipment)

- 80PLUS GOLD (power conversion efficiency)

1.4 Package Size

The ETERNUS DX is shipped in cardboard boxes. These boxes may not fit through some doorways or elevators. To make sure that the ETERNUS DX can be moved to the installation site, carefully check the transport route information.

The following table shows the package size and the maximum package weight of each component for regions other than the EMEA, North American, Central American, and Caribbean regions.

Table 1.2 Package Size (for Regions other than the EMEA, North American, Central American, and Caribbean Regions)

Component		Package size (W × D × H)	Maximum weight
Controller enclosure	2.5" type	600 × 760 × 240mm	Approximately 40kg
	3.5" type	600 × 760 × 240mm	Approximately 40kg
Drive enclosure	2.5" type	600 × 660 × 240mm	Approximately 40kg
	3.5" type	600 × 660 × 240mm	Approximately 40kg
Drive (*1)	2.5" drive	160 × 278 × 106mm	Approximately 0.5kg
	3.5" drive	189 × 300 × 116mm	Approximately 1.2kg
Power distribution units	1U	570 × 710 × 160mm	Approximately 4kg
	2U	(390 × 590 × 180mm) × 2	(Approximately 7kg) × 2

***1:** When an order for optional drives to be installed in the factory is placed, enclosures are shipped with the drives preinstalled.

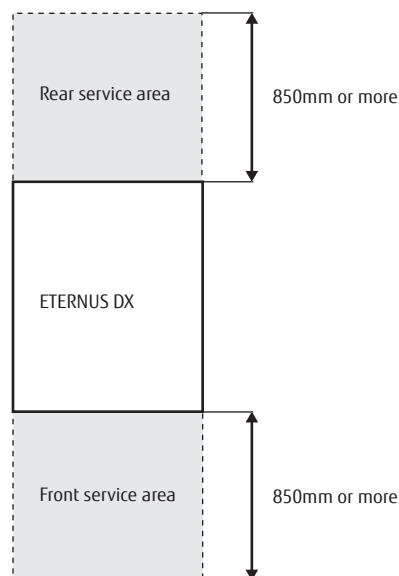
When optional drives are ordered without preinstallation, each drive is shipped in an individual package.

1.5 Installation Area

This section explains the installation areas and the service areas that are required for an ETERNUS DX that is installed in a Fujitsu 19-inch rack.

Secure service areas that are 850mm or more in the front and rear of the ETERNUS DX.

Figure 1.5 Installation Area and Service Area



1.6 Installation Environment

Sufficient consideration of the installation environment should be taken to ensure proper use of the ETERNUS DX. Using the ETERNUS DX in an environment that does not satisfy the installation environment requirements may cause a failure to occur with the ETERNUS DX.

1.6.1 Air Conditioning

It is important to consider the flows of cooling air (intake air and exhaust air) for the installation location of the ETERNUS DX. The temperature in some ETERNUS DX storage systems may rise by taking in air exhausted from other storage systems depending on how they are installed near each other. In addition, check if the ambient temperature in the installation location always satisfies the usage environment temperature by taking into consideration the room size, whether other storage systems are installed, and how many people are present in the room.

When installing air conditioning, consider the following:

- Ambient Temperature

An ETERNUS DX is cooled by taking in air through the front intakes and pushing out the exhaust air through the rear of the ETERNUS DX. If the intake air temperature does not meet the ambient environment conditions, a temperature error occurs and the power of the ETERNUS DX is shut down.

- Front intake air temperature

Make sure that the front intake air temperature is between 10 and 40°C.

- Rear exhaust air temperature

For example, when the intake air temperature is 40°C, the exhaust air temperature is 50°C or higher.

The necessary cooling capacity of air conditioning must be determined by taking the exhaust air cooling into consideration.

Estimate the amount of heat in the exhaust air from the ETERNUS DX by using the heat generation amount and exhaust air amount that are listed in "[1.1 Installation Specifications](#)" (page 10).

1.6.2 Installation Methods

- Perform one of the following rack installation methods to ensure the safe use of an ETERNUS DX that is installed in a rack:
 - To secure a rack, use a rack without stabilizers and secure it to the building with the leveling feet.
 - If a rack is not to be secured, make sure to use a rack with stabilizers and use these stabilizers to prevent the rack from toppling over.
- Which installation method should be used depends on the installation location, the floor conditions, and the type of racks that are to be used. Contact your installation contractor for more details regarding installation and how the installation should actually be performed.

1.6.3 Load Bearing Capacity for Floors

Make sure that the following relationship between the load bearing capacity of the floor and the weight of the ETERNUS DX is maintained.

(Load bearing capacity of the floor) > (ETERNUS DX weight ÷ Installation area that includes service areas)

If the condition above is not satisfied, additional measures are required to ensure sufficient load bearing capacity.

Contact your installation contractor for details about the necessary measures that must be taken.

1.7 Outlet/Socket Specifications

This section explains the power connection specifications of the ETERNUS DX storage systems.

■ Power Supply Units

Power can be supplied from two power sources in the ETERNUS DX because each enclosure has two power supply units.

During normal operation, each of the power sources supplies half of the necessary power.

When one of the power supply lines fails, all of the necessary power is supplied from only one power source.

Using the same power supply condition for all of the power supply units is recommended so that different power supply conditions (such as whether power distribution units are used or not and input voltage) are not used for the ETERNUS DX.

■ Current Rating

The following table shows the rating of the current for each power cord that is used for enclosure connections.

Table 1.3 Rating of the Current for Each Power Cord

Component name	Voltage	
	AC100V	AC200V
Controller enclosure	6.3A	3.0A
Drive enclosure	5.3A	2.7A

For power distribution units, make sure that the total rating of the currents for all of the power supply units that are to be connected does not exceed the normal usage rating of the power distribution unit.

1.7.1 Specifications for Optional Power Supply Products

This section explains the specifications of optional power cords and power related optional products.

For power distribution units, the number of outlets that are required to connect the controller enclosure and drive enclosures should be taken into consideration, and the most appropriate power distribution units should then be selected.

When an existing power socket is used, make sure that the plug type of the power distribution unit fits the existing power socket and that the power supply facility is able to provide sufficient power to the system. If the plug type does not fit the power socket, electrical work to change the power socket is required. This electrical work must be performed in compliance with the electrical codes of the nation, the municipality, or the region.

■ AC200V Power Cords (for the EMEIA, North American, Central American, and Caribbean Regions)

AC200V power cords are used to connect devices to the IEC60320 C13 power socket type. These power cords can be used if the specifications of the connection device allow AC200V.

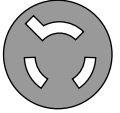
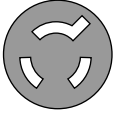
Table 1.4 Specifications for AC200V Power Cords (for the EMEIA, North American, Central American, and Caribbean Regions)

Usage	Plug type	Socket type (Socket)	Cable length	Voltage rating/current rating
Used for connection between the ETERNUS DX and the socket (IEC60320 C13 ↔ IEC60320 C14G)	IEC60320 C14G 	IEC60320 C13 	1.5m	250V 10A

■ AC200V Power Cords (for Regions other than the EMEIA, North American, Central American, and Caribbean Regions)

AC200V power cords are used to connect devices to the NEMA L6-15R power socket type. These power cords can be used if the specifications of the connection device allow AC200V.

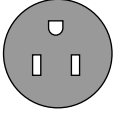
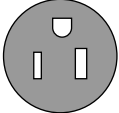
Table 1.5 Specifications for AC200V Power Cords (for Regions other than the EMEIA, North American, Central American, and Caribbean Regions)

Usage	Plug type	Socket type (Socket)	Cable length	Voltage rating/current rating
Used for connection between the ETERNUS DX and the socket (IEC60320 C13 ↔ NEMA L6-15P)	NEMA L6-15P 	NEMA L6-15R 	4.0m	Rating: 250V 10A (Normal usage rating: 8A)

■ AC125V Power Cords (for Regions other than the EMEIA, North American, Central American, and Caribbean Regions)

AC125V power cords are used to connect devices to the NEMA 5-15R power socket type. These power cords can be used if the specifications of the connection device allow AC100V.

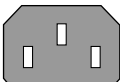
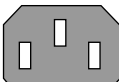
Table 1.6 Specifications for AC125V Power Cords (for Regions other than the EMEIA, North American, Central American, and Caribbean Regions)

Usage	Plug type	Socket type (Socket)	Cable length	Voltage rating/current rating
Used for connection between the ETERNUS DX and the socket (IEC60320 C13 ↔ NEMA 5-15P)	NEMA 5-15P 	NEMA 5-15R 	3.0m	Rating: 125V 13A (Normal usage rating: 10A)

■ AC100V and AC200V Power Cords (for Regions other than the EMEIA, North American, Central American, and Caribbean Regions)

AC100V/200V power cords are used to connect devices to the IEC60320 C13 power socket type. These power cords can be used to connect devices with the AC100V and AC200V specifications.

Table 1.7 Specifications for AC100V and AC200V Power Cords (for Regions other than the EMEIA, North American, Central American, and Caribbean Regions)

Usage	Plug type	Socket type (Socket)	Cable length	Voltage rating/current rating
Used for connection between the ETERNUS DX and the socket (IEC60320 C13 ↔ IEC60320 C14)	IEC60320 C14 	IEC60320 C13 	0.5m 1.0m 1.5m 3.0m	Rating: 250V 10A (Normal usage rating: 8A)

■ Power Distribution Units (1U) (Only for Regions other than the EMEIA, North American, Central American, and Caribbean Regions)

There are four outlets and two inlets.

Figure 1.6 Power Distribution Units (1U)

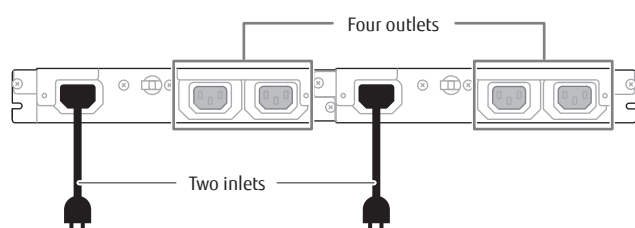
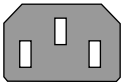


Table 1.8 Power Distribution Unit (AC200-240V, 1U, 4 Outlets) Specifications

Outlet	Inlet			Voltage rating/current rating
Socket type (Socket)	Plug type	Socket type (Socket)	Cable length	
IEC60320 C13 	NEMA L6-15P 	NEMA L6-15R 	4.0m	Rating: 250V 10A (Normal usage rating: 8A)

■ Power Distribution Units (2U) (Only for Regions other than the EMEA, North American, Central American, and Caribbean Regions)

- Power distribution unit (AC200-240V, 2U, 12 outlets)
There are 12 outlets and two inlets.
- Power distribution unit (AC200-240V, 2U, 16 outlets)
There are 16 outlets and two inlets.

Figure 1.7 Power Distribution Units (2U)

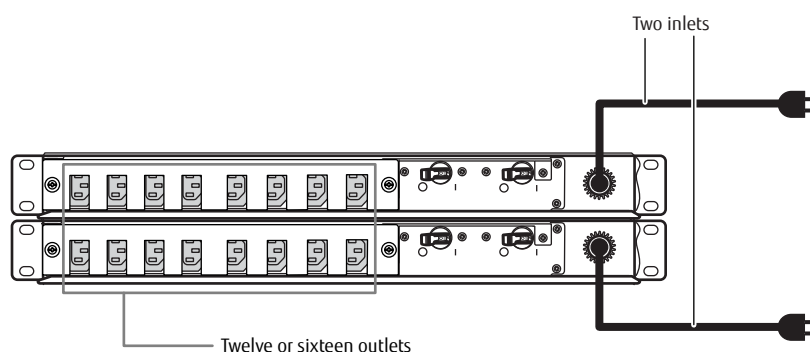


Table 1.9 Power Distribution Unit (AC200-240V, 2U, 12 Outlets) Specifications

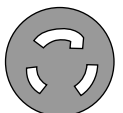
Outlet	Inlet			Voltage rating/current rating
Socket type (Socket)	Plug type	Socket type (Socket)	Cable length	
IEC60320 C13 	NEMA L6-20P 	NEMA L6-20R 	4.0m	Rating: 250V 20A (Normal usage rating: 16A)

Table 1.10 Power Distribution Unit (AC200-240V, 2U, 16 Outlets) Specifications

Outlet	Inlet			Voltage rating/current rating
Socket type (Socket)	Plug type	Socket type (Socket)	Cable length	
IEC60320 C13 	NEMA L6-30P 	NEMA L6-30R 	4.0m	Rating: 250V 30A (Normal usage rating: 24A)

1.7.2 Required Number of Outlets/Socket

The number of power outlets/sockets required to install the ETERNUS DX depends on the number of drive enclosures and power distribution units.

It is recommended that the power cords of the drive enclosures are connected to the power distribution units that are installed in the same rack. Secure the necessary number of power outlets within the same rack to avoid connecting power cords to power outlets in different racks. It may be necessary to purchase additional power distribution units depending on the installation locations of enclosures.

■ Without Power Distribution Units

Two power sockets are required for each enclosure.

■ With Power Distribution Units

Two power sockets are required for each power distribution unit.

1.7.3 Circuit Protectors

Protection coordination must be secured between the distribution board circuit protectors and the ETERNUS DX or power distribution units to protect the ETERNUS DX by blocking the failed circuit immediately when a power supply input error occurs.

Distribution board circuit protectors must satisfy the following required conditions and breaking characteristics.

■ Required Conditions

The distribution board circuit protectors must satisfy the required conditions that are listed below.

Table 1.11 Required Conditions for Distribution Board Circuit Protectors

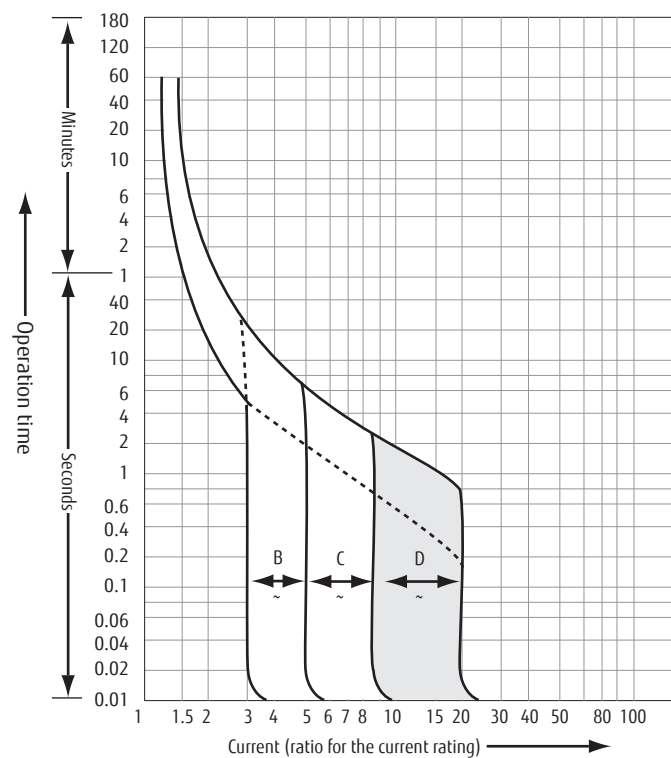
Connected device	Power supply voltage	Current capacity	
		Regions other than the EMEIA, North American, Central American, and Caribbean regions	The EMEIA, North American, Central American, and Caribbean regions
Power distribution unit (AC200-240V, 1U, 4 outlets)	AC 200 – 240V	15A	—
Power distribution unit (AC200-240V, 2U, 12 outlets)	AC 200 – 240V	20A	—
Power distribution unit (AC200-240V, 2U, 16 outlets)	AC 200 – 240V	30A	—
ETERNUS DX (without power distribution units)	AC 100 – 120V AC 200 – 240V	15A	16A

■ Breaking Characteristics

The breaking characteristics (*1) of distribution board circuit protectors must be equivalent to or slower than D (IEC898), which is shown in [Figure 1.8](#).

***1:** Relationship between the size of excess current and operation time

Figure 1.8 Breaking Characteristics of Distribution Board Circuit Protectors



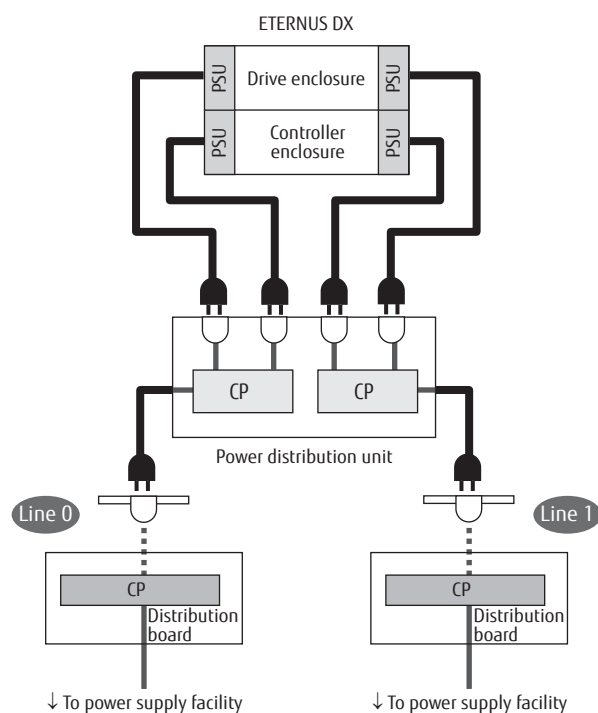
■ Connection Diagrams

The following diagrams show connections between the power distribution units, the ETERNUS DX, and the power sockets of the distribution boards.

● For Power Distribution Unit (1U) Connection

The following diagram shows a power supply connection example when power distribution unit (AC200-240V, 1U, 4 outlets) is used.

Figure 1.9 Example of a Power Supply Connection When a Power Distribution Unit (1U) Is Used



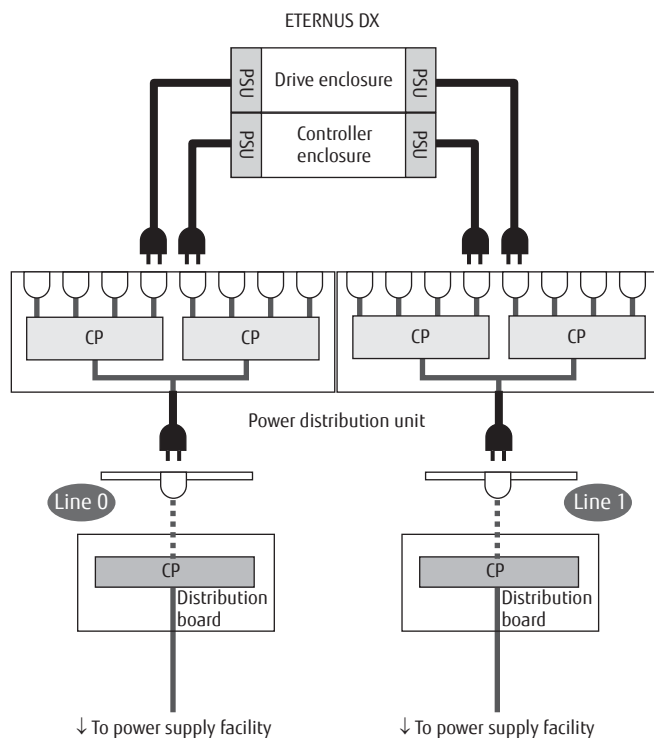
PSU: Power Supply Units

CP: Circuit Protector

- For Power Distribution Unit (2U) Connection

The following diagram shows a power supply connection example when power distribution unit (AC200-240V, 2U, 12 outlets) or power distribution unit (AC200-240V, 2U, 16 outlets) is used.

Figure 1.10 Example of a Power Supply Connection When a Power Distribution Unit (2U) Is Used



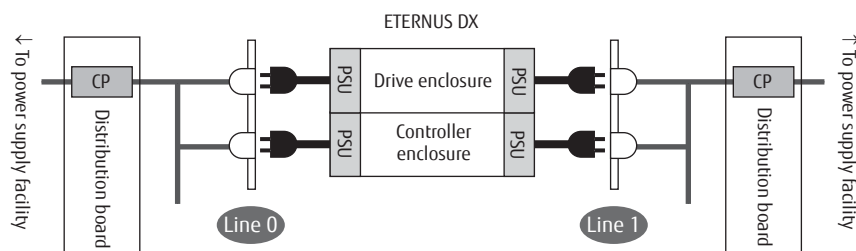
PSU: Power Supply Units

CP: Circuit Protector

- For Direct (No Power Distribution Unit) Connection

The following diagram shows a power supply connection example when no power distribution units are used.

Figure 1.11 Example of a Power Supply Connection When a Power Distribution Unit Is Not Used



PSU: Power Supply Units

CP: Circuit Protector



- Only connect the ETERNUS DX to circuit protectors.

1.7.4 Input Power Supply Lines

Multiple power supply facilities in the building or multiple UPS units are recommended for power supply redundancy. A redundant configuration is used for the power supply of the ETERNUS DX. Business can continue even if one of the power supply lines fails.

However, a single power supply facility configuration is also allowed for the entire system optimization (including the server). When selecting a single configuration, take into consideration the availability of the system.

Figure 1.12 Dual-Line Power Supply (When Connecting to Power Sockets)

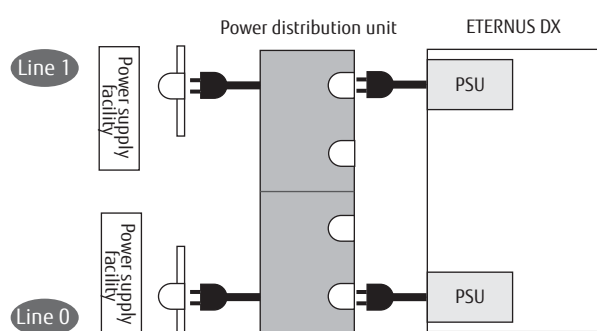


Figure 1.13 Dual-Line Power Supply (When Connecting to a UPS Unit)

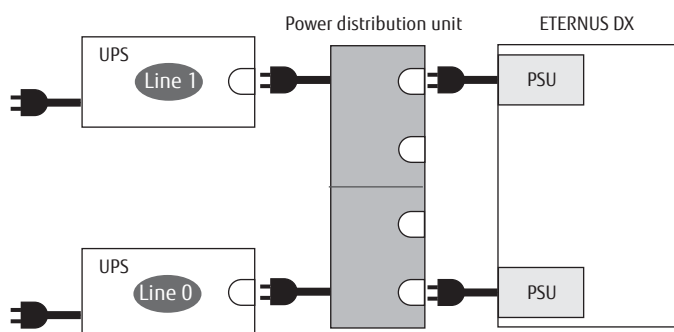


Figure 1.14 Single-Line Power Supply (When Connecting to Power Sockets)

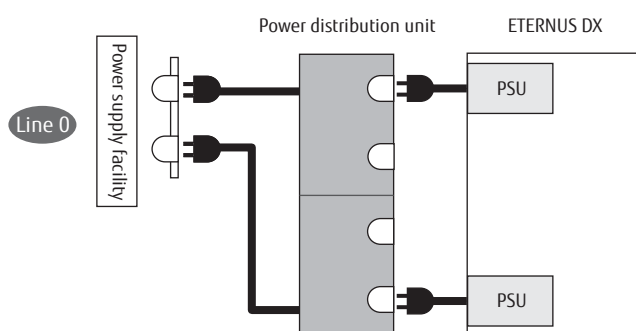


Figure 1.15 Single-line Power Supply (When Connecting to a UPS Unit)

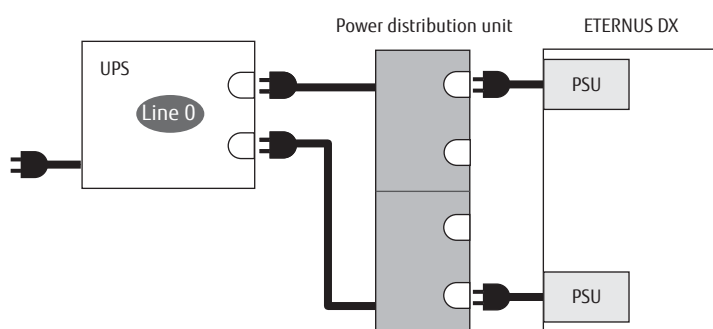
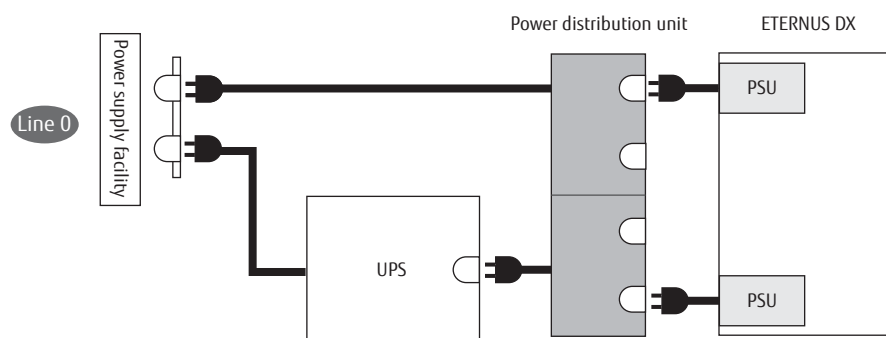
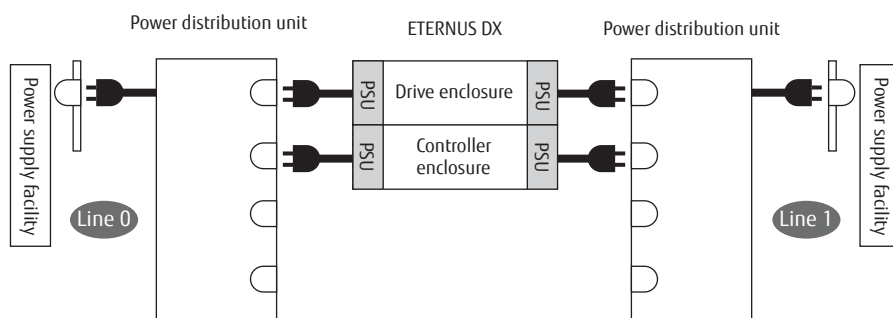


Figure 1.16 Single-line Power Supply (When Connecting to a Power Socket and a UPS Unit)



Note

When the power distribution units are separately connected to line 0 (PSU#0) and line 1 (PSU#1), the availability of the power supply facilities is improved.



Chapter 2

Rack Installation Specifications

This chapter explains the rack installation specifications of the ETERNUS DX.

2.1 Rack Installation Requirements

This section explains the requirements for installing the ETERNUS DX in a 19-inch rack.

2.1.1 Placement in the Rack

Note the following when installing the ETERNUS DX in the rack.

- The center of gravity must be taken into consideration to prevent a rack from toppling over. Enclosures should generally be installed from bottom to top to lower the center of gravity and to ensure the safe use of racks.
- Enclosures are installed in the following order (from bottom to top).

Table 2.1 Enclosure Installation Order

Installation order	Enclosure	Size (height)
4	Drive enclosure	2U
3	Controller enclosure	2U
2	Power distribution unit Power synchronized unit (*2)	1U/2U 1U
1	UPS (*1)	—

***1:** This is an Uninterruptible Power Supply.

***2:** This is an optional product for only the ETERNUS DX.

Note

- When determining the rack-mounting layout of each enclosure and power distribution unit, consider the length of each cable. For example, if the ETERNUS DX is installed at the top of a 2000mm rack and a 4m power cord is used, the surplus length of the power cord at the bottom of a rack should be about 2m.
- If the storage system is installed at the bottom of a rack, a space for the surplus of cables may not be available in some racks, preventing the storage system from being pulled out when maintenance work is required.

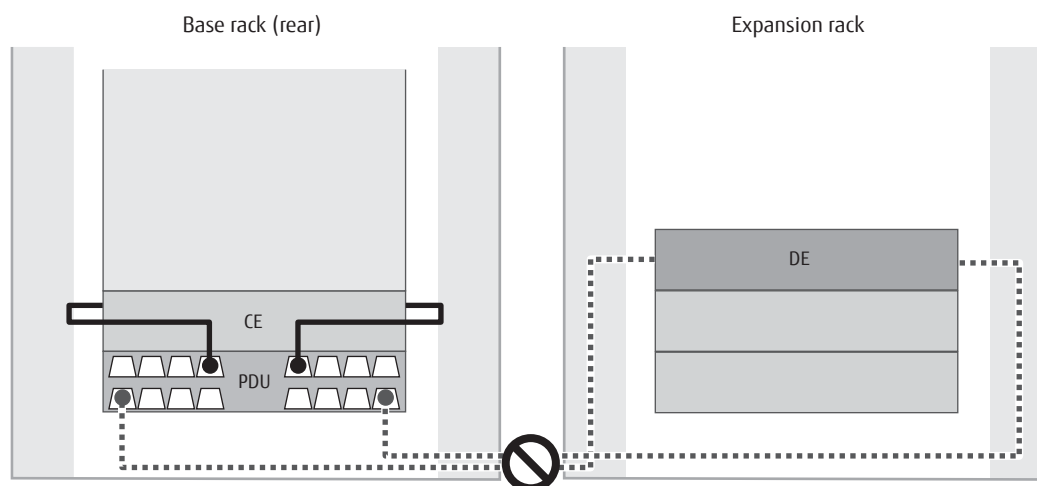
In this case, secure a space of 1U or more at the bottom when installing the storage system.

2.1.2 Cable Connection

2.1.2.1 Cable Connection (Power)

When connecting the power cords (AC cables) of the enclosures to the power distribution units, make sure to secure the necessary number of power outlets within the same rack. Avoid exceeding the power cord length and connecting power cords to different racks.

Figure 2.1 AC Cable Connection



- : AC cable
- CE: Controller Enclosures
- DE: Drive Enclosures
- PDU: Power Distribution Unit

2.1.2.2 Cable Connection (Between Enclosures)

Reverse cabling can be used to connect enclosures in the ETERNUS DX when the ETERNUS DX is configured with two controllers. For reverse cabling, the connection destination for controller 1 (CM#1) must be the last drive enclosure.

Longer cables may be required according to the installation locations of enclosures that are used in the same rack or the installation locations of enclosures that are used in multiple racks.

The cable lengths that are required between enclosures should be taken into consideration when enclosure installation locations are being determined.

For drive enclosures, the length of the provided cables between enclosures is 0.75m.

For extended connections, 2.5m and 3.5m cables are available.

The following guideline shows how the mini SAS HD cables between enclosures should be used according to their cable length.

Table 2.2 Usage of Cables for Connecting Enclosures

Cable length	Usage
0.75m	Provided with drive enclosures and used for connecting controller enclosures.
2.5m	• Used as extension cables when the lengths of the provided cables are not sufficient. • Used for reverse cabling when two or more drive enclosures are installed.
3.5m	Used as extension cables for connections between the racks.

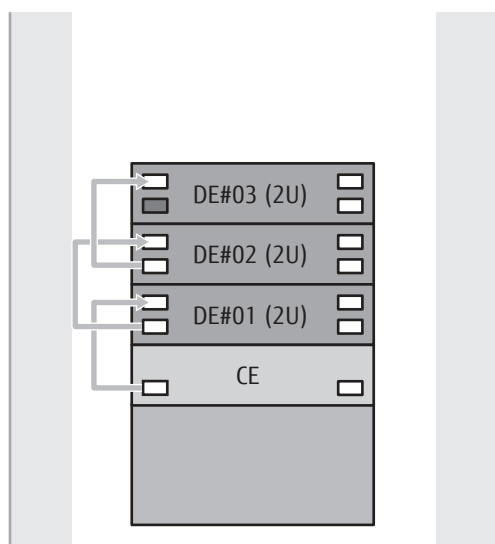
- Installing DEs in the Same Rack (When Only One Controller Is Installed)

This section describes a connection configuration in which all of the enclosures are installed in the same rack.

The following figure shows an example of a single controller configuration when one controller enclosure and three drive enclosures are installed in a rack.

In this example, all the enclosures can be connected with the cables provided with the drive enclosure.

Figure 2.2 Connection Example 1 (Connections in the Same Rack)



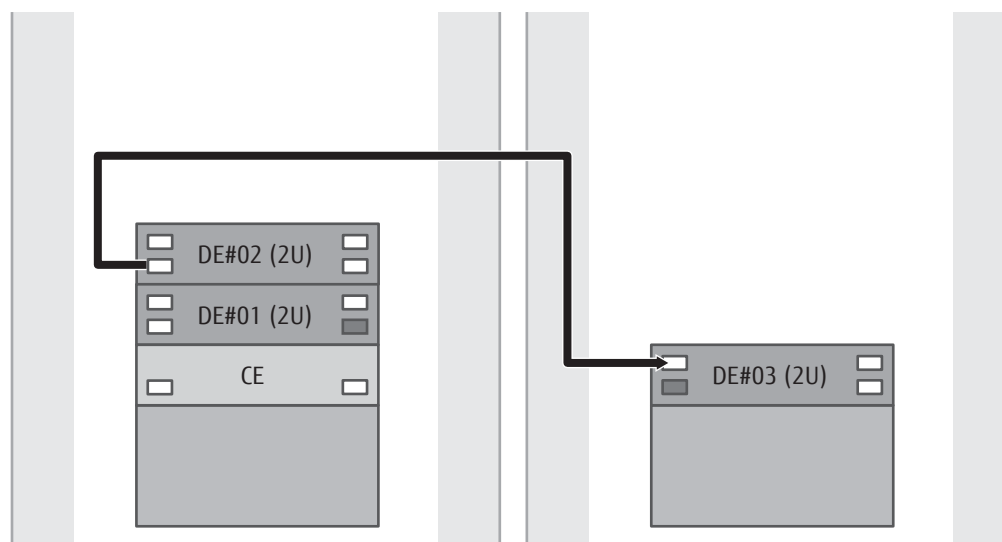
Cables that are supplied as standard

—— 0.75m

- Installing Enclosures in Multiple Racks (When Only One Controller Is Installed)

This section describes a connection configuration in which the enclosures are installed in multiple racks. The following figure shows an example of a single controller configuration when one controller enclosure and three drive enclosures are distributed between two racks. Obtaining extra extension cables for these connections between the racks is required.

Figure 2.3 Connection Example 2 (Connections in Multiple Racks)



Extension cables

— 3.5m

Note

Connections in the same rack are omitted in the above figure.

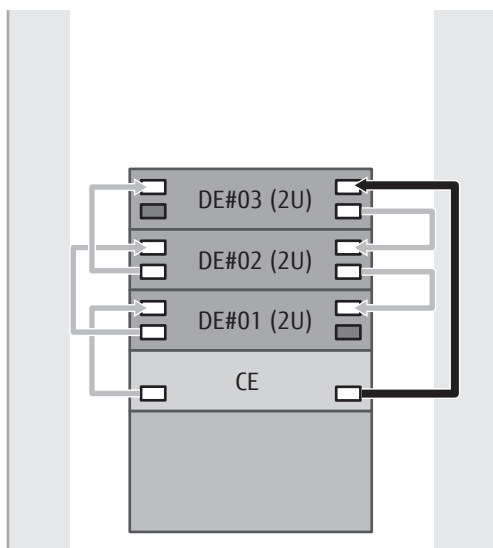
- Installing DEs in the Same Rack (When Two Controllers Are Installed)

This section describes a connection configuration in which all of the enclosures are installed in the same rack.

The following figure shows an example of a dual controller configuration when one controller enclosure and three drive enclosures are installed in a rack.

In this example, all the enclosures can be connected with the cables provided with the drive enclosure.

Figure 2.4 Connection Example 3 (Connections in the Same Rack)



Cables that are supplied as standard

— 0.75m

Extension cables

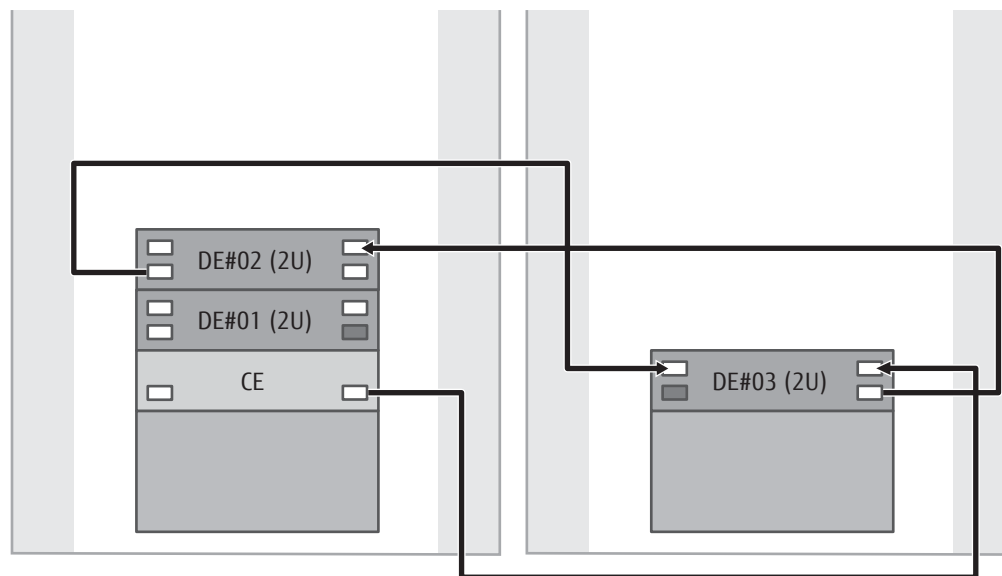
— 2.5m

- Installing Enclosures in Multiple Racks (When Two Controllers Are Installed)

This section describes a connection configuration in which the enclosures are installed in multiple racks.

The following figure shows an example of a dual controller configuration when one controller enclosure and three drive enclosures are distributed between two racks. Obtaining extra extension cables for these connections between the racks is required.

Figure 2.5 Connection Example 4 (Connections in Multiple Racks)



Extension cables

— 3.5m

Note

Connections in the same rack are omitted in the above figure.

2.2 Installable Racks

This section explains the racks in which the ETERNUS DX can be installed.

2.2.1 Fujitsu Racks

The ETERNUS DX can be installed in a Fujitsu 19-inch rack. For information about whether the ETERNUS DX can be installed in an EOLed rack or not, contact your sales representative.

2.2.2 Non-Fujitsu Racks

The ETERNUS DX storage systems are developed and their operation is guaranteed on the assumption that they are installed in Fujitsu 19-inch racks. Since the ETERNUS DX cannot be tested (for cooling and strength) in non-Fujitsu 19-inch racks, the operations of ETERNUS DX storage systems cannot be guaranteed. Any problem that may occur by installing the ETERNUS DX in non-Fujitsu racks is not covered by the warranty.

If the ETERNUS DX needs to be installed in a non-Fujitsu rack, the following conditions must be satisfied.

■ Rack Specifications

Use the rack mount kit supplied with the product to install the ETERNUS DX in the rack. The rack specifications must satisfy the conditions listed below. For rack specifications, refer to the manual for the rack that is used.

- Pitch for mounting holes
EIA Standard Universal pitch
- Size for mounting holes
The size of the square holes must be 9mm or more.
- Load bearing capacity
The load bearing capacity must be equal to or larger than the total weight of the ETERNUS DX.
- Unit Installation Area
The dimensions of the area shown in [Figure 2.6](#) must match the conditions described in [Table 2.3](#).

Figure 2.6 Unit Installation Area

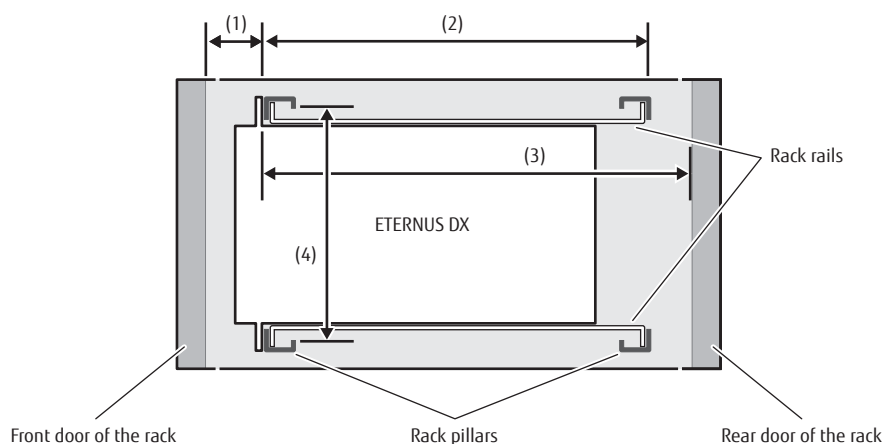


Table 2.3 Specifications for the Unit Installation Area

Specification		Condition
(1)	Rack front space (Space between the fixed part of the ETERNUS DX on the front side and the front of the rack)	40mm or more
(2)	Mount bracket length (Size between each end of the front and rear rack pillars)	685mm or more 775mm or less
(3)	Rack space (Space between the fixed part of the ETERNUS DX on the front side and the rear of the rack)	830mm or more
(4)	Rack mount kit installation area	482mm or more (recommended)

■ Placement Requirements

When determining service areas, refer to the manual of the rack that is to be used.

Make sure to perform the installation according to the placement requirements described in ["1.1 Installation Specifications" \(page 10\)](#) and ["1.6 Installation Environment" \(page 19\)](#).

FUJITSU Storage ETERNUS DX60 S3 Disk storage system Site Planning Guide

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