Fujitsu Storage ETERNUS AB series All-Flash Arrays, ETERNUS HB series Hybrid Arrays

Site Planning Guide



Requirements for transportation/installation



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Preface

Fujitsu would like to thank you for purchasing the Fujitsu Storage ETERNUS AB2100/AB3100, ETER-NUS AB5100/AB6100 All-Flash Arrays, and the ETERNUS HB1100/HB1200/HB2100/HB2200/HB2300, ETERNUS HB5100/HB5200 Hybrid Arrays (hereinafter referred to as ETERNUS AB/HB).

The ETERNUS AB/HB is designed to be connected to Fujitsu servers (Fujitsu SPARC Servers, PRIMEQUEST, PRIMERGY, and other servers) or non-Fujitsu servers.

This manual describes the environmental requirements that are necessary to install and use the ETERNUS AB/HB.

This manual is intended for use of the ETERNUS AB/HB in regions other than Japan.

Please carefully review the information outlined in this manual.

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Trademarks

Third-party trademark information related to this product is available at: https://www.fujitsu.com/global/products/computing/storage/eternus/trademarks.html

About This Manual

Intended Audience

This manual is intended for managers of facilities where the ETERNUS AB/HB is installed.

Related Information and Documents

The latest information for your model is available at: https://www.fujitsu.com/global/support/products/computing/storage/manuals-list.html

Document Conventions

Notice Symbols

The following notice symbols are used in this manual:

Caution

Indicates information that you need to observe when using the ETERNUS AB/HB. Make sure to read the information.

Note

Indicates information and suggestions that supplement the descriptions included in this manual.

Model Name Notation

In this manual, model names may be noted as follows.

Target model	Notation
ETERNUS AX1100/AX1200	ETERNUS AX1x00
ETERNUS AX2100/AX2200	ETERNUS AX2x00
ETERNUS HX2100/HX2200/HX2300	ETERNUS HX2x00

Start of Production for This Product

Production for the ETERNUS AB2100 and ETERNUS AB5100/AB6100 has started from 2020. Production for the ETERNUS HB1100/HB1200/HB2100/HB2200/HB2300 and ETERNUS HB5100/ HB5200 has started from 2020. Production for the ETERNUS AB3100 has started from 2021.

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 AB/HB is not used properly.



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



This symbol indicates IMPORTANT information for the user to note when using the ETERNUS AB/HB.

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

Electric Shock



No Disassembly



 \bigtriangleup 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).

 \bigotimes 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).

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. An example is shown below.



1. Installation Specifications

This chapter provides the installation specifications of the ETERNUS AB/HB.

Installation Specifications

- ETERNUS AB series All-Flash Arrays
 - <u>"ETERNUS AB2100/AB3100" (page 9)</u>
 - "ETERNUS AB5100/AB6100" (page 12)
- ETERNUS HB series Hybrid Arrays
 - "ETERNUS HB1100/HB1200" (page 14)
 - "ETERNUS HB2100/HB2200" (page 17)
 - "ETERNUS HB2300" (page 19)
 - "ETERNUS HB5100/HB5200" (page 22)

ETERNUS AB2100/AB3100

Each installation specification is shown below.

- Installation specifications: Table 1
- Sound level of the drive shelf: <u>Table 2</u>
- Efficiency and the power factor of the power supply unit: Table 3

Table 1	Installation	Specifications	(ETERNUS AB2100/AB3100)
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	Item	ETERNUS AB2100	ETERNUS AB3100		
Dimensions $(W \times D \times H)$	2.5" type controller shelf	480 × 483 × 85 mm (2U)	483 × 543 × 87 mm (2U)		
	DE224C 2.5" type drive shelf	480 × 484 × 85 mm (2U)	480 × 484 × 85 mm (2U)		
	DE212C 3.5" type drive shelf	-	480 × 505 × 87 mm (2U)		
	DE460C 60-drive type drive shelf	-	486 × 922 × 176 mm (4U)		
	Power distribution unit (AC24A/200V, 16 outlets) (2U) (*1)	(485 × 123 × 44 mm) >	(485 × 123 × 44 mm) × 2		
	Power distribution unit (AC24A/250V, six outlets) (2U) (*1)	-	(482 × 73 × 44 mm) × 2		
Maximum	2.5" type controller shelf	23.6 kg (27.6 kg)	27.4 kg (31.4 kg)		
weight (*2) (*3)	DE224C 2.5" type drive shelf	22.9 kg (26.9 kg)	22.9 kg (26.9 kg)		
(3)	DE212C 3.5" type drive shelf	-	27.6 kg (31.6 kg)		
	DE460C 60-drive type drive shelf	-	106.4 kg (110.4 kg)		
	Power distribution unit (AC24A/200V, 16 outlets) (2U) (*1)	(3.0 kg) × 2			
	Power distribution unit (AC24A/250V, six outlets) (2U) (*1)	-	(3.7 kg) × 2		
Power	Voltage	AC100 – 120 V, AC20	AC100 – 120 V, AC200 – 240 V		
	Phase	Single			
	Frequency	50 Hz / 60 Hz			

	lte	m		ETERNUS AB2100	ETERNUS AB3100
Maximum	Controller	2.5" type	AC100 – 120V	659 W (665 VA)	-
power	shelf		AC200 – 240V	659 W (665 VA)	953 W (964 VA)
(*2)	Drive shelf	DE224C	AC100 – 120V	375 W (379 VA)	-
		2.5" type	AC200 – 240V	375 W (379 VA)	375 W (379 VA)
		DE212C	AC100 – 120V	-	-
		3.5" type	AC200 – 240V	-	344 W (344 VA)
		DE460C	AC100 – 120V	-	-
		60-drive type	AC200 – 240V	-	1,460 W (1,466 VA)
	Maximum configuration (*4)		AC100 – 120V	1,784 W (1,802 VA)	-
			AC200 – 240V	1,784 W (1,802 VA)	6,793 W (6,828 VA)
Maximum	Controller shelf	2.5" type	AC100 – 120V	2,371 kJ/h	-
heat			AC200 – 240V	2,371 kJ/h	3,431 kJ/h
(*2)	Drive shelf	DE224C 2.5" type DE212C 3.5" type	AC100 – 120V	1,350 kJ/h	-
			AC200 – 240V	1,350 kJ/h	1,350 kJ/h
			AC100 – 120V	-	-
			AC200 – 240V	-	1,237 kJ/h
		DE460C	AC100 – 120V	-	-
		60-drive type	AC200 – 240V	-	5,256 kJ/h
	Maximum cor	nfiguration	AC100 – 120V	6,422 kJ/h	-
	(*4)		AC200 – 240V	6,422 kJ/h	24,455 kJ/h
Maximum	Controller she	elf		-	
amount of exhaust air	Drive shelf			-	

	Iter	n	ETERNUS AB2100	ETERNUS AB3100		
Environmental	Temperature	Operating	10 – 35 °C (*5)	10 – 35 °C (*6)		
conditions		Not operating	-40 – 70 °C			
		During shipment	-40 – 70 °C			
	Temperature g	gradient	15 °C/Hr or less	15 °C/Hr or less		
	Humidity	Operating	8 – 85 %RH (*5)	8 – 85 %RH (*6)		
		Not operating	5 – 95 %RH	·		
		During shipment	10 – 95 %RH			
	Humidity grad	ient	30 %/day or less			
	Maximum wet bulb temperature		29 °C	29 °C		
	Altitude above	e sea level	0 – 3,048 m	0 – 3,048 m		
	Airborne dust		0.15 mg/m ³ or less			
	Gas concentration tolerance level Oil vapor Seawater (salt corrosion)		Hydrogen sulfide (H_2S): 7.1 ppb or lessSulfur dioxide (SO_2): 37 ppb or lessHydrogen chloride (HCl): 6.6 ppb or lessChlorine (Cl_2): 6.8 ppb or lessHydrogen fluoride (HF): 3.6 ppb or lessNitrogen dioxide (NO_2): 52.3 ppb or lessAmmonia (NH_3): 423.5 ppb or lessOzone (O_3): 5 ppb or less0.2 mg/m ³ or lessIf the ETERNUS AB/HB is installed on the ocean or premises within 0.5 km from the coast, necessary measures must be taken			
Noise	Sound pressur	e level	67 dBA	69.1 dBA		
emission (*7)	Sound power level		6.7 B	7.2 B		

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

*2: These values are for each shelf when 24 drives are installed.

*3: The value in the parentheses for the controller shelf and drive shelves includes the mass of the rack rail kit.

*4: These values are for the maximum load when all the available options are installed in an ETERNUS AB/HB.

- *5: The operating test was performed in environments compatible with the Operating Condition Class A2 of the EU eco-design directive (ErP Directive 2009/125/EC).
- *6: The operating test was performed in environments compatible with the Operating Condition Class A3 of the EU eco-design directive (ErP Directive 2009/125/EC).
- *7: For details about the sound level of the drive shelf, refer to <u>"Table 2 Sound Level of the Drive Shelf" (page 11)</u>.

	DE224C
Sound pressure level	51 dBA
Sound power level	6.7 B

Table 2Sound Level of the Drive Shelf

Table 3 Efficiency and Power Factor of the Power Supply Unit

Component name	@211100		Efficiency		Power factor	Output
Shelf	00PLU3®	20 % (*1)	50 % (*1)	100 % (*1)	50 % (*1)	Output
ETERNUS AB2100	Platinum	91.8 %	94.2 %	92.7 %	0.980	Multiple output
ETERNUS AB3100		93.5 %	94.2 %	91.4 %	1.000	Single output
ETERNUS AB3100	Titanium	94.7 %	96.1 %	94.5 %	1.000	Single output

Component name			Efficiency		Power factor	Output
Shelf	00PLU3®	20 % (*1)	50 % (*1)	100 % (*1)	50 % (*1)	Output
DE224C drive shelf	Platinum	91.8 %	94.2 %	92.7 %	0.980	Multiple output
DE212C drive shelf		91.8 %	94.2 %	92.7 %	0.980	
DE460C drive shelf	Ţ	91.9 %	94.4 %	93.4 %	0.990	

*1: Indicates the rated load against the rated output of the PSU.

ETERNUS AB5100/AB6100

Each installation specification is shown below.

- Installation specifications: Table 4
- Sound level of the drive shelf: <u>Table 5</u>
- Efficiency and the power factor of the power supply unit: <u>Table 6</u>

Table 4 Installation Specifications (ETERNUS AB5100/AB6100)

	lte	m		ETERNUS AB5100	ETERNUS AB6100	
Dimensions $(W \times D \times H)$	2.5" type cont	roller shelf		480 × 483 × 85 mm (2U)	483 × 543 × 87 mm (2U)	
	DE224C 2.5" t	ype drive shel	f	480 × 484 × 85 mm (2U)	480 × 484 × 85 mm (2U)	
	DE212C 3.5" t	ype drive sheli	f	-	480 × 505 × 87 mm (2U)	
	DE460C 60-d	rive type drive	shelf	-	486 × 922 × 176 mm (4U)	
	Power distribut	ution unit (2U)	(*1)	(485 × 123 × 44 mm) :	× 2	
Maximum	2.5" type cont	roller shelf		23.5 kg (27.5 kg)	27.4 kg (31.4 kg)	
weight (*2) (*3)	DE224C 2.5" t	ype drive shel	f	22.9 kg (26.9 kg)	22.9 kg (26.9 kg)	
(3)	DE212C 3.5" t	ype drive shelt	f	-	27.6 kg (31.6 kg)	
	DE460C 60-d	rive type drive	shelf	-	106.4 kg (110.4 kg)	
	Power distribution unit (2U) (*1)		(3.0 kg) × 2			
Power	Voltage			AC 100 – 120V, AC 200 – 240V	AC 200 – 240V	
	Phase			Single		
	Frequency			50 Hz / 60 Hz		
Maximum	Controller	2.5" type	AC100 – 120V	659 W (665 VA)	-	
power	shelf		AC200 – 240V	659 W (665 VA)	979 W (979 VA)	
(*2)	Drive shelf	DE224C	AC100 – 120V	375 W (379 VA)	-	
		2.5" type	AC200 – 240V	375 W (379 VA)	375 W (379 VA)	
		DE212C	AC100 – 120V	-	-	
		3.5" type	AC200 – 240V	-	344 W (344 VA)	
		DE460C	AC100 – 120V	-	-	
		60-drive type	AC200 – 240V	-	1,460 W (1,466 VA)	
	Maximum cor	figuration	AC100 – 120V	2,159W (2,181 VA)	-	
	(*4) AC200 – 24			2,159W (2,181 VA)	979 W (979 VA)	

	lter	n		ETERNUS AB5100	ETERNUS AB6100
Maximum	Controller	2.5" type	AC100 – 120V	2,371 kJ/h	-
heat	shelf		AC200 – 240V	2,371 kJ/h	3,525 kJ/h
(*2)	Drive shelf	DE224C	AC100 – 120V	1,350 kJ/h	-
		2.5" type	AC200 – 240V	1,350 kJ/h	1,350 kJ/h
		DE212C	AC100 – 120V	-	-
		3.5" type	AC200 – 240V	-	1,237 kJ/h
		DE460C	AC100 – 120V	-	-
		60-drive type	AC200 – 240V	-	5,256 kJ/h
	Maximum cont	figuration	AC100 – 120V	7,772 kJ/h	-
	(*4)		AC200 – 240V	7,772 kJ/h	3,525 kJ/h
Maximum	Controller she	lf		-	-
amount of exhaust air	Drive shelf			-	-
Environmental	Temperature	Operating		5 – 40 °C (*5)	10 – 35 °C (*6)
conditions		Not operati	ng	-40 – 70 °C	
		During ship	ment	-40 – 70 °C	
	Temperature gradient		15 °C/Hr or less		
	Humidity	Operating		8 – 85 %RH (*5)	8 – 85 %RH (*6)
		Not operating		5 – 95 %RH	
	During shipment			10 – 95 %RH	
	Humidity grad	ient		30 %/day or less	
	Maximum wet	bulb tempera	ature	29 °C	
	Altitude above	e sea level		0 – 3,048 m	
	Airborne dust			0.15 mg/m ³ or less	
	Gas concentra	tion tolerance	e level	Hydrogen sulfide (H ₂	S): 7.1 ppb or less
				Sulfur dioxide (SO ₂): 37 ppb or less	
				Hydrogen chloride (HCl): 6.6 ppb or less Chlorine (Cl ₂): 6.8 ppb or less	
				Hydrogen fluoride (HF): 3.6 ppb or less	
				Nitrogen dioxide (NO_2) : 52.3 ppb or less	
				Ammonia (NH ₃): 423.	5 ppb or less
	Oilean an			Ozone (O ₃): 5 ppb or less	
	Oit vapor			0.2mg/m³ or less	
	Seawater (salt	corrosion)		If the ETERNUS AB/H	B is installed on the
				coast, necessary mea	sures must be taken
				to prevent salt corros	sion.
Noise	Sound pressur	e level		72 dBA	69.1 dBA
emission (*/)	Sound power level			7.2 B	7.2 B

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

*2: These values are for each shelf when 24 drives are installed.

*3: The value in the parentheses for the controller shelf and drive shelves includes the mass of the rack rail kit.

*4: These values are for the maximum load when all the available options are installed in an ETERNUS AB/HB.

*5: The operating test was performed in environments compatible with the Operating Condition Class A3 of the EU eco-design directive (ErP Directive 2009/125/EC).

*6: The operating test was performed in environments compatible with the Operating Condition Class A2 of the EU eco-design directive (ErP Directive 2009/125/EC).

*7: For details about the sound level of the drive shelf, refer to <u>"Table 5 Sound Level of the Drive Shelf" (page 14)</u>.

	DE212C	DE224C	DE460C
Sound pressure level	64 dBA	51 dBA	72 dBA
Sound power level	6.4 B	6.7 B	7.2 B

Table 6Efficiency and Power Factor of the Power Supply Unit

Component name			Efficiency		Power factor	Output
Shelf	00FL03®	20 % (*1)	50 % (*1)	100 % (*1)	50 % (*1)	Output
ETERNUS AB5100	Platinum	91.8 %	94.2 %	92.7 %	0.980	Multiple output
ETERNUS AB6100		93.5 %	94.2 %	91.4 %	1.000	Single output
ETERNUS AB6100	Titanium	94.7 %	96.1 %	94.5 %	1.000	Single output
DE224C drive shelf	Platinum	91.8 %	94.2 %	92.7 %	0.980	Multiple output

*1: Indicates the rated load against the rated output of the PSU.

ETERNUS HB1100/HB1200

Each installation specification is shown below.

- Installation specifications: Table 7
- Sound level of the drive shelf: <u>Table 8</u>
- Efficiency and the power factor of the power supply unit: Table 9

Table 7 Installation Specifications (ETERNUS HB1100/HB1200)

-	ltem	ETERNUS HB1100	ETERNUS HB1200	
Dimensions $(W \times D \times H)$	3.5" type controller shelf	480 × 505 × 87 mm (2U)	-	
	2.5" type controller shelf	-	480 × 483 × 85 mm (2U)	
	DE212C 3.5" type drive shelf	480 × 505 × 87 mm (2U)	-	
	DE224C 2.5" type drive shelf	-	480 × 484 × 85 mm (2U)	
	Power distribution unit (2U) (*1)	$(485 \times 123 \times 44 \text{ mm}) \times 2$		
Maximum	3.5" type controller shelf	29.3 kg (33.3 kg)	-	
weight (*2) (*2)	2.5" type controller shelf	-	24.6 kg (28.6 kg)	
(~3)	DE212C 3.5" type drive shelf	27.6 kg (31.6 kg)	-	
	DE224C 2.5" type drive shelf	-	22.9 kg (26.9 kg)	
	Power distribution unit (2U) (*1)	(3.0 kg) × 2		
Power	Voltage	AC 100 – 120V, AC 200 – 240V		
	Phase	Single		
	Frequency	50 Hz / 60 Hz		

	lter	n		ETERNUS HB1100	ETERNUS HB1200
Maximum	Controller	3.5" type	AC100 – 120V	565 W (568 VA)	-
power	shelf		AC200 – 240V	565 W (568 VA)	-
(*2)		2.5" type	AC100 – 120V	-	674 W (674 VA)
			AC200 – 240V	-	674 W (674 VA)
	Drive shelf	DE212C	AC100 – 120V	344 W (344 VA)	-
		3.5" type	AC200 – 240V	344 W (344 VA)	-
		DE224C	AC100 – 120V	-	452 W (450 VA)
		2.5" type	AC200 – 240V	-	452 W (450 VA)
	Maximum con	figuration	AC100 – 120V	909 W (912 VA)	1,126 W (1,124 VA)
	(*4)		AC200 – 240V	909 W (912 VA)	1,126 W (1,124 VA)
Maximum	Controller	3.5" type	AC100 – 120V	2,035 kJ/h	-
heat	shelf		AC200 – 240V	2,035 kJ/h	-
generation (*2)		2.5" type	AC100 – 120V	-	2,425 kJ/h
(-/			AC200 – 240V	-	2,425 kJ/h
	Drive shelf	DE212C	AC100 – 120V	1,237 kJ/h	-
		3.5" type	AC200 – 240V	1,237 kJ/h	-
		DE224C	AC100 – 120V	-	1,627 kJ/h
		2.5" type	AC200 – 240V	-	1,627 kJ/h
	Maximum con	figuration	AC100 – 120V	3,273 kJ/h	4,052 kJ/h
	(*4)	•	AC200 – 240V	3,273 kJ/h	4,052 kJ/h
Maximum	Controller shelf		<u> </u>	-	-
amount of exhaust air	Drive shelf			-	-
Environmental	Temperature Operating			5 – 45 °C (*5)	5 – 40 °C (*6)
conditions		Not operating		-40 – 70 °C	
		During ship	ment	-40 – 70 °C	
	Temperature g	gradient		15 °C/Hr or less	
	Humidity	Operating		8 – 90 %RH (*5)	8 – 85 %RH (*6)
		Not operating		5 – 95 %RH	
		During shipment		10 – 95 %RH	
	Humidity grad	lient		30 %/day or less	
	Maximum wet	bulb tempera	ature	29 °C	
	Altitude above	e sea level		0 – 3,048 m	
	Airborne dust			0.15 mg/m ³ or less	
	Gas concentra	ation tolerance	e level	Hydrogen sulfide (H ₂ S): 7.1 ppb or less	
				Sulfur dioxide (SO ₂):	37 ppb or less
				Hydrogen chloride (HCl): 6.6 ppb or less Chlorine (Cl ₂): 6.8 ppb or less	
				Hydrogen fluoride (HF): 3.6 ppb or less	
			Nitrogen dioxide (NC	D ₂): 52.3 ppb or less	
				Ammonia (NH ₃): 423.5 ppb or less	
	Oil vapor			$0.2 \text{ ma/m}^3 \text{ or less}$	
	Seawater (salt	corrosion)		If the ETERNUS AB/H	IB is installed on the
		,		ocean or premises w	ithin 0.5 km from the
				coast, necessary mea	asures must be taken
				to prevent salt corros	SIOH.

	Item	ETERNUS HB1100	ETERNUS HB1200	
Noise emission (*7)	Sound pressure level	64 dBA		
	Sound power level	6.4 B		

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

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

*3: The value in the parentheses for the controller shelf and drive shelves includes the mass of the rack rail kit.

- *4: These values are for the maximum load when all the available options are installed in a 2.5" type or 3.5" type ETERNUS AB/HB.
- *5: The operating test was performed in environments compatible with the Operating Condition Class A4 of the EU eco-design directive (ErP Directive 2009/125/EC).
- *6: The operating test was performed in environments compatible with the Operating Condition Class A3 of the EU eco-design directive (ErP Directive 2009/125/EC).
- *7: For details about the sound level of the drive shelf, refer to <u>"Table 8 Sound Level of the Drive Shelf" (page 16)</u>.

Table 8 Sound Level of the Drive Shelf

	DE212C	DE224C
Sound pressure level	64 dBA	51 dBA
Sound power level	6.4 B	6.7 B

Table 9 Efficiency and Power Factor of the Power Supply Unit

Component name			Efficiency		Power factor	Outout
Shelf	00FL03®	20 % (*1)	50 % (*1)	100 % (*1)	50 % (*1)	Output
ETERNUS HB1100	Platinum	91.8 %	94.2 %	92.7 %	0.980	Multiple output
ETERNUS HB1200		91.8 %	94.2 %	92.7 %	0.980	
DE212C drive shelf		91.8 %	94.2 %	92.7 %	0.980	
DE224C drive shelf		91.8 %	94.2 %	92.7 %	0.980	

*1: Indicates the rated load against the rated output of the PSU.

ETERNUS HB2100/HB2200

Each installation specification is shown below.

- Installation specifications: <u>Table 10</u>
- Sound level of the drive shelf: <u>Table 11</u>
- Efficiency and the power factor of the power supply unit: <u>Table 12</u>

Table 10 Installation Specifications (ETERNUS HB2100/HB2200)

Item				ETERNUS HB2100	ETERNUS HB2200	
Dimensions $(W \times D \times H)$	3.5" type controller shelf			480 × 505 × 87 mm (2U)	-	
	2.5" type con	troller shelf		-	480 × 483 × 85 mm (2U)	
	DE212C 3.5" t	ype drive shel	f	$480 \times 505 \times 87$ mm (2)	20)	
	DE224C 2.5" t	type drive shel	lf	$480 \times 484 \times 85 \text{ mm}$ (2	2U)	
	DE460C 60-d	rive type drive	e shelf	$486 \times 922 \times 176 \text{ mm}$ (4U)	
	Power distrib (AC24A/200V	ution unit 7, 16 outlets) (2	2U) (*1)	(485 × 123 × 44 mm) :	× 2	
	Power distrib (AC24A/250V	ution unit ′, six outlets) (2	2U) (*1)	(482 × 73 × 44 mm) ×	2	
Maximum	3.5" type con	troller shelf		29.3 kg (33.3 kg)	-	
weight (*2) (*3)	nt (*2) 2.5" type controller			-	24.6 kg (28.6 kg)	
(^3)	DE212C 3.5" t	ype drive shel	f	27.6 kg (31.6 kg)	27.6 kg (31.6 kg)	
	DE224C 2.5" t	type drive shel	lf	22.9 kg (26.9 kg)	22.9 kg (26.9 kg)	
	DE460C 60-d	rive type drive	e shelf	106.4 kg (110.4 kg)	106.4 kg (110.4 kg)	
	Power distrib (AC24A/200V	ution unit /, 16 outlets) (*	1)	(3.0 kg) × 2		
	Power distrib (AC24A/250V	ution unit ′, six outlets) ('	*1)	(3.7 kg) × 2		
Power	Voltage			AC 100 – 120V, AC 20	00 – 240V	
	Phase			Single		
	Frequency			50 Hz / 60 Hz		
Maximum	Controller	3.5" type	AC100 – 120V	565 W (568 VA)	-	
power	shelf		AC200 – 240V	565 W (568 VA)	-	
(*2)		2.5" type	AC100 – 120V	-	674 W (674 VA)	
			AC200 – 240V	-	674 W (674 VA)	
	Drive shelf	DE212C	AC100 – 120V	344 W (344 VA)	344 W (344 VA)	
		3.5" type	AC200 – 240V	344 W (344 VA)	344 W (344 VA)	
		DE224C	AC100 – 120V	452 W (450 VA)	452 W (450 VA)	
		2.5" type	AC200 – 240V	452 W (450 VA)	452 W (450 VA)	
		DE460C	AC100 – 120V	-	-	
		60-drive type	AC200 – 240V	1,460 W (1,466 VA)	1,460 W (1,466 VA)	
	Maximum cor	nfiguration	AC100 – 120V	1,921 W (1,918 VA)	2,029 W (2,024 VA)	
	(*4)		AC200 – 240V	4,945 W (4,966 VA)	4,046 W (4,056 VA)	

Item				ETERNUS HB2100	ETERNUS HB2200	
Maximum	Controller	3.5" type	AC100 – 120V	2,035 kJ/h	-	
heat	shelf		AC200 – 240V	2,035 kJ/h	-	
(*2)		2.5" type	AC100 – 120V	-	2,425 kJ/h	
_			AC200 – 240V	-	2,425 kJ/h	
	Drive shelf	DE212C	AC100 – 120V	1,237 kJ/h	1,237 kJ/h	
		3.5" type	AC200 – 240V	1,237 kJ/h	1,237 kJ/h	
		DE224C	AC100 – 120V	1,627 kJ/h	1,627 kJ/h	
		2.5" type	AC200 – 240V	1,627 kJ/h	1,627 kJ/h	
		DE460C	AC100 – 120V	-	-	
		60-drive type	AC200 – 240V	5,256 kJ/h	5,256 kJ/h	
	Maximum cont	figuration	AC100 – 120V	6,916 kJ/h	7,305 kJ/h	
	(*4)		AC200 – 240V	17,803 kJ/h	14,564 kJ/h	
Maximum	Controller she	lf		-	-	
amount of	Drive shelf	2.5" type / 3	3.5" type	-	-	
exhaust all		60-drive typ	be	-	-	
Environmental	Temperature	Operating		5 – 45 °C (*5)	5 – 40 °C (*6)	
conditions		Not operating		-40 – 70 °C		
		During shipment		-40 – 70 °C		
	Temperature g	gradient		15 °C/Hr or less		
	Humidity	Operating		8 – 90 %RH (*5)	8 – 85 %RH (*6)	
		Not operating		5 – 95 %RH		
		During shipment		10 – 95 %RH		
	Humidity grad	ient		30 %/day or less		
	Maximum wet	bulb tempera	ature	29 °C		
	Altitude above	e sea level		0 – 3,048 m		
	Airborne dust			0.15 mg/m ³ or less		
	Gas concentra	tion tolerance	e level	Hydrogen sulfide (H ₂ S): 7.1 ppb or less		
				Sulfur dioxide (SO ₂): 37 ppb or less		
				Hydrogen chloride (HCl): 6.6 ppb or less		
				Hydrogen fluoride (HF): 3.6 ppb or less		
				Nitrogen dioxide (NC	2): 52.3 ppb or less	
				Ammonia (NH ₃): 423.	5 ppb or less	
				Ozone (O ₃): 5 ppb or	less	
	Oil vapor			0.2 mg/m ³ or less		
	Seawater (salt	corrosion)		If the ETERNUS AB/H	IB is installed on the	
				ocean or premises wi	thin 0.5 km from the	
				to prevent salt corros	sion.	
Noise	Sound pressur	e level		64 dBA		
emission (*7)	nission (*7) Sound power level			6.4 B		

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

*2: These values are for each shelf when 24 drives are installed in a 2.5" type shelf, 12 drives are installed in a 3.5" type shelf, or 60 drives are installed in a 60-drive shelf.

*3: The value in the parentheses for the controller shelf and drive shelves includes the mass of the rack rail kit.

*4: These values are for the maximum load when all the available options are installed in a 2.5" type or 3.5" type ETERNUS AB/HB.

- *5: The operating test was performed in environments compatible with the Operating Condition Class A4 of the EU eco-design directive (ErP Directive 2009/125/EC).
- *6: The operating test was performed in environments compatible with the Operating Condition Class A3 of the EU eco-design directive (ErP Directive 2009/125/EC).
- *7: For details about the sound level of the drive shelf, refer to <u>"Table 11 Sound Level of the Drive Shelf" (page 19)</u>.

	DE212C	DE224C	DE460C
Sound pressure level	64 dBA	51 dBA	72 dBA
Sound power level	6.4 B	6.7 B	7.2 B

Table 12 Efficiency and Power Factor of the Power Supply Unit

Component name	8001115@		Efficiency		Power factor	Output
Shelf	00PLU3®	20 % (*1)	50 % (*1)	100 % (*1)	50 % (*1)	Colpor
ETERNUS HB2100	Platinum	91.8 %	94.2 %	92.7 %	0.980	Multiple output
ETERNUS HB2200		91.8 %	94.2 %	92.7 %	0.980	
DE212C drive shelf		91.8 %	94.2 %	92.7 %	0.980	
DE224C drive shelf		91.8 %	94.2 %	92.7 %	0.980	
DE460C drive shelf		91.9 %	94.4 %	93.4 %	0.990	

*1: Indicates the rated load against the rated output of the PSU.

ETERNUS HB2300

Each installation specification is shown below.

- Installation specifications: <u>Table 13</u>
- Sound level of the drive shelf: Table 14
- Efficiency and the power factor of the power supply unit: <u>Table 15</u>

Table 13	Installation Specifications	(ETERNUS HB2300)
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	Item	ETERNUS HB2300
Dimensions	3.5" type controller shelf	486 × 922 × 176 mm (4U)
$(W \times D \times H)$	DE212C 3.5" type drive shelf	480 × 505 × 87 mm (2U)
	DE224C 2.5" type drive shelf	480 × 484 × 85 mm (2U)
	DE460C 60-drive type drive shelf	486 × 922 × 176 mm (4U)
	Power distribution unit (AC24A/200V, 16 outlets) (2U) (*1)	$(485 \times 123 \times 44 \text{ mm}) \times 2$
	Power distribution unit (AC24A/200V, six outlets) (2U) (*1)	$(482 \times 73 \times 44 \text{ mm}) \times 2$
Maximum	3.5" type controller shelf	108.1 kg (112.1 kg)
weight (*2) (*2)	DE212C 3.5" type drive shelf	27.6 kg (31.6 kg)
(*3)	DE224C 2.5" type drive shelf	22.9 kg (26.9 kg)
	DE460C 60-drive type drive shelf	106.4 kg (110.4 kg)
	Power distribution unit (AC24A/200V, 16 outlets) (2U) (*1)	(3.0 kg) × 2
	Power distribution unit (AC24A/200V, six outlets) (2U) (*1)	(3.7 kg) × 2

Item			ETERNUS HB2300	
Power	Voltage			AC 200 – 240V
	Phase			Single
	Frequency			50 Hz / 60 Hz
Maximum	Controller	3.5" type	AC100 – 120V	-
power	shelf		AC200 – 240V	1,537 W (1,543 VA)
(*2)	Drive shelf	DE212C	AC100 – 120V	-
		3.5" type	AC200 – 240V	344 W (344 VA)
		DE224C	AC100 – 120V	-
		2.5" type	AC200 – 240V	452 W (450 VA)
		DE460C	AC100 – 120V	-
		60-drive type	AC200 – 240V	1,460 W (1,466 VA)
	Maximum configuration (*4)		AC100 – 120V	-
			AC200 – 240V	4,801 W (4,819 VA)
Maximum	Controller shelf	3.5" type	AC100 – 120V	-
heat			AC200 – 240V	5,533 kJ/h
(*2)	Drive shelf	DE212C	AC100 – 120V	-
		3.5" type	AC200 – 240V	1,237 kJ/h
		DE224C	AC100 – 120V	-
		2.5" type	AC200 – 240V	1,627 kJ/h
		DE460C	AC100 – 120V	-
		60-drive type	AC200 – 240V	5,256 kJ/h
	Maximum cont	figuration	AC100 – 120V	-
	(*4)		AC200 – 240V	17,283 kJ/h
Maximum	Controller she	lf		-
amount of exhaust air	Drive shelf	2.5" type / 3	3.5" type	-
exilaust all	60-drive typ		pe	-

	Iter	n	ETERNUS HB2300	
Environmental	Temperature	Operating (*5)	5 – 40 °C	
conditions		Not operating	-40 – 70 °C	
		During shipment	-40 – 70 °C	
	Temperature g	gradient	15 °C/Hr or less	
	Humidity	Operating (*5)	8 – 85 %RH	
		Not operating	10 – 95 %RH	
		During shipment	10 – 95 %RH	
	Humidity grad	ient	30 %/day or less	
	Maximum wet	bulb temperature	29 °C	
	Altitude above sea level		-30.5 – 3,048 m	
	Airborne dust		0.15 mg/m ³ or less	
	Gas concentration tolerance level		Hydrogen sulfide (H_2S): 7.1 ppb or less Sulfur dioxide (SO_2): 37 ppb or less Hydrogen chloride (HCl): 6.6 ppb or less Chlorine (Cl_2): 6.8 ppb or less Hydrogen fluoride (HF): 3.6 ppb or less Nitrogen dioxide (NO_2): 52.3 ppb or less Ammonia (NH_3): 423.5 ppb or less Ozone (O_3): 5 ppb or less	
	Oil vapor		0.2 mg/m ³ or less	
	Seawater (salt	corrosion)	If the ETERNUS AB/HB is installed on the ocean or premises within 0.5 km from the coast, necessary measures must be taken to prevent salt corrosion.	
Noise	Sound pressur	e level	72 dBA	
emission (*6)	Sound power level		7.2 В	

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

*2: These values are for each shelf when 24 drives are installed in a 2.5" type shelf, 12 drives are installed in a 3.5" type shelf, or 60 drives are installed in a 60-drive shelf.

*3: The value in the parentheses for the controller shelf and drive shelves includes the mass of the rack rail kit.

*4: These values are for the maximum load when all the available options are installed in a 2.5" type or 3.5" type ETERNUS AB/HB.

*5: The operating test was performed in environments compatible with the Operating Condition Class A3 of the EU eco-design directive (ErP Directive 2009/125/EC).

*6: For details about the sound level of the drive shelf, refer to <u>"Table 14 Sound Level of the Drive Shelf"</u> (page 21).

Table 14Sound Level of the Drive Shelf

	DE212C	DE224C	DE460C
Sound pressure level	64 dBA	51 dBA	72 dBA
Sound power level	6.4 B	6.7 B	7.2 B

Component name		Efficiency		Power factor	Output	
Shelf	00PLU3®	20 % (*1)	50 % (*1)	100 % (*1)	50 % (*1)	Output
ETERNUS HB2300	Platinum	91.9 %	94.4 %	93.4 %	0.990	Multiple output
DE212C drive shelf		91.8 %	94.2 %	92.7 %	0.980	
DE224C drive shelf		91.8 %	94.2 %	92.7 %	0.980	
DE460C drive shelf		91.9 %	94.4 %	93.4 %	0.990	

Table 15 Efficiency and Power Factor of the Power Supply Unit

*1: Indicates the rated load against the rated output of the PSU.

ETERNUS HB5100/HB5200

Each installation specification is shown below.

- Installation specifications: Table 16
- Sound level of the drive shelf: Table 17
- Efficiency and the power factor of the power supply unit: Table 18

Table 16	Installation Specifications	(ETERNUS HB5100/HB5200)
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	Item	ETERNUS HB5100	ETERNUS HB5200
Dimensions $(W \times D \times H)$	3.5" type controller shelf	-	482×922×176 mm (4U)
	2.5" type controller shelf	480 × 483 × 85 mm (2U)	-
	DE224C 2.5" type drive shelf	$480 \times 484 \times 85 \text{ mm}$ (2	2U)
	DE460C 60-drive type drive shelf	$486 \times 922 \times 176 \text{ mm}$ (4	4U)
	Power distribution unit (AC24A/200V, 16 outlets) (2U) (*1)	(485 × 123 × 44 mm) >	< 2
	Power distribution unit (AC24A/200V, six outlets) (2U) (*1)	$(482 \times 73 \times 44 \text{ mm}) \times 2$	
Maximum	3.5" type controller shelf	-	108.5 kg (112.5 kg)
weight (*2) (*3)	2.5" type controller shelf	25.1 kg (29.1 kg)	-
(3)	DE224C 2.5" type drive shelf	22.9 kg (26.9 kg)	
	DE460C 60-drive type drive shelf	106.4 kg (110.4 kg)	
	Power distribution unit (AC24A/200V, 16 outlets) (2U) (*1)	(3.0 kg) × 2	
	Power distribution unit (AC24A/200V, six outlets) (2U) (*1)	(3.7 kg) × 2	
Power	Voltage	AC 100 – 120V, AC 200 – 240V	AC 200 – 240V
	Phase	Single	
	Frequency	50 Hz / 60 Hz	

	lter	n	ETERNUS HB5100	ETERNUS HB5200	
Maximum	Controller	3.5" type	AC100 – 120V	-	-
power	shelf		AC200 – 240V	-	1,777 W (1,793 VA)
(*2)		2.5" type	AC100 – 120V	694 W (701 VA)	-
			AC200 – 240V	694 W (701 VA)	-
	Drive shelf	DE224C	AC100 – 120V	423 W (426 VA)	-
		2.5" type	AC200 – 240V	423 W (426 VA)	423 W (426 VA)
		DE460C	AC100 – 120V	-	-
		60-drive type	AC200 – 240V	1,486 W (1,501 VA)	1,486 W (1,501 VA)
	Maximum configuration (*4)		AC100 – 120V	3,652 W (3,683 VA)	-
			AC200 – 240V	11,093 W (11,208 VA)	12,176 W (12,300 VA)
Maximum	Controller shelf	3.5" type	AC100 – 120V	-	-
heat			AC200 – 240V	-	6,397 kJ/h
(*2)		2.5" type	AC100 – 120V	2,499 kJ/h	-
			AC200 – 240V	2,499 kJ/h	-
	Drive shelf	DE224C 2.5" type	AC100 – 120V	1,521 kJ/h	-
			AC200 – 240V	1,521 kJ/h	1,521 kJ/h
		DE460C	AC100 – 120V	-	-
		60-drive type	AC200 – 240V	5,348 kJ/h	5,348 kJ/h
	Maximum cont	figuration	AC100 – 120V	13,148 kJ/h	-
	(*4)		AC200 – 240V	39,937 kJ/h	43,835 kJ/h
Maximum	Controller she	lf		-	-
amount of	Drive shelf	2.5" type / 3	8.5" type	-	-
exhaust air		60-drive typ	be	-	-

Item		ETERNUS HB5100	ETERNUS HB5200			
Environmental	Temperature	Operating (*5)	5 – 40 °C			
conditions		Not operating	-40 – 70 °C	-40 – 70 °C		
		During shipment	-40 – 70 °C			
	Temperature g	gradient	15 °C/Hr or less	15 °C/Hr or less		
	Humidity	Operating (*5)	8 – 85 %RH			
		Not operating	5 – 95 %RH	10 – 95 %RH		
		During shipment	10 – 95 %RH			
	Humidity grad	ient	30 %/day or less			
	Maximum wet bulb temperature		29 °C			
	Altitude above sea level		0 – 3,048 m	-30.5 – 3,048 m		
	Airborne dust		0.15 mg/m ³ or less			
	Gas concentration tolerance level		Hydrogen sulfide (H ₂ S): 7.1 ppb or less Sulfur dioxide (SO ₂): 37 ppb or less Hydrogen chloride (HCl): 6.6 ppb or less Chlorine (Cl ₂): 6.8 ppb or less Hydrogen fluoride (HF): 3.6 ppb or less Nitrogen dioxide (NO ₂): 52.3 ppb or less Ammonia (NH ₃): 423.5 ppb or less Ozone (O ₃): 5 ppb or less			
	Oil vapor		0.2 mg/m ³ or less			
	Seawater (salt corrosion)		If the ETERNUS AB/HB is installed on the ocean or premises within 0.5 km from the coast, necessary measures must be taken to prevent salt corrosion.			
Noise	Sound pressure level		51 dBA	72 dBA		
emission (*6)	Sound power level		6.7 B	7.2 B		

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

*2: These values are for each shelf when 24 drives are installed in a 2.5" type shelf, 12 drives are installed in a 3.5" type shelf, or 60 drives are installed in a 60-drive shelf.

*3: The value in the parentheses for the controller shelf and drive shelves includes the mass of the rack rail kit.

*4: These values are for the maximum load when all the available options are installed in an ETERNUS AB/HB.
*5: The operating test was performed in environments compatible with the Operating Condition Class A3 of the EU eco-design directive (ErP Directive 2009/125/EC).

*6: For details about the sound level of the drive shelf, refer to <u>"Table 17 Sound Level of the Drive Shelf"</u> (page 24).

	Table 17	Sound	Level	of the	Drive	Shelf
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	DE224C	DE460C
Sound pressure level	51 dBA	72 dBA
Sound power level	6.7 B	7.2 B

Table 18 Efficiency and Power Factor of the Power Supply Unit

Component name			Efficiency		Power factor	Output
Shelf	00FL03®	20 % (*1)	50 % (*1)	100 % (*1)	50 % (*1)	Corpor
ETERNUS HB5100	Platinum	91.8 %	94.2 %	92.7 %	0.980	Multiple output
ETERNUS HB5200		91.9 %	94.4 %	93.4 %	0.990	
DE224C drive shelf		91.8 %	94.2 %	92.7 %	0.980	
DE460C drive shelf		91.9 %	94.4 %	93.4 %	0.990	

*1: Indicates the rated load against the rated output of the PSU.

19-inch Racks

The following table shows the installation specifications of the 19-inch racks.

Table 19 19-inch Rack Installation Specifications

ltom	Specification			
item	Base rack	Expansion rack		
Dimensions ($W \times D \times H$)	700 × 1,050 × 2,000 mm 700 × 1,272 × 2,000 mm (including anti-tipping stabilizer)			
Maximum weight	129 kg 103 kg			
Service area	Refer to Figure 14 under <u>"Installation Area" (page 37)</u> .			
Number of units	42U			

Table 20 19-inch Wide Rack Installation Specifications

ltom	Specification			
item	Base rack	Expansion rack		
Dimensions (W \times D \times H)	800 × 1,200 × 2,000 mm 800 × 1,432 × 2,000 mm (including anti-tipping stabilizer)			
Maximum weight	155 kg	125 kg		
Service area (including a space for using the lifter)	Refer to Figure 15 under <u>"Installatio</u>	n Area" (page 37).		
Number of units	42U			

ETERNUS AB/HB Dimensions

Controller Shelf Dimensions

The following diagrams show the dimensions of a controller shelf. The dimensions are approximations and do not include protruding parts.

• 2.5" Type Controller Shelf

Figure 1 2.5" Type Controller Shelf Dimensions (ETERNUS AB2100, AB5100, ETERNUS HB1200/ HB2200, HB5100)



Figure 2 2.5" Type Controller Shelf Dimensions (ETERNUS AB3100, AB6100)



• 3.5" Type Controller Shelf





• 3.5" Type 4U Controller Shelf





486 mm (with the flanges)





482 mm (with the flanges)

Drive Shelf Dimensions

The diagrams below show the dimensions of a drive shelf. The dimensions are approximations and do not include protruding parts.

DE224C 2.5" Type Drive Shelf





480 mm (with the flanges)

• DE212C 3.5" Type Drive Shelf

Figure 7 DE212C 3.5" Type Drive Shelf Dimensions



DE460C 60-Drive Type Drive Shelf Dimensions 449 mm (without the flanges) 922 mm 922 mm 922 mm 926 mm 928 mm (with the flanges)

Rack Dimensions

The following diagrams show the dimensions of a 19-inch rack and an anti-tipping stabilizer. The dimensions are approximations and do not include protruding parts. For specification information that is required for securing a rack, refer to <u>Figure 16</u> under <u>"Installation Methods" (page 40)</u>.







Figure 10 19-inch Rack Internal Dimensions (Horizontal Cross Section)







Figure 12 19-inch Wide Rack Internal Dimensions (Horizontal Cross Section)

*1: Holes for fixing the storage system to the rack (size: 9.5mm square hole, universal pitch)

*2: Pitch of holes for fixing the storage system to the rack

*3: Inside the rack

Figure 13 Anti-Tipping Stabilizer Dimensions



Installation image of the L-shaped stabilizer

Compliance Standards

- About Compliance Standards
- Product safety
 EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013
 IEC 60950-1:2005, 2nd Edition + A1:2009 + A2:2013
 ANSI/UL 60950-1:2014
 CAN/CSA-C22.2 No 60950-1-07, + A1:2011 + A2:2014
 EN 62368-1:2014 + A11:2017
 IEC 62368-1:2014 + A11:2017
 IEC 62368-1:2014
 IANSI/UL 62368-1, 2nd Edition
 CAN/CSA C22.2 No. 62368-1-14
 CNS 14336-1:2010
 IS 13252(Part 1):2010
 TP TC 004/2011
- Electromagnetic Compatibility (EMC) EN 55032 Class A EN 55024:2010 EN 61000-3-2:2014 EN 61000-3-3:2013 FCC Part-15 Subpart B Class A ICES-003 Class A VCCI Class A JIS C 61000-3-2 CNS 13438:2006 AS/NZS CISPR 32 Class A 2015 TP TC 020/2011 KN32 Class A KN35
- Environmental compliance

This product complies with the requirements of the European Union directives listed below: 2014/35/EU Low Voltage Directive 2014/30/EU Electromagnetic Compatibility Directive 2012/19/EU Waste Electrical and Electronic Equipment (WEEE) Directive 2009/125/EC, Regulation (EU) 019/424 Erp Directive 2011/65/EU Restriction of Hazardous Substances (RoHS) Directive

• 80PLUS® (power conversion efficiency)

Package Size

The ETERNUS AB/HB is shipped in cardboard boxes or in a rack. These boxes may not fit through some doorways or elevators. To make sure that the ETERNUS AB/HB 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.

Component		Package size (W \times D \times H)	Maximum weight
Reinforced cardboard for 19-inch racks		950 × 1,450 × 2,190 mm (*1)	Approximately 240 kg (*1) (*2)
Reinforced cardboard for 19-inch wide racks		1,030 × 1,550 × 2,170 mm (*1)	Approximately 260 kg (*1) (*2)
Controller shelf	2.5" type	$810 \times 490 \times 710 \text{ mm}$	44.5 kg
(ETERNUS AB2100/AB3100, AB5100/AB6100, ETERNUS HB1100/HB1200, HB2100/ HB2200, HB5100)	3.5" type	810 × 490 × 710 mm	44.5 kg
Controller shelf (ETERNUS HB2300, HB5200)		1,180 × 690 × 700 mm	140.0 kg
Drive shelf	2.5" type	810 × 490 × 710 mm	44.5 kg
	3.5" type	$810 \times 490 \times 710 \text{ mm}$	44.5 kg
	60-drive type	1,180 × 690 × 700 mm	140 kg
Drive (*3)	2.5" type	160 imes 278 imes 106 mm	Approximately 0.5 kg
	3.5" type	$189 \times 300 \times 116 \text{ mm}$	Approximately 1.2 kg
Power distribution unit		$(540 \times 380 \times 310 \text{ mm}) \times 2$	(Approximately 10 kg) $ imes$ 2

Table 21 Package Size

*1: The size includes the ramp (slope) for the crate package.

*2: This value is used when shelves are not installed in the rack.

*3: When an order for optional drives to be installed in the factory is placed, shelves are shipped with the drives preinstalled. When optional drives are ordered without preinstallation, each drive is shipped in an individual package.
Installation Area

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

Secure service areas in the front and rear of the 19-inch rack.

Figure 14 Installation Area and Service Area (When the Lifter Is Not Used)



*1: The areas on the left and right of the front service area are not required if the ETERNUS AB/HB is installed in the rack.

When 4U controller shelves or DE460C drive shelves (60-drive) are installed in a rack or being maintained, temporary space is required to use the lifter around the rack.





*1: If a service area in front of the rack can be secured, secure a size 1,800mm or more.

 Precautions for Installing an ETERNUS HB2300/HB5200 Controller Shelf or a DE460C Drive Shelf in a Rack

- A lifter must be used to ensure safety during the installation of the drive shelf in the rack. Secure a space required to use the lifter.
- When a drive is added or replaced, the front left and right of the rack must be secured as service areas to pull out the drawer.
- The drive shelf weighs a maximum of 115 kg. Be sure to maintain the load bearing capacity of the location where the drive shelves are installed.

Installation Environment

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

Air Conditioning

It is important to consider the flows of cooling air (intake air and exhaust air) for the installation location of the ETERNUS AB/HB. The temperature in some ETERNUS AB/HB 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.

Take the following points into consideration when installing the air-conditioning system:

Ambient Temperature

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

- Front intake air temperature The air temperature of the front intake varies depending on the model. Refer to the environmental conditions that are listed in <u>"Installation Specifications" (page 9)</u> for details.
- 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.

Installation Methods

- Perform one of the following rack installation methods to ensure the safe use of an ETERNUS AB/ HB 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.
- The installation method that should be used depends on the installation location, the floor conditions, and the type of racks where the ETERNUS AB/HB is to be installed. Contact your installation contractor for more details regarding installation and how the installation should actually be performed.

An installation diagram when installing a rack (or the floor dimensions of the rack) is shown below.



Figure 16 Floor Dimensions of the Rack (of 19-inch Racks)



Figure 17 Floor Dimensions of the Rack (of 19-inch Wide Racks)

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 AB/HB is maintained.

(Load bearing capacity of the floor) > (ETERNUS AB/HB 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.

Outlet/Socket Specifications

This section explains the power connection specifications of the ETERNUS AB/HB storage systems.

Power Supply Units

The ETERNUS AB/HB has multiple power supply units in each of its shelf.

Using the same power requirements for all the power supply units is recommended so that the power requirements (use of power distribution units and input voltage) do not vary in the ETERNUS AB/HB.

Caution

When connecting a power cord, use the power cord clamp (cable tie) that is attached to the power supply unit to prevent it from coming out.

Controller Shelves and Drive Shelves

Power can be supplied from two power sources because each shelf has two power supply units. During normal operation, each of the power sources supplies half of the necessary power. If either of the power supply lines fails, all of the necessary power is supplied from the other power source.

Current Consumption

The following table shows the current consumption (guideline) of each power cord that is used for ETERNUS AB/HB connections.

Component name		Volt	tage
		AC100V	AC200V
Controller shelf	ETERNUS AB2100	4.49A	2.76A
	ETERNUS AB3100	-	4.38A
	ETERNUS AB5100	6.30A	3.02A
	ETERNUS AB6100	-	4.54A
	ETERNUS HB1100	5.43A	2.72A
	ETERNUS HB1200		2.98A
	ETERNUS HB2100	5.43A	2.72A
	ETERNUS HB2200	5.95A	2.98A
	ETERNUS HB2300		7.90A
	ETERNUS HB5100	6.48A	3.24A
	ETERNUS HB5200	-	8.12A
Drive shelf	DE212C	3.36A	1.68A
	DE224C	3.88A	1.94A
	DE460C	-	6.82A

Table 22 Maximum Current Consumption of Each Power Cord

-: Incompatible with AC100V

When power distribution units are used, make sure that the current capacity totaling the maximum current consumption value of power cords that connect to the shelves does not exceed the maximum current consumption value of the power distribution unit.

Specifications for Optional Power Supply Products

This section explains the specifications of optional power cords and power related optional products for the ETERNUS AB/HB.

When using power distribution units, take the number of outlets required to connect each shelf into consideration to select the most appropriate power distribution units.

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

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 23	Specifications for	AC250V Power	Cords (IEC60320	C13 - NEMA L6-15P)
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Usage	Plug type	Socket type	Power cord	Voltage rating/
	(Socket)	(Power supply unit)	length	current rating
Used for connection between the ETERNUS AB/HB and the socket (IEC60320 C13 <-> NEMA L6- 15P)	NEMA L6-15P	IEC60320 C13	4.0 m	250V/10A

AC200V power cords are used to connect devices to the IEC60320 C19 power socket type. These power cords can be used if the specifications of the connection device allow AC200V.

Table 24 Specifications for AC250V Power Cords (IEC60320 C19 - C20)

Usage	Plug type	Socket type	Power cord	Voltage rating/
	(Socket)	(Power supply unit)	length	current rating
Used for connection between the ETERNUS AB/HB and the socket (IEC60320 C19 <-> IEC60320 C20)	IEC60320 C20	IEC60320 C19	3.0 m	250V/16A

AC200V power cords are used to connect devices to the NEMA L6-20R power socket type. These power cords can be used if the specifications of the connection device allow AC200V.

Table 25 Specifications for AC250V Power Cords (IEC60320 C19 - NEMA L6-20P)

Usage	Plug type	Socket type	Power cord	Voltage rating/
	(Socket)	(Power supply unit)	length	current rating
Used for connection between the ETERNUS AB/HB and the socket (IEC60320 C19 <-> NEMA L6- 20P)	NEMA L6-20P	IEC60320 C19	3.0 m	250V/16A

AC100V Power Cords

AC100V 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 26 Specifications for AC100V Power Cords (IEC60320 C13 - NEMA 5-15P)

Usage	Plug type	Socket type	Power cord	Voltage rating/
	(Socket)	(Power supply unit)	length	current rating
Used for connection between the ETERNUS AB/HB and the socket (IEC60320 C13 <-> NEMA 5- 15P)	NEMA 5-15P	IEC60320 C13	3.0 m	125V/15A

AC100V/AC200V Power Cords

AC100V/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 AC100V or AC200V.

Table 27 Specifications for AC100V/AC250V Power Cords (IEC60320 C13 - C14)

Usage	Plug type	Socket type	Power cord	Voltage rating/
	(Socket)	(Power supply unit)	length	current rating
Used for connection between the ETERNUS AB/HB and the socket (IEC60320 C13 <-> IEC60320 C14)	IEC60320 C14	IEC60320 C13	3.0 m	250V/10A

Power Distribution Unit (AC24A/200V, 2U, 16 Outlets)

There are 16 outlets and two inlets.

Estimate the maximum current consumption to supply power to all the connected devices using one of the modules of the power distribution unit.

Figure 18 Power Distribution Unit (AC24A/200V, 2U, 16 Outlets)



: The current rating in four of the outlets must be 12A or lower

Table 28 Specifications for Power Distribution Units (AC24A/200-240V, 2U, 16 Outlets)

Outlet		Inlet		Voltago rating/
Socket type (Socket)	Plug type	Socket type (Socket)	Power cord length	current rating
IEC60320 C13	NEMA L6-30P	NEMA L6-30R	4.0m	Rating: 200-240V 24A

Power Distribution Unit (AC24A/200V, 2U, Six Outlets)

There are six outlets and two inlets.

Estimate the maximum current consumption to supply power to all the connected devices using one of the modules of the power distribution unit.

Figure 19 Power Distribution Unit (AC24A/200V, 2U, Six Outlets)



Table 29 Specifications for Power Distribution Units (AC24A/200-240V, 2U, Six Outlets)

Outlet		Inlet		Voltago rating/
Socket type (Socket)	Plug type	Socket type (Socket)	Power cord length	current rating
IEC60320 C19	NEMA L6-30P	NEMA L6-30R	4.4m	Rating: 200-240V 24A

Table 30 Specifications for Power Distribution Units (AC24A/200-240V, 2U, Six Outlets) (for Korea)

Outlet		Inlet		
Socket type (Socket)	Plug type	Socket type (Socket)	Power cord length	current rating
IEC60320 C19	IEC Industrial Plug IP44 32A 2P+PE	IEC Industrial Socket IP44 32A 2P+PE	4.4m	Rating: 200-240V 24A

Required Number of Outlets/Sockets

The number of power outlets/sockets required to install the ETERNUS AB/HB depends on the number of shelves and power distribution units.

It is recommended that the power cords of the shelves 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 shelves.

Without Power Distribution Units

Two power sockets are required for each controller shelf and drive shelf.

With Power Distribution Units

Two power sockets are required for each power distribution unit.

Circuit Protectors

Protection coordination must be secured between the distribution board circuit protectors and the ETERNUS AB/HB or power distribution units to protect the ETERNUS AB/HB 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.

Connected device	Power supply voltage	Current capacity
Power distribution unit (AC24A/200V, 2U, 16 outlets)	AC 200 – 240V	24A
Power distribution unit (AC24A/200V, 2U, six outlets)	AC 200 – 240V	24A
ETERNUS AB/HB (without power distribution units)	AC 100 – 120V AC 200 – 240V	15A

 Table 31
 Required Conditions for Distribution Board Circuit Protectors

Breaking Characteristics

Caution

The breaking characteristics (*1) of the distribution board circuit protectors must be the long-time delay type and must be equivalent to or slower than the D (IEC/EN60898-1) shown in <u>Figure 20</u>. If the distribution board's circuit protectors have a breaking characteristic that is faster than D, the breaker may trip when a power supply unit in the storage system fails. When the breaker trips, a shutoff occurs on multiple power supply units connected to the same connection line as the failed power supply unit.

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



Figure 20 Breaking Characteristics of Distribution Board Circuit Protectors

Connection Diagrams

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

Caution

Do not connect just one power distribution unit to multiple ETERNUS storage systems. In addition, do not connect just one circuit protector of a power distribution unit to multiple ETERNUS storage systems.

Note

When power cords are connected to a single power supply line, the connections are more secure if a one-to-one connection is made between each power cord and circuit protector of the distribution board.

For Power Distribution Unit (Six Outlets) Connections

The following diagram shows an example of a power supply connection when a power distribution unit (six outlets) is used.

- Current consumption of each outlet: 16A or less
- Current consumption of each inlet cable: 24A or less
- Figure 21 Example of a Power Supply Connection When a Power Distribution Unit (Six Outlets) Is Used



• For Power Distribution Unit (16 Outlets) Connections

The following diagram shows an example of a power supply connection when a power distribution unit (16 outlets) is used.

- Current consumption of each outlet: 10A or less
- Current consumption of each CP (four outlets: OUT1 to OUT4, or OUT5 to OUT8): 12A or less
- Current consumption of each inlet cable: 24A or less

Figure 22 Example of a Power Supply Connection When a Power Distribution Unit (16 Outlets) Is Used



• For Direct (No Power Distribution Unit) Connections

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

Figure 23 Example of a Power Supply Connection When a Power Distribution Unit Is Not Used





Input Power Supply Lines

It is recommended to use multiple power supply facilities in the building for power supply redundancy, or divide the AC input system for the ETERNUS AB/HB into a dual system (line 0 and line 1). Because the power supply of the ETERNUS AB/HB is configured redundantly, 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 26 Single-Line Power Supply (When Connecting to 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.



2. Rack Installation Specifications

This chapter provides the installation specification of the ETERNUS AB/HB.

Rack Installation Requirements

This section explains the requirements for installing the ETERNUS AB/HB in a 19-inch rack.

Placement in the Rack

Note the following when installing the ETERNUS AB/HB in the rack.

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

Table 32Shelf Installation Order

Installation order	Shelf	Size (height)
6	DE212C drive shelf	2U
	DE224C drive shelf	2U
5	DE460C drive shelf	4U
4	Controller shelf	2U
3	Controller shelf	4U
2	Power distribution unit	2U
1	UPS (*1)	-

*1: Uninterruptible Power Supply.

Note

- When determining the rack-mounting layout of each shelf and power distribution unit, consider the length of each cord. For example, if the ETERNUS AB/HB is installed at the top of a 2000 mm rack and a 4 m power cord is used, the surplus length of the power cord at the bottom of a rack should be about 2 m.
- If the ETERNUS AB/HB is installed at the bottom of a rack, a space for the surplus of cables may not be available in some racks, preventing the ETERNUS AB/HB 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 ETERNUS AB/HB.
- If drive shelves are to be added in the future, securing sufficient space for power distribution units in the bottom of the rack is recommended.
- If devices are installed above and below the ETERNUS AB/HB and there is a difference in depth of 100 mm or more, leave a space of 1U above the ETERNUS AB/HB so the rear of the unit can be easily accessed.

Cable Connection

Cable Connection (Power)

This section explains the requirements for connecting a power distribution unit with the ETERNUS AB/HB.

- Power Distribution Units (2U, 16 Outlets, 24A)
- For each power distribution unit, the total current capacity of the current consumption value of the power cords that connect from outlets OUT1 to OUT8 must be 24A or less.
- For each power distribution unit, the total current capacity of the current consumption value of the power cords that connect from outlets OUT1 to OUT4 and total current capacity of the current consumption value of the power cords that connect from outlets OUT5 to OUT8 must be 12A or less.
- Connect a new shelf to OUT5 if the total current capacity of the current consumption value of the power cords that connect from outlets OUT1 to OUT4 exceeds 12A.
 Connect a new shelf to the next power distribution unit if the total current capacity of the current consumption value of the power cords that connect from outlets OUT5 to OUT8 exceeds 12A.
- Power Distribution Units (2U, 6 Outlets, 24A)
- For each power distribution unit, the total current capacity of the current consumption value of the power cords that connect from outlets OUT1 to OUT3 must be 24A or less.

Cable Connection (Mini SAS HD Cable)

Mini SAS HD cables are used to connect between shelves in the ETERNUS AB/HB. Four (2 m) are provided with each drive shelf.

For extended connections, 5 m cables are available. To connect between shelves across racks, use 5 m cables.

Caution

The field engineer (FE) will perform the cable connection work.

Image: selection of the selec

Figure 27 Cable Connection (Mini SAS HD Cable)

Installable Racks

This section explains the racks in which the ETERNUS AB/HB can be installed.

Fujitsu Racks

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

Table 33	Installable Racks
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Model	Rack
Controller shelf	19-inch rack
- ETERNUS AB2100/AB3100	
- ETERNUS AB5100	
- ETERNUS HB1100/HB1200/HB2100/HB2200	
- ETERNUS HB5100	
Drive shelf	
- DE212C	
- DE224C	
Controller shelf	19-inch wide rack
- ETERNUS AB2100/AB3100	
- ETERNUS AB5100/AB6100	
- ETERNUS HB1100/HB1200/HB2100/HB2200/HB2300 (*1)	
- ETERNUS HB5100/HB5200 (*1)	
Drive shelf	
- DE212C	
- DE224C	
- DE460C (*1)	

*1: Because the depth is larger, the ETERNUS HB2300/HB5200 controller shelf and the DE460C drive shelf can only be installed in 19-inch wide racks.

Precautions for Installing an ETERNUS HB2300/HB5200 Controller Shelf or a DE460C Drive Shelf in a Rack

• Because the depth is larger than other shelves, install the shelf in a 19-inch rack designated by Fujitsu or a rack with a rack space of 922 mm (external depth of the drive shelf) plus an additional 100 mm or more cable area.

• Refer to <u>"Non-Fujitsu Racks" (page 57)</u> for the specification of the rack space in a rack.

Non-Fujitsu Racks

The ETERNUS AB/HB storage systems are developed and their operation is guaranteed on the assumption that they are installed in Fujitsu 19-inch racks. Any problem that may occur by installing the ETERNUS AB/HB in non-Fujitsu racks is not covered by the warranty.

If the ETERNUS AB/HB 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 AB/HB 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 Square hole: 9.5 ± 0.1 mm (recommended) Round hole: 7.1 ± 0.1 mm (recommended)
- Load bearing capacity The load bearing capacity must be equal to or larger than the total weight of the ETERNUS AB/ HB.
- Unit installation area The dimensions of the area shown in <u>Figure 28</u> must match the conditions described in <u>Table 34</u>.

Figure 28 Unit Installation Area



Table 34	Specifications for the Unit Installation Are	ea
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	Specification	Condition
(1)	Rack front space (Space between the fixed part of the ETERNUS AB/HB on the front side and the front of the rack)	50 mm or more
(2)	Mount bracket length (Size between each end of the front and rear rack pillars)	600 mm to 790 mm

	Specification	Condition
(3)	Rack space (Space between the fixed part of the ETERNUS AB/HB on the front side and the rear of the rack)	The depth of the shelf body (*1) + 100 mm or more (recommended for the extra cable length)
(4)	Rack mount kit installation area	483 mm or more (recommended)

*1: For the ETERNUS HB2300, ETERNUS HB5200, and DE460C, the recommended depth of the rack space is equal to the depth of the shelf body (922 mm) + 60 mm or more because the cable connection interface has depth of 40 mm from the rear surface of the shelf.

Installation Requirements

When determining service areas, refer to the manual of the rack that is to be used. Be sure to perform the installation according to the requirements described in <u>"Installation Specifications" (page 9)</u> and <u>"Installation Environment" (page 39)</u>.

Components and LEDs Α.

Controller: ETERNUS AB2100, ETERNUS HB1x00/HB2x00

There are three types of controllers for the ETERNUS AB2100 and ETERNUS HB1x00/HB2x00.

- · Controllers that are equipped with a 2-port FC/iSCSI host interface port as standard
- Controllers that are equipped with a 2-port iSCSI Base-T host interface port as standard Controllers that are not equipped with a host interface port

Either one can be equipped with one HIC as an option.

Caution

- The current controller cannot be mixed with a Btype controller in the controller shelf.
- Btype controllers do not have an onboard host port.

Figure 29 Controller: FC/iSCSI (Optical) Onboard Host Ports

• Btype controllers are supported in SANtricity 11.70.2 and later.



- *1: Btype controllers do not have host interface ports.
- *2: For details on the LEDs, refer to Figure 31 and Table 36.



Figure 30 Controller: Base-T Onboard Host Ports

- *1: Btype controllers do not have host interface ports.
- *2: For details on the LEDs, refer to Figure 31 and Table 36.

Table 35	Controller LED Status Display	v

No.	lcon	LED	Color	LED on	LED off
1	*	Host port link/ activity	Green	 On: The link is up with no activity. Flashing: The link is up with activity. 	The link is down.
2		Host port attention	Amber	The port requires atten- tion.	Normal state.
3	X	Ethernet management port link state (top left)	Green	The link is up.	The link is down.
4	-6	Ethernet management port link activity (top right)	Green	Flashing: The link is up with activity.	The link has no activity.
5	-0	CacheActive	Green	Data is being written in the cache.	Normal state.
6	۲	Locate	Blue	The user is required to determine the installation location of the enclosure.	Normal state.
7	!	Attention	Amber	An error has occurred in the controller canister.	Normal state.

No.	lcon	LED	Color	LED on	LED off
8	≁	Activity	Green	Flashing: The controller is active.	The controller is not run- ning.
9	8.	Heartbeat (dot on the bottom right side of the first digit in the 7- segment LED)	Yellow	Flashing: Heartbeat on	The controller is not run- ning.
10	0 Diagnostic (dot on the to side of the las in the 7-segm LED)		Yellow	The diagnostic code is shown on the 7-segment display.	The shelf ID is shown on the 7-segment display.
		7-segment LED (2 units)	Yellow	Shelf ID when the Diag- nostic LED is off. Diagnostic code when the Diagnostic LED is on.	The controller is powered off.
11	11 Drive expansion fault		Amber	At least one of the four PHYs on the output port is up and running, but another PHY cannot establish a similar link to the expansion output con- nector.	This port is optimized. (Links are established on all PHYs of the port.)
12		Drive expansion link	Green	The link is up.	The link is down.
13	_1=	Host port link state (top left)	Green	The link is up.	The link is down.
14		Host port link activity (top right)	Green	The link has activity.	The link has no activity.

Figure 31 The ETERNUS AB2100 and the ETERNUS HB2100/HB2200/HB2300 Host Expansion Ports

iSCSI 10Gb (10GBASE-T) 2 ports

SAS 12Gb 4 ports

FC 16Gb / iSCSI 10Gb 4 ports



|--|

No.	lcon	LED	Color	LED on	LED off
1		Host port link state (top left)	Green	The link is up.	The link is down.
2	-12	Host port link activity (top right)	Green	The link has activity.	The link has no activity.

No.	lcon		LED	C	olor	LED on	LE	D off
3		Drive expansion link		Green		The link is up.	The link is down.	
4	₩ł	Drive expansion fault		Amber At least one of the four PHYs on the output port is up and running, but another PHY cannot establish a similar link to the expansion output con- nector.		This port is optimized. (Links are established on all PHYs of the port.)		
5	4	Host port link/ activity		Gre	een	 On: The link is up with no activity. Flashing: The link is up with activity. 	The link is do	own.
6	*	Ho	Host port attention		nber	The port requires atten- tion.	Normal state	e.
7	4	Host port link/ activity		Gro	een	 On: The link is up with no activity. Flashing: The link is up with activity. 	The link is do	own.
8	•	Ho	ost port attention A		nber	The port requires atten- tion.	Normal state	e.
LED speed (No9) LED speed (No1)			0)		Link rate		Color	
On On		-,	The link is operating at 25Gbps with ity.		th no activ-	Green		
Fla		Flashing The		The	e link is operating at 25Gbps and has I/Os		Green	

	Flashing	the link is operating at 25Gbps and has I/Os that are being processed.	Green
Off	On	The link is operating at 10Gbps with no activ- ity.	Green
	Flashing	The link is operating at 10Gbps and has I/Os that are being processed.	Green
Off	Off	The link is down.	-

Controller: ETERNUS AB5100, ETERNUS HB5x00

There are two types of controllers for the ETERNUS AB5100 and ETERNUS HB5x00.

- Controllers that are equipped with a 2-port FC/iSCSI host interface port as standard
- Controllers that are not equipped with a host interface port

Either one can be equipped with one HIC as an option.

Caution

- The current controller cannot be mixed with a Btype controller in the controller shelf.
- Btype controllers do not have an onboard host port.
- Btype controllers are supported in SANtricity 11.70.2 and later.





- *1: Btype controllers do not have host interface ports.
- *2: For details on the LEDs, refer to Figure 33 and Table 38.

Table 37 Controller LED Status Displa	Table 37	Controller LED Status Display
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No.	lcon	LED	Color	LED on	LED off
1	*	Host port link/ activity	Green	 On: The link is up with no activity. Flashing: The link is up with activity. 	The link is down.
2		Host port attention	Amber	The port requires atten- tion.	Normal state.
3	₩ł	Drive expansion fault	Amber	At least one of the four PHYs on the output port is up and running, but another PHY cannot establish a similar link to the expansion output con- nector.	This port is optimized. (Links are established on all PHYs of the port.)
4		Drive expansion link	Green	The link is up.	The link is down.
5	-0	CacheActive	Green	Data is being written in the cache.	Normal state.
6	۲	Locate	Blue	The user is required to determine the installation location of the enclosure.	Normal state.
7	!	Attention	Amber	An error has occurred in the controller canister.	Normal state.
8	-∕-	Activity	Green	Flashing: The controller is active.	The controller is not run- ning.
9	8.	Heartbeat (dot on the bottom right side of the first digit in the 7- segment LED)	Yellow	Flashing: Heartbeat on	The controller is not run- ning.
10	.8	Diagnostic (dot on the top left side of the last digit in the 7-segment LED)	Yellow	The diagnostic code is shown on the 7-segment display.	The shelf ID is shown on the 7-segment display.
		7-segment LED (2 units)	Yellow	Shelf ID when the Diag- nostic LED is off Diagnostic code when the Diagnostic LED is on	The controller is powered off.
11	×	Ethernet management port link state (top left)	Green	The link is up.	The link is down.
12	-	Ethernet management port link activity (top right)	Green	Flashing: The link is up with activity.	The link has no activity.

Figure 33 Host Expansion Ports



FC 32Gb 4 ports



SAS 12Gb 4 ports

iSCSI 25Gb 4 ports



Table 38 HIC LED Status Display

No.	lcon	LED	Color	LED on	LED off
1		QSFP link	Amber	The physical link is active.	The physical link is not active.
2	IB HOST CARD	QSFP activity	Green	 On: The link is up with no activity. Flashing: The link is up with activity. 	The controller has not yet loaded the driver for the ConnectX host channel adapter.
3	Đ.	Host SAS channel fault	Amber	At least one of the four PHYs is running, but another PHY cannot establish the same link to the device connected to the host input port con- nector.	Normal state.
4		Host SAS channel activity	Green	At least one of the four PHYs in the host input port is running, and a link has been established to the device connected to the input port connector.	A link error has occurred.
5	4	Host port link/ activity	Green	 On: The link is up with no activity. Flashing: The link is up with activity. 	The link is down.
6		Host port attention	Amber	The port requires atten- tion.	Normal state.

LED speed (No.7)	LED speed (No.8)	Link rate	Color
On	On	The link is operating at 25Gbps with no activ- ity.	Green
	Flashing	The link is operating at 25Gbps and has I/Os that are being processed.	Green
Off	On	The link is operating at 10Gbps with no activ- ity.	Green
	Flashing	The link is operating at 10Gbps and has I/Os that are being processed.	Green
Off	Off	The link is down.	-

Controller: ETERNUS AB3100

There is only one controller type for the ETERNUS AB3100, and the host interfaces are onboard interfaces only. When connecting the controller with a drive shelf, insert the adapter card to Slot 1.



Figure 34 Controller

For details on the LEDs, refer to Figure 35 and Table 40. *1:

No	lcon	LED	Color	LED on	I ED off
110.	icon				
1	0	250	Green	operating normally.	i nere is no power supply.
			Red	There is something wrong with the power supply.	
2		Management port link (top left)	Green	The link is up.	The link is down.
3		Management port link activity (top right)	Green	Flashing: Indicates Ether- net port activity.	The link has no activity.
4	LNK	NV LED	Green	On by default when the power is turned on. On: Battery backup is enabled and cache opera- tion is supported.	Turned off by the software during startup. Battery backup is disabled.
5	۲	Locate	Blue	Identifies the enclosure (*1).	Does not indicate the installation position of the enclosure.
6	!	Attention	Amber	Calls attention to control- ler service events.	There is no problem with the controller.
7	-∕~	Activity	Green	Flashing: The controller is running.	The controller is not run- ning.
8	_1	Host port attention	Amber	Attention is required.	No special conditions.
9		Host port link	Green	The link is up.	No link.

Table 39 Controller LED Status Display

*1: This LED is initially turned on the moment the power is turned on, but turns off when startup is complete.

Figure 35 Host Expansion Ports

FC 32Gb 4ports / iSCSI 25Gb 4 ports





InfiniBand 100Gb 2 ports



Table 40 HIC LED Status Display

No.	LED	Color	LED on	LED off
1	Host port attention	Amber	Attention is required.	No special conditions.
2	Host port link	Green	The link is up.	No link.

No.	LED	Color	LED on	LED off
3	Drive expansion fault	Amber	At least one of the four PHYs on the output port is up and running, but another PHY cannot establish a similar link to the expansion output con- nector.	This port is optimized. (Links are established on all PHYs of the port.)
4	Drive expansion link	Green	The link is up.	The link is down.

Controller: ETERNUS AB6100

There is only one controller type for the ETERNUS AB6100, and the host interfaces are optional HICs only.

Two HICs can be installed on one controller.

Figure 36 Controller



*1: For details on the LEDs, refer to Figure 37 and Table 42.

No.	lcon	LED	Color	LED on	LED off
1	0	PSU	Green	The power supply unit is operating normally.	There is no power supply.
	•		Red	There is something wrong with the power supply.	
2		Management port link (top left)	Green	The link is up.	The link is down.
З		Management port link activity (top right)	Green	Flashing: Indicates Ether- net port activity.	The link has no activity.
4	LNK	NV LED	Green	On by default when the power is turned on. On: Battery backup is enabled and cache opera- tion is supported.	Turned off by the software during startup. Battery backup is disabled.
5	۲	Locate	Blue	Identifies the enclosure (*1).	Does not indicate the installation position of the enclosure.
6	!	Attention	Amber	Calls attention to control- ler service events.	There is no problem with the controller.
7	-∕~	Activity	Green	Flashing: The controller is running.	The controller is not run- ning.
8	_1=	Host port attention	Amber	Attention is required.	No special conditions.
9		Host port link	Green	The link is up.	No link.

Table 41 Controller LED Status Display

*1: This LED is initially turned on the moment the power is turned on, but turns off when startup is complete.

Figure 37 Host Expansion Ports

FC 32Gb 4ports / iSCSI 25Gb 4 ports



InfiniBand 100Gb 2 ports



Table 42 HIC LED Status Display

No.	LED	Color	LED on	LED off
1	Host port attention	Amber	Attention is required.	No special conditions.
2	Host port link	Green	The link is up.	No link.

Operator Display Panel (ODP)

The Operator Display Panel on the controller shelf and drive shelf (hereinafter referred to as "panel") has LEDs, a Shelf ID, and a push button.

Shelf Power LED
 Shelf Attention LED

3. Shelf Locate LED

4. Shelf identity (*1)5. ODP Push Button (*2)

*1: The default value for the controller shelf is "99". *2: Used when the Shelf ID is changed externally.

Figure 38 Panel: 2U Controller Shelf and Drive Shelf





With an end cap

Without an end cap

Table 43Panel LED status

LED	Color	LED on	LED off
Shelf Power	Green	The power is on.	The power is off.
Shelf Attention	Amber	Attention is required for the parts inside the controller shelf.	Normal state.
Shelf Locate	Blue	The user is required to determine the physical installation location of the shelf.	Normal state.

Figure 20	Donal 11	Controllor	chalf	~ ~ ~		Chalf
FIGULE 34	Panec 40	Controller	Sneu	and	Drive	Sneu
				•••••		



- 1. Shelf identity
- 2. Shelf Power LED
- 3. Shelf Attention LED
- 4. Shelf Locate LED
- 5. ODP Push Button (*1)

*1: Used when the Shelf ID is changed externally.

Table 44 Pan	el LED Status
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LED	Color	LED on	LED off
Shelf Power	Green	The power is on.	The power is off.
Shelf Attention	Amber	There is a functional error on the drive.	Normal state.
Shelf Locate	Blue	The user is required to determine the physical installation location of the shelf.	Normal state.

Power Fan Canister

This section describes the appearance and LEDs of the Power Fan Canister that is installed on the 2U controller shelf and drive shelf.

Figure 40 Power Fan Canister



Table 45 Power Fan Canister LED Status

LED	Color	LED on	LED off
Power	Green	The AC power is on.	The AC power is off.
Attention	Amber	There is something wrong with the power supply or the inte- grated fan.	Normal state.

Power Canister

This section describes the appearance and LEDs of the Power Canister that is installed on the 4U controller shelf and drive shelf.



Figure 41 Power Canister

Table 46 Power Canister LED Status

LED	Color	LED on	LED off
Power	Green	The AC power is on.	The AC power is off.
Attention	Amber	There is something wrong with the power supply.	Normal state.

Fan Canister

This section describes the appearance and LEDs of the Fan Canister that is installed on the 4U controller shelf and drive shelf.

Figure 42 Fan Canister



Table 47 Fan Canister LED Status

LED	Color	LED on	LED off
Attention	Amber	There is something wrong with the fan.	Normal state.

I/O Module (IOM)

There are two types of IOMs that are installed in the drive shelf, IOM12B and IOM12. This section describes the appearance and LEDs of the IOM12B and IOM12.

Caution

- IOM12B and IOM12 cannot be installed in the same drive shelf.
- IOM12B is supported in SANtricity 11.70.2 and later.


Figure 44 IOM



Table 48 IOM LED Status

LED	Color	LED on	LED off
Drive Expansion link	Green	The link is up.	The link is down.
Drive Expansion fault	Amber	At least one of the four PHYs on the output port is up and running, but another PHY cannot establish a similar link to the expansion output connector.	This port is optimized. (Links are established on all PHYs of the port.)
Attention	Amber	An error has occurred in the IOM.	Normal state.
Locate	Blue	The user is required to determine the installation location of the enclosure.	Normal state.

Drive Drawer

There are two types of drive drawers that are installed in the high-density drive (60-drive) shelf: Drawer B and Drawer.

Caution

- Drawer B and Drawer cannot be installed in the same IOM12 mounted drive shelf.
- Drawer B is supported in SANtricity 11.70.2 and later.

Figure 45 Drawer B



Figure 46 Drawer

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Fujitsu Storage ETERNUS AB series All-Flash Arrays, ETERNUS HB series Hybrid Arrays Site Planning Guide

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