3. Adding Optional Components

3.1 Before Starting Addition of Optional Components

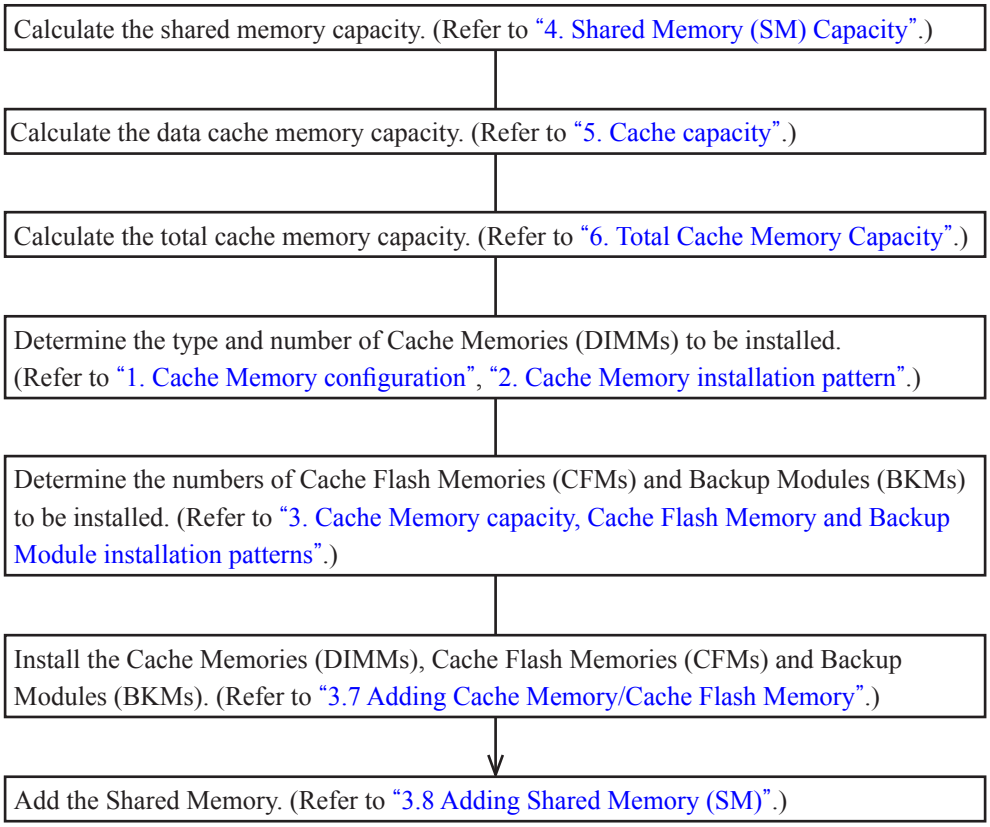
NOTICE:	During the addition work, the part statuses in the "Web Console", "Maintenance Utility", and "Maintenance" windows might be displayed differently from the actual statuses. (Example: The Drives during the addition are displayed as the [Blocked] status.) In that case, complete the running maintenance operation, and then refresh the display information in each window.

If you make a mistake in operation during an addition of the optional component, it is feared that user data in the Storage System is lost. Therefore, perform the following before starting the addition of the optional component to provide against an unexpected accident.

1. Backup user data.
   Backup user data in the Storage System by the operation on the host computer side.
2. The work to add an optional component varies depending on the component and a location where the component is to be installed. Besides, perform the addition after making sure whether the work must be done with the Storage System power turned on or off.
   - An addition with the Storage System power turned on :
     A status in which the Storage System power is turned on regardless of whether the system (host computer) is turned on or off.
   - An addition with the Storage System power turned off :
     A status in which the Storage System power is turned off regardless of whether the system (host computer) is turned on or off.
3. When adding the optional component, it is required to change the settings of the Storage System using a Maintenance PC connected via a LAN. Make the following preparations before starting the addition of the optional component.
   - Prepare a PC in which Web Console is installed. The PC must be used in the LAN environment.
   - Ask the customer whether the Storage System is operable via a LAN. If not, obtain customer's permission to operate the Storage System via a LAN.
4. Promote mutual understanding with the user about the possibility of a system down in order to minimize damage caused by failures.
5. When adding the optional component with the Storage System power turned on, the operation replacing dummy (Drive) with Drive has to be finished within 10 minutes.
6. It is required to install the adaptable firmware depending on the parts to be added.
   Check the adaptable firmware revision. See OPTION & FIRMWARE VERSION SECTION "1. Relationship between Option and Firmware Version".
   Install the Web Console stored in the installation media that includes the adaptable firmware or the later version of the Web Console in the Maintenance PC.
   If the Web Console compatible with the adaptable firmware is not installed, the setting for the option to be added cannot be made.
7. Connect only the regular parts defined in the "Maintenance Manual" for the maintenance parts.
8. Do not work behind DB60 for a long time.

3.1.1 Cache Capacity and the Number of Required Options

To increase the cache memory and the shared memory, calculate the additional cache memory capacity and shared memory capacity, and then determine the type and number of Cache Memories (DIMMs) to be installed. Follow the steps below to increase the cache memory and the shared memory.



1. Cache Memory configuration
   The following shows the specification of the Cache Memory (DIMM) configuration.
   Addible DIMMs are 16 GiB, 32 GiB and 64 GiB.

Table 3-1 Cache Memory Configuration Specification

Item	Maximum number of DIMMs to be installed (DIMMs/CTL)	Minimum number of DIMMs (DIMMs/CTL)	Addition Unit (CMG)
CBXSS/CBXSL	1 DIMM	1 DIMM	—
CBSS/CBSL	2 DIMMs	2 DIMMs	2 DIMMs (Replacement for storage capacity expansion)
CBLH1	8 DIMMs	4 DIMMs	4 DIMMs (Replacement for storage capacity expansion or addition to CMG1)
CBLH2	8 DIMMs	4 DIMMs	4 DIMMs (Replacement for storage capacity expansion or addition to CMG1)

2. Cache Memory installation pattern
   The following table shows Cache Memory installation patterns.
   CBLH1/CBLH2 needs to install the memories in CMG0.

Table 3-2 CBXSS/CBXSL/CBSS/CBSL Cache Memory Installation Pattern

○ : Support
— : Not Support

Memory capacity/ System	Controller Board 1	Controller Board 2	Supported or not supported		
			CBXSS/CBXSL	CBSS1/CBSL1	CBSS2/CBSL2
32 GiB	16 GiB × 1	16 GiB × 1	○	—	—
64 GiB	16 GiB × 2	16 GiB × 2	—	○	—
128 GiB	32 GiB × 2	32 GiB × 2	—	○	○
256 Gib	64 GiB × 2	64 GiB × 2	—	—	○

Table 3-3 CBLH1/CBLH2 Cache Memory Installation Pattern

○ : Support
— : Not Support

Memory capacity/ System	Controller Board 1 (CTL1)			Controller Board 2 (CTL2)			Supported or not supported	
	CTL1 total	CMG0	CMG1	CTL2 total	CMG0	CMG1	CBLH2	CBLH1
128 GiB	64 GiB	16 GiB × 4	Uninstalled	64 GiB	16 GiB × 4	Uninstalled	—	○
256 GiB	128 GiB	16 GiB × 4	16 GiB × 4	128 GiB	16 GiB × 4	16 GiB × 4	—	○
256 GiB	128 GiB	32 GiB × 4	Uninstalled	128 GiB	32 GiB × 4	Uninstalled	○	○
512 GiB	256 GiB	32 GiB × 4	32 GiB × 4	256 GiB	32 GiB × 4	32 GiB × 4	○	○
512 GiB	256 GiB	64 GiB × 4	Uninstalled	256 GiB	64 GiB × 4	Uninstalled	○	—
1,024 GiB	512 GiB	64 GiB × 4	64 GiB × 4	512 GiB	64 GiB × 4	64 GiB × 4	○	—

3. Cache Memory capacity, Cache Flash Memory and Backup Module installation patterns
   You need to add a Cache Flash Memory and a Backup Module at the same time depending on the Cache Memory capacity to be added.

Table 3-4 Cache Memory Capacity, Cache Flash Memory and Backup Module Installation Patterns

Model	Total memory capacity of the system	Cache Flash Memory installation patterns		Backup Module installation patterns
		CFM-10/20 (CFM-1/2)	CFM-11/21	Number of Basic Backup Modules / system BKMF-x1/x2/x3 (BKM-1/2)
CBXSS/CBXSL	32 GiB	BM05		2 (BAT-1/2)
CBSS1/CBSL1	128 GiB	BM15		2
	64 GiB	BM15		2
CBSS2/CBSL2	256 GiB	BM15		2
	128 GiB	BM15		2
CBLH1	512 GiB	BM35	BM35	6
	256 GiB	BM35	—	6
	128 GiB	BM35	—	6
CBLH2	1,024 GiB	BM45	BM45	6
	512 GiB	BM45	—	6
	512 GiB	BM35	BM35	6
	256 GiB	BM35	—	6

4. Shared Memory (SM) Capacity

The number of pairs, the number of migration plans, and the capacity of pools and virtual volumes, which can be created by the program products, depend on the Shared Memory capacity. To add the Shared Memory capacity, add Shared Memory Function by Maintenance Utility (see Figure 3-1). The Shared Memory capacity allocated by Shared Memory Function and the cache memory capacity required for adding Shard Memory Function vary depending on storage system models.

Table 3-5 Influences on Program Products depending on Shared Memory Capacity

Program product	Items affected by Shared Memory capacity
ShadowImage TrueCopy Universal Replicator global-active device	The number of pairs that can be created. For details, refer to User Guide of the program product.
Volume Migration Volume Migration V2	The number of migration plans that can be executed concurrently. For details, refer to User Guide of the program product.
Dynamic Provisioning Dynamic Tiering active flash Thin Image dedupe and compression	Pool capacity and virtual volume capacity that can be created. For details, see Table 3-6.

Table 3-6 Usable Capacity of Pools/Virtual Volumes

(Unit: PiB)

Shared Memory Function	VSP G130	VSP G350 VSP F350	VSP G370 VSP F370	VSP G700 VSP F700	VSP G900 VSP F900
Base	~ 0.24	~ 0.29	~ 1.6	~ 1.6	~ 4.4
Extension1	—	~ 1.6	~ 4.4	~ 4.4	~ 8.05
Extension2	—	~ 4.4	~ 8.05	~ 8.05	~ 12.5
Extension3	—	—	—	~ 12.5	~ 16.6

NOTE: When decreasing Shared Memory Function, delete all DP, DT, active flash, TI, and dedupe and compression pools.

Table 3-7 Correspondence Table of Shared Memory Function and Shared Memory Capacity

(Unit: GiB)

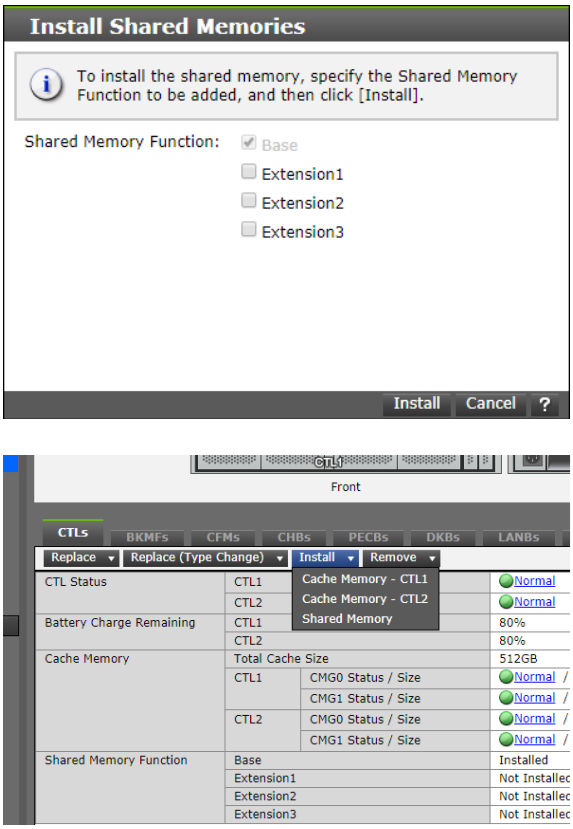
Shared Memory Function	VSP G130	VSP G350 VSP F350	VSP G370 VSP F370	VSP G700 VSP F700	VSP G900 VSP F900
Base	21.0	34.0	72.0	74.5	108.5
Extension1	—	42.5	94.0	96.5	124.5
Extension2	—	54.5	110.0	112.5	140.5
Extension3	—	—	—	128.5	156.5

Table 3-8 Minimum Cache Memory Capacity Required for Shared Memory Function

(Unit: GiB)

Shared Memory Function	VSP G130	VSP G350 VSP F350	VSP G370 VSP F370	VSP G700 VSP F700	VSP G900 VSP F900
Base	32	64	128	128	256
Extension1	—	128	128	128	256
Extension2	—	128	256	256	256
Extension3	—	—	—	256	256

Figure 3-1 Maintenance Utility Setting Window (In Case of VSP G700, G900)



5. Cache capacity
The cache capacity is determined by the RAID level, the drives installed in the Storage System, whether Dynamic Provisioning (DP)/Dynamic Tiering (DT)/active flash/dedupe and compression/Universal Volume Manager (UVM) is applied/not applied so on.

The recommended cache capacity is determined by the Drives installed in the Storage System, whether DP/DT/active flash/UVM is applied/not applied etc.

(1) In the case of CLPR to which DP/DT/active flash is not applied
Install the recommended data cache capacity (or more) shown in the table below.

Table 3-9 Recommended Data Cache Capacity in Case DP/DT/active flash/DCR Is Not Applied

Total logical capacity of External volumes + Internal volumes per CLPR	Recommended data cache capacity per CLPR (*1)
Less than 4 TB	12 GB
4 TB or more	16 GB
16 TB or more	24 GB
48 TB or more	32 GB
96 TB or more	40 GB
160 TB or more	48 GB
240 TB or more	56 GB
360 TB or more	64 GB
600 TB or more	72 GB

*1: When the recommended capacity exceeds the maximum data cache capacity of each model, install the maximum capacity.

(2) In the case of CLPR to which DP, DT or active flash is applied
Install the recommended data cache capacity (or more) shown in the table below for CLPR in which DP, DT or active flash exists.

Table 3-10 Recommended Data Cache Capacity in Case DP, DT or active flash Is Applied

Total logical capacity of External volumes + Internal volumes per CLPR	Recommended data cache capacity per CLPR (*1)
Less than 16 TB	20 GB or more
16 TB or more	24 GB or more
48 TB or more	32 GB or more
96 TB or more	40 GB or more
160 TB or more	48 GB or more
240 TB or more	56 GB or more
360 TB or more	64 GB or more
600 TB or more	72 GB or more

*1: When the recommended capacity exceeds the maximum data cache capacity of each model, install the maximum capacity.

(3) In the case of CLPR to which dedupe and compression is applied
CLPR to which dedupe and compression is applied uses cache for management information on dedupe and compression. Therefore, it is recommended that you install the data cache capacity that is equal to the sum of (a) and (b).

(a) Recommended data cache capacity shown in the tables in (1) and (2)
(b) Total amount of used capacity of virtual volumes to which dedupe and compression is applied × 0.0025

(4) In the case of CLPP exclusively used for UVM
If the configuration of the concerned CLPR meets the conditions described in Table 3-11, you can apply the recommended data cache capacity shown in Table 3-12.

Table 3-11 CLPR for UVM Only

Conditions of CLPR for UVM
• One CLPR consists of only external volumes • Performance is not important • The cache mode of the mapped volumes is “Disable”

Table 3-12 Recommended Cache Memory Capacity of CLPR for UVM Only

Total logical capacity of external volumes in CLPR for UVM only	Recommended cache capacity of CLPR for UVM only
Less than 128 TB	4 GB
128 TB or more	8 GB

6. Total Cache Memory Capacity

The total cache memory capacity is determined by the shared memory function and the required data cache memory (data CM) capacity. The relation between the total cache memory capacity and the data cache memory capacity, for each shared memory function, is shown in Table 3-13 through Table 3-17.

Table 3-13 Reference Table of Total Cache Memory Capacity (VSP G130)

(Unit: GiB)

Shared Memory Function	Data Cache Memory Capacity	Cache Memory Capacity
Base	~ 8.75	32

Table 3-14 Reference Table of Total Cache Memory Capacity (VSP G350, VSP F350)

(Unit: GiB)

Shared Memory Function	Data Cache Memory Capacity	Cache Memory Capacity
Base	~ 27	64
	~ 90.75	128
Extension1	~ 82.25	128
Extension2	~ 70.25	128

Table 3-15 Reference Table of Total Cache Memory Capacity (VSP G370, VSP F370)

(Unit: GiB)

Shared Memory Function	Data Cache Memory Capacity	Cache Memory Capacity
Base	~ 52	128
	~ 179.5	256
Extension1	~ 30	128
	~ 157.5	256
Extension2	~ 141.5	256

Table 3-16 Reference Table of Total Cache Memory Capacity (VSP G700, VSP F700)

(Unit: GiB)

Shared Memory Function	Data Cache Memory Capacity	Cache Memory Capacity
Base	~ 47.5	128
	~ 175	256
	~ 430	512
Extension1	~ 25.5	128
	~ 153	256
	~ 408	512
Extension2	~ 137	256
	~ 392	512
Extension3	~ 121.25	256
	~ 376.25	512

Table 3-17 Reference Table of Total Cache Memory Capacity (VSP G900, VSP F900)

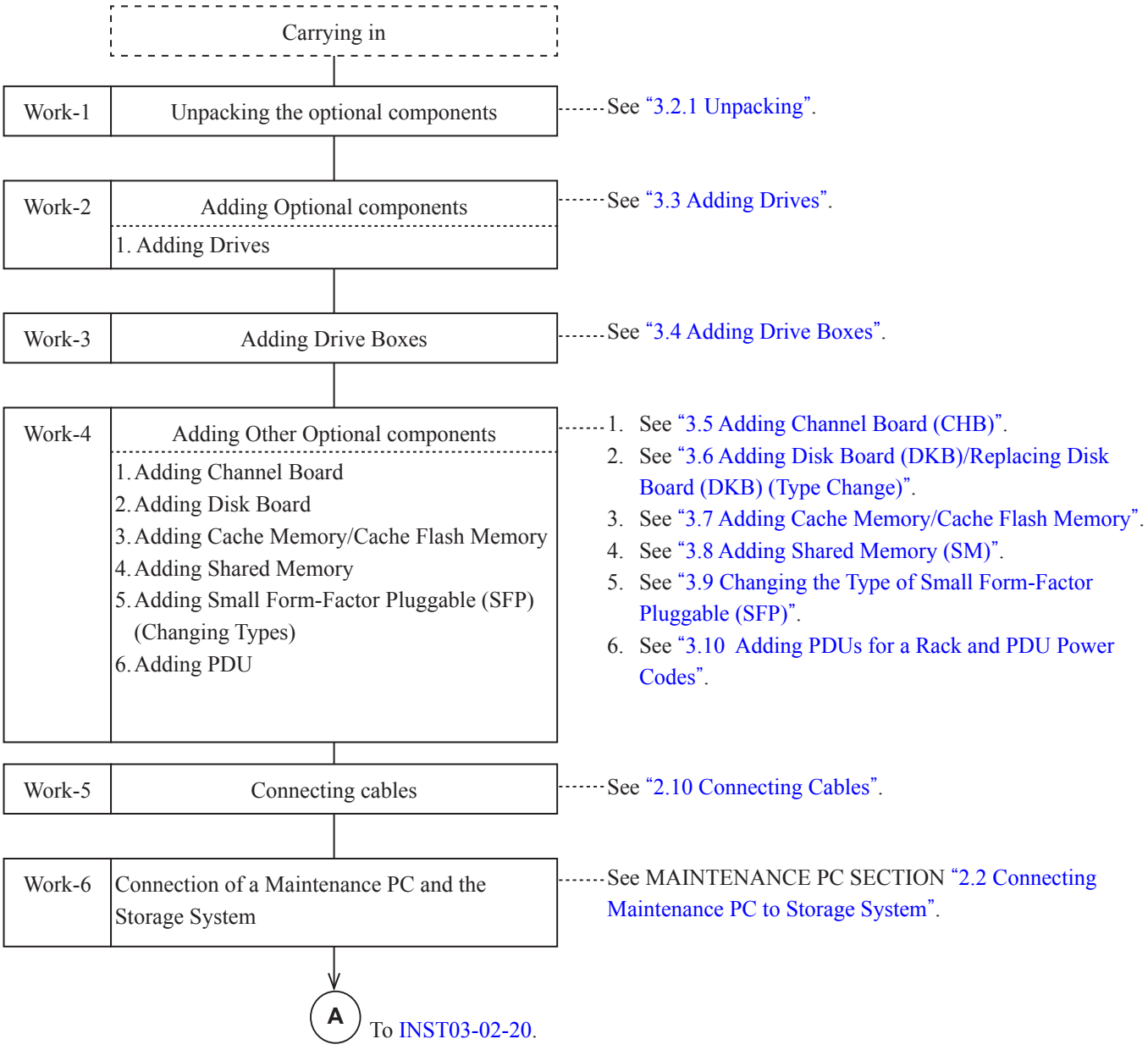
(Unit: GiB)

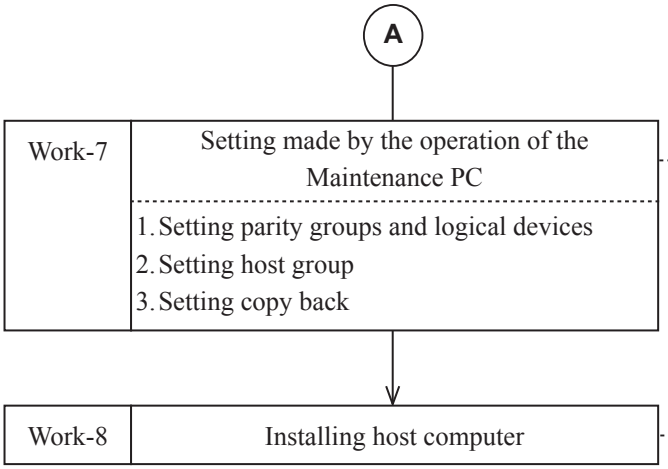
Shared Memory Function	Data Cache Memory Capacity	Cache Memory Capacity
Base	~ 138	256
	~ 393	512
	~ 903	1024
Extension1	~ 122.25	256
	~ 377.25	512
	~ 887.25	1024
Extension2	~ 106.25	256
	~ 361.25	512
	~ 871.25	1024
Extension3	~ 90.25	256
	~ 345.25	512
	~ 855.25	1024

3.2 Procedures for Adding Optional Component

1. Procedure for adding optional components online

NOTE : • For safety use, always close the Front Bezel after the operation.
• Service personnel must check if a customer has backed up user data.
If the customer does not perform the backup, start the work after getting customer's permission.



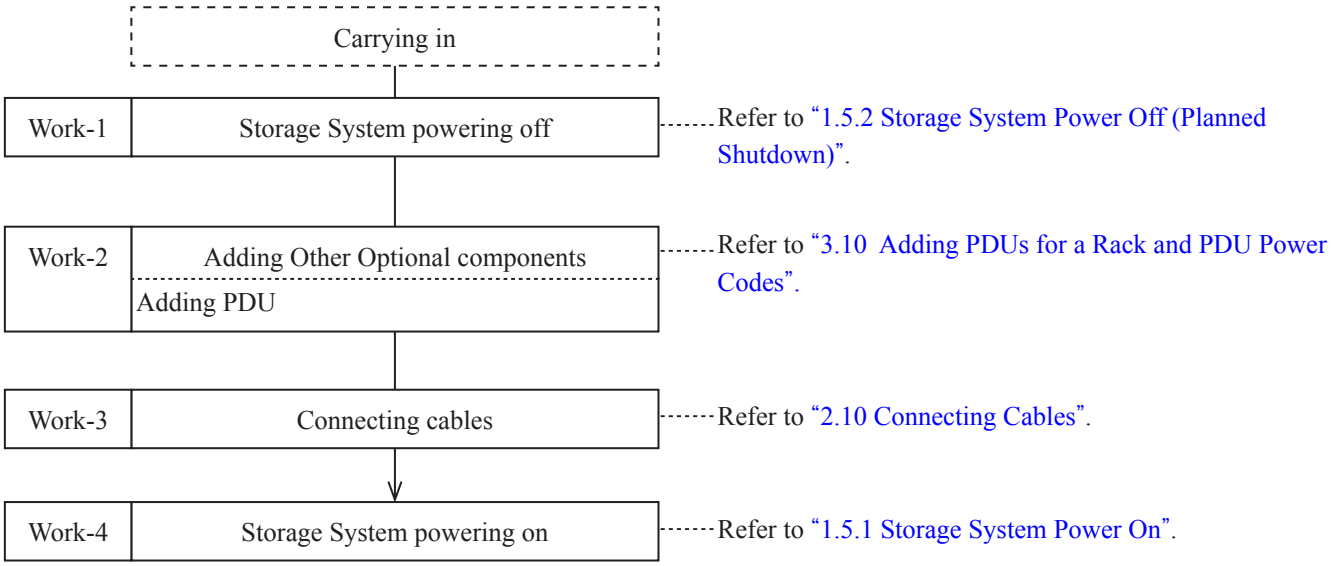


1. Refer to MAINTENANCE PC SECTION “4.2 Managing Drives”.
2. Refer to MAINTENANCE PC SECTION “4.1.4 Configuring a Host Group or iSCSI Target”.
3. Refer to .MAINTENANCE PC SECTION “4.6 Copy Back Setting”.

Refer to manual of each host computer.

2. Procedure for adding the optional components offline

NOTE : For the powering off procedure, refer to "1.5.2 Storage System Power Off (Planned Shutdown)".



3. Tool for optional addition work

Table 3-18 Tool for Optional Work

Division	Tool names	Specification	Rackmount Model (RKU rack frame)
Tool	Special lifter	−	○
	Phillips screwdriver	No.2	○
	Allen wrench	No.3	−
	Allen wrench	No.4	○
	Allen wrench	No.5	○
	Allen wrench	No.6	○
	Spanner	No.8	−
	Spanner	No.13	−
	Spanner	No.22	○
Tool of other	Wrist strap	−	○
	LAN cross cable	Category 5	○
	Maintenance PC (*1)	−	○

*1 : More than or equal to 50 G bytes of free space on the hard disk

For the usage of the tools for adding optional components, refer to the chapter for each type.

3.2.1 Unpacking

NOTE :
- Unpack it indoors.
  Especially, do not unpack it in such places with the outdoor dust, the direct sunlight, and the infiltration of rainwater.
- 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 part that remains at high or low temperature in transport is installed in the Storage System, it may not operate normally.

1. Checking exterior of optional component.
   Check the exterior of each component visually for distortion or damage owing to transport.

2. Checking contents of package.
   Check if the contents of the package (their model names, product serial numbers, and quantities) agree with those in the packing list shipped with the Storage System.

3.3 Adding Drives

3.3.1 Before Adding Drives

NOTE : See OPTION & FIRMWARE VERSION SECTION "1. Relationship between Option and Firmware Version" and check that drives to be added are supported by the Storage System model and firmware version.

NOTE : The Controller Chassis, CBXSS, CBXSL, CBSS and CBSL, can add Drives. CBLH1 and CBLH2 cannot add Drives.

1. Connecting the Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding the Drives, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

---

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

---

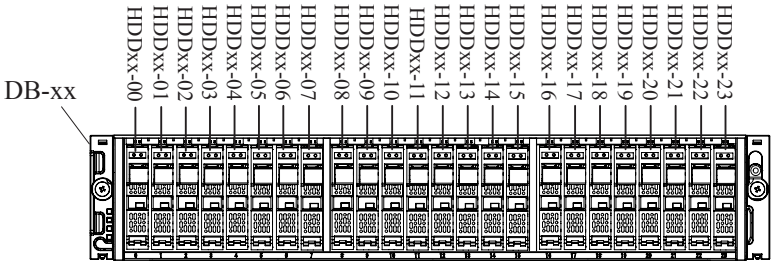
3. Remove the Front Bezel. (Refer to "1.4.1 How to Attach/Remove the Front Bezel".)
   In case of DB60 Pull out from the rack and remove the top cover. (Refer to "1.4.1.3 In Case of DB60".)

4. Checking the Drives

Table 3-19 List of Mountable Drive Model Names

No.	Locations	Model Number	Model Name	Remarks
1	CBXSS/CBSS/ DBS	DKC-F810I-600JCMC DKC-F810I-1R2JCMC DKC-F810I-2R4JGM DKC-F810I-480MGM DKC-F810I-960MGM DKC-F810I-1R9MGM DKC-F810I-3R8MGM DKC-F810I-7R6MGM DKC-F810I-15RMGM	Disk Drive	–
2	CBXSL/CBSL/ DBL	DKC-F810I-6R0H9M DKC-F810I-10RH9M	Disk Drive	–
3	DB60	DKC-F810I-1R2J7MC DKC-F810I-2R4J8M DKC-F810I-6R0HLM DKC-F810I-10RHLM	Disk Drive	–
4	DBF	DKC-F810I-3R2FN DKC-F810I-7R0FP DKC-F810I-14RFP	Flash Module Drive	–

Figure 3-2 Drive Mounting Location (CBXSS/CBSS/DBS)



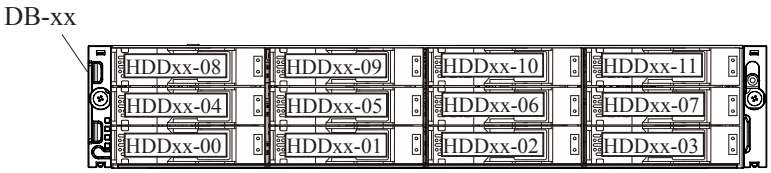
Front view

*1 : The name in parentheses in the Maintenance PC messages shows HDDxx-yy here.

*2 : DB-xx

└→ DB No. (00, 01, 02, ..., 47)

Figure 3-3 Drive Mounting Location (CBXSL/CBSL/DBL)



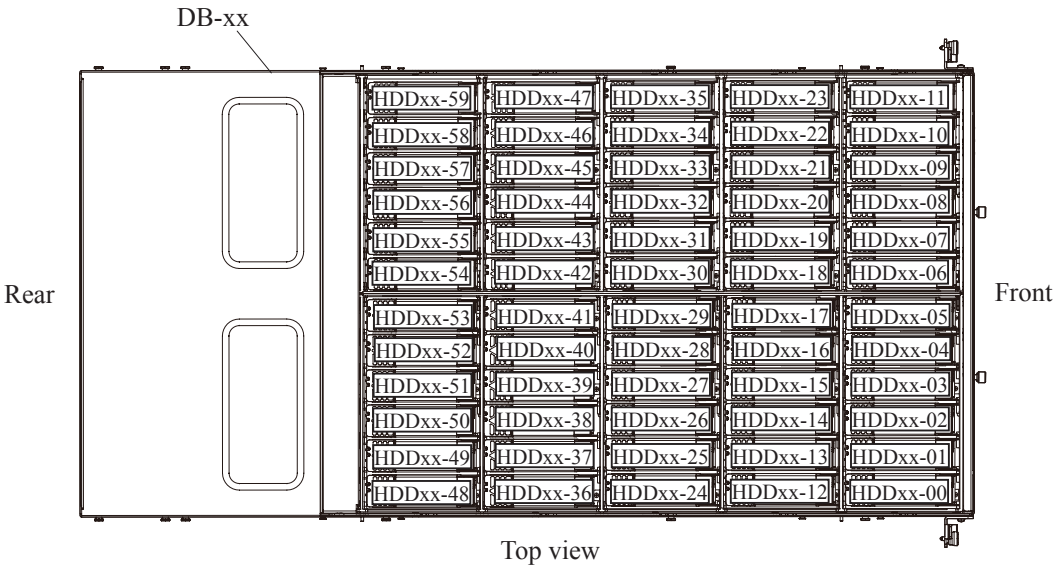
Front view

*1 : The name in parentheses in the Maintenance PC messages shows HDDxx-yy here.

*2 : DB-xx

└→ DB No. (00, 01, 02, ..., 47)

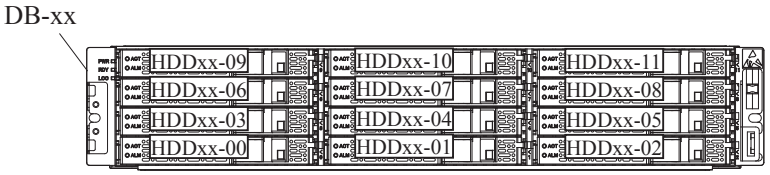
Figure 3-4 Drive Mounting Location (DB60)



Top view

*1 : The name in parentheses in the Maintenance PC messages shows HDDxx-yy here.
*2 : DB-xx
└→ DB No. (00, 01, 02, ..., 23)

Figure 3-5 Drive Mounting Location (DBF)



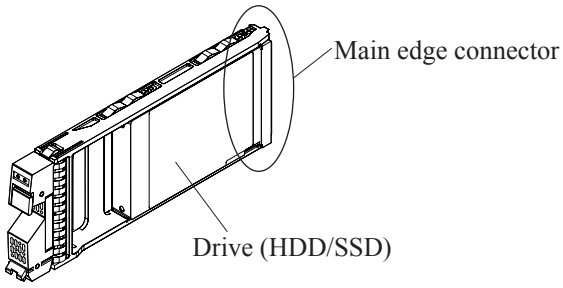
Front view

*1 : The name in parentheses in the Maintenance PC messages shows HDDxx-yy here.
*2 : DB-xx
└→ DB No. (00, 01, 02, ..., 46)

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 "1.1.2 Note when Installing and Removing Parts".

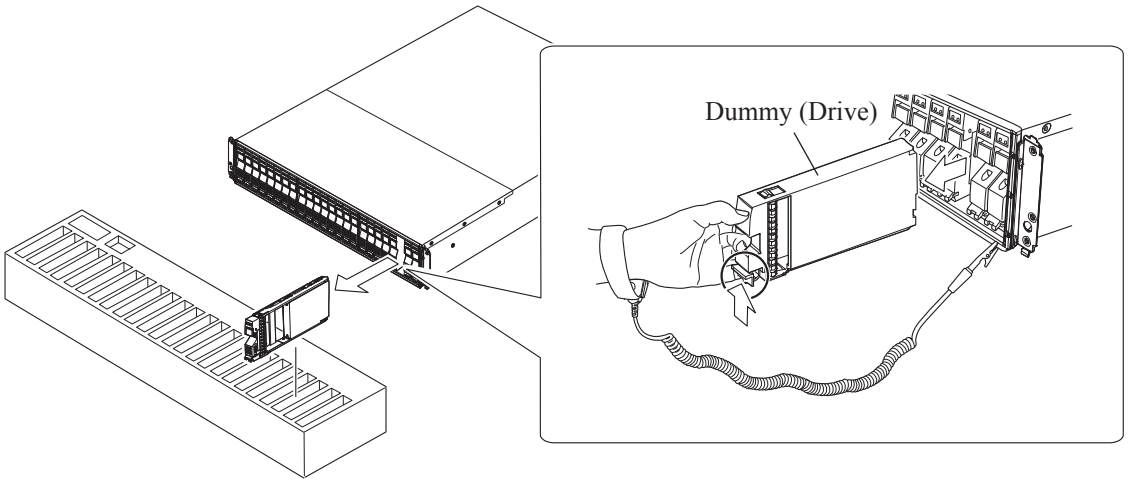
3.3.2 Adding Work of Drives

NOTICE: Check that the main edge connector of the Drive (HDD/SSD) has no deformation, damage or sticking of dust before installing the Drive.



1. Adding Drives for CBXSS/CBSS/DBS
   (1) Removing dummy (Drive).
   Remove the dummy (Drives) from the slots to which Drives are added.

Figure 3-6 Removing Dummy (Drive) (CBXSS/CBSS/DBS)



(2) Installing Drives.

NOTICE: Since the Drive is a precision component, handle it very carefully not to apply a vibration or shock to it.

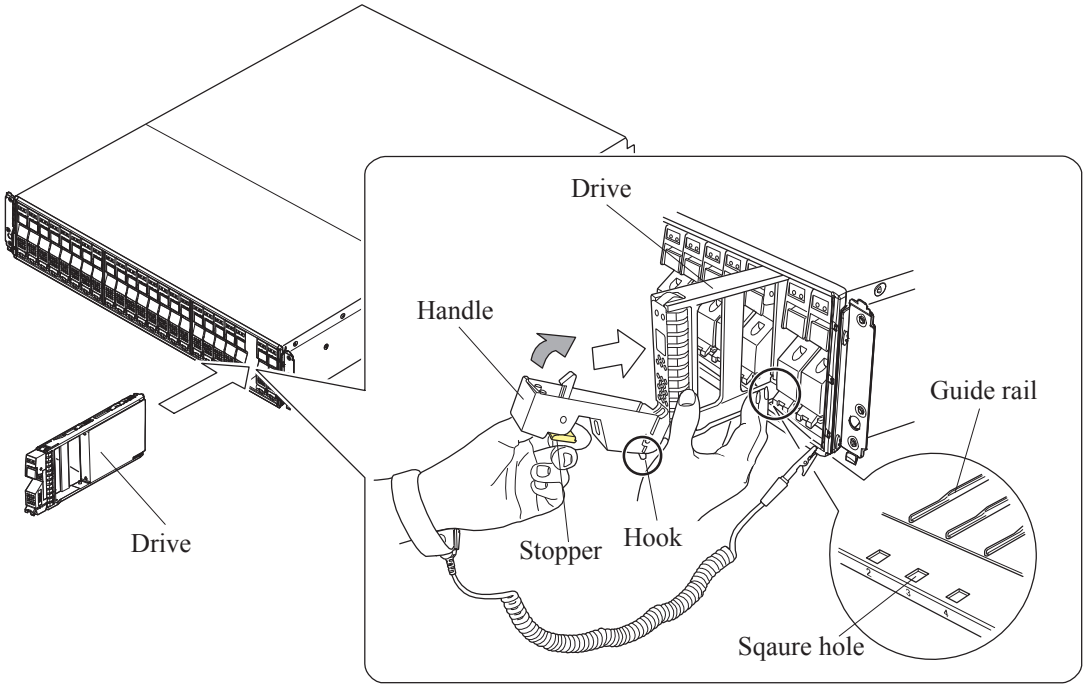
(a) Fit the Drive in the guide rail and slide it in the direction shown by the arrow not to give a shock.
(b) Push the Drive in until it reaches the position where a hook of the handle can be entered into the square hole at the lower part of a frame on the front side of the Drive Box.
(c) Close the opened stopper,and then press the stopper to lock.

NOTE : If the handle is closed in the state in which its hook cannot be entered into the square hole, the Drive cannot be installed correctly because it runs into the frame of the Storage System.

(d) Pull the handle lightly to make sure that the Drive cannot be pulled out.

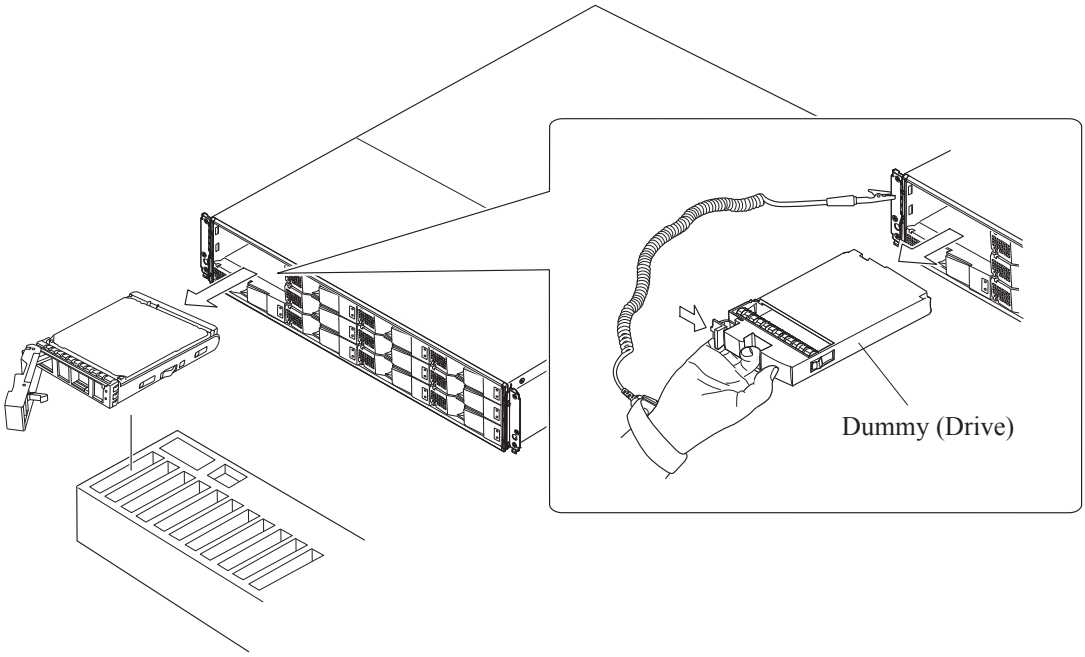
NOTE : At this time. ACT LED (green) of the drive may slightly light. However it is acceptable.

Figure 3-7 Installing the Drive (CBXSS/CBSS/DBS)



2. Adding Drives for CBXSL/CBSL/DBL
   (1) Removing dummy (Drive).
   Remove the dummies (Drives) from the slots to which the Drives are added.

Figure 3-8 Removing Dummy (Drive) (CBXSL/CBSL/DBL)



(2) Installing Drives.

NOTICE: Since the Drive is a precision component, handle it very carefully not to apply a vibration or shock to it.

NOTE : When handling the Drive, hold the rail side because the SHIELD SPRING is subject to breakage.

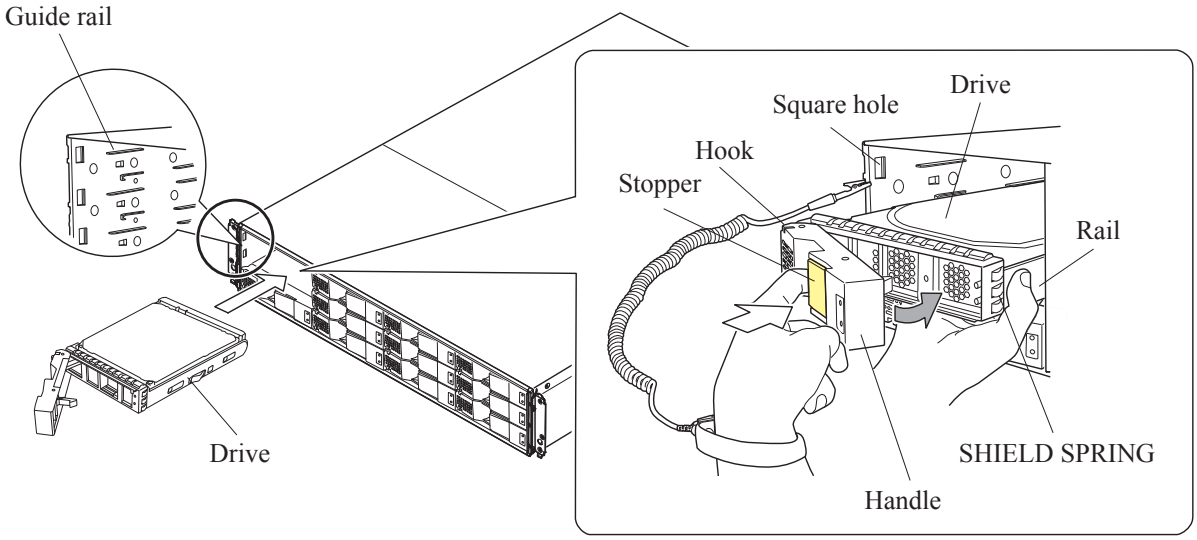
(a) Open the handle fully, fit the Drive in the guide rail and slide it in the direction shown by the arrow not to give a shock.
(b) Push it in until it reaches the position where a hook of the handle can be entered into the square hole on the frame.
(c) Pull the stopper lightly and close the handle, and then have the lock on by pressing the stopper.

NOTE : If the handle is closed in the state in which its hook cannot be entered into the square hole, the Drive cannot be installed correctly because it runs into the frame of the Storage System.

(d) Pull the handle lightly to make sure that the Drive cannot be pulled out.

NOTE : At this time. ACT LED (green) of the drive may slightly light. However it is acceptable.

Figure 3-9 Installing the Drive (CBXSL/CBSL/DBL)



3. Adding Drives for DB60

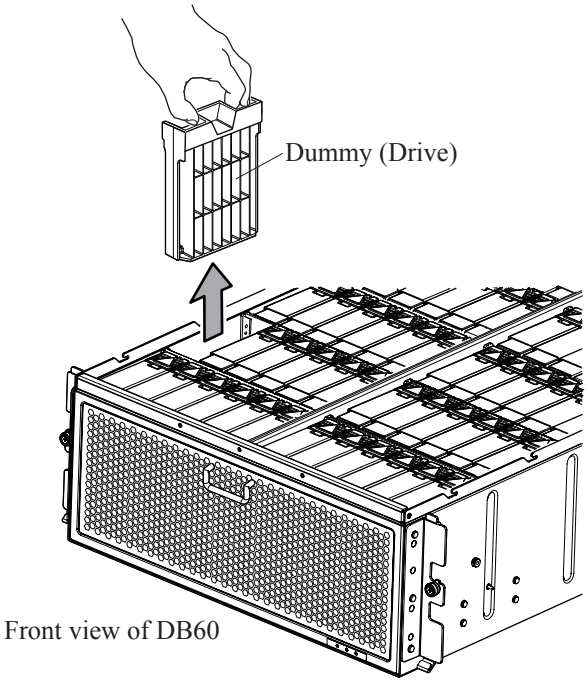
⚠ CAUTION

- Be careful of the workers on the other side when pulling out or storing the DB60.
- Do not pull out multiple DB60s at a time because the rack may fall over.
- Do not put objects on the DB60 which has been pulled out of the rack or use it as working space because the rack may fall over.

(1) Pull the DB60 out of the rack, and remove the top cover. (Refer to "1.4.1.3 In Case of DB60".)

(2) Remove dummy (Drive).
Remove the dummies (Drives) from the slots to which the Drives are added.

Figure 3-10 Removing Dummy (Drive) (DB60)



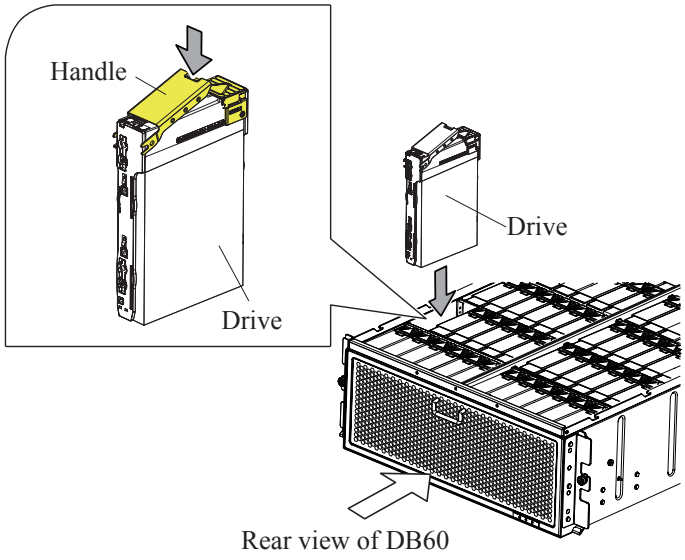
(3) Installing Drives.

NOTICE:	Since the Drive is a precision component, handle it very carefully not to apply a vibration or shock to it.

(a) Open the handle fully and slide the Drive gently to the arrow direction.
(b) Push the handle to lock until it clicks.
(c) Pull the handle lightly to make sure that the Drive cannot be pulled out.

NOTE : At this time. ACT LED (green) of the drive may slightly light. However it is acceptable.

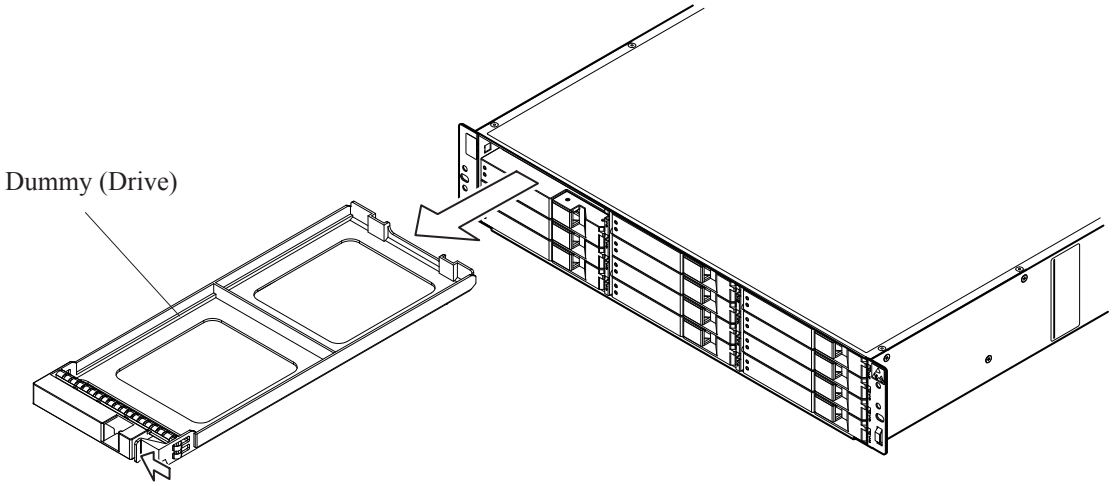
Figure 3-11 Installing the Drive (DB60)



(4) Attach the cover on the top of the DB60 and return it to the rack (refer to "1.4.1.3 In Case of DB60").

4. Adding Drives for DBF
   (1) Remove dummy (Drive).
   Remove the dummies (Drives) from the slots to which Drives are added.

Figure 3-12 Remove Dummy (Drive) (DBF)



(2) Installing Drives.

NOTICE: Since the Drive is a precision component, handle it very carefully not to apply a vibration or shock to it.

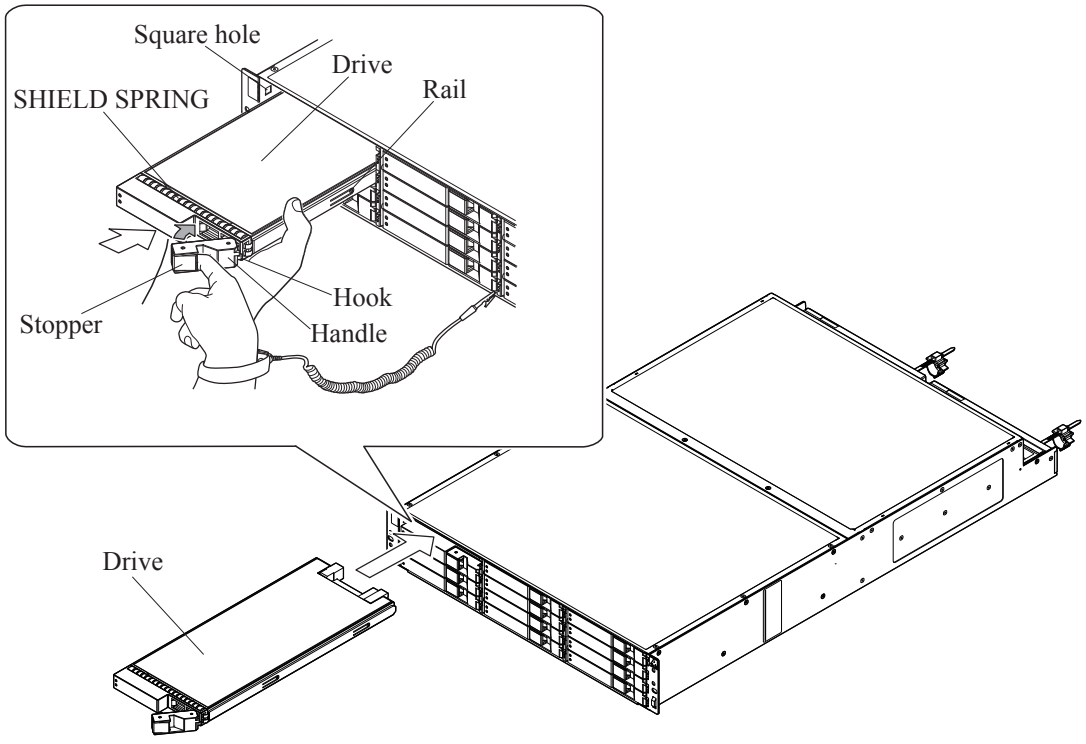
NOTE : When handling the Drive, hold the rail side because the SHIELD SPRING is subject to breakage.

(a) Open the handle fully, fit the Drive in the guide rail and slide it in the direction shown by the arrow not to give a shock.
(b) Push the Drive in until it reaches the position where a hook of the handle can be entered into the square hole at the lower part of a frame on the front side of the Drive Box.
(c) Close the opened stopper, and then press the stopper to lock.

NOTE : If the handle is closed in the state in which its hook cannot be entered into the square hole, the Drive cannot be installed correctly because it runs into the frame of the Storage System.

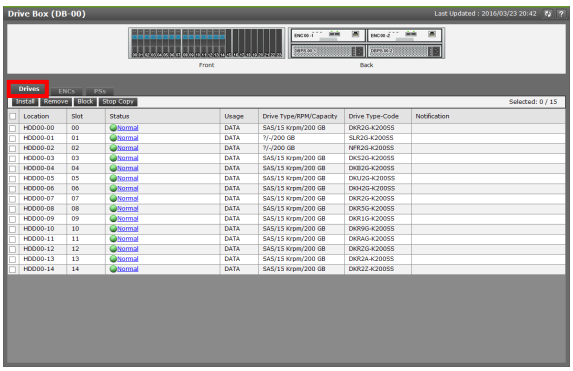
(d) Pull the handle lightly to make sure that the Drive cannot be pulled out.

Figure 3-13 Installing the Drive (DBF)



3.3.3 Recognizing Drives by Maintenance Utility

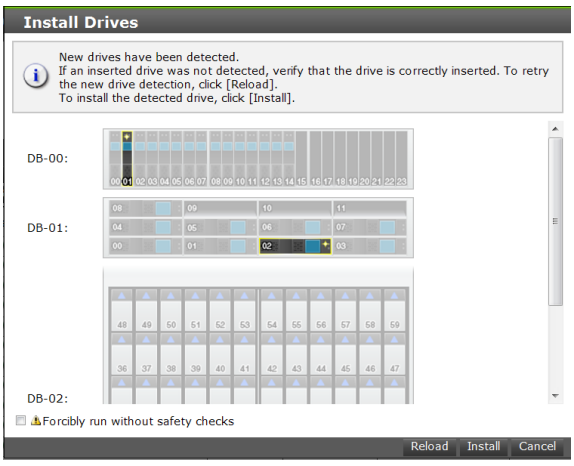
1. <Select Drive Addition Chassis>
   Select the Controller Chassis or the Drive Box that added the Drives from Display Item Selection Panel. Click the [Drives] tab and then the [Install] button.



2. <Drive Detection Window>

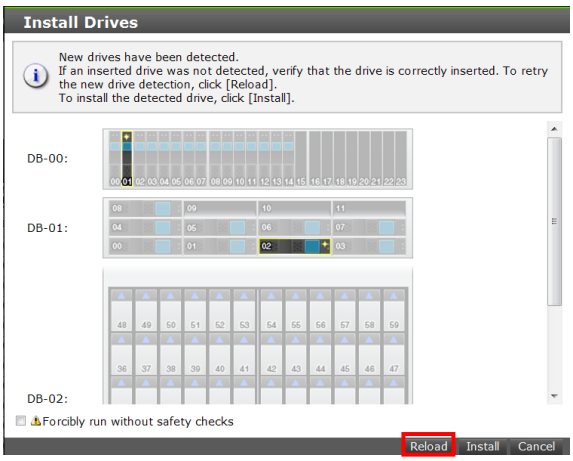
> **⚠ CAUTION**
>
> About "Forcibly run without safety checks":
> If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

When the added Drives are detected, the following window is displayed.



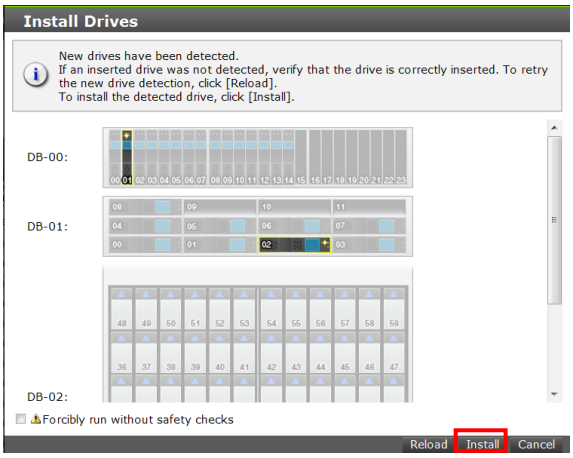
3. <Continued Addition>
To continue adding Drives, perform the Drive addition work (refer to "3.3.2 Adding Work of Drives"), check the slot positions of the added Drives and click the [Reload] button. If the addition positions are incorrect, re-install the Drives in the correct positions and click the [Reload] button.

NOTE : Check that the LEDs on the Drives to be re-installed go out.



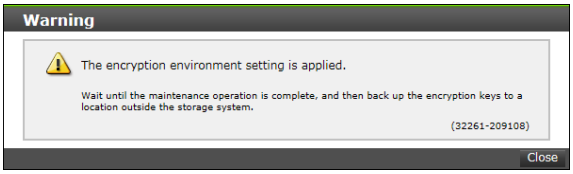
4. <Execute Addition>
Mount all the Drives to be added and click the [Install] button.

NOTE : The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



5. <Check Addition Completion>
   Check that the following message is displayed and click the [Close] button.
   If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.

6. <Check back up the encryption key Messages>
   When the encryption environment is applied, the following message is displayed.
   Check the message and click the [Close] button.



7. Click the refresh button to have the latest information displayed on the Maintenance Utility main window, and then check that the added Drives and the Storage System are Normal.

8. Attach the Front Bezel. (See “1.4.1 How to Attach/Remove the Front Bezel”.)
   In case of DB60, attach the cover and return it to the rack. (See “1.4.1.3 In Case of DB60”.)

9. Click the [Logout] button to close the window.

10. Disconnecting the Maintenance PC and the Storage System.
    Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION “2.8.3 Disconnecting the Maintenance PC from the Storage System”.

11. Back up the encryption key
    If the message is displayed in Step 6, ask your customer to back up the encryption key using Storage Navigator (refer to Encryption License Key User Guide).

    NOTE: When a message is not displayed in Step 6, this procedure is not required.

3.4 Adding Drive Boxes

Perform this work after confirming the following precautions.

NOTICE:
- Check that no Drive is installed in the Drive Boxes to be installed.
- If the Drives are installed, remove them.
- DBS is the Drive Box that can be added to VSP F350 and F370.
- DBS and DBF are the Drive Box that can be added to VSP F700 and F900.

3.4.1 Estimated Work Time

The estimated working hours for Adding Drive Boxes are the total of the following A, B, C, D, and E.

Table 3-20 Estimated Working Hours for Adding Drive Boxes

	Addition type	Process	Estimated work time	Remarks
A	Chassis	Chassis installation time	DBS/DBL/DBF: 60min DB60: 120 min	−
B		Firmware processing time (path)	90 sec × (The number of existing chassis + number of additional chassis)	(*1)
C	HDD	HDD installation time	1 min / 1 HDD	−
D		Firmware processing time (HDD)	• In case of DBS: 30 seconds up to 16, 45 seconds up to 23, 60 seconds up to 24. • In case of DBL/DBF: 40 seconds up to 8, 60 seconds up to 11, 80 seconds up to 12. • In case of DB60: 40 seconds up to 21, 60 seconds up to 38, 80 seconds up to 51, 100 seconds up to 60.	−
E		LDEV Formatting time	See THEORY OF OPERATION SECTION "2.3 Logical Volume Formatting".	−

*1: The number of paths of each model is as shown below.
VSP G130, G350, G370: One path
VSP G700: Four paths
VSP G900: Four paths or eight paths (when using one Disk Board option (eight paths), and the firmware processing time includes the time for replacing the firmware)

3.4.2 Parts List

3.4.2.1 DW-F800-DBSC

Table 3-21 Parts List of DW-F800-DBSC

Item No.	Part Name	Part No.	Quantity	Remarks
1	SFF Drive Box	3290953-E	1	—
2	Front Bezel	5560002-A	1	—
3	Bracket (L)	3282470-1	1	—
4	Bracket (R)	3290548-101	1	—
5	Side Bezel (L)	2855177-1	1	—
6	Side Bezel (R)	2855176-1	1	—
7	Binding screw (M5 x 10)	SB510N	5	—
8	Key	—	2	Key No. T750
9	Repeat Binder	5409042-1	2	100 mm, Color: Black
10	Binder	5532297-1	2	292 mm, Color: White
11	Binder (OMEGA LOCK)	5552817-1	4	—

When adding DBS, execute “3.4.3 Adding Drive Boxes (DW-F800-DBSC/DBLC)”.

3.4.2.2 DW-F800-DBLC

Table 3-22 Parts List of DW-F800-DBLC

Item No.	Part Name	Part No.	Quantity	Remarks
1	LFF Drive Box	3290953-D	1	—
2	Front Bezel	5560002-A	1	—
3	Bracket (L)	3282470-1	1	—
4	Bracket (R)	3290548-101	1	—
5	Side Bezel (L)	2855177-1	1	—
6	Side Bezel (R)	2855176-1	1	—
7	Binding screw (M5 x 10)	SB510N	5	—
8	Key	—	2	Key No. T750
9	Repeat Binder	5409042-1	2	100 mm, Color: Black
10	Binder	5532297-1	2	292 mm, Color: White
11	Binder (OMEGA LOCK)	5552817-1	4	—

When adding DBL, execute “3.4.3 Adding Drive Boxes (DW-F800-DBSC/DBLC)”.

3.4.2.3 DW-F800-DB60C

Table 3-23 Parts List of DW-F800-DB60C

Item No.	Part Name	Part No.	Quantity	Remarks
1	Drive Box	3289096-A	1	—
2	DB60-Rail	3289061-A	1	Rail
3	CMA	3285498-R	1	CMA
4	Clamp Tape	3285498-R	12	—
5	Repeat Binder	5409042-3	2	250mm, Color: Black
6	Binder	5532297-1	4	292mm, Color: White
7	Accessory Bracket	3289061-A	2	(*1)
8	Cage Nut	3289061-A	5	(*1)
9	Rack Nut	3289061-A	5	(*1)
10	Hex Head Flange Screw	3289061-A	5	(*1)
11	Truss Head Screw	3289061-A	5	(*1)
12	Front Bezel	5560139-A	1	—
13	Flange (L)	3290550-1	1	Plate (L)
14	Flange (R)	3290549-1	1	Plate (R)
15	Side Cover (L)	2856458-1	1	—
16	Side Cover (R)	2856459-1	1	—
17	Screw	SB306N	4	—
18	Key	3276491-1	2	—
19	SAS Cable	3290632-A	2	—

*1: These parts are put in one plastic bag.

When adding DB60, execute “3.4.4 Adding Drive Boxes (DW-F800-DB60C)”.

3.4.2.4 DW-F800-DBF

Table 3-24 Parts List of DW-F800-DBF

Item No.	Part Name	Part No.	Quantity	Remarks
1	Drive Box (DBF)	2854522-B	1	—
2	Front Bezel	3286660-A	1	—
3	Side cover	3286646-001	1	—
4	Plate	5550593-001	1	—
5	Key	—	2	Key No. T750
6	Binder (omega lock)	5552817-001	4	—
7	Binder	5532297-001	2	292 mm, Color: White
8	Repeat Binder	5409042-001	2	100 mm, Color: Black

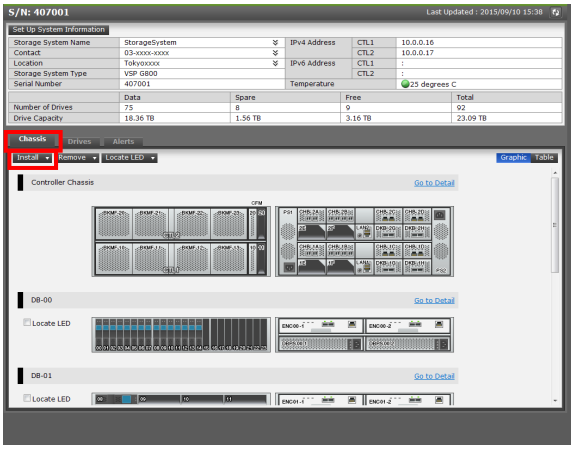
When adding DBF execute, see “3.4.5 Adding Flash Module Drive Boxes (DW-F800-DBF)”.

3.4.3 Adding Drive Boxes (DW-F800-DBSC/DBLC)

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding the Drive Boxes, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

3. Instructing to start addition by Maintenance Utility
   (1) <Main Window>
   Click the [Chassis] tab in the main window and click the [Install] button. For CBLH2, click the [Install] button and select [Drive Box].



(2) <Set Number of Drive Boxes/Types>

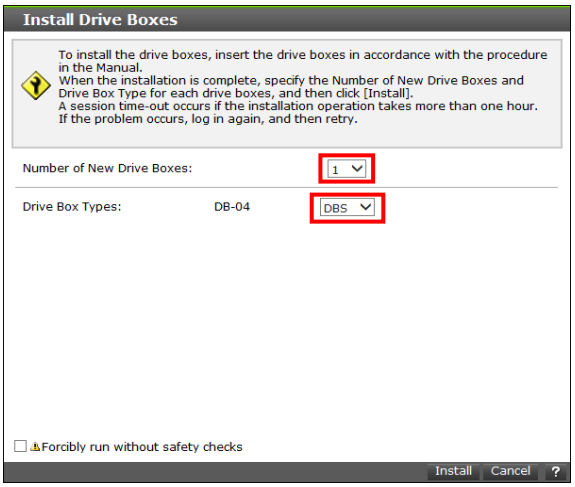
⚠ CAUTION

About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

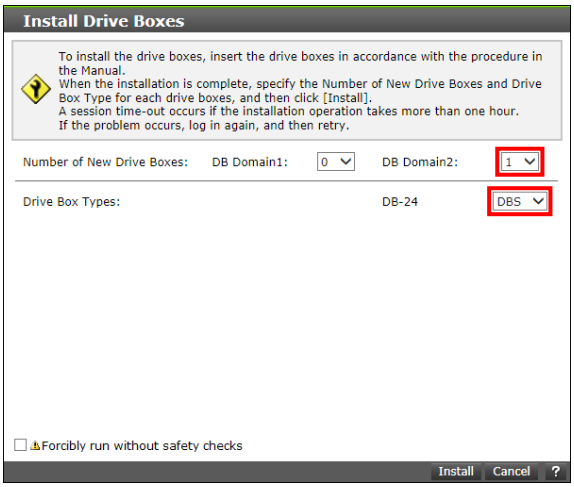
Set the number of Drive Boxes to be added and the types.
When the Controller Chassis is a CBLH1, input columns of the DB Domain 1 and DB Domain 2. Loop are displayed in the location of the Number of New Drive Boxes in the window.
When the Controller Chassis is a CBLH2, input columns of the Basic Loop and Ext. Loop are displayed in the location of the Number of New Drive Boxes in the window.
When connecting the Drive Box to be added to the optional Disk Board (1E/2E or 1F/2F), be sure to input the number and type of the Drive Box to be added to the Ext. Loop.

NOTE : Do not click the [Install] button at this time.
Click the [Install] button after completing the addition work.

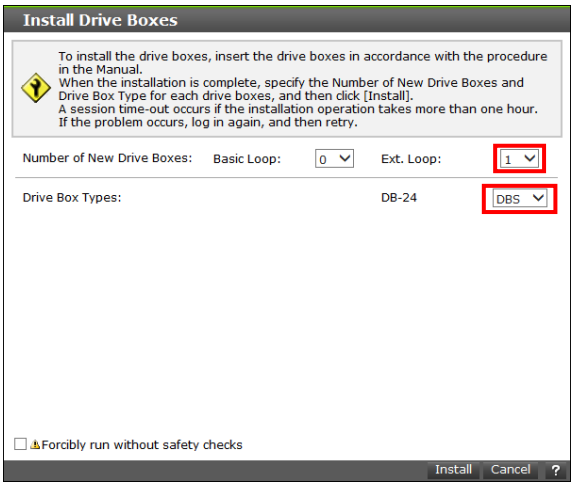
• When Controller Chassis is CBXSS, CBXSL, CBSS or CBSL



• When Controller Chassis is CBLH1



• When Controller Chassis
is CBLH2

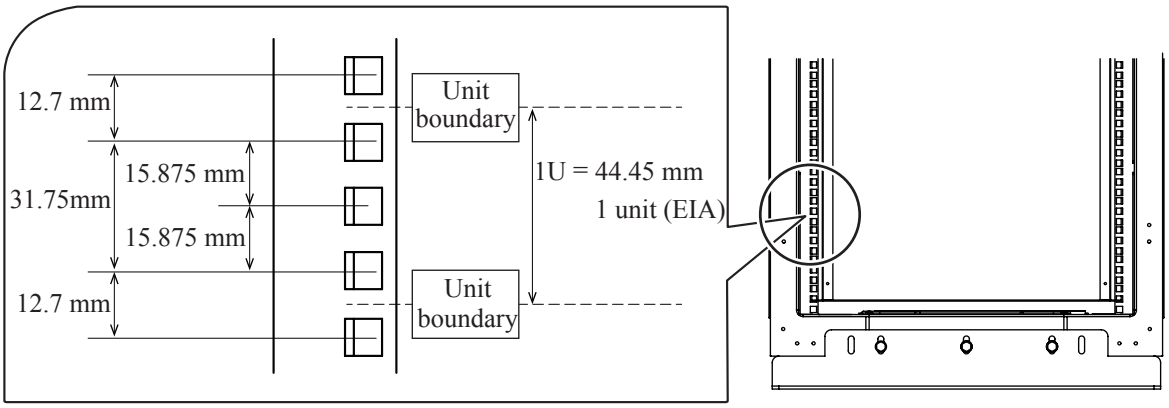


4. Checking the installation location

EIA units and intervals of mounting holes of RKU rack frame conforming to EIA standard

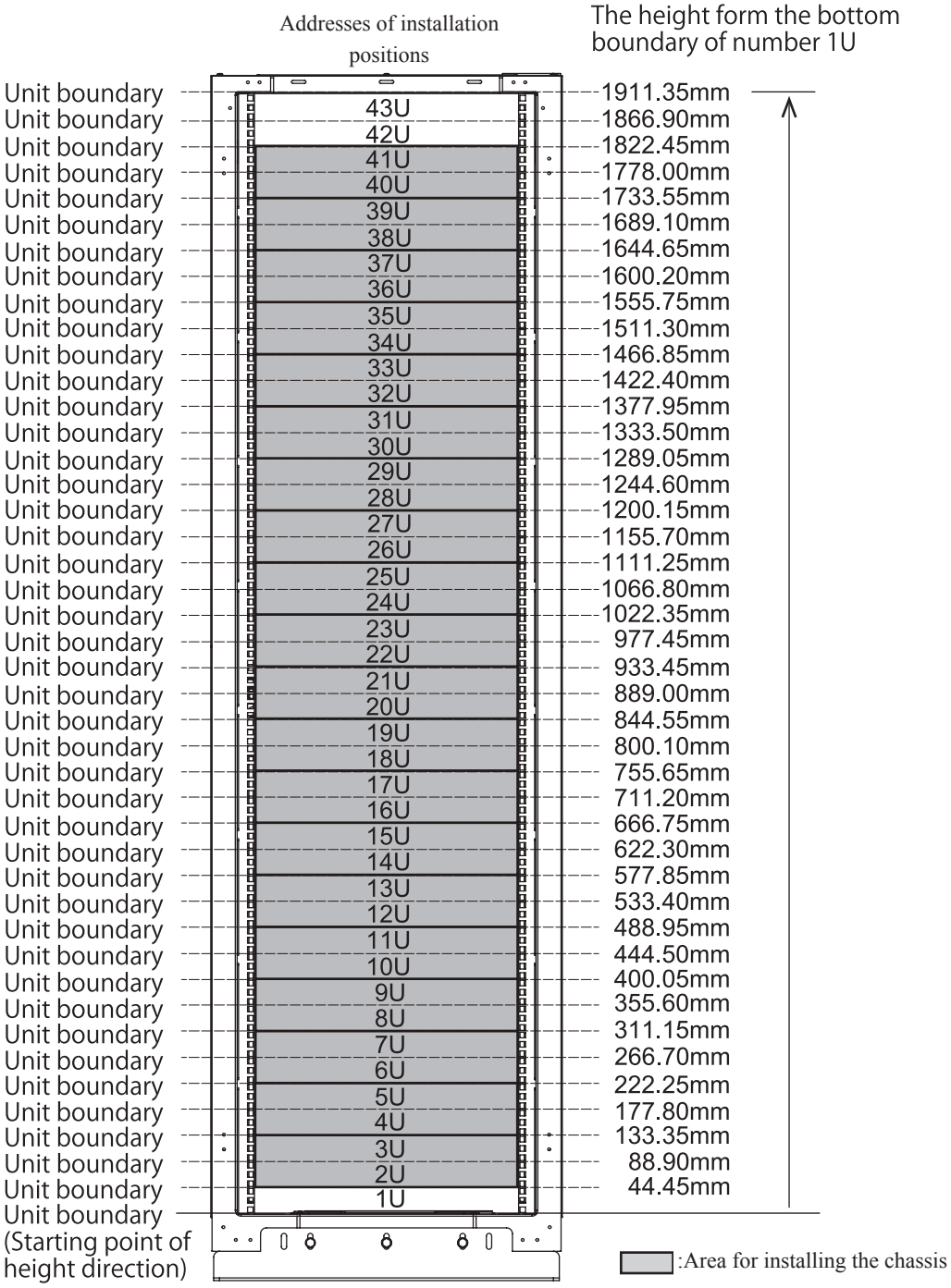
- A unit (U) space conforming to EIA standard is 44.45 mm as shown in the figure below.
- The boundary of the unit falls on the middle of the interval of 12.7mm.
  The boundary of the unit (1 U/1 EIA) is from the center of the interval of 12.7 mm to the center of the next interval of 12.7 mm.
- For rack, hole size for rack installation is determined based on the EIA standard.
  Hole size for rack installation :
  Universal intervals: Repeat of 44.45 mm (15.875 mm + 15.875 mm + 12.7 mm)

Figure 3-14 Attachment Hole Size of Rack



The addresses are called unit (EIA) numbers and given as 1, 2, 3, and so on counted from the bottom of the rack frame.
The following figures show a layout example of installing Drive Box (DW-F800-DBSC/DBLC) in 43 units rack frame. However, installing positions of Drive Box may differ according to the construction within the rack frame.

Figure 3-15 Mounting Position of Drive Box



5. Installing rails

The rail install procedure is different depending on the hole shape (circular or square hole) on the rack. Check the holes on the rack before the installation work.

(1) Remove positioning pin ① from the front of the rail (only when it is installed).

(2) When the length of the rail needs to be adjusted to fit a rack to be used, remove the screw and nut, adjust the rail length, and then install them again.
When the length of the rail does not need to be adjusted or when the rail is installed in the RKU rack, leave the screw and nut as they are and go to Step (3).

(3) When the rack installation hole is circular replace positioning pin ② with the supplied pin screw (ϕ 6.8 head screw).
When the rack installation hole is rectangular go to Step (4) (remain the guide screw (ϕ 9.2 head screw) as is).

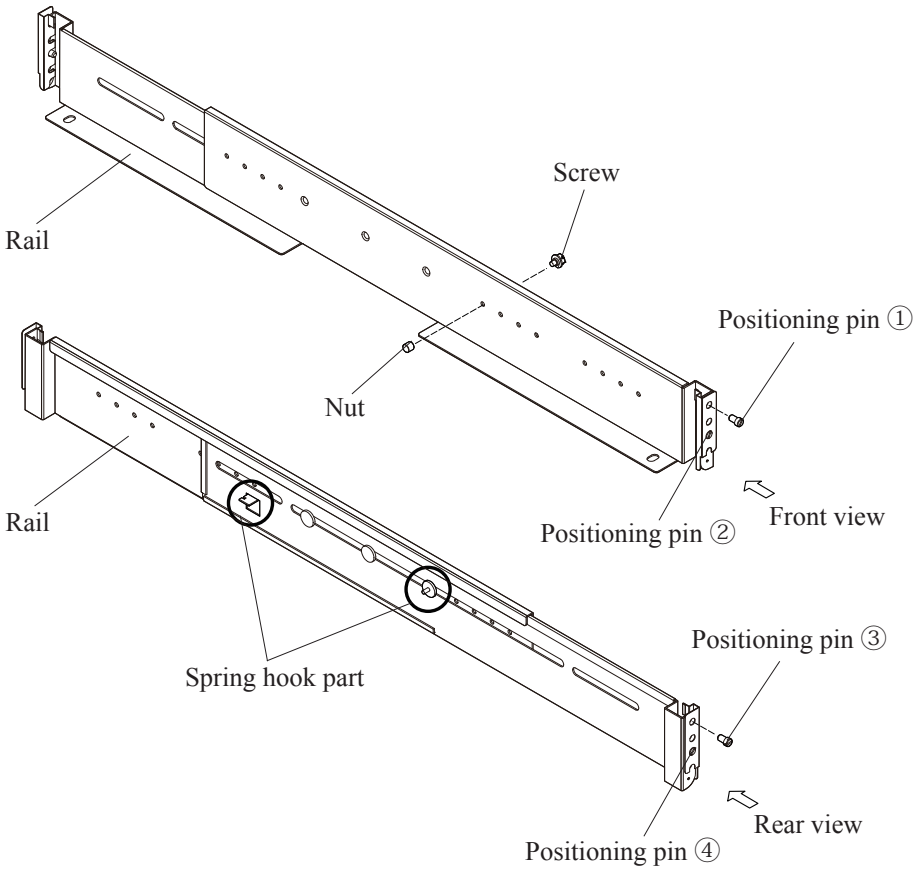
(4) Remove positioning pin ③ from the rear of the rail (only when it is installed).

(5) When the rack installation hole is circular replace positioning pin ④ with the supplied pin screw (ϕ 6.8 head screw).
When the rack installation hole is rectangular go to Step (6) (remain the guide screw (ϕ 9.2 head screw) as is).

(6) Hook the supplied spring on the spring hook part on the rear of the rail (the direction is not required).

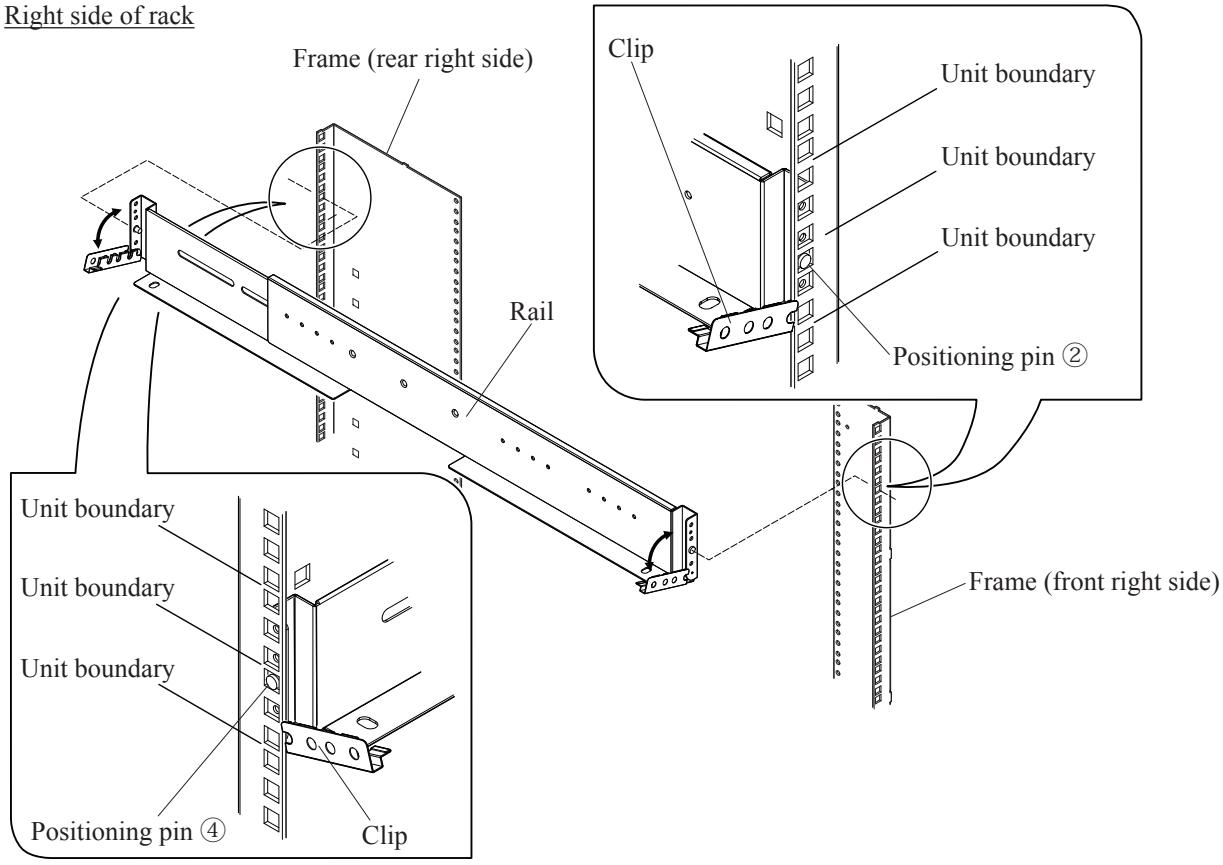
(7) Work on the left rail in the similar procedure.

Figure 3-16 Work before Installing Rails



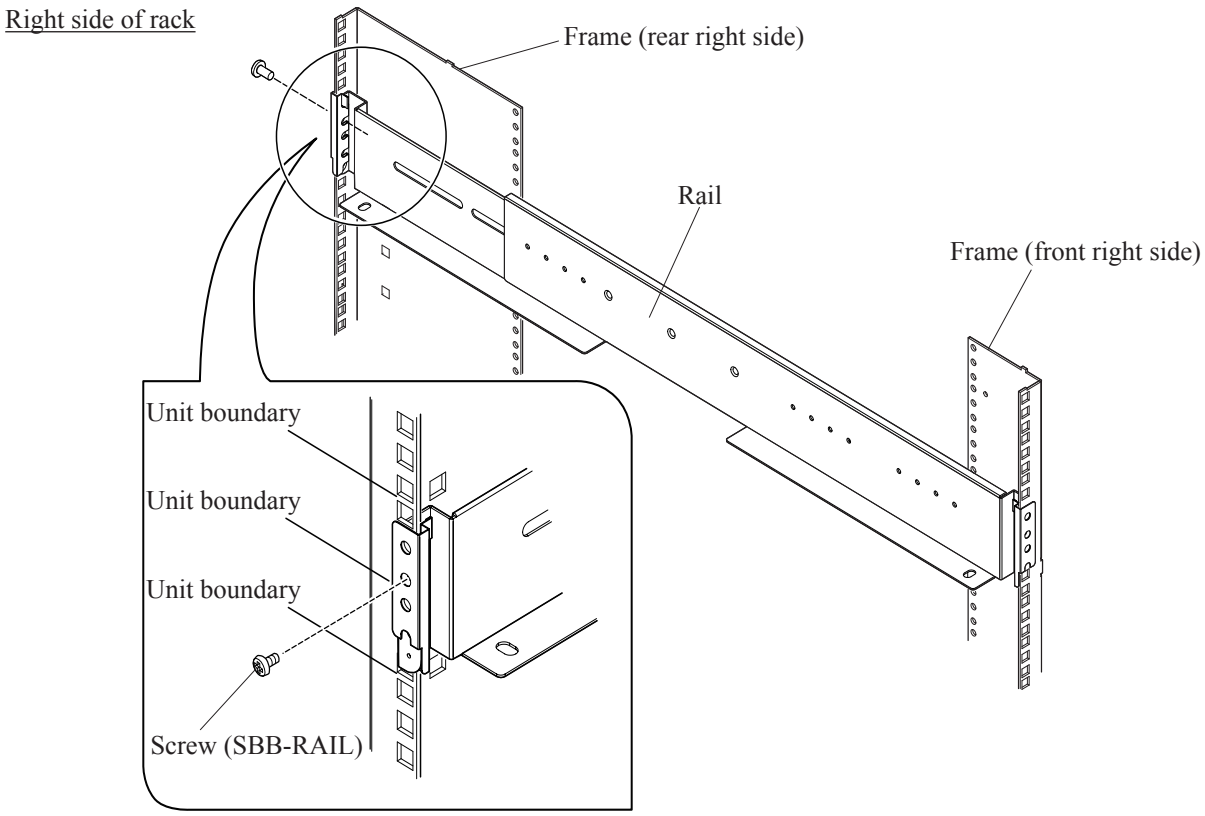
(8) Bring down two Clips on the front and rear edge of the rail.
(9) Fit Positioning Pins ② and ④ of the rail (two pins in total on the front and back edge) into holes on the right side of the rack at the position where you want to install the Drive Box.
(10) Raise the Clips of the rail to fix the rail to the rack.

Figure 3-17 Installing Rails



(11) Tighten the screw (SBB-RAIL) on the rear edge of the rail to fit the rail to the rack.
The fixing position is the fourth hole from the bottom of the unit boundary line.

Figure 3-18 Fixing the Rails



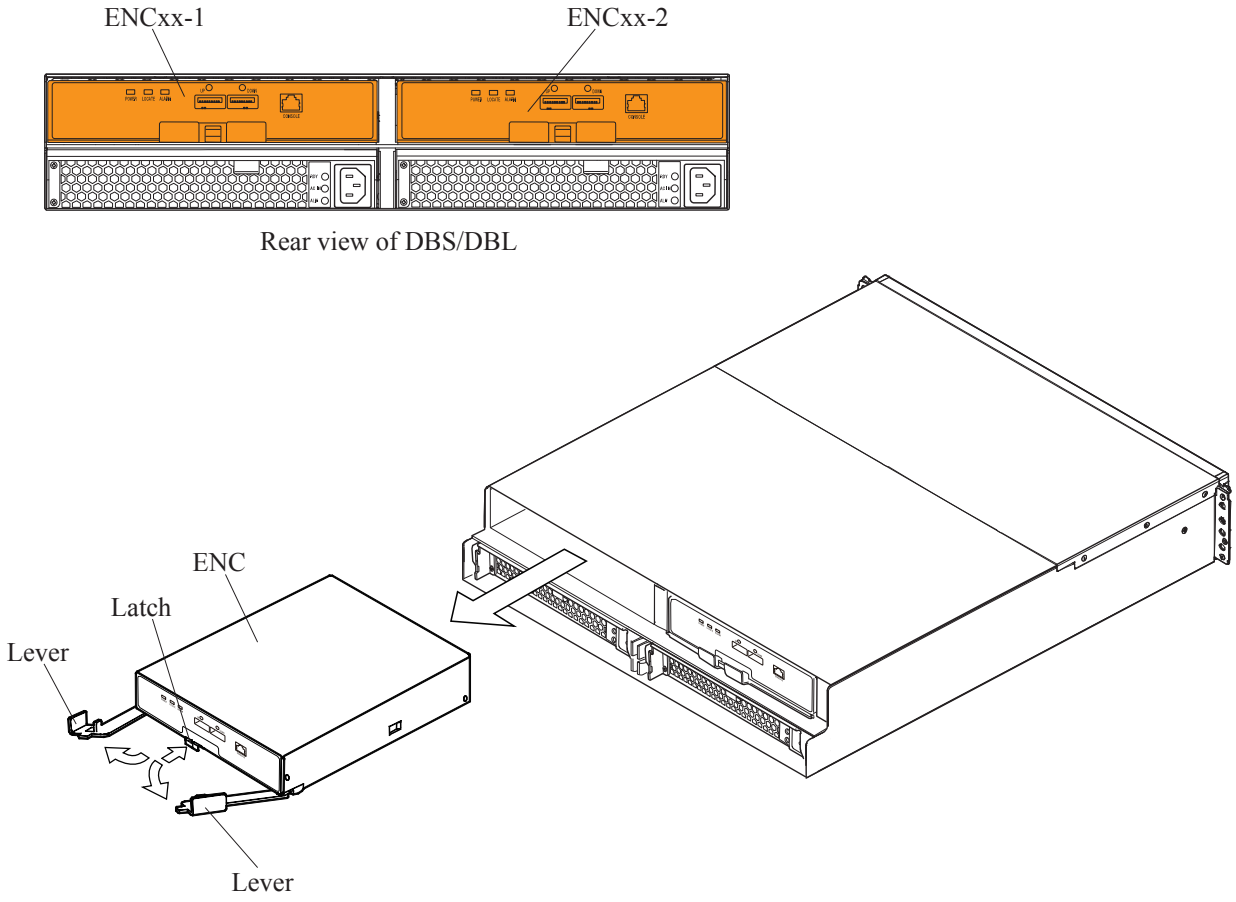
(12) Install the rail into the left side of the rack in the same way as procedures Step (8) to Step (11).
The right and left rails are same in shape. Horizontally turn the left rail in the opposite direction of the right rail (180 degree turn).

6. Removing the parts
   If the Drive Box is installed at a height of 1 m or below installed by using the special lifter, this procedure is not required because the Drive Box is installed into the rack frame with its parts mounted. (Go to Step 7.)
   If other than above, remove the parts first and then install the Drive Box into the rack frame.

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. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the Drive Box.
(2) Removing an ENC
   (a) On the rear of the Drive Box, push the latch on the rear panel of the left ENC toward the arrow direction to unlock the lever.
   (b) Open the right and left levers of the ENC and remove the ENC.
   (c) Remove the other ENC in the same manner.

Figure 3-19 Removing ENCs



*1: ENCxx-1
└> DB No. (00, 01, 02, ..., 47)

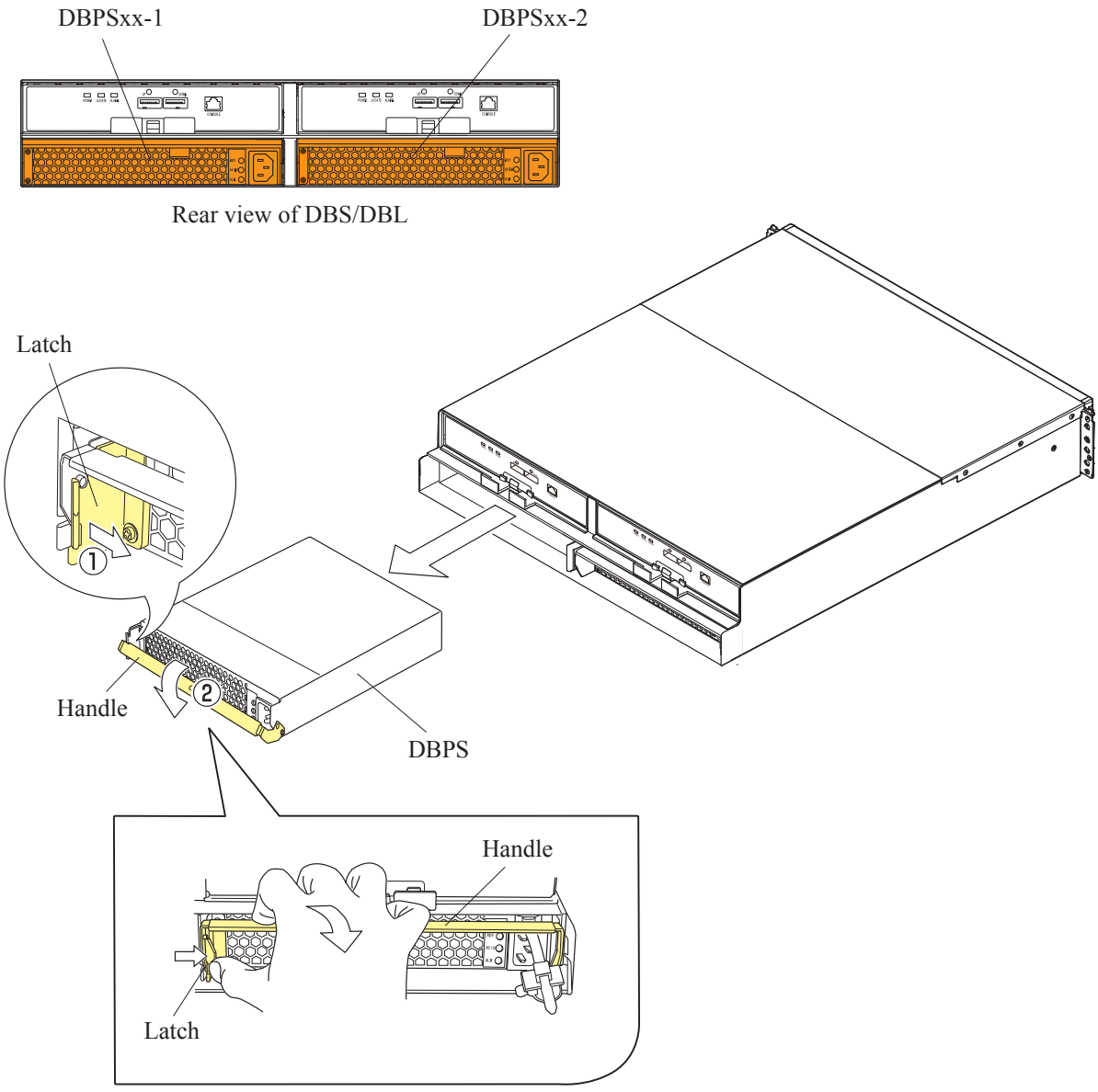
(3) Removing a DBPS

(a) Open the handle (②) while pushing the latch of the DBPS in the left side of the rear of the Drive Box inward (①).

(b) Pull the DBPS and remove it from the Drive Box.

(c) Remove the other DBPS in the same manner.

Figure 3-20 Removing DBPS



*1: DBPSxx-1
└→DB No. (00, 01, 02, ..., 47)

7. Installing the Drive Box

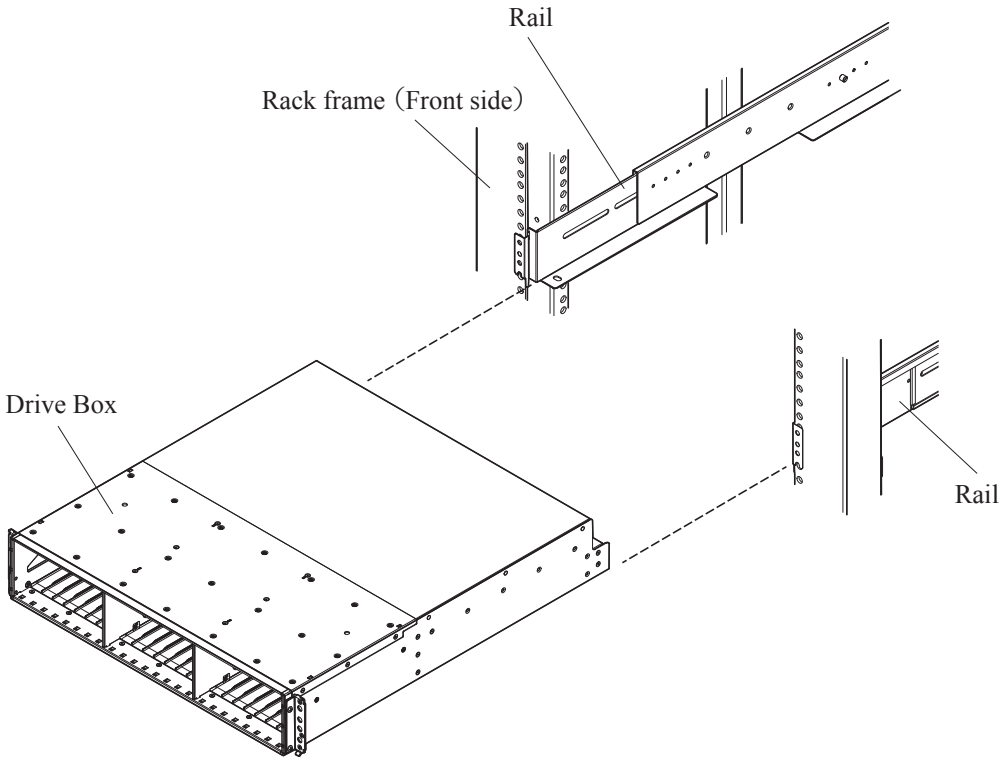
⚠ CAUTION

Be careful of the mass:
Work carefully because the mass of the DBS is about 23 kg and DBL is about 27 kg.

Be careful of falling over and dropping:
To prevent Drive Box from falling over and dropping, the installation work must be done by two or more personnel.

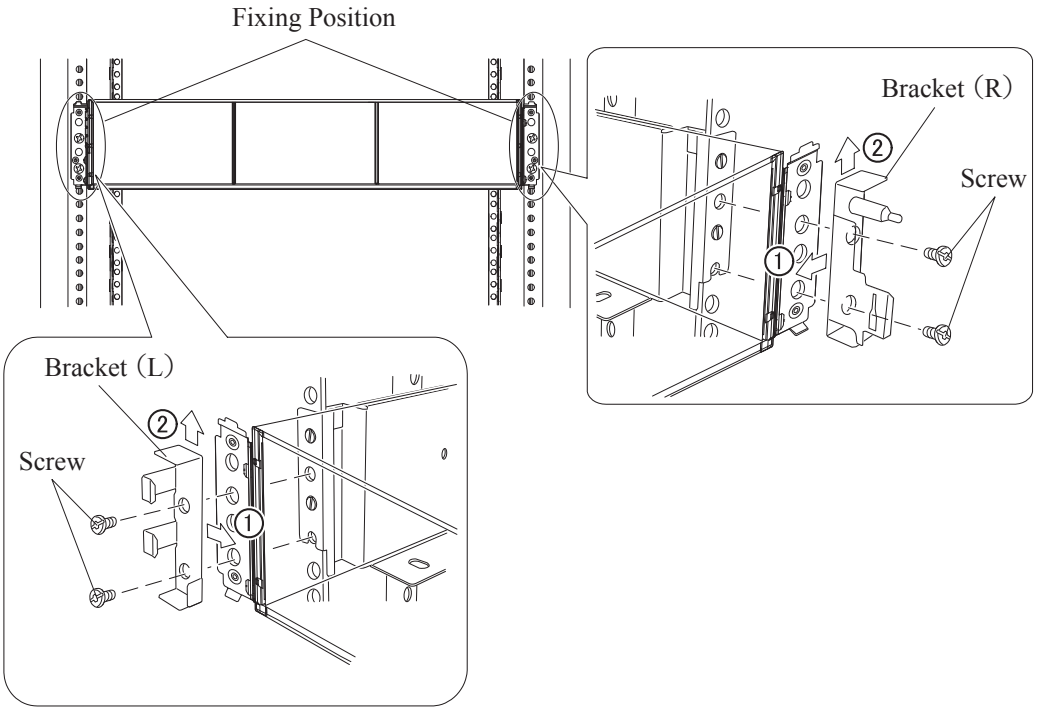
(1) Install the Drive Box on the front side of the rack frame referring to mounting procedure using the special lifter. (Refer to "2.6.1 Mounting Storage System on a Special Lifter".)

Figure 3-21 Installing Drive Box



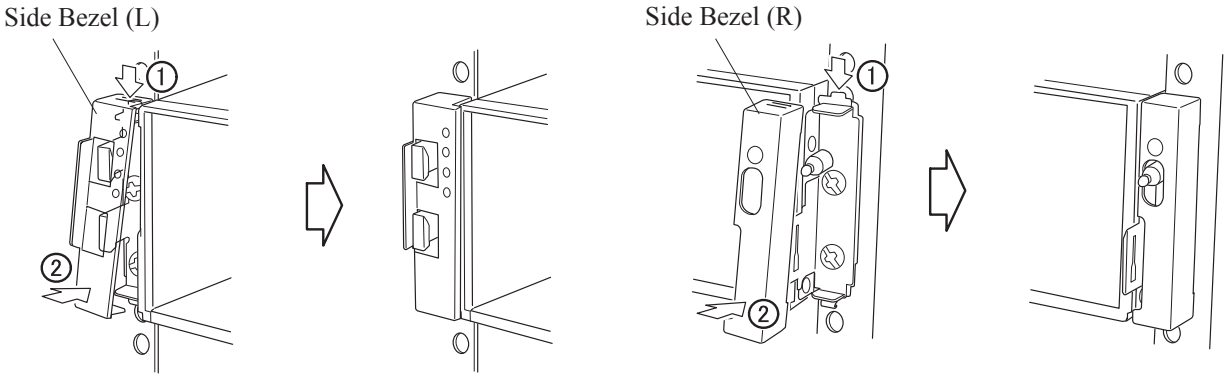
8. Fixing the Drive Box
   (1) Install the Drive Box with two brackets. Fasten the Drive Box to the rack frame with two screws temporarily.
   (2) Tighten the screws pressing the bracket in the direction of ① and ② to fix.

Figure 3-22 Fixing Drive Box (Front)



9. Attaching the side bezel
   (1) Attach the side bezel in the procedure ① and ② to cover the left side of the front side of the Drive Box with the side bezel (L) from the top.
   (2) Attach the side bezel in the procedure ① and ② to cover the right side of the front side of the Drive Box with the side bezel (R) from the top.

Figure 3-23 Attaching Side Bezels



(a) Attaching the Side Bezel (L) (b) Attaching the Side Bezel (R)

10. Reinstalling the removed parts

If you removed the parts in "6. Removing the parts", install the removed parts again.
If you did not remove the parts, go to Step 11.

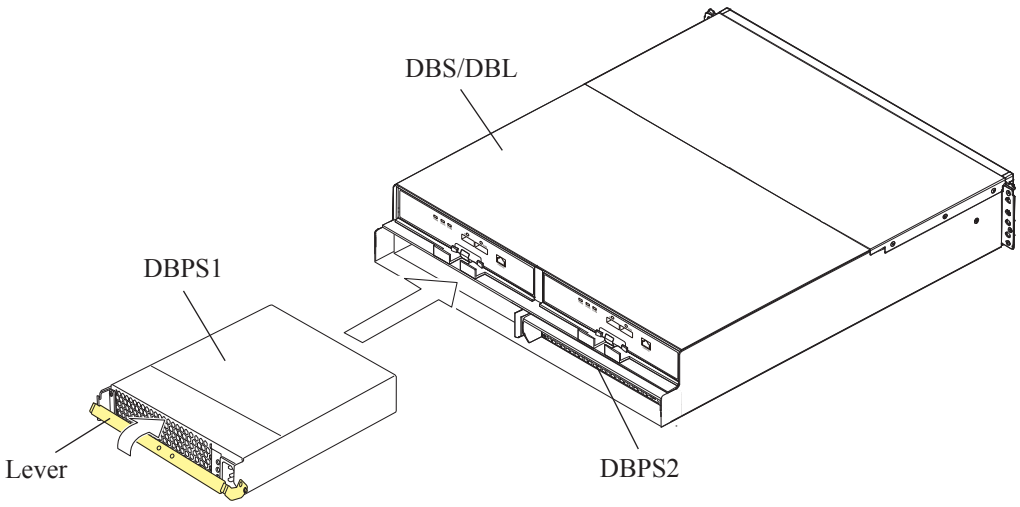
(1) Installing the DBPS

(a) With the lever completely opened, insert the Power Supply (DBPS) in to the slot.
If you cannot insert the Power Supply (DBPS) into the slot easily, insert it after adjusting the position by slightly returning the lever.

(b) Push the Power Supply (DBPS) in all the way.

(c) Close the lever completely to fix the Power Supply (DBPS).

Figure 3-24 Installing DBPS



(2) Attaching the ENC

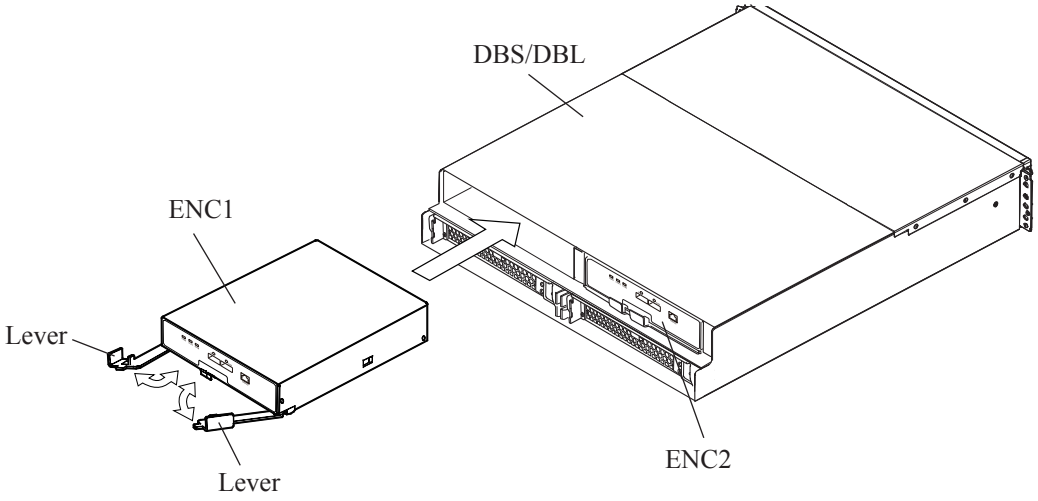
(a) Open the right and left levers of the ENC.

(b) Insert the ENC until the edge of the lever comes in contact with the Drive Box.

(c) Close the right and left levers to insert the ENC completely.

(d) Install the other ENC in the same manner.

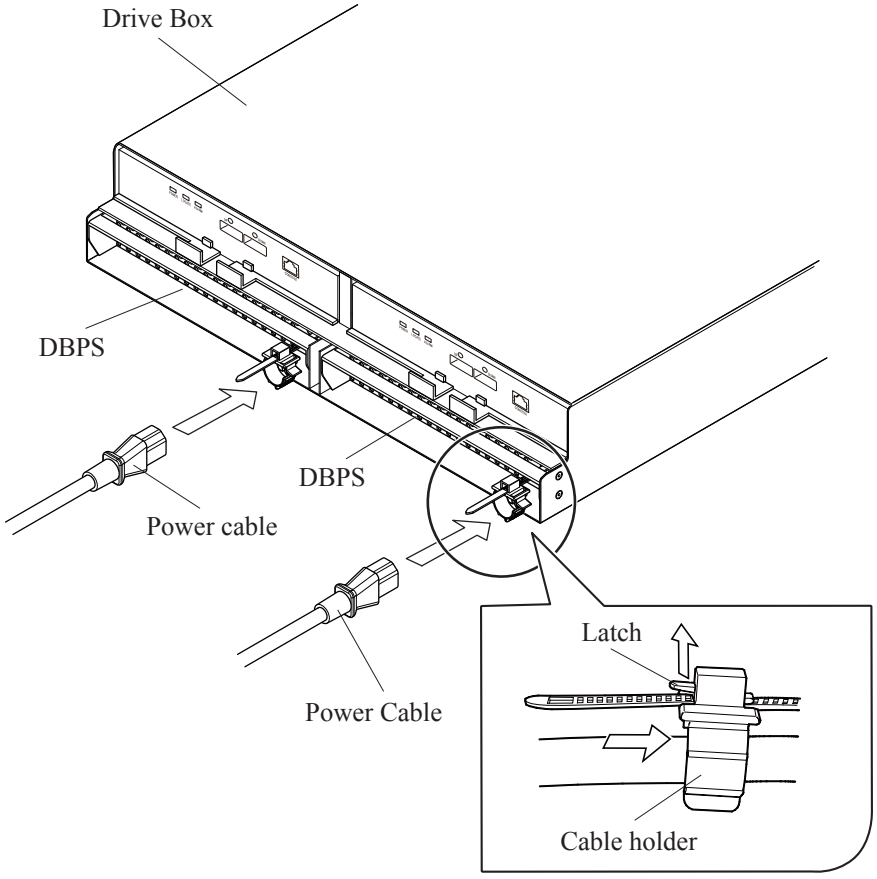
Figure 3-25 Installing ENC



11. Connecting SAS Cables
    Connect the SAS cables, attach the location labels and route the cables referring to “2.10.2 Connecting SAS Cables”.

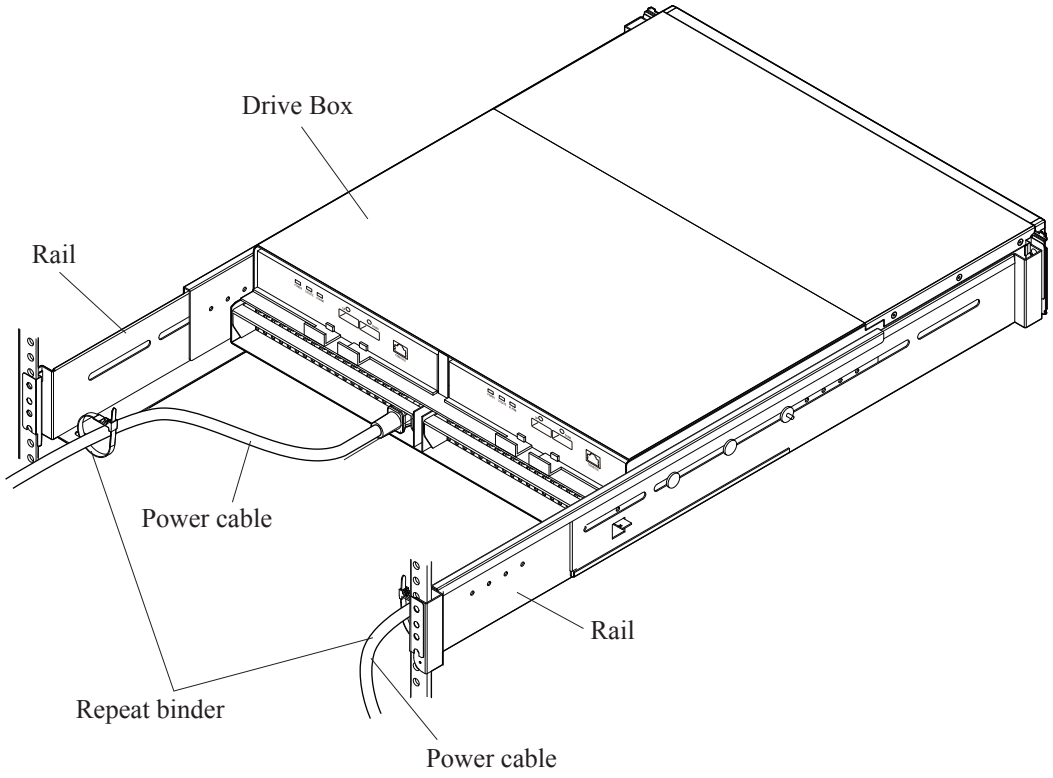
12. Connecting of Power Cables
    (1) Connect two power cables to the DBPSs.
    (2) The following figure shows a power cable connection example in the configuration where only DBS/DBL is installed in the same rack.
    (3) Push the power cable holder toward the DBPS until it stops.

Figure 3-26 Connection of Power Cables



(4) Pull the repeat binder through the hole on the rear edge of the rail to fix the power cable. The cables should have extra length moderately.

Figure 3-27 Fixation of Power Cables



(5) Connect the two power cables to the PDUs and fix them with a stopper.

NOTE : • Connect the power cable for the DBPSxx-1 to the left PDU.
Connect the power cable for the DBPSxx-2 to the right PDU.
If they are plugged in the receptacles of the PDUs on the same side, the function of the duplicated power supply does not work.
• Insert only the installed power cable into the PDU outlet.
• Limit the total current output from the outlets J101 to J103 so that it does not exceed 10 amperes.
Limit the total current output from the outlets J201 to J203 so that it does not exceed 10 amperes.

Figure 3-28 Connection Example of Power Cables

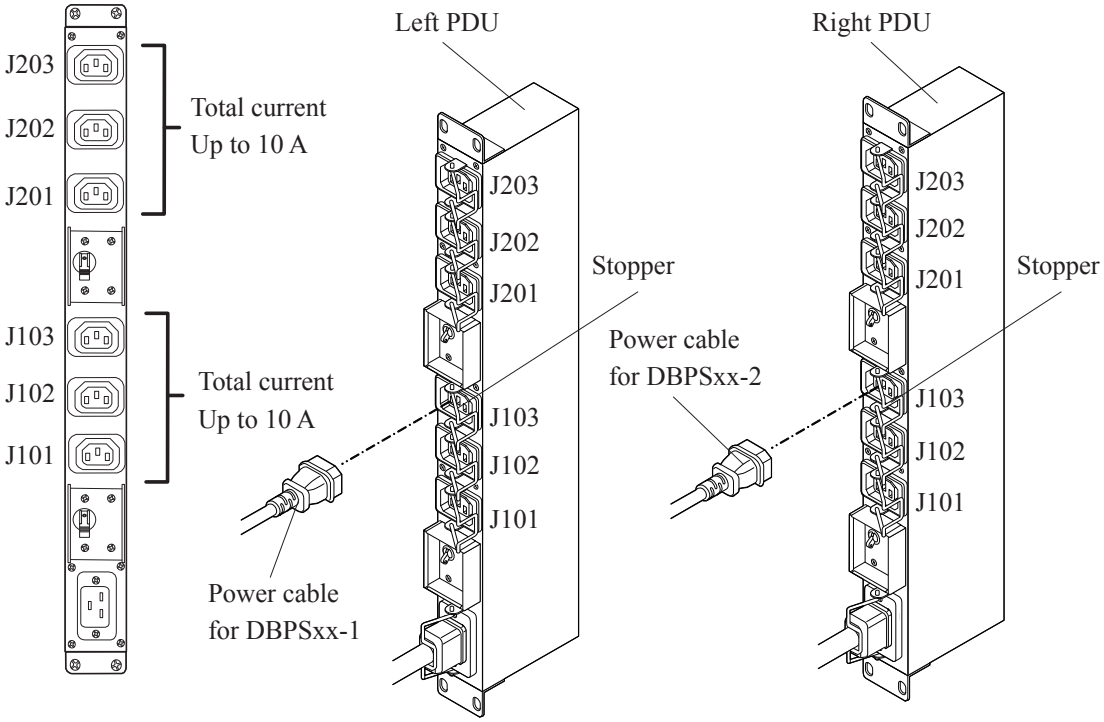
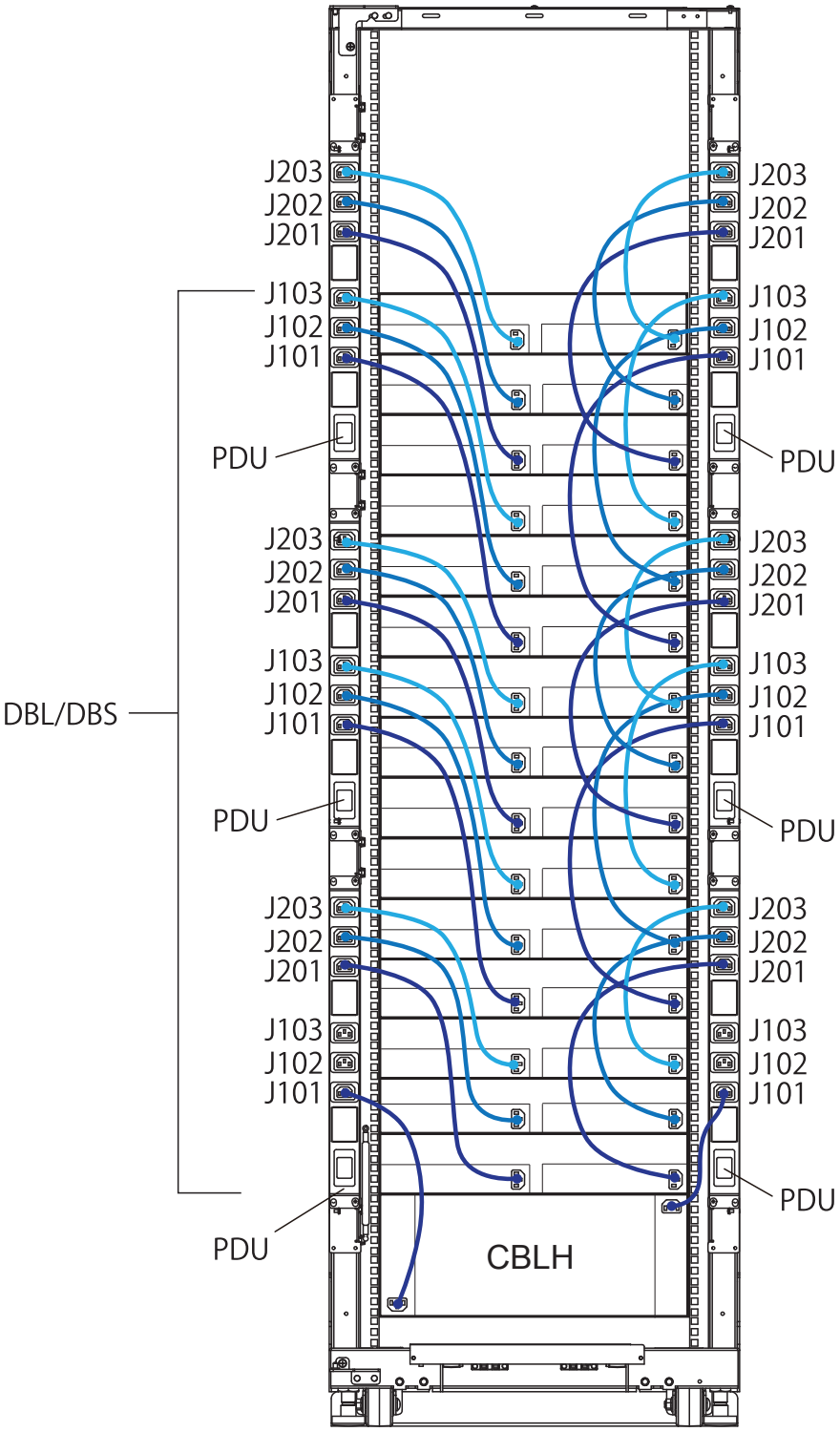


Table 3-25 Load Current of Each Model Number

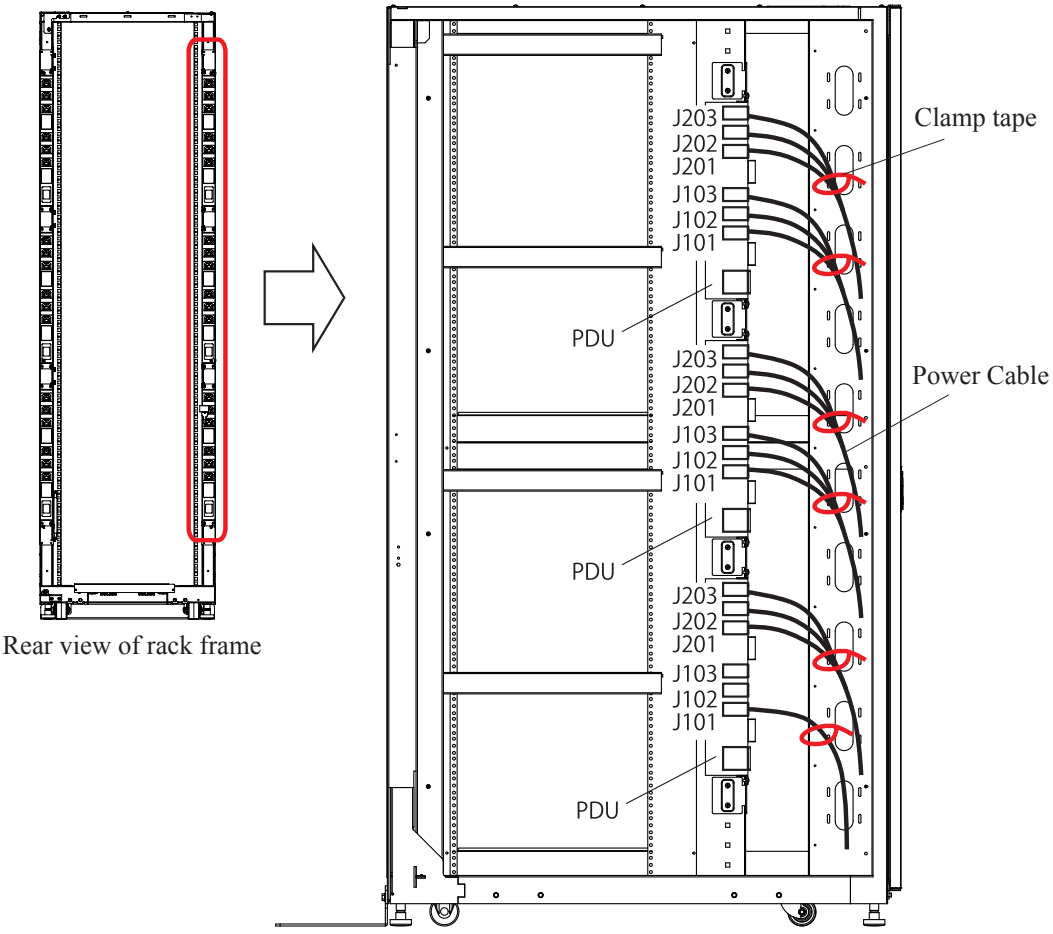
No.	Model Number	Load Current (per PS)
1	DW850-CBXSS	4.0 A
2	DW850-CBXSL	4.0 A
3	DW800-CBSS	4.0 A
4	DW800-CBSL	4.0 A
5	DW850-CBLH1	7.0 A
6	DW850-CBLH2	8.0 A
7	DW-F800-DBSC	2.4 A
8	DW-F800-DBLC	1.9 A
9	DW-F800-DB60C	6.0 A
10	DW-F800-DBF	2.6 A

Figure 3-29 Connection Example of Power Cables (Configuration which Mounts Only DBSs/ DBLs on the Same Rack)



(a) Fix power cables with clamp tapes on the both sides of the rear of the rack frame.

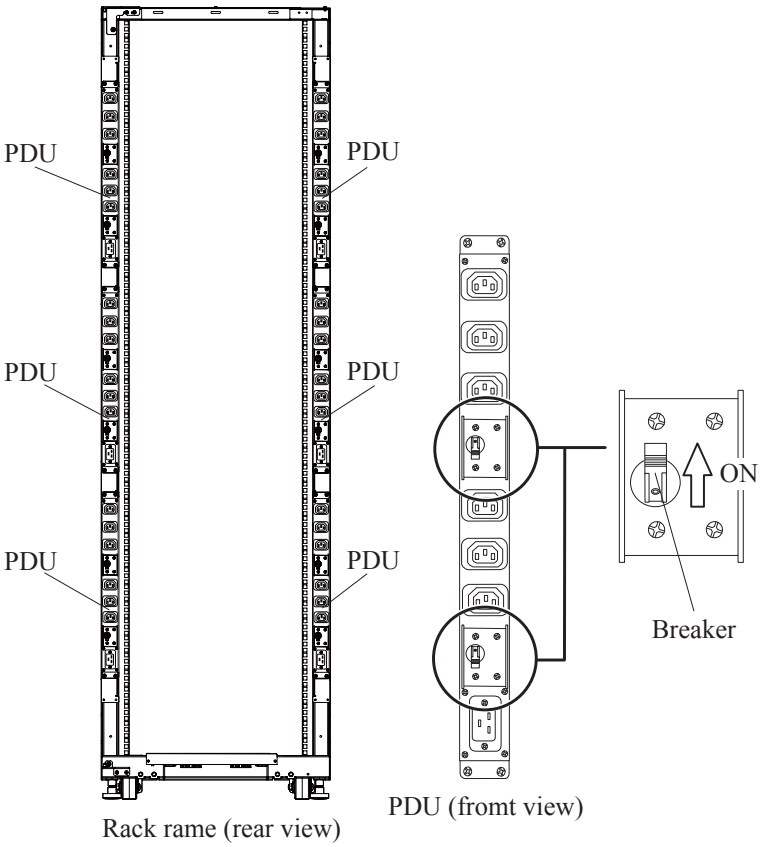
Figure 3-30 Fixing Power Cables



*1: The figure shows fixation of the right side.

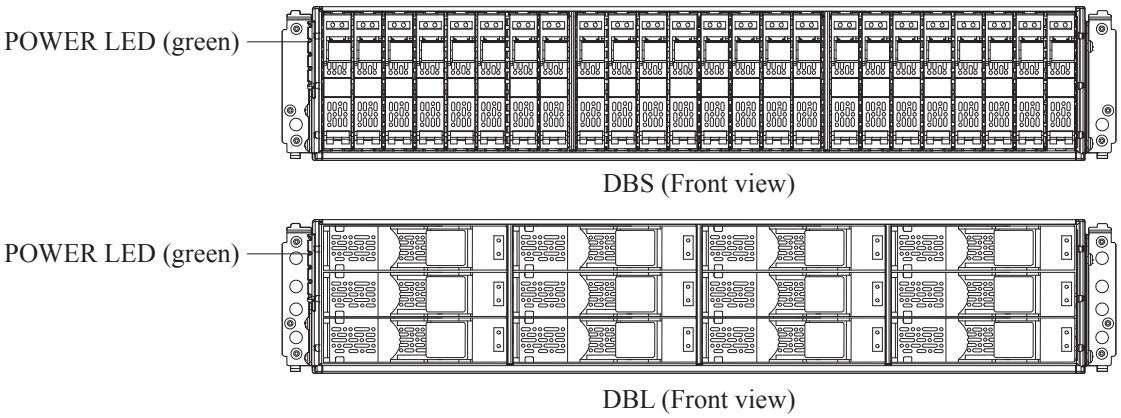
(b) Turn on of the PDU.
Turn it on when the PDU breaker connecting the power cables is turned off.

Figure 3-31 PDU Breaker



(c) Check that the ROWER LED (green) on the front of the DBS/DBL lights up.

Figure 3-32 DBS/DBL on POWER LED



13. Attaching the Front Bezel

Attach the Front Bezel referring to "1.4.1 How to Attach/Remove the Front Bezel".

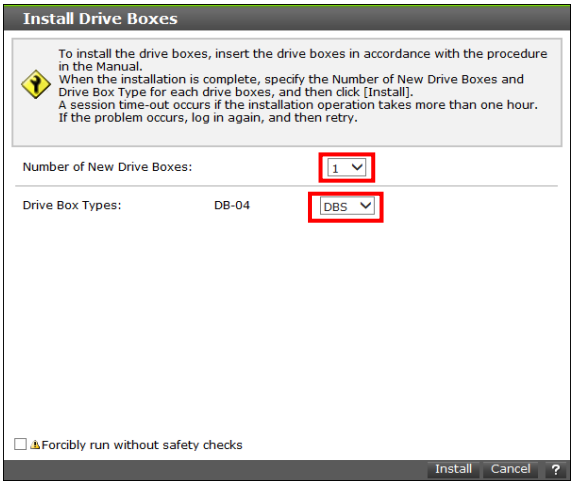
14. Checking addition completion by Maintenance Utility

(1) <Recognize Drive Boxes>

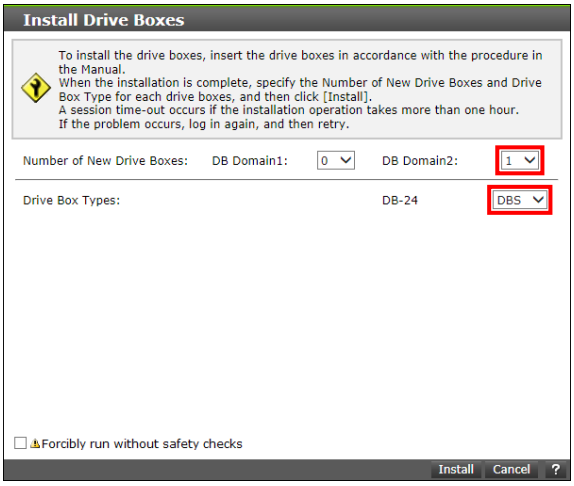
Click the [Install] button.

NOTE : The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.

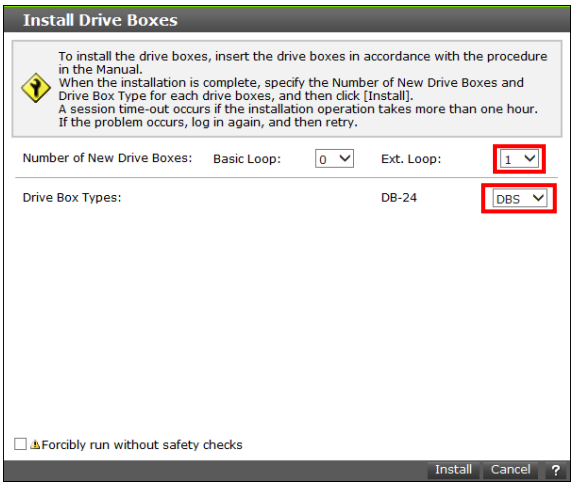
• When Controller Chassis is CBXSS, CBXSL, CBSS or CBSL



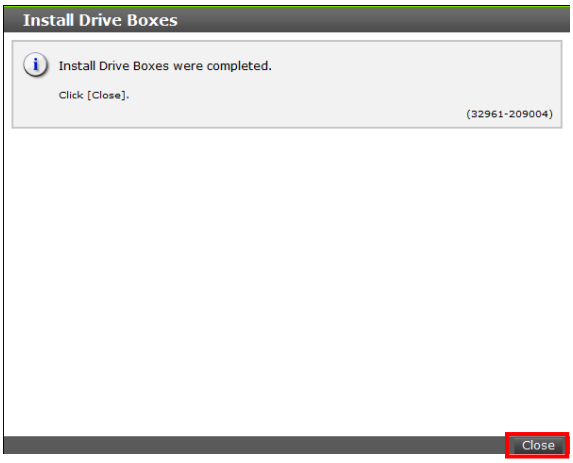
• When Controller Chassis is CBLH1



• When Controller Chassis is CBLH2



(2) <Check Addition Completion>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to "Device Manager-Storage Navigator Messages".



15. Click the [Logout] button to close the window.

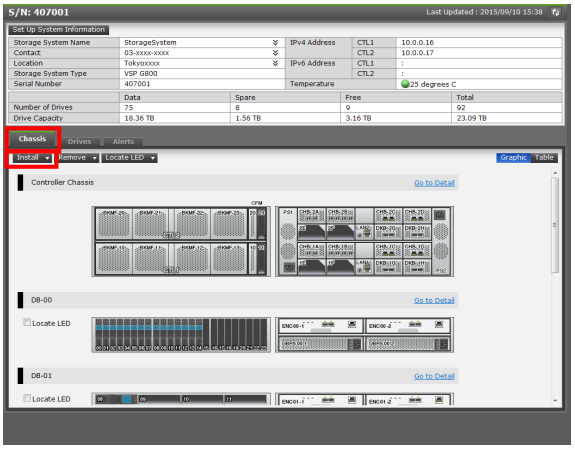
16. Disconnecting the Maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".

3.4.4 Adding Drive Boxes (DW-F800-DB60C)

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding the Drive Boxes, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

3. Instructing to start addition by Maintenance Utility
   (1) <Main Window>
   Click the [Chassis] tab in the main window and click the [Install] button. For CBLH2, click the [Install] button and select [Drive Box].



(2) <Set Number of Drive Boxes/Types>

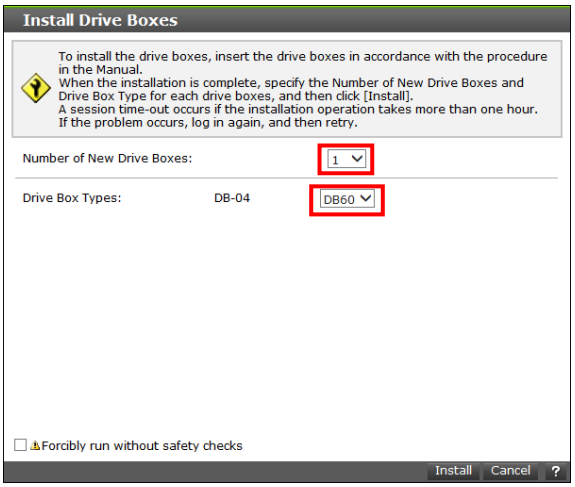
⚠ CAUTION

About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

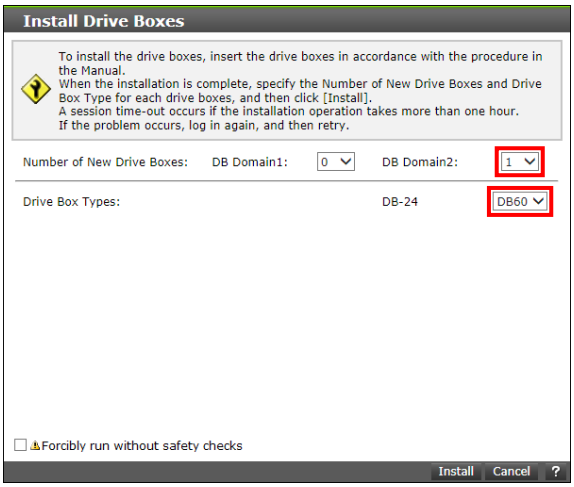
Set the number of Drive Boxes to be added and the types.
When the Controller Chassis is a CBLH1, input columns of the DB Domain 1 and DB Domain 2. Loop are displayed in the location of the Number of New Drive Boxes in the window.
When the Controller Chassis is a CBLH2, input columns of the Basic Loop and Ext. Loop are displayed in the location of the Number of New Drive Boxes in the window.
When connecting the Drive Box to be added to the optional Disk Board (1E/2E or 1F/2F), be sure to input the number and type of the Drive Box to be added to the Ext. Loop.

NOTE : Do not click the [Install] button at this time.
Click the [Install] button after completing the addition work.

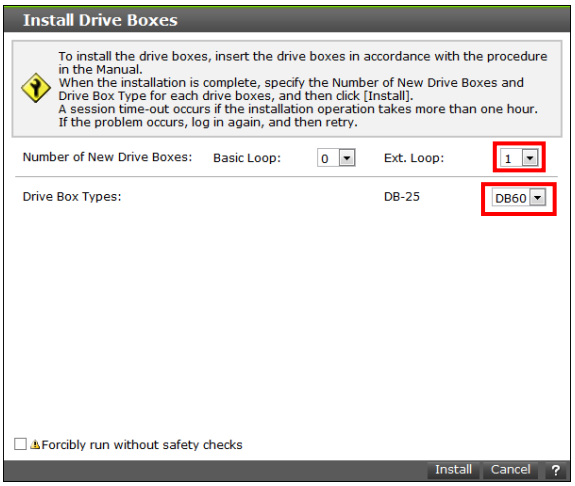
• When Controller Chassis is CBSS or CBSL



• When Controller Chassis is CBLH1



• When Controller Chassis is CBLH2

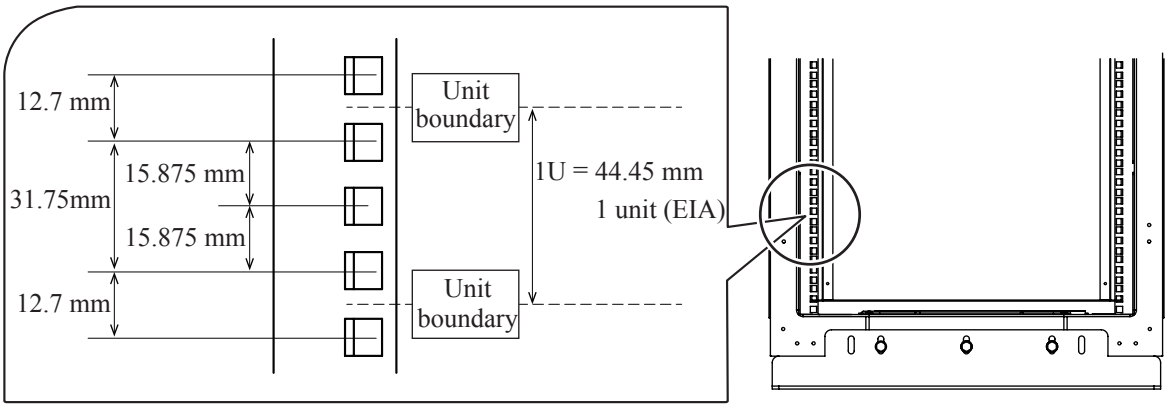


4. Checking the installation location

EIA units and intervals of mounting holes of RKU rack frame conforming to EIA standard

- A unit (U) space conforming to EIA standard is 44.45 mm as shown in the figure below.
- The boundary of the unit falls on the middle of the interval of 12.7mm.
  The boundary of the unit (1 U/1 EIA) is from the center of the interval of 12.7 mm to the center of the next interval of 12.7 mm.
- For rack, hole size for rack installation is determined based on the EIA standard.
  Hole size for rack installation :
  Universal intervals: Repeat of 44.45 mm (15.875 mm + 15.875 mm + 12.7 mm)

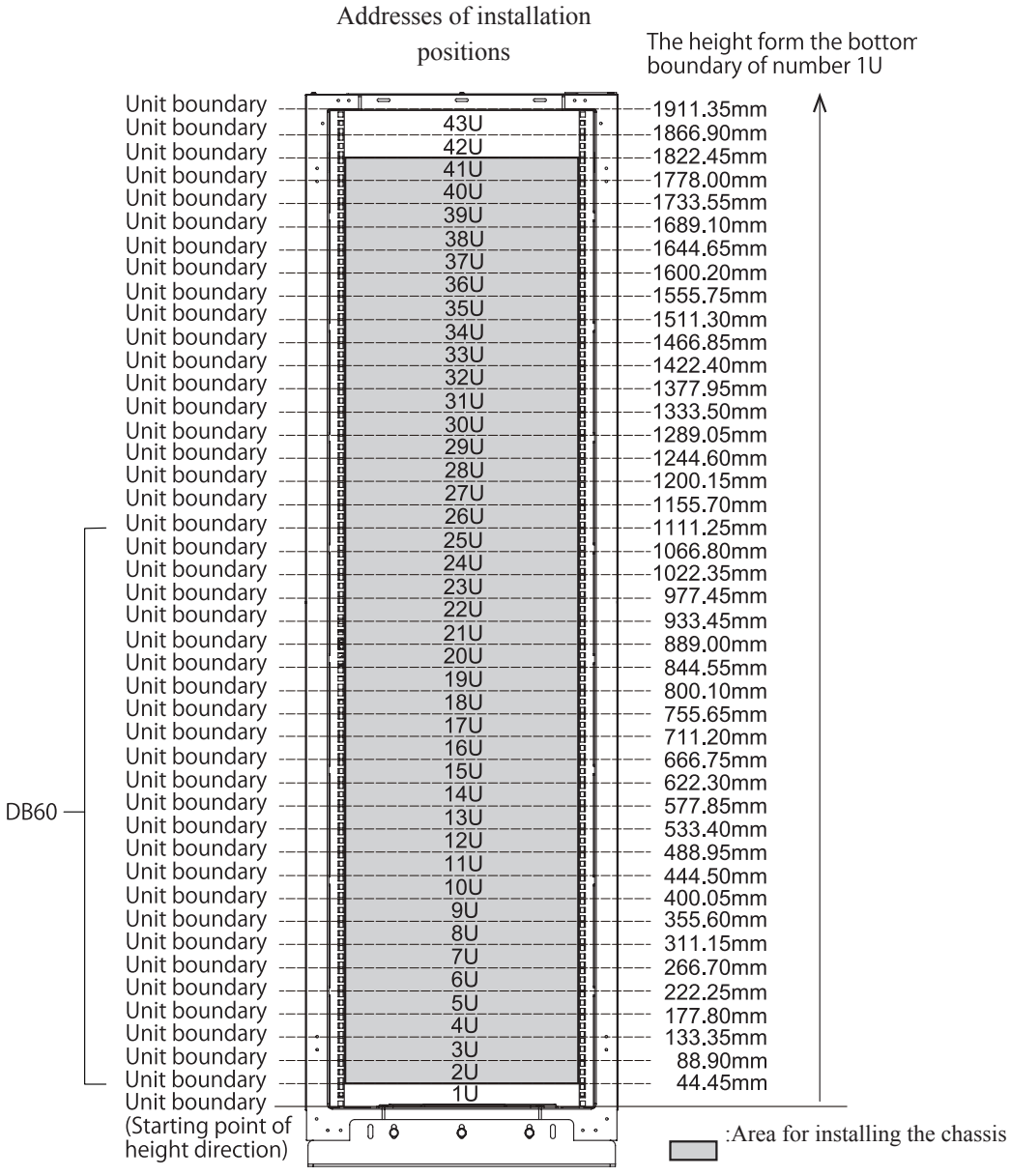
Figure 3-33 Attachment Hole Size of Rack



The addresses are called as unit (EIA) number and given as 1, 2, 3, and so on counted from the bottom of the rack frame.
The following figures show a layout example of installing Drive Box in 43 units rack frame. However, installing positions of Drive Box may differ according to the construction within the rack frame.

NOTICE: One rack can mount up to six DB60. However, if a Controller Chassis is mounted, the rack only mounts up to five DB60.
Mount the DB60 at the level of 1,300mm or lower (a range from 2U to 25U) from the floor.

Figure 3-34 Mounting Position of Drive Box



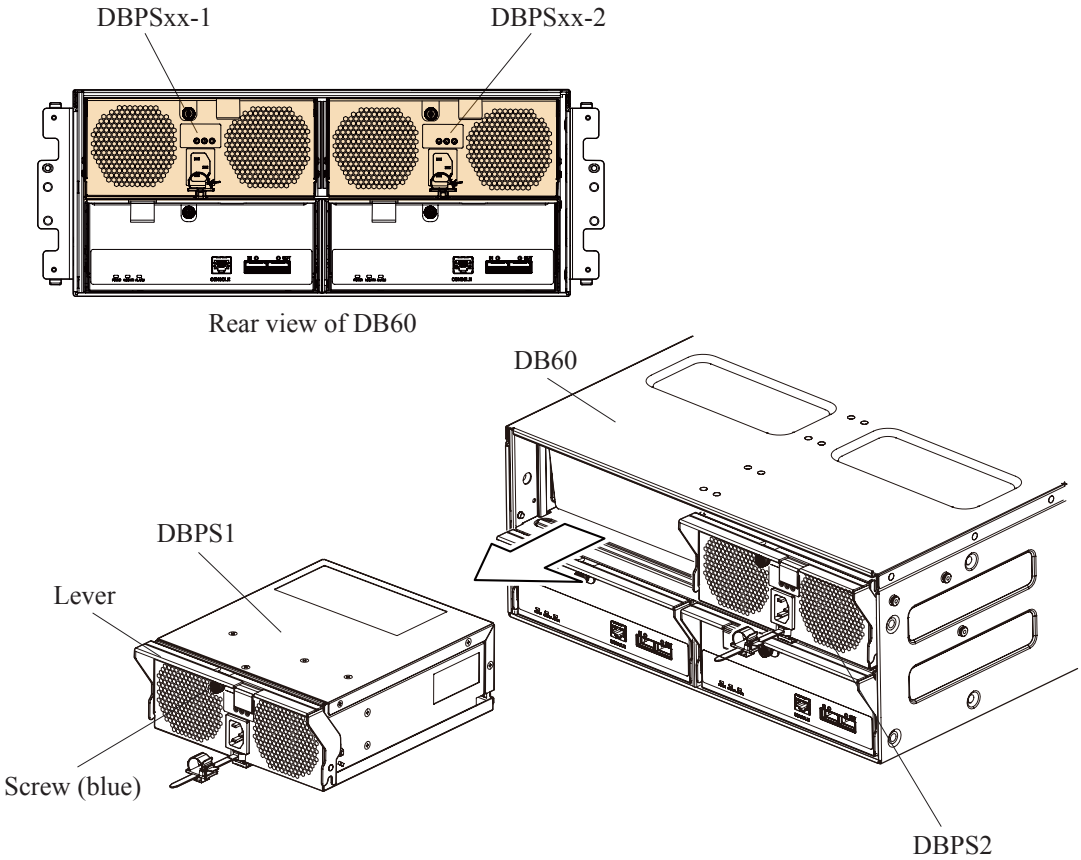
5. Removing the parts
   Be sure to remove the parts first, and then install the Drive Box in the rack frame regardless of the installation position.

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. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the DB60.

(2) Removing a DBPS
   (a) Loosen the screw (blue) fixing the DBPS and pull the lever down toward you.
   (b) Hold the DBPS with both hands and pull out it to remove.
   (c) Remove the rest of DBPSs in the same procedure.

Figure 3-35 Removal of DBPS



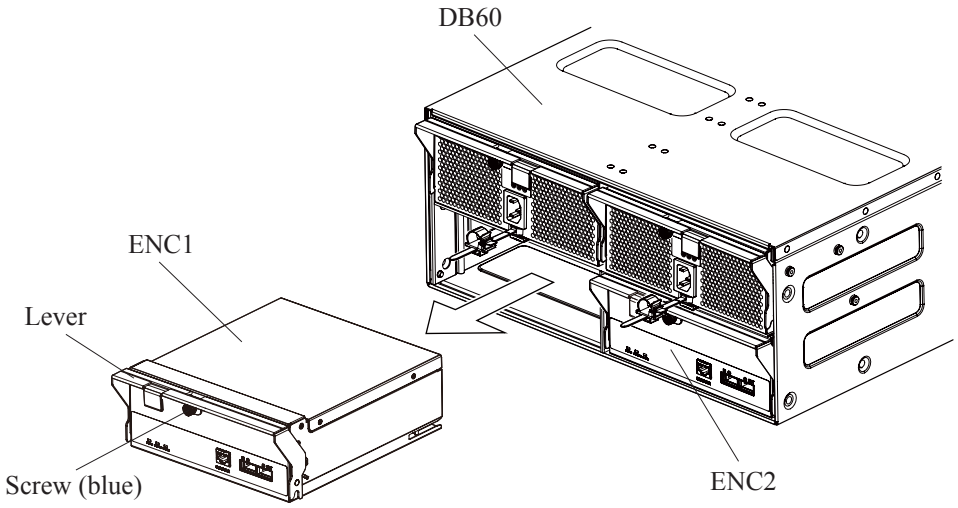
(3) Removing a ENC (DB60)

(a) Loosen the screw (blue) fixing the ENC and pull the lever down toward you.

(b) Hold the ENC with both hands and pull out it to remove.

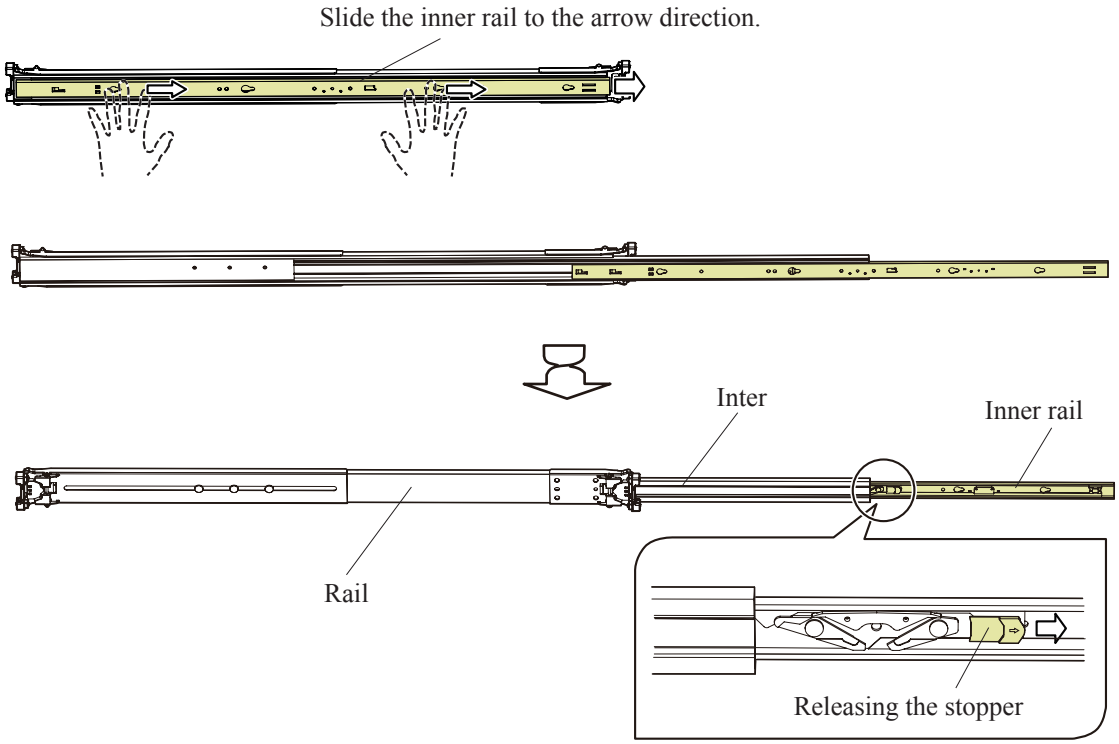
(c) Remove the other DBPS in the same manner.

Figure 3-36 Removal of ENC (DB60)



6. Remove the inner rails
   Remove the inner rails of two rails respectively.
   (1) Slide the inner rail to the arrow direction until it stops.
   (2) Turn over the rail and remove the inner rail by pressing the stopper of the inner rail.
   (3) Remove the inner rail from the other rail in the same manner.

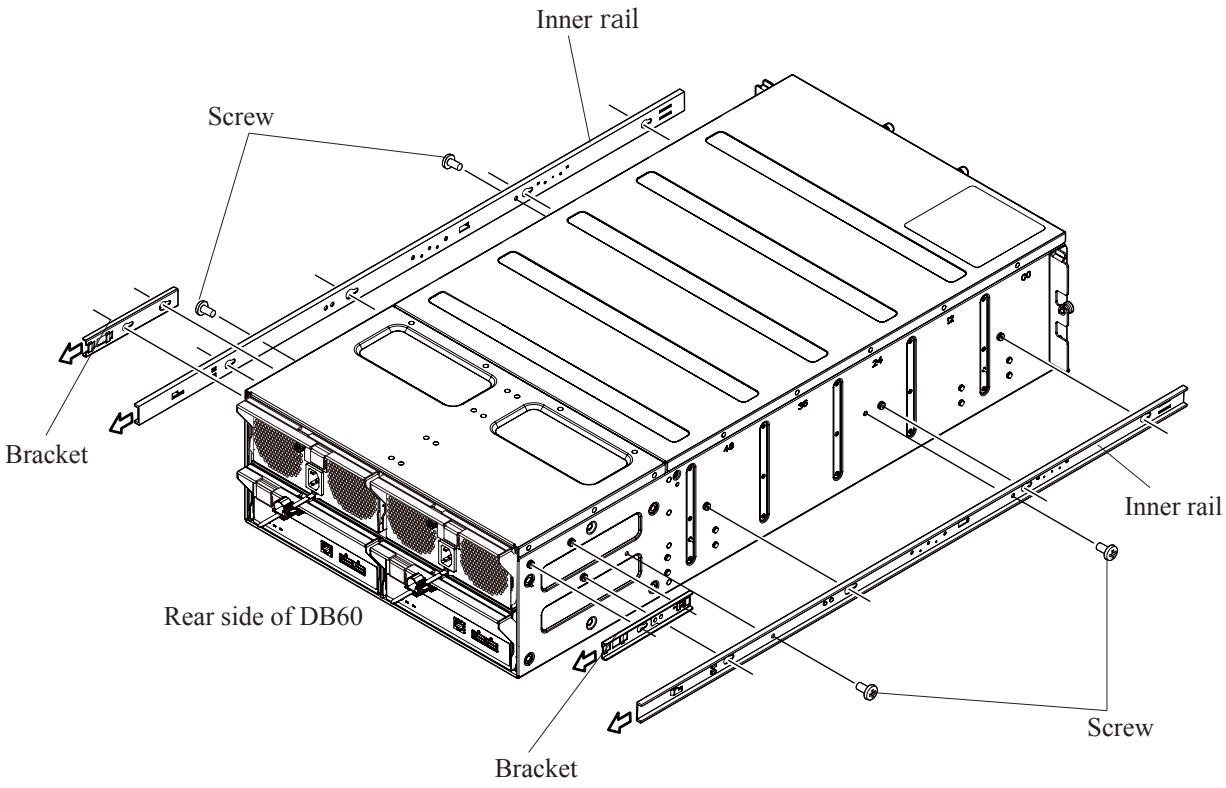
Figure 3-37 Removing the Inner Rails



7. Install the inner rails
   (1) Fit the projections (four places) on the sides of the DB60 in the holes of the inner rail and slide the rail backward to fix.
   (2) Fit the projections (two places) on the sides of the DB60 in the holes of the bracket and slide the rail backward to fix.
   (3) Fix the inner rail with screws (two places).

NOTE : • Check that the inner rails and brackets are surely installed.
• Install the inner rails and brackets in the right and left of the DB60.

Figure 3-38 Installing the Inner Rails

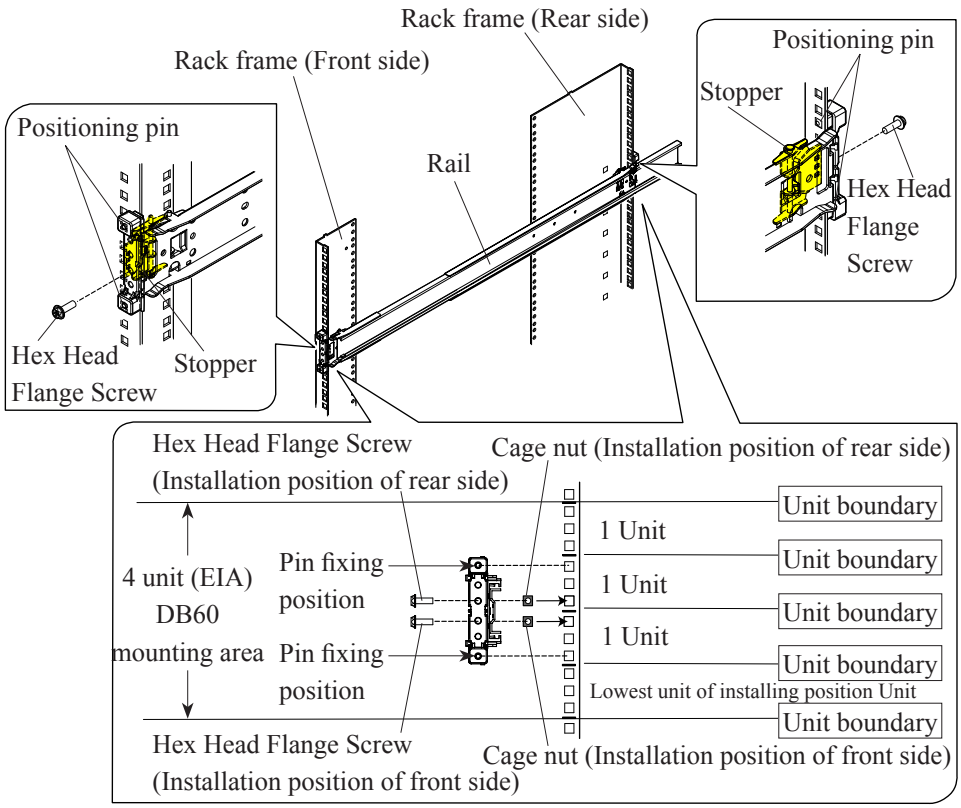


8. Install the rails.
   The rail install procedure is different depending on the hole shape (square or circular hole) on the rack. Check the holes on the rack before the installation work.
   (1) Install rack nuts for a rack with circular holes or cage nuts for a rack with rectangular holes in the sixth holes from the bottom unit boundary line on the front side of the rack to install the rails.
   (2) Install rack nuts for a rack with circular holes or cage nuts for a rack with rectangular holes in the seventh holes from the bottom unit boundary line on the rear side of the rack to install the rails.
   (3) Fit the positioning pins (two places each) on the front and rear sides of the rails to the fourth and ninth holes from the bottom unit boundary line on the rack to install the pins with the stopper.

       NOTE : When the rails are installed normally, the stopper on the rear of the positioning pins clicks and locks.
       Check that the rails are surely fixed.

   (4) Fix the front side with Hex Head Flange Screws. The fixing position is the sixth hole from the bottom of the unit boundary line.
   (5) Fix the rear side with Hex Head Flange Screws. The fixing position is the seventh hole from the bottom of the unit boundary line.
   (6) Install the rails in the right and left.

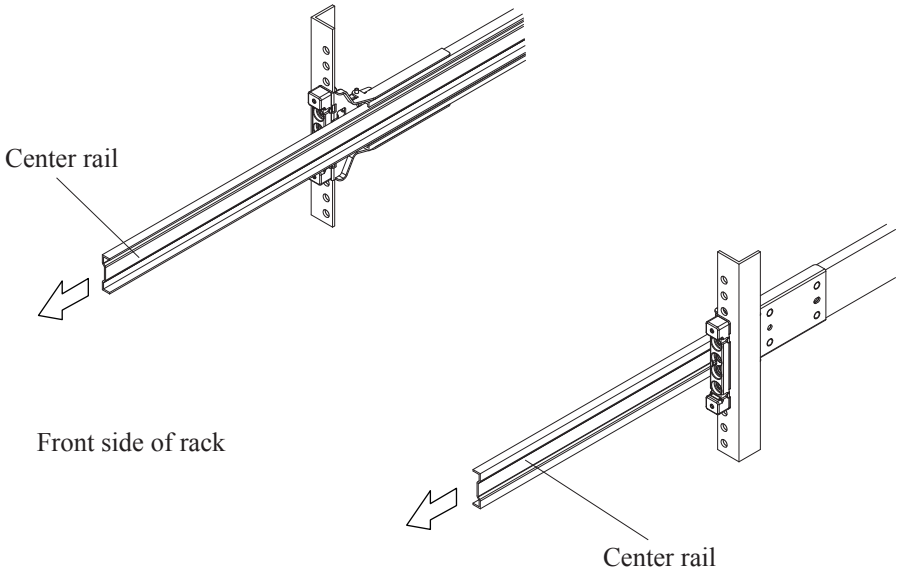
Figure 3-39 Fixing the Rails Installation Positions



*1: One EIA unit is approximately 44.45 mm.
*2: This figure shows the rail is installed in the left side of the rack frame.

9. Installing the DB60
   (1) Pull out the right and left center rails until they lock.

Figure 3-40 Pulling out the Center Rail



⚠ CAUTION

Be careful of the mass:
Work carefully because the mass of the DB60 is about 90 kg.

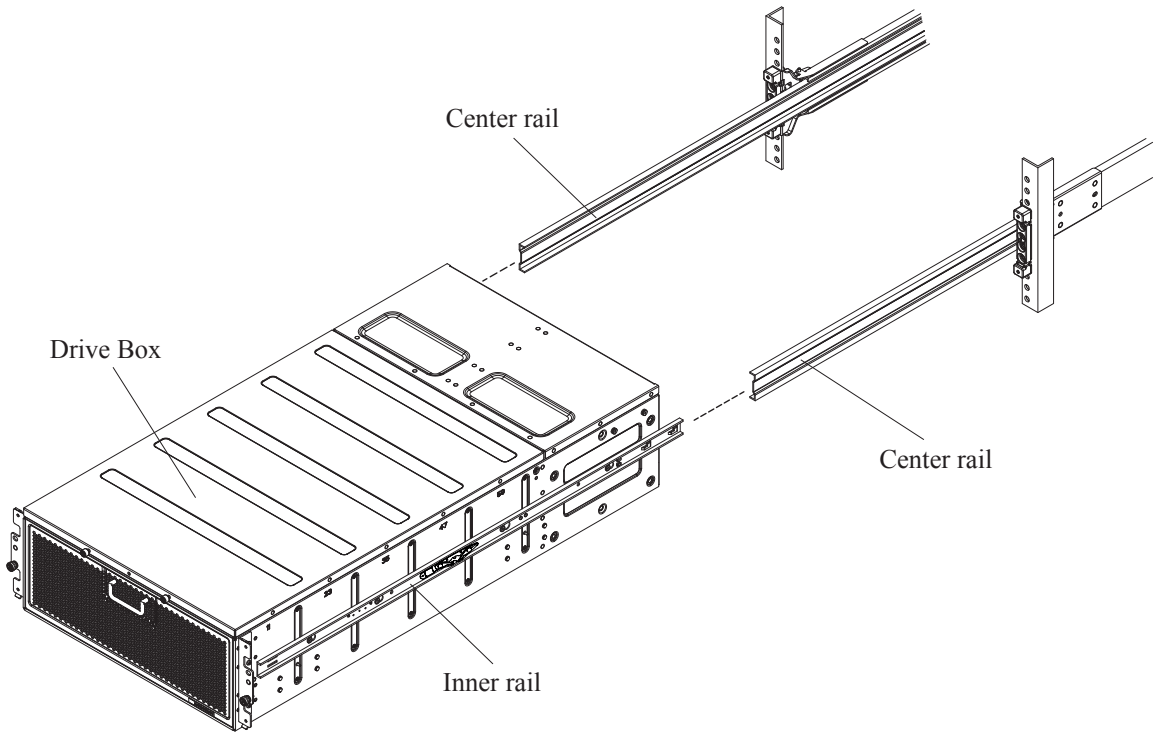
Be careful of falling over and dropping:
To prevent Drive Box from falling over and dropping, the installation work must be done by two or more personnel.

(2) Move the Drive Box to the mounting position referring to the mounting procedure ("2.6.1 Mounting Storage System on a Special Lifter") using the special lifter.

NOTE : Use the handle in front of the Drive Box to pull out the Drive Box.
Do not hold this handle when lifting the Drive Box.

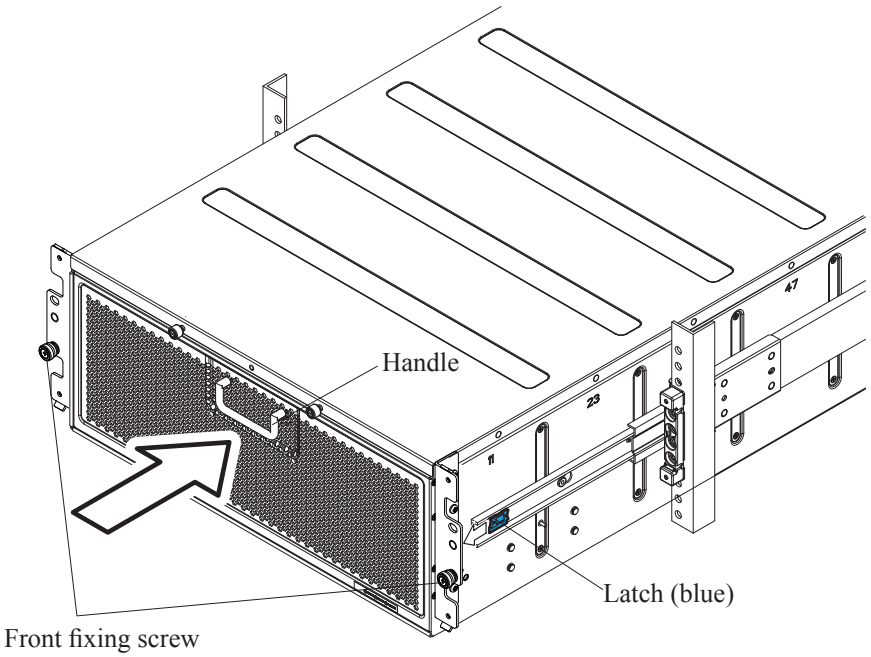
(3) Adjust the position of the inner rails by pushing the right and left center rails inward by hand, and then insert the Drive Box.

Figure 3-41 Inserting Inner Rails



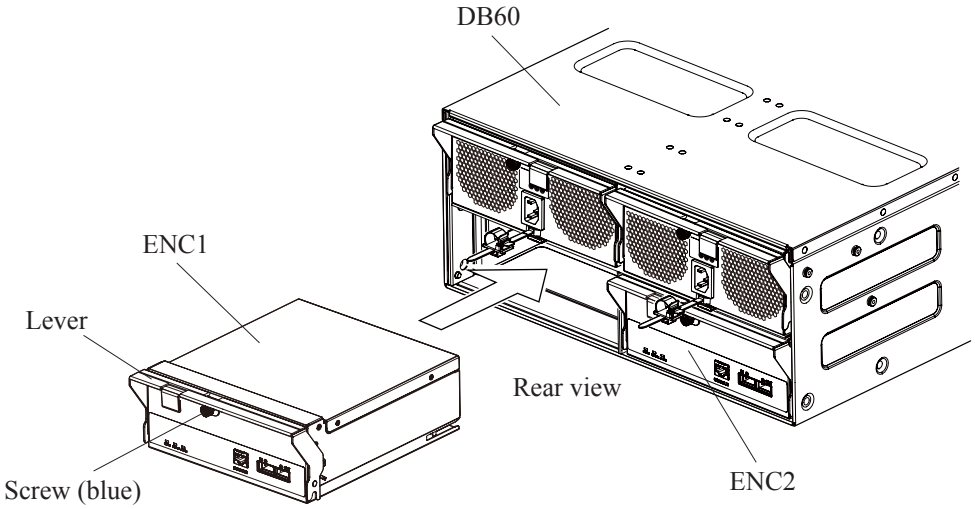
10. Storing and fixing the DB60
    (1) Slide the latches (blue) of the inner rails toward you to unlock.
    (2) Push the inner rails in about 2 cm, leave your fingers from the latches and push the Drive Box.
    (3) Tighten the front side fixing screw (one each for right and left) to fix it.

Figure 3-42 Fixing Front Side of Drive Box (Drive Box (DB60))



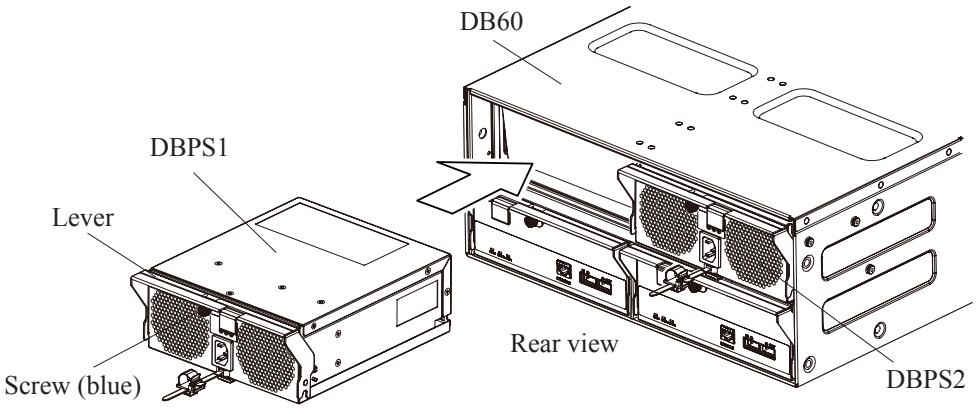
11. Installing the parts
    (1) Installing the ENC
        (a) Open the lever of the ENC to be installed completely.
        (b) Install the ENC in the slot.
            Insert the ENC and close the lever.
        (c) Tighten the screw (blue) and fix the ENC.
        (d) Install the remaining ENC in the similar procedure.

Figure 3-43 Installing of the ENC (DB60)



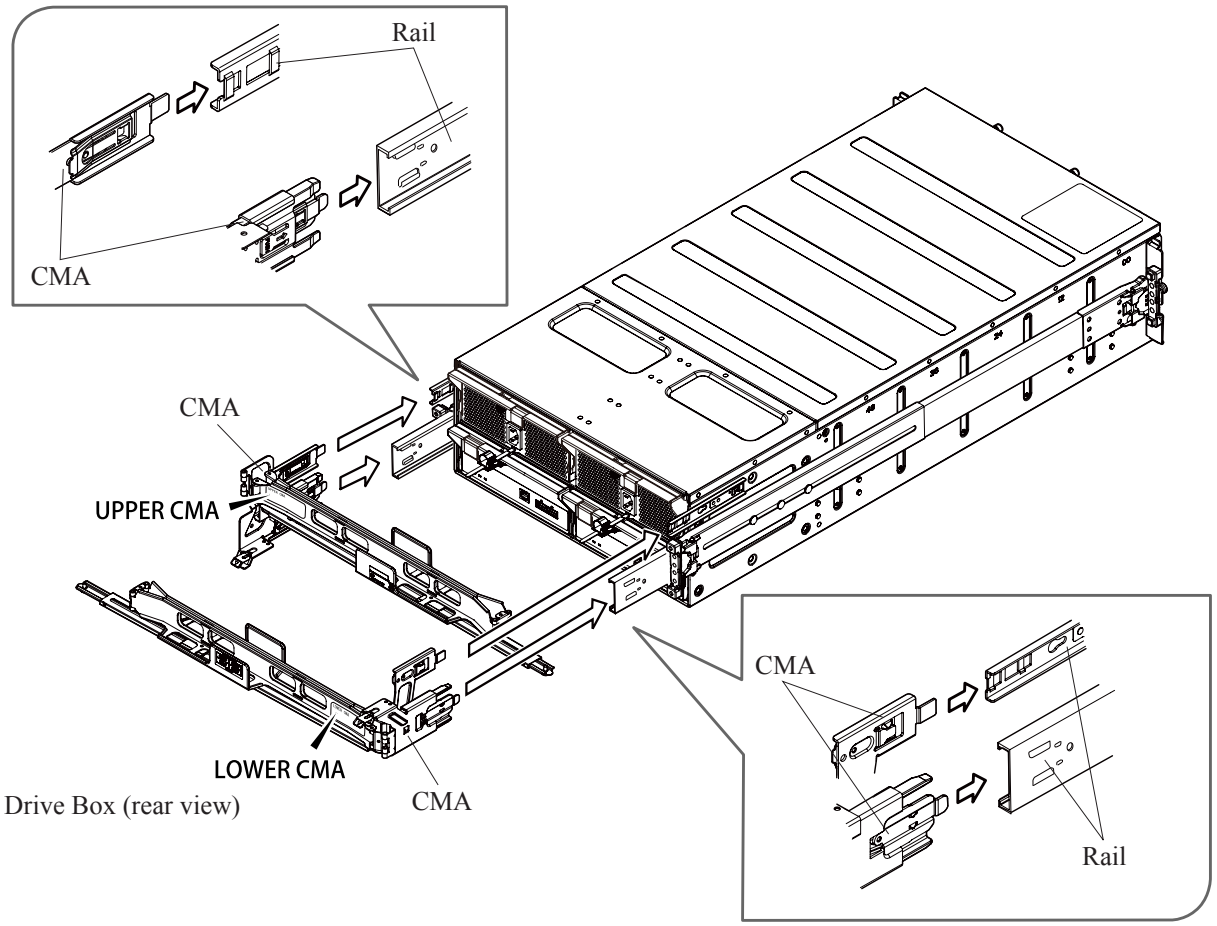
    (2) Installing the DBPS.
        (a) With the lever opened completely, insert a DBPS into a slot. If the DBPS is less likely to insert into the slot, return the lever position a little, adjust and insert the DBPS.
        (b) Push the DBPS in to the end.
        (c) Close the lever.
        (d) Tighten the screw (blue) and fix the DBPS.
        (e) Install the remaining DBPS in the similar procedure.

Figure 3-44 Installing the Power Supply (DB60)



12. Attaching the CMA.
    Install two CMAs on the right and left sides of the rear of the Drive Box.
    The CMAs on the right and left have different shapes. Install the CMA with UPPER CMA display on the left side and the CMA with LOWER CMA display on the right side.

Figure 3-45 Installing CMA



13. Connecting SAS cables
    Connect the SAS cables and attach the location labels referring to "2.10.2 Connecting SAS Cables".

    NOTE : Do not route the SAS cables. Route them with the power cables in Step 16.

14. Connecting power cables
    Connect the power cables referring to "2.10.3 Connecting Power Cables".

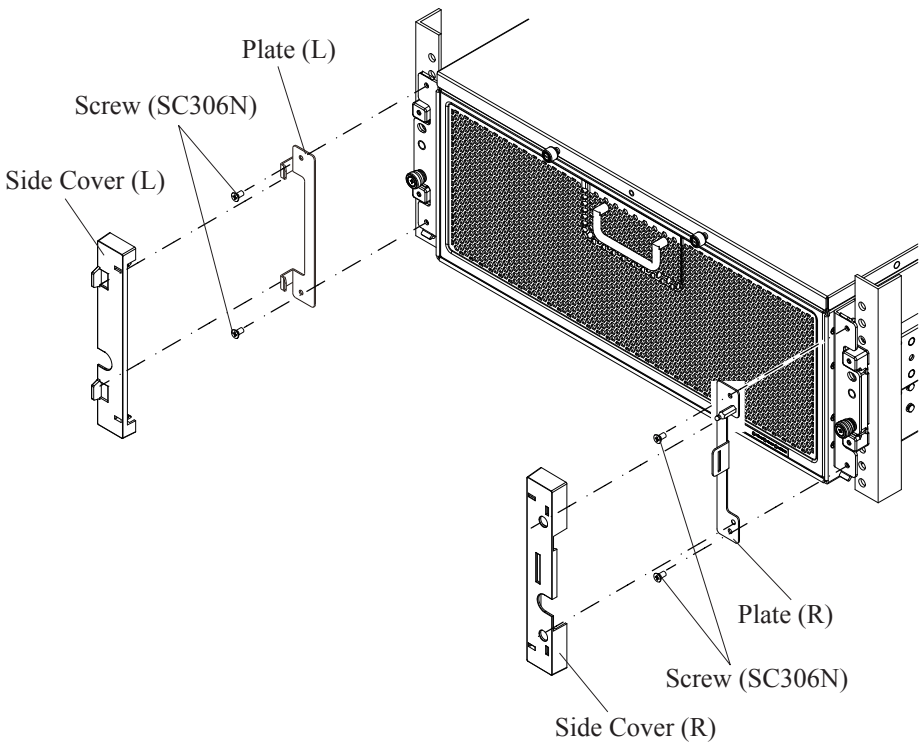
    NOTE : Do not route the power cables. Route them with the SAS cables in Step 16.

15. Cable Routing
    Route the SAS cables and the power cables referring to "2.11 Routing Cables for DB60".

16. Routing and connecting SAS cables to an existing Drive Box (connection source Drive Box)
    (1) To route and connect the SAS cables, which are required to be installed at the same time of the installation of the DKB and Drive Boxes, to a connection source Drive Box, follow the procedures of the "3.6 Adding Disk Board (DKB)/Replacing Disk Board (DKB) (Type Change)" and "3.4 Adding Drive Boxes".

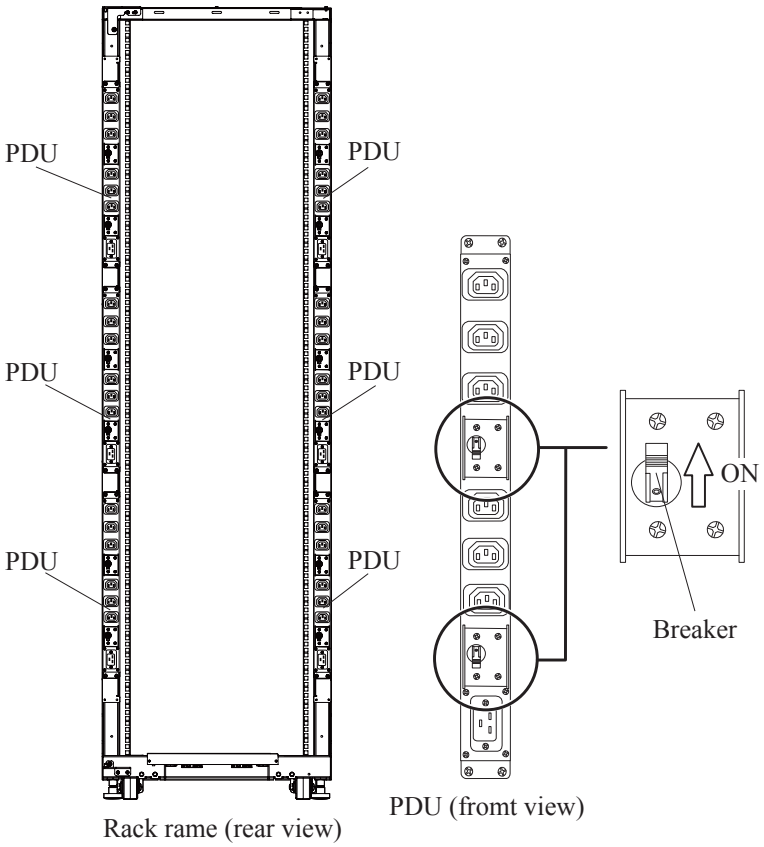
17. Installing the Side Bezels
    (1) Attach the plate (L) to the left front side of the Drive Box and fix it with two screws.
    (2) Attach the plate (R) to the right front side of the Drive Box and fix it with two screws.
    (3) Attach the side cover (L) to the plate (L).
    (4) Attach the side cover (R) to the plate (R).

Figure 3-46 Attaching Parts for the Side Bezel



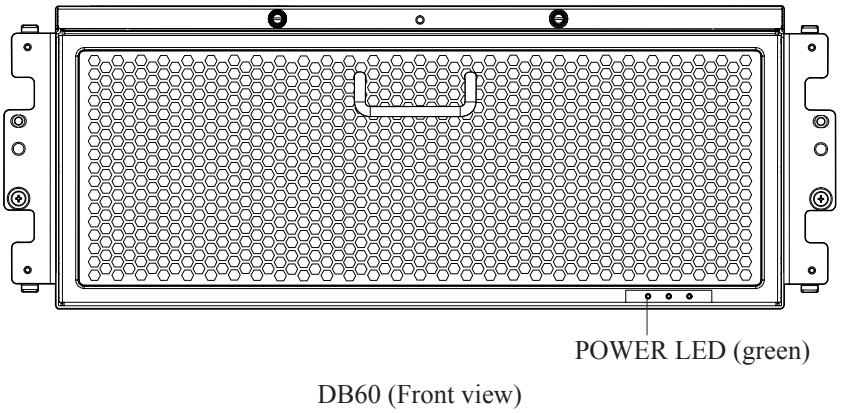
18. Turn on of the PDU.
    Turn it on when the PDU breaker connecting the power cables is turned off.

Figure 3-47 PDU Breaker



19. Check that the POWER LED (green) on the front of the DB60 lights up.

Figure 3-48 DB60 POWER LED

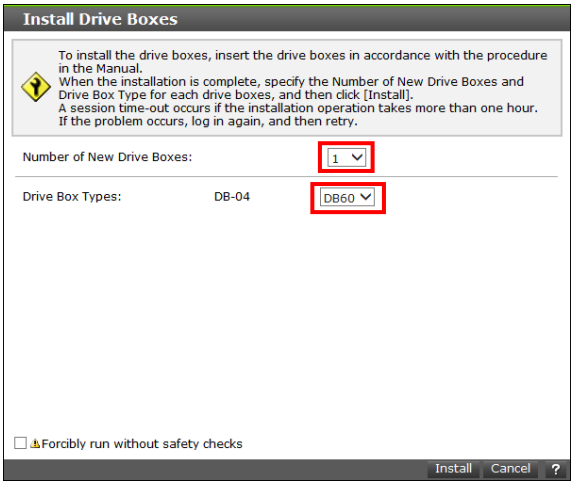


20. Attachinging the Front Bezel
    Attach the Front Bezel referring to "1.4.1 How to Attach/Remove the Front Bezel".

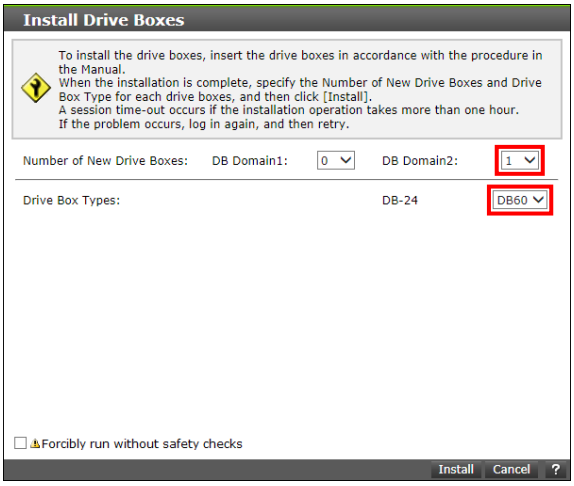
21. Checking addition completion by Maintenance Utility
    (1) <Recognize Drive Boxes>
    Click the [Install] button.

    NOTE : The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.

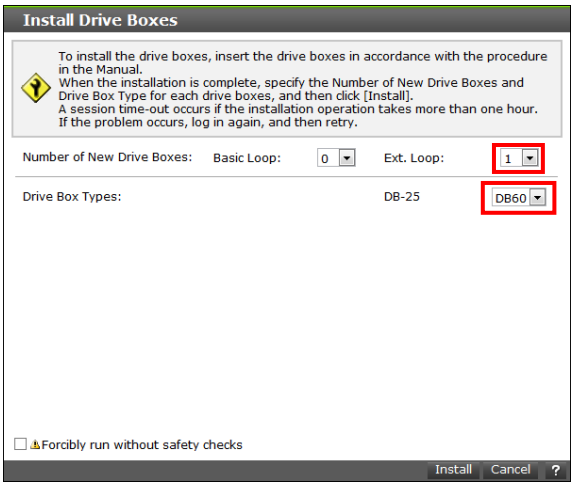
• When Controller Chassis is CBSS or CBSL



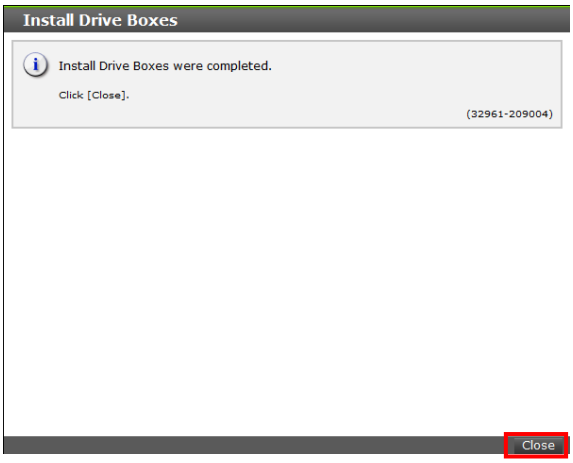
• When Controller Chassis is CBLH1



• When Controller Chassis is CBLH2



(2) <Check Addition Completion>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to "Device Manager-Storage Navigator Messages".



When the Drive Box addition fails, click the [Close] button of the completion message. After that, click the [Drive Box] tab and check the Drive Box status.
When the Drive Box status is normal, the number and type of the Drive Boxes set by the procedure of the addition start instruction may be incorrect. Review the setting and perform the addition again.
In that case, when adding two or more Drive Boxes at one time, add them one by one. Note that, in either case, it is not required to remove the installed hardware.

(3) Click the [Logout] button to close the window.

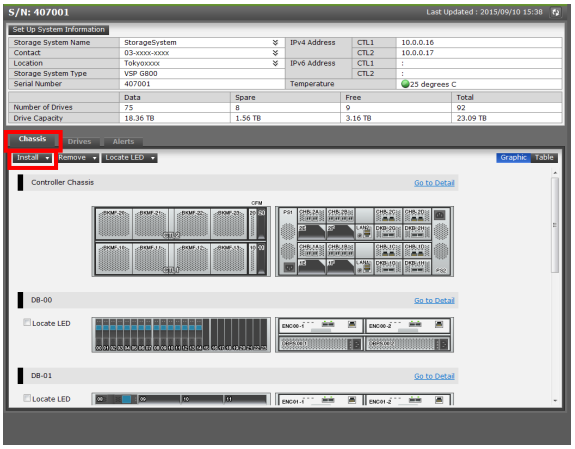
22. Disconnecting the Maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".

3.4.5 Adding Flash Module Drive Boxes (DW-F800-DBF)

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding the Flash Module Drive Boxes, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

3. Instructing to start addition by Maintenance Utility
   (1) <Main Window>
   Click the [Chassis] tab in the main window and click the [Install] button. For CBLH2, click the [Install] button and select [Drive Box].



(2) <Setting the Number/Type of Drive Boxes>

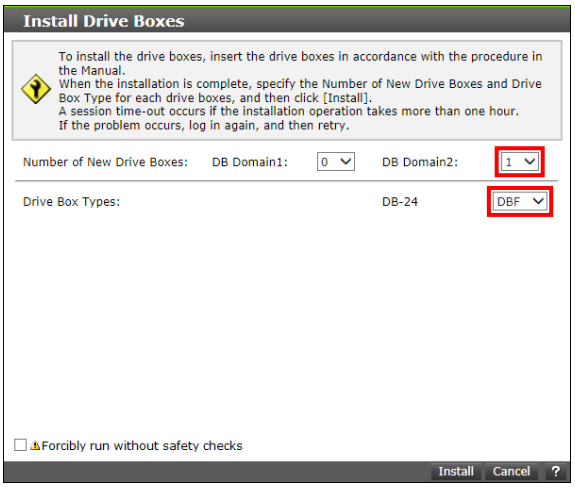
⚠ CAUTION

About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

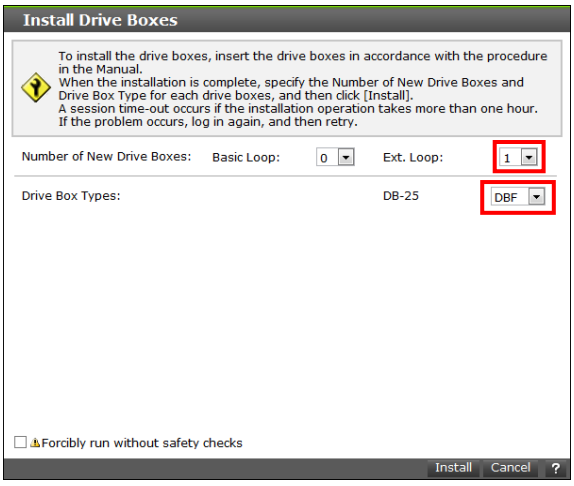
Set the number of Drive Boxes to be added and the types.
When the Controller Chassis is a CBLH1, input columns of the DB Domain 1 and DB Domain 2. Loop are displayed in the location of the Number of New Drive Boxes in the window.
When the Controller Chassis is a CBLH2, input columns of the Basic Loop and Ext. Loop are displayed in the location of the Number of New Drive Boxes in the window.
When connecting the Drive Box to be added to the optional Disk Board (1E/2E or 1F/2F), be sure to input the number and type of the Drive Box to be added to the Ext. Loop.

NOTE : Do not click the [Install] button at this time.
Click the [Install] button after completing the addition work.

• When Controller Chassis is CBLH1



• When Controller Chassis is CBLH2

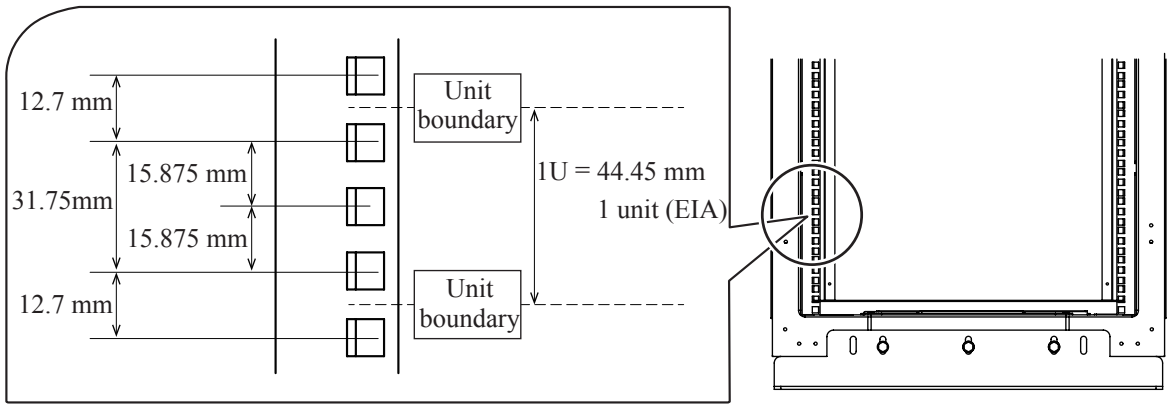


4. Checking the installation location

   EIA units and intervals of mounting holes of RKU rack frame conforming to EIA standard

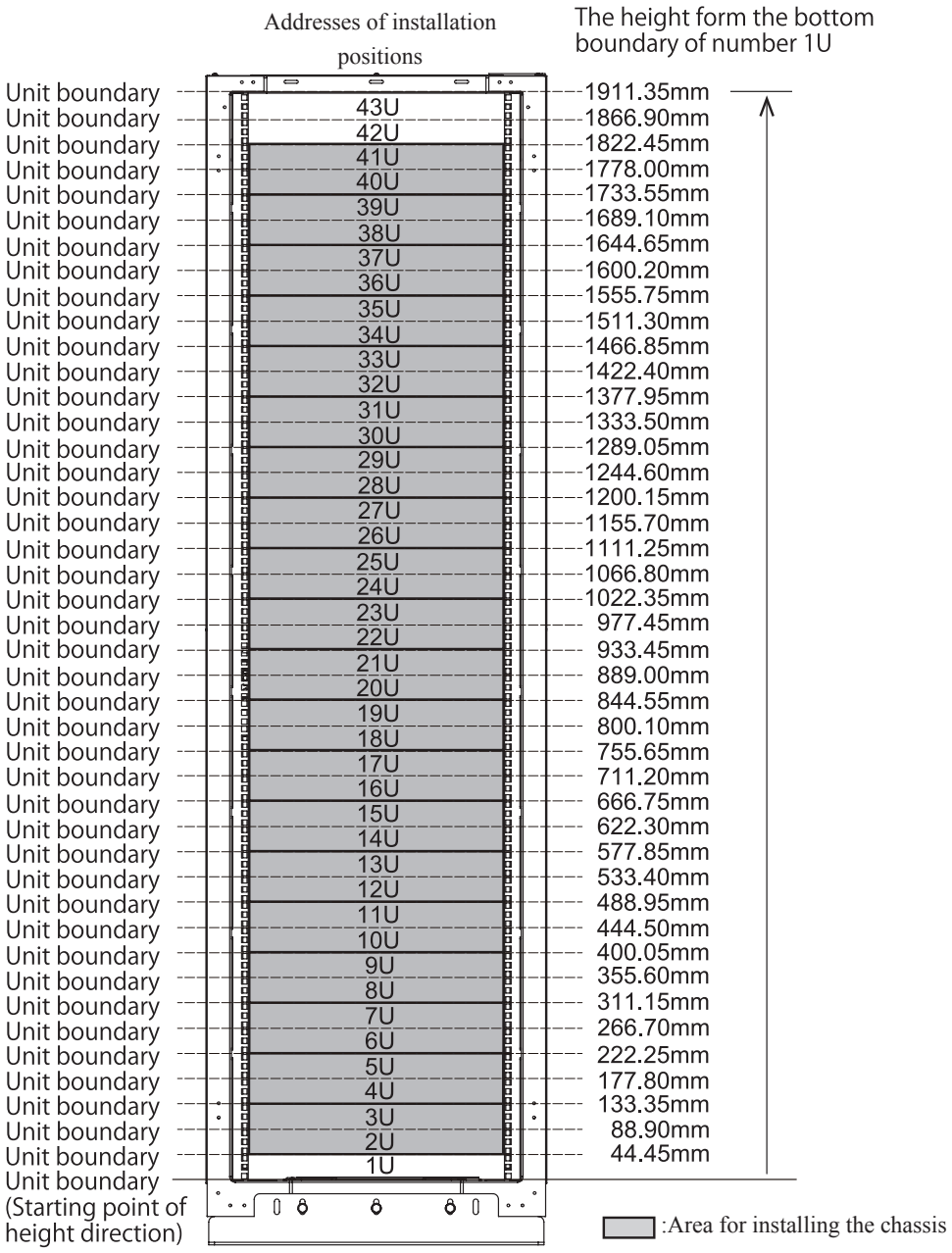
   - A unit (U) space conforming to EIA standard is 44.45 mm as shown in the figure below.
   - The boundary of the unit falls on the middle of the interval of 12.7mm.
     The boundary of the unit (1 U/1 EIA) is from the center of the interval of 12.7 mm to the center of the next interval of 12.7 mm.
   - For rack, hole size for rack installation is determined based on the EIA standard.
     Hole size for rack installation :
     Universal intervals: Repeat of 44.45 mm (15.875 mm + 15.875 mm + 12.7 mm)

Figure 3-49 Attachment Hole Size of Rack



The addresses are called unit (EIA) numbers and given as 1, 2, 3, and so on counted from the bottom of the rack frame.
The following figures show a layout example of installing Drive Box in 43 units rack frame. However, installing positions of Drive Box may differ according to the construction within the rack frame.

Figure 3-50 Mounting Position of Drive Box



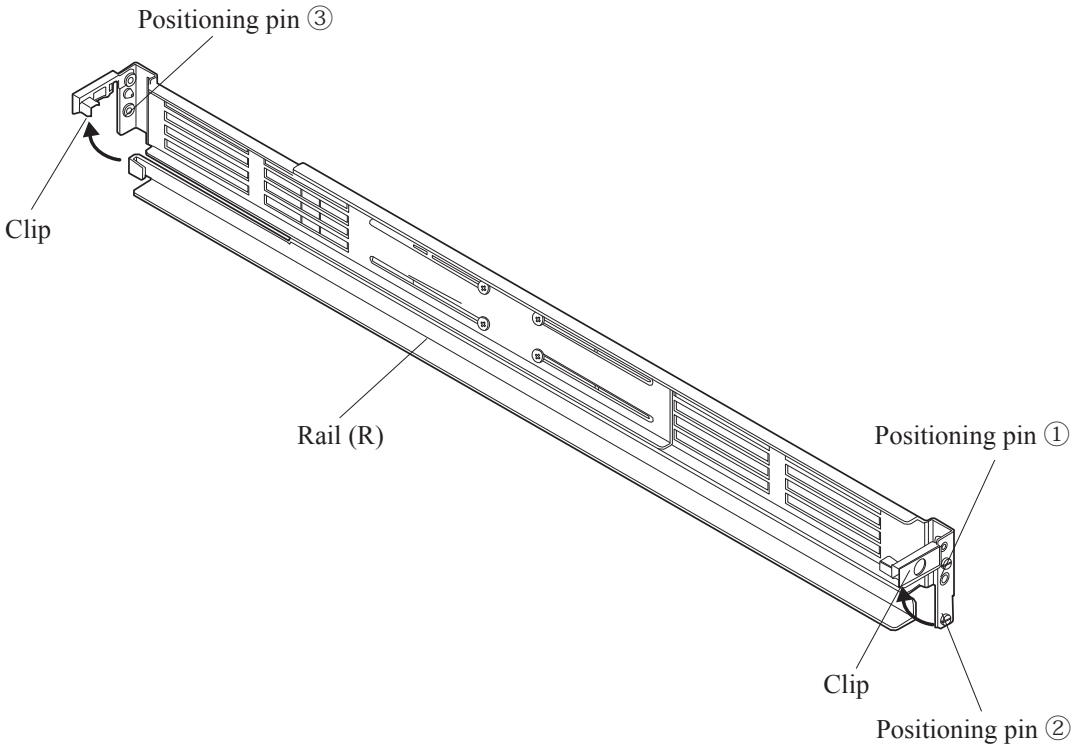
5. Installing the rails

The rail install procedure is different depending on the hole shape (square or circular hole) on the rack. Check the holes on the rack before the installation work.

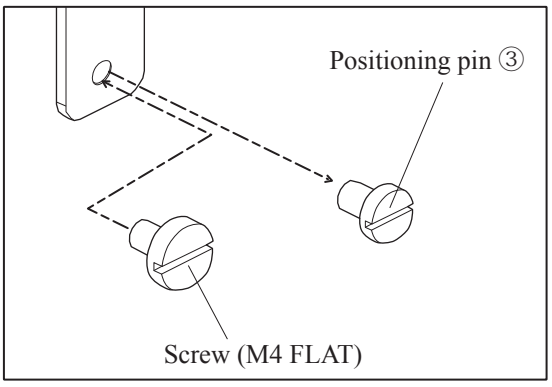
(1) Open two clips on the front and back of the rail (R).

(2) When the rack installation hole is rectangular, replace positioning pins ① , ② and ③ with the supplied screws (M4 FLAT) (ϕ 9.2 head screw).

Figure 3-51 Work before Installing Rails

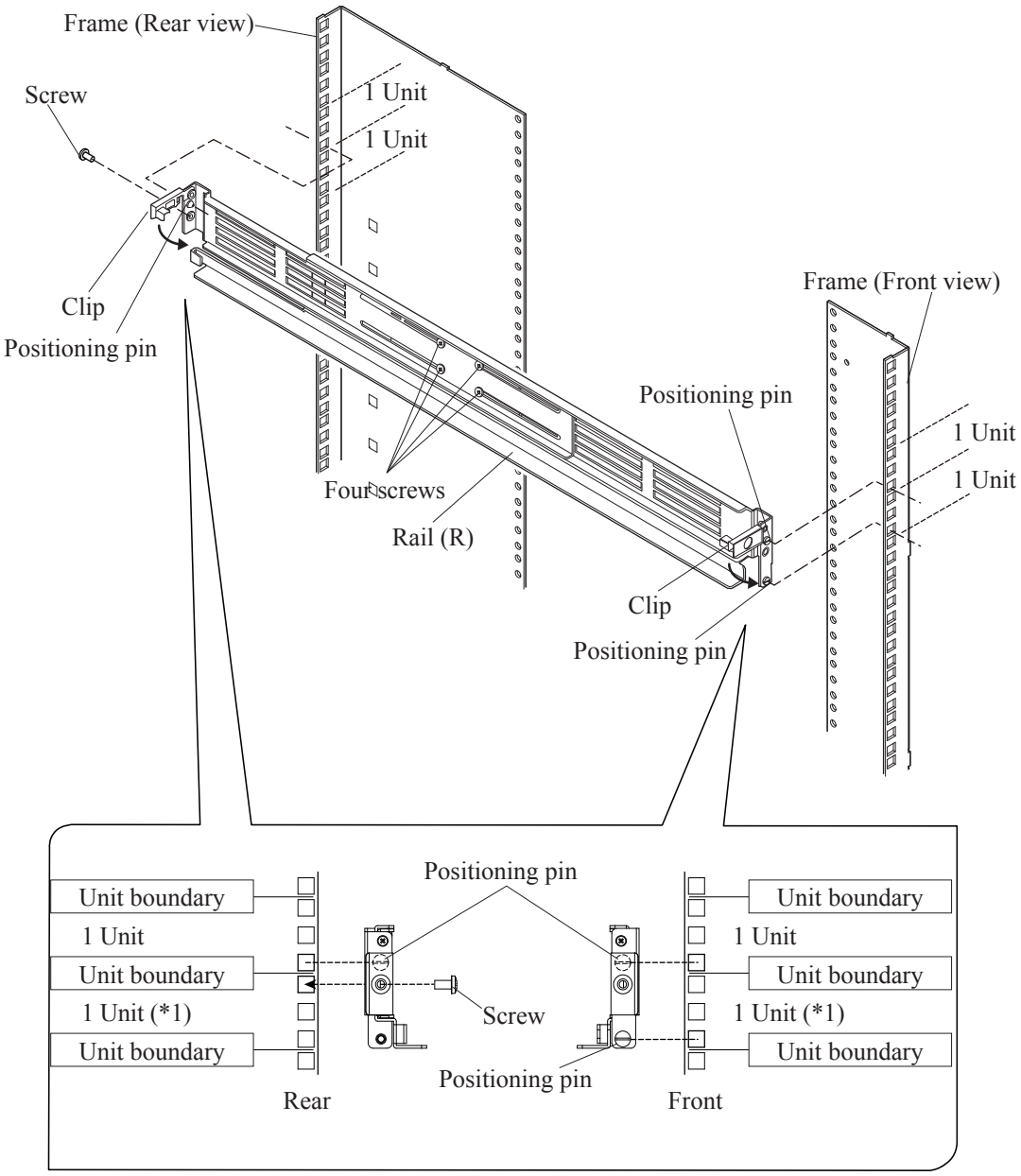


In case of square hole



(3) Loosen the four screws on the side of the rail (R) and adjust the rail (R) length.
When the rack frame and the rail width do not match even if loosening the screws, remove the four screws, adjust the length, and then fix the rail with four screws again.
(4) Fit the positioning pins (at three places in front and rear) in the holes in the position to be installed on the right side of the rack.
(5) Close the clips on the rail (R) and install the rail (R) in the rack.
(6) Tighten the four screws on the side of the rail (R).
(7) Fix the rear side of rail (R) with screw. The fixing position is the third hole from the bottom of the unit boundary line.
(8) Install a rail (L) on the left side of the rack in the similar procedure.

Figure 3-52 Installing Rails



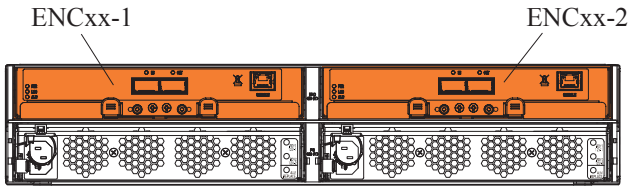
*1: Lowest unit of installing position Unit

6. Removing the parts
   If the Drive Box is installed at a height of 1 m or below installed by using the special lifter, this procedure is not required because the Drive Box is installed into the rack frame with its parts mounted. (Go to Step 7.)
   If other than above, remove the parts first and then install the Drive Box into the rack frame.

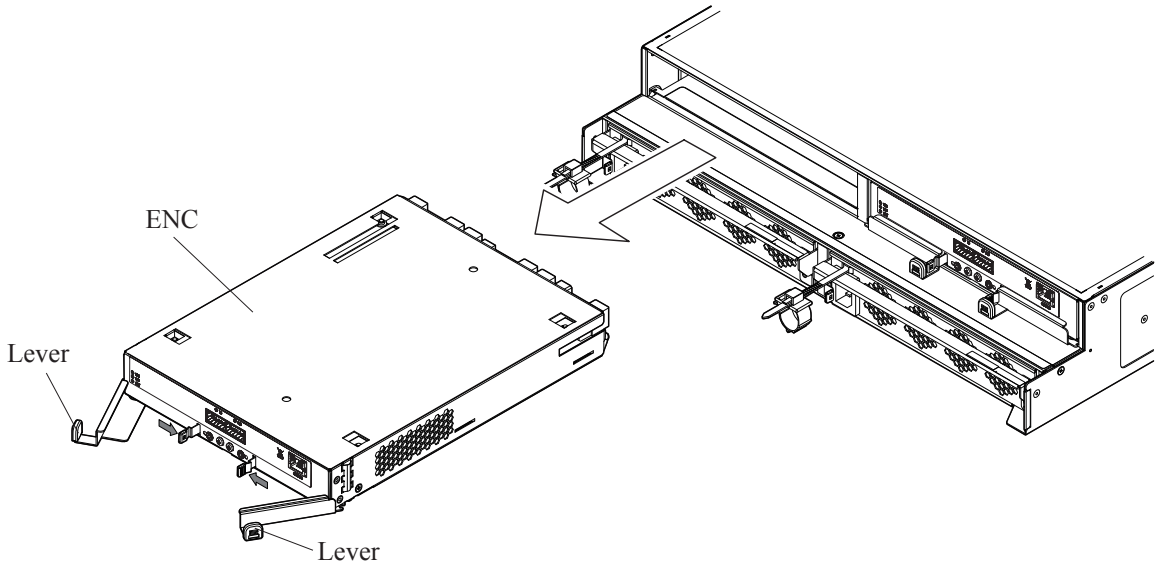
NOTICE:	To prevent part failures caused by static electrical charge built up on your own body, be sure to wear a wrist strap connected to the Storage System before starting and do not take it off until you finish. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Attach a label or the like for identification of installation location to a removed part so that it can be installed in the same place in the Drive Box.
(2) Removing a ENC
   (a) Press the latches of the ENC in the left side of the rear of the Drive Box inward to unlock the levers.
   (b) Open the right and left levers and remove the ENC.
   (c) Remove the other ENC in the same manner.

Figure 3-53 Removal of ENC



Rear view of DBF



*1: ENCxx-1
└→ DB No. (00, 01, 02, ..., 47)

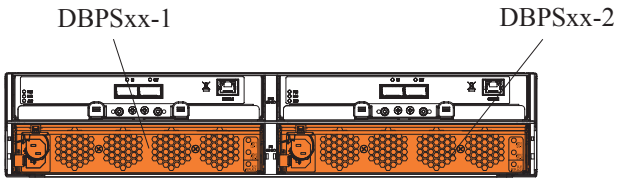
(3) Removing a DBPS

(a) Open the handle (②) while pushing the latch of the DBPS in the left side of the rear of the Drive Box inward (①).

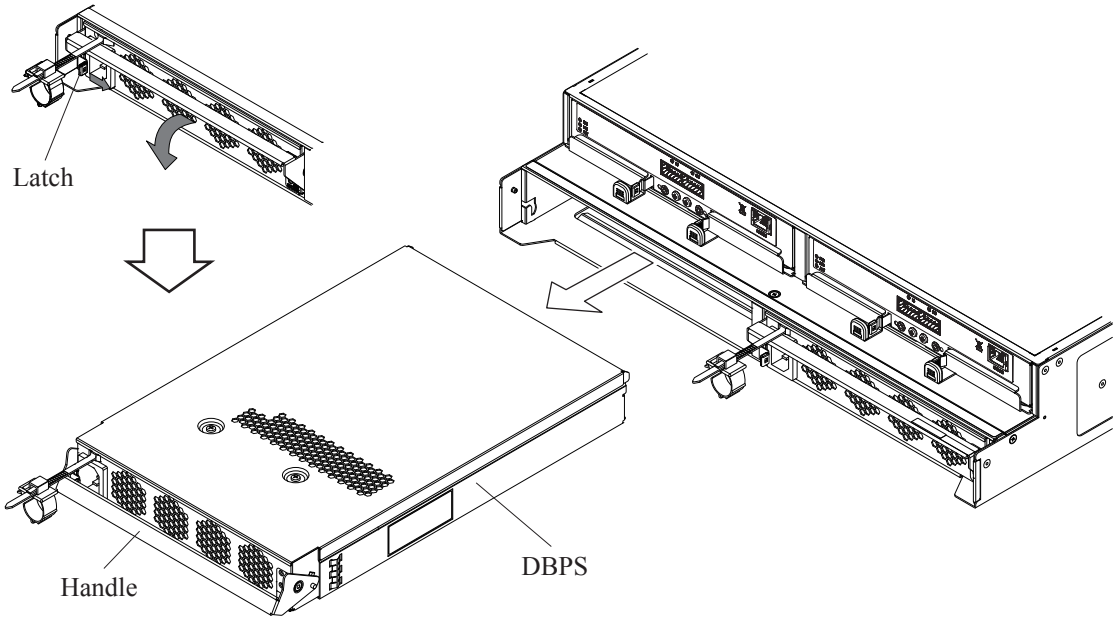
(b) Pull the DBPS and remove it from the Drive Box.

(c) Remove the other DBPS in the same manner.

Figure 3-54 Removal of DBPS



Rear view of DBF



*1: DBPSxx-1

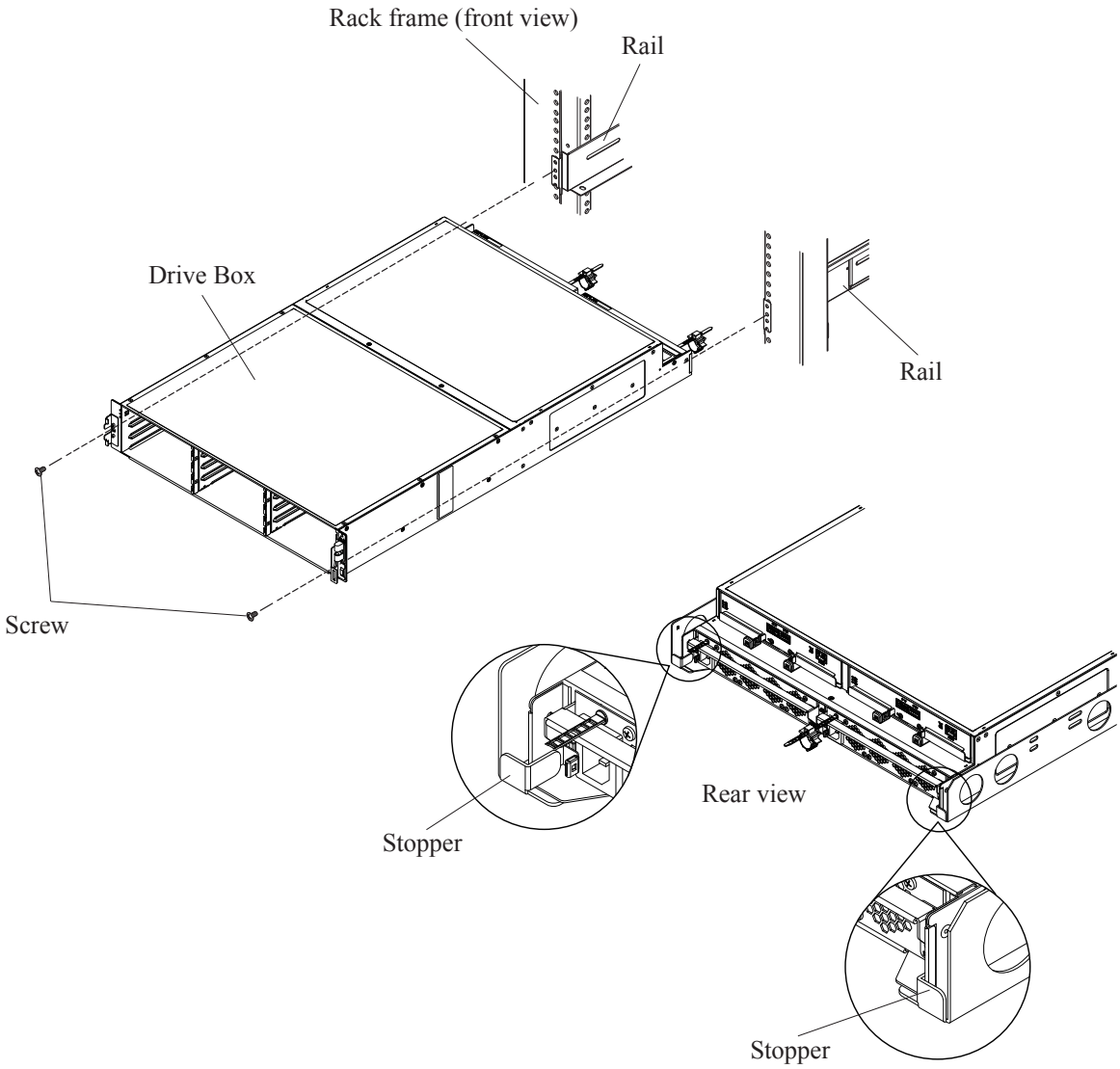
└→ DB No. (00, 01, 02, ..., 47)

7. Installing the Drive Box

> **⚠ CAUTION**
>
> Be careful of the mass:
> Work carefully because the mass of the DBF is about 38 kg.
>
> Be careful of falling over and dropping:
> To prevent Drive Box from falling over and dropping, the installation work must be done by two or more personnel.

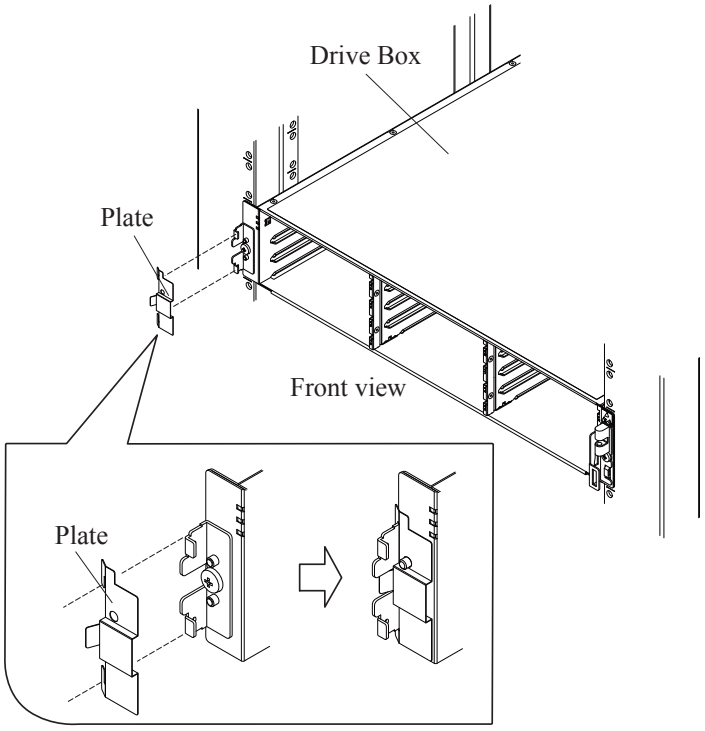
(1) Install the Drive Box on the front side of the Rack frame referring to mounting procedure using the special lifter. (Refer to "2.6.1 Mounting Storage System on a Special Lifter".)
(2) Fasten two screws and fix the Drive Box.

Figure 3-55 Installing Drive Box



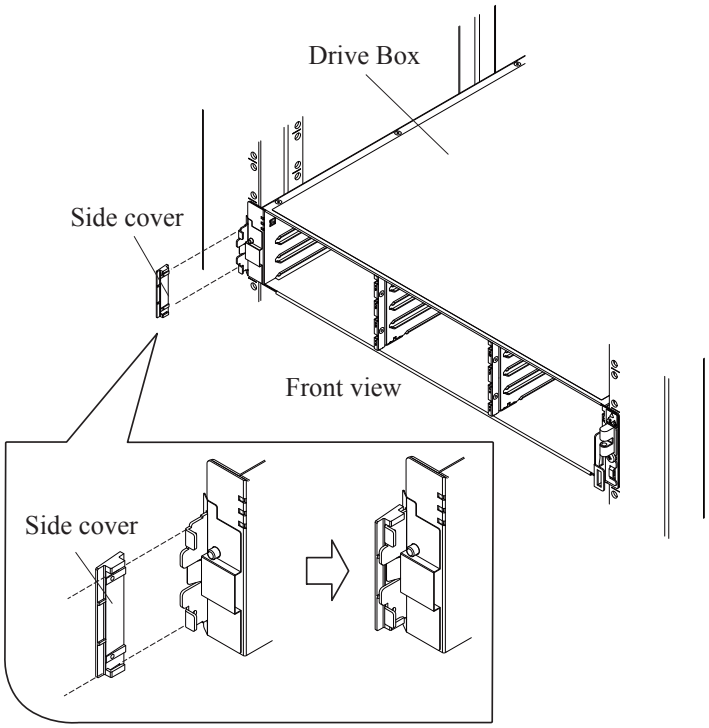
(3) Attaching the plate to the left side of the front of the Drive Box.

Figure 3-56 Attaching the Plate



(4) Attach the side cover to the left side of the front of the Drive Box.

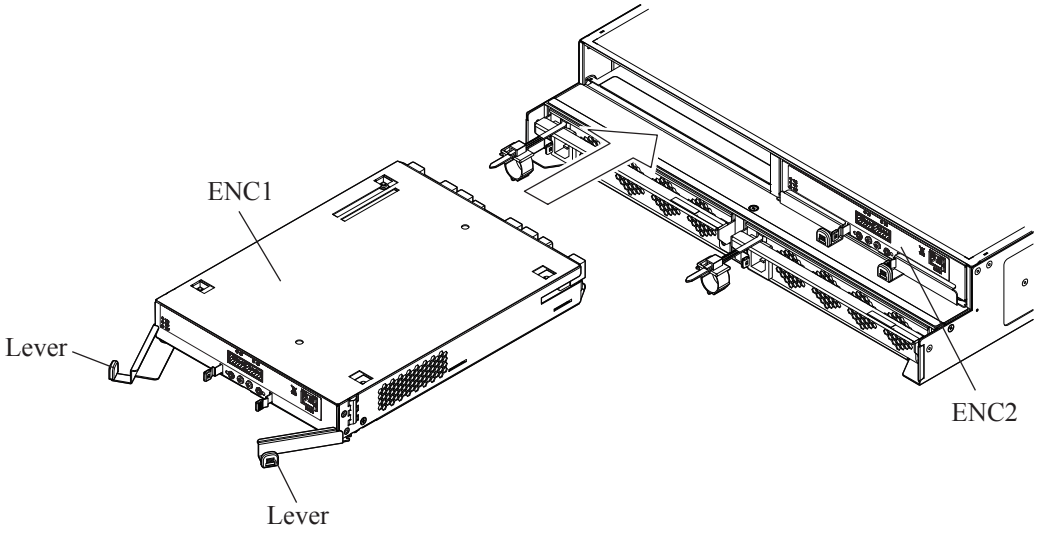
Figure 3-57 Attaching the Side Cover



8. Reinstalling the removed parts
   If parts were removed in "6. Removing the parts", reinstall the parts.
   If parts were not removed, go to Step 9.

   (1) Attaching the ENC
      (a) Open the right and left levers of the ENC.
      (b) Insert the ENC until the edge of the lever comes in contact with the Drive Box.
      (c) Close the right and left levers to insert the ENC completely.
      (d) Install the other ENC in the same manner.

Figure 3-58 Installing ENC



(2) Attaching the DBPS

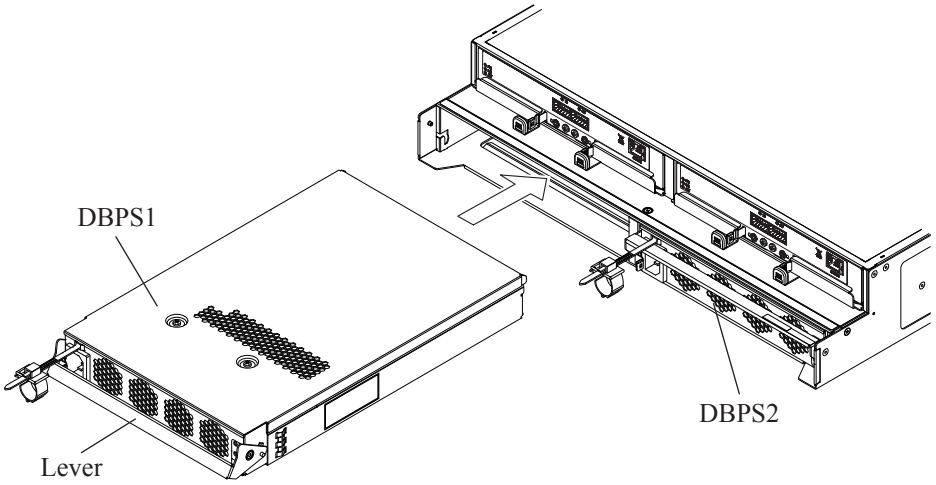
(a) Open the handle of the DBPS completely.

(b) Insert the DBPS into the slot and push it to the full.

(c) Open the handle completely and fix the DBPS.

(d) Install the other DBPS in the same manner.

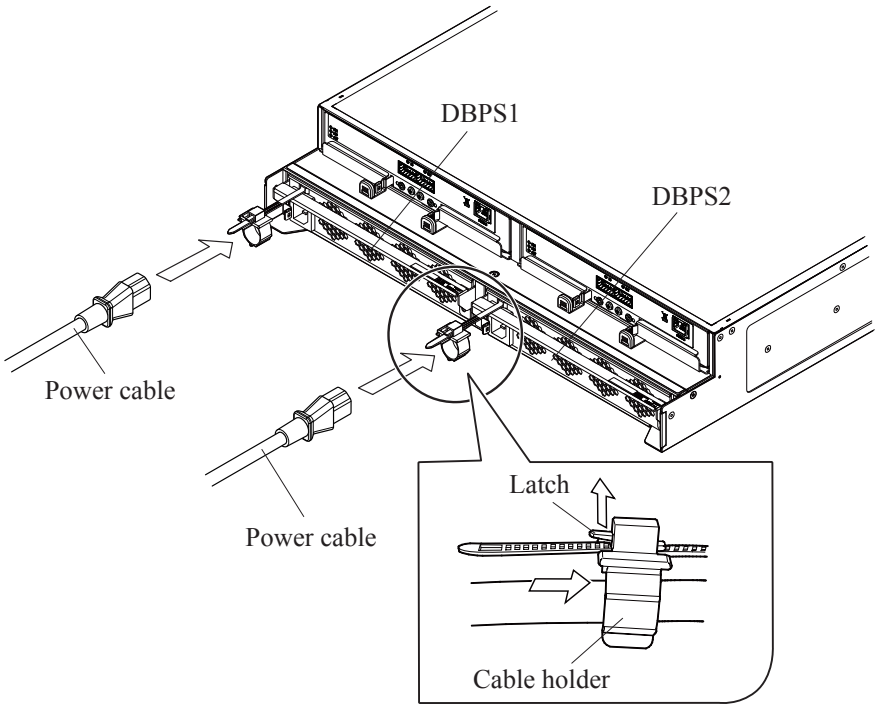
Figure 3-59 Installing DBPS



9. Connecting SAS Cables.
   Connect the SAS cables, attach the location labels and route the cables referring to “2.10.2 Connecting SAS Cables”.

10. Connecting Power Cables
    (1) Connect two power cables to the DBPSs.
    (2) Put the power cable through the cable holder and fix it with the cable holder.
    (3) Lift the latch of the cable holder and push the power cable holder toward the DBPS until it stops.

Figure 3-60 Connecting Power Cables



(4) Connect two power cables to the PDUs and fix them with a stopper.

NOTE : • Connect the power cable for the DBPSxx-1 to the left PDU.
Connect the power cable for the DBPSxx-2 to the right PDU.
If they are plugged in the receptacles of the PDUs on the same side, the function of the duplicated power supply does not work.
• Check the rated current of the PDU to be used and make sure the total load doesn't exceed the rated current by calculation when connecting a power cable.
• Limit the total current output from the outlets J101 to J103 so that it does not exceed 10 amperes.
Limit the total current output from the outlets J201 to J203 so that it does not exceed 10 amperes.

Figure 3-61 Connection Example of Power Cables

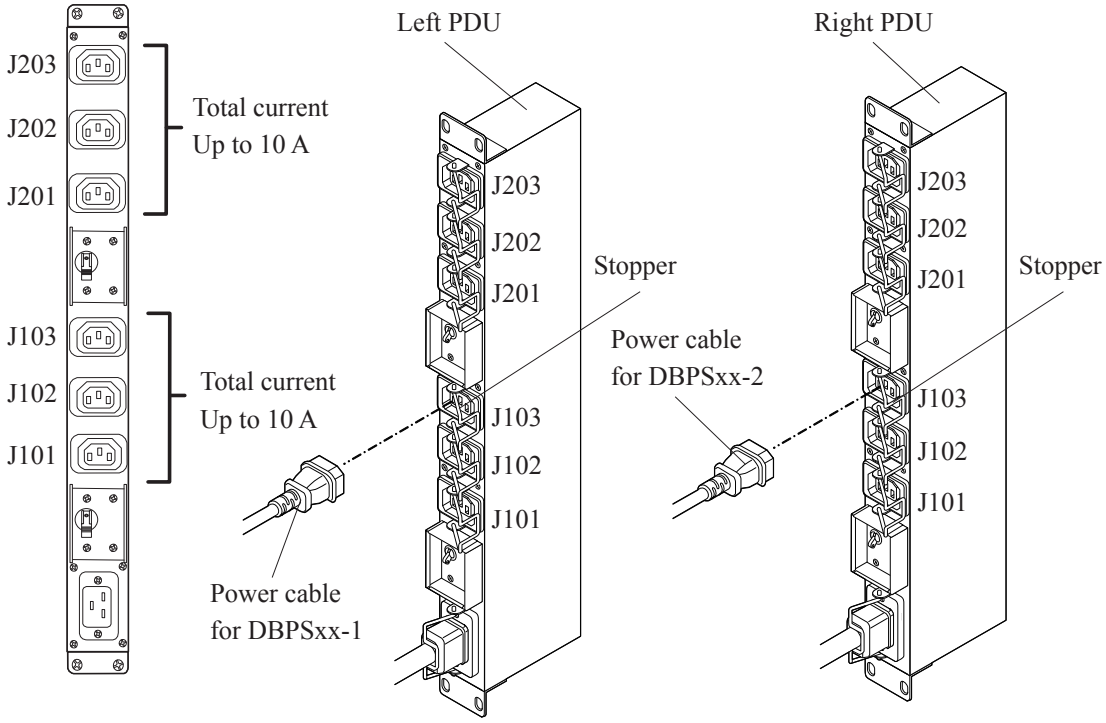
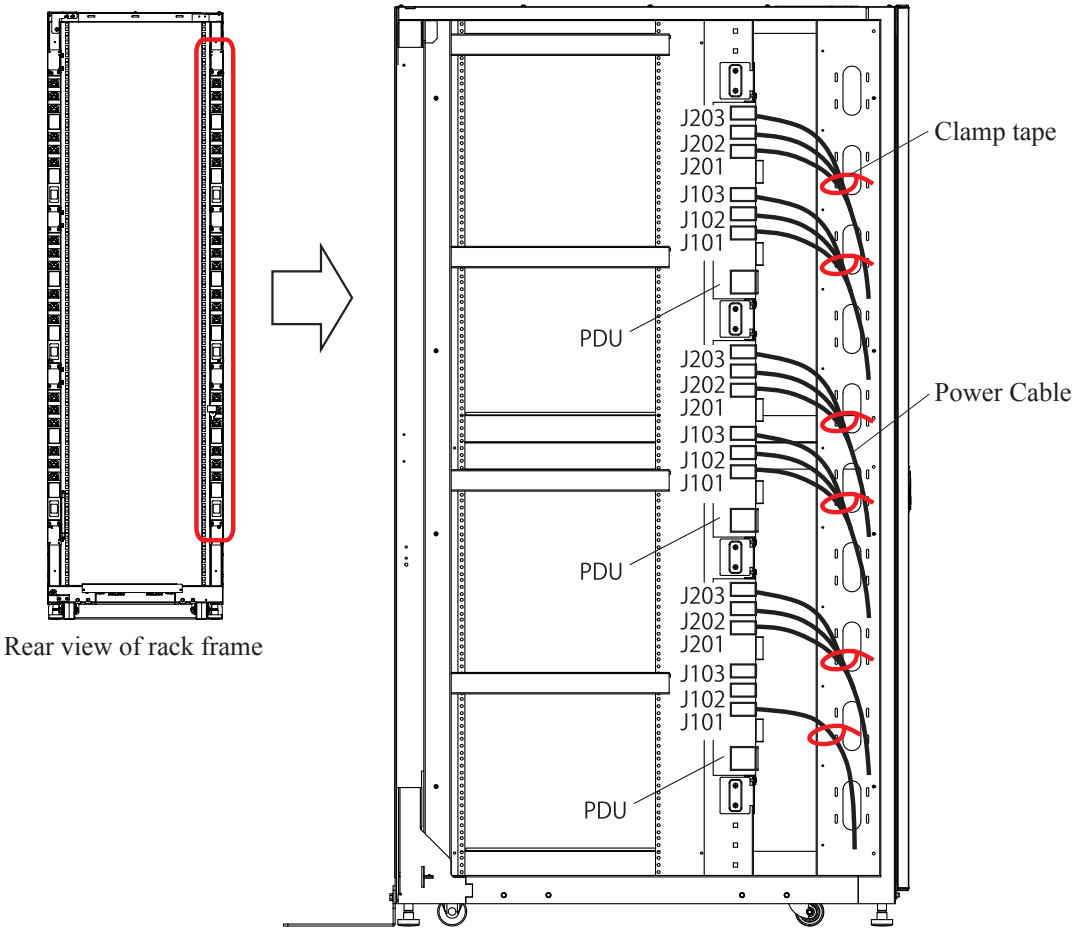


Table 3-25 Load Current of Each Model Number

No.	Model Number	Load Current (per PS)
1	DW850-CBLH1	7.0 A
2	DW850-CBLH2	8.0 A
3	DW-F800-DBSC	2.4 A
4	DW-F800-DBLC	1.9 A
5	DW-F800-DB60C	6.0 A
6	DW-F800-DBF	2.6 A

(5) Fix the power cables with the clump tapes on the both sides of the rear of the rack frame.

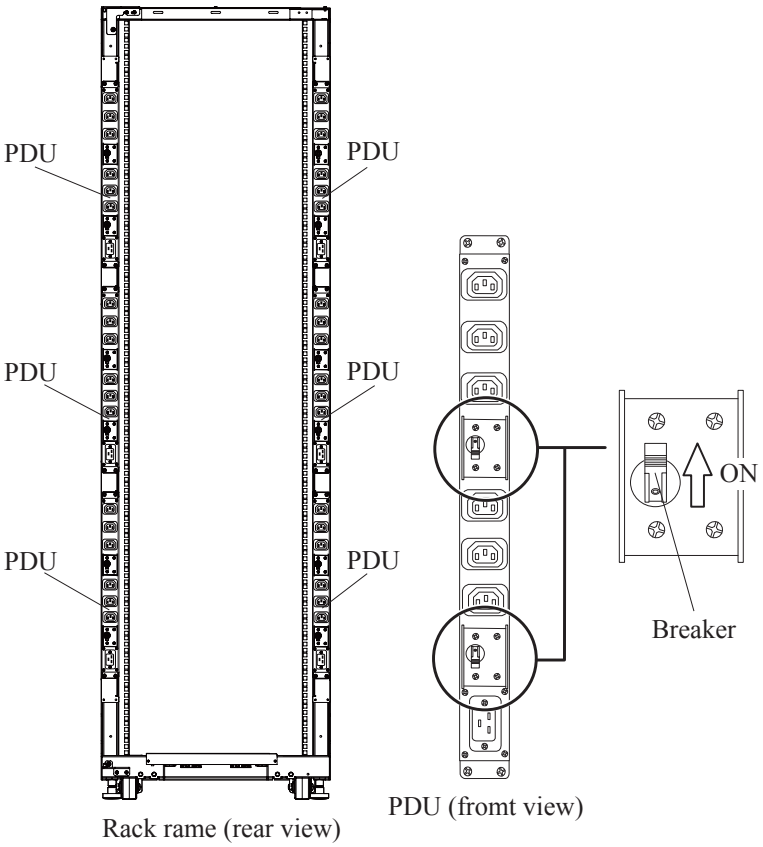
Figure 3-62 Fixing the Power Cables



*1: The figure shows fixation of the right side.

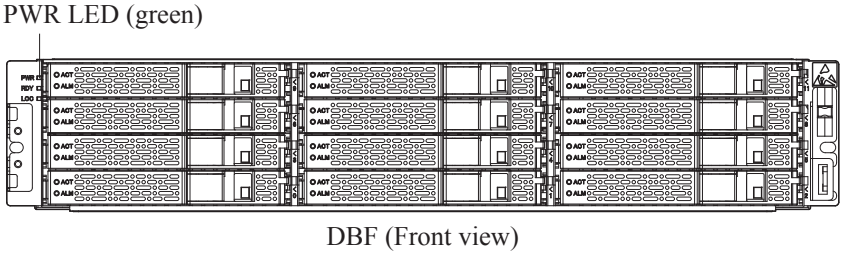
(6) Turn on of the PDU.
Turn it on when the PDU breaker connecting the power cables is turned off.

Figure 3-63 PDU Breaker



(7) Check that the PWR LED (green) on the front of the DBF lights up.

Figure 3-64 DBF PWR LED

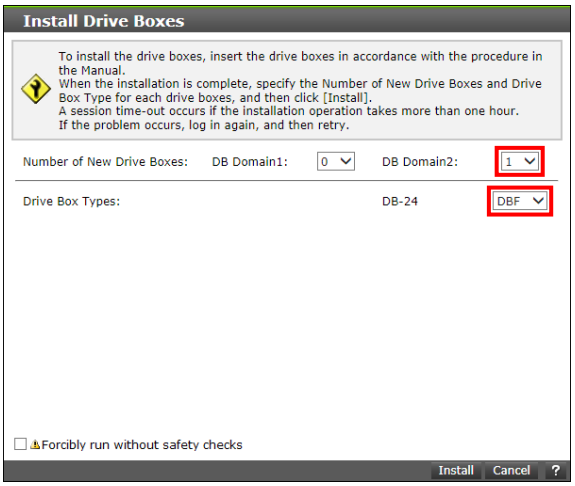


11. Attaching the Front Bezel.
    Attach the Front Bezel. (Refer to “1.4.1 How to Attach/Remove the Front Bezel”.)

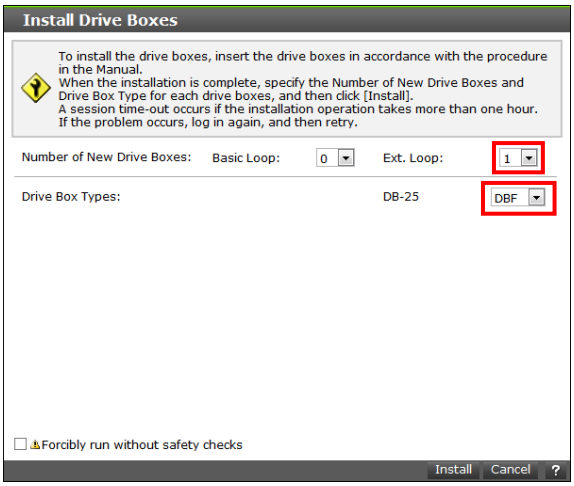
12. Checking addition completion by Maintenance Utility
    (1) <Recognize Drive Boxes>
    Click the [Install] button.

    NOTE : The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.

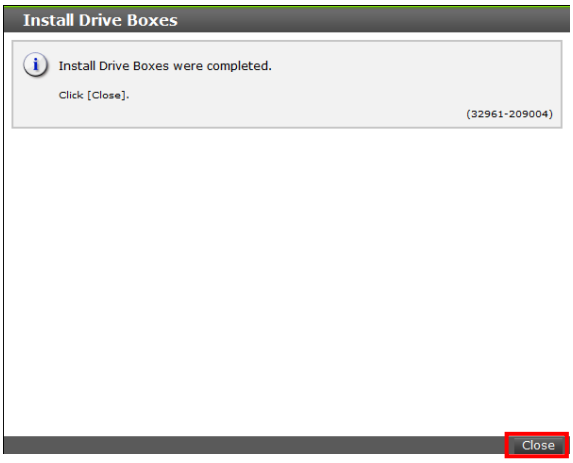
• When Controller Chassis is CBLH1



• When Controller Chassis is CBLH2



(2) <Check Addition Completion>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.



(3) Click the [Logout] button to close the window.

13. Disconnecting the Maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION “2.8.3 Disconnecting the Maintenance PC from the Storage System”.

3.5 Adding Channel Board (CHB)

When adding Channel Boards, the window and the procedure differ between the CBSS/CBSL and the CBLH.

- When adding Channel Boards to the CBSS/CBSL: "3.5.1 Adding Channel Board for CBSS/CBSL"
- When adding Channel Boards to the CBLH: "3.5.2 Adding Channel Board for CBLH"
- When adding Channel Boards to the Channel Board Box: "3.5.3 Adding Channel Board for Channel Board Box"

3.5.1 Adding Channel Board for CBSS/CBSL

NOTE : Add Channel Boards of the same type to the same positions of Controller Boards 1 and 2.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding the Channel Boards, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

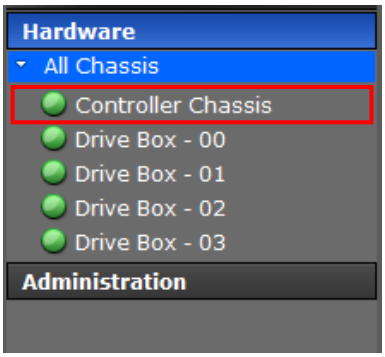
---

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

3. Selecting additional parts by Maintenance Utility

(1) <Main Window>

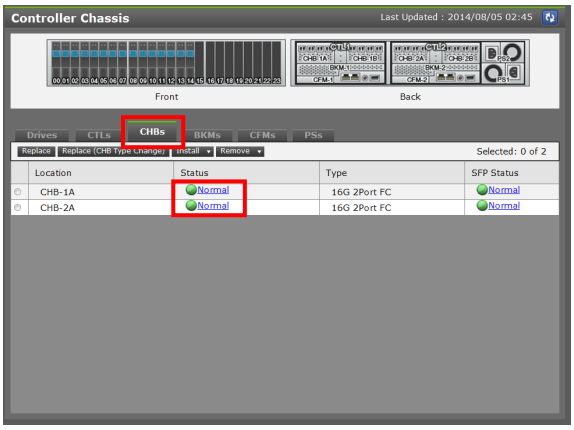
Click the [Controller Chassis] tab in the main window.



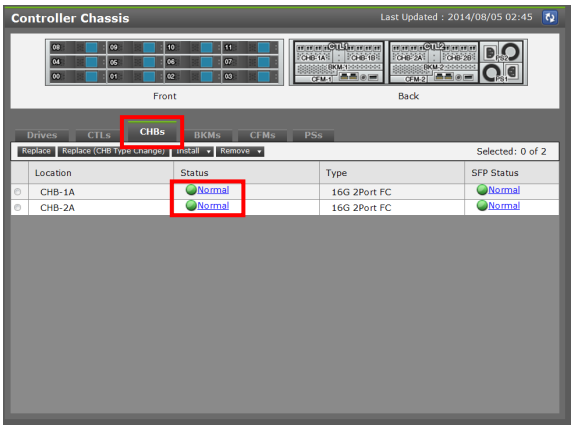
(2) <Controller Chassis Window>

Click the [CHBs] tab in the "Controller Chassis" window and display the Channel Board status.

• In case of CBSS



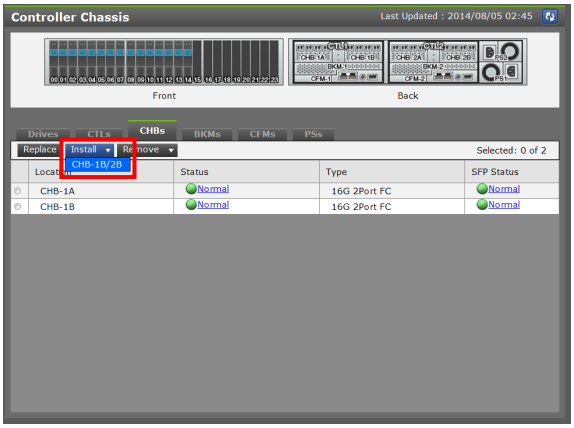
• In case of CBSL



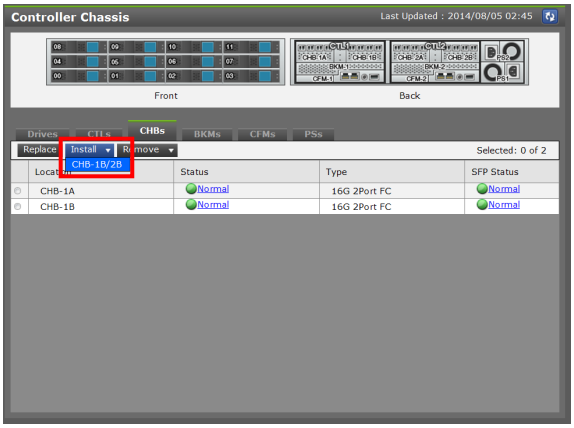
(3) <Select Additional Slots>

Click the [Install] button and select a slot to be added.

• In case of CBSS



• In case of CBSL



(4) <Select Channel Board>

⚠ CAUTION

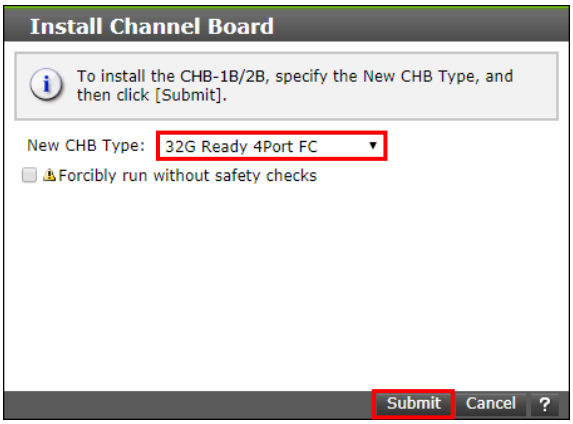
About "Forcibly run without safety checks":

If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

Select the type of a Channel Board to be added and click the [Submit] button.

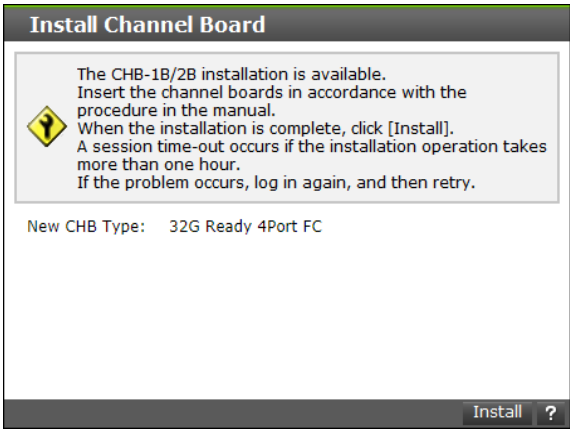
For the relation between the type and the model name of Channel Board to be selected, see "1.2.3 MPC Window Display and Conversion Table of Option Type Names".

NOTE : The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



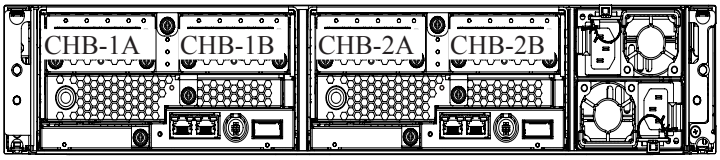
(5) <Check Addition Preparation of Channel Boards>
Check the following addition preparation completion window.

NOTE : Do not click the [Install] button at this time.
Click the [Install] button after completing the addition work.



4. Addition work of Channel Boards for CBSS/CBSL

Location	Additional part name		Parts name
Rear View of CBSS/CBSL	1	Channel Board	• DW-F800-4HF32R (32 G FC) • DW-F800-2HS10S (10 G iSCSI (Optic)) • DW-F800-2HS10B (10 G iSCSI (Copper))



CBSS/CBSL (Rear view)

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. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Adding work of Channel Boards
Add Channel Boards to the same positions of Controller Boards 1 and 2.

⚠ CAUTION

Install the Channel Board (CHB) for CBSS/CBSL upside down.

NOTICE: If Channel Boards are inserted randomly, malfunction may occur. Therefore, insert the Channel Boards in two steps, Step (c) and Step (d) shown below.

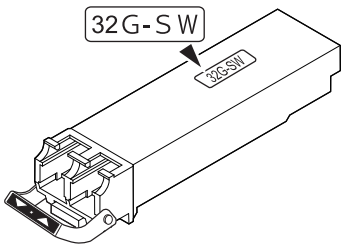
(a) Remove the dummy.
Two types of dummies exist, which are removed in different ways.
- Metal dummy

(i) Loosen two screws (blue) fixing the dummy.
(ii) Hold the screws (blue) and pull out and remove the dummy.
- Plastic dummy

(i) Pull out and remove the dummy.

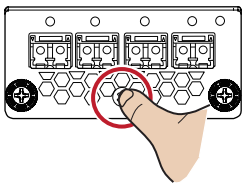
(b) When adding 32 Gbps Channel Boards, mount the Small Form Factor Pluggable (SFP) on the Channel Board to be added.
For channel boards other than 32 Gbps ones, this step is not required. Go onto Step (c).
Check the insertion direction of the SFP, and insert it into the Channel Board to be added until it clicks.

NOTE: The label "32G-SW" is attached to the 32 Gbps Small Form Factor Pluggable (SFP).



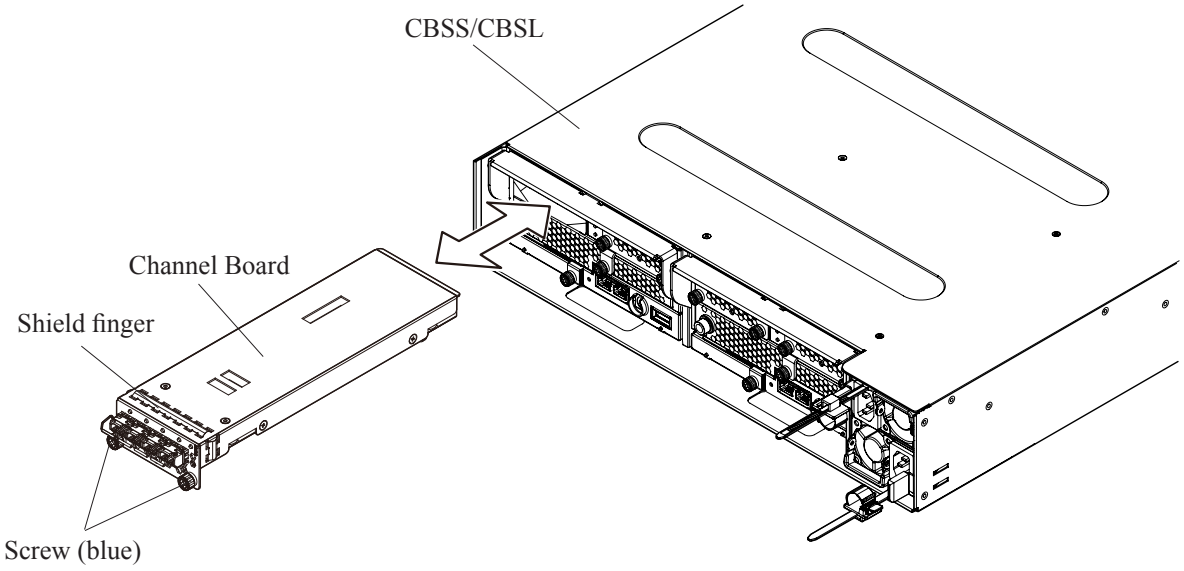
(c) Insert the Channel Boards to be added into the slots just before the shield finger.
(d) Push the Channel Boards gently all the way in.

NOTICE: Push the front side of the Channel Board all the way to insert it to the end.



(e) Tighten two screws (blue) and fix the Channel Board.

Figure 3-65 Adding Channel Board

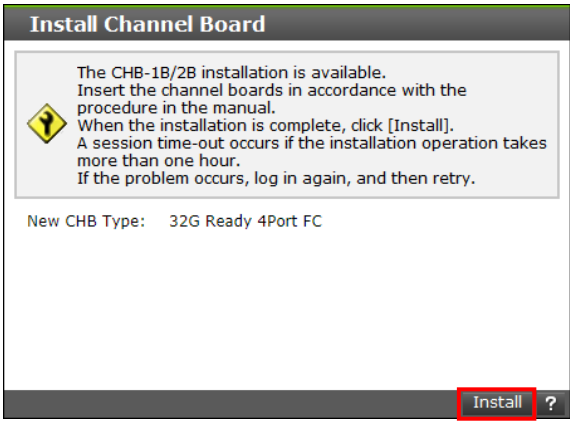


(2) Connect cables to the added Channel Board.

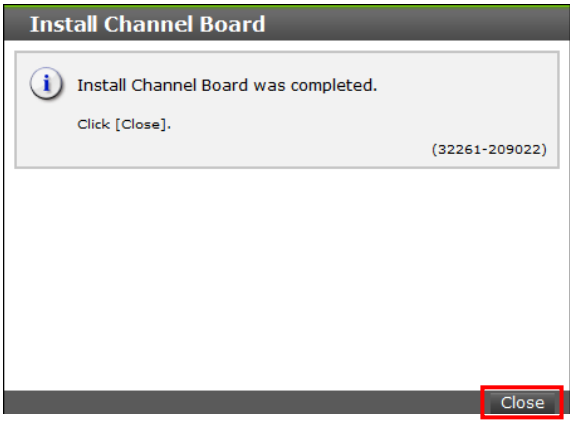
NOTE: Check that cable latch clicks and the cables are surely connected.

5. Checking addition completion by Maintenance Utility
   (1) <Recognize Channel Boards>
   Click the [Install] button.

   NOTE : The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



   (2) <Check Addition Completion>
   Check that the following message is displayed and click the [Close] button.
   If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.



6. Checking the SFP status
   Click the [CHBs] tab in the Controller Chassis window, and check if SFP Status is “Normal”.
   If “Not Fix” is displayed in SFP Status, check if the SFP is properly inserted.
   When “Not Fix” is displayed in SFP Status even if the SFP is properly inserted or “Warning” is displayed in SFP Status, replace the SFP with the maintenance part. See REPLACEMENT SECTION “2.13 Replacing a Small Form-Factor Pluggable (SFP)”.

7. Click the [Logout] button to close the window.

8. Disconnecting the Maintenance PC and the Storage System
   Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION “2.8.3 Disconnecting the Maintenance PC from the Storage System”.

3.5.2 Adding Channel Board for CBLH

NOTE : Add Channel Boards of the same type to the same positions of Controller Boards 1 and 2.

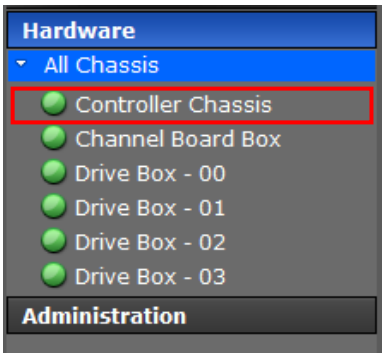
1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding the Channel Boards, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

---

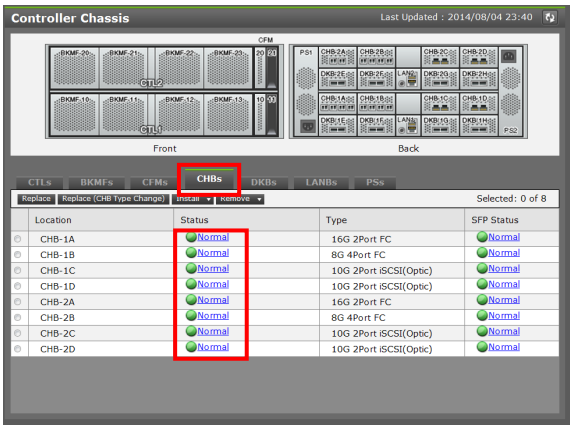
2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

---

3. Selecting additional parts by Maintenance Utility
   (1) <Main Window>
   Click the [Controller Chassis] tab in the main window.

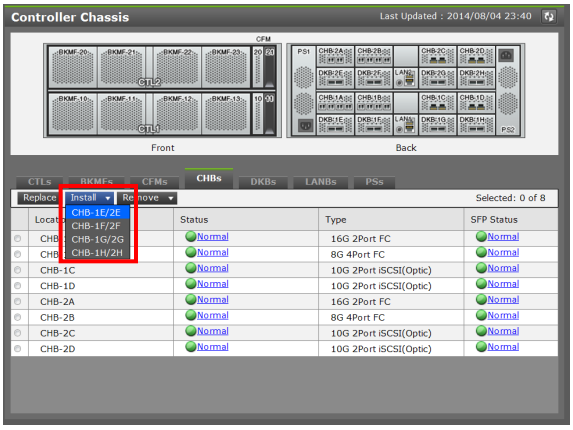


   (2) <Controller Chassis Window>
   Click the [CHBs] tab in the "Controller Chassis" window and display the Channel Board status.



(3) <Select Additional Slots>

Click the [Install] button to select slots to add the Channel Boards.



(4) <Select Channel Board>

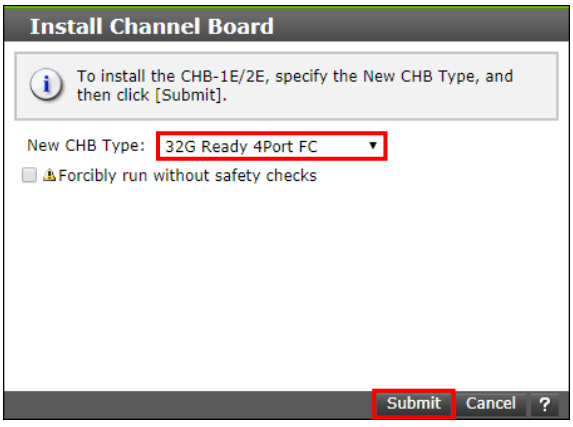
⚠ CAUTION

About "Forcibly run without safety checks":

If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

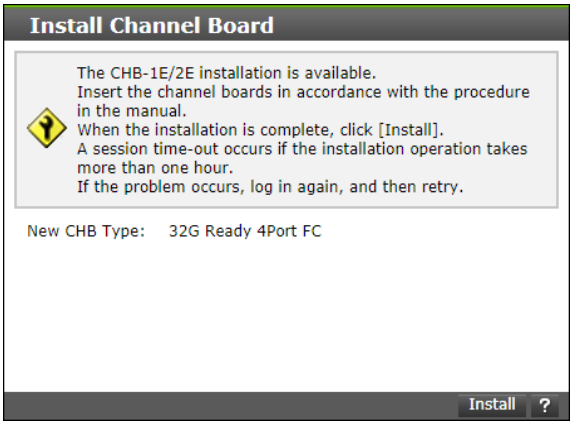
Select the type of a Channel Board to be added and click the [Submit] button.

For the relation between the type and the model name of Channel Board to be selected, see "1.2.3 MPC Window Display and Conversion Table of Option Type Names".



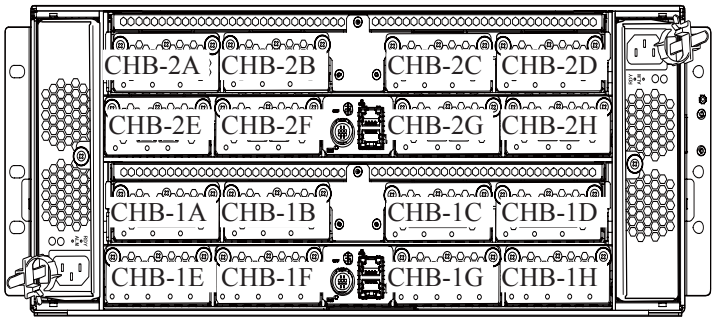
(5) <Check Addition Preparation of Channel Boards>
Check the following addition preparation completion window.

NOTE : Do not click the [Install] button at this time.
Click the [Install] button after completing the addition work.



4. Addition work of Channel Boards for CBLH

Location	Additional part name		Parts name
Rear View of CBLH	1	Channel Board	• DW-F800-4HF32R (32 G FC) • DW-F800-2HS10S (10 G iSCSI (Optic)) • DW-F800-2HS10B (10 G iSCSI (Copper))



CBLH (Rear view)

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. Refer to "1.1.2 Note when Installing and Removing Parts".

NOTICE: If Channel Boards are inserted randomly, malfunction may occur. Therefore, insert the Channel Boards in two steps, Step (c) and Step (d) shown below.

(1) Adding work of Channel Boards

Add Channel Boards to the same positions of Controller Boards 1 and 2.

(a) Remove the dummy.

Two types of dummies exist, which are removed in different ways.

- Metal dummy

(i) Loosen two screws (blue) fixing the dummy.

(ii) Hold the screws (blue) and pull out and remove the dummy.

- Plastic dummy

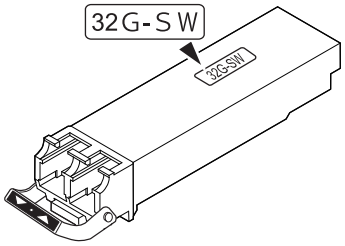
(i) Pull out and remove the dummy.

(b) When adding 32 Gbps Channel Boards, mount the Small Form Factor Pluggable (SFP) on the Channel Board to be added.

For channel boards other than 32 Gbps ones, this step is not required. Go onto Step (c).

Check the insertion direction of the SFP, and insert it into the Channel Board to be added until it clicks.

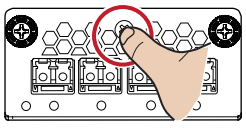
NOTE: The label "32G-SW" is attached to the 32 Gbps Small Form Factor Pluggable (SFP).



(c) Insert the Channel Boards to be added into the slots just before the shield finger.

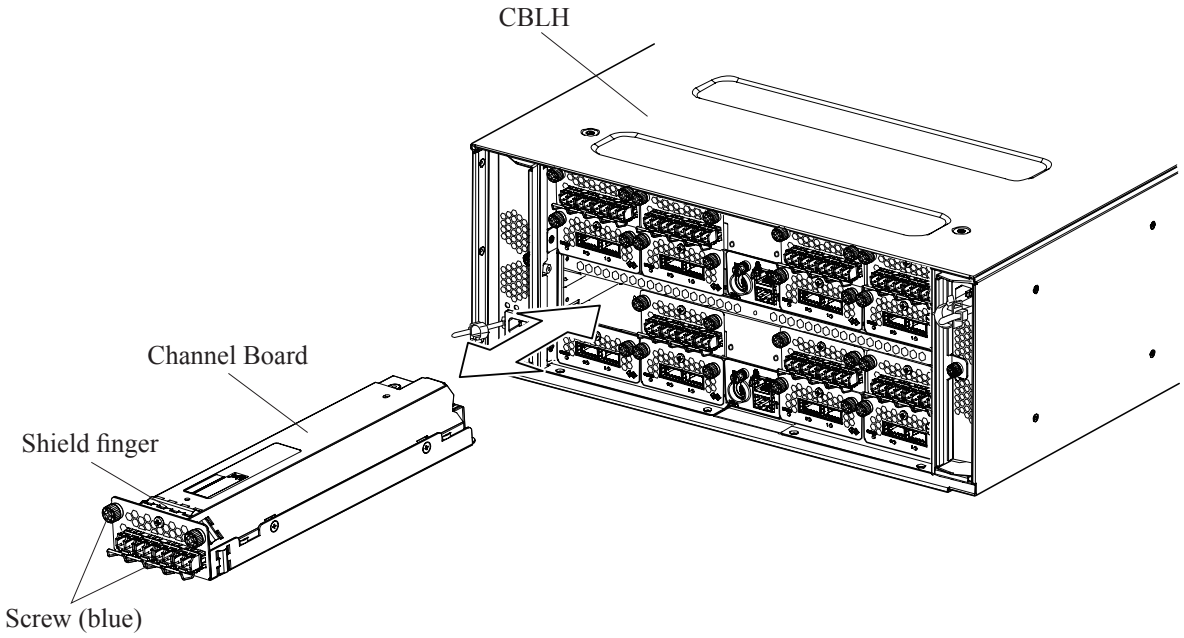
(d) Push the Channel Boards gently all the way in.

NOTICE: Push the front side of the Channel Board all the way to insert it to the end.



(e) Tighten two screws (blue) and fix the Channel Board.

Figure 3-66 Adding Channel Board

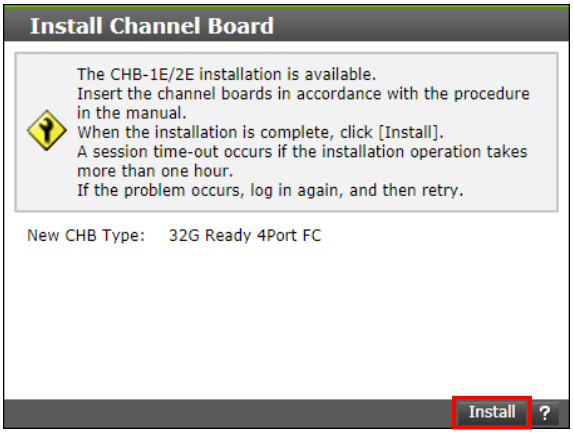


(2) Connect the cables to the added Channel Board.

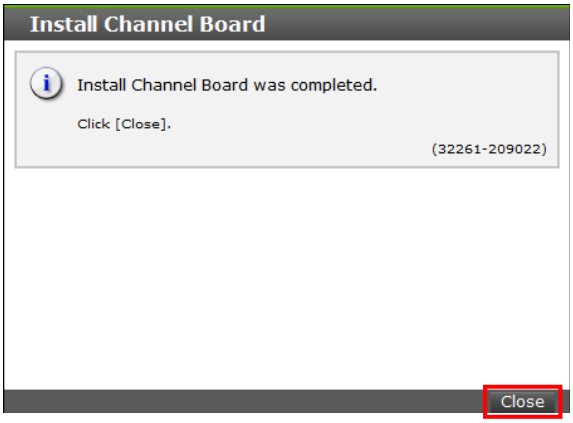
NOTE: Check that cable latch clicks and the cables are surely connected.

5. Checking addition completion by Maintenance Utility
   (1) <Recognize Channel Boards>
   Click the [Install] button.

   NOTE : The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



   (2) <Check Addition Completion>
   Check that the following message is displayed and click the [Close] button.
   If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.



6. Checking the SFP status
   Click the [CHBs] tab in the Controller Chassis window, and check if SFP Status is “Normal”.
   If “Not Fix” is displayed in SFP Status, check if the SFP is properly inserted.
   When “Not Fix” is displayed in SFP Status even if the SFP is properly inserted or “Warning” is displayed in SFP Status, replace the SFP with the maintenance part. See REPLACEMENT SECTION “2.13 Replacing a Small Form-Factor Pluggable (SFP)”.

7. Click the [Logout] button to close the window.

8. Disconnecting the Maintenance PC and the Storage System
   Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION “2.8.3 Disconnecting the Maintenance PC from the Storage System”.

3.5.3 Adding Channel Board for Channel Board Box

NOTE : Add Channel Boards of the same type to the same positions of Switch Packages 1 and 2.

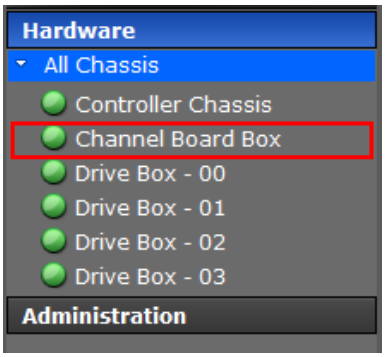
1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding the Channel Boards, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

---

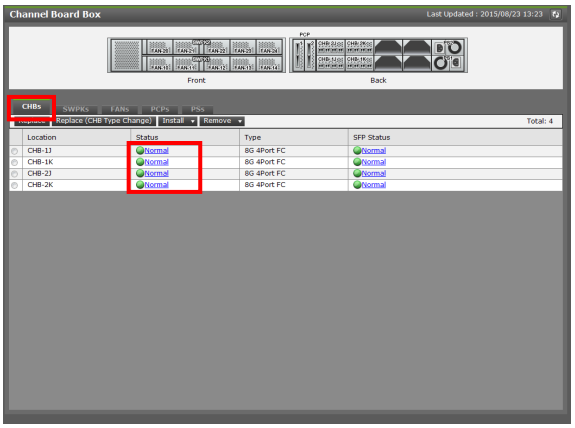
2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

---

3. Selecting additional parts by Maintenance Utility
   (1) <Main Window>
   Click the [Channel Board Box] tab in the main window.

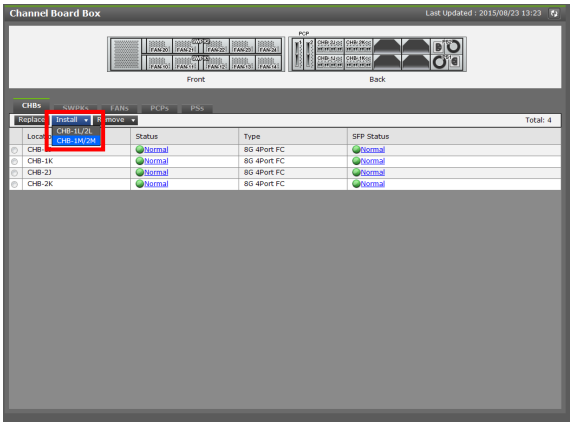


   (2) <Channel Board Box Window>
   Click the [CHBs] tab in the "Channel Board Box" window and display the Channel Board status.



(3) <Select Additional Slots>

Click the [Install] button to select slots to add the Channel Boards.



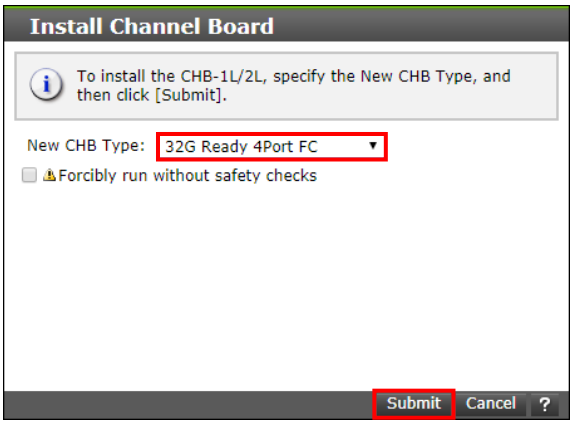
(4) <Select Channel Board>

⚠ CAUTION

About "Forcibly run without safety checks":

If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

Select the type of a Channel Board to be added and click the [Submit] button.

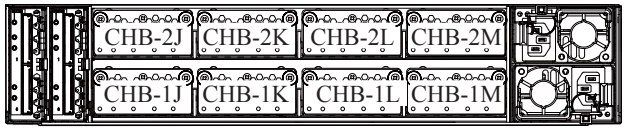


(5) <Check Addition Preparation of Channel Boards>
Check the following addition preparation completion window.

NOTE : Do not click the [Install] button at this time.
Click the [Install] button after completing the addition work.

4. Addition work of Channel Boards for CHBB

Location	Additional part name		Parts name
Rear View of CHBB	1	Channel Board	• DW-F800-4HF32R (32 G FC) • DW-F800-2HS10S (10 G iSCSI (Optic)) • DW-F800-2HS10B (10 G iSCSI (Copper))



CHBB (Rear view)

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. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Adding work of Channel Boards
Add Channel Boards to the same positions of Switch Packages 1 and 2.

NOTICE: If Channel Boards are inserted randomly, malfunction may occur. Therefore, insert the Channel Boards in two steps, Step (c) and Step (d) shown below.

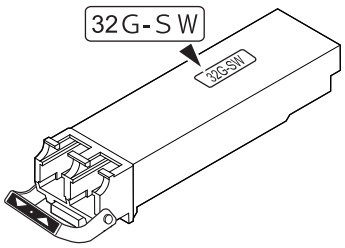
(a) Remove the dummy.
Two types of dummies exist, which are removed in different ways.
- Metal dummy

(i) Loosen two screws (blue) fixing the dummy.
(ii) Hold the screws (blue) and pull out and remove the dummy.
- Plastic dummy

(i) Pull out and remove the dummy.

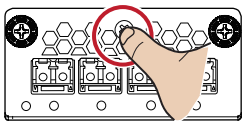
(b) When adding 32 Gbps Channel Boards, mount the Small Form Factor Pluggable (SFP) on the Channel Board to be added.
For channel boards other than 32 Gbps ones, this step is not required. Go onto Step (c).
Check the insertion direction of the SFP, and insert it into the Channel Board to be added until it clicks.

NOTE: The label "32G-SW" is attached to the 32 Gbps Small Form Factor Pluggable (SFP).



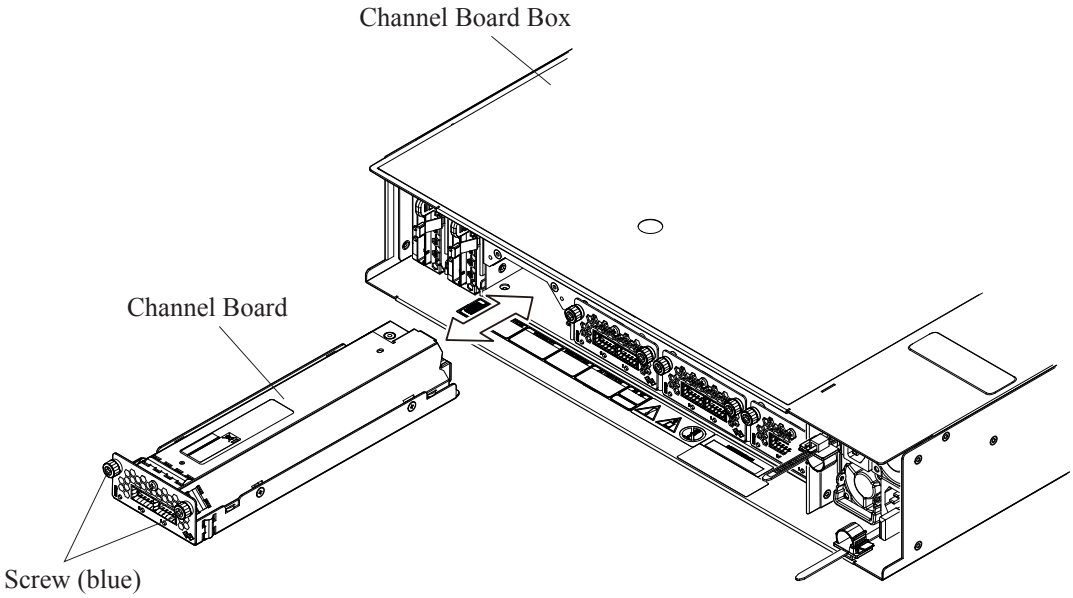
(c) Insert the Channel Boards to be added into the slots just before the shield finger.
(d) Push the Channel Boards gently all the way in.

NOTICE: Push the front side of the Channel Board all the way to insert it to the end.



(e) Tighten two screws (blue) and fix the Channel Board.

Figure 3-67 Adding Channel Board

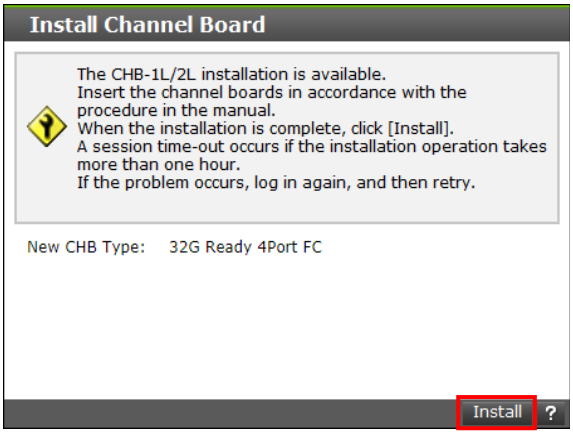


(2) Connect the cables to the added Channel Board.

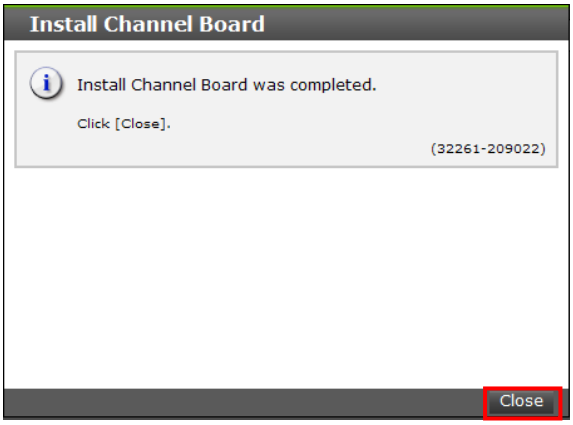
NOTE: Check that cable latch clicks and the cables are surely connected.

5. Checking addition completion by Maintenance Utility
   (1) <Recognize Channel Boards>
   Click the [Install] button.

   NOTE : The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



   (2) <Check Addition Completion>
   Check that the following message is displayed and click the [Close] button.
   If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.



6. Checking the SFP status
   Click the [CHBs] tab in the Channel Board Box window, and check if SFP Status is “Normal”.
   If “Not Fix” is displayed in SFP Status, check if the SFP is properly inserted.
   When “Not Fix” is displayed in SFP Status even if the SFP is properly inserted or “Warning” is displayed in SFP Status, replace the SFP with the maintenance part. See REPLACEMENT SECTION “2.13 Replacing a Small Form-Factor Pluggable (SFP)”.

7. Click the [Logout] button to close the window.

8. Disconnecting the Maintenance PC and the Storage System
   Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION “2.8.3 Disconnecting the Maintenance PC from the Storage System”.

3.6 Adding Disk Board (DKB)/Replacing Disk Board (DKB) (Type Change)

3.6.1 Adding Disk Board/Replacing Disk Board (DKB) (Type Change) for CBLH

NOTE : Two types of Disk Boards exist. You cannot install them by mixing the types. Check the Disk Boards and add them.

The following cases:

- When adding Disk Boards to free slots
- When replacing the already installed Disk Boards by changing the type

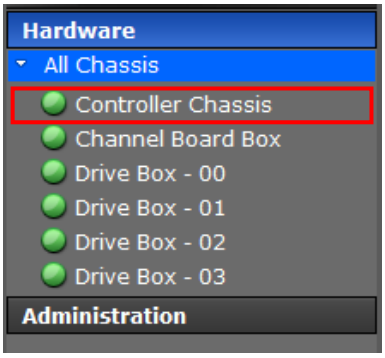
NOTE : Add Disk Boards of the same type to the same positions of Controller Boards 1 and 2.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   - When adding Disk Boards to free slots:
     Connect the Maintenance PC and Controller Board 1 and add Disk Boards to the same positions of Controller Board 1 and Controller Board 2 at the same time.
   - When replacing Disk Boards (Type Change) which are already installed:
     Connect the Maintenance PC and Controller Board 2 and add Disk Boards to Controller Board 1.
     Then, connect the Maintenance PC and Controller Board 1 and add Disk Boards to Controller Board 2.
     Connect the Maintenance PC and Controller Board 1 and replace the type of the Disk Board on the same position of Controller Board 1 and Controller Board 2.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION “2.2 Connecting Maintenance PC to Storage System”.

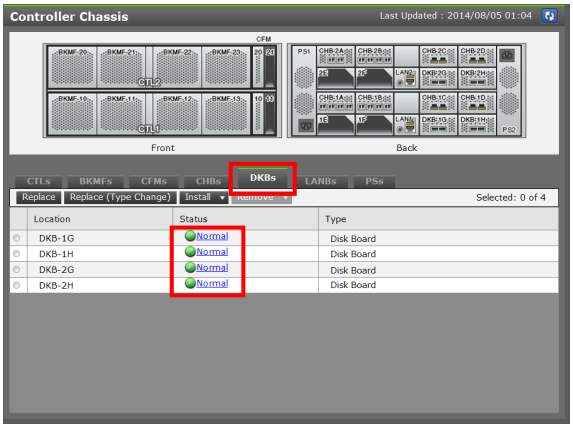
2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION “2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL”).

3. Selecting target parts by Maintenance Utility

(1) <Main Window>
Click the [Controller Chassis] tab in the main window.



(2) <Controller Chassis Window>
Click the [DKBs] tab in the "Controller Chassis" window and display the Disk Board status.



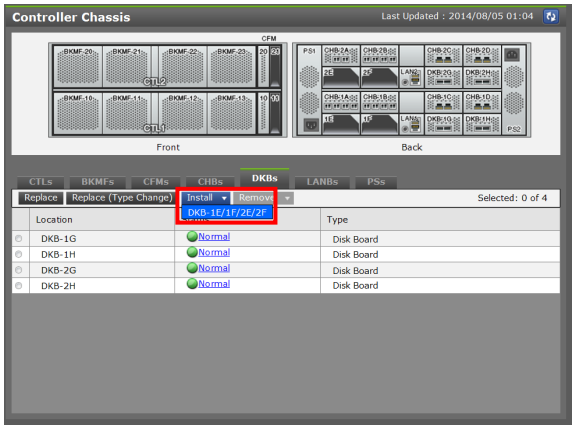
(3) Procedures differ by the following work.

- When adding Disk Boards to free slots ····· Step (a)
- When replacing Disk Boards (Type Change) · Step (b)

(a) When adding Disk Boards to free slots

(i) <Select Additional Slots>

Click the [Install] button to select slots to add the Disk Boards.



(ii) <Select Disk Board>

⚠ CAUTION

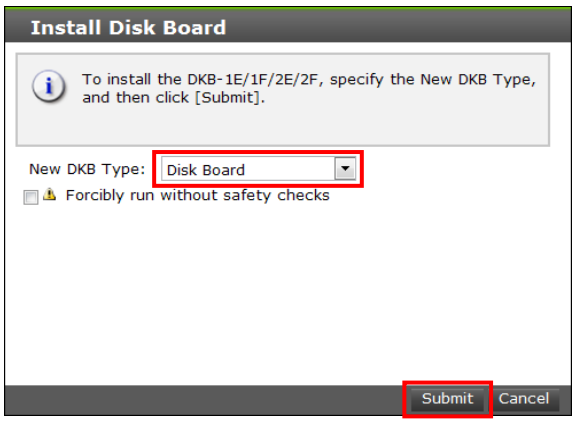
About "Forcibly run without safety checks":

If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

NOTE: When adding CBLH2 Disk Boards, if some Disk Boards are already installed, only the same type of Disk Board as the existing one is displayed.

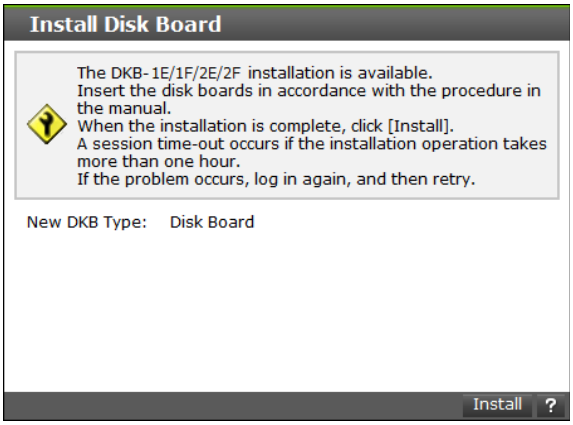
Select the type of a Disk Board to be added and click the [Submit] button.

NOTE : The error list window is displayed if multiple errors are detected by the prior check. If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.



(iii) <Check Addition Preparation of Disk Boards>
Check the following addition preparation completion window.

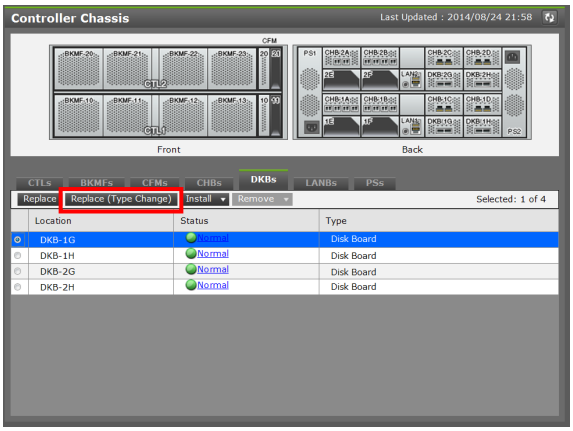
NOTE : Do not click the [Install] button at this time.
Click the [Install] button after completing the addition work.



(b) When replacing Disk Boards (Type Change)

(i) <Select Disk Boards>

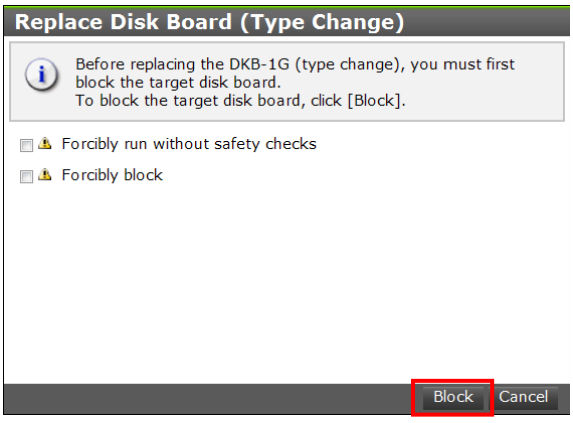
Select the Disk Boards to be replaced after changing the type and click the [Replace (Type Change)] button.



(ii) <Block Disk Boards>

> **⚠ CAUTION**
>
> About "Forcibly run without safety checks":
> If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual.
>
> About "Forcibly block":
> If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the contact described in the manual.
>
> This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

Check the completion of the replacement (type change) preparation and click the [Block] button.



(iii) <Displaying the Password entry window>

> **⚠ CAUTION**
>
> This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the login password for the maintenance account of the storage system, and then click the [OK] button.

(iv) <Select Types>

Select the Disk Boards to be replaced by changing the type.

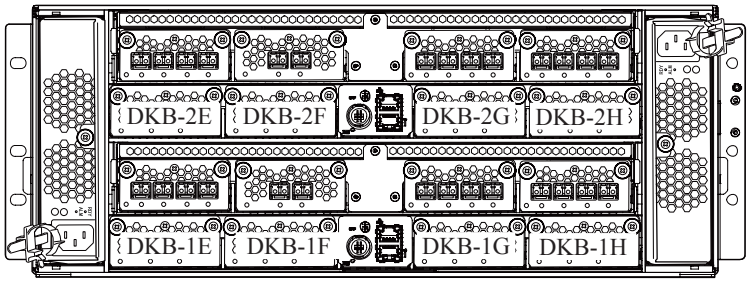
For the relation between the type and the model name of Channel Board to be selected, see "1.2.3 MPC Window Display and Conversion Table of Option Type Names".

NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the type change work.

4. Addition work of Disk Boards for CBLH

Location	Additional part name		Parts name
Rear View of CBLH	1	Disk Board	• DW-F800-BS12G • DW-F800-BS12GE

NOTE : Two types of Disk Boards exist. You cannot install them by mixing the types. Check the Disk Boards and add them.



CBLH (Rear view)

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. Refer to "1.1.2 Note when Installing and Removing Parts".

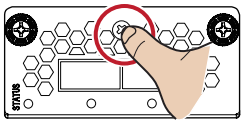
When adding the Disk Boards to free slots, add them to the same slots of Controllers 1 and 2 at the same time.
When replacing the Controllers, perform it in order from Controller 1 to 2.

(1) When replacing the Disk Boards, remove the SAS cables connected to the Disk Boards to be replaced.

NOTICE: If Disk Boards are inserted randomly, malfunction may occur. Therefore, insert the Disk Boards in two steps, Step (d) and Step (e) shown below.

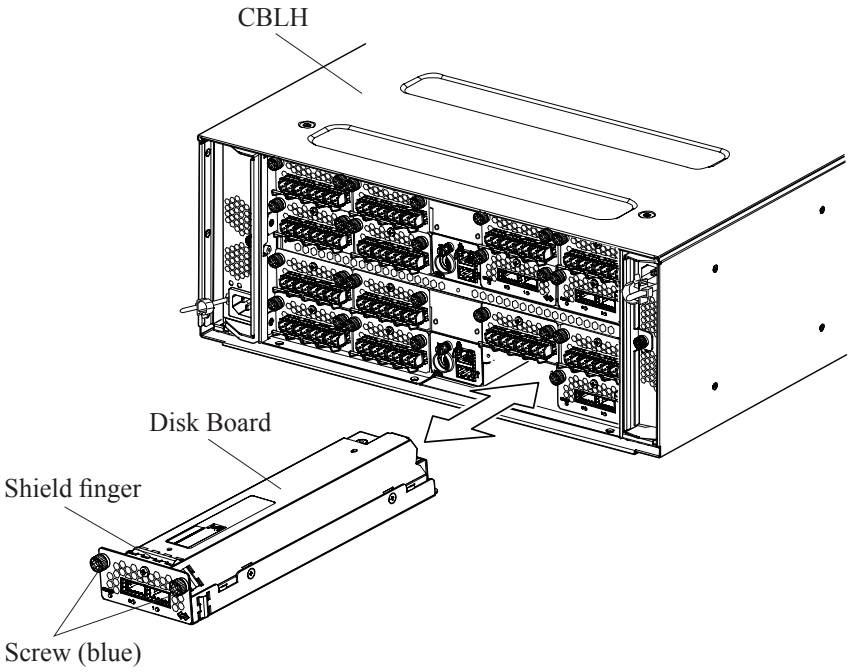
(2) Adding/replacing work of Disk Boards.
  (a) Remove the dummy or Disk Board (DKB).
    Two types of dummies exist, which are removed in different ways.
    • Metal dummy
      The metal dummy and Disk Board (DKB) can be removed in the same way.
    (i) Loosen two screws (blue) fixing the dummy or Disk Boards.
    (ii) Hold the screws (blue) and pull out and remove the dummy or Disk Boards.
    • Plastic dummy
    (i) Pull out and remove the dummy.
  (b) Loosen two screws (blue) fixing the dummy or Disk Boards.
  (c) Hold the screws (blue) and pull out and remove the dummy or Disk Boards.
  (d) Insert the Disk Boards to be added into the slots just before the shield finger.
  (e) Push the Disk Boards gently all the way in.

NOTICE: Push the front side of the Disk Board all the way to insert it to the end.



  (f) Tighten two screws (blue) and fix the Disk Board.

Figure 3-68 Adding/Replacing Disk Board



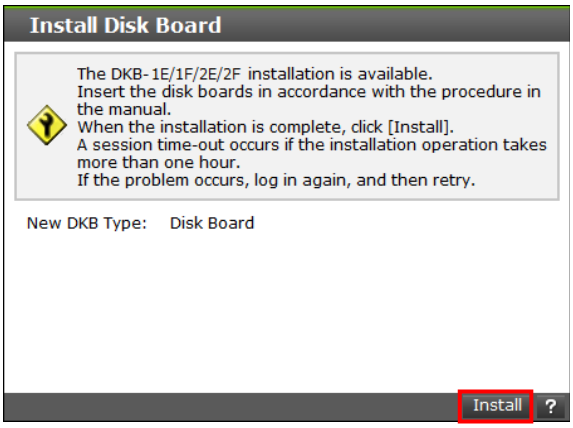
(3) When the Disk Boards were replaced, connect the SAS cables to the replaced Disk Boards. When connecting SAS cables, be careful not to damage the tips of the cables. (Refer to "2.10.2.1 Precautions when Connecting SAS Cables".)

5. Checking addition completion by Maintenance Utility

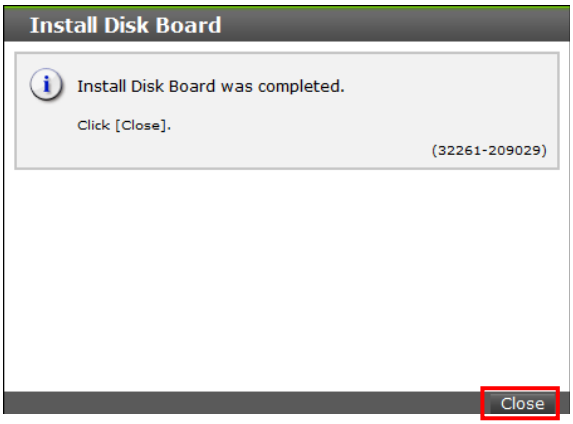
(1) Procedures differ by the following work.
- When added Disk Boards to free slots ····· Step (a)
- When replaced Disk Boards (Type Change) ·· Step (b)

(a) When added Disk Boards to free slots

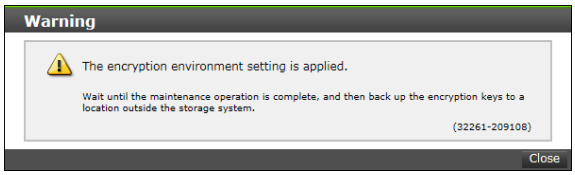
(i) <Recognize Disk Boards>
Click the [Install] button.



(ii) <Check Addition Completion>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.

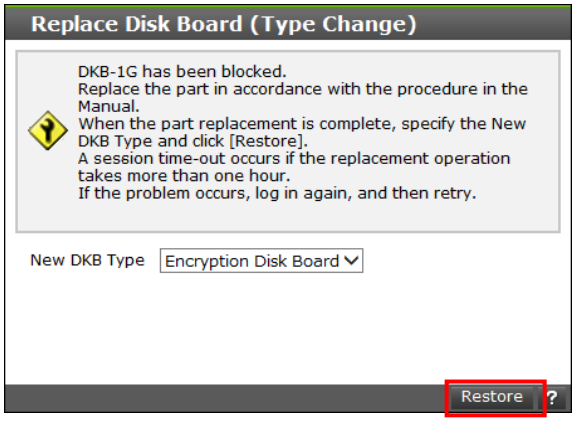


(iii) <Check back up the encryption key Messages>
When the encryption environment is applied, the following message is displayed.
Check the message and click the [Close] button.

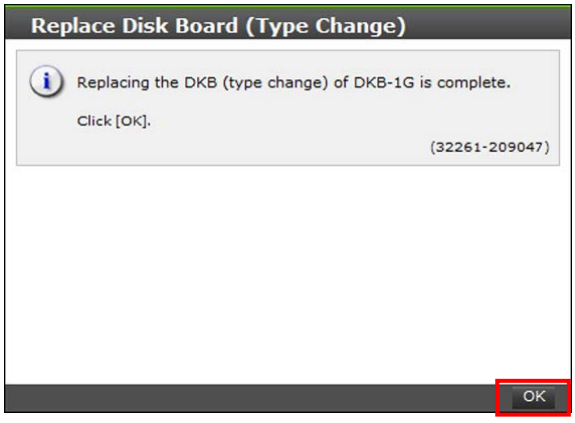


(b) When replaced Disk Boards (Type Change)

(i) <Recognize Disk Boards>
Click the [Restore] button.



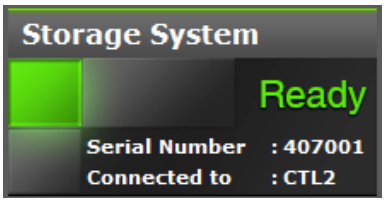
(ii) <Check Replace Disk Boards (Type Change) Completion>
Check that the following message is displayed and click the [OK] button.
If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.



When the Disk Boards without performing Replace Disk Boards (Type Change) are installed, the following window is displayed due to the mixture of the Disk Boards.

Since two types of Disk Boards cannot be used together in the Storage System, the following message is displayed. Check the content and click the [Close] button.

(iii) Click the Storage System name to return to the main window.
When the Disk Boards without performing Replace Disk Boards (Type Change) are installed, the warning sign " ⚠ " is displayed in the [Type] column of the window due to the mixture of the Disk Boards.



(iv) When replacing (Type Change) Disk Board, perform it for the other Controller.
Replace the Disk Board on the same position of the other Controller Board similarly referring to "3. Selecting target parts by Maintenance Utility".

(2) After completing the work of both Controller Boards 1 and 2, go to Step (3).

(3) Click the [Logout] button to close the window.

6. Disconnecting the Maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".

7. Back up the encryption key
If the message is displayed in Step 5(1)(a)(iii), ask your customer to back up the encryption key using Storage Navigator (refer to Encryption License Key User Guide).

NOTE: When a message is not displayed in Step 5(1)(a)(iii), this procedure is not required.

3.7 Adding Cache Memory/Cache Flash Memory

Decide Cache Memories and Cache Flash Memories to be added referring to "3.1.1 Cache Capacity and the Number of Required Options".
When adding Cache Memories, the window and the procedure differ between the CBSS/CBSL and the CBLH.

- When adding Cache Memories to the CBSS/CBSL: "3.7.1 Adding Cache Memory for CBSS/CBSL"
- When adding Cache Memories to the CBLH: "3.7.2 Adding Cache Memory/Cache Flash Memory for CBLH"

NOTICE:	The operation time depends on the I/O load. When the I/O load is extremely high, it might take up to about four hours to complete the procedure on one Controller Board.

3.7.1 Adding Cache Memory for CBSS/CBSL

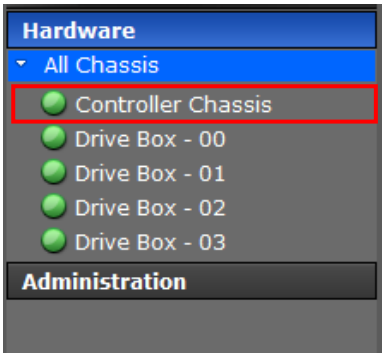
NOTE :
- Be sure to add the Cache Memories in order from Controller Board 1 to 2.
- Add Cache Memories to Controller Boards 1 and 2.
- Install the same amount of Cache Memories in Controller Boards 1 and 2.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding Cache Memories to Controller Board 1, connect the Maintenance PC and Controller Board 2.
   When adding Cache Memories to Controller Board 2, connect the Maintenance PC and Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

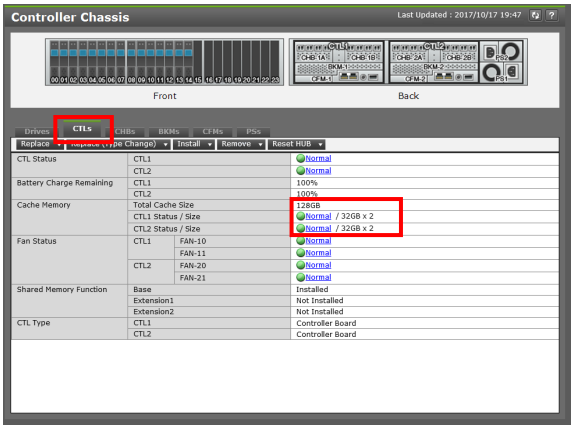
3. Selecting additional parts by Maintenance Utility.

(1) <Main Window>
Click the [Controller Chassis] tab in the main window.

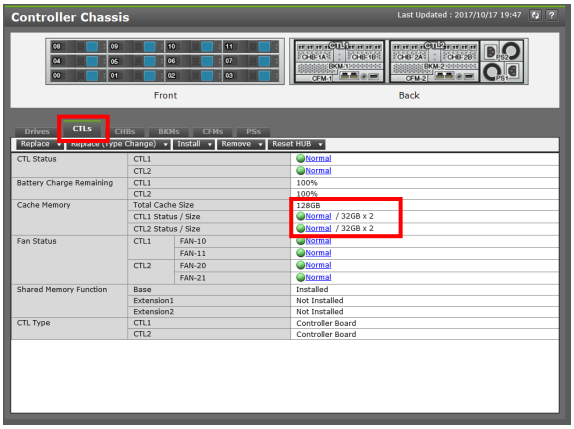


(2) <Controller Chassis Window>
Click the [CTLs] tab in the "Controller Chassis"window to display the Cache Memory status and the mounted capacity.

• In case of CBSS



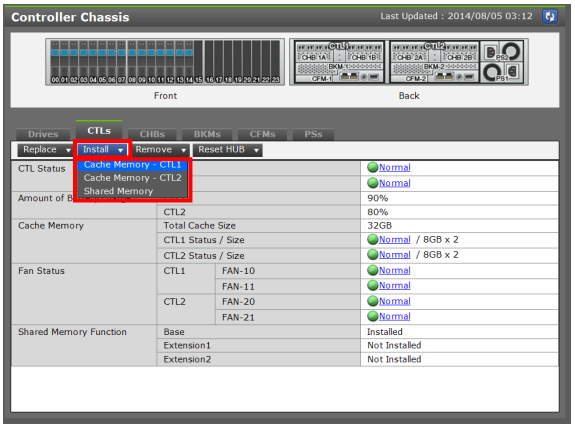
• In case of CBSL



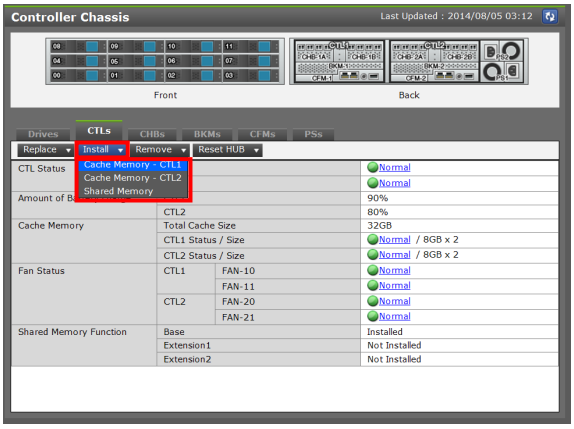
(3) <Select Controller Board>

Check the status display, click the [Install] and select the Controller Board in which the Cache Memory to add is installed.

• In case of CBSS



• In case of CBSL



(4) <Specify Cache Size>

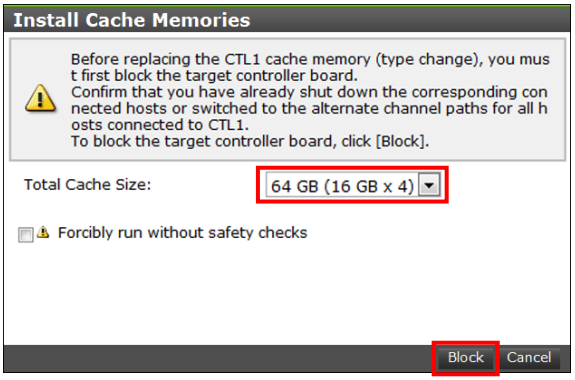
⚠ CAUTION

About "Forcibly run without safety checks":

If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

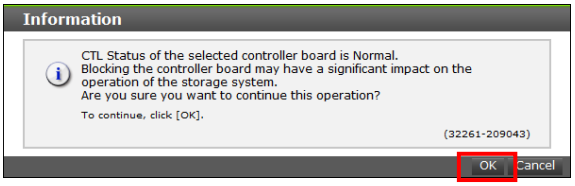
Select the size of Cache Memories to be added and click the [Block] button.

The size of a Cache Memory to be selected is the total of Controller Boards 1 and 2.



(5) <Check Controller Board>

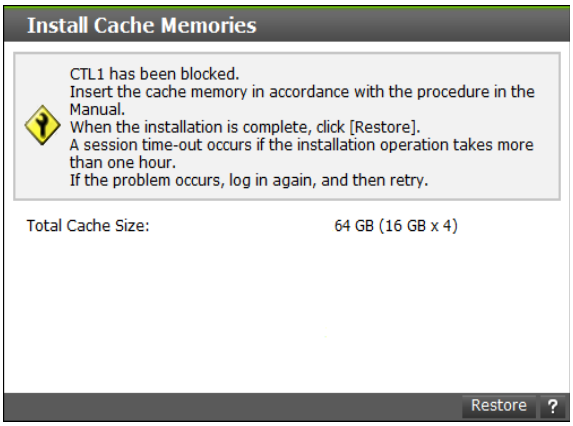
Check that the Controller Board to be replaced is correct again and click the [OK] button.



(6) <Check Cache Memory Addition Preparation Start>

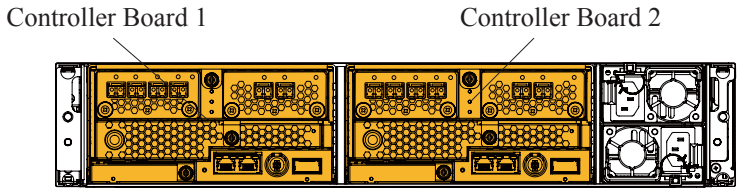
Check that the Controller Board is blocked and the Cache Memory is in the Addition Preparation Start status.

NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the addition work.



4. Addition work of Cache Memory

Location	Additional part name		Parts name
Rear View of CBSS/CBSL	1	Cache Memory	• DW-F850-CM16G (CBSS1/CBSL1) • DW-F850-CM32G (CBSS1/CBSL1/CBSS2/CBSL2) • DW-F850-CM64G (CBSS2/CBSL2)

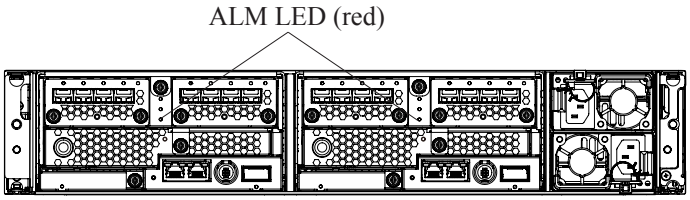


CBSS/CBSL (Rear view)

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. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Check that the ALM LEDs (red) on the Controller Board to add a CBSS/CBSL Cache Memory light up.

Figure 3-69 Position of the ALM LED (CBSS/CBSL)

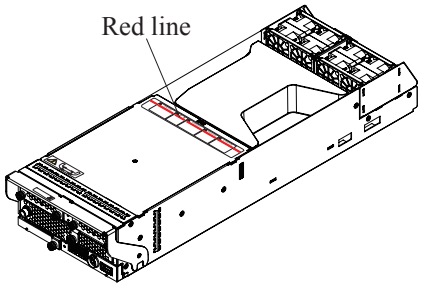


Controller Board

(2) Remove all the Optical cables and SAS cables connected to the Controller Board.
(3) Removing the Controller Board from CBSS/CBSL

⚠ CAUTION

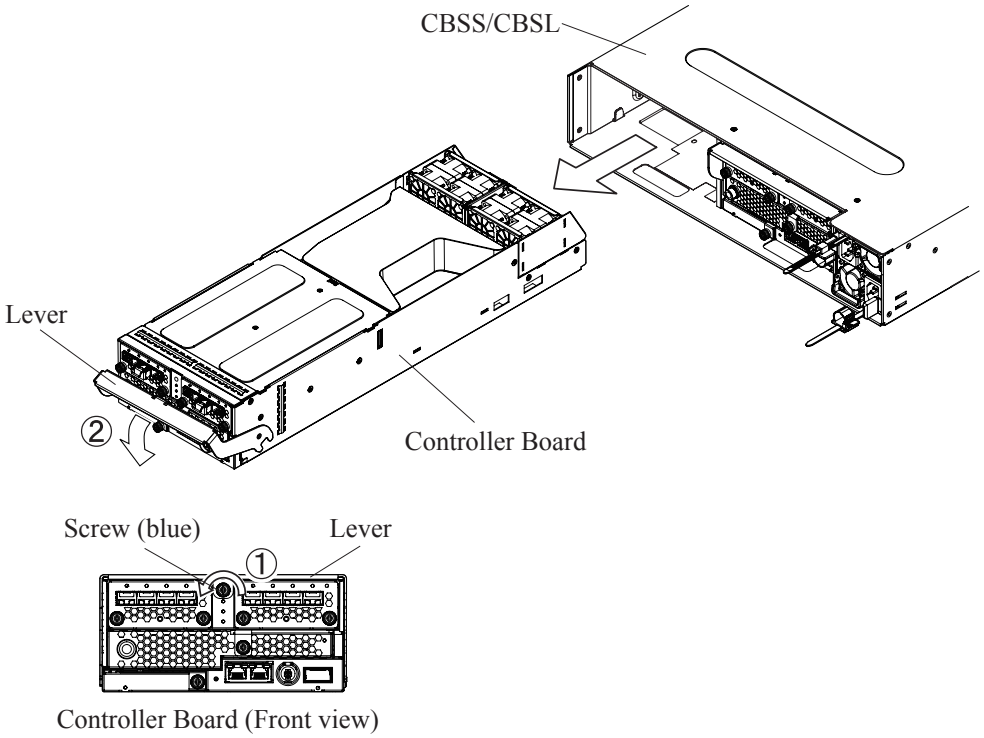
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE: When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to with any components.

(a) Loosen the screw (blue) fixing the Controller Board (①) and open the lever (②).
(b) Hold the Controller Board with both hands and pull out it to remove.

Figure 3-70 Removing Controller Board (CBSS/CBSL)

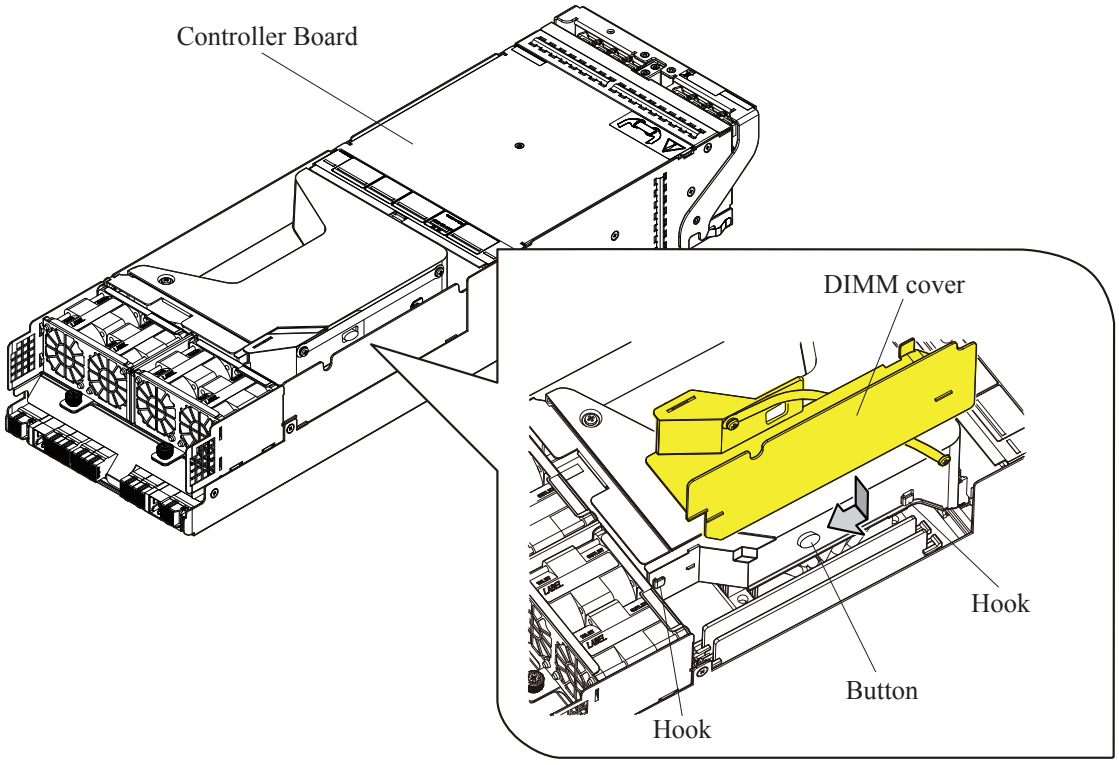


NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the work.
The READY LED (green) on the front of CBSS/CBSL lights up after performing "5. Checking addition completion by Maintenance Utility" of the "3.7.1".

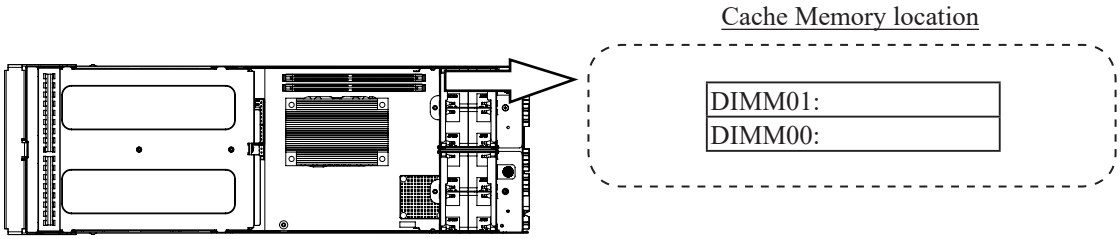
(4) Slide the DIMM cover to the arrow direction while pressing its button and remove the DIMM cover from the hooks (two places).
(5) Lift the DIMM cover to remove.

NOTE : The DIMM cover has a band. Do not pull it hard when removing the DIMM cover.

Figure 3-71 Removing DIMM Cover



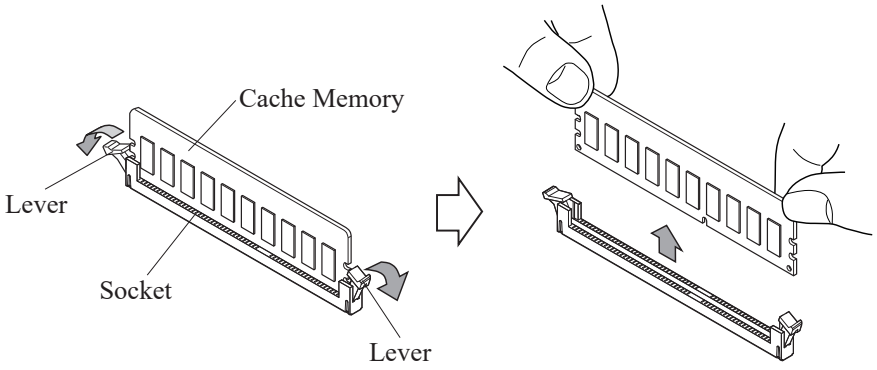
(6) Adding Cache Memories



Position of Cache memory (Controller Board top view)

(a) Procedure for removing.
(i) Pull the lever outward.
(ii) Hold both ends with the fingers and pull out the Cache Memory straight from the socket.

Figure 3-72 Removing the Cache Memory (CBSS/CBSL)

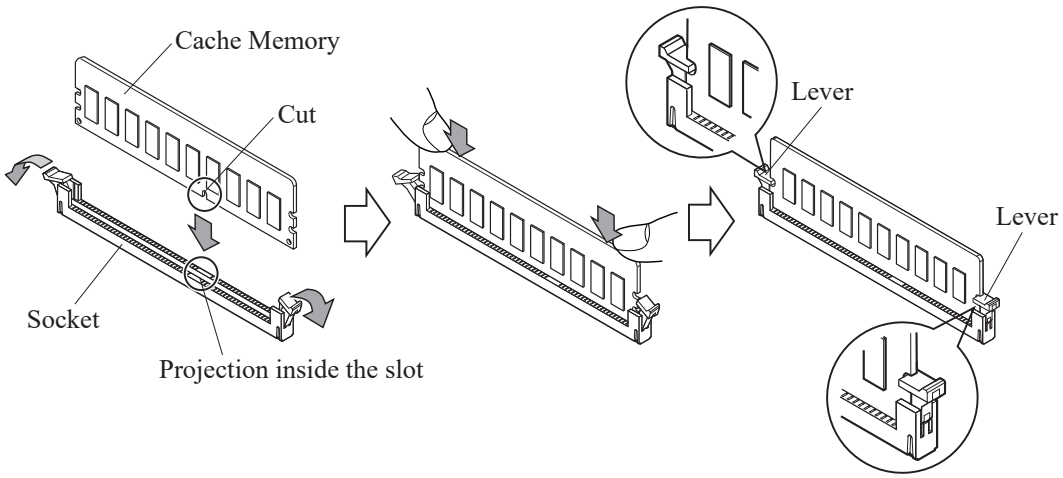


(b) Procedure for installing.

NOTICE: When installing a Cache Memory, do not put intense pressure on the Cache Memory to the extent that the PCB greatly bends after the Cache Memory is fixed by the lever. Applying excessive pressure may damage the PCB.

(i) Position the cut of the Cache Memory with the projection inside the slot and place the Cache Memory on the socket.
(ii) Hold both ends of the Cache Memory with the fingers and fit it into the socket.
(iii) Check that the lever is firmly fit in the Cache Memory.

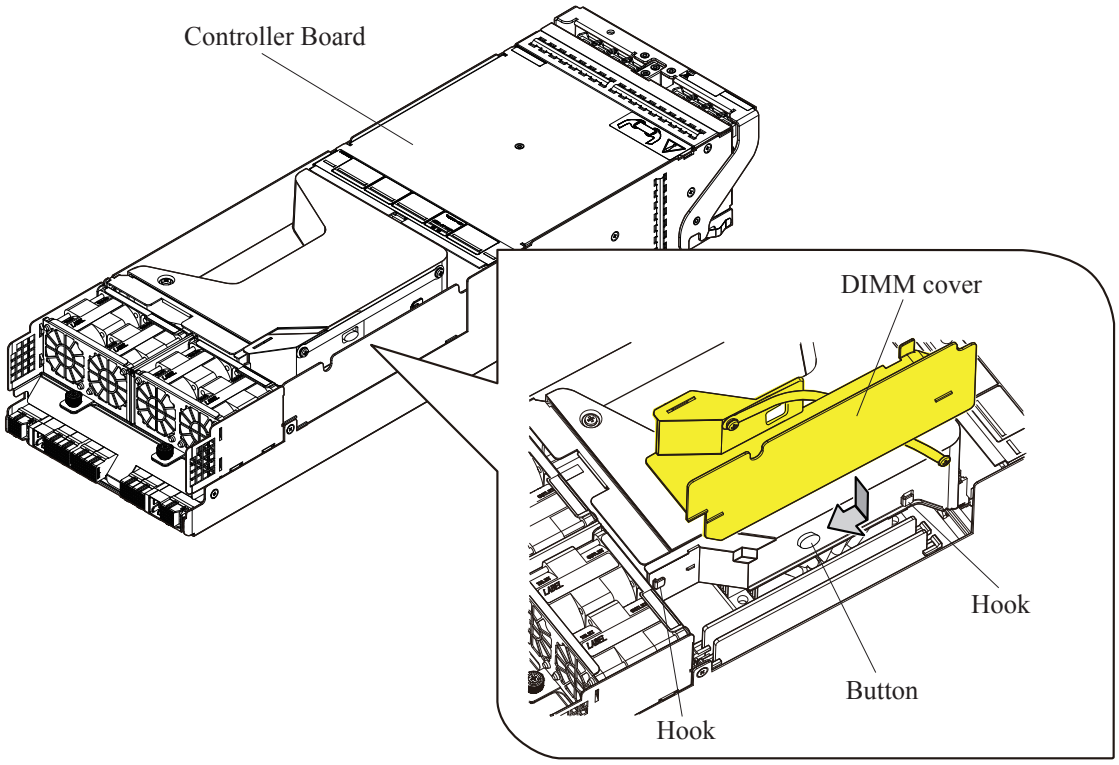
Figure 3-73 Adding the Cache Memory



(7) Slide the DIMM cover to the arrow direction to attach.

NOTE : Check that the DIMM cover is surely fixed by hooks (two places).

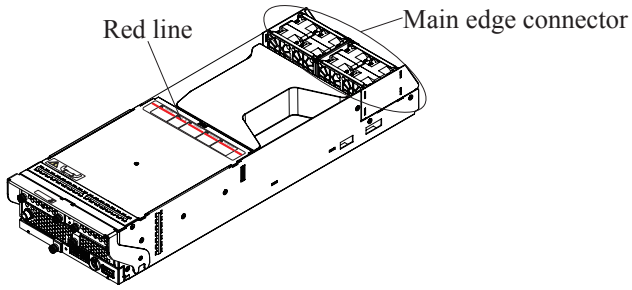
Figure 3-74 Installing the DIMM Cover



(8) Installing the Controller Board.

⚠ CAUTION

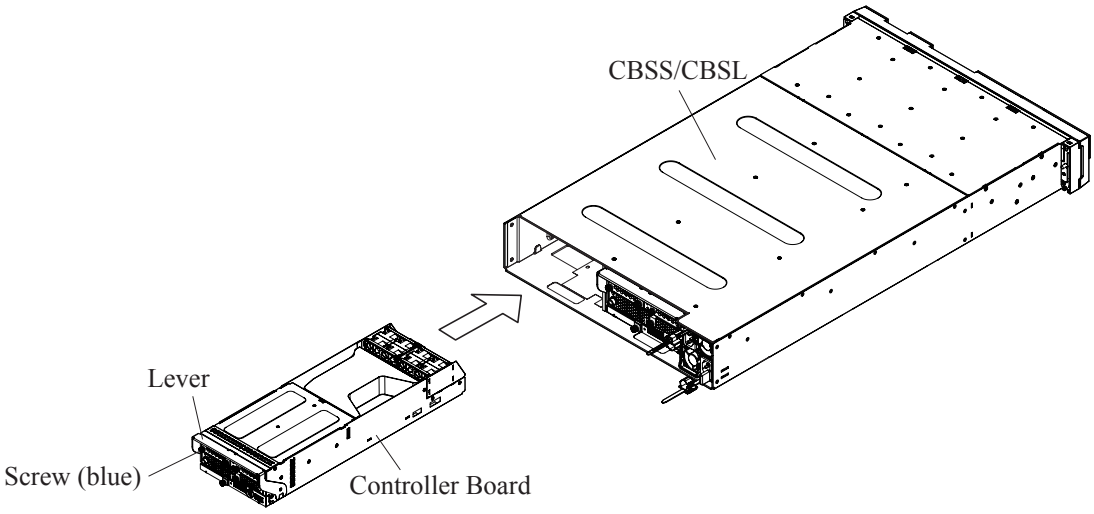
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE:
- Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
- When installing the Controller Board, hold it with both hands and install it straight not to apply a shock to with any components.

(a) Open the right and left levers of the Controller Board completely and insert the Controller Board into the installation location of the CBSS/CBSL.
(b) Push the Controller Board all the way in and close the lever completely.
(c) Tighten the screw (blue) and fix the Controller Board.

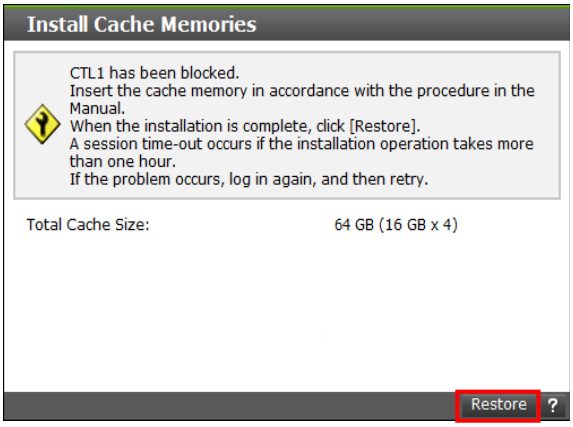
Figure 3-75 Installing the Controller Board (CBSS/CBSL)



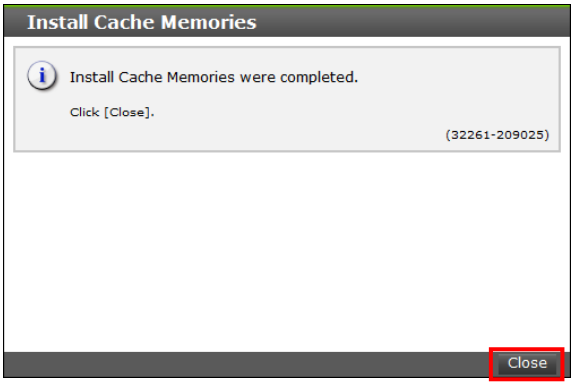
(9) Connect all the removed Optical cables and SAS cables to the Controller Board.

5. Checking addition completion by Maintenance Utility

(1) <Restore Controller Board>
Click the [Restore] button.

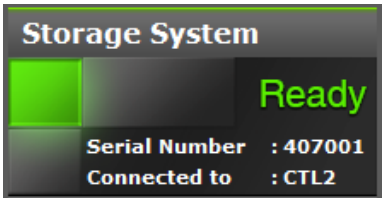


(2) <Check Additional Completion>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.



NOTE: It may take a few minutes to be able to connect to the GUM of the recovered Controller.

(3) Click the Storage System name to return to the main window.



6. Click the [Logout] button to close the window.

7. Add Cache Memories to Controller Board 2.
   In the addition procedure, add Cache Memories to Controller Board 2 similarly referring to "1. Connecting a Maintenance PC".
   Add Cache Memories to both Controller Boards 1 and 2, and then go to Step 8.

8. Disconnecting the Maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".

3.7.2 Adding Cache Memory/Cache Flash Memory for CBLH

Adding Cache Memories of CBLH has the following cases.

- When increasing total capacity of Cache Memories
- When changing types of Cache Memories without changing total capacity of Cache Memories

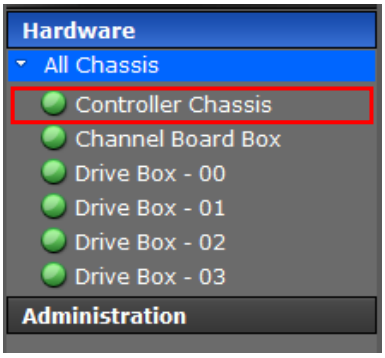
NOTE :
- Be sure to add the Cache Memories in order from Controller Board 1 to 2.
- Add Cache Memories to Controller Boards 1 and 2.
- Install the same amount of Cache Memories in Controller Boards 1 and 2.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding Cache Memories to Controller Board 1, connect the Maintenance PC and Controller Board 2.
   When adding Cache Memories to Controller Board 2, connect the Maintenance PC and Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

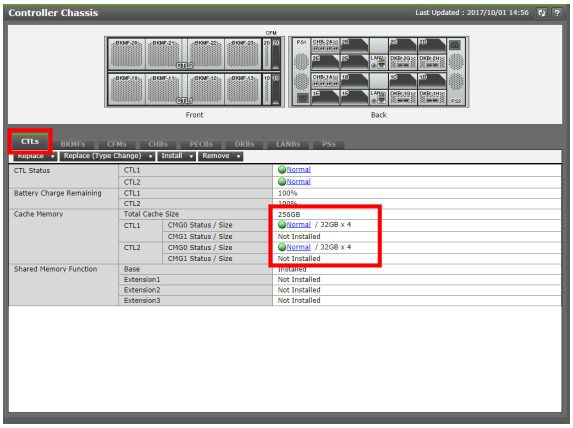
2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

3. Selecting additional parts by Maintenance Utility.

(1) <Main Window>
Click the [Controller Chassis] tab in the main window.



(2) <Controller Chassis Window>
Click the [CTLs] tab in the "Controller Chassis" window to display the Cache Memory status and the mounted capacity.



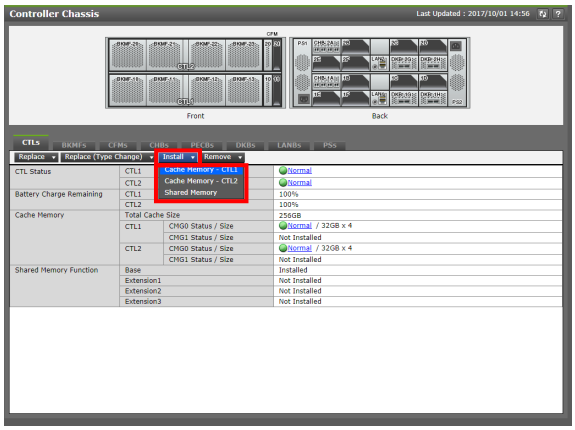
(3) Procedures differ by the following work.

- When increasing total capacity of Cache Memories ····· Step (a)
- When changing types of Cache Memories without changing total capacity of Cache Memories ····· Step (b)

(a) When increasing total capacity of Cache Memories

(i) <Select Controller Board>

Check the status display and click the [Install] button to select a Controller Board to install the Cache Memories to be added.



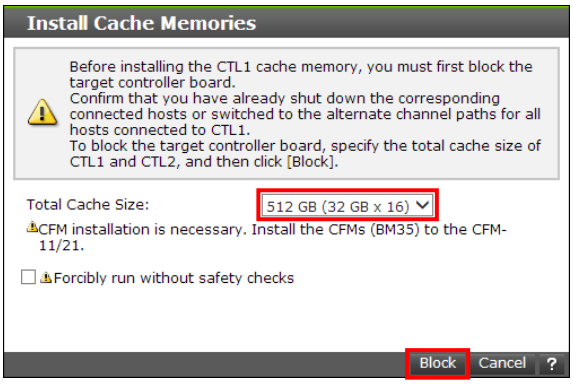
(ii) <Specify Cache Size>

⚠ CAUTION

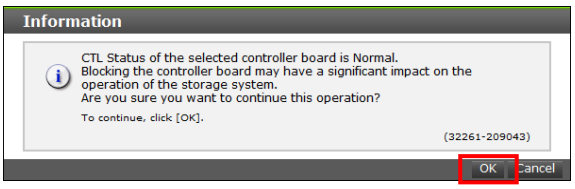
About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

Select the size of Cache Memories to be added and click the [Block] button. The Cache Memory size to be selected is the total size of Cache Memories of Controller Boards 1 and 2.

- Cache Flash Memories need to be added depending on the size of the Cache Memories to be added. When the following window is displayed, add Cache Flash Memories according to the instructions. "CFM-11/21" displayed in the window indicates the location of Cache Flash Memory in Controller Boards 1 and 2. When the operation target is Controller Board 1, "CFM-11" is the installation location. When the operation target is Controller Board 2, "CFM-21" is the installation location.

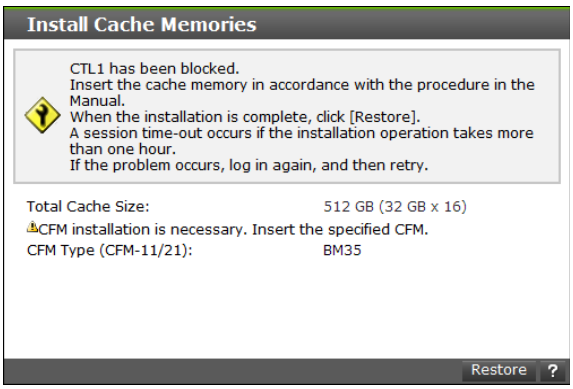


(iii) <Check Controller Board>
Check that the Controller Board to be replaced is correct again and click the [OK] button.



(iv) <Check Cache Memory Addition Preparation Start>
Check that the Controller Board is blocked and the Cache Memory is in the Addition Preparation Start status.

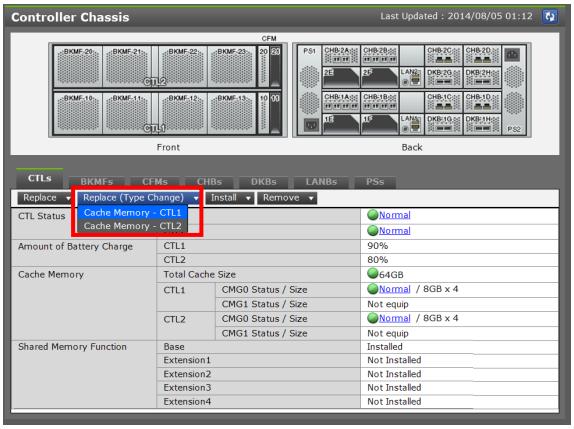
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the addition work.



(b) When changing types of Cache Memories without changing total capacity of Cache Memories

(i) <Select Controller>

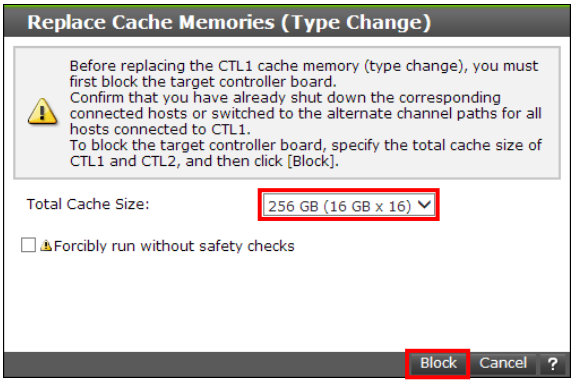
Check the status display and click the [Replace（Type Change）] button to select Controller Boards to change types.



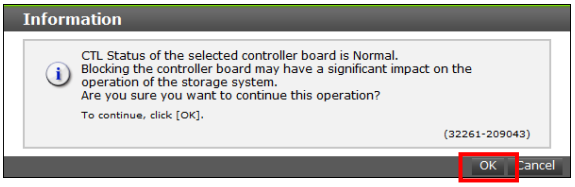
(ii) <Specify Cache Size>

> **⚠ CAUTION**
>
> About "Forcibly run without safety checks":
>
> If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

Select the size of Cache Memories to change types and click the [Block] button.



(iii) <Check Controller Board>
Check that the Controller Board to be replaced is correct again and click the [OK] button.



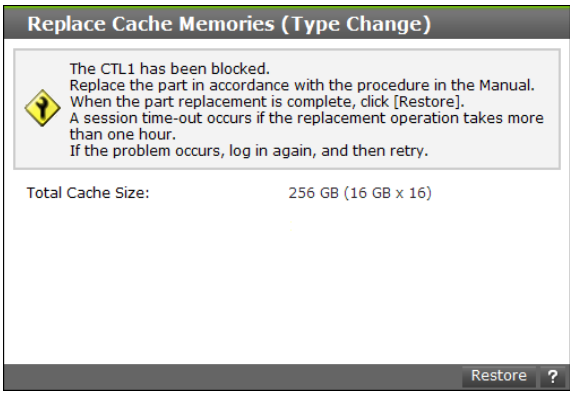
(iv) <Displaying the Password entry window>

> **⚠ CAUTION**
>
> This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the login password for the maintenance account of the storage system, and then click the [OK] button.

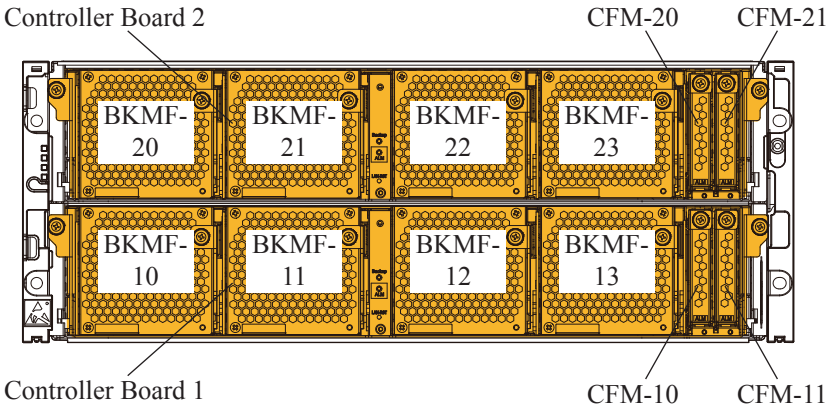
(v) <Check Cache Memory Addition Preparation Start>
Check that the Controller Board is blocked and the Cache Memory is in the Addition Preparation Start status.

NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the type change work.



4. Addition work of Cache Memory

Location	Additional parts name		Parts name
Front View of CBLH	1	Cache Memory	• DW-F850-CM16G (CBLH1) • DW-F850-CM32G (CBLH1/CBLH2) • DW-F850-CM64G (CBLH2)
	2	Cache Flash Memory	• DW-F850-BM35 (CBLH1/CBLH2) • DW-F850-BM45 (CBLH2)

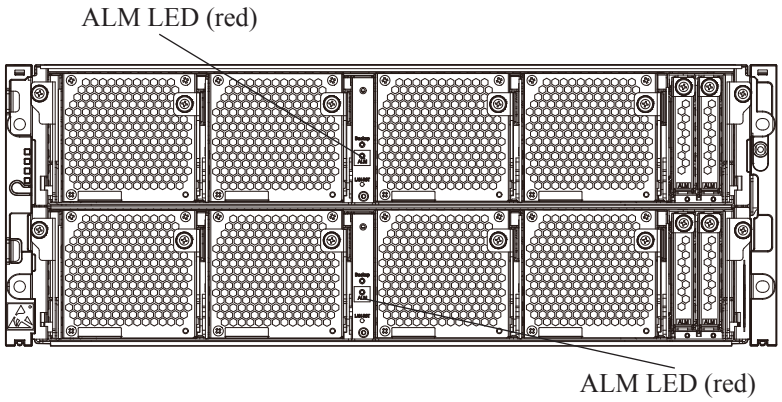


CBLH (Front view)

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. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Check that the ALM LEDs (red) on the Controller Board to add a CBLH Cache Memory light up.

Figure 3-76 Position of the ALM LED (CBLH)



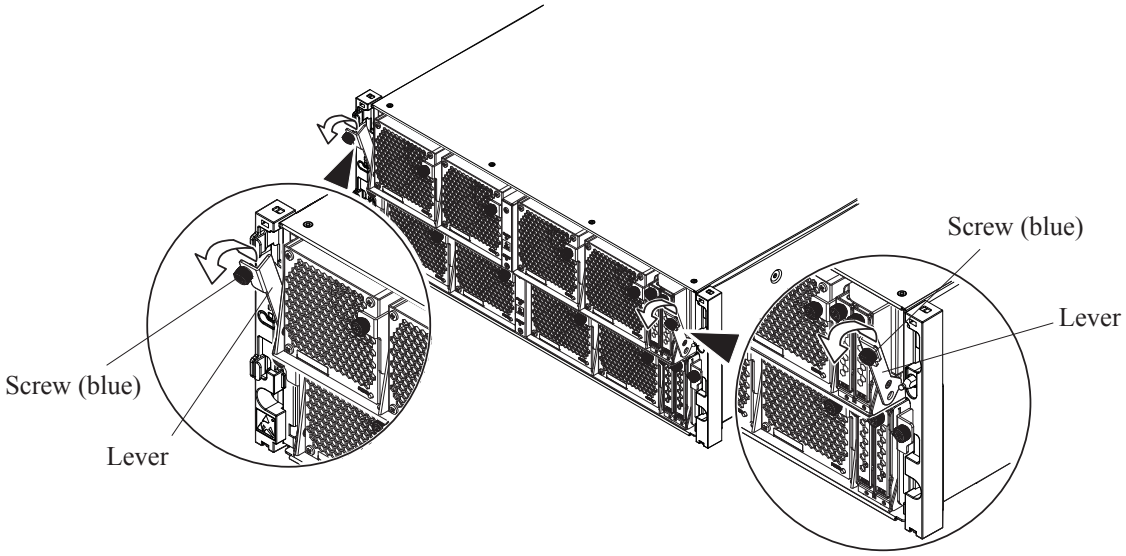
(2) Removing the Controller Board from CBLH.

⚠ CAUTION

When removing a Controller Board of the CBLH, be sure to remove BKMFs first because the mass of the Controller Board is about 19 kg.

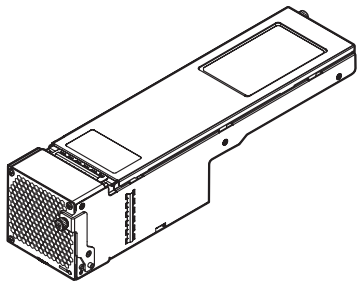
(a) Loosen the right and left screws (blue) on the lever of the Controller Board to add the Cache Memory in the front of the CBLH and open the lever.

Figure 3-77 Removing Controller Board (CBLH)



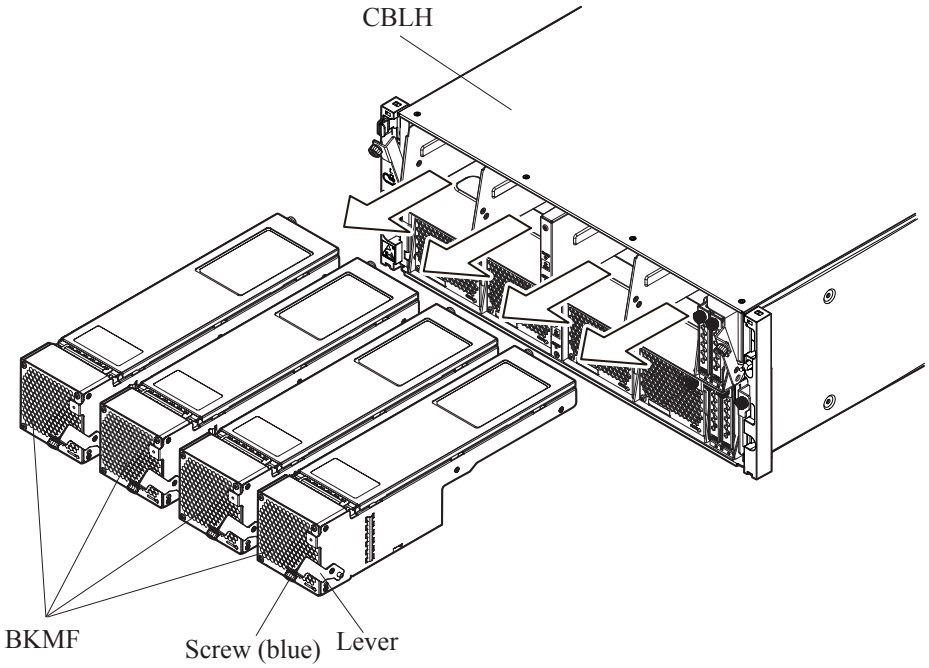
NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the work.
The READY LED (green) on the front of CBLH lights up after performing "5. Checking addition completion by Maintenance Utility" of the "3.7.2".

NOTICE: When removing the BKMF, hold it with both hands and remove it straight not to apply a shock to the connector.



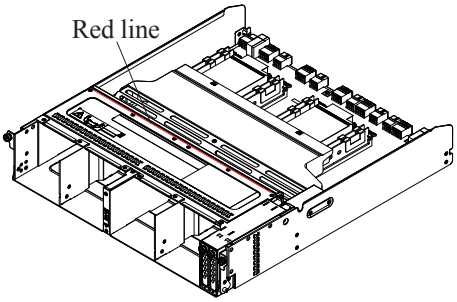
(b) Remove all BKMFs (four) installed in the Controller Board.
(i) Loosen the screws (blue) fixing the BKMF.
(ii) Open the lever and pull out the BKMF to remove.

Figure 3-78 Removing BKMFs (CBLH)



⚠ CAUTION

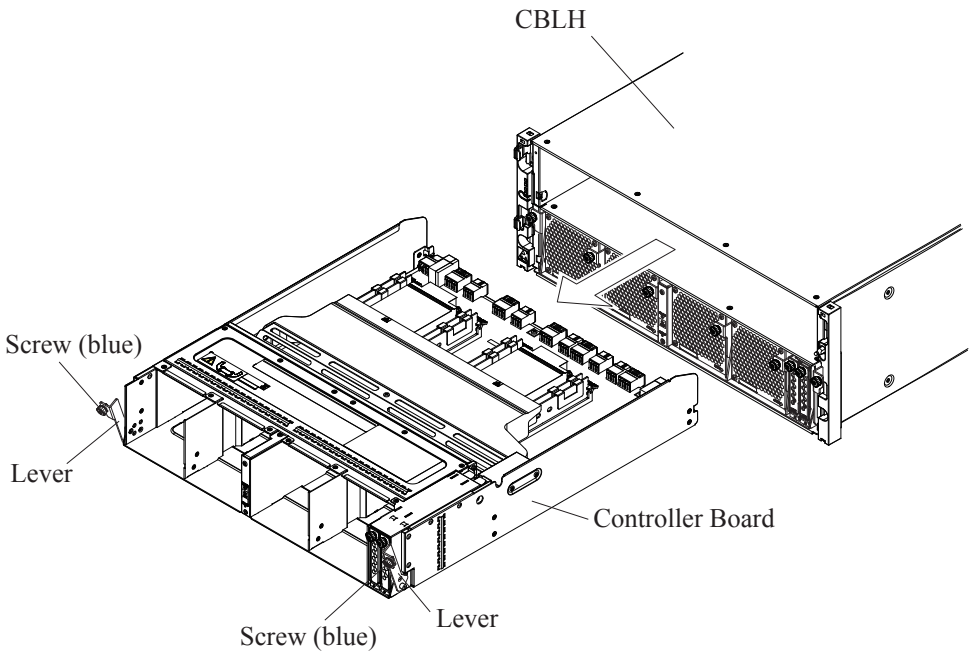
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE: When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to with any components.

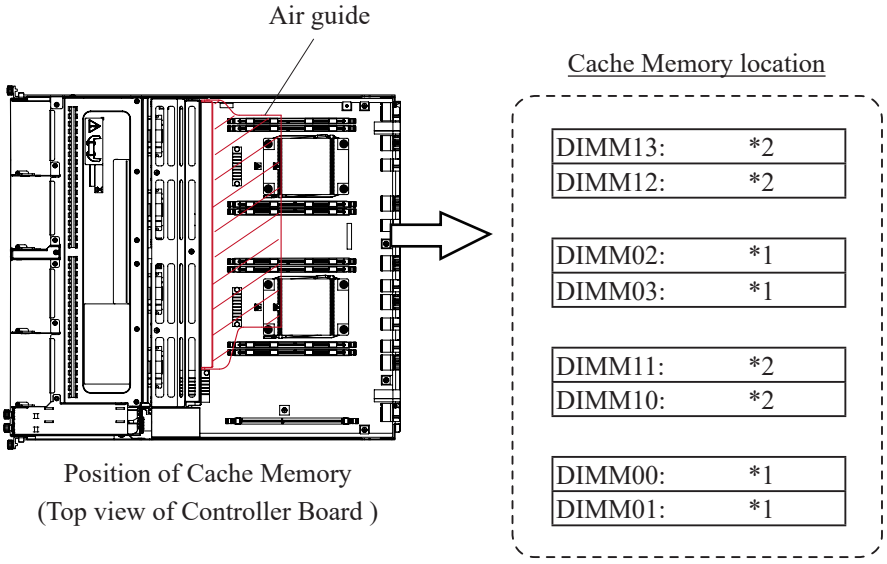
(c) With the lever opened completely, pull out and remove the Controller Board.

Figure 3-79 Removing Controller Boards (CBLH)



(3) Adding the Cache Memories

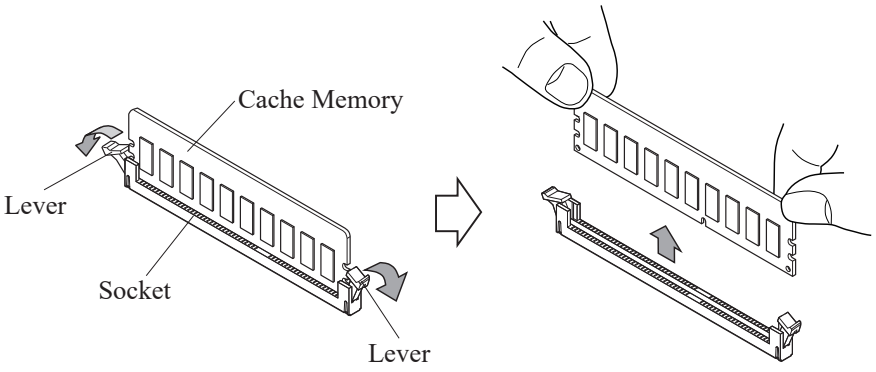
When replacing types, remove all the installed Cache Memories and install the prepared Cache Memories.



*1 : Belonging to CMG0 (Cache Memory Group 0).
*2 : Belonging to CMG1 (Cache Memory Group 1).
Be sure to install DIMM in CMG0.
CMG1 is an additional slot of DIMM.
Install DIMM in sets of four.

(a) Open the air guide.
(b) When adding the Cache Memories to free slots, go to Step (d).
(c) The procedure for removing
(i) Open the levers outward.
(ii) Hold both ends with the fingers and pull out the Cache Memory straight from the socket.

Figure 3-80 Removing the Cache Memory



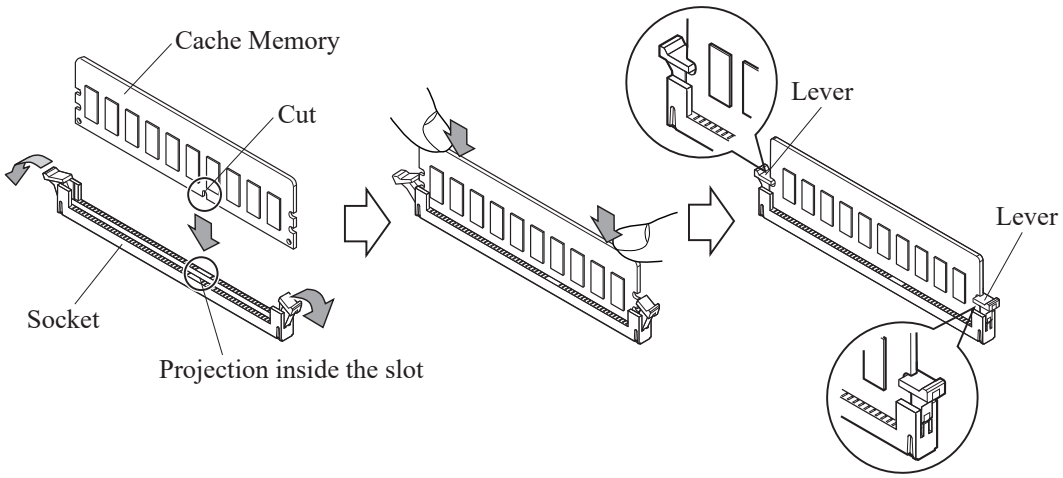
(d) Procedure for installing

NOTICE: Do not put intense pressure on the cache memory to the extent that the printed-circuit board greatly bends after the cache memory is secured with the levers in installation procedure of the cache memory. The printed-circuit board may be damaged when intense pressure is applied.

(i) Position the cut of the Cache Memory with the projection inside the slot of Controller Board and place the Cache Memory on the socket.
(ii) Hold both ends of the Cache Memory with the fingers and fit it into the socket.
(iii) Check that the lever is firmly fit in the Cache Memory.

(e) Close the air guide.

Figure 3-81 Installing the Cache Memory



(4) Adding the Cache Flash Memory

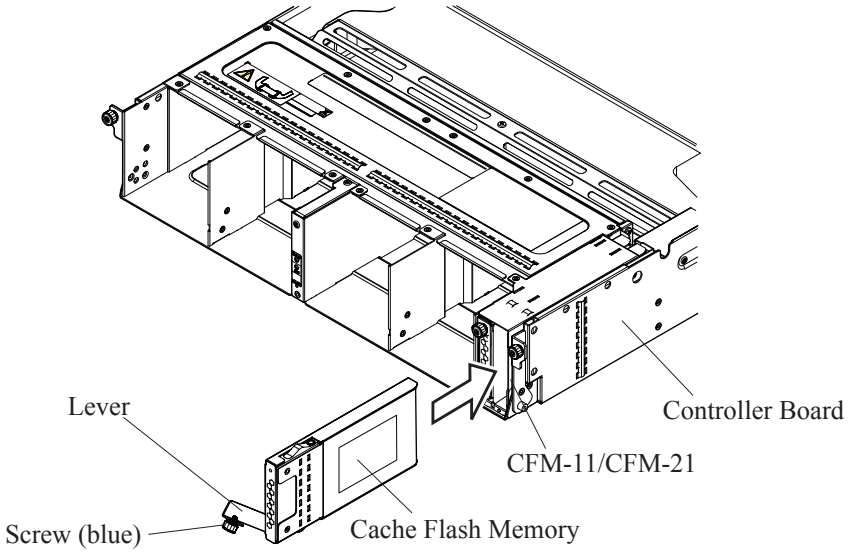
Add a Cache Flash Memory depending on the Cache capacity after addition.

When you need to add a Cache Flash Memory, refer to Table 3-4 to add the memory.

NOTE : • The Cache Flash Memories can be added to the slots of CFM-11 and CFM-21.
• It is necessary to match the type (model name) of CFM-10/20 and CFM-11/21 (addition side).
When adding Cache Memories, check the model name of CFM-10/20 and add the same model.
• When replacing Cache Memories, it is necessary to match the type (model name) defined in the configuration information.
Example: When the configuration information is defined as BM35, replacing to BM45 is impossible.
• Add a Cache Flash Memory to the removed Controller Board.

(a) Pull out and remove the dummy from the CFM slots (CFM-11 and CFM-21).
(b) With the lever of the Cache Flash Memory to be added opened completely, insert the Cache Flash Memory into the slot.
(c) Push the Cache Flash Memory all the way in and close the lever completely.
(d) Tighten the screw (blue) and fix the Cache Flash Memory.

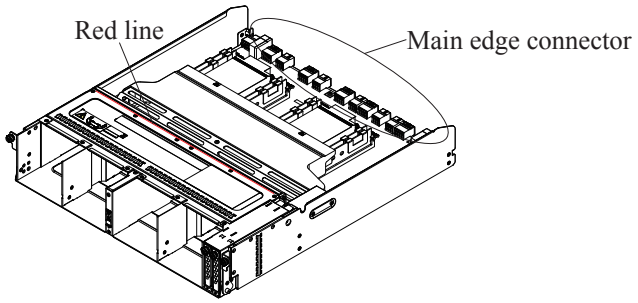
Figure 3-82 Adding the Cache Flash Memory



(5) Installing the Controller Board

⚠ CAUTION

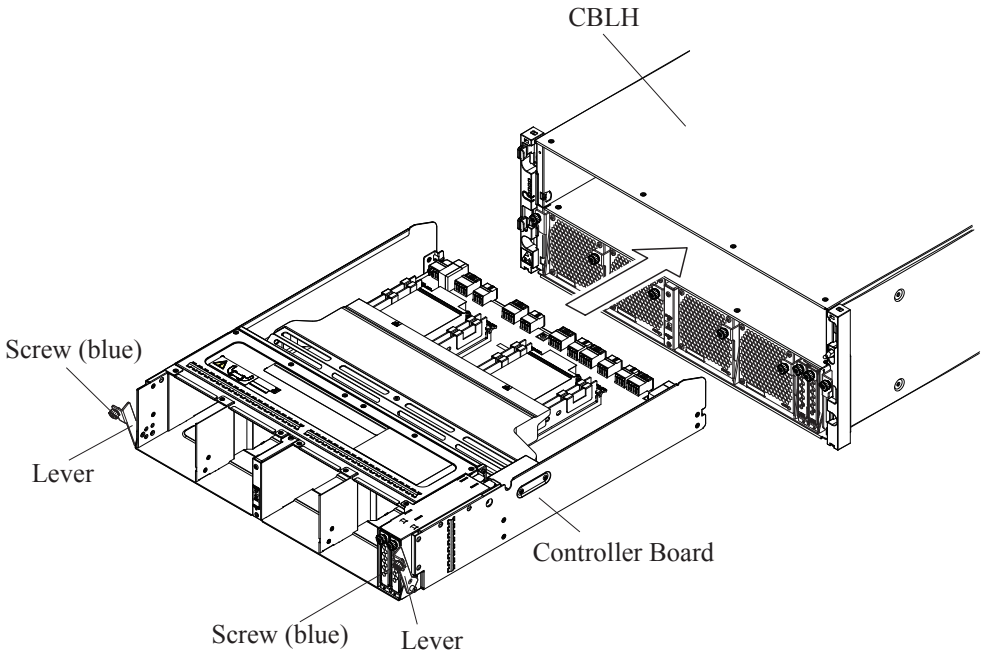
Dropping the Controller Board may cause injury. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the array past this mark, keep a firm hold on the Controller Board.



NOTICE:
- Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
- When installing the Controller Board, hold it with both hands and install it straight not to apply a shock to with any components.

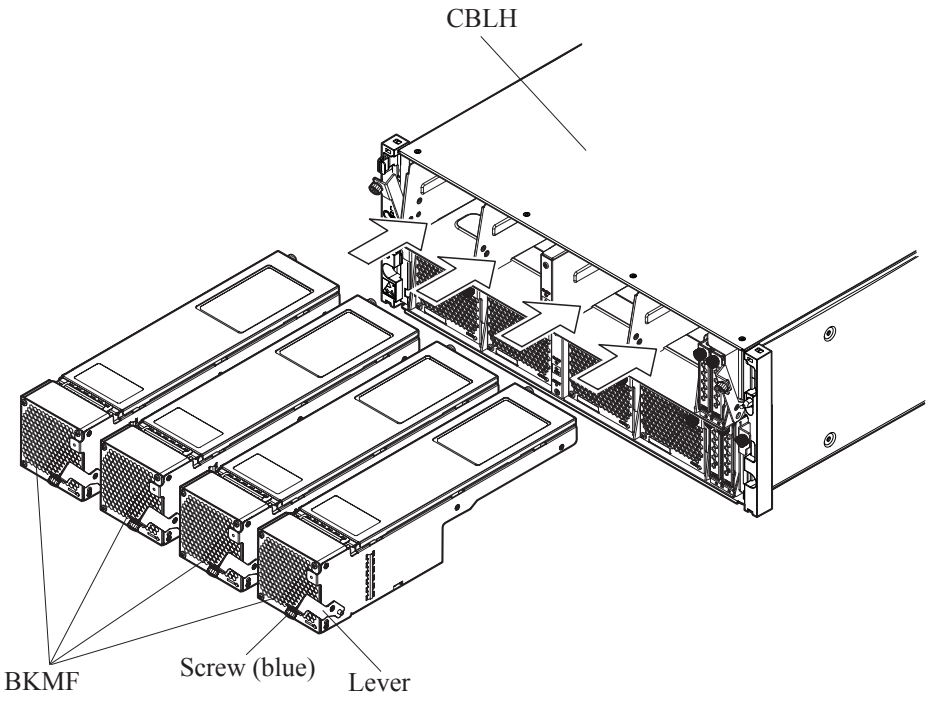
(a) Open the right and left levers of the Controller Board completely and insert the Controller Board into the installation location of the CBLH.

Figure 3-83 Installing the Controller Board (CBLH)



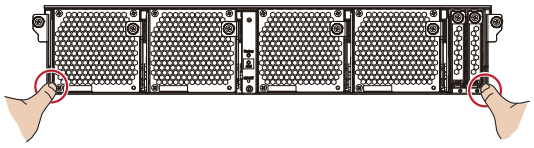
(b) Install four BKMFs in the Controller Board.
(i) Open the BKMF lever and insert the BKMF into the slot.
(ii) Raise the BKMF lever and tighten the screws (blue) and fix it.

Figure 3-84 Installing the BKMF



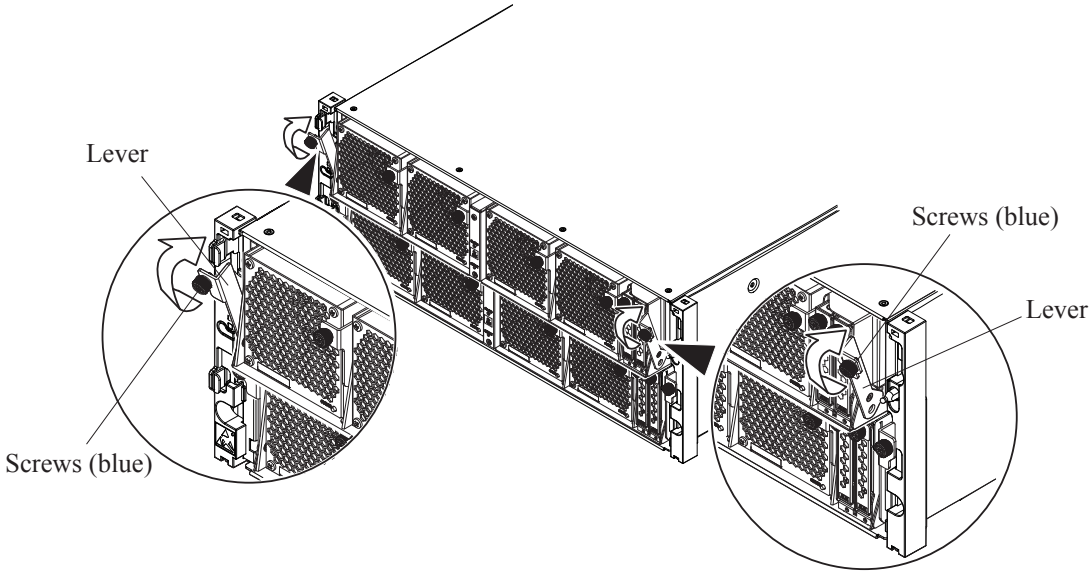
(c) Push the Controller Board all the way in and close the right and left levers completely.

NOTICE: Push the bottom of the front side of the Controller Board all the way to insert it to the end.



(d) Tighten the screws (blue) and fix the Controller Board.

Figure 3-85 Fixing the Controller Board

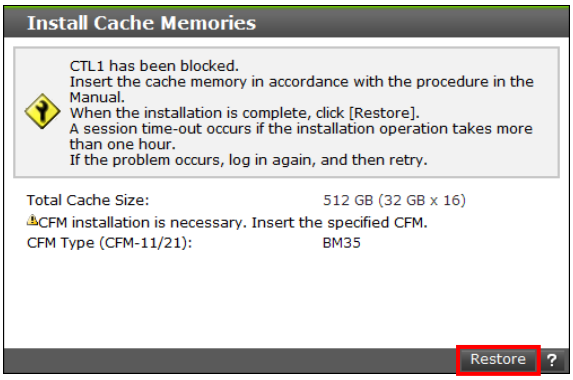


5. Checking addition completion by Maintenance Utility

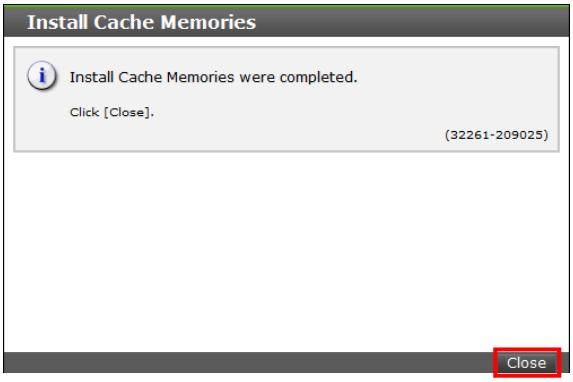
(1) Procedures differ by the following work.
- When increased total capacity of Cache Memories ····· Step (a)
- When changed types of Cache Memories without changing total capacity of Cache Memories ····· Step (b)

(a) When increased total capacity of Cache Memories

(i) <Restore Controller Board>
Click the [Restore] button.

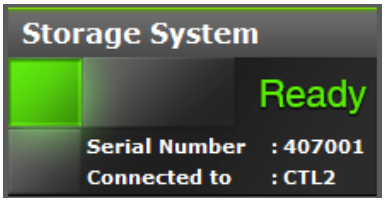


(ii) <Check Additional Completion>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.



NOTE: It may take a few minutes to be able to connect to the GUM of the recovered Controller.

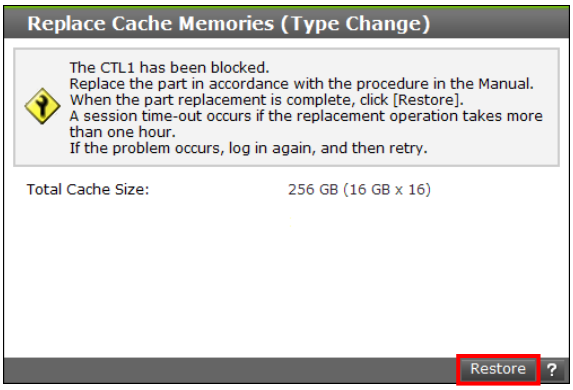
(iii) Click the Storage System name to return to the main window.



(b) When changed types of Cache Memories without changing total capacity of Cache Memories

(i) <Restore Controller Board>

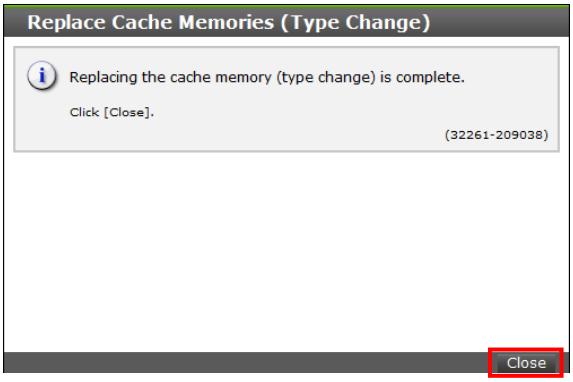
Click the [Restore] button.



(ii) <Check Type Change>

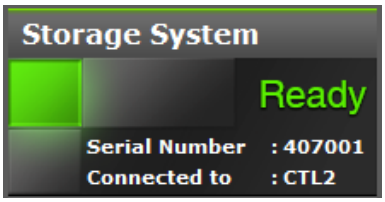
Check that the following message is displayed and then click the [Close] button.

If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.



NOTE: It may take a few minutes to be able to connect to the GUM of the recovered Controller.

(iii) Click the Storage System name to return to the main window.



6. Add Cache Memories to Controller Board 2
   In the addition procedure, add Cache Memories to Controller Board 2 similarly referring to "1. Connecting a Maintenance PC".
   Add Cache Memories to both Controller Boards 1 and 2, and then go to Step 7.

7. Click the [Logout] button to close the window.

8. Disconnecting the Maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".

3.8 Adding Shared Memory (SM)

Decide Cache Memories to be added referring to "3.1.1 Cache Capacity and the Number of Required Options".

When adding Shared Memories, the window and the procedure differ between the CBSS/CBSL and the CBLH.

- When adding Shared Memories to the CBSS/CBSL: "3.8.1 Adding Shared Memory for CBSS/CBSL"
- When adding Shared Memories to the CBLH: "3.8.2 Adding Shared Memory for CBLH"

NOTICE:
- As a result of the addition, if the total capacity of Cache Memories is insufficient, the addition processing fails. In that case, add Cache Memories first. (Refer to "3.7 Adding Cache Memory/Cache Flash Memory".)
  Refer to "3.1.1 Cache Capacity and the Number of Required Options" for the details of the total capacity of Cache Memories.
- The capacity used for adding Shared Memories (SMs) is assigned by the cache capacity of CLPR0.
  When using Virtual Partition Manager, if the cache capacity becomes less than 4 GB (at least Cache capacity) as a result of the addition, the addition processing fails. Check in advance that the cache capacity of CLPR0 is more than or equal to 4 GB larger than the capacity of the Share Memories (SMs) to be added (Shared Memory capacity (GB) after addition - Current Shared Memory capacity (GB) + 4 ≦ cache capacity (GB) of CLPR0).
  Refer to "4. Shared Memory (SM) Capacity" of "3.1.1" for the Shared Memory capacity (GB).
- The operation time depends on the I/O load. When the I/O load is extremely high, it might take up to about eight hours to complete the procedure.

3.8.1 Adding Shared Memory for CBSS/CBSL

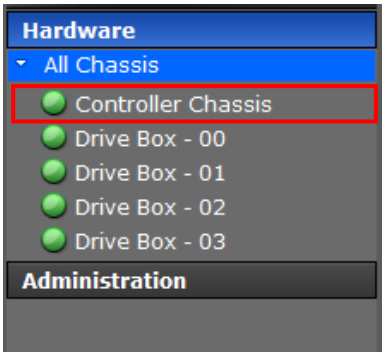
1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding the Shared Memories, connect the Maintenance PC and the Controller Board 1 or Controller Board 2.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

---

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

---

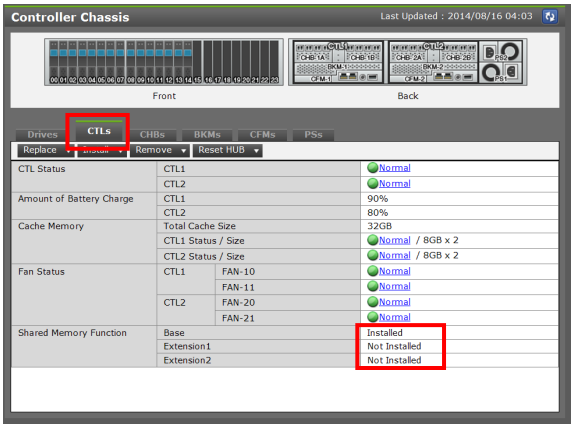
3. Selecting additional parts by Maintenance Utility
   (1) <Main Window>
   Select the [Controller Chassis] tab in the main window.



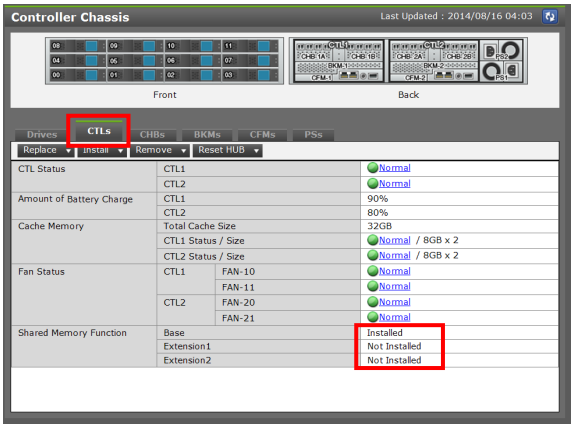
(2) <Controller Chassis Window>

Click the [CTLs] tab in the “Controller Chassis” window to check the Shared Memory Function status.

• In case of CBSS



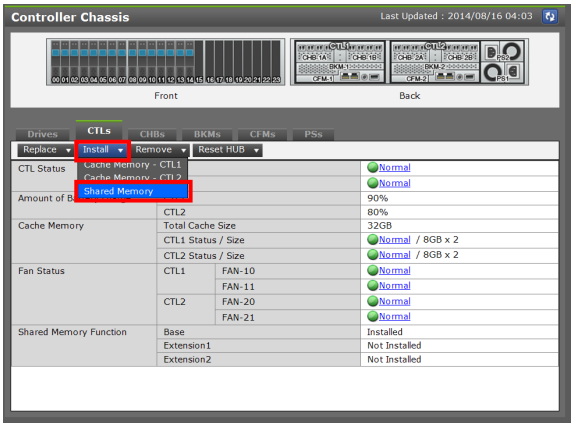
• In case of CBSL



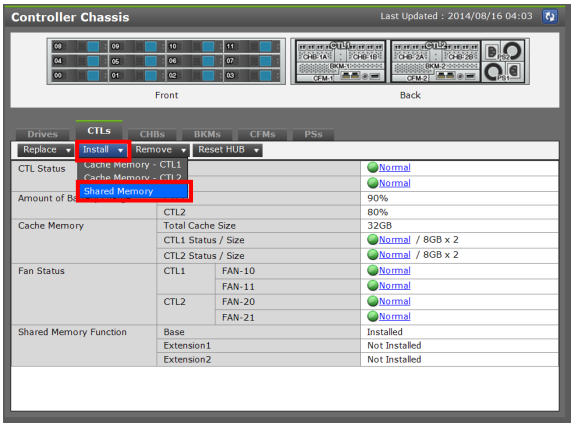
(3) <Select Controller Board>

Click the [Install] button and select [Shared Memory].

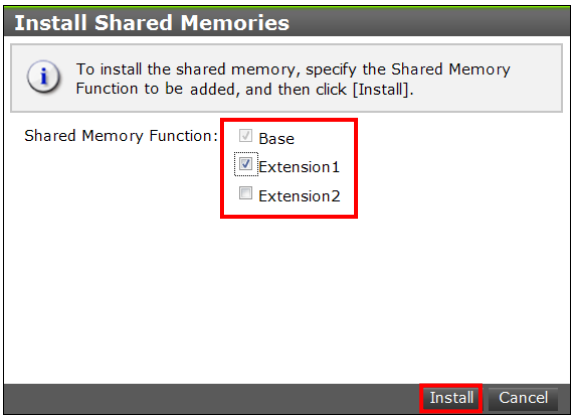
• In case of CBSS



• In case of CBSL



(4) <Shared Memory Addition Window>
Check the [Shared Memory Function] to be added in the "Install Shared Memories" window and click the [Install] button.

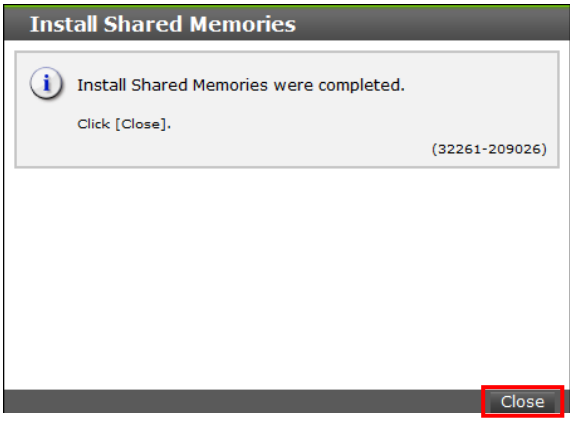


It might take one hour or more to add the shared memory due to I/O load.
If the message [32261-209052] is displayed at the time of adding the shared memory, perform the Step (a) to Step (b) shown below.

(a) Close the Maintenance Utility and log in again following the procedure described in the message [32261-209052].

(b) Then, the message [32061-208063] is displayed.
Click the refresh button, confirm that [System Locked] displayed in the upper part of the window is changed to [System Unlocked], and then check the Shared Memory Function status in the "Controller Chassis" window following the procedure described in the message.

(5) <Shared Memory Addition Completion Window>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to "Device Manager-Storage Navigator Messages".



(6) Click the [Logout] button to close the window.

4. Disconnecting the Maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION “2.8.3 Disconnecting the Maintenance PC from the Storage System”.

3.8.2 Adding Shared Memory for CBLH

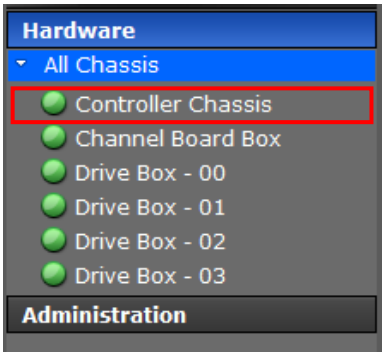
1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding the Shared Memories, connect the Maintenance PC and the Controller Board 1 or Controller Board 2.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

---

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

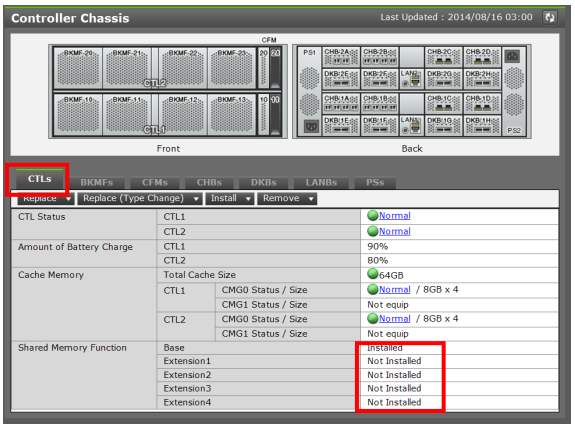
---

3. Selecting additional parts by Maintenance Utility
   (1) <Main Window>
   Select the [Controller Chassis] tab in the main window.



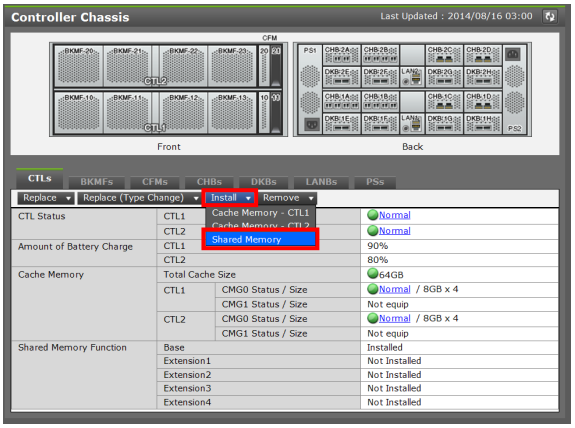
(2) <Controller Chassis Window>

Click the [CTLs] tab in the “Controller Chassis” window and check the Shared Memory Function status.



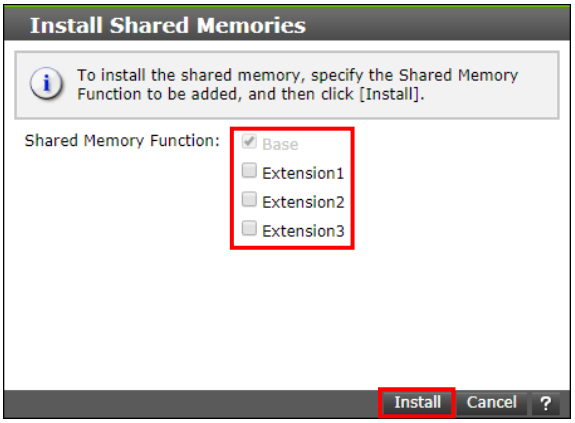
(3) <Shared Memory Addition Execution>

Click the [Install] button and select [Shared Memory].

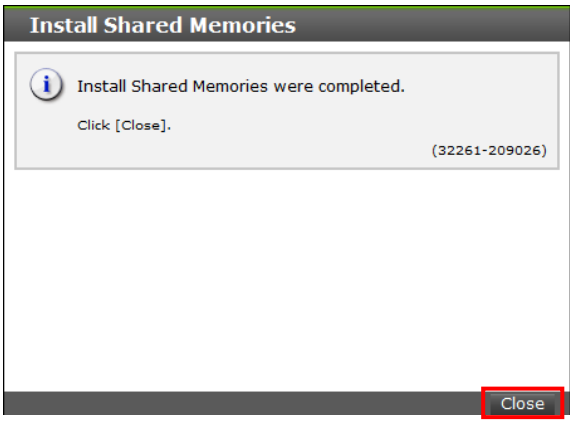


(4) <Shared Memory Addition Window>

Check the [Shared Memory Function] to be added in the “Install Shared Memories” window and click the [Install] button.



(5) <Shared Memory Addition Completion Window>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.



(6) Click the [Logout] button to close the window.

4. Disconnecting the Maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION “2.8.3 Disconnecting the Maintenance PC from the Storage System”.

3.9 Changing the Type of Small Form-Factor Pluggable (SFP)

For Change SFP Type, Wavelength and Data Transfer Rate can be changed.
When changing the type, the window and the procedure differ between the CBSS/CBSL,the CBLH and the Channel Board Box.

- When changing the type of Small Form-Factor Pluggable of the CBSS/CBSL:
  "3.9.1 Changing the Type of Small Form-Factor Pluggable (SFP) for CBSS/CBSL"
- When changing the type of Small Form-Factor Pluggable of the CBLH:
  "3.9.2 Changing the Type of Small Form-Factor Pluggable (SFP) (Changing Types) for CBLH"
- When changing the type of Small Form-Factor Pluggable of the Channel Board Box:
  "3.9.3 Changing the Type of Small Form-Factor Pluggable (SFP) (Changing Types) for Channel Board Box"

Data Transfer Rate can be changed for the SFP installed in the 32G Ready 4Port FC Channel Board.

Prerequisites

- The target Channel Board type is "32G Ready 4Port FC".

3.9.1 Changing the Type of Small Form-Factor Pluggable (SFP) for CBSS/CBSL

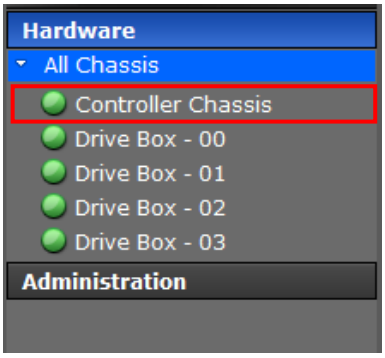
NOTE : Install Small Form-Factor Pluggables (SFP) of the same type to the same positions of Controller Boards 1 and 2.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When changing the Small Form-Factor Pluggable (SFP), connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

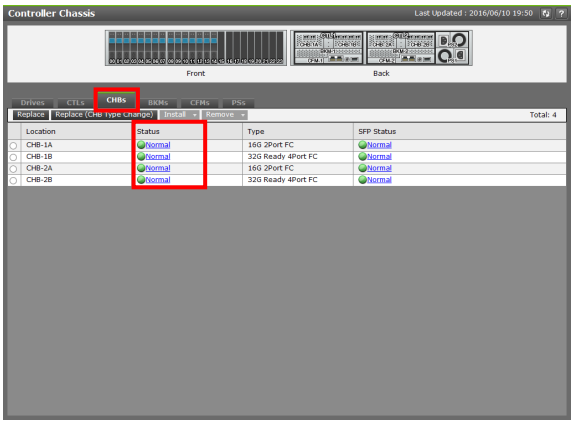
3. Selecting additional parts by Maintenance Utility

(1) <Main Window>
Select the [Controller Chassis] in the main window.

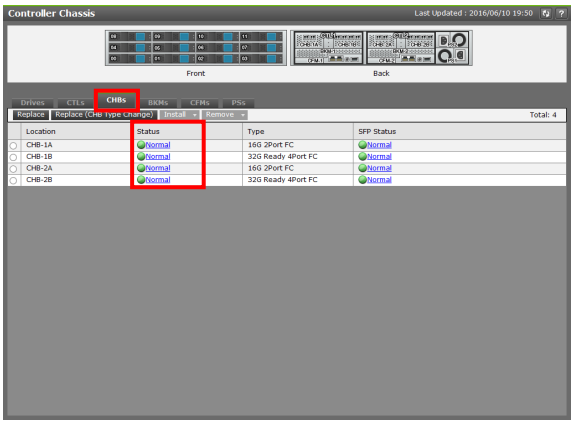


(2) <Controller Chassis Window>
Click the [CHBs] tab in the “Controller Chassis” window and display the Channel Board status.

• In case of CBSS



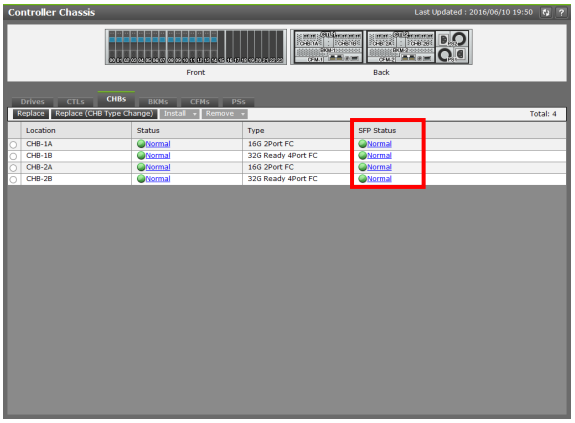
• In case of CBSL



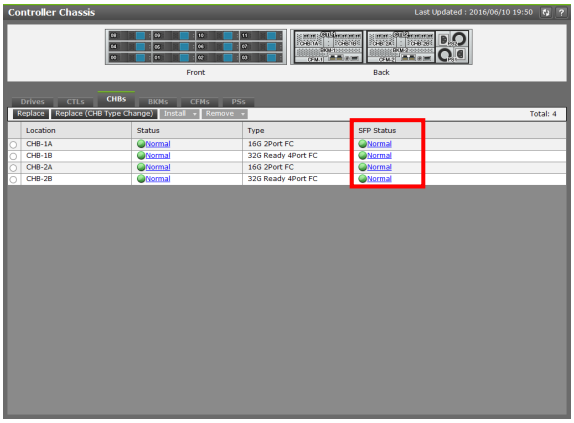
(3) <Select Channel Board>

Click the [SFP Status] on the Channel Board to change the Small Form-Factor Pluggable (SFP) Type.

• In case of CBSS



• In case of CBSL

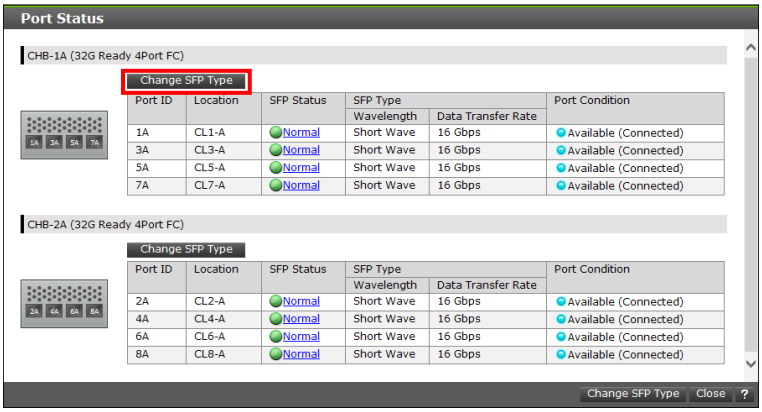


(4) <Instruct Type Change>

Click the [Change SFP Type] button in the “Port Status” window.

NOTE: The [Data Transfer Rate] column is displayed only for the 32G Ready 4Port FC Channel Board.

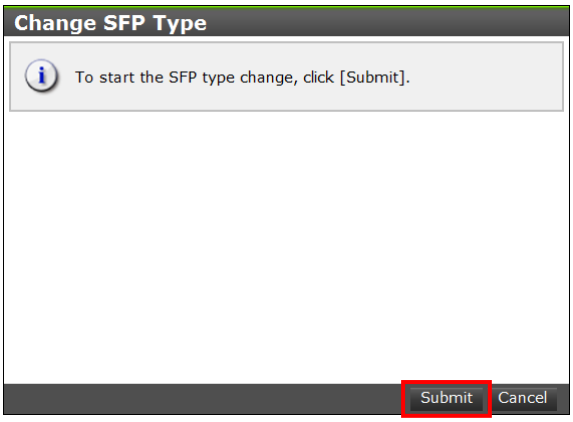
NOTE: When changing the wavelength of Small Form-Factor Pluggable per Storage System, click the [Change SFP Type] button at the bottom of the “Port Status” window. The SFP data transfer rate cannot be changed with this button.



(5) <Start Type Change>

For other than 32G Ready 4Port FC Channel Board:

Click the [Submit] button in the "Change SFP Type" window.



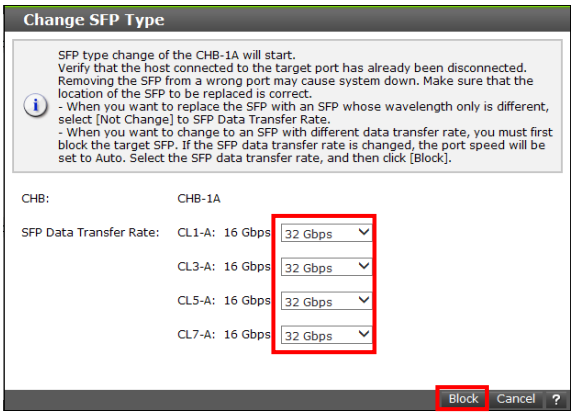
When changing the data transfer rate of SFP for 32G Ready 4Port FC Channel Board:

CAUTION

About "Forcibly run without safety checks":

If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

Select a new transfer rate from the pull-down box for the target [SFP Data Transfer Rate] in the [Change SFP Type] window. For SFP not to be changed, select [Not Change]. Then click the [Block] button.



(6) <Displaying the Password entry window>

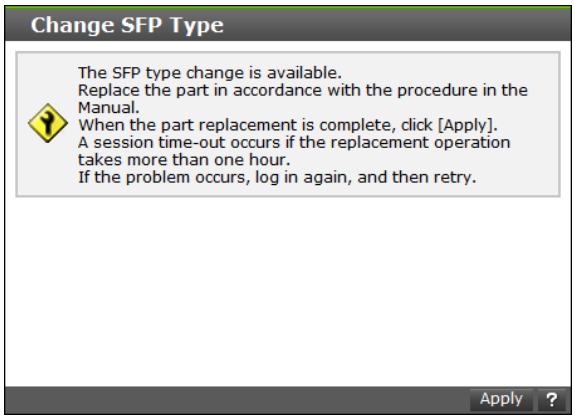
CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the login password for the maintenance account of the storage system, and then click the [OK] button.

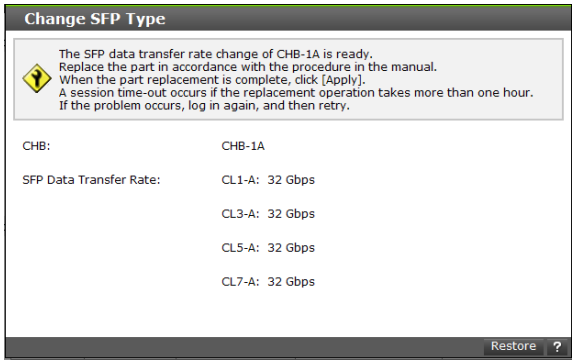
(7) <Check Type Change Preparation>
Check the following type change preparation completion window.
If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.
For other than 32G Ready 4Port FC Channel Board:

NOTE : Do not click the [Apply] button at this time.
Click the [Apply] button after completing the type change work.



For 32G Ready 4Port FC Channel Board:

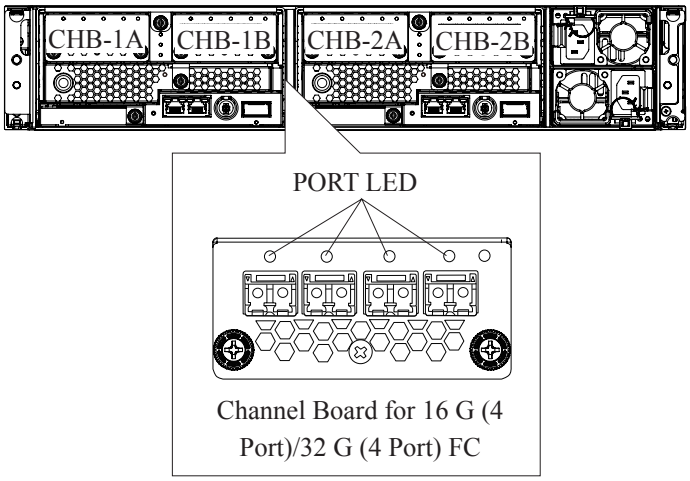
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the type change work.



NOTE: When the preparation for SFP type change is terminated with the error code [30762-208784], check the prerequisites and procedure, and then retry the operation.
If this problem persists, contact the Technical Support Division.

4. Changing the type of Small Form-Factor Pluggable (SFP) for CBSS/CBSL

Location	Changing part name		Parts name
Rear View of CBSS/CBSL	1	Small Form-Factor Pluggable (SFP)	• Shortwave, For 16 G FC • Longwave, For 16 G FC • Shortwave, For 32 G FC



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. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Confirm that the customer has disconnected the host connected to the port to be changed.

(2) Remove the optical cable from the Small Form-Factor Pluggable (SFP) to be changed.

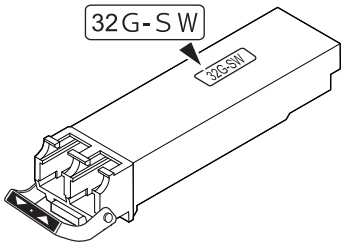
(3) Changing the Small Form-Factor Pluggable (SFP)

(a) Pull the Small Form-Factor Pluggable (SFP) lever down toward you and pull out the module.

NOTE : If the Small Form-Factor Pluggable (SFP) is not removable, pull it out while pushing open the lever toward you.

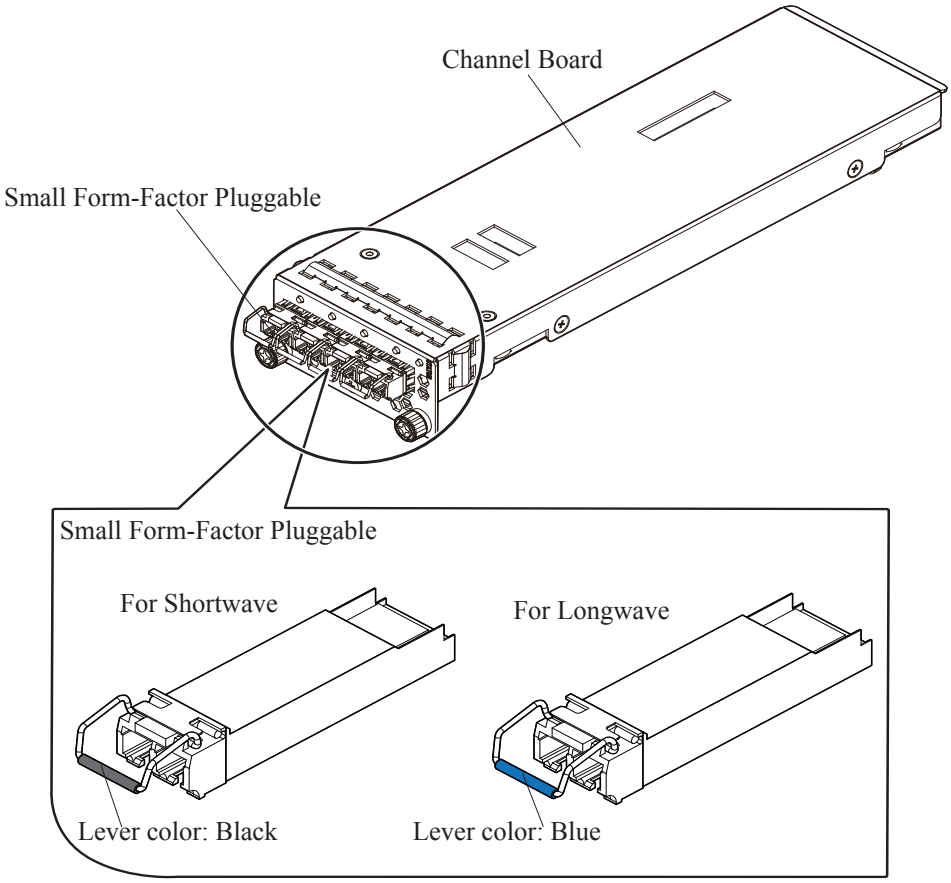
(b) Check the insertion direction of the Small Form-Factor Pluggable (SFP) to be changed and insert the Small Form-Factor Pluggable (SFP) into the port until it clicks.

NOTE: The label "32G-SW" is attached to the 32 Gbps Small Form Factor Pluggable (SFP).



(c) Change the types of all the Small Form-Factor Pluggables (SFP) on the Channel Board in the similar procedure.

Figure 3-86 Changing the Small Form-Factor Pluggable (SFP)



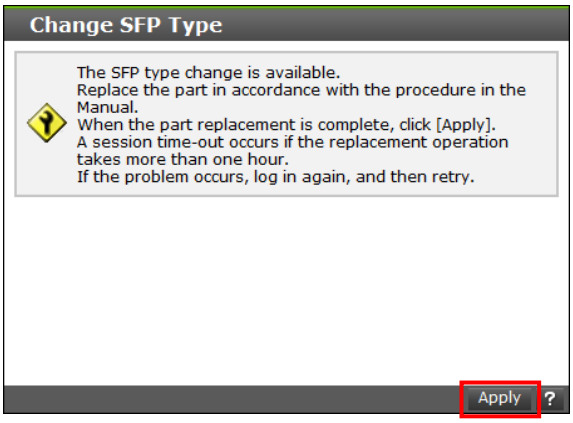
(4) Connect optical cables corresponding to the changed Small Form-Factor Pluggable (SFP).

NOTE: Check that optional cable latch clicks and the cables are surely connected.

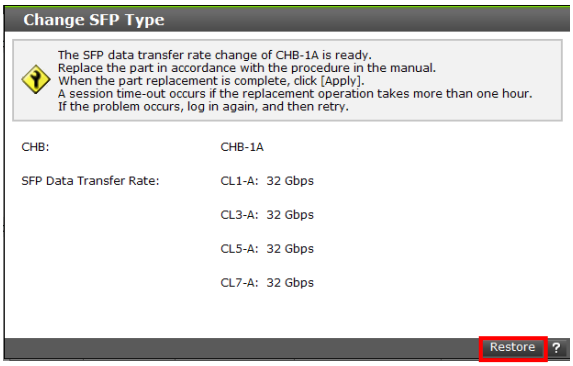
5. Executing the type change of Small Form-Factor Pluggable by Maintenance Utility

(1) <Changing the type of Small Form-Factor Pluggables>

For other than 32G Ready 4Port FC Channel Board:
Click the [Apply] button.



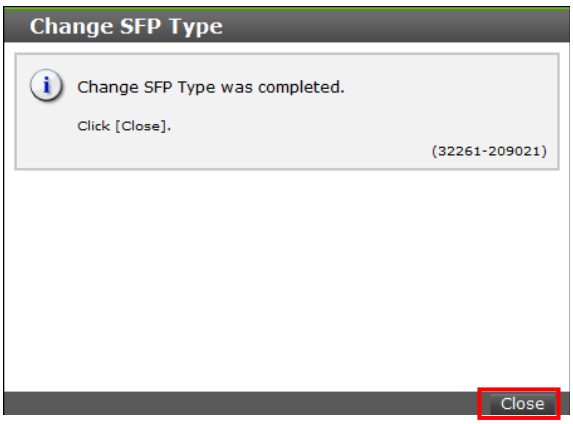
For 32G Ready 4Port FC Channel Board:
Click the [Restore] button.



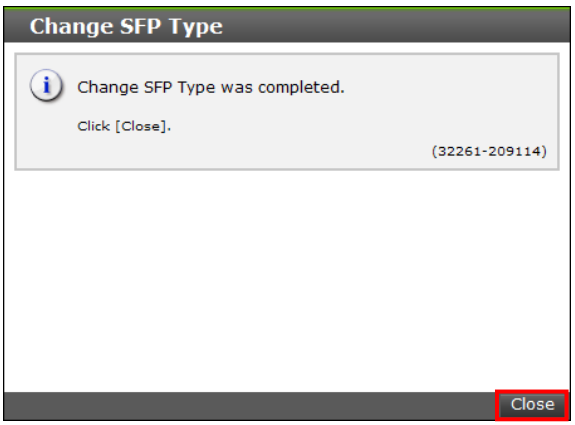
(2) <Check Type Change Completion>

Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.

For other than 32G Ready 4Port FC Channel Board:



For 32G Ready 4Port FC Channel Board:



When the SFP replacement by changing the type fails, click the [Close] button of the completion message. Then, to change the wavelength, click the [CHB] tab in the "Controller Chassis" window on Maintenance Utility and check if [SFP Status] is "Normal".
If "Not Fix" is displayed in SFP Status, check if the SFP is properly inserted.
When "Not Fix" is displayed in SFP Status even if the SFP is properly inserted or "Warning" is displayed in SFP Status, replace the SFP with the maintenance part. See REPLACEMENT SECTION "2.13 Replacing a Small Form-Factor Pluggable (SFP)".
To change the data transfer rate, click the [CHB] tab in the "Controller Chassis" window on Maintenance Utility and check if [SFP Status] is "Normal".
If "Not Fix" is displayed in SFP Status, check if the SFP is properly inserted.
When [SFP Status] is "Not Fix" even if the SFP is properly inserted or [SFP Status] is "Warning", see TROUBLESHOOTING SECTION "2.2.18 Recovery Procedure when Procedure for Small Form-Factor Pluggable (SFP) Data Transfer Rate Change fails" to perform the procedure.

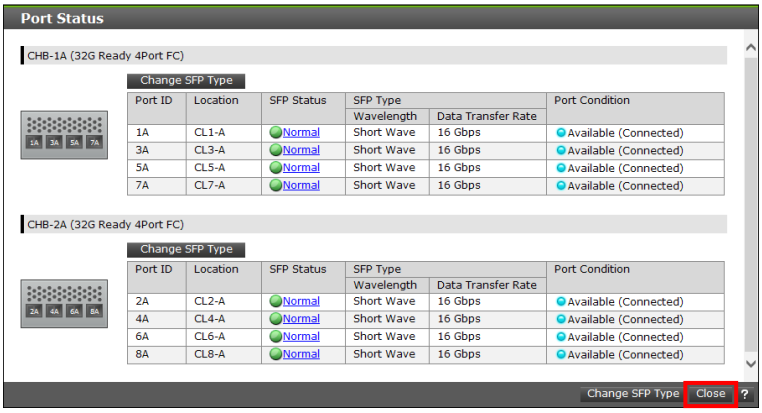
When changing the data transfer rate of SFP for 32G Ready 4Port FC Channel Board:

(a) To change the SFP data transfer rate, perform the operation on one controller.
Perform the procedure from "3. Selecting additional parts by Maintenance Utility" on the other controller to change the type of the SFP in the channel board in the same location.

(b) Change SFP Type has been performed on the controller board 1 and 2, and then go on to Step (3).

(3) Click the [Close] button in the “Port Status” window.
For other than 32G Ready 4Port FC Channel Board:
Check that the SFP type is correct.
For 32G Ready 4Port FC Channel Board:
Check that the Wavelength and Data Transfer Rate of the SFP Type are correct.

NOTE: The [Data Transfer Rate] column is displayed only for the 32G Ready 4Port FC Channel Board.



(4) Click the [Logout] button to close the window.

6. Disconnecting the Maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION “2.8.3 Disconnecting the Maintenance PC from the Storage System”.

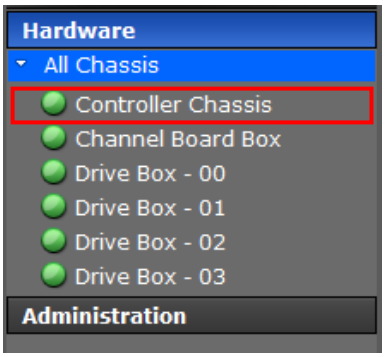
3.9.2 Changing the Type of Small Form-Factor Pluggable (SFP) (Changing Types) for CBLH

NOTE : Install Small Form-Factor Pluggables (SFP) of the same type to the same positions of Controller Boards 1 and 2.

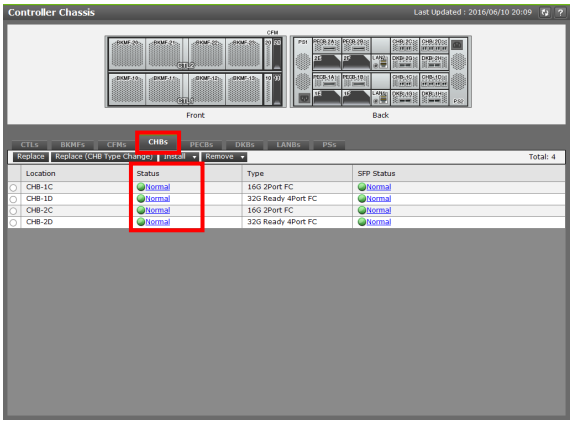
1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When changing the Small Form-Factor Pluggable (SFP), connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

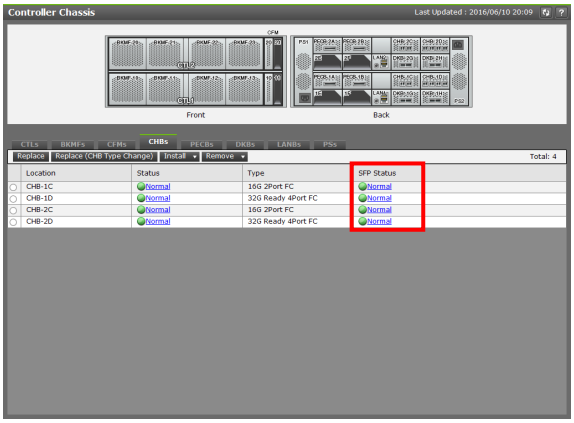
3. Selecting additional parts by Maintenance Utility
   (1) <Main Window>
   Select the [Controller Chassis] in the main window.



(2) <Controller Chassis Window>
Click the [CHBs] tab in the “Controller Chassis” window and display the Channel Board status.



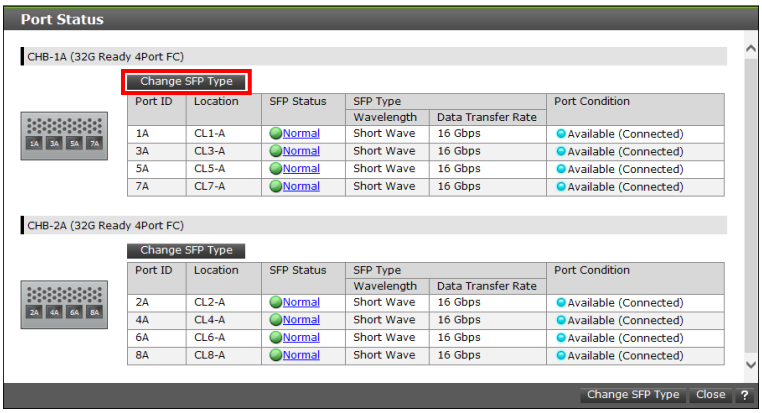
(3) <Select Channel Board>
Click the [SFP Status] on the Channel Board to change the type of Small Form-Factor Pluggable (SFP).



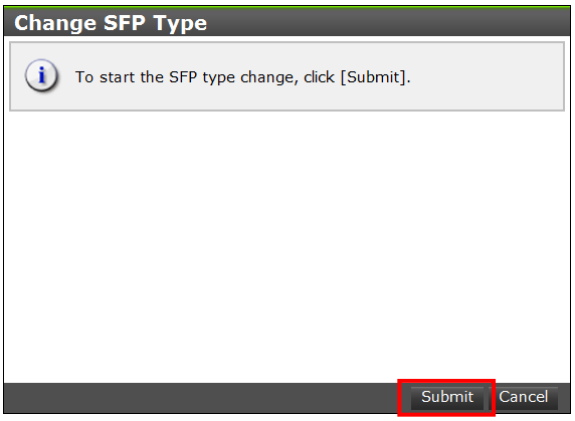
(4) <Instruct Type Change>
Click the [Change SFP Type] button in the "Port Status" window.

NOTE: The [Data Transfer Rate] column is displayed only for the 32G Ready 4Port FC Channel Board.

NOTE: When changing the wavelength of Small Form-Factor Pluggable per Storage System, click the [Change SFP Type] button at the bottom of the "Port Status" window. The SFP data transfer rate cannot be changed with this button.



(5) <Start Type Change>
For other than 32G Ready 4Port FC Channel Board:
Click the [Submit] button in the "Change SFP Type" window.

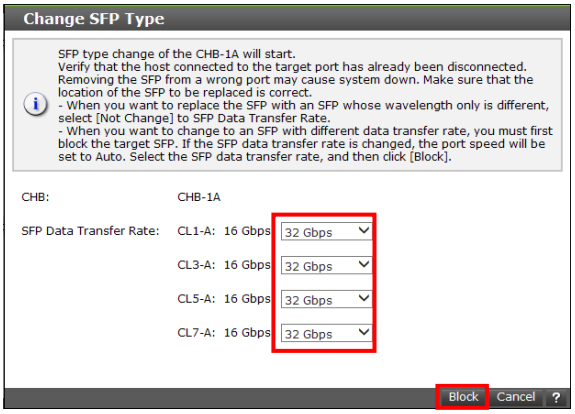


When changing the data transfer rate of SFP for 32G Ready 4Port FC Channel Board:

⚠ CAUTION

About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

Select a new transfer rate from the pull-down box for the target [SFP Data Transfer Rate] in the [Change SFP Type] window. For SFP not to be changed, select [Not Change]. Then click the [Block] button.



(6) <Displaying the Password entry window>

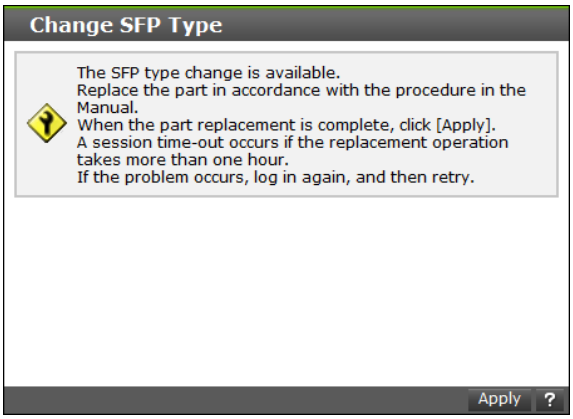
⚠ CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the login password for the maintenance account of the storage system, and then click the [OK] button.

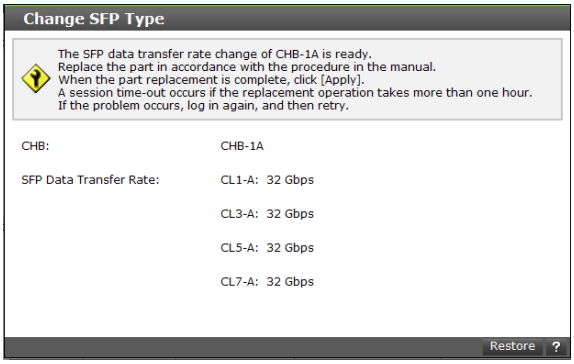
(7) <Check Type Change Preparation>
Check the following type change preparation completion window.
If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.
For other than 32G Ready 4Port FC Channel Board:

NOTE : Do not click the [Apply] button at this time.
Click the [Apply] button after completing the type change work.



For 32G Ready 4Port FC Channel Board:

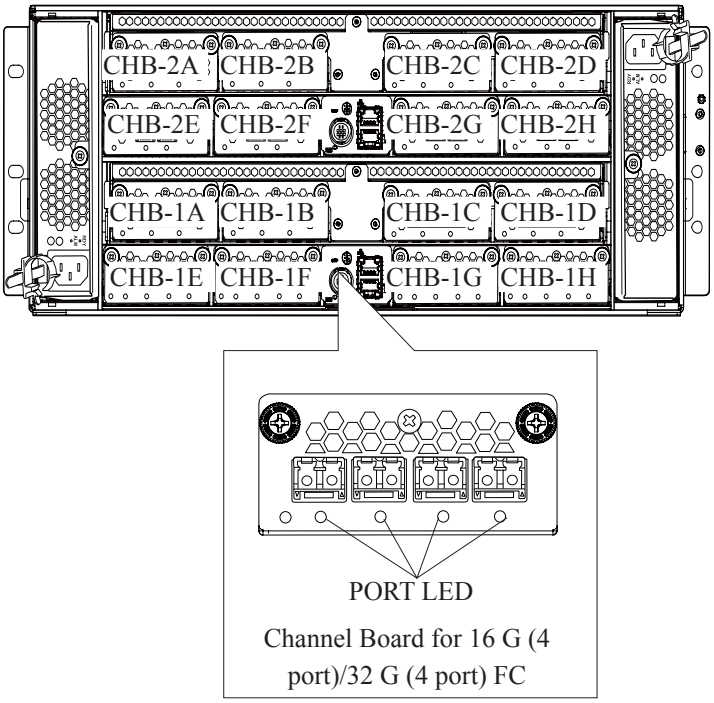
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the type change work.



NOTE: When the preparation for SFP type change is terminated with the error code [30762-208784], check the prerequisites and procedure, and then retry the operation.
If this problem persists, contact the Technical Support Division.

4. Changing the type of Small Form-Factor Pluggable (SFP) for CBLH

Location	Changing part name		Parts name
Rear View of CBLH (Rear)	1	Small Form-Factor Pluggable (SFP)	• Shortwave, For 16 G FC • Longwave, For 16 G FC • Shortwave, For 32 G FC



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. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Confirm that the customer has disconnected the host connected to the port to be changed.

(2) Remove the optical cable from the Small Form-Factor Pluggable (SFP) to be changed.

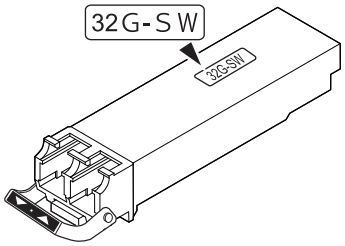
(3) Changing the Small Form-Factor Pluggable (SFP)

(a) Pull the Small Form-Factor Pluggable (SFP) lever down toward you and pull out the module

NOTE : If the Small Form-Factor Pluggable (SFP) is not removable, pull it out while pushing open the lever toward you.

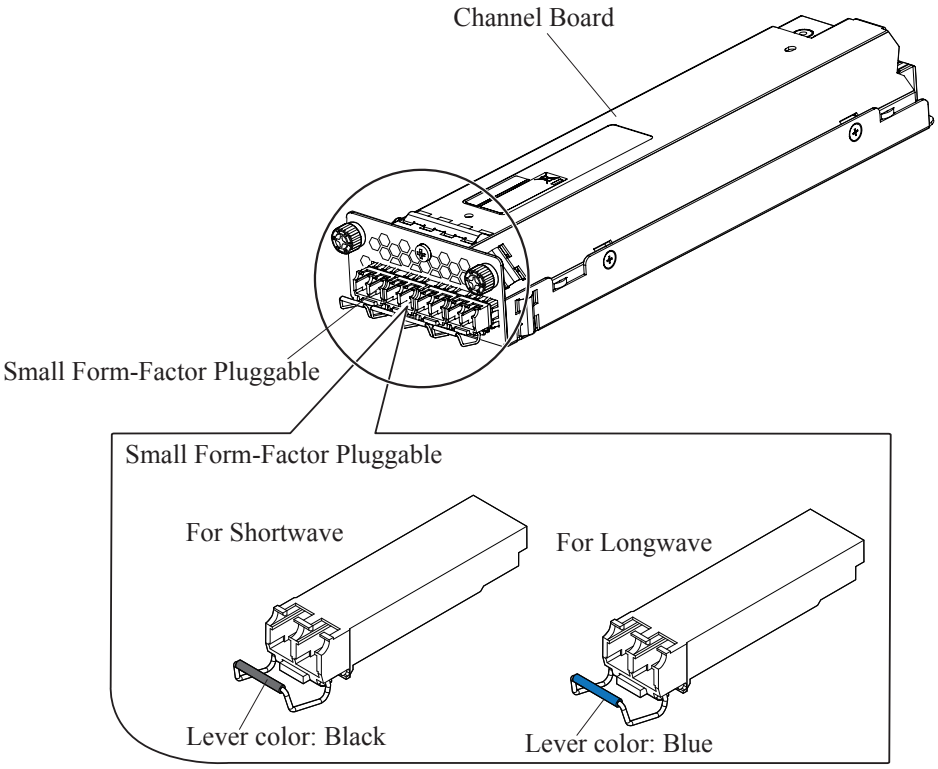
(b) Check the insertion direction of the Small Form-Factor Pluggable (SFP) to be changed and insert the Small Form-Factor Pluggable (SFP) into the port until it clicks.

NOTE: The label "32G-SW" is attached to the 32 Gbps Small Form-Factor Pluggable (SFP).



(c) Change the types of all the Small Form-Factor Pluggables (SFP) on the channel board in the similar procedure.

Figure 3-87 Changing the Small Form-Factor Pluggable (SFP)



(4) Connect optical cables corresponding to the changed Small Form-Factor Pluggable (SFP).

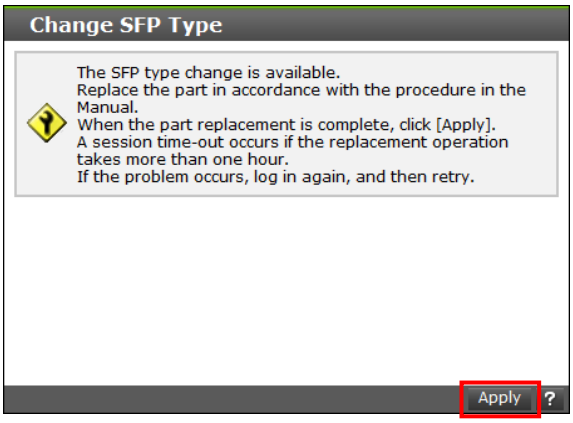
NOTE: Check that optional cable latch clicks and the cables are surely connected.

5. Changing the types of Small Form-Factor Pluggable (SFP) by Maintenance Utility

(1) <Recognize Small Form-Factor Pluggable>

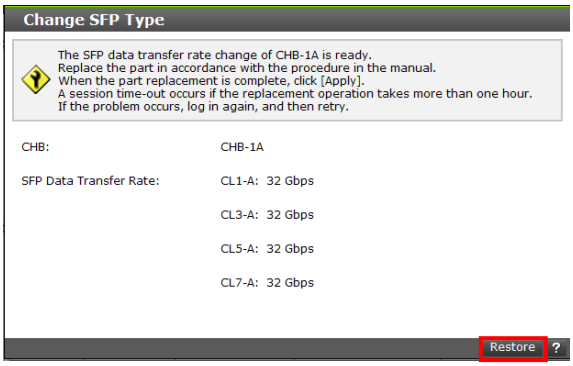
For other than 32G Ready 4Port FC Channel Board:

Click the [Apply] button.



For 32G Ready 4Port FC Channel Board:

Click the [Restore] button.

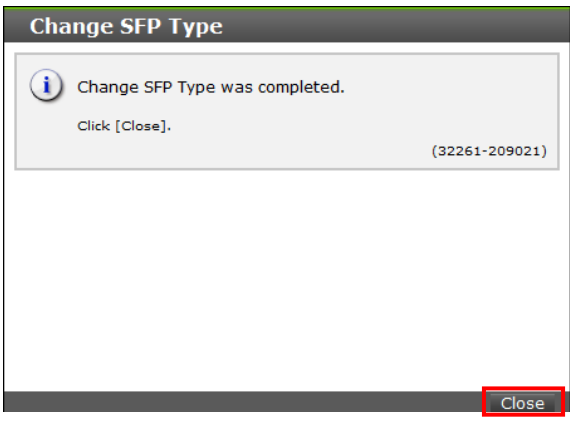


(2) <Check Type Change Completion>

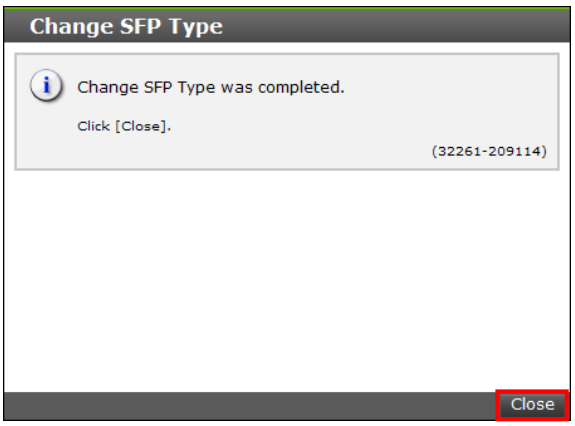
Check that the following message is displayed and click the [Close] button.

If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.

For other than 32G Ready 4Port FC Channel Board:



For 32G Ready 4Port FC Channel Board:



When the SFP replacement by changing the type fails, click the [Close] button of the completion message. Then, to change the wavelength, click the [CHB] tab in the "Controller Chassis" window on Maintenance Utility and check if [SFP Status] is "Normal".
If "Not Fix" is displayed in SFP Status, check if the SFP is properly inserted.
When "Not Fix" is displayed in SFP Status even if the SFP is properly inserted or "Warning" is displayed in SFP Status, replace the SFP with the maintenance part. See REPLACEMENT SECTION "2.13 Replacing a Small Form-Factor Pluggable (SFP)".
To change the data transfer rate, click the [CHB] tab in the "Controller Chassis" window on Maintenance Utility and check if [SFP Status] is "Normal".
If "Not Fix" is displayed in SFP Status, check if the SFP is properly inserted.
When [SFP Status] is "Not Fix" even if the SFP is properly inserted or [SFP Status] is "Warning", see TROUBLESHOOTING SECTION "2.2.18 Recovery Procedure when Procedure for Small Form-Factor Pluggable (SFP) Data Transfer Rate Change fails" to perform the procedure.

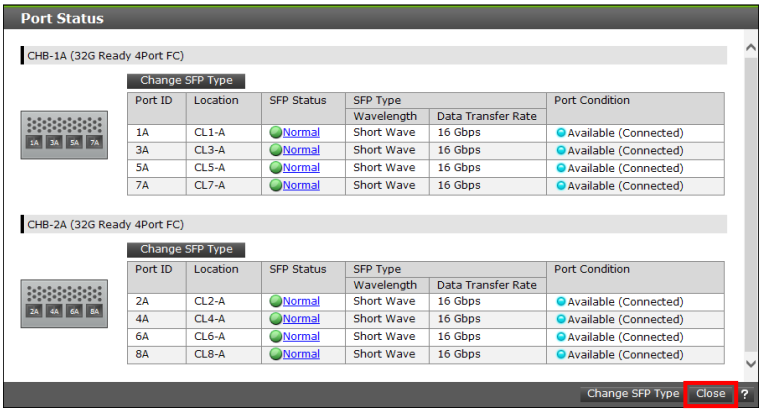
When changing the data transfer rate of SFP for 32G Ready 4Port FC Channel Board:

(a) To change the SFP data transfer rate, perform the operation on one controller.
Perform the procedure from "3. Selecting additional parts by Maintenance Utility" on the other controller to change the type of the SFP in the channel board in the same location.

(b) Change SFP Type has been performed on the controller board 1 and 2, and then go on to Step (3).

(3) Click the [Close] button in the “Port Status” window.

NOTE: The [Data Transfer Rate] column is displayed only for the 32G Ready 4Port FC Channel Board.



(4) Click the [Logout] button to close the window.

6. Disconnecting the Maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION “2.8.3 Disconnecting the Maintenance PC from the Storage System”.

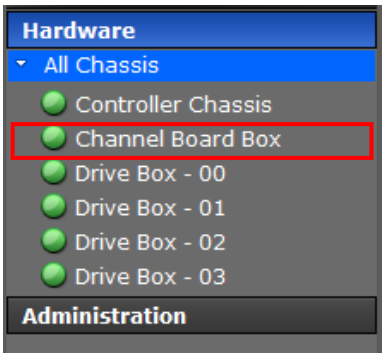
3.9.3 Changing the Type of Small Form-Factor Pluggable (SFP) (Changing Types) for Channel Board Box

NOTE: Install Small Form-Factor Pluggables (SFP) of the same type to the same positions of Switch Packages 1 and 2.

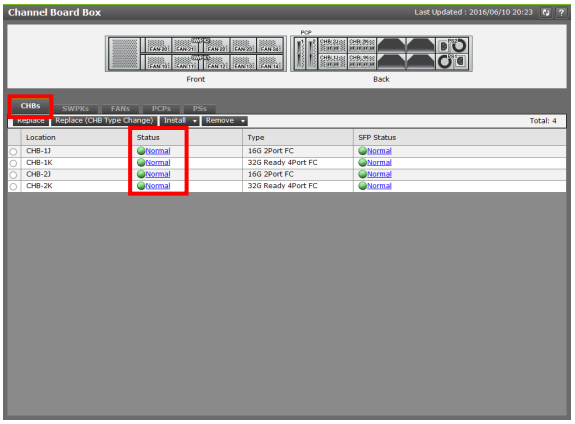
1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When changing the Small Form-Factor Pluggable (SFP), connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

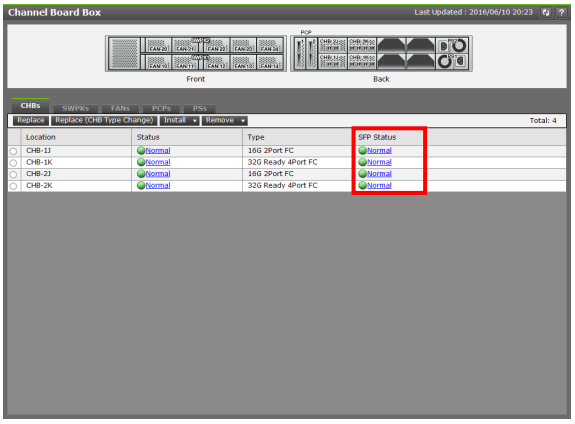
3. Selecting additional parts by Maintenance Utility
   (1) <Main Window>
   Select the [Channel Board Box] in the main window.



(2) <Channel Board Box Window>
Click the [CHBs] tab in the “Channel Board Box” window and display the Channel Board status.



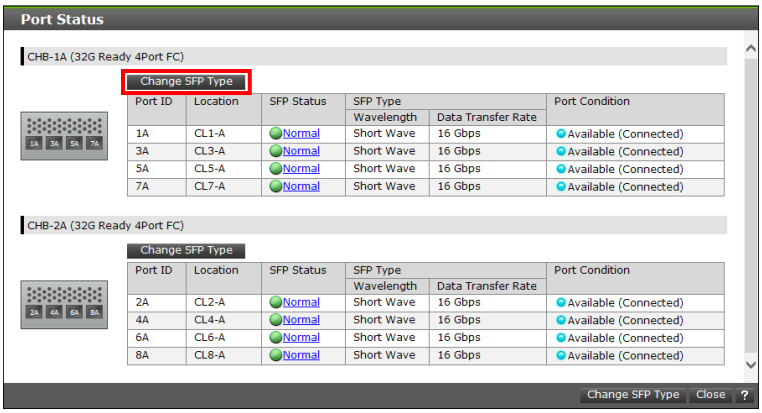
(3) <Select Channel Board>
Click the [SFP Status] on the Channel Board to change the type of Small Form-Factor Pluggable (SFP).



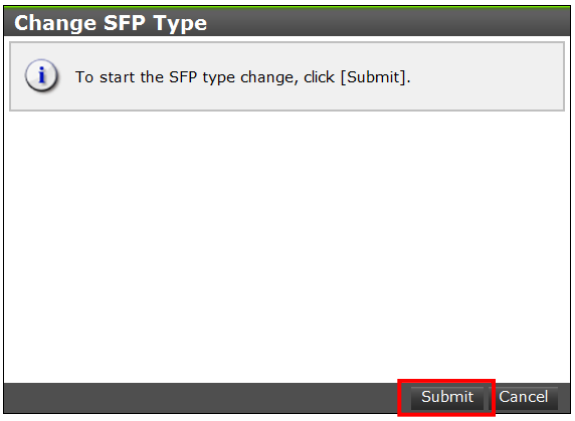
(4) <Instruct Type Change>
Click the [Change SFP Type] button in the “Port Status” window.

NOTE: The [Data Transfer Rate] column is displayed only for the 32G Ready 4Port FC Channel Board.

NOTE: When changing the wavelength of Small Form-Factor Pluggable per Storage System, click the [Change SFP Type] button at the bottom of the “Port Status” window. The SFP data transfer rate cannot be changed with this button.



(5) <Start Type Change>
For other than 32G Ready 4Port FC Channel Board:
Click the [Submit] button in the “Change SFP Type” window.

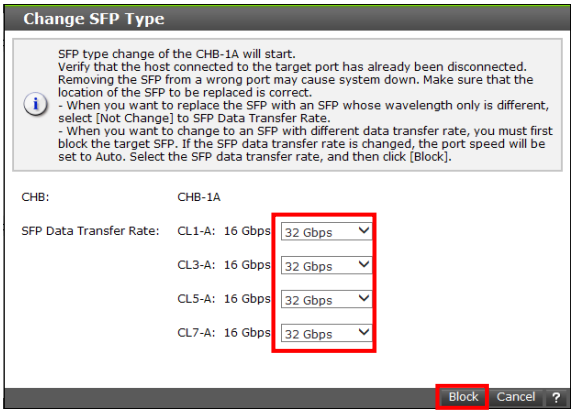


When changing the data transfer rate of SFP for 32G Ready 4Port FC Channel Board:

⚠ CAUTION

About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

Select a new transfer rate from the pull-down box for the target [SFP Data Transfer Rate] in the [Change SFP Type] window. For SFP not to be changed, select [Not Change]. Then click the [Block] button.



(6) <Displaying the Password entry window>

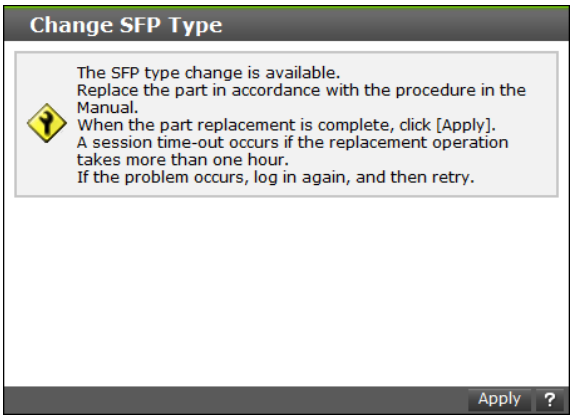
⚠ CAUTION

This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the login password for the maintenance account of the storage system, and then click the [OK] button.

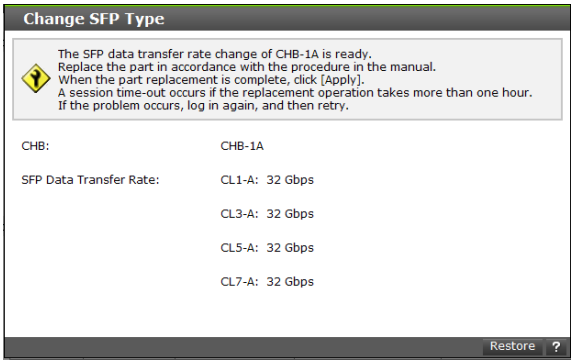
(7) <Check Type Change Preparation>
Check the following type change preparation completion window.
If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.
For other than 32G Ready 4Port FC Channel Board:

NOTE : Do not click the [Apply] button at this time.
Click the [Apply] button after completing the type change.



For 32G Ready 4Port FC Channel Board:

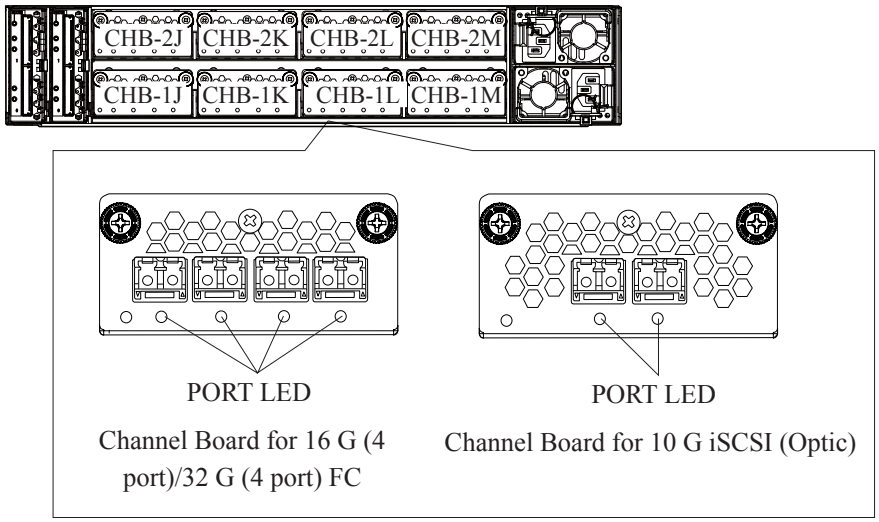
NOTE : Do not click the [Restore] button at this time.
Click the [Restore] button after completing the type change work.



NOTE: When the preparation for SFP type change is terminated with the error code [30762-208784], check the prerequisites and procedure, and then retry the operation.
If this problem persists, contact the Technical Support Division.

4. Changing the type of Small Form-Factor Pluggable (SFP) for Channel Board Box

Location	Changing part name		Parts name
Rear View of CHBB	1	Small Form-Factor Pluggable (SFP)	• Shortwave, For 16 G FC • Longwave, For 16 G FC • Shortwave, For 32 G FC • Shortware, For 10 G iSCSI



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. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Confirm that the customer has disconnected the host connected to the port to be changed.

(2) Remove the optical cable from the Small Form-Factor Pluggable (SFP) to be changed.

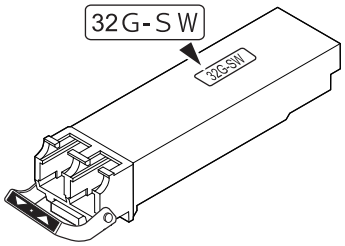
(3) Changing the Small Form-Factor Pluggable (SFP)

(a) Pull the Small Form-Factor Pluggable (SFP) lever down toward you and pull out the module

NOTE : If the Small Form-Factor Pluggable (SFP) is not removable, pull it out while pushing open the lever toward you.

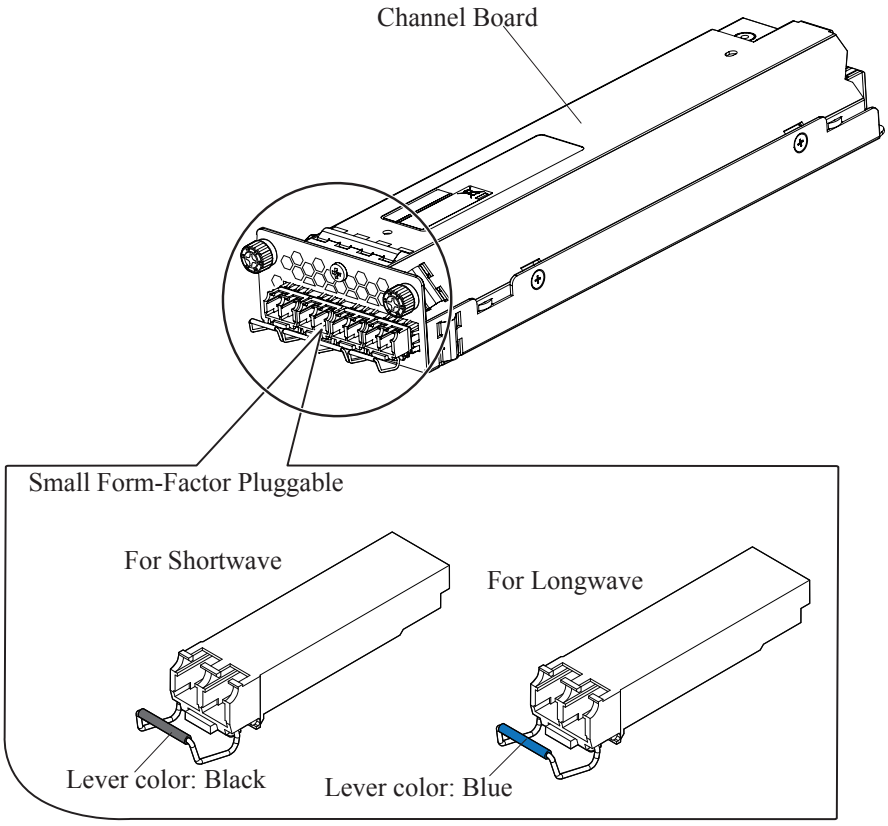
(b) Check the insertion direction of the Small Form-Factor Pluggable (SFP) to be changed and insert the Small Form-Factor Pluggable (SFP) into the port until it clicks.

NOTE: The label "32G-SW" is attached to the 32 Gbps Small Form-Factor Pluggable (SFP).



(c) Change the types of all the Small Form-Factor Pluggables (SFP) on the channel board in the similar procedure.

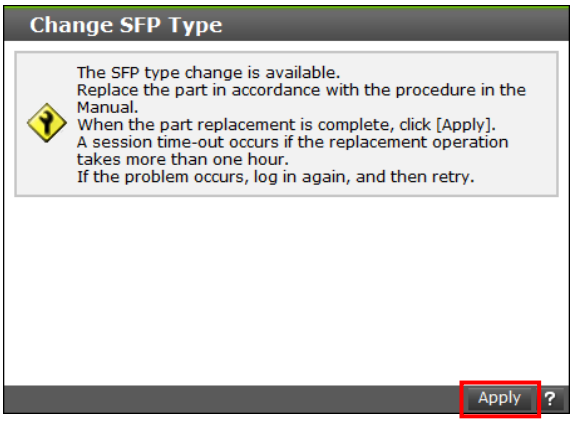
Figure 3-88 Changing the Small Form-Factor Pluggable (SFP)



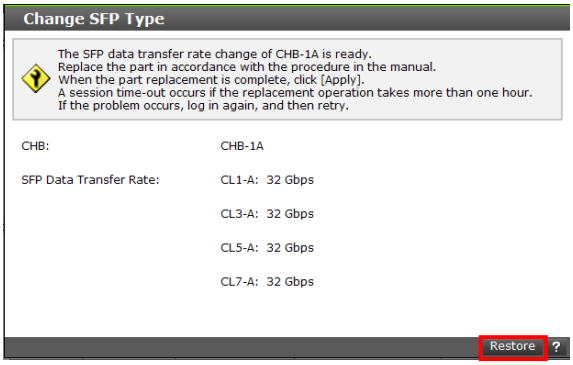
(4) Connect optical cables corresponding to the changed Small Form-Factor Pluggable (SFP).

NOTE: Check that optional cable latch clicks and the cables are surely connected.

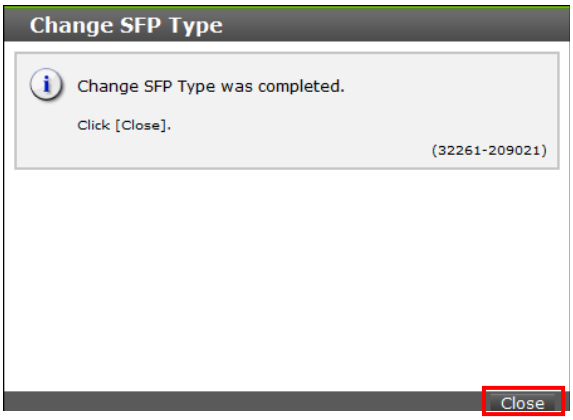
5. Changing the types of Small Form-Factor Pluggable (SFP) by Maintenance Utility
   (1) <Recognize Small Form-Factor Pluggable>
   For other than 32G Ready 4Port FC Channel Board:
   Click the [Apply] button.



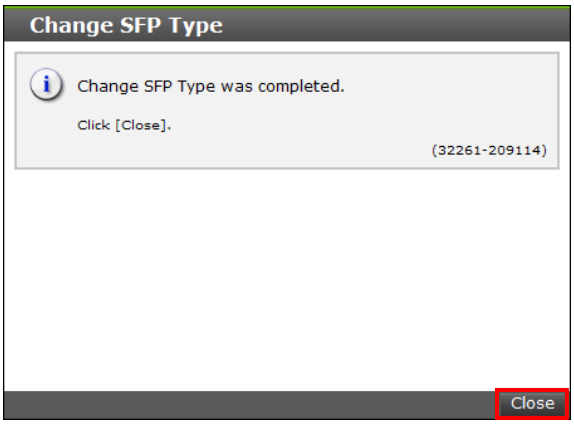
   For 32G Ready 4Port FC Channel Board:
   Click the [Restore] button.



(2) <Check Type Change Completion>
Check that the following message is displayed and click the [Close] button.
If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.
For other than 32G Ready 4Port FC Channel Board:



For 32G Ready 4Port FC Channel Board:



When the SFP replacement by changing the type fails, click the [Close] button of the completion message. Then, to change the wavelength, click the [CHB] tab in the “Controller Chassis” window on Maintenance Utility and check if [SFP Status] is “Normal”.
If “Not Fix” is displayed in SFP Status, check if the SFP is properly inserted.
When “Not Fix” is displayed in SFP Status even if the SFP is properly inserted or “Warning” is displayed in SFP Status, replace the SFP with the maintenance part. See REPLACEMENT SECTION “2.13 Replacing a Small Form-Factor Pluggable (SFP)”.
To change the data transfer rate, click the [CHB] tab in the “Controller Chassis” window on Maintenance Utility and check if [SFP Status] is “Normal”.
If “Not Fix” is displayed in SFP Status, check if the SFP is properly inserted.
When [SFP Status] is “Not Fix” even if the SFP is properly inserted or [SFP Status] is “Warning”, see TROUBLESHOOTING SECTION “2.2.18 Recovery Procedure when Procedure for Small Form-Factor Pluggable (SFP) Data Transfer Rate Change fails” to perform the procedure.

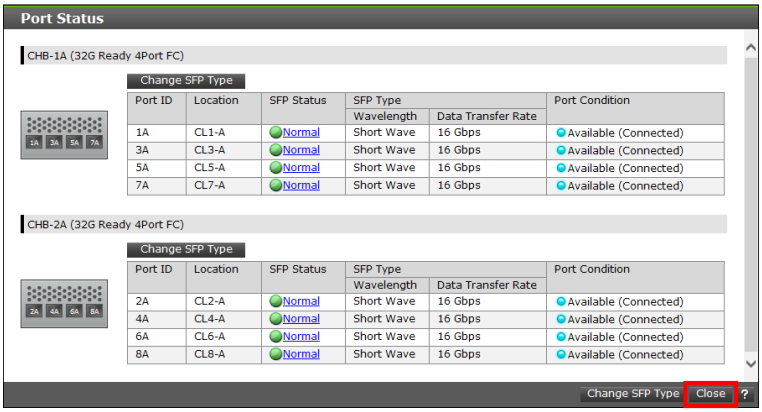
When changing the data transfer rate of SFP for 32G Ready 4Port FC Channel Board:

(a) To change the SFP data transfer rate, perform the operation on one controller.
Perform the procedure from "3. Selecting additional parts by Maintenance Utility" on the other controller to change the type of the SFP in the channel board in the same location.

(b) Change SFP Type has been performed on the controller board 1 and 2, and then go on to Step (3).

(3) Click the [Close] button in the "Port Status" window.
For other than 32G Ready 4Port FC Channel Board:
Check that the SFP type is correct.
For 32G Ready 4Port FC Channel Board:
Check that the Wavelength and Data Transfer Rate of the SFP Type are correct.

NOTE: The [Data Transfer Rate] column is displayed only for the 32G Ready 4Port FC Channel Board.



(4) Click the [Logout] button to close the window.

6. Disconnecting the Maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".

3.10 Adding PDUs for a Rack and PDU Power Codes

Table 3-26 Parts List

No.	Model Number	Model Name	Parts No	Quantity	Remarks
1	A-F6516-PDU6	PDB (PDU6) ASSY	3276098-A	2	PDU
		Binding screw (M5 x 10)	SB510N	10(*1)	
		Rack nut	5510146-1	10	Unused
2	A-F6516-P620	PDU power cable	3279357-A	2	
3	HT-F4933-PDU6	PDU	3276098-A	2	
		Rack nut	5510146-1	10(*2)	
		Binding screw (M5 x 10)	SB510N	10(*2)	
		Cage nut	5528564-1	10(*2)	
		LL washer	5513553-5	10(*2)	
		Support bracket	3272220-1	4	
		Socket bolt M5 × 20	3261899-520	10(*2)	
		Cable holder	3230194-1	2	
		Socket bolt M4 × 30	5538207-1	6	
		Plate holder	5519109-1	1	
		Socket bolt M4 × 8	BS408	4	
		Hexagon socket bolts (unified)	5503443-1	10	Unused

*1 : 6 spares are included.

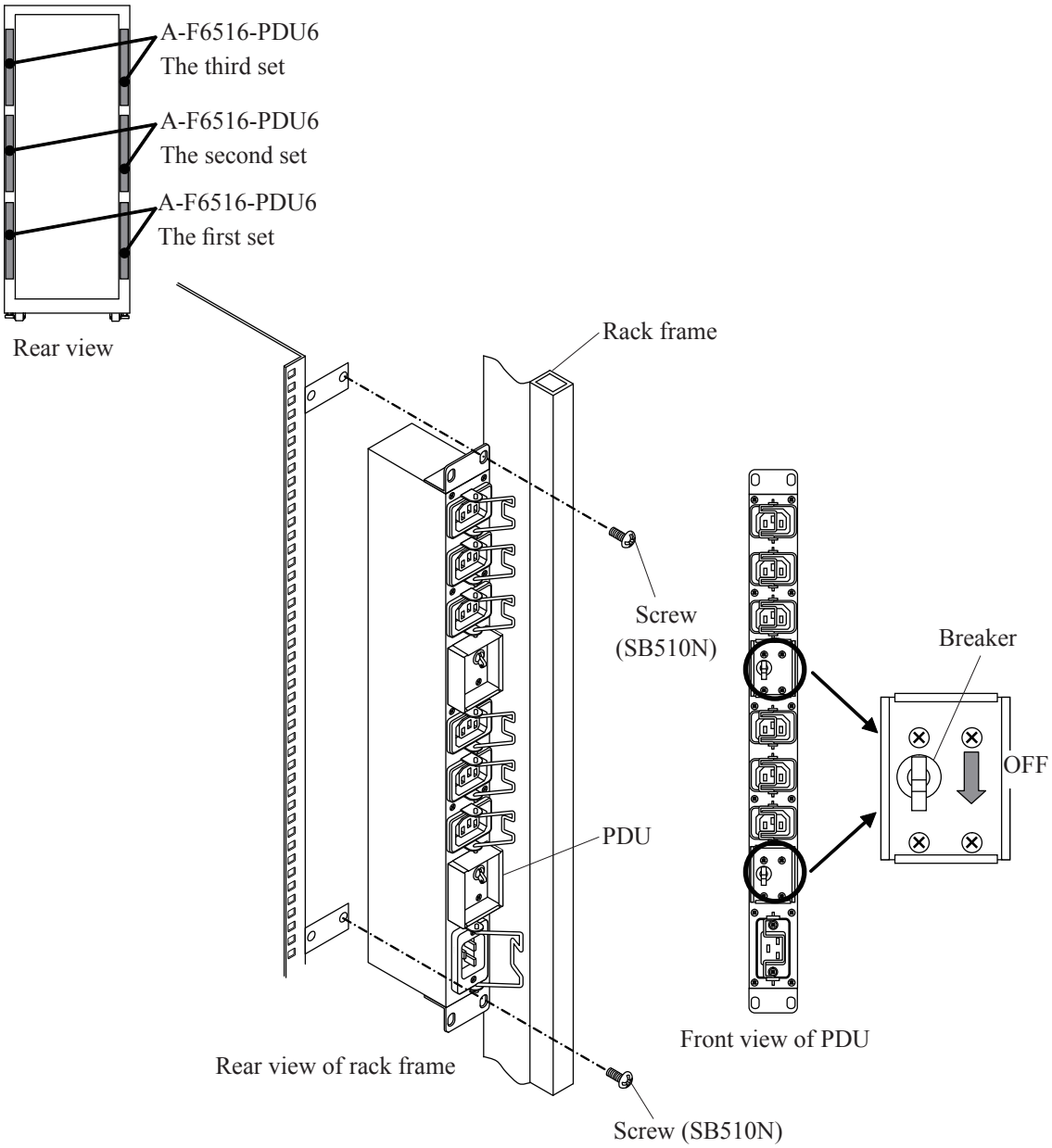
*2 : 2 spares are included.

3.10.1 Procedure for Adding PDUs for a Rack and PDU Power Codes

Adding the PDUs (A-F6516-PDU6) for a rack and PDU power codes (A-F6516-P620).

1. Installing PDUs
   (1) Turn off the breaker of the PDU to be installed.
   (2) Install the PDU in the right side of the rear of the rack frame and fix it with two screws.
   (3) Install the PDU in the left side in the similar procedure.

Figure 3-89 Installing PDU

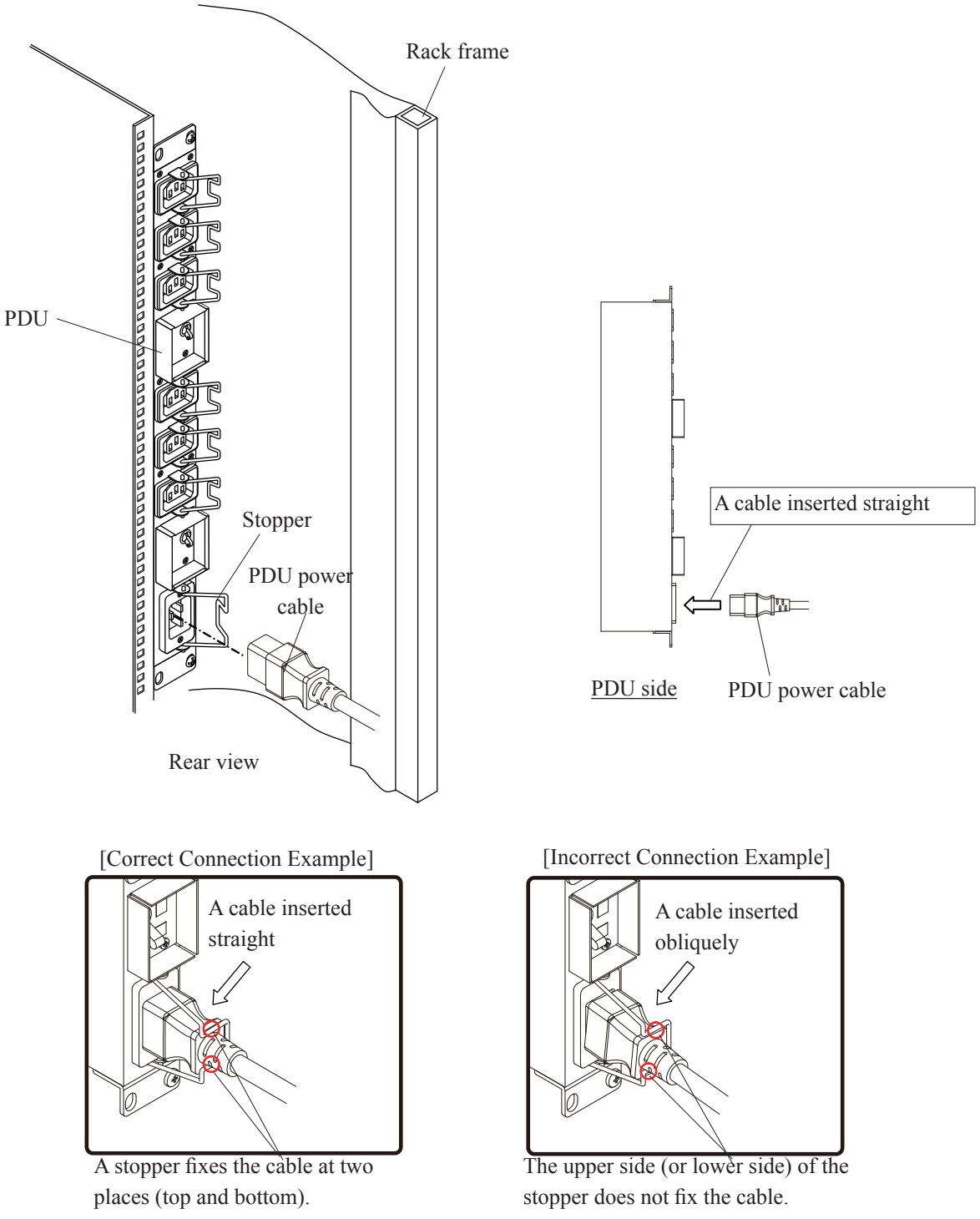


2. Connecting power cables
   (1) Insert a PDU power cable straight into the PDU on the right side of the rear of the rack frame and fix it with a stopper.

   NOTE: Check that the stopper fixes the cable at two places (top and bottom).

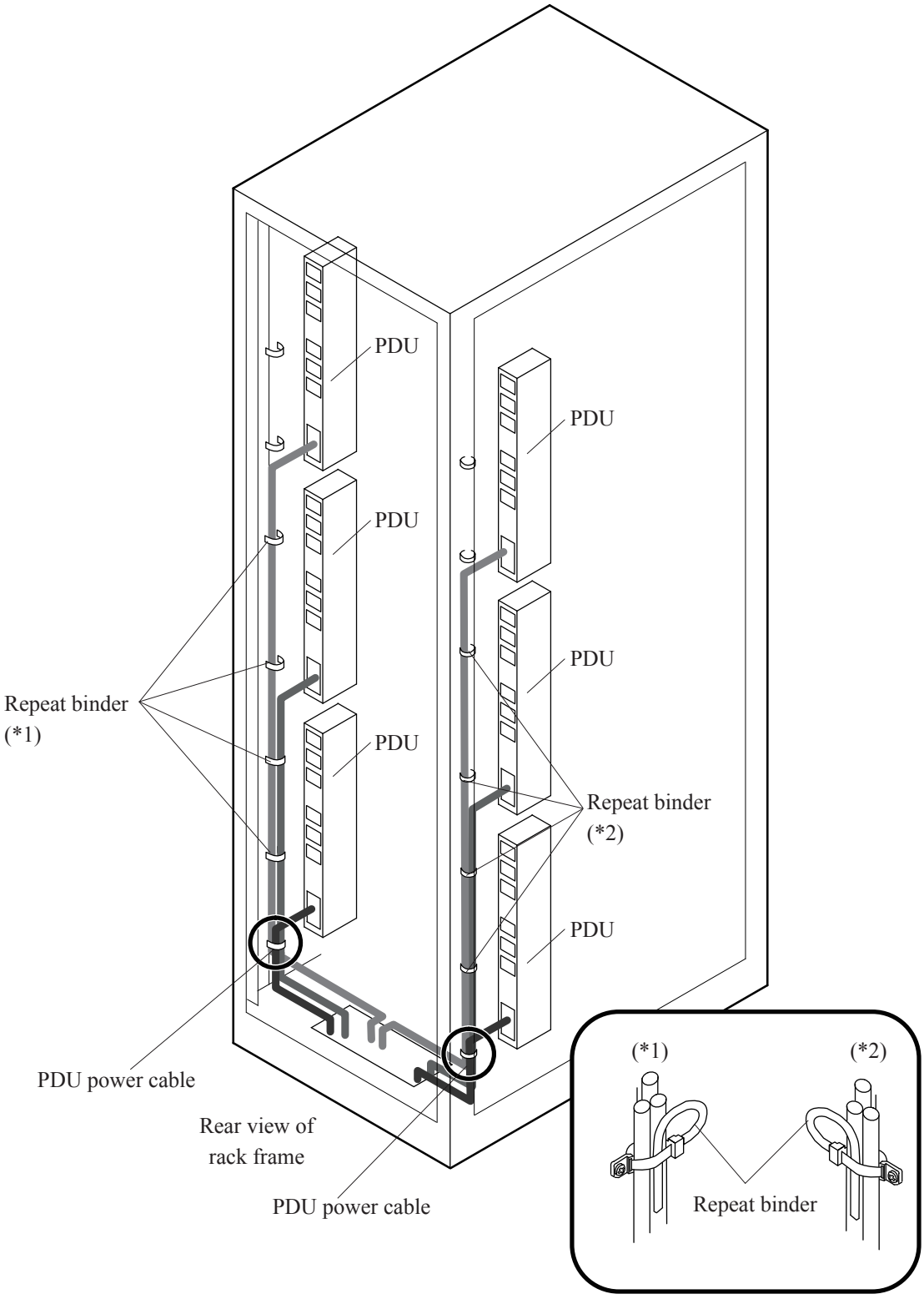
   (2) Connect a power cable to the PDU on the left side in the similar procedure.

Figure 3-90 Connecting PDU Power Cables



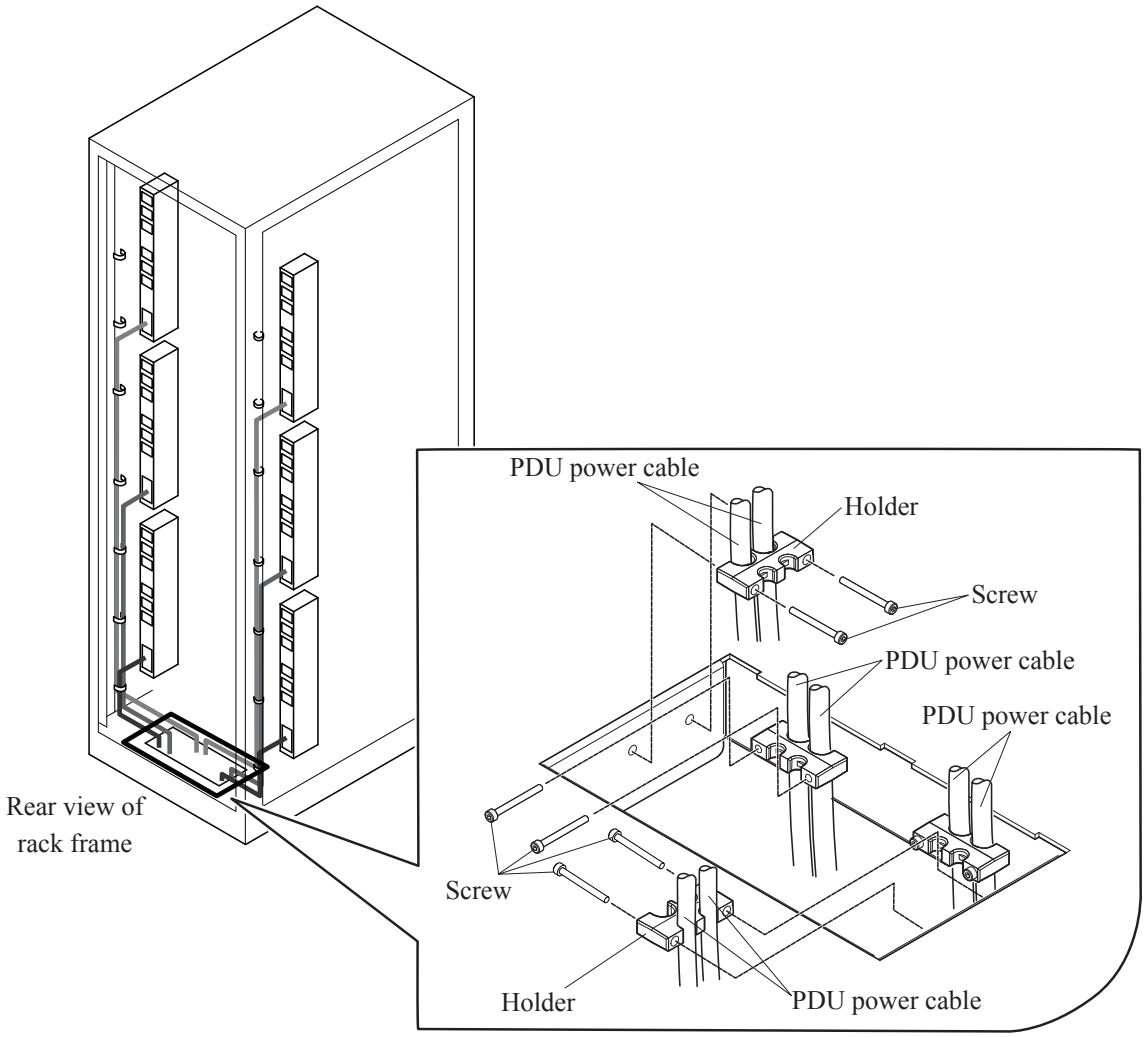
(3) Route PDU power cables to the rack frame and fix them with repeat binders.

Figure 3-91 Installing PDU Power Cables



(4) Fix power cables by the holder of the opening at the lower part of the rack frame.

Figure 3-92 Fixing PDU Power Cables



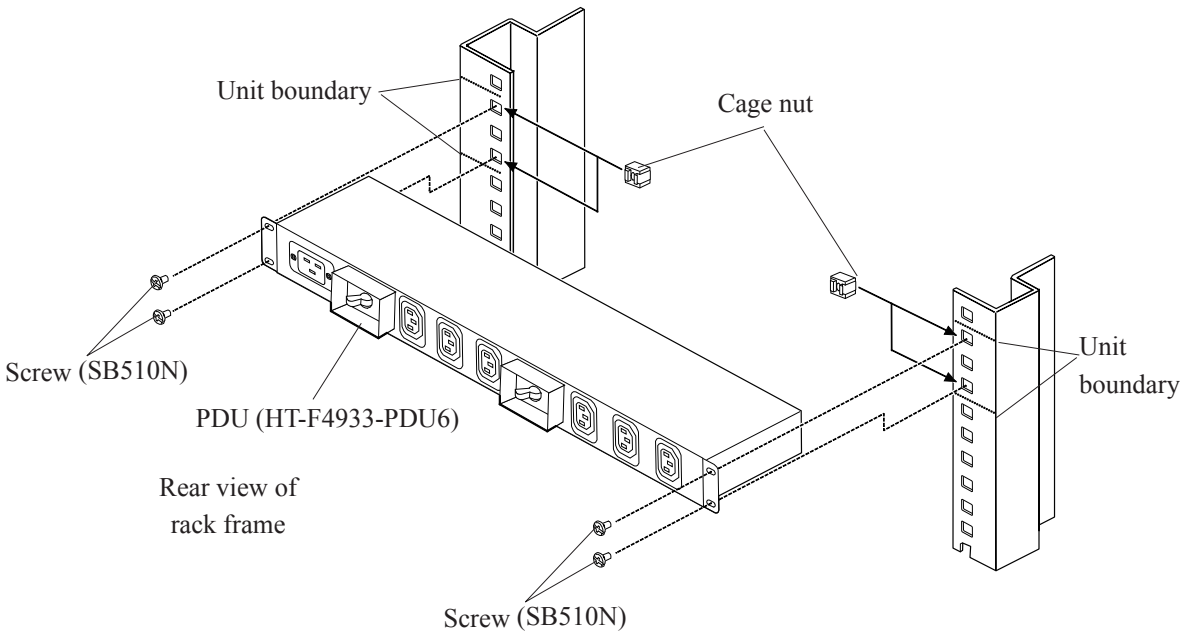
3.10.2 Procedure for Adding PDUs for a Rack

Adding the PDUs (HT-F4933-PDU6) for a rack. Install the PDU in the rack frame sideways. Install it so that the outlet plug faces the rear of the Storage System.

NOTE: PDUs need to be added in sets of two (top and bottom) for the duplex Power Supply.

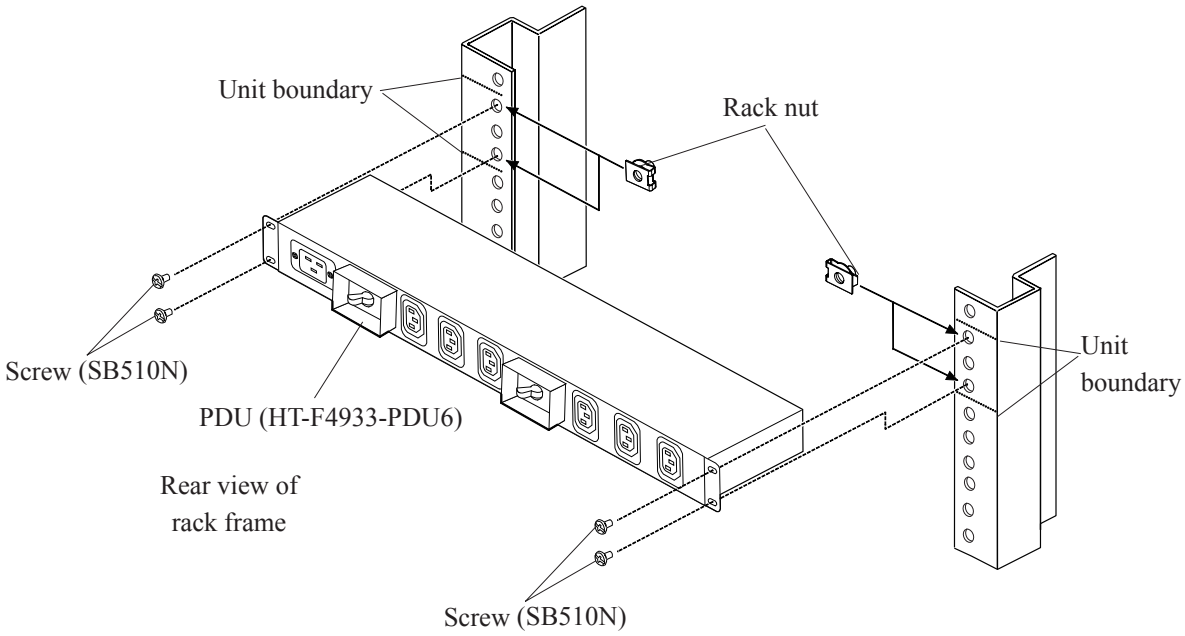
1. In case of square holes in rack frame.
   (1) Install four cage nuts in the upper and lower holes of the unit in the rear of the rack frame in which the PDU is to be installed.
   (2) Fix the PDU with four screws.
   (3) Add the other PDU in the same procedure.

Figure 3-93 Installing the Square Holes Rack Frame (Top and Bottom)



2. In case of circular holes in rack frame.
   (1) Install four rack nuts in the upper and lower holes of the unit in the rear of the rack frame in which the PDU is to be installed.
   (2) Fix the PDU with four screws.
   (3) Add the other PDU in the same procedure.

Figure 3-94 Installing the Circular Holes Rack Frame (Top and Bottom)



3.11 Adding Channel Board Box

NOTE:
- Confirm that a space for 2U is available immediately above the CBLH2.
- If no space is available, perform the following procedure.
  - Confirm with the customer, and then turn off the Storage System (see "1.5 Power On/Off Procedure").
  - Install it to leave a space for 2U immediately above the CBLH2.
    See "2. Installation" for how to install rails and how to mount the Storage System.
  - Turn on the Storage System (see "1.5 Power On/Off Procedure").

Table 3-27 Parts List of DW-F800-CHBB

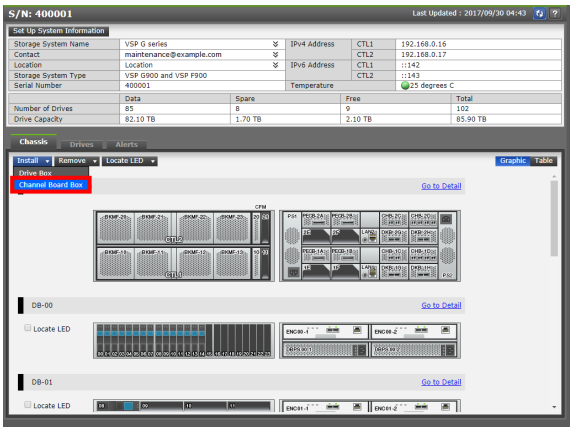
Item No.	Part Name	Part No.	Quantity	Remarks
1	Channel Board Box	5560929-A	1	CHBB
2	CHBB Front Bezel	5560931-A	1	-
3	Bezel Key	-	2	-
4	PCIe Channel Board	3289195-A	2	-
5	PCIe Cable	3290994-A	2	1,500 mm
6	Binder	5559281-1	2	122 mm
7	Label (PCIe cable)	3290993-1	1	PCP1
8	Label (PCIe cable)	3290993-2	1	PCP2

The Channel Board can be expanded by mounting the Channel Board Box.
Adding the PCIe Channel Board (PECB) to CBLH2 is required to add the Channel Board Box.

1. Connecting a Maintenance PC
   Connect the Maintenance PC and the Storage System.
   When adding the Channel Board Box, connect the Maintenance PC and the Controller Board 1.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION “2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL”).

3. Selecting additional parts by Maintenance Utility
   (1) <Main Window>
   Click the [Chassis] tab in the main window and click the [Channel Board Box] from the [Install] pull down list.



(2) <Install Channel Board Box Window>

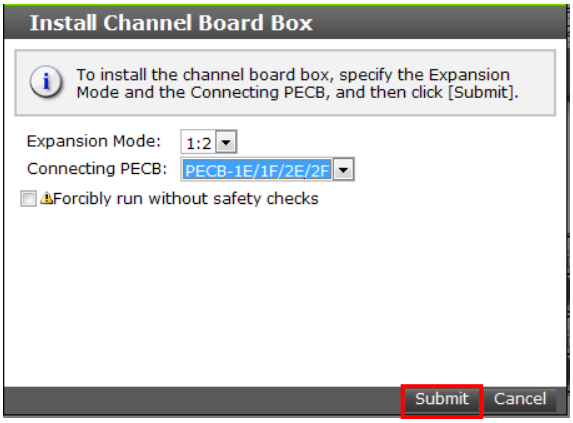
⚠ CAUTION

About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

Select the expansion mode and the connecting PECB in the "Install Channel Board Box" window and click the [Submit] button.

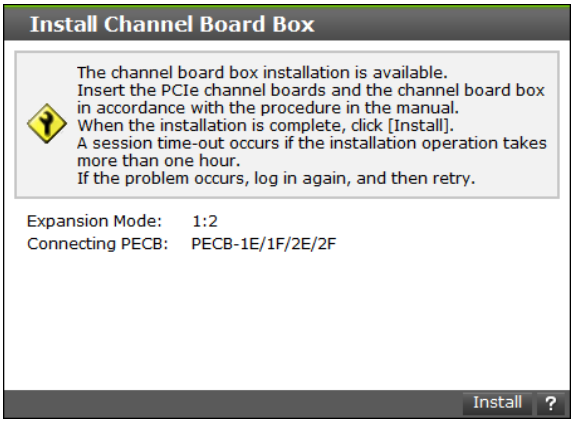
NOTE : If multiple errors are detected in the prior check, the error list window is displayed. If it is displayed, click the test of "Error Code" and recover the failures or the blockade in accordance with the details of the displayed errors.

NOTE: As for [Expansion Mode], "1:2" is fixed.



(3) <Check Addition Preparation of Channel Board Box>
Check the following addition preparation completion window.

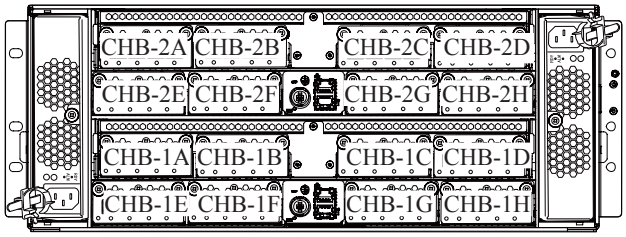
NOTE : Do not click the [Install] button at this time.
Click the [Install] button after completing the addition work.



NOTICE: When the SIM = afa0xx, afa1xx, or afa2xx is reported, perform the dummy replacement of the SWPK. (Refer to TROUBLESHOOTING SECTION "3.68 Recovery Procedure When the CHBB Firmware Update Occurs (SIM = afa0xx, afa1xx, afa2xx)".)
If the dummy replacement of the SWPK is not performed, a serious failure might occur while the storage system in which the CHBB is installed is operating.

4. Addition work of Channel Board Box

Location	Additional part name		Parts name
Rear View of CBLH2	1	PCIe Channel Board (PECB)	• DW-F800-1HP8
Rack	2	Channel Board Box	• DW-F800-CHBB



CBLH2 (Rear view)

The slot that the PCIe Channel Board can be mounted is limited depending on the connection configuration of the PCIe cable.
Add the PCIe Channel Board in accordance with Table 3-28.
It cannot be mounted to the location G/H.

Table 3-28 PCIe Channel Board Installing Rules

PCIe Cable Connection	Installation Slot Location
2-cable/Cluster	1A/1B/2A/2B, 1C/1D/2C/2D, 1E/1F/2E/2F (*1)

*1: If the Channel Board or the Disk Board is already mounted to the slot to be added, the PCIe Channel Board cannot be added.

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. Refer to "1.1.2 Note when Installing and Removing Parts".

(1) Add PCIe Channel Boards to the same positions of Controller Boards 1 and 2.

NOTICE: If Channel Boards are inserted randomly, malfunction may occur. Therefore, insert the Channel Boards in two steps, Step (b) and Step (c) shown below.

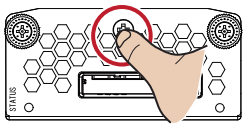
(a) Remove the dummy.
Two types of dummies exist, which are removed in different ways.
- Metal dummy

(i) Loosen two screws (blue) fixing the dummy.
(ii) Hold the screws (blue) and pull out and remove the dummy.
- Plastic dummy

(i) Pull out and remove the dummy.

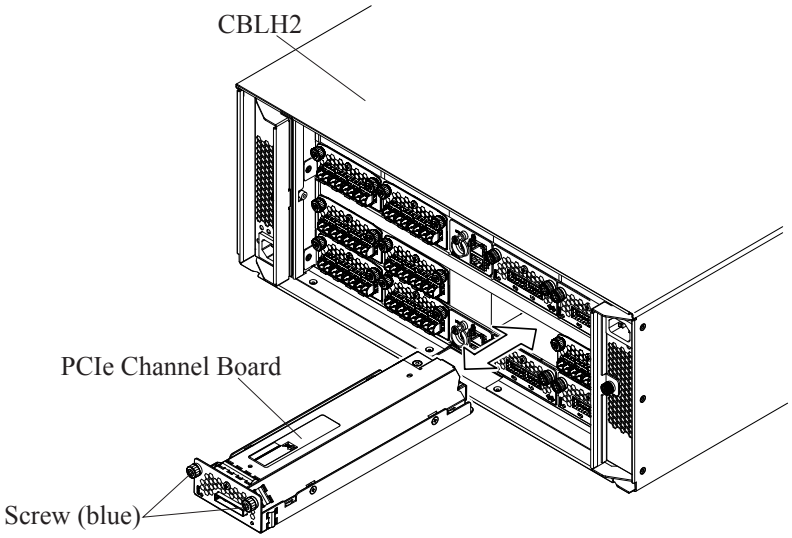
(b) Insert the PCIe Channel Boards to be added into the slots just before the shield finger.
(c) Push the PCIe Channel Boards gently all the way in.

NOTICE: Push the front side of the PCIe Channel Board all the way to insert it to the end.



(d) Tighten two screws (blue) and fix the PCIe Channel Board.

Figure 3-95 Adding PCIe Channel Board



(2) Adding work of Channel Board Box

(a) Removing the parts
See "2.5.6 Removing Built-in Parts from the Channel Board Box" and remove the switch package, PCIe-cable connecting Package, Channel Board, and CHBBPS from the Channel Board Box to be added.

(b) Attaching the rails
See "5. Installing rails for Channel Board Box" of the "2.3" and install the rails for mounting the Channel Board Box.

(c) Fixing the Channel Board Box
See "2.7.5 Fixing Channel Board Box" and fix the Channel Board Box to the rack.

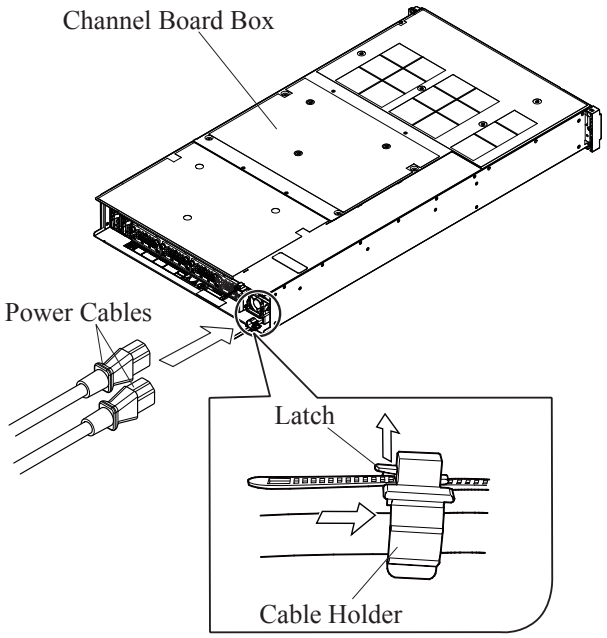
(d) Mounting the parts
See "2.8.6 Installing Built-in Parts of the Channel Board Box" and mount the removed switch package, PCIe-cable connecting Package, Channel Board, and CHBBPS on the Channel Board Box that was fixed to the rack.

(3) Connecting of PCIe Cables
Mount two PCIe Channel Boards on each of Controller Board 1 and 2, and connect the PCIe Channel Boards and the PCIe-cable Connecting Package (PCP) of the Channel Board Box with four PCIe cables (see "2.10.1.3 Connecting PCIe Cables").

(4) Connecting of Power Cables

(a) Connect two power cables to the CHBBPSs.
(b) Pass through power cable to the power cable holder to fix the power cable.

Figure 3-96 Connecting of Power Cables



(c) Connect the two power cables to the PDUs and fix them with a stopper.

NOTE:
- Connect the power cable for the CHBBPS-1 to the left PDU.
  Connect the power cable for the CHBBPS-2 to the right PDU.
  If they are plugged in the receptacles of the PDUs on the same side, the function of the duplicated power supply does not work.
- Insert only the installed power cable into the PDU outlet.
- Limit the total current output from the outlets J101 to J103 so that it does not exceed 10 amperes.
  Limit the total current output from the outlets J201 to J203 so that it does not exceed 10 amperes.

Figure 3-97 Connection Example of Power Cables

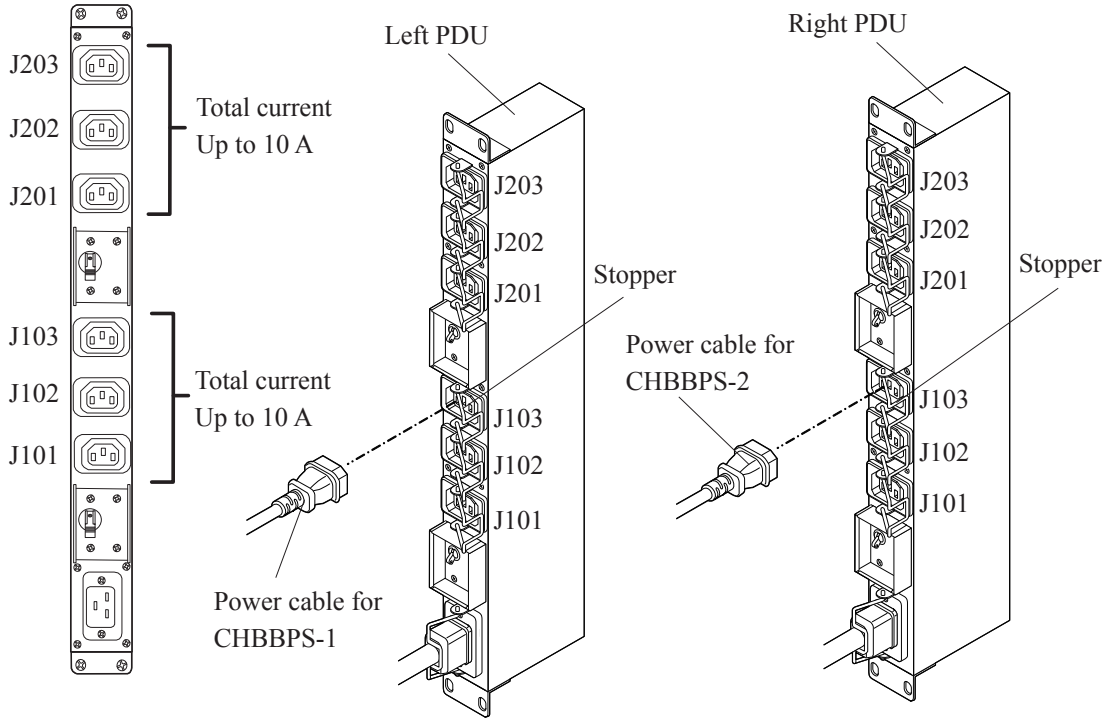
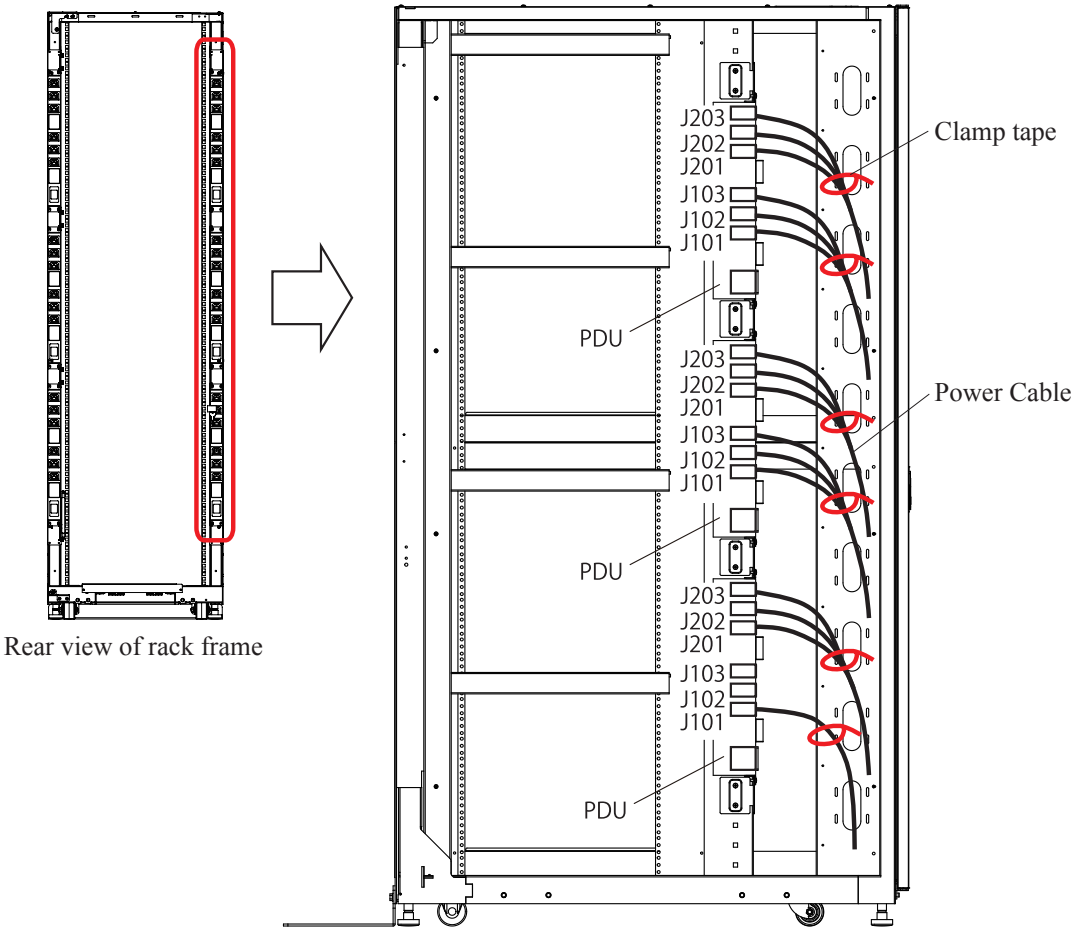


Table 3-29 Load Current of Each Model Number

No.	Model Number	Load Current (per PS)
1	DW850-CBLH2	8.0 A
2	DW-F800-CHBB	4.0 A
3	DW-F800-DBSC	2.4 A
4	DW-F800-DBLC	1.9 A
5	DW-F800-DB60C	6.0 A
6	DW-F800-DBF	2.6 A

(d) Fix the power cables with the clump tapes on the both sides of the rear of the rack frame.

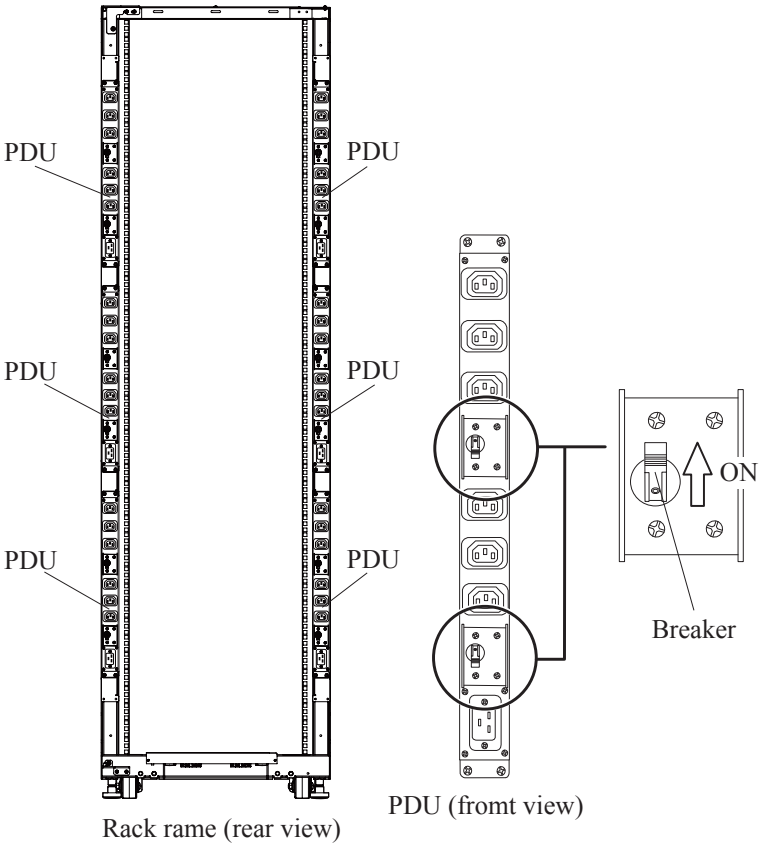
Figure 3-98 Fixing the Power Cables



*1: The figure shows fixation of the right side.

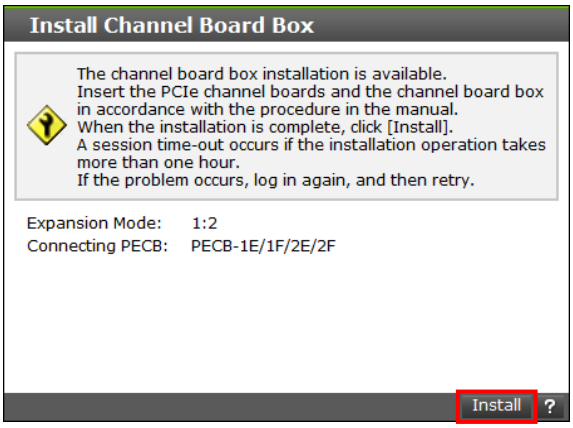
(e) Turn on of the PDU.
Turn it on when the PDU breaker connecting the power cables is turned off.

Figure 3-99 PDU Breaker

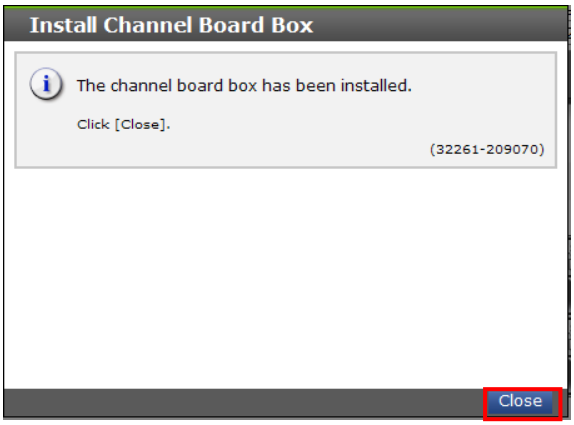


(5) Attach the Front Bezel. (Refer to "1.4.1 How to Attach/Remove the Front Bezel".)

5. Checking addition completion by Maintenance Utility
   (1) <Recognize Channel Board Box>
   Click the [Install] button.



   (2) <Check Addition Completion>
   Check that the following message is displayed and click the [Close] button.
   If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.



   (3) Click the [Logout] button to close the window.

6. Disconnecting the Maintenance PC and the Storage System.
   Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION “2.8.3 Disconnecting the Maintenance PC from the Storage System”.

3.12 Replace Controller Board for CBSS/CBSL (Type Change)

NOTE: The Controller Board is blocked by this maintenance work. Since the alternate path setting might be required, consult with the customer, and then perform the work.

Replace (Type Change) the non-encryption-supported Controller Board with the encryption-supported Controller Board and otherwise.

NOTE :
- Replace Controller Board 1 and 2 (Type Change).
- Be sure to replace the Controller Boards in order from 1 to 2 (Type Change).

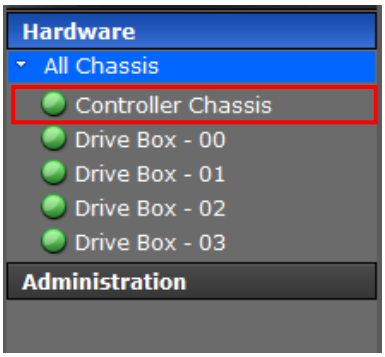
1. Connecting a Maintenance PC
   Connect the maintenance PC and the Storage System. When replacing Controller Board 1 (Type Change), connect the Maintenance PC and Controller Board 2 through LAN cables. When replacing Controller Board 2 (Type Change), connect the Maintenance PC and Controller Board 1 through LAN cables.
   - Connect the Maintenance PC and the Controller Board via LAN cable referring to MAINTENANCE PC SECTION "2.2 Connecting Maintenance PC to Storage System".

2. Starting Maintenance Utility
   Start Maintenance Utility (refer to MAINTENANCE PC SECTION "2.7.3 Starting the Maintenance Utility Window by Specifying IP Address of CTL").

3. Select the parts to be replaced (Type Change) by Maintenance Utility.

(1) <Main Window>

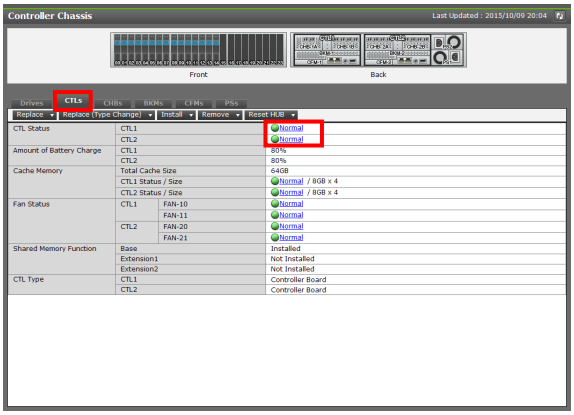
Click the [Controller Chassis] tab in the main window.



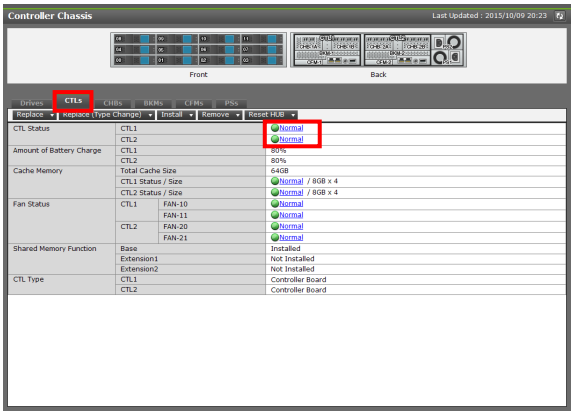
(2) <Controller Chassis Window>

Click the [CTLs] tab in the "Controller Chassis" window to display a Controller Board status.

• In case of CBSS



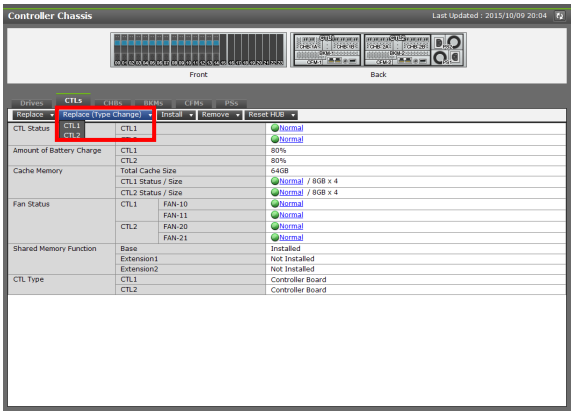
• In case of CBSL



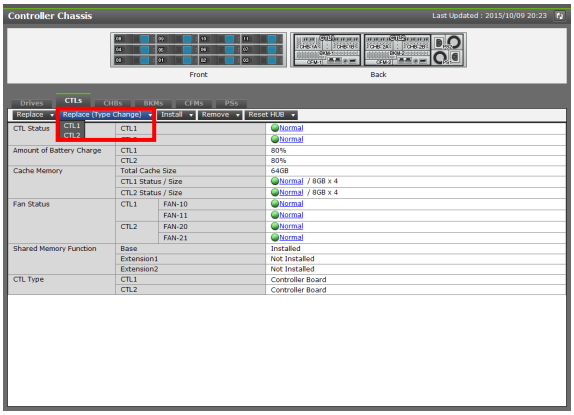
(3) <Select Controller Board>

Click [Replace (Type Change)] to select Controller Boards to be replaced (Type Change).

• In case of CBSS



• In case of CBSL

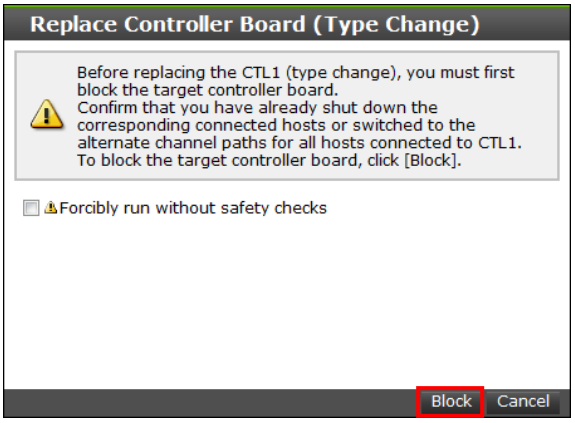


(4) <Block Controller Board>

⚠ CAUTION

About "Forcibly run without safety checks":
If you check this checkbox and execute the maintenance, the system may go down. Do not check it unless instructed by the message, the manual or the contact described in the manual. This checkbox is displayed only when Maintenance Utility is started from the "Web Console" window or the "MPC" window.

Confirm that the Controller Boards are to be replaced (Type Change), and then click the [Block] button.



(5) <Displaying the Password entry window>

⚠ CAUTION

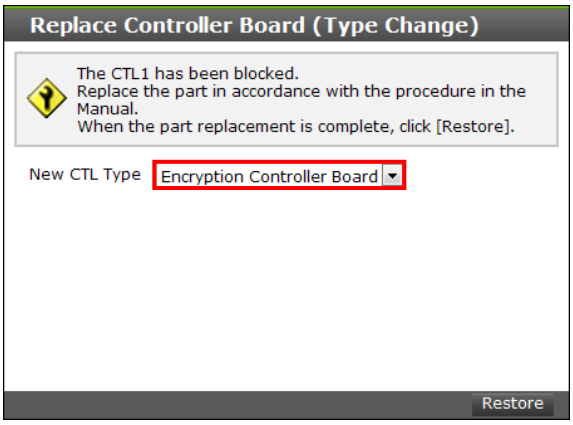
This operation may cause a serious error such as a system down or a data loss. Confirm the appropriateness of the operation, and then input of the password.

Enter the login password for the maintenance account of the storage system, and then click the [OK] button.

(6) <Select Controller Board type>
The Controller Boards after the replacement (Type Change) are displayed in [New CTL Type]. [New CTL Type] is the Controller Board after the replacement (Type Change). Confirm the type of Controller Board to select.

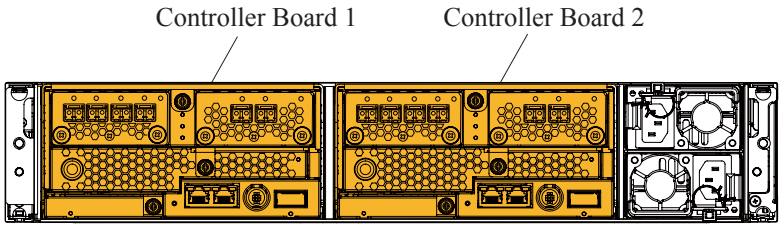
New CTL Type	Controller Board Type
Controller Board	Unencrypted Controller Board
Encryption Controller Board	Encrypted Controller Board

NOTE: Do not click the [Restore] button at this time. Click the [Restore] button after completing the replacement (Type Change).



4. Replacement work (Type Change) of Controller Boards

Location	Replace (Type Change) part name		Parts name
Rear view of CBSS1/CBSL1	1	• Controller Board • Controller Board (Encryption)	• DW-F850-CTLS • DW-F850-CTLSE
Rear view of CBSS2/CBSL2	2	• Controller Board • Controller Board (Encryption)	• DW-F850-CTLSH • DW-F850-CTLSHE

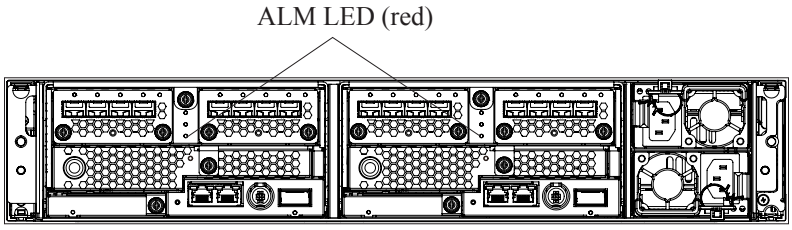


Rear view of CBSS/CBSL

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 "1.1.2 Note when Installing and Removing Parts".

(1) Check that the CTL ALM LED on the CBSS/CBSL Controller Board to be replaced (Type Change) lights up.

Figure 3-100 CTL ALM LED Position

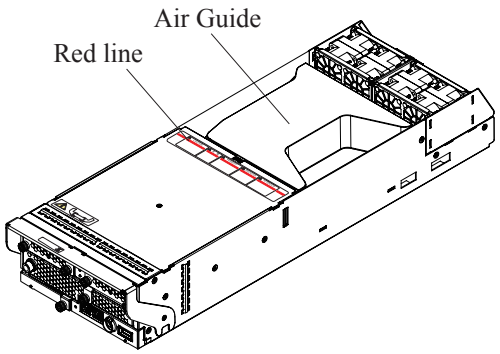


Rear view of CBSS/CBSL

(2) Remove all the cables connected to the Controller Board.
(3) Remove the Controller Board from the CBSS/CBSL.
  (a) Loosen the screw (blue) which fixes the Controller Board (①) and open the lever to pull out (②).
  (b) Pull out and remove the Controller Board while holding its body with both hands.

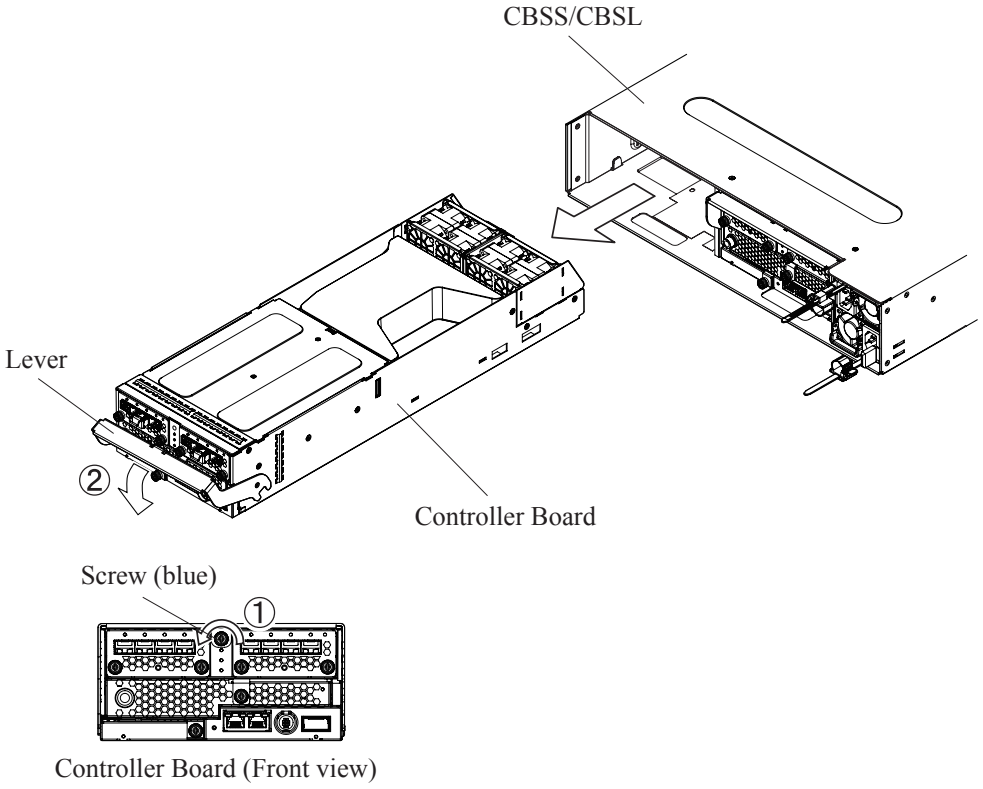
⚠ CAUTION

Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



NOTICE:
- When removing the Controller Board, hold it with both hands and remove it straight not to apply a shock to any components.
- Do not put anything on the Air Guide of the CBSS/CBSL Controller Board at the time of work. It may cause breakage.

Figure 3-101 Removal of Controller Board



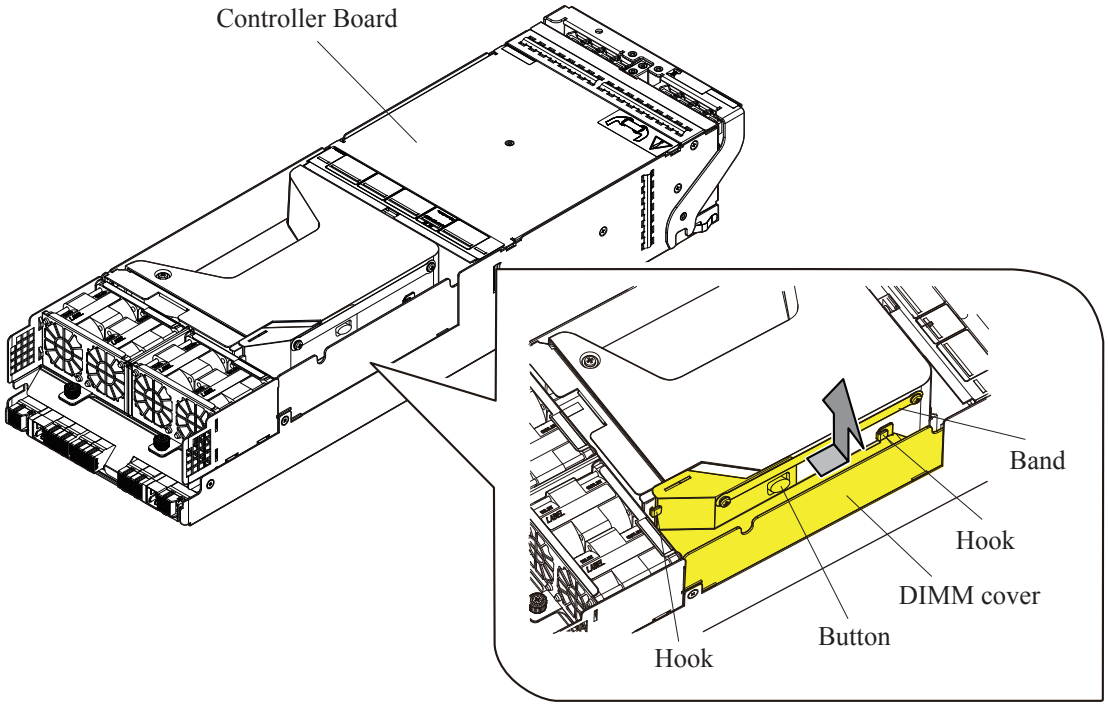
NOTICE: After removing the Controller Board, the LEDs (POWER/READY/WARNING/ALARM) might go out.
If the LED on the front goes out, check that anything other than the Controller Board is normal in the "Maintenance Utility" window and continue the work.
The READY LED (green) on the front of CBSS/CBSL lights up after performing "5. Check the completion of the replacement (Type Change) by Maintenance Utility" of the "3.12".

(4) Slide the DIMM cover to the arrow direction while pressing its button and remove the DIMM cover from the hooks (two places).

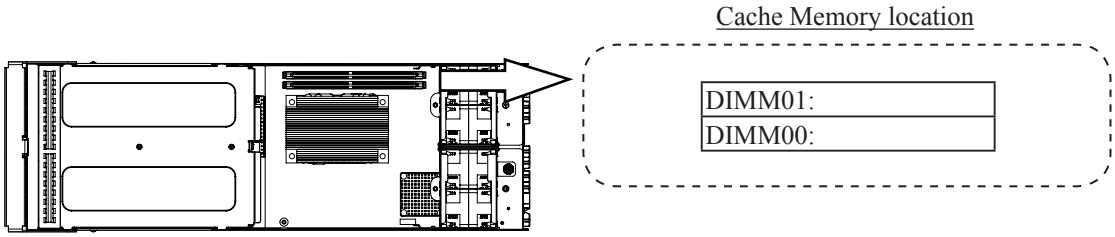
(5) Lift the DIMM cover to remove.

NOTE : The DIMM cover has a band. Do not pull it hard when removing the DIMM cover.

Figure 3-102 Removing DIMM Cover



(6) Move all the Cache Memories installed in the removed Controller Board to the same installation location on the Controller Board to be replaced (Type Change). In the same way as Step (4) and Step (5), remove the cover of the Controller Board to be replaced (Type Change) before starting the work.



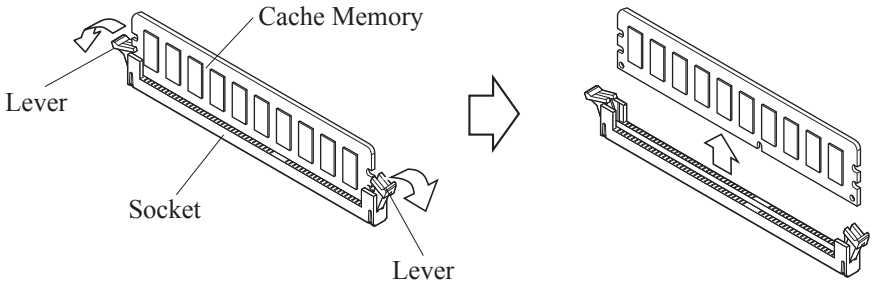
Cache memory location (Controller Board top view)

(7) Installation/Removing Cache Memory

NOTICE: When installing a Cache Memory, do not put intense pressure on the Cache Memory to the extent that the PCB greatly bends after the Cache Memory is fixed by the lever. Applying excessive pressure may damage the PCB.

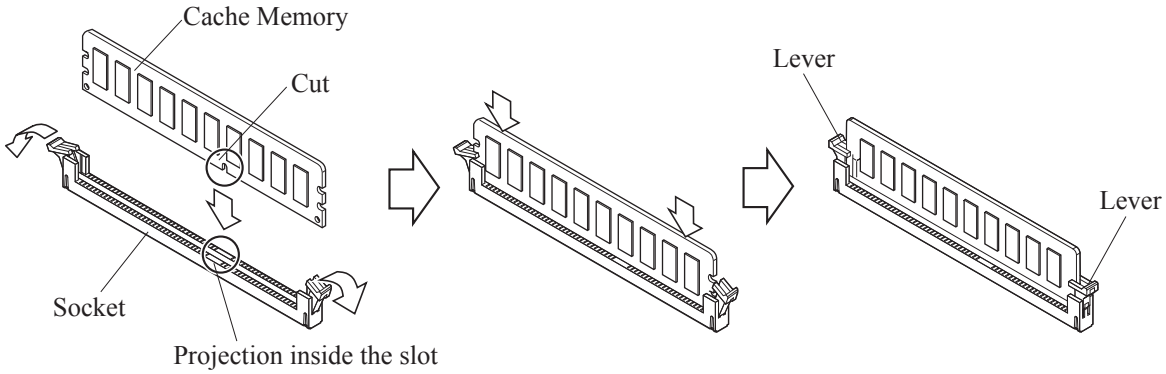
(a) Procedure for removing.
(i) Pull the lever outward.
(ii) Hold both ends of the Cache Memory by the fingers and pull out the Cache Memory from the socket.

Figure 3-103 Removal of the Cache Memory



(b) Procedure for installing.
(i) Position the cut of the Cache Memory with the projection inside the slot and place the Cache Memory on the socket.
(ii) Hold both ends of the Cache Memory by the fingers, and fit it into the socket.
(iii) Check that the lever is firmly fitted in the Cache Memory.

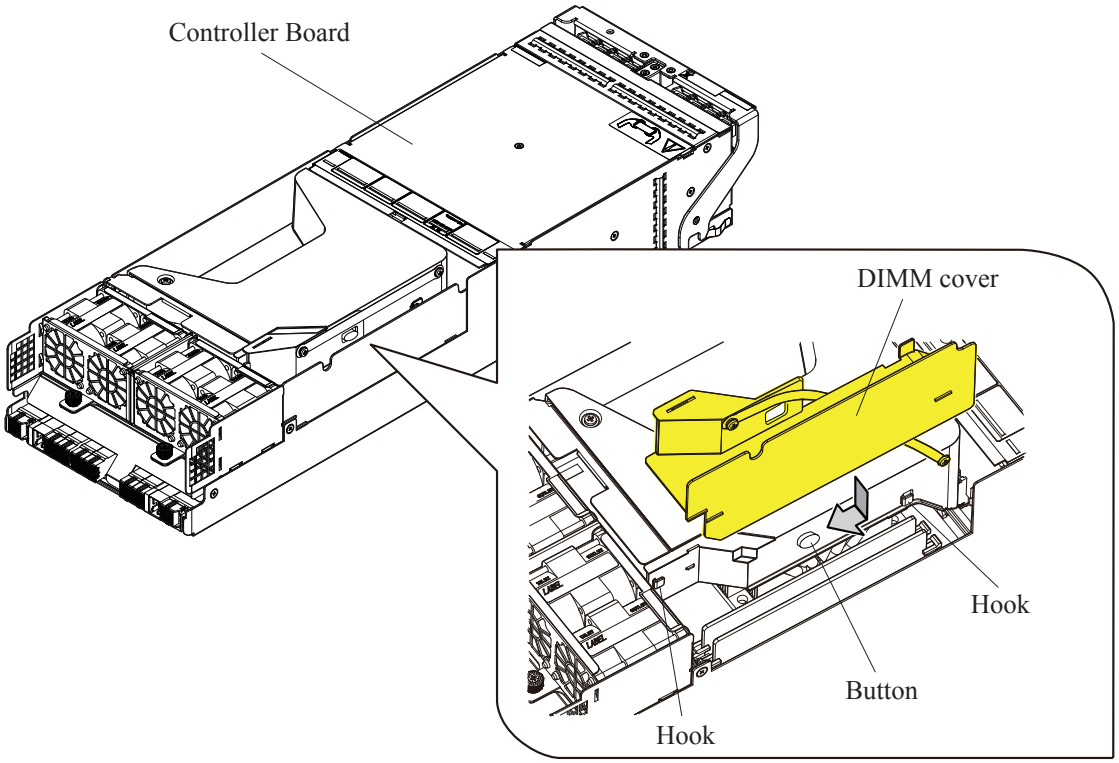
Figure 3-104 Installation of the Cache Memory



(8) Slide the DIMM cover to the arrow direction to attach.

NOTE : Check that the DIMM cover is surely fixed by hooks (two places).

Figure 3-105 Installation of DIMM Cover

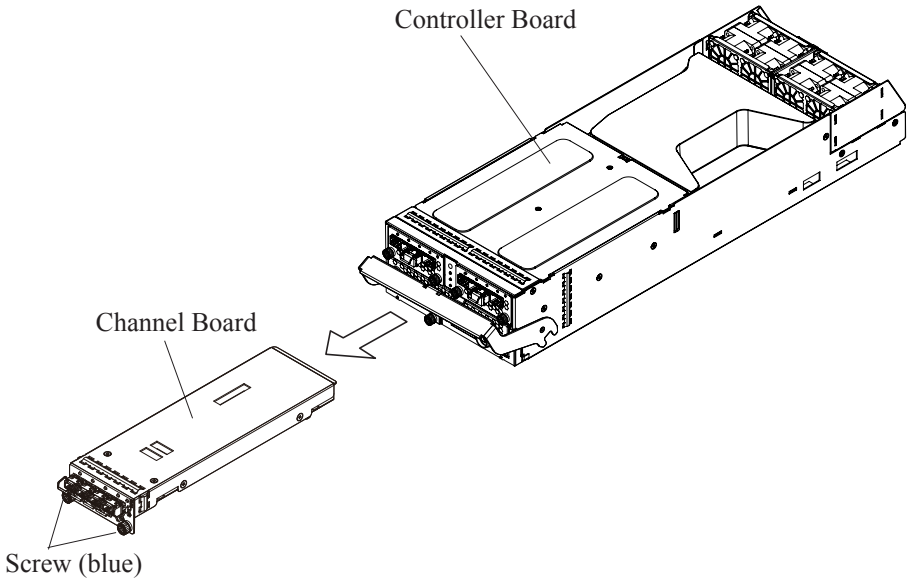


(9) Move the Channel Board from the removed Controller Board to the Controller Board to be replaced (Type Change).

(a) Loosen the two screws (blue) which fix the Channel Board installed in the removed Controller Board.

(b) Pull out and remove the Channel Board while holding the screws (blue).

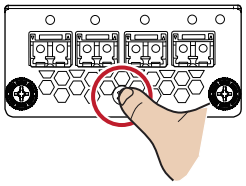
Figure 3-106 Removal of Channel Board



(c) Insert the Channel Board into the slot of the Controller Board to be replaced (Type Change).

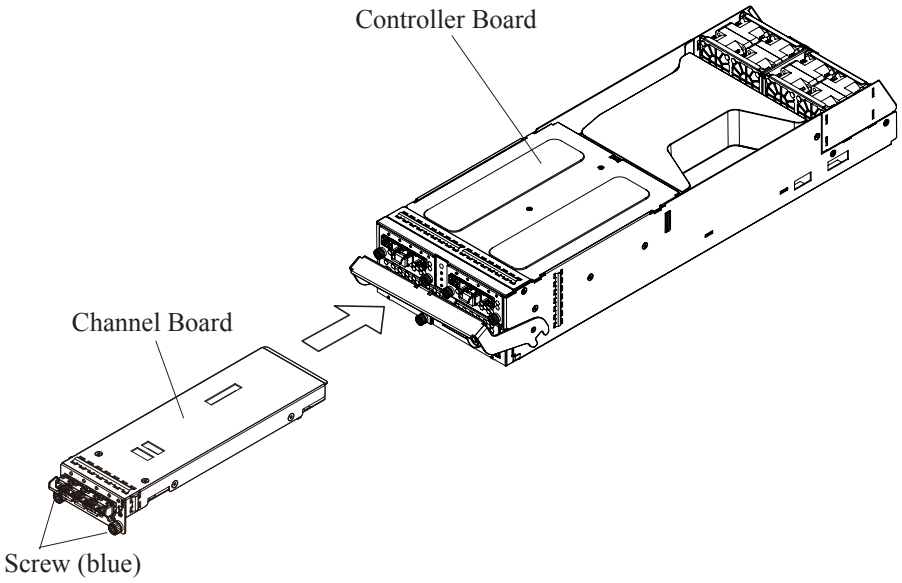
(d) Push the Channel Board all the way in.

NOTICE: Push the front side of the Channel Board all the way to insert it to the end.



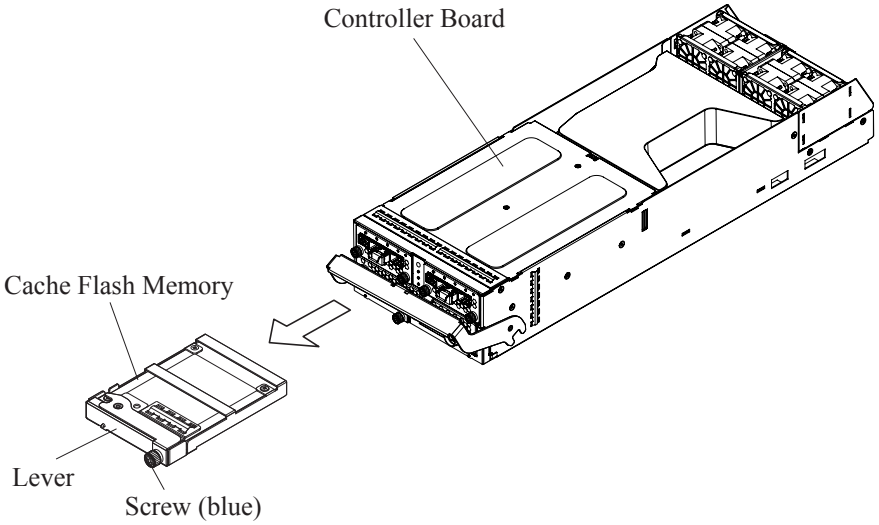
(e) Tighten the two screws (blue) to fix the Channel Board.

Figure 3-107 Installation of Channel Board



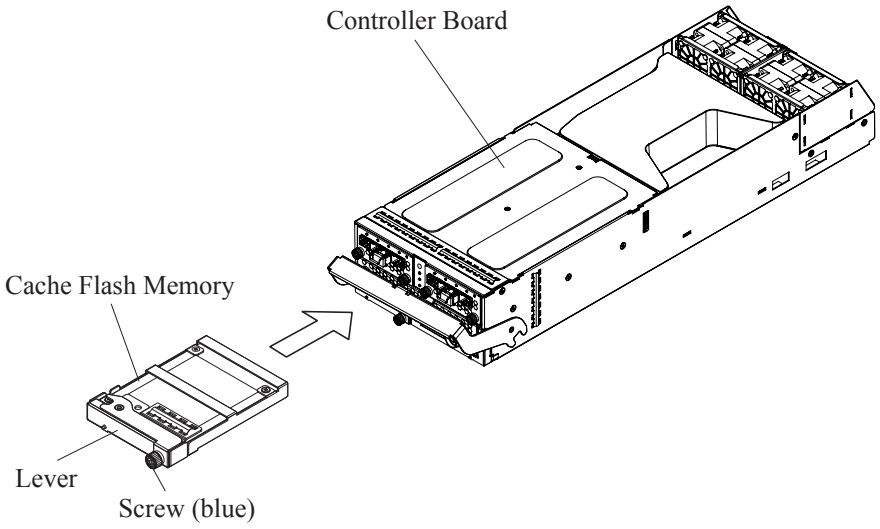
(10) Move the Cache Flash Memory from the removed Controller Board to the Controller Board to be replaced (Type Change).
(a) Loosen the screw (blue) which fixes the Cache Flash Memory installed in the removed Controller Board.
(b) Open the lever to pull out and remove the Cache Flash Memory.

Figure 3-108 Removal of Cache Flash Memory



(c) With the lever fully open, insert the Cache Flash Memory into the slot of the Controller Board to be replaced (Type Change).
(d) Push the Cache Flash Memory all the way in and close the lever completely.
(e) Tighten the screw (blue) and fix the Cache Flash Memory.

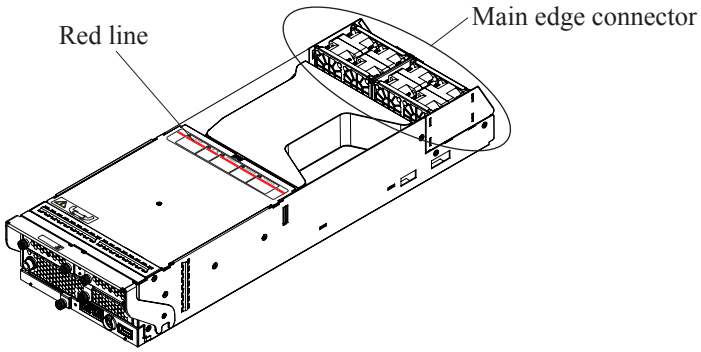
Figure 3-109 Installation of Cache Flash Memory



(11) Install the Controller Board to be replaced (Type Change).

⚠ CAUTION

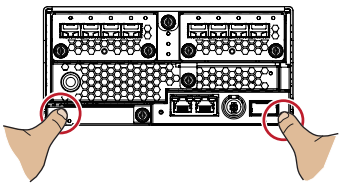
Dropping the Controller Board may cause injury. Keep hands securely on array. Be aware of the red line marked on the Controller Board top - when sliding the Controller Board out of the rail terminal past this mark, keep a firm hold on the Controller Board.



NOTICE:
- Check that the main edge connector of the Controller Board has no deformation, damage or sticking of dust before installing the Controller Board.
- When installing the Controller Board, hold it with both hands and install it straight not to apply a shock to with any components.

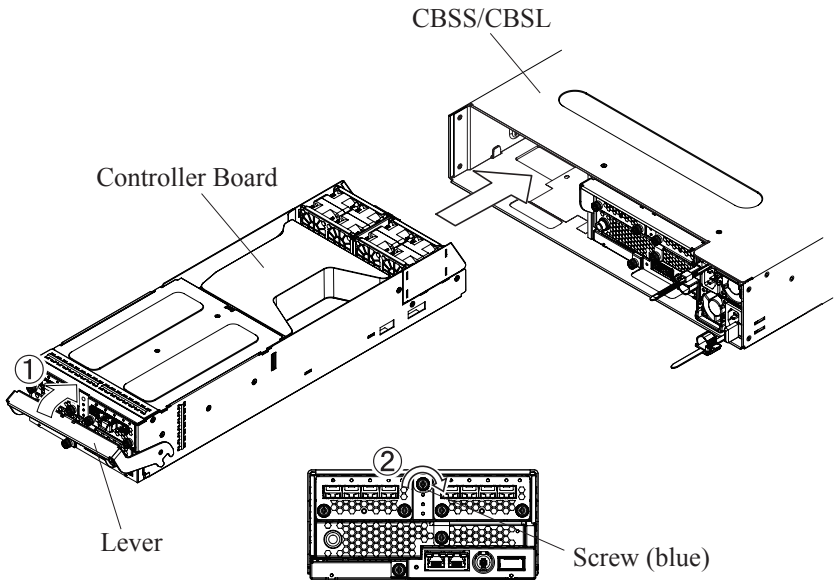
(a) With the right and left levers on the Controller Board opened completely, insert it into the slot of the CBSS/CBSL.
(b) Push the Controller Board all the way in and close the lever completely (①).

NOTICE: Push the bottom of the front side of the Controller Board all the way to insert it to the end.



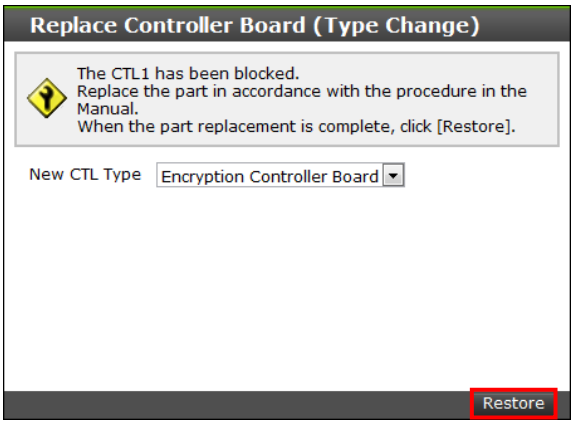
(c) Tighten the screw (blue) and fix the Controller Board (②).

Figure 3-110 Installation of Controller Board

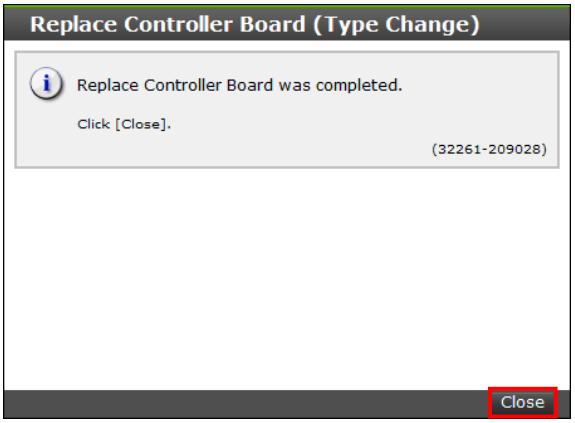


(12) Connect all the removed cables to the Controller Board.
When connecting SAS cables, be careful not to damage the tips of the cables. (See "2.10.2.1 Precautions when Connecting SAS Cables".

5. Check the completion of the replacement (Type Change) by Maintenance Utility
   (1) <Restore the Controller Board>
   Click the [Restore] button.

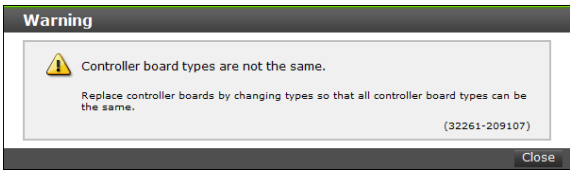


   (2) <Check the completion of the replacement (Type Change) of the Controller Board>
   Check that the following message is displayed and click the [Close] button.
   If a message other than the described is displayed, refer to “Device Manager-Storage Navigator Messages”.



(3) <Check the messages>
If Controller Board 1 is replaced (Type Change), the following message is displayed.
Click the [Close] button
This message is not displayed when the replacement (Type Change) of both Controller Boards 1 and 2 is completed.

(4) Click the [Logout] button to close the window.
Replace (Type Change) Controller Board 2 in the same procedure as "1. Connecting a Maintenance PC". This message is not displayed when the replacement (Type Change) of both Controller Boards 1 and 2 is completed. Click the [Close] button and go to Step 6.



6. Disconnecting the maintenance PC and the Storage System.
Remove the LAN cable from the Controller Board referring to MAINTENANCE PC SECTION "2.8.3 Disconnecting the Maintenance PC from the Storage System".