INSTALLATION SECTION
[General]

Contents

NOTICE: In the following cases, start the Maintenance Utility from the Web Console window. (See "Starting Maintenance Utility" (MU01-10).)
- The instruction to use the force execution option is provided.
- The instruction is specifically provided by factory.

1. Before Starting Installation Work

The direction word "Note" indicates points to be checked on the work. Read and understand them well before performing the installation.
Take notice of the following when performing an installation work for the Storage System.

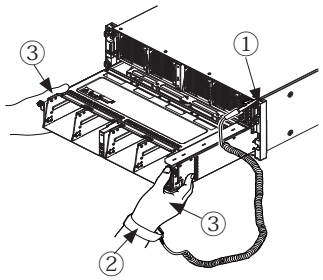
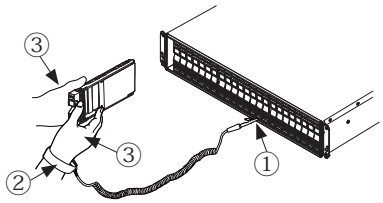
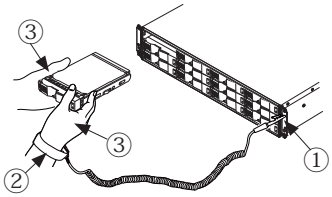
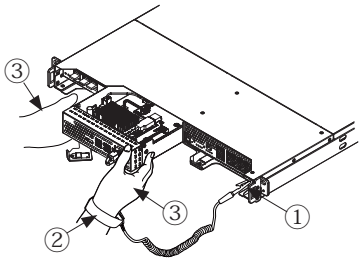
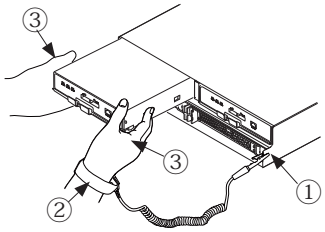
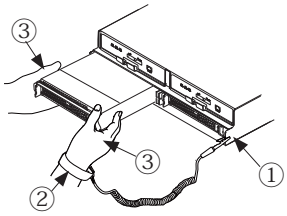
1.1 Note at the Time of the Unpacking

- Unpack indoors.
  Do not unpack outdoors, especially in a place that is exposed to dust, direct sunlight, or rain.
- Work on the unpacking in the place where a rapid difference of temperature does not occur. It may have dew condensation when it is unpacked in the place where a difference of temperature is extreme.
  Further, if the Storage System remains at high or low temperature in transport, it may not operate after turning on the power.
- Check that dummy parts are inserted firmly in the chassis. When they are not inserted firmly, re-tighten the fixing screws (blue) on metal dummies.
  For plastic dummies, make sure the following points:
  - Dummy (Channel Board/Disk Board): The dummy is inserted so that there is no gap between the board and the chassis.
  - Dummy (drive): The dummy is locked.
  - Dummy (cache flash memory): The dummy is set straight in the slot. If the dummy protrudes from the front face of the Controller Board, the dummy is not inserted properly. Remove and reinsert the dummy so that the springs on the dummy do not get caught in the slot.

1.2 Note when Installing and Removing Parts

- Generally, each part is equipped with high-precision components. Remove and install the part gently so as not to give it any shock.
- Be sure to put on the wrist strap before starting work in order to protect from electrostatic discharge.
- When you install parts support its metal part with your hand that has the wrist strap. You can discharge static electricity by touching the metal plate.

Table 1-1 Attaching the Wrist Strap

Front view		
		
Front view		Rear view
		

① : The clip side of wrist strap: Connect this to the metal part on the frame of the Storage System

② : A wrist strap (Be sure to wear this before starting maintenance.)

③ : Support the part by touching its metal part (metal plate) with your fingers

1.3 Note at the Time of Cable Routing

1. Handling of cables on the floor
   - Protect cables which cannot be accommodated by the Storage System and thus laid on the floor or cables which cross a passage with cable protecting, etc.
   - Do not make inter-Storage System cables apart from the floor but lay them on the floor.
2. Handling of under-floor cables when the Storage System is installed on the free access floor.
   - Give excess lengths to cables routed under the floor so that they can easily be laid on the slab. Do not make them to be hung dangling.
3. How to route cables
   - Give adequate margin of length to cables to withstand earthquakes, etc.
   - Route cables giving them excess lengths lest they should disturb replacement of part to be done for maintenance.
   - When using cable protecting duct, be careful not to damage or break cables by catching them.
4. Be sure to insert or pull out a cable connector holding it with your hand. If you pull a cable, a trouble may be caused.
5. When bending the interface cable, SAS cable and NVMe cable to connect it, give it a bend with a long radius (not less than 30 mm) so as not to apply the cable and the connector excessive stresses.

1.4 Installation of the Adaptable Micro-program

It is required to install the adaptable micro-program depending on the parts to be installed.
Check the adaptable micro-program revision referring to “Relationship between Option and Micro-program Version” (OPTVER01-10).

1.5 Note at the Time Restarting

When restarting the Storage System, turn off the main switch (after the POWER LED goes out), and then turn on the main switch after waiting for one minute or more.

1.6 Note when Completing a Maintenance Work

- It is required to make all the external covers closed to operate the Storage System properly.
- The external covers have effect of preventing the release of radio waves and the noise of disturbance waves.

1.7 Notes while the Storage System is Being Started

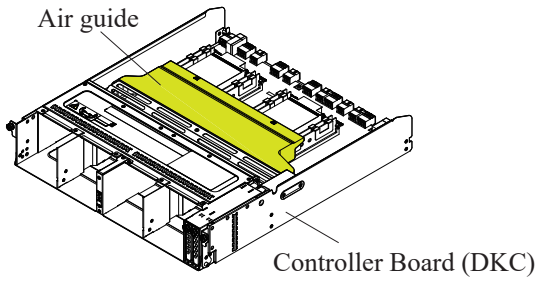
Because the status where the Storage System is being started is in the middle of the transition to the status of the Storage System power turned on (Ready status) from the status of the Storage System power turned off, do not perform the following work while the Storage System is being started.

- Installing or removing the parts
- Inserting or pulling out the cables
- Restarting the Storage System

Also, the setting function or the reference function using the Web Console cannot be executed to the Storage System which is being started.

1.8 Note at the Time of Installation Work

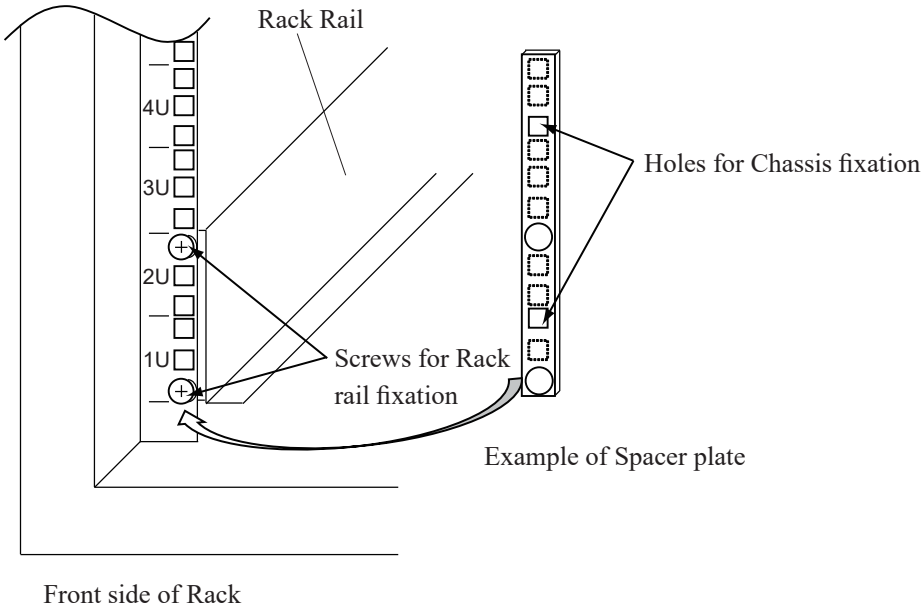
- Do not put anything on the air guide of the DKC or the DIMM cover during the work. It may cause breakage.



1.9 Notes for Installing Controller Chassis

Make sure that the chassis attachment surface is flat. Step less than 0.5 mm is acceptable.
If there're any protrusions on the surface of Rack mount angle, it sometimes comes from Rack Rail.
Then please talk wish the Rail supplier, and prepare spacer plates to make the surface flat.
Take care that whole 4U height flatness is necessary for Controller Chassis.

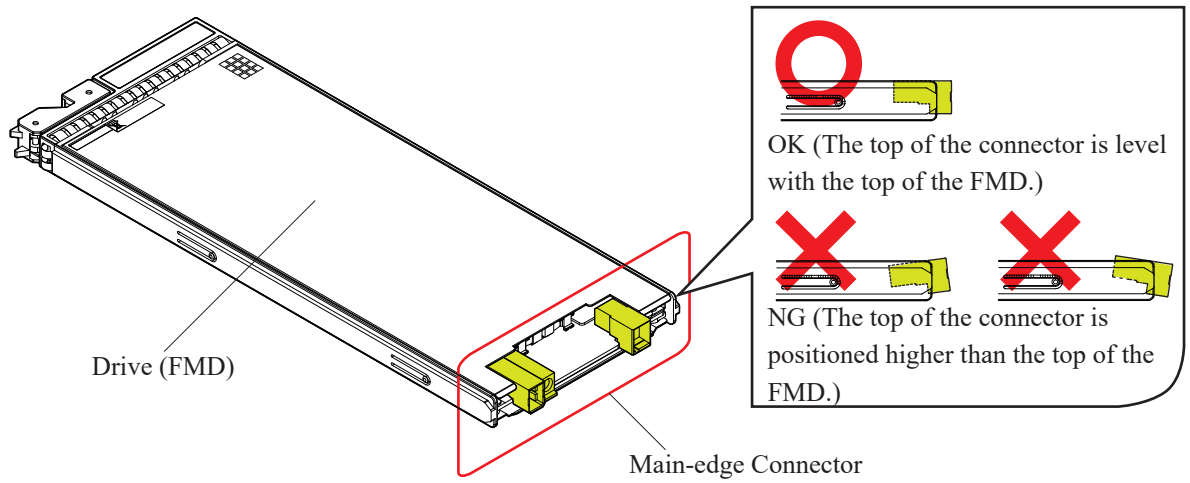
Figure 1-1 Example of protrusion on Rack mount angle and Spacer plate



1.10 Notes when Handling the Flash Module Drive (FMD)

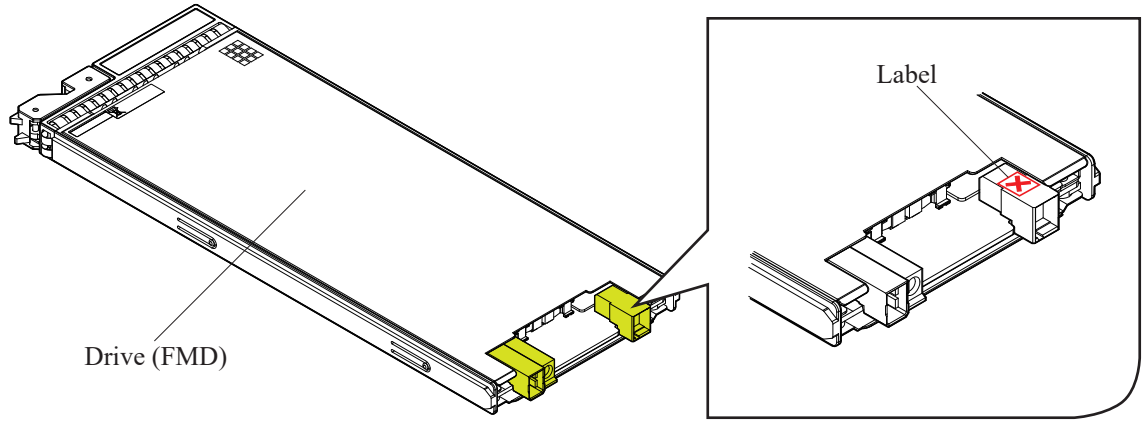
1. Be sure to check that the main edge connector of the drive (FMD) has no deformation, damage, float or sticking of dust before installing the drive (FMD).

Figure 1-2 Checking connectors



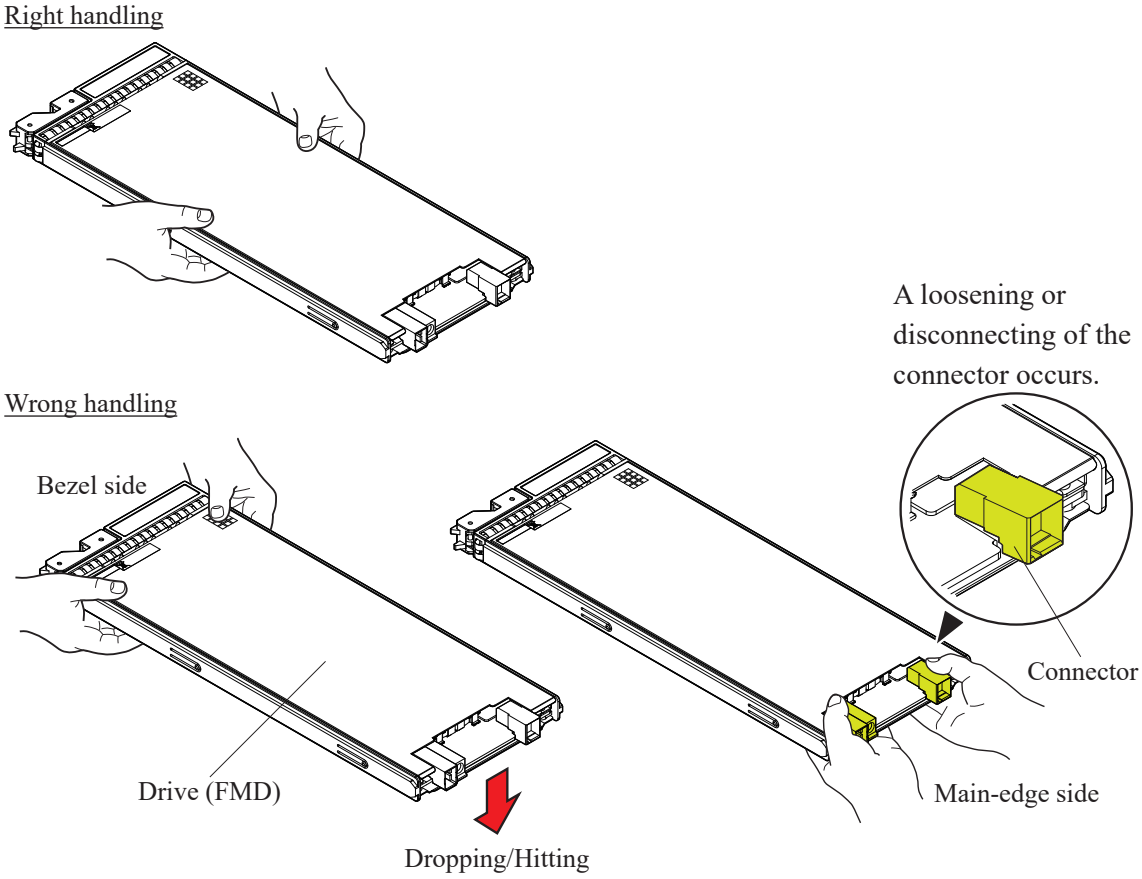
2. When there is a float or a position gap in a connector, mark it with a label, etc.

Figure 1-3 Marking of defective connectors



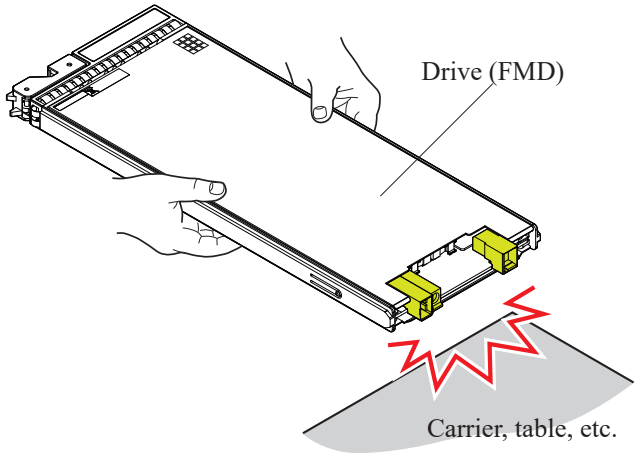
3. When holding the drive (FMD), hold the middle part of the drive (FMD) with both hands.
   Holding the main-edge side or bezel side of the drive (FMD) may cause a breakdown of the drive (FMD) by dropping it under its weight or hitting it against something. Moreover, holding the main-edge side or bezel side of the drive (FMD) may cause a loosening or disconnecting of the connector.

Figure 1-4 Handling of the Drive (FMD) (at maintenance)



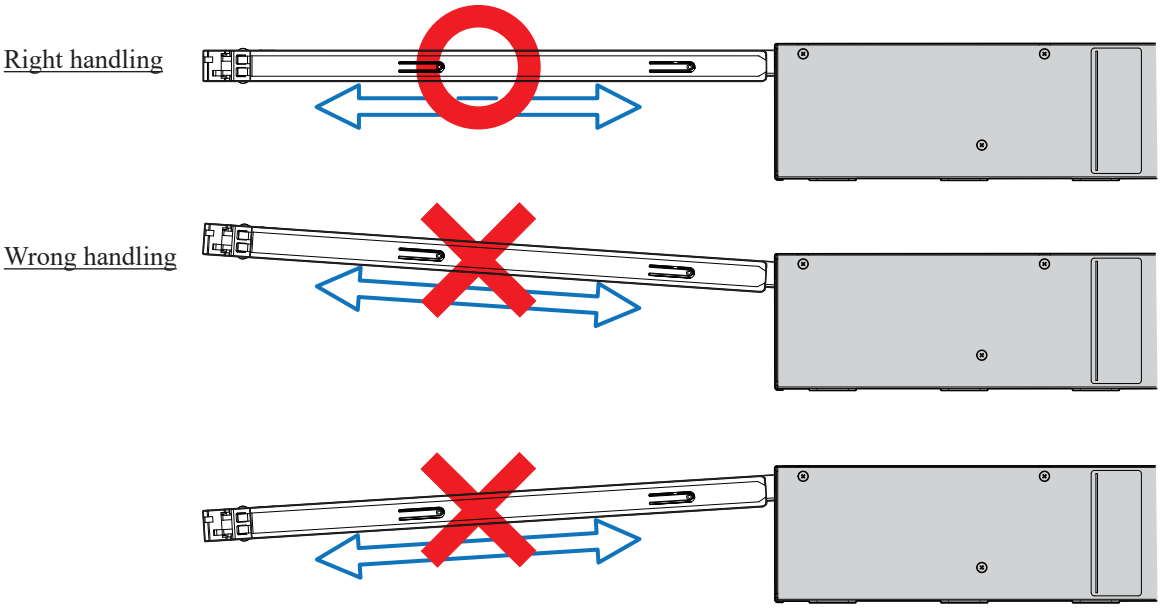
4. When moving the drive (FMD), be careful not to hit it against device or something.
   Hitting the main-edge connector against the device or something may cause damage, distortion or float on the main edge connector.

Figure 1-5 Handling of the Drive (FMD) (at moving)



5. Installing and removing the drive (FMD) at an angle may damage the connector. When installing and removing the drive (FMD), install and remove it straight horizontally.

Figure 1-6 Handling of the Drive (FMD) (at Installation and Removal)



2. Model List

2.1 Model List of DKC910I

Table 2-1 show the model list of DKC910I.

Table 2-1 Model List of DKC910I

Model Number	Model Name	Major Part	Remarks
DKC910I-CBXA	Primary Controller Chassis	• 4U Controller Chassis × 1 • RAID Controller × 2 • BKMF × 4 • Battery × 4 • HIE × 4 • 1U HSNBX Chassis × 2 • ISW × 4 • SVP × 1 • SSVP × 1	
DKC910I-CBX	Primary Controller Chassis supports 2CBX-2CTL model	• 4U Controller Chassis × 1 • RAID Controller × 1 • BKMF × 2 • Battery × 2 • HIE × 2 • 1U HSNBX Chassis × 2 • ISW × 4 • SVP × 1 • SSVP × 1	
DKC-F910I-CBXB	Secondary Controller Chassis	• 4U Controller Chassis × 1 • RAID Controller × 2 • BKMF × 4 • Battery × 4 • HIE × 4	
DKC-F910I-CBX2	Secondary Controller Chassis supports 2CBX-2CTL model	• 4U Controller Chassis × 1 • RAID Controller × 1 • BKMF × 2 • Battery × 2 • HIE × 2	
DKC-F910I-CTL	Controller Board	• RAID Controller × 1 • BKMF × 2 • Battery × 2 • HIE × 2	
DKC-F910I-SBX	SFF Drive Chassis (2U)	• Drive Box (SBX) × 4 • ENC × 8 • DBPS × 8	
DKC-F910I-UBX DKC-F910I-UBXE	LFF Drive Chassis (2U)	• Drive Box (UBX) × 8 • ENC × 16 • DBPS × 16	
DKC-F910I-FBX	Flash Module Drive Chassis (2U)	• Drive Box (FBX) × 4 • ENC × 8 • DBPS × 8	
DKC-F910I-NBX	NVMe SFF Drive Chassis (2U)	• Drive Box (NBX) × 4 • ENC × 8 • DBPS × 8	

(To be continued)

(Continued from the preceding page)

Model Number	Model Name	Major Part	Remarks
DKC-F910I-CBLFB	Controller Chassis Bezel	• Bezel (CBX) × 1	(*1)
DKC-F910I-DBFB	Drive Chassis Bezel	• Bezel (UBX/SBX) × 1	(*1)
DKC-F910I-HSNFB	HSN Chassis Bezel	• Bezel (HSNBX) × 1	(*1)
DKC-F910I-CBLFBA	Controller Chassis Bezel w/Filter	• Bezel (CBX) × 1	(*1)
DKC-F910I-DBFBA	Drive Chassis Bezel w/Filter	• Bezel (UBX/SBX) × 1	(*1)
DKC-F910I-HSNFBA	HSN Chassis Bezel w/Filter	• Bezel (HSNBX) × 1	(*1)
DKC-F910I-CBLFBP	Controller Chassis Bezel	• Bezel (CBX) × 1	(*2)
DKC-F910I-DBFBP	Drive Chassis Bezel	• Bezel (UBX/SBX) × 1	(*2)
DKC-F910I-HSNFBP	HSN Chassis Bezel	• Bezel (HSNBX) × 1	(*2)
DKC-F910I-SVP	Additional Service Processor	• SVP × 1	
DKC-F910I-HUB	Additional HUB	• SSVP × 1	
DKC-F910I-FANM	Fan Module	• BKMF (FANM) × 1	
DKC-F910I-OPPNL	Operation Panel Kit	• Operation panel × 1	
DKC-F910I-BM35	Cache Flash Memory 35	• CFM35 × 1	
DKC-F910I-BM3E	Cache Flash Memory 35 with encryption	• CFM3E × 1	(*3)
DKC-F910I-BM45	Cache Flash Memory 45	• CFM45 × 1	
DKC-F910I-BM4E	Cache Flash Memory 45 with encryption	• CFM4E × 1	(*3)
DW-F850-CM32G	Cache Memory 32 GB	• Cache Memory 32 GB × 1	
DW-F850-CM64G	Cache Memory 64 GB	• Cache Memory 64 GB × 1	(*1)
DW-F850-CM64GL	Cache Memory 64 GB	• Cache Memory 64 GB (LR) × 1	
DKC-F910I-4HF32R	Fibre 4-port 32 Gbps Ready Host Adapter	• CHB 4HF32R × 1	
DKC-F910I-4MS16	Mainframe Fibre 4-port 16G Host Adapter for Shortwave	• CHMSW 4P 16G (PM251) × 1 • SFP SW (16G) × 4	
DKC-F910I-4ML16	Mainframe Fibre 4-port 16G Host Adapter for Longwave	• CHMLW 4P 16G (PM251) × 1 • SFP LW (16G) × 4	
DKC-F910I-2HS10S	iSCSI 2-port 10G Host Adapter	• CHB 2P 10G (SH595) × 1 • SFP SW 10G × 2	
DKC-F910I-BS12G	Disk Adapter	• DKB (SH599) × 1	
DKC-F910I-BS12GE	Encryption Disk Adapter	• EDKB (SH599) × 1	
DKC-F910I-BN8G	NVMe Disk Adapter	• DKBN × 1	
DKC-F810I-1PS16	SFP for 16 Gbps Shortwave	• SFP SW (16G) × 1	
DKC-F810I-1PL16	SFP for 16 Gbps Longwave	• SFP LW (16G) × 1	
DKC-F810I-1PS32	SFP for 32 Gbps Shortwave	• SFP SW (32G) × 1	
DKC-F910I-MCC1	PCIe Cable set for primary module CBXA	• PCIe Copper Cable 0.6 m × 8	(*1)
DKC-F910I-MCC1P			(*2)
DKC-F910I-MCC2	PCIe Cable set for primary module CBXB	• PCIe Copper Cable 0.45 m × 8	(*1)
DKC-F910I-MCC2P			(*2)

(To be continued)

*1: For Hitachi Vantara

*2: For HPE

*3: The encryption feature is planned to be supported for function enhancement. This item can be used as hardware not supporting encryption until the encryption feature is supported.

(Continued from the preceding page)

Model Number	Model Name	Major Part	Remarks
DKC-F910I-MCC60	PCIe Cable set for primary module CBX	• PCIe Copper Cable 0.6 m × 4	(*1)
DKC-F910I-MCC60P			(*2)
DKC-F910I-MCC45	PCIe Cable set for primary module CBX2	• PCIe Copper Cable 0.45 m × 4	(*1)
DKC-F910I-MCC45P			(*2)
DKC-F910I-MPC5	PCIe Cable 5 m	• PCIe Optical Cable 5 m × 8	(*1)
DKC-F910I-MPC5P			(*2)
DKC-F910I-SCCS	SAS Cable set for Disk Adapter	• SAS Copper Cable 1.2 m × 4 • SAS Copper Cable 1.5 m × 4	(*1)
DKC-F910I-SCCSP			(*2)
DKC-F910I-SCQ1	QSFP Metal Cable 1 m	• SAS Cable 1 m QSFP Metal × 8	(*1)
DKC-F910I-SCQ1P			(*2)
DKC-F910I-SCQ1F	QSFP Metal Cable 1.5 m	• SAS Cable 1.5 m QSFP Metal × 8	(*1)
DKC-F910I-SCQ1FP			(*2)
DKC-F910I-SCQ5A	SAS Cable 5 m	• SAS Optical Cable 5 m × 8	(*1)
DKC-F910I-SCQ5AP			(*2)
DKC-F910I-PQSFP	PCIe Optical Module	• PCIe Module (a pair) × 8	(*1)
DKC-F910I-PQSFPP			(*2)
DKC-F910I-SQSFP	SAS Optical Module	• SAS Module (a pair) × 8	(*1)
DKC-F910I-SQSFPP			(*2)
DKC-F910I-MPC10	Optical Cable 10 m	• PCIe/SAS Optical Cable 10 m × 8	(*1)
DKC-F910I-MPC10P			(*2)
DKC-F910I-MPC20	Optical Cable 20 m	• PCIe/SAS Optical Cable 20 m × 8	(*1)
DKC-F910I-MPC20P			(*2)
DKC-F910I-MPC30	Optical Cable 30 m	• PCIe/SAS Optical Cable 30 m × 8	(*1)
DKC-F910I-MPC30P			(*2)
DKC-F910I-MPC1H	Optical Cable 100 m	• PCIe/SAS Optical Cable 100 m × 8	(*1)
DKC-F910I-MPC1HP			(*2)
DKC-F910I-NCCS	NVMe Cable for NVMe Disk Adapter	• NVMe Copper Cable 1.2 m × 4 • NVMe Copper Cable 1.5 m × 4	(*1)
DKC-F910I-NCCSP			(*2)
DKC-F910I-CBLFB	Controller Chassis Bezel	• CBX Front Bezel × 1	(*1)
DKC-F910I-CBLFBP			(*2)
DKC-F910I-CBLFBA	Controller Chassis Bezel	• CBX Front Bezel w/filter × 1	(*1)
DKC-F910I-HSNFB	HSN Chassis Bezel	• HSN Front Bezel × 1	(*1)
DKC-F910I-HSNFBP			(*2)
DKC-F910I-HSNFBA	HSN Chassis Bezel	• HSN Front Bezel w/filter × 1	(*1)
DKC-F910I-DBFB	Drive Chassis Bezel	• Drive Front Bezel × 1	(*1)
DKC-F910I-DBFBP			(*2)
DKC-F910I-DBFBA	Drive Chassis Bezel	• Drive Front Bezel w/filter × 1	(*1)
DKC-F910I-FBFB	Flash Module Bezel	• FBX Front Bezel × 1	(*1)
DKC-F910I-FBFBP			(*2)
DKC-F910I-FBFBA	Flash Module Bezel	• FBX Front Bezel w/filter × 1	(*1)

(To be continued)

*1: For Hitachi Vantara

*2: For HPE

(Continued from the preceding page)

Model Number	Model Name	Major Part	Remarks
DW-F800-RRCB	Rack Rail	• CB Rack Rail Kit × 1	
DKC-F910I-RRCBE	Rack Rail	• CB Rack Rail Kit (For Earthquake) × 1	
DKC-F910I-RRHSN	HSN Chassis Rail	• HSN Rack Rail Kit × 2	
DKC-F910I-RRHSNE	HSN Chassis Rail	• HSN Rack Rail Kit (For Earthquake) × 2	
DW-F800-RRDB	Rack Rail	• DBS/DBL Rack Rail Kit × 1	
DKC-F810I-FMDRAL	Drive Chassis Rail for FBX	• DBF Rack Rail Kit × 1	
DKC-F910I-3RBKT	Chassis fixation bracket for CBXA/CBX	• Stopper for 4U chassis × 1 • Stopper for 1U chassis × 2	
DKC-F910I-3RBKT2	Chassis fixation bracket for CBXB/CBX2	• Stopper for 4U chassis × 1	
DKC-F910I-SCFC	Safety Cover for empty CTL slot	• Safety Cover × 1	
DKC-F910I-RRNB	NVMe Chassis Rail	• NVMe Rack Rail Kit × 1	
DKC-F910I-J2HFU	Power Cord Kit (USA)	• Power Cord Kit 1.5 m (USA) × 1	
DKC-F910I-J2HFE	Power Cord Kit (EU)	• Power Cord Kit 1.5 m (EU) × 1	
DKC-F910I-J2HFC	Power Cord Kit (China)	• Power Cord Kit 1.5 m (China) × 1	
DKC-F910I-J2H9HU	Power Cord Kit (USA)	• Power Cord Kit 0.9 m (USA) × 1	
DKC-F910I-J2H9HE	Power Cord Kit (EU)	• Power Cord Kit 0.9 m (EU) × 1	
DKC-F910I-J2H9HC	Power Cord Kit (China)	• Power Cord Kit 0.9 m (China) × 1	
DKC-F910I-LC	RJ45 bundled LAN Cable Kit	• RJ45 bundled LAN Cable Kit × 1	(*1)
DKC-F910I-LCP			(*2)
DKC-F910I-LC06	RJ45 Cable 0.6 m	• RJ45 Cable 0.6 m × 1	(*1)
DKC-F910I-LC06P			(*2)
DKC-F910I-LC5	RJ45 Cable 5 m	• RJ45 Cable 5 m × 1	(*1)
DKC-F910I-LC5P			(*2)
DKC-F910I-LC10	RJ45 Cable 10 m	• RJ45 Cable 10 m × 1	(*1)
DKC-F910I-LC10P			(*2)
DKC-F910I-LC20	RJ45 Cable 20 m	• RJ45 Cable 20 m × 1	(*1)
DKC-F910I-LC20P			(*2)
DKC-F910I-LC30	RJ45 Cable 30 m	• RJ45 Cable 30 m × 1	(*1)
DKC-F910I-LC30P			(*2)
DKC-F910I-LC1J	RJ45 Cable 100 m	• RJ45 Cable 100 m × 1	(*1)
DKC-F910I-LC1JP			(*2)
DKC-F810I-2R4JGM	SFF 2.4 TB Disk Drive	• HDU800-2R4JGMSS × 1	(*4)
DKC-F810I-10RH9M	LFF 10 TB Disk Drive	• HDU800-10RH9MSS × 1	(*4)
DKC-F810I-14RH9M	LFF 14 TB Disk Drive	• HDU800-14RH9MSS × 1	(*4)
DKC-F810I-960MGM	SFF 960 GB SSD Drive	• HDU800-960MGMSS × 1	(*4)
DKC-F810I-1T9MGM	SFF 1.9 TB SSD Drive	• HDU800-1T9MGMSS × 1	(*4)
DKC-F810I-3R8MGM	SFF 3.8 TB SSD Drive	• HDU800-3R8MGMSS × 1	(*4)
DKC-F810I-7R6MGM	SFF 7.6 TB SSD Drive	• HDU800-7R6MGMSS × 1	(*4)

(To be continued)

*1: For Hitachi Vantara

*2: For HPE

*4: The drive capacity values are calculated as 1 G byte =1,000,000,000 bytes. This definition is different from that calculated as 1 k byte =1,024 bytes, which are actually displayed on PCs that you are using. The RAID group capacity values displayed in the Web Console are calculated as 1 k byte = 1,024 bytes.

(Continued from the preceding page)

Model Number	Model Name	Major Part	Remarks
DKC-F810I-15RMGM	SFF 15 TB SSD Drive	• HDU800-15RMGMSS × 1	(*4)
DKC-F810I-30RMGM	SFF 30 TB SSD Drive	• HDU800-30RMGMSS × 1	(*4)
DKC-F810I-7R0FP	7 TB Flash Module Drive	• HDU800-7R0FPSS × 1	(*4)
DKC-F810I-14RFP	14 TB Flash Module Drive	• HDU800-14RFPSS × 1	(*4)
DKC-F910I-1R9RVM	SFF 1.9 TB NVMe Drive	• HDU900-1R9RVMNC × 1	(*4)
DKC-F910I-3R8RVM	SFF 3.8 TB NVMe Drive	• HDU900-3R8RVMNC × 1	(*4)
DKC-F910I-7R6RVM	SFF 7.6 TB NVMe Drive	• HDU900-7R6RVMNC × 1	(*4)
DKC-F910I-15RRVM	SFF 15 TB NVMe Drive	• HDU900-15RRVM × 1	(*4)

*4: The drive capacity values are calculated as 1 G byte =1,000,000,000 bytes. This definition is different from that calculated as 1 k byte =1,024 bytes, which are actually displayed on PCs that you are using. The RAID group capacity values displayed in the Web Console are calculated as 1 k byte = 1,024 bytes.

2.2 Disk Drive Model

Table 2-2 Web Console Window Display of Disk Type Name

Disk Drive Model	Web Console Window	Drive Form Factor
DKS5K-J2R4SS	DKS5K-J2R4SS	2.5 inch SAS HDD
DKR2H-H10RSS	DKR2H-H10RSS	3.5 inch SAS HDD
DKS2K-H10RSS	DKS2K-H10RSS	3.5 inch SAS HDD
DKS2K-H14RSS	DKS2K-H14RSS	3.5 inch SAS HDD
SLB5F-M960SD	SLB5F-M960SS	2.5 inch SSD
SLB5G-M960SS	SLB5G-M960SS	2.5 inch SSD
SLB5I-M1T9SS	SLB5I-M1T9SS	2.5 inch SSD
SLB5F-M3R8SS	SLB5F-M3R8SS	2.5 inch SSD
SLB5G-M3R8SS	SLB5G-M3R8SS	2.5 inch SSD
SLR5E-M3R8SS	SLR5E-M3R8SS	2.5 inch SSD
SLR5F-M3R8SS	SLR5F-M3R8SS	2.5 inch SSD
SLM5A-M3R8SS	SLM5A-M3R8SS	2.5 inch SSD
SLB5G-M7R6SS	SLB5G-M7R6SS	2.5 inch SSD
SLR5E-M7R6SS	SLR5E-M7R6SS	2.5 inch SSD
SLR5F-M7R6SS	SLR5F-M7R6SS	2.5 inch SSD
SLM5A-M7R6SS	SLM5A-M7R6SS	2.5 inch SSD
SLB5H-M15RSS	SLB5H-M15RSS	2.5 inch SSD
SLM5A-M30RSS	SLM5A-M30RSS	2.5 inch SSD
NFHAF-Q6R4SS	NFHAF-Q6R4SS	Flash Module Drive
NFHAH-Q6R4SS	NFHAH-Q6R4SS	Flash Module Drive
NFHAJ-Q6R4SS	NFHAJ-Q6R4SS	Flash Module Drive
NFHAK-Q6R4SS	NFHAK-Q6R4SS	Flash Module Drive
NFHAL-Q6R4SS	NFHAL-Q6R4SS	Flash Module Drive
NFHAM-Q6R4SS	NFHAM-Q6R4SS	Flash Module Drive
NFHAF-Q13RSS	NFHAF-Q13RSS	Flash Module Drive
NFHAH-Q13RSS	NFHAH-Q13RSS	Flash Module Drive
NFHAJ-Q13RSS	NFHAJ-Q13RSS	Flash Module Drive
NFHAK-Q13RSS	NFHAK-Q13RSS	Flash Module Drive
NFHAM-Q13RSS	NFHAM-Q13RSS	Flash Module Drive
SNR5A-R1R9NC	SNR5A-R1R9NC	2.5 inch SSD
SNB5A-R1R9NC	SNB5A-R1R9NC	2.5 inch SSD
SNR5A-R3R8NC	SNR5A-R3R8NC	2.5 inch SSD
SNB5A-R3R8NC	SNB5A-R3R8NC	2.5 inch SSD
SNR5A-R7R6NC	SNR5A-R7R6NC	2.5 inch SSD
SNB5A-R7R6NC	SNB5A-R7R6NC	2.5 inch SSD
SNB5A-R15RNC	SNB5A-R15RNC	2.5 inch SSD
SNN5A-R15RNC	SNN5A-R15RNC	2.5 inch SSD

The following table shows recommended setting models on the Maintenance PC when different types of Disk Drives (same number of rotations and same capacity) to be added are mixed in the ECC.

Mixed Disk Type Name	Recommended Setting Model
DKS5x-J2R4SS	DKS5K-J2R4SS
DKR2x-H10RSS	DKR2H-H10RSS
DKS2x-H10RSS	
DKS2x-H14RSS	DKS2K-H14RSS
SLB5x-M960Sy	SLB5F-M960SS
SLB5x-M1T9SS	SLB5I-M1T9SS
SLB5x-M3R8SS	SLB5F-M3R8SS
SLR5x-M3R8SS	
SLM5x-M3R8SS	
SLB5x-M7R6SS	SLB5G-M7R6SS
SLR5x-M7R6SS	
SLM5x-M7R6SS	
SLB5x-M15RSS	SLB5H-M15RSS
SLM5x-M30RSS	SLM5A-M30RSS
NFHAx-Q6R4SS	NFHAF-Q6R4SS
NFHAx-Q13RSS	NFHAF-Q13RSS
SNR5x-R1R9NC	SNR5A-R1R9NC
SNB5x-R1R9NC	
SNR5x-R3R8NC	SNR5A-R3R8NC
SNB5x-R3R8NC	
SNR5x-R7R6NC	SNR5A-R7R6NC
SNB5x-R7R6NC	
SNB5x-R15RNC	SNB5A-R15RNC
SNN5x-R15RNC	

x : A, B, C, ...
y : S, D

The following table shows Drives compatible with the Drives to be replaced by Drive replacement.

Drives before replacement	Drives after replacement
DKS5x-J2R4SS	DKS5x-J2R4SS
DKR2x-H10RSS	DKR2x-H10RSS
	DKS2x-H10RSS
DKS2x-H10RSS	DKR2x-H10RSS
	DKS2x-H10RSS
DKS2x-H14RSS	DKS2x-H14RSS
SLB5x-M960Sy	SLB5x-M960Sy
SLB5x-M1T9SS	SLB5x-M1T9SS
SLB5x-M3R8SS	SLB5x-M3R8SS
	SLR5x-M3R8SS
	SLM5x-M3R8SS
SLR5x-M3R8SS	SLB5x-M3R8SS
	SLR5x-M3R8SS
	SLM5x-M3R8SS
SLM5x-M3R8SS	SLB5x-M3R8SS
	SLR5x-M3R8SS
	SLM5x-M3R8SS
SLB5x-M7R6SS	SLB5x-M7R6SS
	SLR5x-M7R6SS
	SLM5x-M7R6SS
SLR5x-M7R6SS	SLB5x-M7R6SS
	SLR5x-M7R6SS
	SLM5x-M7R6SS
SLM5x-M7R6SS	SLB5x-M7R6SS
	SLR5x-M7R6SS
	SLM5x-M7R6SS
SLB5x-M15RSS	SLB5x-M15RSS
SLM5x-M30RSS	SLM5x-M30RSS
NFHAx-Q6R4SS	NFHAx-Q6R4SS
NFHAx-Q13RSS	NFHAx-Q13RSS

(To be continued)

x : A, B, C, ...
y : S, D

(Continued from the preceding page)

Drives before replacement	Drives after replacement
SNR5x-R1R9NC	SNR5x-R1R9NC
	SNB5x-R1R9NC
SNB5x-R1R9NC	SNR5x-R1R9NC
	SNB5x-R1R9NC
SNR5x-R3R8NC	SNR5x-R3R8NC
	SNB5x-R3R8NC
SNB5x-R3R8NC	SNR5x-R3R8NC
	SNB5x-R3R8NC
SNR5x-R7R6NC	SNR5x-R7R6NC
	SNB5x-R7R6NC
SNB5x-R7R6NC	SNR5x-R7R6NC
	SNB5x-R7R6NC
SNB5x-R15RNC	SNB5x-R15RNC
	SNN5x-R15RNC
SNN5x-R15RNC	SNB5x-R15RNC
	SNN5x-R15RNC

x : A, B, C, ...
y : S, D

2.3 Web Console Window Display and Conversion Table of Option Type Names

Table 2-3 Window Display of Channel Board (CHB)

Model Number	Web Console Window
DKC-F910I-4HF32R	32 G Ready 4Port FC
DKC-F910I-2HS10S	10 G 2Port iSCSI (Optic)
DKC-F910I-4MS16	16 G 4Port Mainframe Fibre
DKC-F910I-4ML16	16 G 4Port Mainframe Fibre

Table 2-4 Window Display of Disk Board (DKB)

Model Number	Web Console Window
DKC-F910I-BS12G	Disk Board
DKC-F910I-BS12GE	Encryption
DKC-F910I-BN8G	Disk Board for NVMe

Table 2-5 Window Display of Cache Memory

Model Number	Web Console Window
DW-F850-CM32G	32 GB
DW-F850-CM64GL	64 GB (LR)

3. Installation Configuration of Storage System

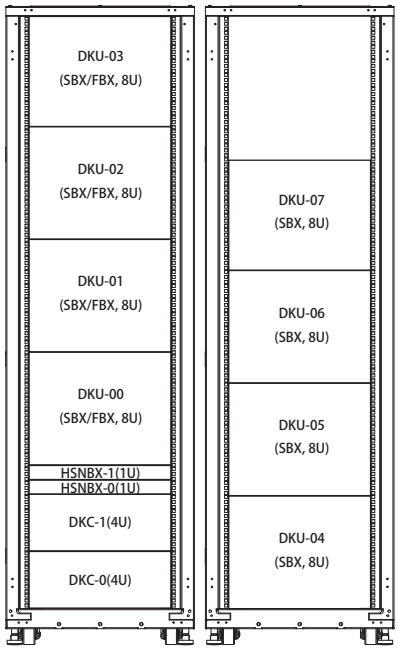
The DKC910I storage system is configured per CBX Pair, and the Controller Chassis (DKC), Drive Chassis (DKU), and HSN Boxes (HSNBX) are installed in rack frames.
The following chassis layouts are recommended to connect a large number of cables and allow easy maintenance, while free layouts are allowed. In this manual, procedures are described based on the following basic layouts unless otherwise specified.

- In the 1 CBX Pair configuration, DKC-0, DKC-1, HSNBX0, and HSNBX1 are adjacently installed in a rack in order from bottom to top. The installation space for them in the rack is referred to as Basic 10U. DKU is installed above HSNBX1 or in an adjacent rack.
- In the 2 CBX Pairs configuration, DKC-2 and DKC-3 are installed in a rack adjacent to the rack for the first CBX Pair in order from bottom to top or installed directly above HSNBX1 in the same order, and DKU is installed directly above DKC-3 or in an adjacent rack. In the 3 CBX Pairs configuration, DKC-4 and DKC-5 are installed in a rack adjacent to the rack for the second CBX Pair in order from bottom to top or installed directly above DKC-3 in the same order, and DKU is installed directly above DKC-5 or in an adjacent rack.
- There are four types of DKUs: SBX (DBS2 × 4), UBX (DBL × 8), FBX (DBF3 × 4) and NBX (DBN × 4). Drive Boxes (DBS2s/DBLs/DBF3s/DBNs) composing one DKU (SBX/UBX/FBX/NBX) must be adjacently installed in one rack.
- Only SBX, FBX, or NBX can be installed in the DKU-x0 location. UBX is installed in the next location of the location where SBX or FBX is installed. (UBX cannot be directly connected to DKC and needs to be connected to DKC via SBX or FBX.)
- Up to four UBXs can be installed per CBX Pair. Up to four FBXs can be installed per CBX Pair. Up to eight SBXs can be installed per CBX Pair. Up to eight DKUs (total number of SBX, UBX, and FBX) can be installed per CBX pair. NBX, which has a different interface from SBX, UBX and FBX, cannot be connected to a CBX pair that connects to SBX, UBX, or FBX. Up to one NBX can be installed per CBX pair.

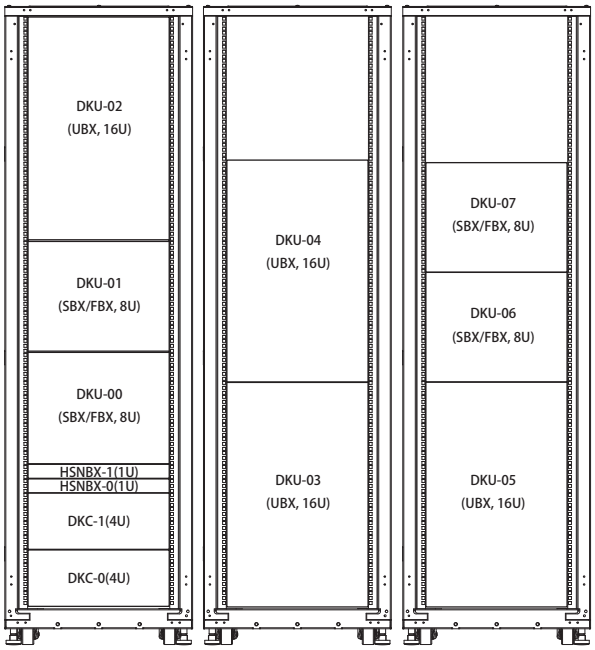
Figure 3-1 Storage System Configuration Example (1 CBX Pair Configuration)

1 CBX Pair Configuration

When DKUs are SBX/FBX only



When DKUs are SBX/FBX and UBX



When DKU is NBX only

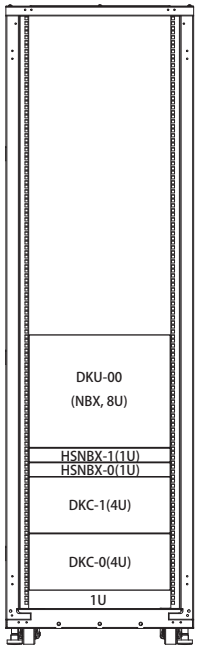
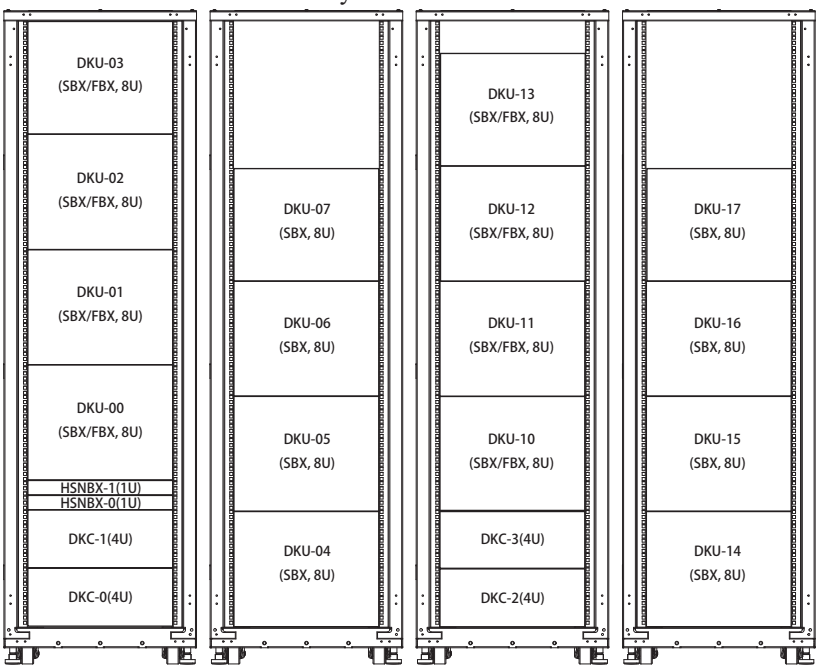


Figure 3-2 Storage System Configuration Example (2 CBX Pairs Configuration)

2 CBX Pairs Configuration
When DKUs are SBX/FBX only



When DKUs are SBX/FBX and UBX

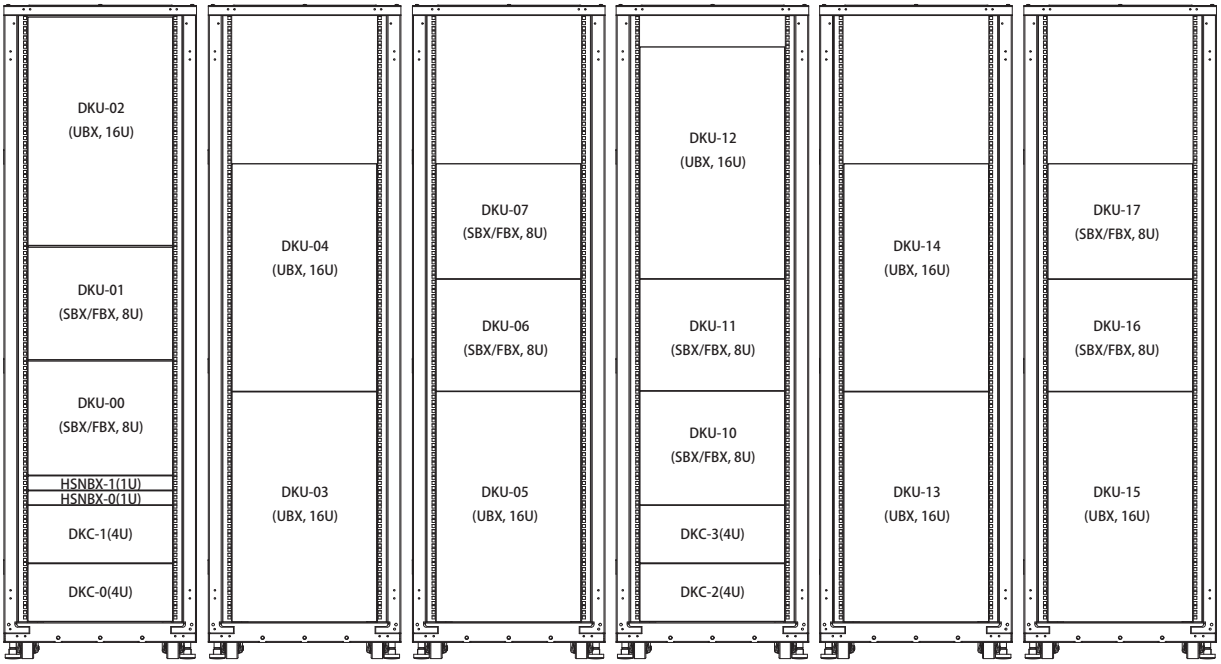
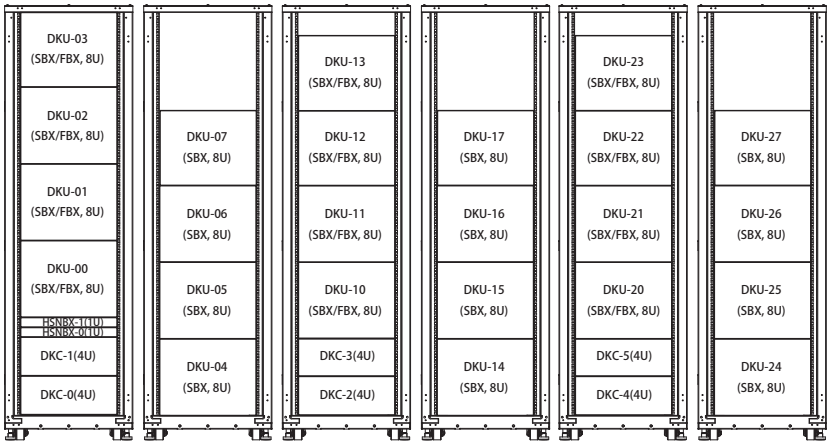


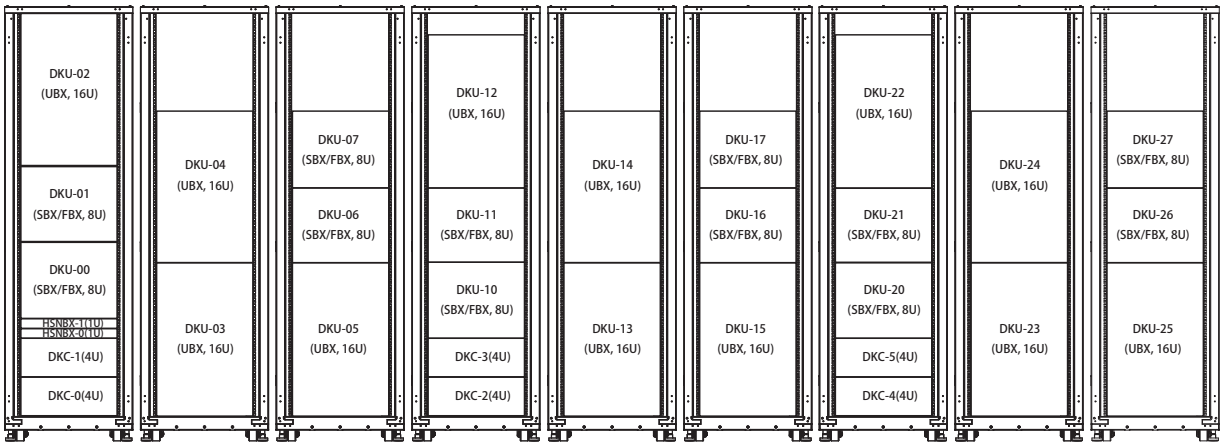
Figure 3-3 Storage System Configuration Example (3 CBX Pairs Configuration)

3 CBX Pairs Configuration

When DKUs are SBX/FBX only



When DKUs are SBX/FBX and UBX



3.1 Channel Board Option Installation Rule

Recommend installation locations and installation orders of Channel Board (CHB) pairs are shown in the table below. There is no order of priority among CBX Pair.
However, Channel Board pair installations other than shown in the table are also allowed.

Table 3-1 Channel Board Installation Rule (For VSP 5500 and VSP 5500H)

Installation Location					
Installation Order	DKC-0/1 (CBX Pair 0)	Installation Order	DKC-2/3 (CBX Pair 1)	Installation Order	DKC-4/5 (CBX Pair 2)
1	CHB-01A/11A	1	CHB-21A/31A	1	CHB-41A/51A
2	CHB-02A/12A	2	CHB-22A/32A	2	CHB-42A/52A
3	CHB-01B/11B	3	CHB-21B/31B	3	CHB-41B/51B
4	CHB-02B/12B	4	CHB-22B/32B	4	CHB-42B/52B
5	CHB-01E/11E	5	CHB-21E/31E	5	CHB-41E/51E
6	CHB-02E/12E	6	CHB-22E/32E	6	CHB-42E/52E
7	CHB-01F/11F	7	CHB-21F/31F	7	CHB-41F/51F
8	CHB-02F/12F	8	CHB-22F/32F	8	CHB-42F/52F

Table 3-2 Channel Board Installation Rule (For VSP 5100 and VSP 5100H)

Installation Location	
Installation Order	DKC-0/1 (CBX Pair 0)
1	CHB-01A/12A
2	CHB-01B/12B
3	CHB-01E/12E
4	CHB-01F/12F

3.2 Disk Board Option Installation Rule

Disk Board options are installed in Disk Board installation locations on each DKC.

Table 3-3 Disk Board Installation Rule (For VSP 5500 and VSP 5500H)

Installation Location					
Installation Order	DKC-0/1 (CBX Pair 0)	Installation Order	DKC-2/3 (CBX Pair 1)	Installation Order	DKC-4/5 (CBX Pair 2)
1	DKB-01D/11D	1	DKB-21D/31D	1	DKB-41D/51D
	DKB-01H/11H		DKB-21H/31H		DKB-41H/51H
	DKB-02D/12D		DKB-22D/32D		DKB-42D/52D
	DKB-02H/12H		DKB-22H/32H		DKB-42H/52H

Table 3-4 Disk Board Installation Rule (For VSP 5100 and VSP 5100H)

Installation Location	
Installation Order	DKC-0/1 (CBX Pair 0)
1	DKB-01D
	DKB-01H
	DKB-12D
	DKB-12H

3.3 HIE Installation Rule

HIE are already installed in HIE installation locations (C/G) on each DKC.

Table 3-5 HIE Installation Rule (For VSP 5500 and VSP 5500H)

Installation Location					
Installation Order	DKC-0/1 (CBX Pair 0)	Installation Order	DKC-2/3 (CBX Pair 1)	Installation Order	DKC-4/5 (CBX Pair 2)
1	HIE-01C/11C	1	HIE-21C/31C	1	HIE-41C/51C
	HIE-01G/11G		HIE-21G/31G		HIE-41G/51G
	HIE-02C/12C		HIE-22C/32C		HIE-42C/52C
	HIE-02G/12G		HIE-22G/32G		HIE-42G/52G

Table 3-6 HIE Installation Rule (For VSP 5100 and VSP 5100H)

Installation Location	
Installation Order	DKC-0/1 (CBX Pair 0)
1	HIE-01C
	HIE-01G
	HIE-12C
	HIE-12G

3.4 Cache Memory Installation Rule

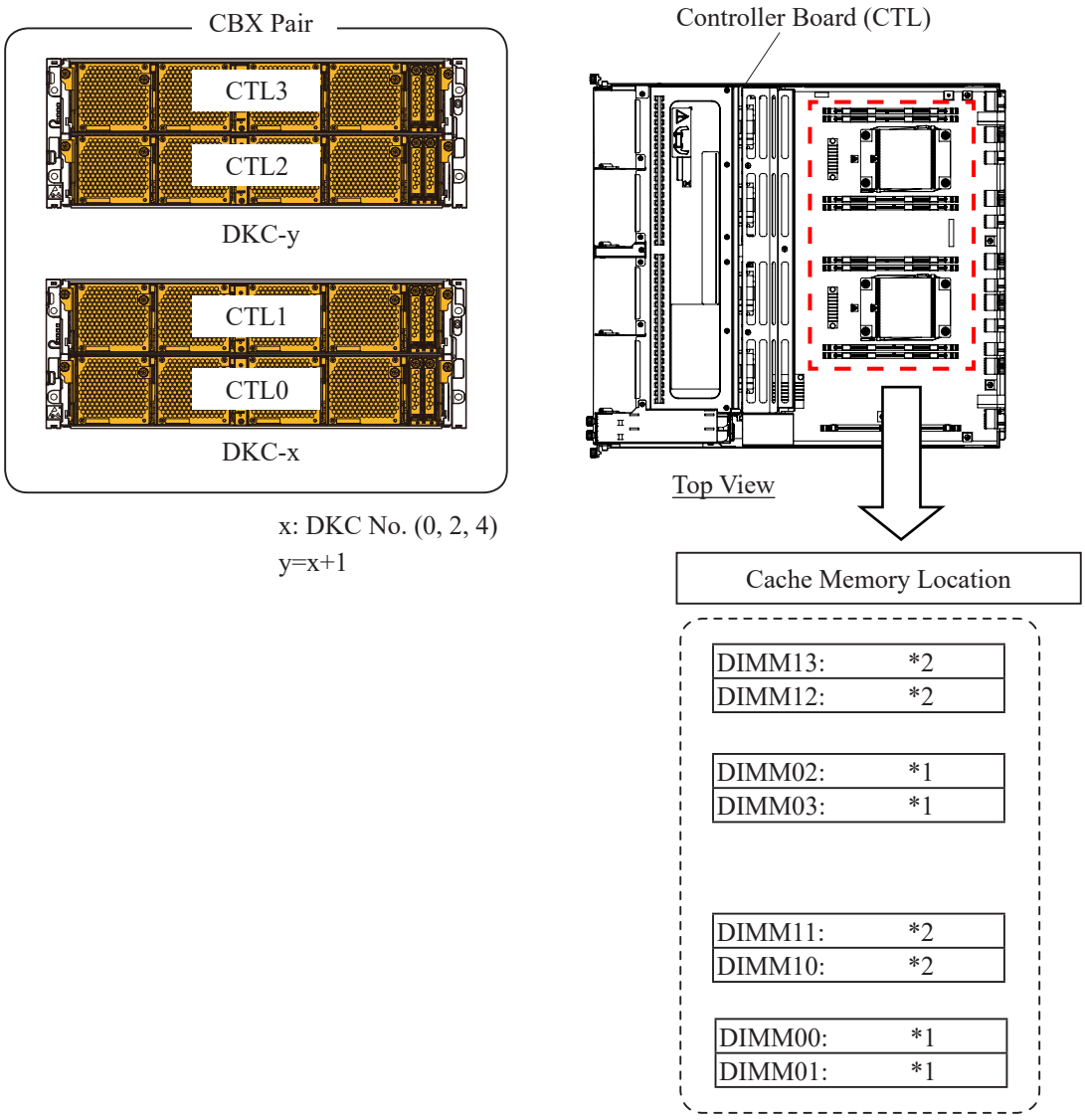
Cache Memory (DIMM) is installed in the Controller Boards of DKC.
The data of Shared Memory, to which the Storage System configuration information is written, is saved in the Cache Memory on the Controller Board.
Shared Memory capacity plus Cache Memory capacity equals Total Cache Memory Capacity necessary for the Storage System. The Shared Memory capacity must be allocated to CMG0 (Cache Memory Group 0).
DIMMs must be installed according to the following rules:

For VSP 5500 and VSP 5500H

- DIMMs must be always installed in CMG0 on each CTL.
- DIMMs with different capacities cannot be mixed in the same CMG. Also, any DIMM slots of the same CMG cannot be empty.
- DIMMs with different capacities cannot be mixed in the same CBX Pair.
- DIMMs with the same capacity must be installed in the same installation pattern in both CTL0 and CTL2 in the same CBX Pair.
- DIMMs with the same capacity must be installed in the same installation pattern in both CTL1 and CTL3 in the same CBX Pair.

For the Cache Memory installation pattern, see Table 3-7.

Figure 3-4 Cache Memory Location (DKC)



*1 : Belong to CMG0 (Cache Memory Group 0)
*2 : Belong to CMG1 (Cache Memory Group 1).
DIMMs must be always installed in CMG0 slots.
Additional DIMMs are installed in CMG1 slots.
DIMMs are installed in sets of four.

Table 3-7 Cache Memory Installation Pattern (per CBX Pair)
(For VSP 5500 and VSP 5500H)

Memory Capacity/ CBX Pair	DKC-x (x: 0, 2, 4)				DKC-y (y=x+1)			
	CTLx1		CTLx2		CTLy1		CTLy2	
	CMG0	CMG1	CMG0	CMG1	CMG0	CMG1	CMG0	CMG1
512 GB	32 GB × 4	Not installed	32 GB × 4	Not installed	32 GB × 4	Not installed	32 GB × 4	Not installed
768 GB				32 GB × 4				32 GB × 4
		32 GB × 4		Not installed		32 GB × 4		Not installed
1024 GB				32 GB × 4				32 GB × 4
	64 GB × 4	Not installed	64GB × 4	Not installed	64 GB × 4	Not installed	64 GB × 4	Not installed
1536 GB				64 GB × 4				64 GB × 4
		64 GB × 4		Not installed		64 GB × 4		Not installed
2048 GB				64 GB × 4				64 GB × 4

Table 3-8 Cache Memory Capacity and Cache Flash Memory Installation Patterns
(For VSP 5500 and VSP 5500H)

DIMM capacity	Memory Capacity/ CBX Pair	DKC-x (x: 0, 2, 4)		DKC-y (y=x+1)	
		CTLx1	CTLx2	CTLy1	CTLy2
32 GB DIMM	512 GB	BM35/BM3E × 1(*1)	BM35/BM3E × 1(*1)	BM35/BM3E × 1(*1)	BM35/BM3E × 1(*1)
	768 GB	BM35/BM3E × 1(*1)	BM35/BM3E × 2(*1)	BM35/BM3E × 1(*1)	BM35/BM3E × 2(*1)
		BM35/BM3E × 2(*1)	BM35/BM3E × 1(*1)	BM35/BM3E × 2(*1)	BM35/BM3E × 1(*1)
	1024 GB	BM35/BM3E × 2(*1)	BM35/BM3E × 2(*1)	BM35/BM3E × 2(*1)	BM35/BM3E × 2(*1)
64 GB DIMM	1024 GB	BM45/BM4E × 1(*2)	BM45/BM4E × 1(*2)	BM45/BM4E × 1(*2)	BM45/BM4E × 1(*2)
	1536 GB	BM45/BM4E × 1(*2)	BM45/BM4E × 2(*2)	BM45/BM4E × 1(*2)	BM45/BM4E × 2(*2)
		BM45/BM4E × 2(*2)	BM45/BM4E × 1(*2)	BM45/BM4E × 2(*2)	BM45/BM4E × 1(*2)
	2048 GB	BM45/BM4E × 2(*2)	BM45/BM4E × 2(*2)	BM45/BM4E × 2(*2)	BM45/BM4E × 2(*2)

*1: BM35 and BM3E cannot be mixed in the same storage system.
*2: BM45 and BM4E cannot be mixed in the same storage system.

For VSP 5100 and VSP 5100H

- DIMMs must be always installed in CMG0 on each CTL.
- DIMMs with different capacities cannot be mixed in the same CMG. Also, any DIMM slots of the same CMG cannot be empty.
- DIMMs with different capacities cannot be mixed in the same CTL.
- DIMMs with the same capacity must be installed in the same installation pattern in both CTL01 and CTL12.

For the Cache Memory location, see Figure 3-4.

Table 3-9 Cache Memory Installation Pattern (For VSP 5100 and VSP 5100H)

Memory Capacity/ CBX Pair	DKC-0		DKC-1	
	CTL01		CTL12	
	CMG0	CMG1	CMG0	CMG1
256 GB	32 GB × 4	Not installed	32 GB × 4	Not installed
512 GB		32 GB × 4		32 GB × 4
512 GB	64 GB × 4	Not installed	64 GB × 4	Not installed
1024 GB		64 GB × 4		64 GB × 4

Table 3-10 Cache Memory Capacity and Cache Flash Memory Installation Patterns (For VSP 5100 and VSP 5100H)

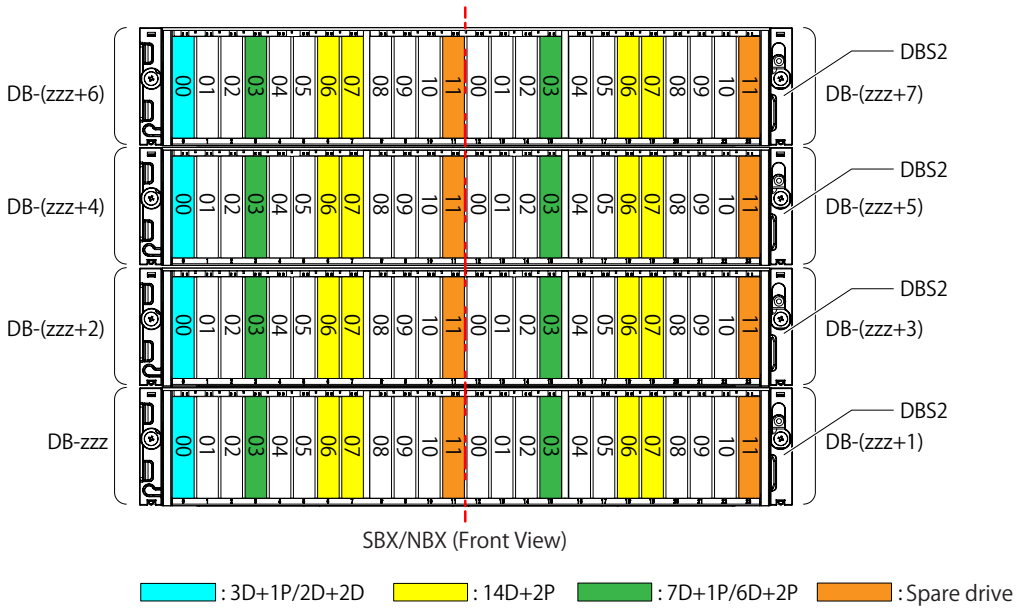
DIMM capacity	Memory Capacity/ CBX Pair	DKC-0	DKC-1
		CTL01	CTL12
32 GB DIMM	256 GB	BM35/BM3E × 1(*1)	BM35/BM3E × 1(*1)
	512 GB	BM35/BM3E × 2(*1)	BM35/BM3E × 2(*1)
64 GB DIMM	512 GB	BM45/BM4E × 1(*2)	BM45/BM4E × 1(*2)
	1024 GB	BM45/BM4E × 2(*2)	BM45/BM4E × 2(*2)

*1: BM35 and BM3E cannot be mixed in the same storage system.
*2: BM45 and BM4E cannot be mixed in the same storage system.

3.5 Relation between Drive Installation Location and RAID Group Configuration/Spare Drive

1. Drive Installation in SBX/NBX
   SBX consists of four DBS2s. NBX consists of four DBNs. A DBS2/DBN is divided into two logical Drive Boxes (DBs). Each of the left-half DB and the right-half DB has 12 drive slots. Even DB numbers are assigned to the left-side DBs and odd DB numbers are assigned to the right-side DBs.

Figure 3-5 Relation between Drive Installation Location and RAID Group Configuration/ Spare Drive on SBX/NBX



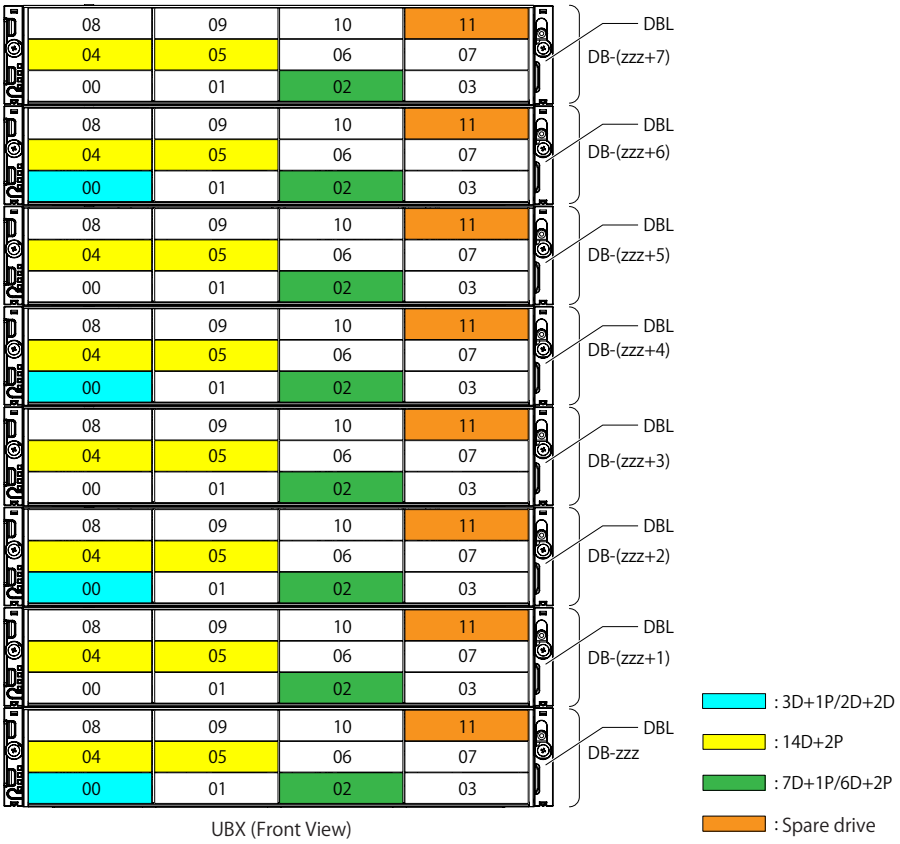
DB-zzz,zzz+n
└> DB number (000, 001, 002, ..., 191)
For NBX, the DB number is in the ranges from 000 to 007, from 064 to 071, and from 128 to 135.

RAID Group Type or Spare Drive	Drive Installation Location (*1)
3D+1P/2D+2D	Four drives in the same slot number on the even numbered DBs can comprise a RAID group of 3D+1P or 2D+2D, and so do four drives in the same slot number on the odd numbered DBs.
7D+1P/6D+2P	Eight drives in the same slot number on each DB can comprise a RAID group of 7D+1P or 6D+2P.
14D+2P	16 drives in the same even numbered slot and the next slot (e.g. 06 and 07) on each DB can comprise a RAID group of 14D+2P.
Spare Drive	Drives in the slot number 11 can be configured as spare drives. NOTE: • Drives in the slot number 11 can also be configured as data drives (RAID groups). • When you configure drives in the slot number 11 as spare drives, you do not need to always fill all the slots with drives. (Some slots can be empty.)

*1: The “slot number” described in the table is the slot number displayed in the DKU-mm: Drive Box window of Maintenance Utility.

2. Drive Installation in UBX
UBX consists of eight DBLs. A DB number is assigned to each DBL.

Figure 3-6 Relation between Drive Installation Location and RAID Group Configuration/ Spare Drive on UBX



DB-zzz,zzz+n
└→DB number (008, 009, 010, ..., 191)

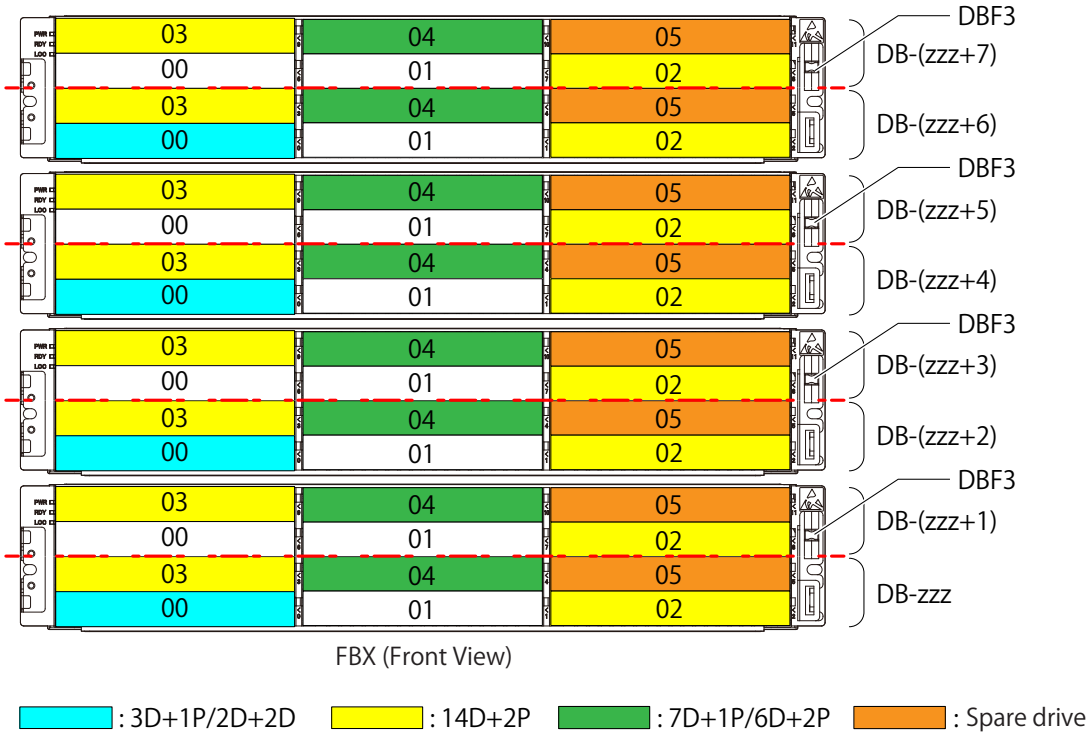
RAID Group Type or Spare Drive	Drive Installation Location (*1)
3D+1P/2D+2D	Four drives in the same slot number on the even numbered DBs can comprise a RAID group of 3D+1P or 2D+2D, and so do four drives in the same slot number on the odd numbered DBs.
7D+1P/6D+2P	Eight drives in the same slot number on each DB can comprise a RAID group of 7D+1P or 6D+2P.
14D+2P	16 drives in the same even numbered slot and the next slot (e.g. 04 and 05) on each DB can comprise a RAID group of 14D+2P.
Spare Drive	Drives in the slot number 11 can be configured as spare drives. NOTE: • Drives in the slot number 11 can also be configured as data drives (RAID groups). • When you configure drives in the slot number 11 as spare drives, you do not need to always fill all the slots with drives. (Some slots can be empty.)

*1: The “slot number” described in the table is the slot number displayed in the DKU-mm: Drive Box window of Maintenance Utility.

3. Drive Installation in FBX

FBX consists of four DBF3s. A DBF3 is divided into two logical Drive Boxes (DBs). Each of the upper-half DB and the lower-half DB has 6 drive slots. Even DB numbers are assigned to the lower-side DBs and odd DB numbers are assigned to the upper-side DBs.

Figure 3-7 Relation between Drive Installation Location and RAID Group Configuration/ Spare Drive on FBX



DB-zzz,zzz+n
└→DB number (000, 001, 002, ..., 191)

RAID Group Type or Spare Drive	Drive Installation Location (*1)
3D+1P/2D+2D	Four drives in the same slot number on the even numbered DBs can comprise a RAID group of 3D+1P or 2D+2D, and so do four drives in the same slot number on the odd numbered DBs.
7D+1P/6D+2P	Eight drives in the same slot number on each DB can comprise a RAID group of 7D+1P or 6D+2P.
14D+2P	16 drives in the same even numbered slot and the next slot (e.g. 02 and 03) on each DB can comprise a RAID group of 14D+2P.
Spare Drive	Drives in the slot number 05 can be configured as spare drives. NOTE: • Drives in the slot number 05 can also be configured as data drives (RAID groups). • When you configure drives in the slot number 05 as spare drives, you do not need to always fill all the slots with drives. (Some slots can be empty.)

*1: The “slot number” described in the table is the slot number displayed in the DKU-mm: Drive Box window of Maintenance Utility.

4. Connection between Disk Boards and Drive Boxes
   The connection between Disk Boards on DKC and Drive Boxes is shown below.

Figure 3-8 Connection Diagram of Disk Boards and Drive Boxes (SBX/FBX)

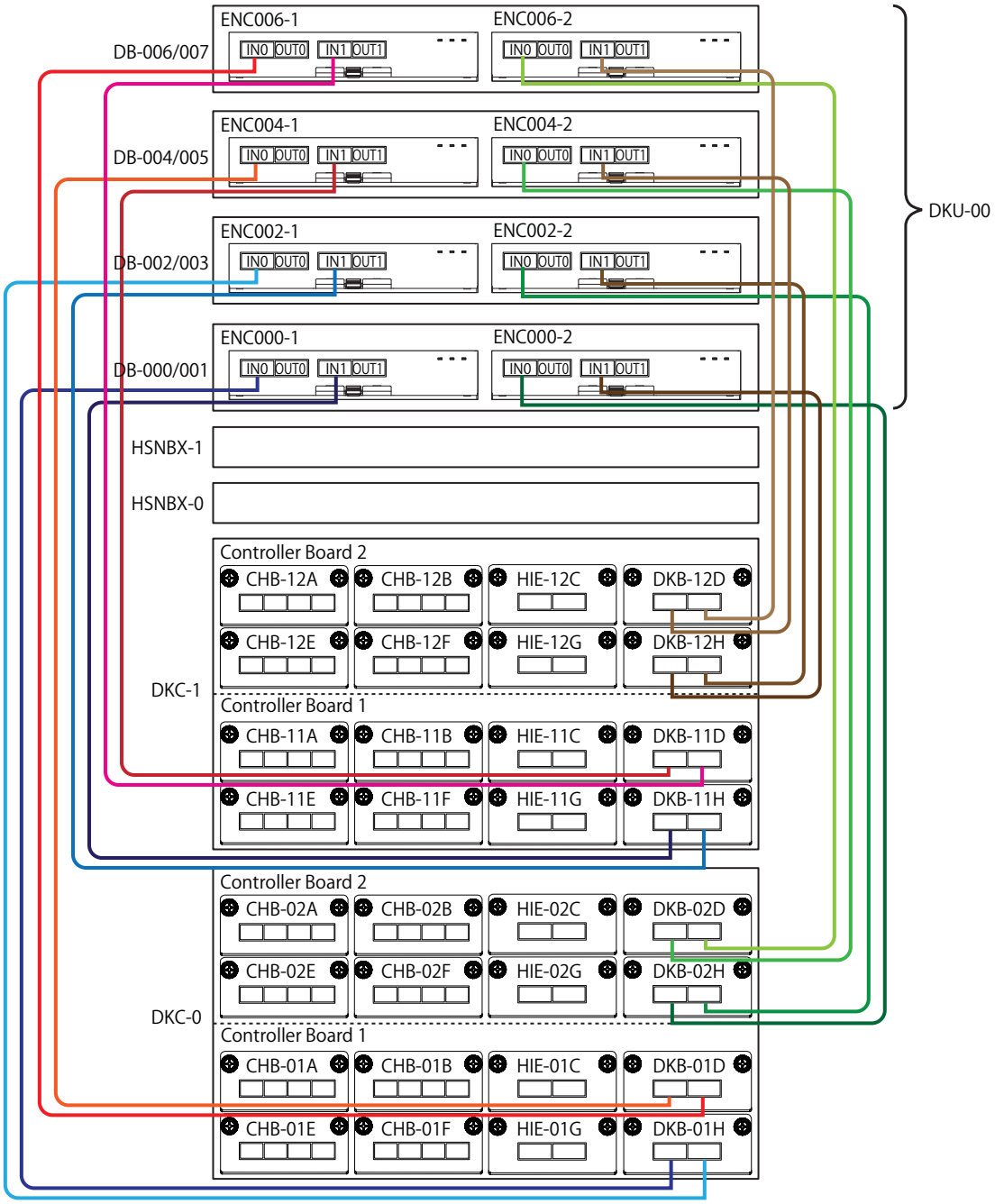
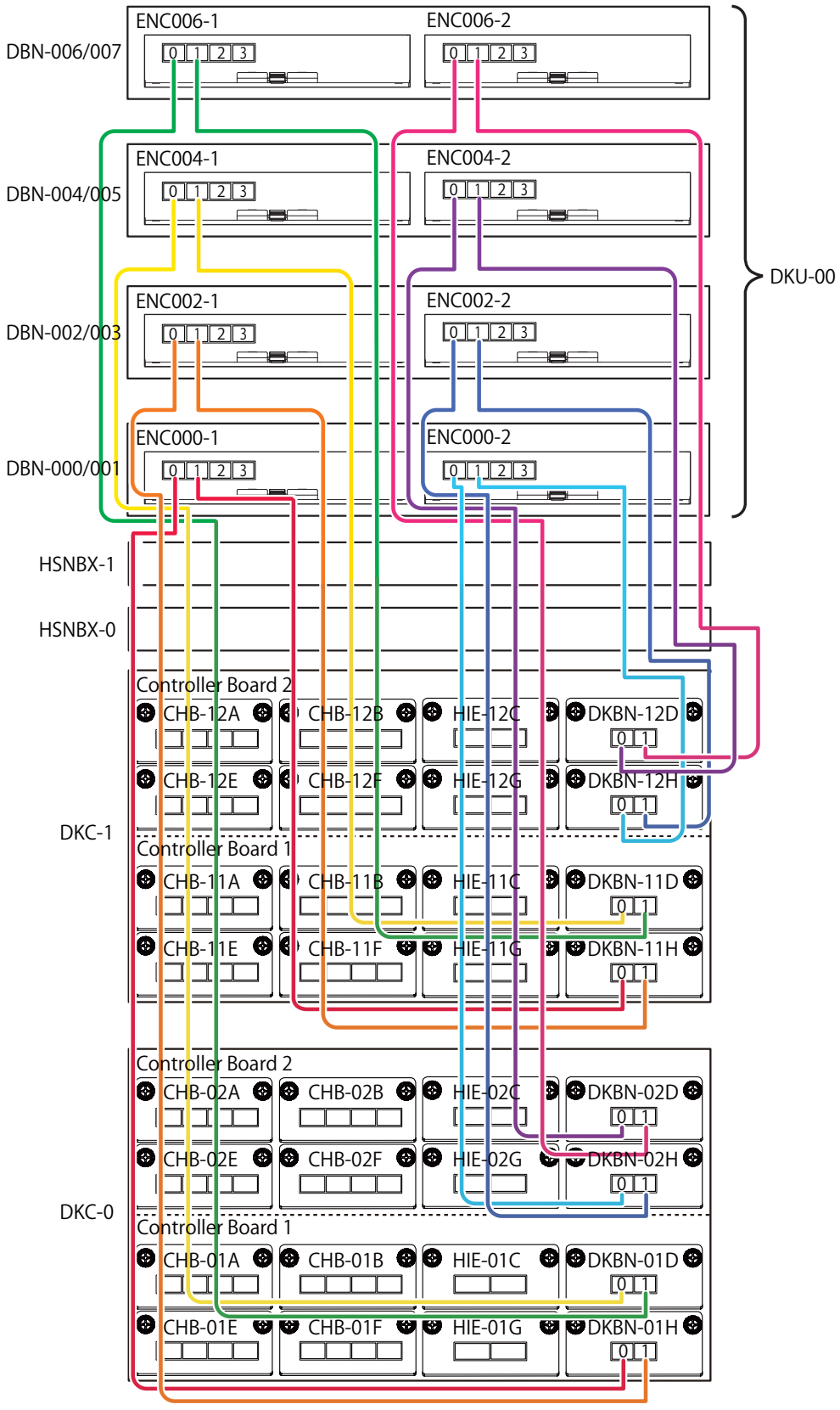


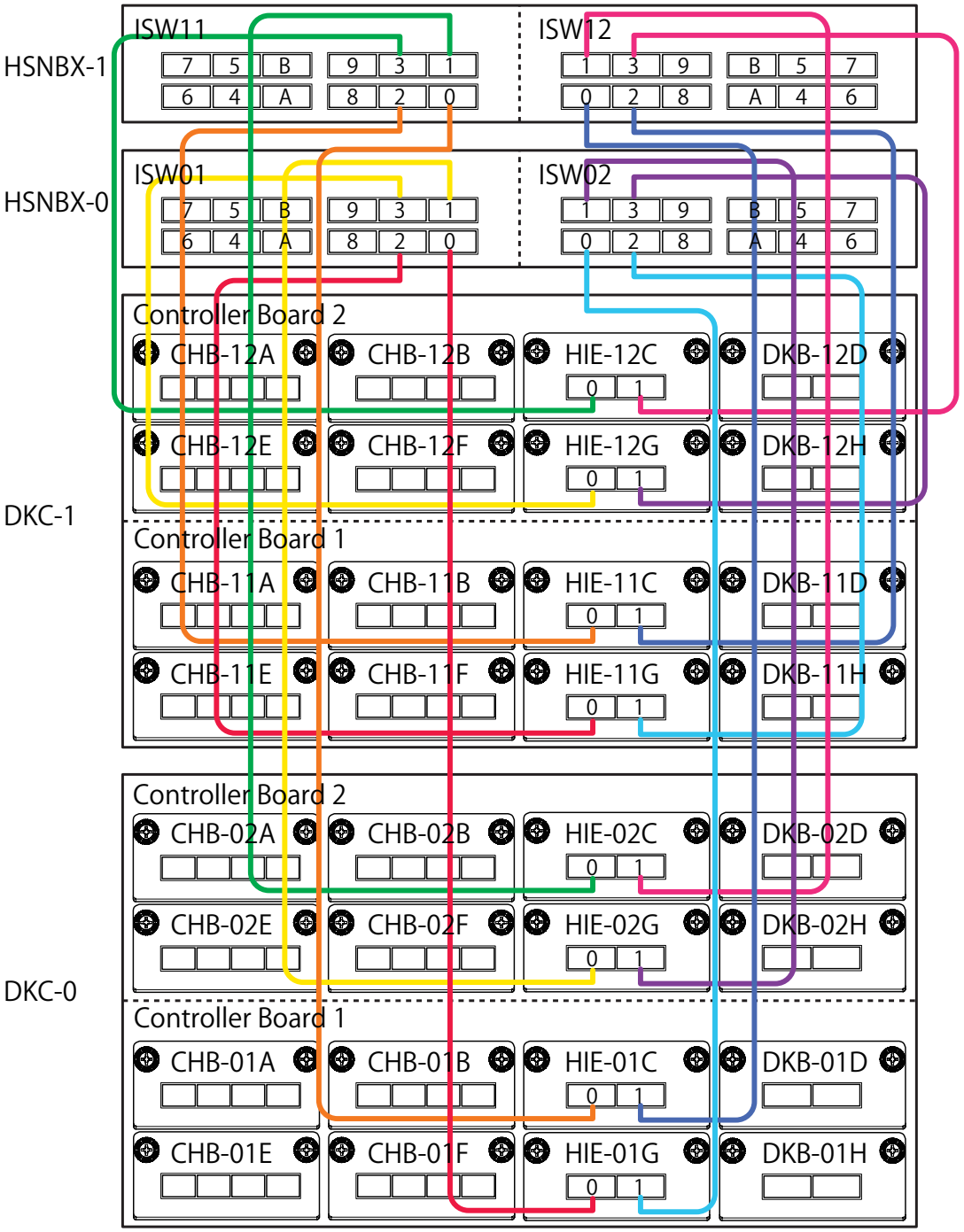
Figure 3-9 Connection Diagram of Disk Boards and Drive Boxes (NBX)



5. Connection between HIE and HSNBX

The connection between HIE on DKC and HSNBX is shown below.

Figure 3-10 Connection Diagram of HIE and HSNBX



4. How to Open/Close Rear Door or Attach/Remove Front Bezel/Rear Door

4.1 How to Attach/Remove the Front Bezel

⚠ CAUTION

Attach or remove the Front Bezel carefully following the procedure. Otherwise, you may hurt your fingers by pinching them.

NOTICE:
- To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. See “1.2 Note when Installing and Removing Parts”.
- The Front Bezels of SBX/UBX/FBX/NBX, DKC and HSNBX are different in size.
- When installing or removing the Front Bezel, try not to operate the main switch incorrectly with the hook or the ON/OFF button of the Front Bezel.

4.1.1 In Case of SBX/UBX/FBX/NBX

A key is necessary to attach or remove a Front Bezel.

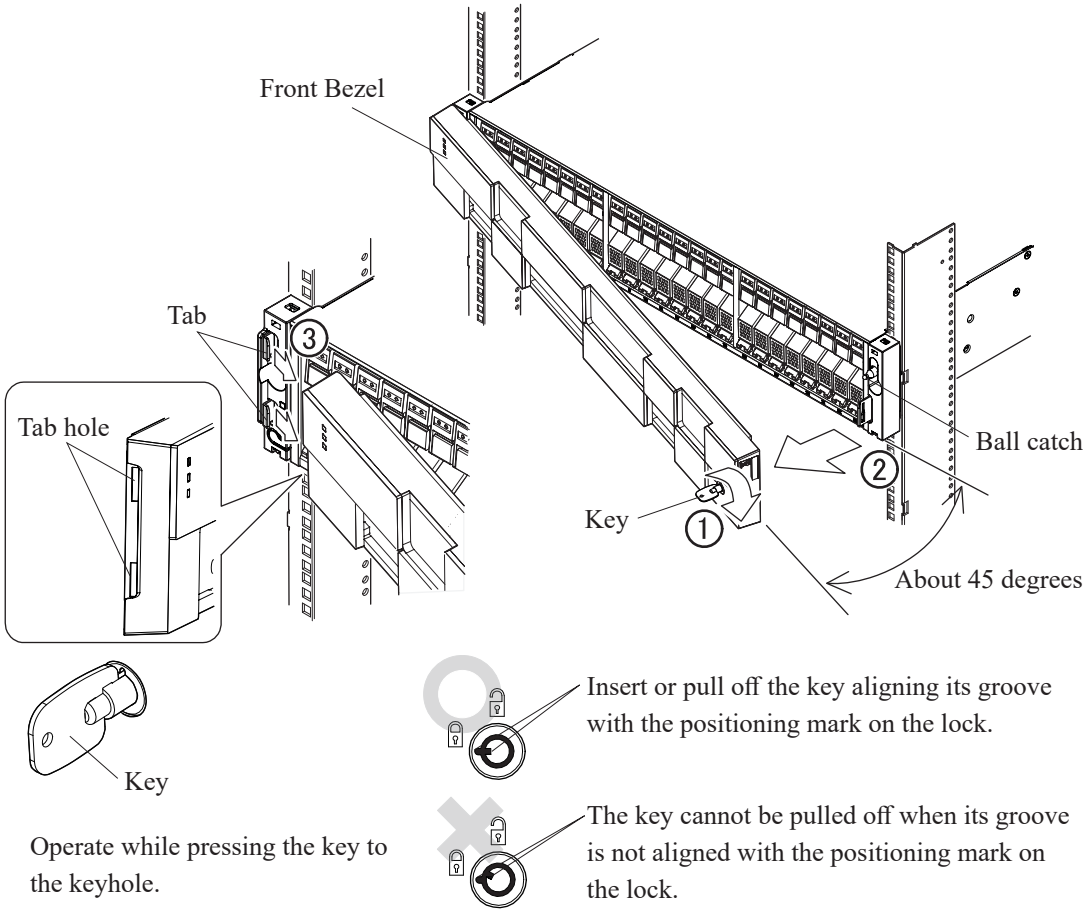
1. Procedure for removal
   (1) Insert the key into the keyhole on the Front Bezel and release the Lock of the Front Bezel (①).
   (2) Pull the key toward you while holding the lower right portion of the Front Bezel, and then remove the right side of the Front Bezel from the ball catch (②).

   NOTE : When removing the Front Bezel, work with the opening angle between the Front Bezel and the Storage System of up to 45 degrees.
   Do not force the Front Bezel open too wide. Otherwise, a damage of Front Bezel may be caused.

   (3) Remove the Front Bezel from the left tabs while pulling, and then remove it (③).

   NOTE: When removing Front Bezel, don't push left side of Front Bezel.

Figure 4-1 Procedure for Removing Front Bezel



NOTE : • When inserting and turning the key, have it inserted completely. If you turn the key while pulling it towards you, a damage of it may be caused.
• When removing the key after locking up the Front Bezel, pull it off aligning its groove with the positioning mark on the lock.
When the key is pulled off in the state where its groove is not aligned with the positioning mark on the lock, a damage of the lock may be caused.

2. Procedure for attachment
   (1) Unlock the Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
   (2) Insert the tabs on the left front side of the Storage System into the tab holes on the Front Bezel (①).

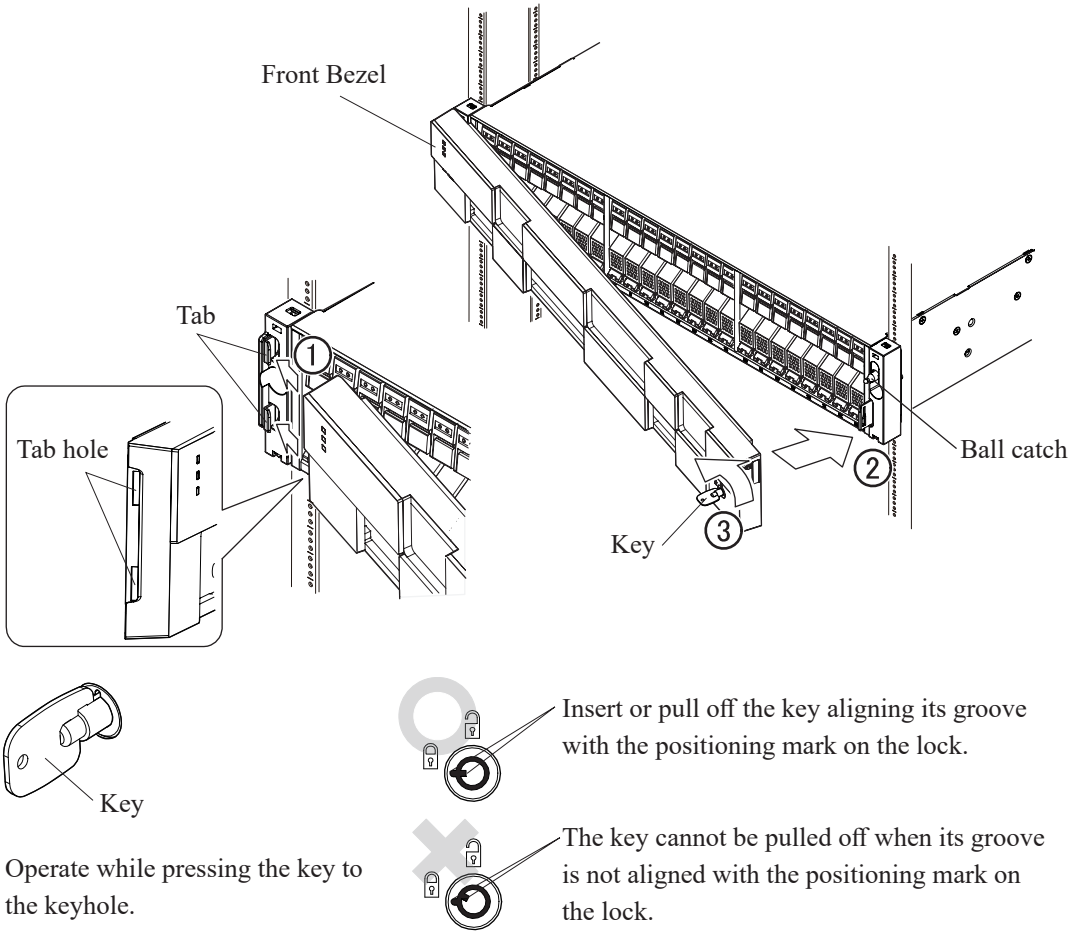
       NOTE: When inserting Front Bezel, don't push left side of Front Bezel.

   (3) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it with the ball catch on the front side of the Storage System (②).

       NOTE: When fixing Front Bezel, don't push left side of Front Bezel.

   (4) Lock the Front Bezel with the key (③).

Figure 4-2 Procedure for Attaching Front Bezel



NOTE : • When inserting and turning the key, have it inserted completely. If you turn the key while pulling it towards you, a damage of it may be caused.
• When removing the key after locking up the Front Bezel, pull it off aligning its groove with the positioning mark on the lock.
When the key is pulled off in the state where its groove is not aligned with the positioning mark on the lock, a damage of the lock may be caused.

4.1.2 In Case of DKC

A key is necessary to attach or remove a Front Bezel.

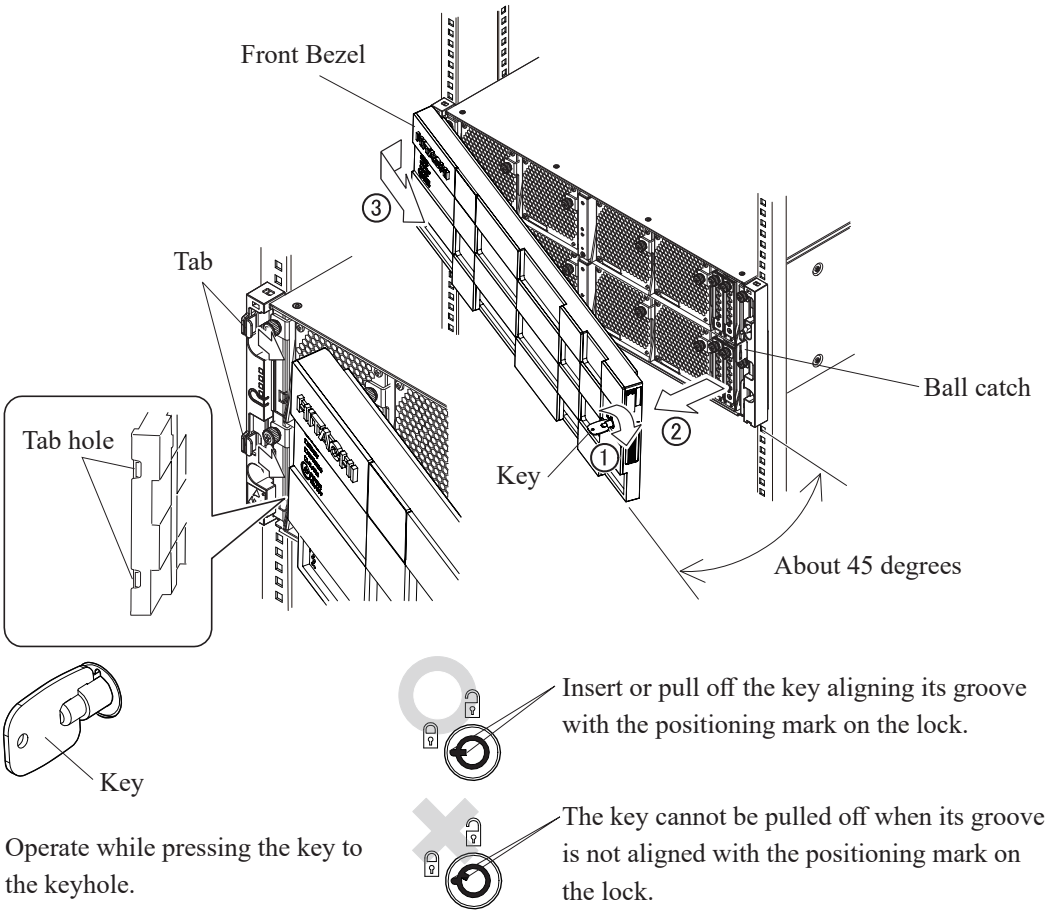
1. Procedure for removal
   (1) Insert the key into the keyhole on the Front Bezel and release the Lock of the Front Bezel (①).
   (2) Pull the key toward you while holding the lower right part of the Front Bezel, and then remove the right side of the Front Bezel from the ball catch (②).

      NOTE : When removing the Front Bezel, work with the opening angle between the Front Bezel and the Storage System of up to 45 degrees.
      Do not force the Front Bezel open too wide. Otherwise, a damage of Front Bezel may be caused.

   (3) Remove the Front Bezel from the left tabs while pulling, and then remove it (③).

      NOTE: When removing Front Bezel, don't push left side of Front Bezel.

Figure 4-3 Procedure for Removing Front Bezel (DKC)



NOTE : • When inserting and turning the key, have it inserted completely. If you turn the key while pulling it towards you, a damage of it may be caused.
• When removing the key after locking up the Front Bezel, pull it off aligning its groove with the positioning mark on the lock.
When the key is pulled off in the state where its groove is not aligned with the positioning mark on the lock, a damage of the lock may be caused.

2. Procedure for attachment
   (1) Unlock the Front Bezel with the key, and hold the key and bottom of Front Bezel with your both hands.
   (2) Insert the tabs on the left front side of the Storage System into the tab holes on the Front Bezel (①).

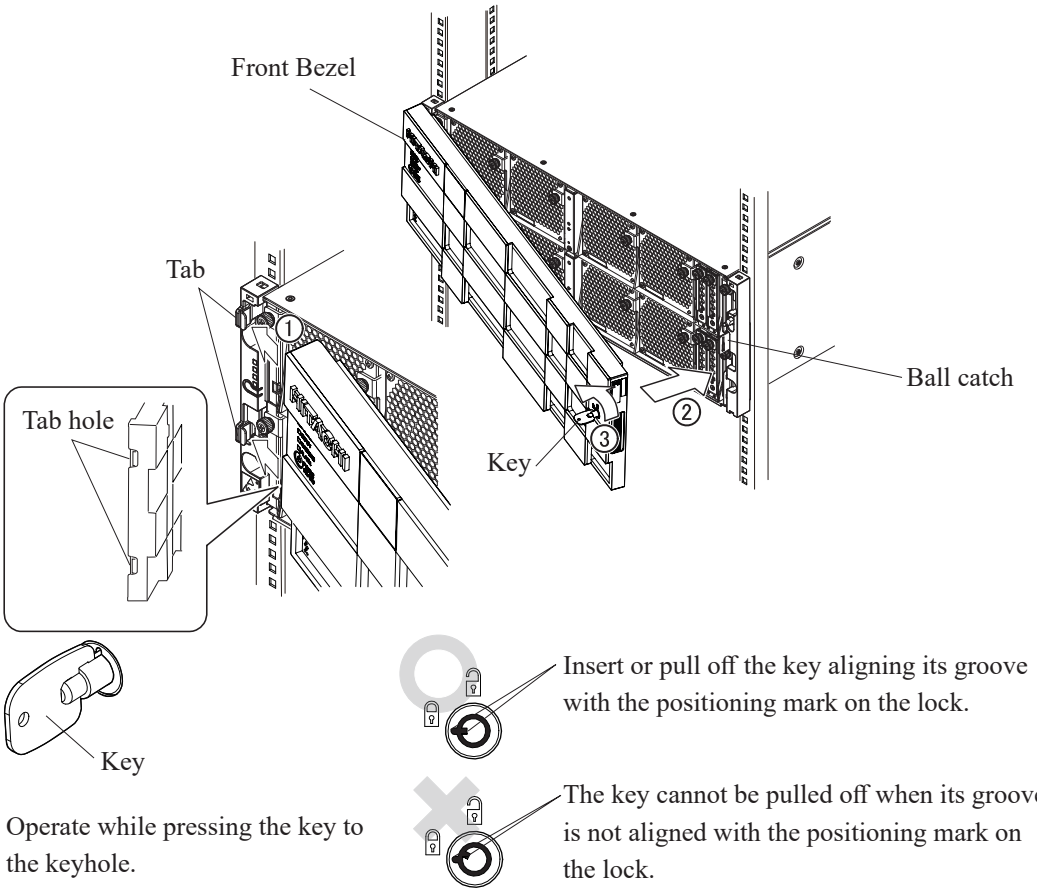
       NOTE: When inserting Front Bezel, don't push left side of Front Bezel.

   (3) Fix the Front Bezel by pressing the right side of the Front Bezel to engage it with the ball catch on the front side of the Storage System (②).

       NOTE: When fixing Front Bezel, don't push left side of Front Bezel.

   (4) Lock the Front Bezel with the key (③).

Figure 4-4 Procedure for Attaching Front Bezel (DKC)

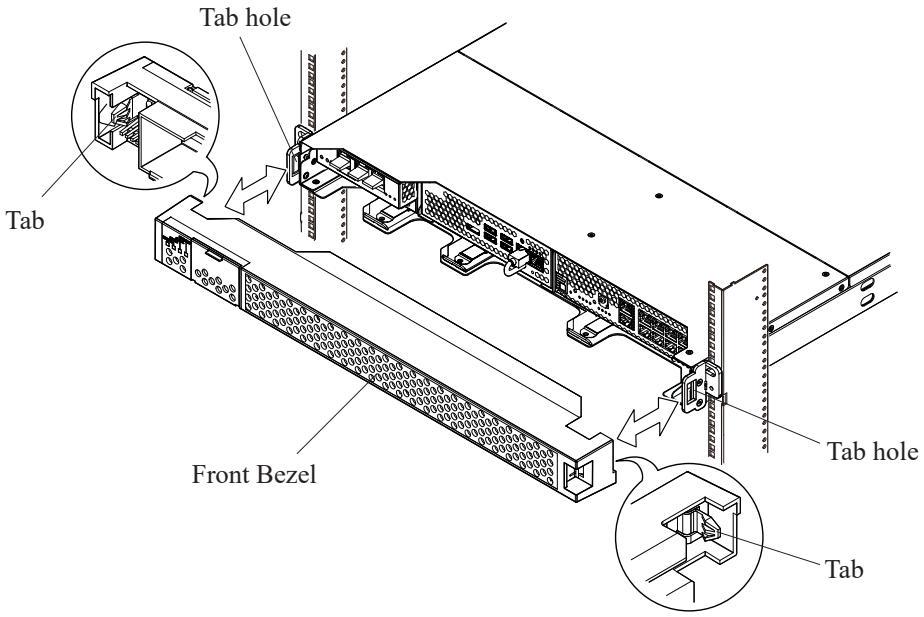


NOTE : • When inserting and turning the key, have it inserted completely. If you turn the key while pulling it towards you, a damage of it may be caused.
• When removing the key after locking up the Front Bezel, pull it off aligning its groove with the positioning mark on the lock.
When the key is pulled off in the state where its groove is not aligned with the positioning mark on the lock, a damage of the lock may be caused.

4.1.3 In Case of HSNBX

1. Attachment and removal of Front Bezel
   (1) To remove the Front Bezel, pull it toward you.
   (2) To attach the Front Bezel, insert the tabs on the Front Bezel into the tab holes on the front side of HSNBX, and then press the Front Bezel against the HSNBX.

Figure 4-5 Attachment and Removal of Front Bezel



4.2 How to Open/Close the Door of the RKU Rack Frame

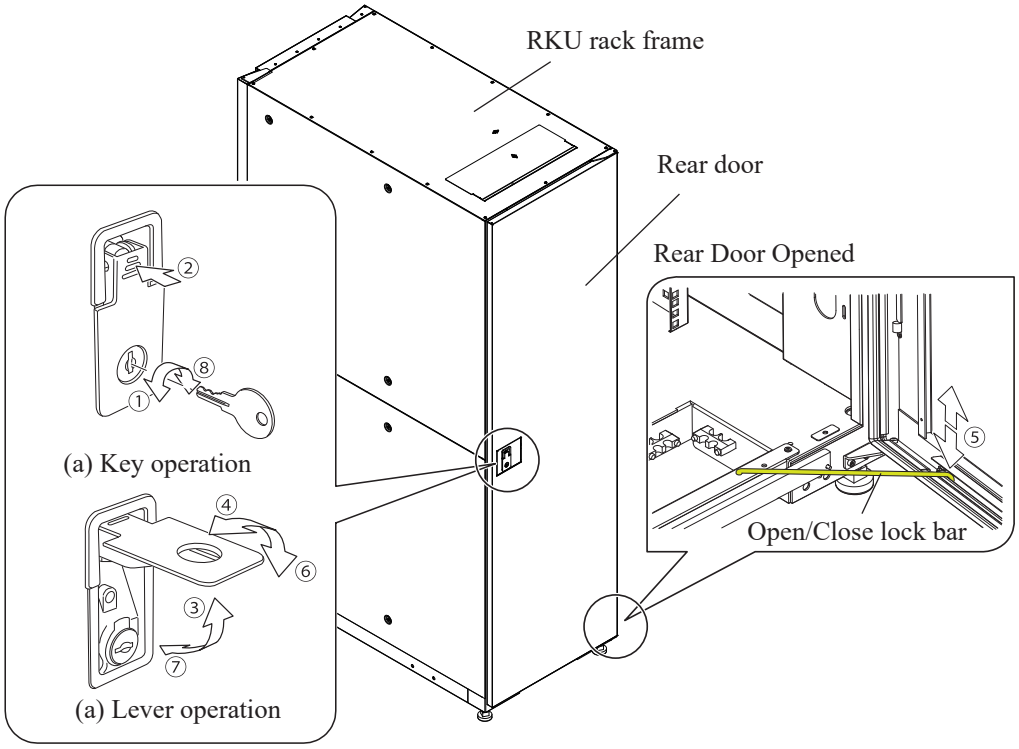
> **⚠ CAUTION**
>
> Open or close the door carefully following the procedure. Otherwise, you may hurt your fingers by pinching them.

For the procedure for removing and installing the Front Bezel, refer to "4.1 How to Attach/Remove the Front Bezel".

1. Procedure for opening the door
   (1) Insert the key to the keyhole on the rear door, and turn the key to the left to open lock (①).
   (2) Push the upper part of the lever, and raise the lower part of the lever toward (②, ③).
   (3) Turn the lever to the left and pull the lever toward to open the rear door (④).
   (4) Set the open/close lock bar to the inside bottom of the rear door (⑤).

2. Procedure for closing the door
   (1) Lift the open/close lock bar on the bottom of the back of the rear door to release the lock (⑤).
   (2) Close the door, and push and turn the lever to the right (⑥).
   (3) Push down the lever and push the lower part of the lever (⑦).
   (4) Insert the key to the keyhole on the door and turn the key to the right to lock (⑧).

Figure 4-6 Procedure for Opening/Closing the Rear Door



5. Power On/Off Procedure

The Drive may emit mechanical sound “click-clack” when the Drive is started (spun up) immediately after the Storage System powering on and when the Drive is powered off (spun down). However, there is no problem.

NOTICE: The profile data written by the profile tool is initialized by the power off procedure, so the external volume that performs the mapping of the external storage system connected by using the profile tool is blocked after the power on procedure.
When SIM = efd000 is reported and the external volume is blocked by the power on/off procedure, perform the recovery procedure according to ″Recovery Procedure for Path Failure While Device is Blocked (SIM = 21d0xy, efd000)″ (TRBL14-60).

5.1 Storage System Power On

NOTICE: The standby electricity starts to be consumed by rotating FANs, and so on, at the moment when the PDU breakers are turned on, even if the storage system is in the off state.

1. Turn on the main breakers at the PDUs on the Rack frames. (See Figure 5-1)
   If you turned off the breakers of the PDUs connected to the HSNBXs just before this step, wait for 5 minutes or more, and then turn on the breakers.

2. Check that POWER LEDs on all chassis light in green. A chassis on which the POWER LED is off is not supplied AC power. Check PDU breakers and power supply devices.
   If the POWER LED on a DKC lights in amber, power on the DKC by pressing the POWER ON/OFF switch for 10 seconds.

3. Turn on the switch. (See Figure 5-2)
   Set the PS ON/PS OFF switch on the HSNPANEL0 on the front side of HSNBX-0 to ON while holding up the PS SW ENABLE switch in the ENABLE position.

4. Check that the READY LED (green) on the Controller Chassis lights up. (See Figure 5-2) See the following table for the standard time to turn on the LED.

Table 5-1 Standard Lighting Time

Model name	Normal Time
VSP 5100, 5100H, 5500, 5500H	About 45 minutes later

NOTICE:
- When turning off and then on the power, check that the same HDD micro-program version is displayed in the Current pane and CFM Version pane after the READY LED lights solid. (See (SVP03-05-80))
- If the power is turned off during the HDD micro-program update, the HDD micro-program version might not be consistent.
  If the HDD micro-program version is not consistent, update the HDD micro-program. (See (MICRO03-10) or (MICRO04-10))

Figure 5-1 PDU Breaker

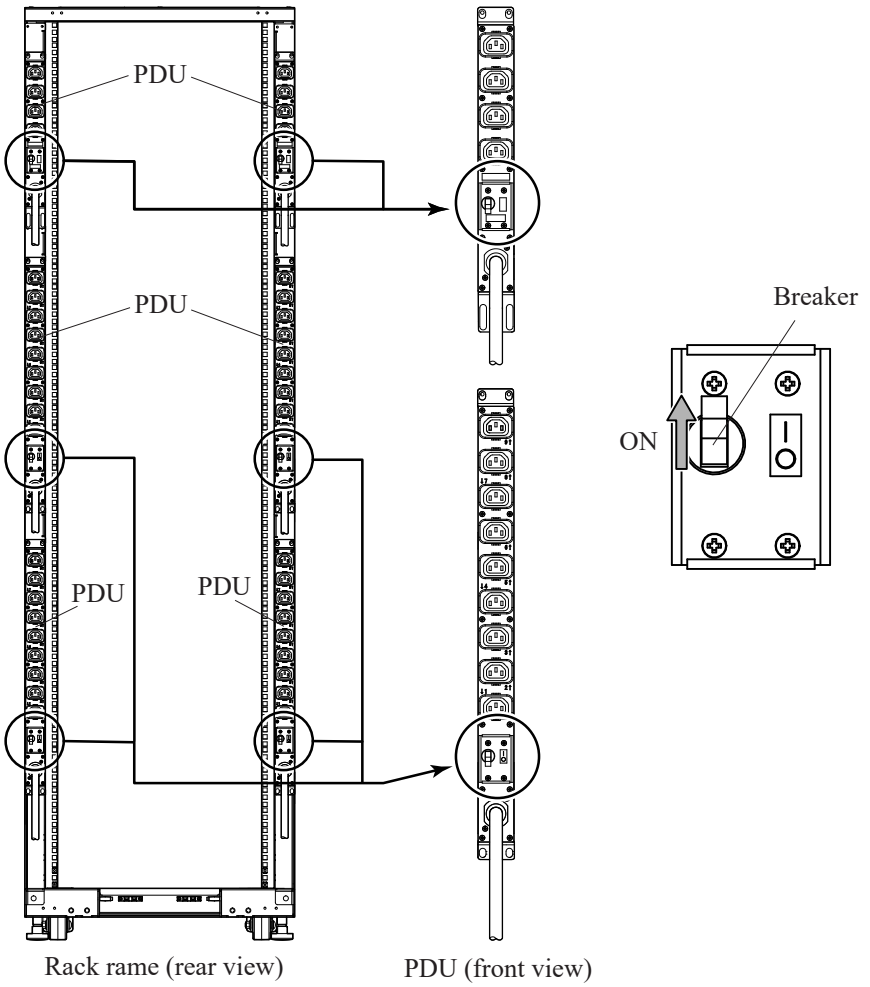
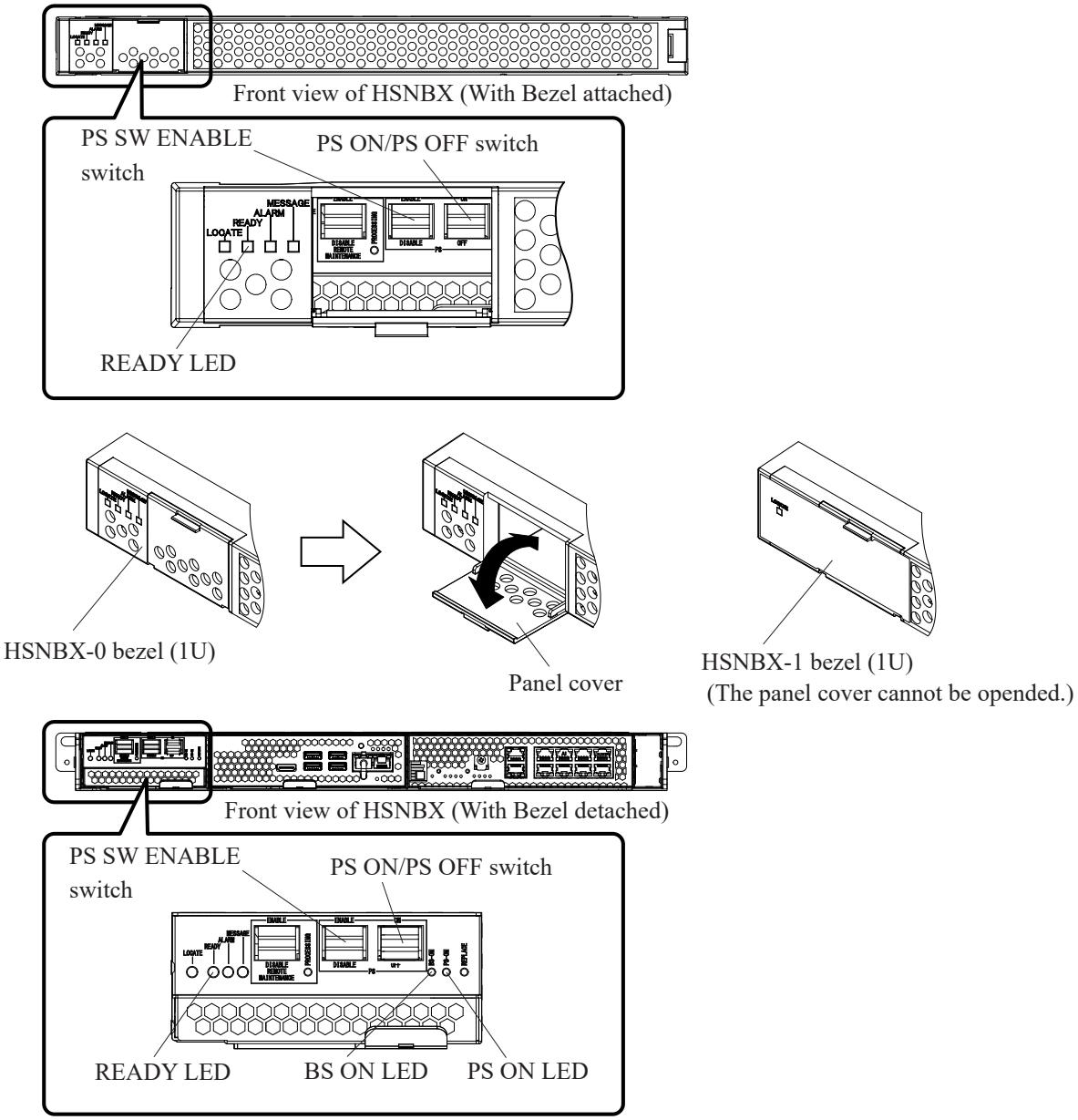


Figure 5-2 MAIN Switch on the Front Side of HSNPANEL



5.2 Storage System Power Off (Planned Shutdown)

NOTICE:
- Confirm that maintenance operations (except for configuration information setting) have been completed before powering OFF the Storage System.
- When ISW01 or ISW02 is blocked, this procedure cannot be performed. Recover from the failure, and then perform this procedure.
- When turning the breaker off before or during a power-off operation, an emergency processing that transfers data to the SSD is performed with the battery. Make sure the power is completely turned off after executing the following procedures because the emergency processing drains the batteries and prolongs the next power-on time according to the remaining battery charge.

1. Turn off the switch.
   Set the PS ON/PS OFF switch on the HSNPANEL0 on the front side of HSNBX-0 to OFF while holding up the PS SW ENABLE switch in the ENABLE position.

2. When the state of the PS ON LED (green) on the HSNPANEL0 changes from solid green to blinking after the power switch is turned off, the power-off processing starts.
   The PS ON LED (green) is blinking during the power-off processing.
   When the PS ON LED goes off, the power-off processing ends.
   The time required for the PS ON LED to go off is shown in Table 5-2.
   There is no problem if the ACT LED (green) on each drive blinks after the PS ON LED goes off.

3. Turn off the power of the SVP referring to the "Power Off" (SVP01-200)

NOTICE: Make sure to perform the procedure within 15 minutes after turning OFF the power of SVP. If the condition that SVP is OFF and breaker is ON continues for 15 minutes or more, the following occurs.
- (If SVP High Availability kit is not installed) SVP power is forcibly turned ON.
- (If SVP High Availability kit is installed) SVP failover takes place.

If it will take 15 minutes or more to perform the procedure, set the SVP RAS switch #1 (LOC03-40) on the SSVP to ON before starting.
After completion of the procedure, set the SVP RAS switch #1 to OFF.

4. Power off the Storage System in the following procedure (AC input completely turned off).
   (1) If the power cables of the Storage System are connected to the PDU, check if a power cable of other Storage System such as a switch is connected to the PDU.
   If the power cable of other Storage System is not connected, power off the breakers of the PDU.
   If the power cable of other Storage System is connected to the PDU, check whether the other Storage System can be powered off. If the other Storage System cannot be powered off, remove two power cables from the power supply of the Controller Chassis side and Drive Box side.
   (2) If power cables are connected to something other than PDU, remove two power cables of the Controller Chassis and Drive Box, or turn off the input power.

Table 5-2 Required Time for Completion of Power-off

Data cache capacity	Required time for power-off			
	(a) Power-off processing time	(b) Destage processing time		
		Write pending rate (0%) (*1)	Time to be added each time the write pending rate increases by 10% (*2)	Write pending rate (Maximum value of 70%)
32 GiB	13 minutes	5 minutes	+ 8 minutes	61 minutes
64 GiB	13 minutes	6 minutes	+ 16 minutes	118 minutes
128 GiB	13 minutes	8 minutes	+ 32 minutes	232 minutes
256 GiB	13 minutes	12 minutes	+ 64 minutes	460 minutes
512 GiB	13 minutes	20 minutes	+ 128 minutes	916 minutes
1024 GiB	13 minutes	36 minutes	+ 256 minutes	1828 minutes
2048 GiB	13 minutes	68 minutes	+ 512 minutes	3652 minutes
4096 GiB	13 minutes	132 minutes	+ 1024 minutes	7300 minutes
6144 GiB	13 minutes	196 minutes	+ 1536 minutes	10948 minutes

The above values are the estimated maximum time in the case that the write processing is concentrated on one RAID group for RAID5 and RAID6, and on one physical disk in one RAID group for RAID1. Distributing the write processing to multiple RAID groups reduces the processing time. For example, when the processing load is distributed to two RAID groups, the time will be the half of the time shown in the table. When external storage systems are used, the values change depending on the processing abilities of the external storage systems.

*1: The time at the write pending rate of 0% is 4 minutes + 1 minute × (data cache capacity ÷ 32 GiB).

*2: The time to be added each time the rate increases by 10% is 8 minutes × (data cache capacity ÷ 32 GiB).
Example of the operating storage system where the data cache capacity is 32 GiB and the write pending rate is 10% is as follows: (a) 13 minutes + (b) 5 minutes + 8 minutes × 1 = 26 minutes

The amount of time taken from the start of the power-off processing to the completion of the power-off is the sum of the power-off processing time and the destage processing time.

(a) Power-off processing time: Required processing time regardless of the system configuration
(b) Destage processing time: Depends on the data cache capacity and the amount of write pending data in the cache

When the destage processing time exceeds 240 minutes, powering off the storage system fails. (The SIM = 388f00 is issued.) To perform the power-off procedure, adjust the amount of write pending data so that the destage processing time becomes 240 minutes or less.

5.2.1 Planned Shutdown of the Storage System that GAD Uses

Planned shutdown of the storage system that GAD uses and startup operation after the planned shutdown are explained.

1. Planned shutdown of the storage system
   Table 5-3 shows “Planned shutdown patterns of the storage system”.
   And Figure 5-3 shows operation outline of planned shutdown patterns.

Table 5-3 Planned Shutdown Patterns of the Storage System

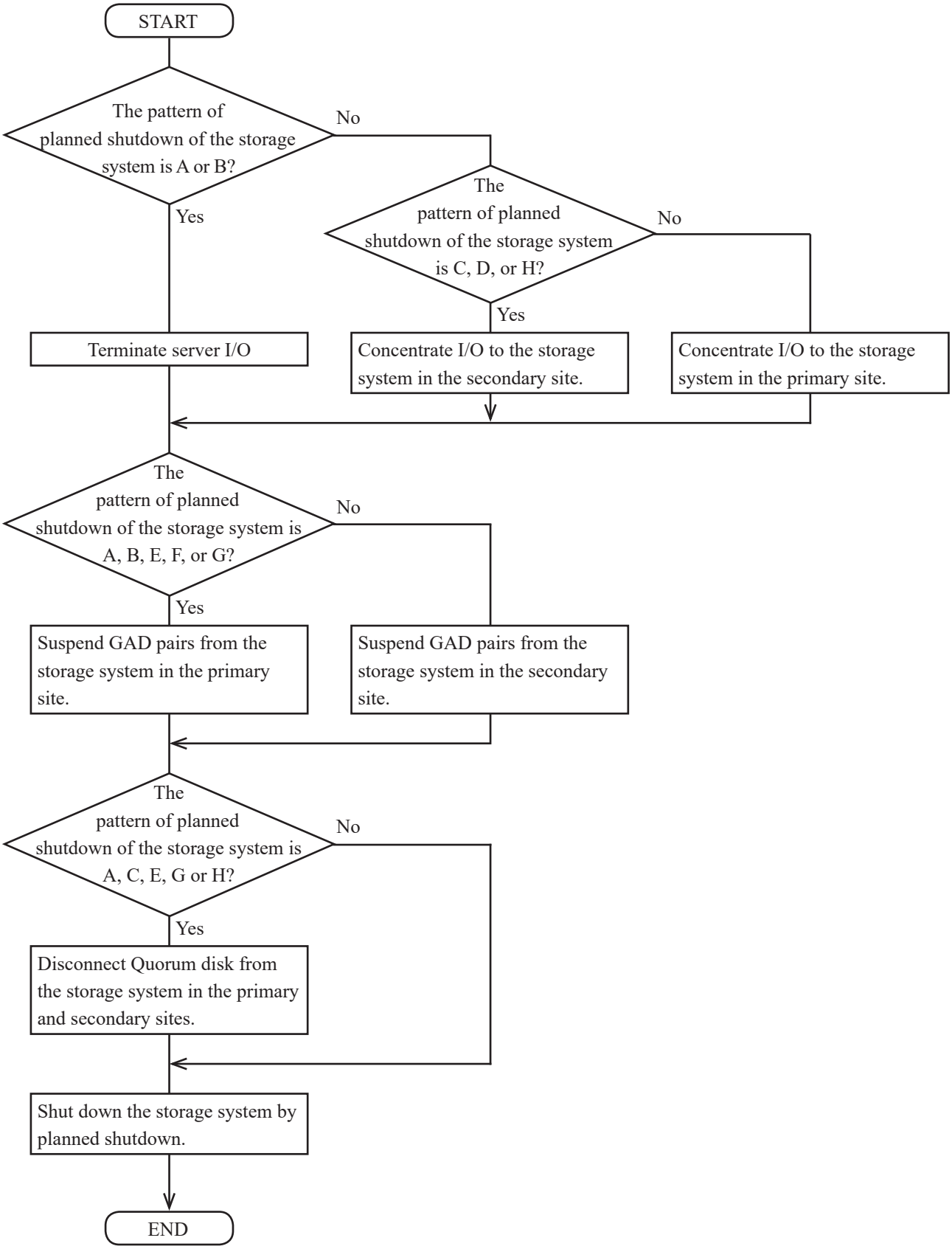
× : To be performed
— : Not performed

Planned shutdown patterns of the storage system	Storage system to be powered off (*1)			Storage system to continue I/O		Storage system in which a GAD pair is suspended		Disconnection of Quorum disk (*2)
	Primary site	Secondary site	External (*3)	Primary site	Secondary site	Primary site	Secondary site	
A	×	×	×	—	—	×	—	×
B	×	×	—	—	—	×	—	—
C	×	—	×	—	×	—	×	×
D	×	—	—	—	×	—	×	—
E	—	×	×	×	—	×	—	×
F	—	×	—	×	—	×	—	—
G (*4)	—	—	×	×	—	×	—	×
H (*5)	—	—	×	—	×	—	×	×

*1: The order of power off of the storage system is not regulated. Power off is available from wherever “ × ” is marked.
*2: SIM of Quorum disk blockade may be reported on storage system of primary and/or secondary site by disconnection of Quorum disk.
*3: External storage systems for Quorum disk.
*4: I/O continues in the storage system of the primary site when the external storage system is stopped.
*5: I/O continues in the storage system of the secondary site when the external storage system is stopped.

For operation procedures, refer to the description on planned shutdown of the storage system in the “Global-Active Device User Guide”.

Figure 5-3 Operation Outline of Planned Shutdown Patterns of the Storage System



2. Startup of the storage system after planned shutdown
   Table 5-4 shows “Startup patterns of the storage system after planned shutdown”.
   And Figure 5-4 shows operation outline (flow) of startup patterns of the storage system after planned shutdown”.

Table 5-4 Startup Patterns of the Storage System After Planned Shutdown

× : To be performed
— : Not performed

Startup patterns of the storage system after planned shutdown	Storage system to be powered on (*1)			Storage system to continue I/O		Storage system in which GAD pairs are resynchronized		Connect Quorum disk (*2)
	Primary site	Secondary site	External (*3)	Primary site	Secondary site	Primary site	Secondary site	
A	×	×	×	(*4)	(*4)	×	—	×
B	×	×	—	(*4)	(*4)	×	—	—
C	×	—	×	(*4)	×	—	× (*5)	×
D	×	—	—	(*4)	×	—	× (*5)	—
E	—	×	×	×	(*4)	×	—	×
F	—	×	—	×	(*4)	×	—	—
G (*6)	—	—	×	×	(*4)	×	—	×
H (*7)	—	—	×	(*4)	×	—	× (*5)	×

*1: The order of power on of the storage system is not regulated. Power on is available from wherever “ × ” is marked.
*2: In case of SIM of Quorum disk blockade was reported on storage system of primary or secondary site by disconnection of Quorum disk, please complete the SIM after connection of Quorum disk.
*3: External storage systems for Quorum disk.
*4: Storage system in which I/O restarts.
*5: A GAD pair is resynchronized in the storage system of the secondary site by swapping the primary volume for the secondary volume (Swap resync).
*6: I/O continues in the storage system of the primary site when the external storage system is stopped.
*7: I/O continues in the storage system of the secondary site when the external storage system is stopped.

For operation procedures, refer to the description on planned shutdown of the storage system in the “Global-Active Device User Guide”.

Figure 5-4 Operation Outline in Startup Patterns After Planned Shutdown of the Storage System

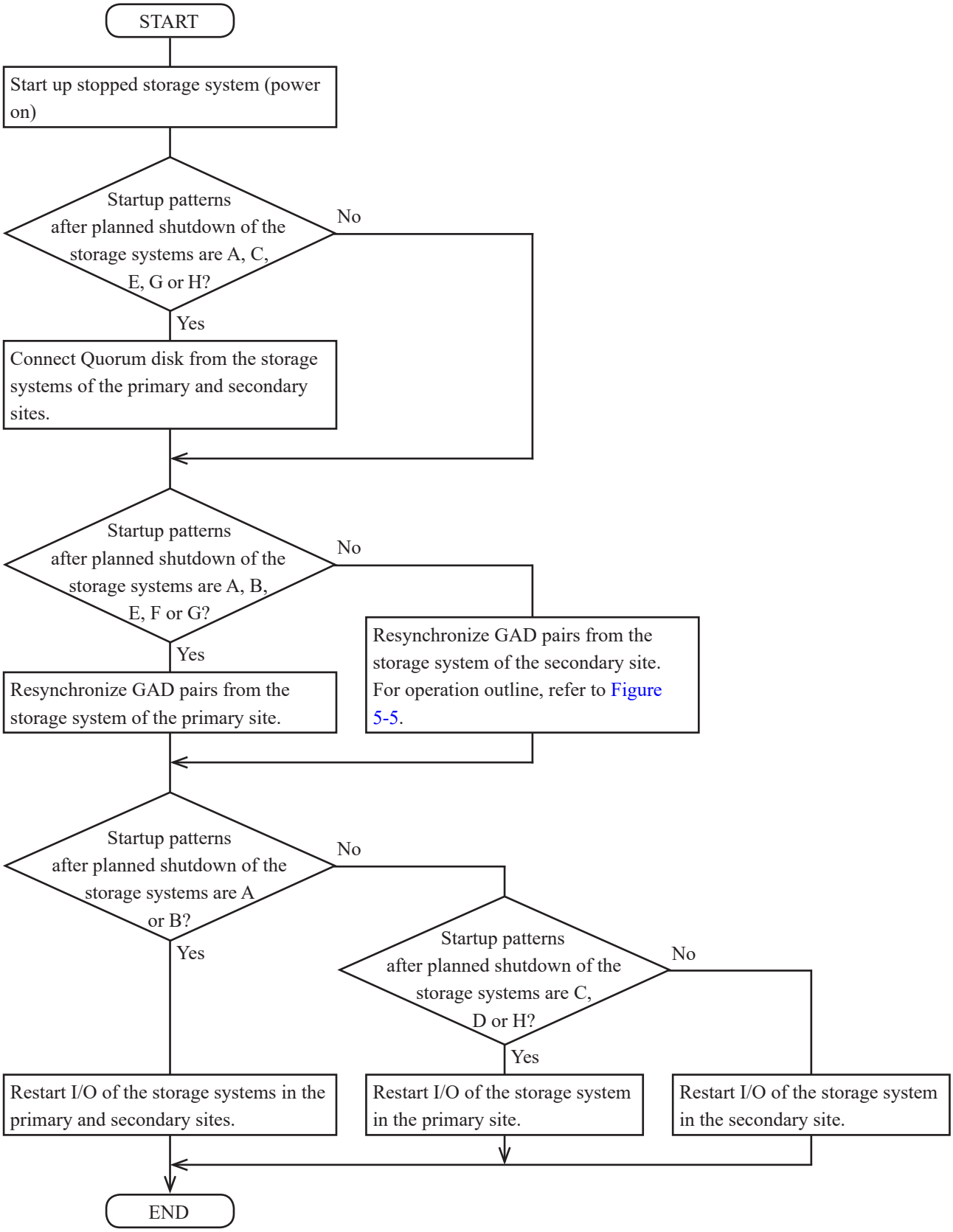
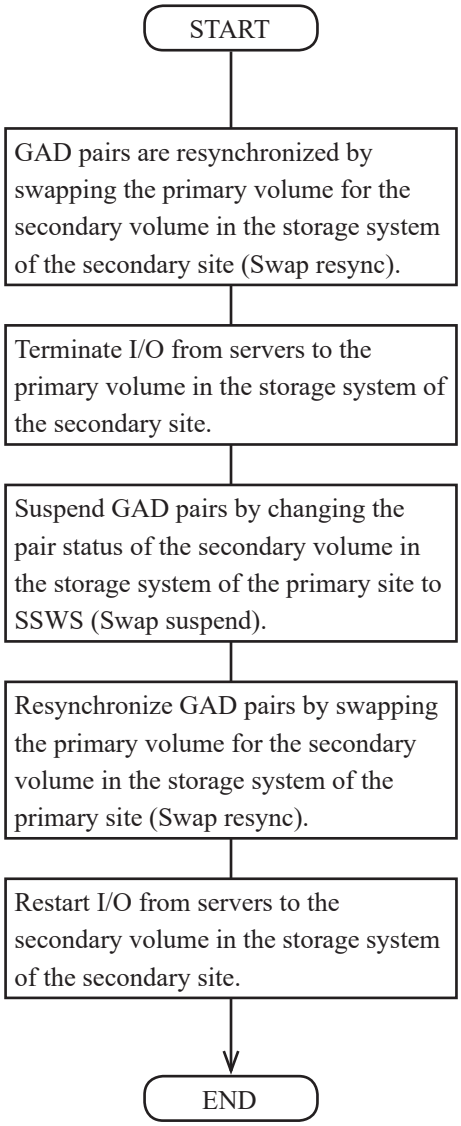


Figure 5-5 Resynchronization of GAD Pairs from the Storage System in the Secondary Site



6. Starting the Window for Maintenance Work

Connect the Maintenance PC to the Storage System, and then start the window for maintenance work.

- Starting Web Console (WEBCON02-50)
- Starting SVP window (SVP01-30)
- Starting Maintenance Utility (MU01-10)
- Starting Maintenance Utility (Sub Panel) (MU01-80)