LOCATION SECTION

Contents

1. Overview of Disk Subsystem

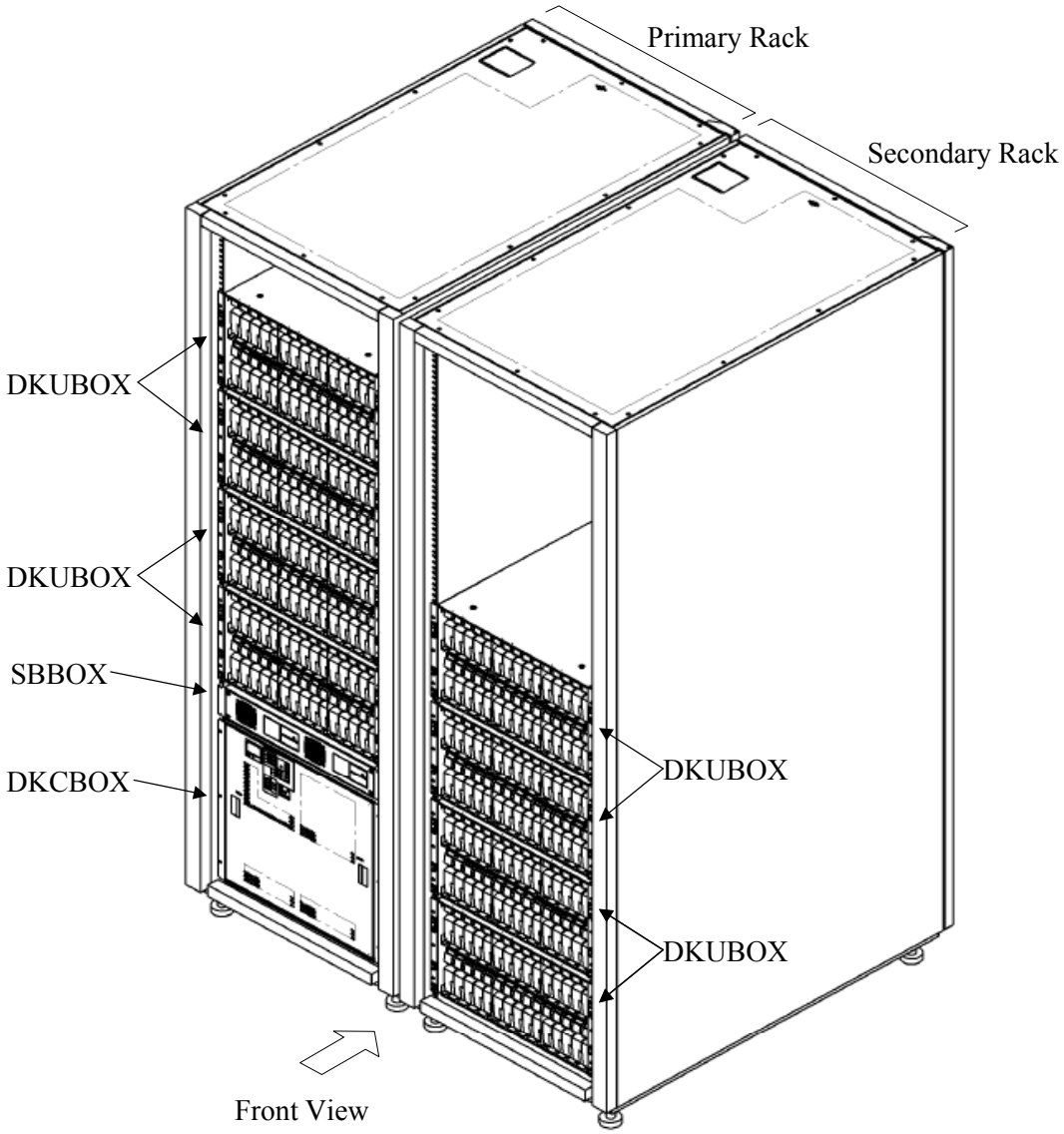


Fig. 1-1 Overview of Disk Subsystem

2. Parts Location

2.1 Configuration example of main parts

The following figure shows a configuration example of installing main parts in 40 units rack frame.

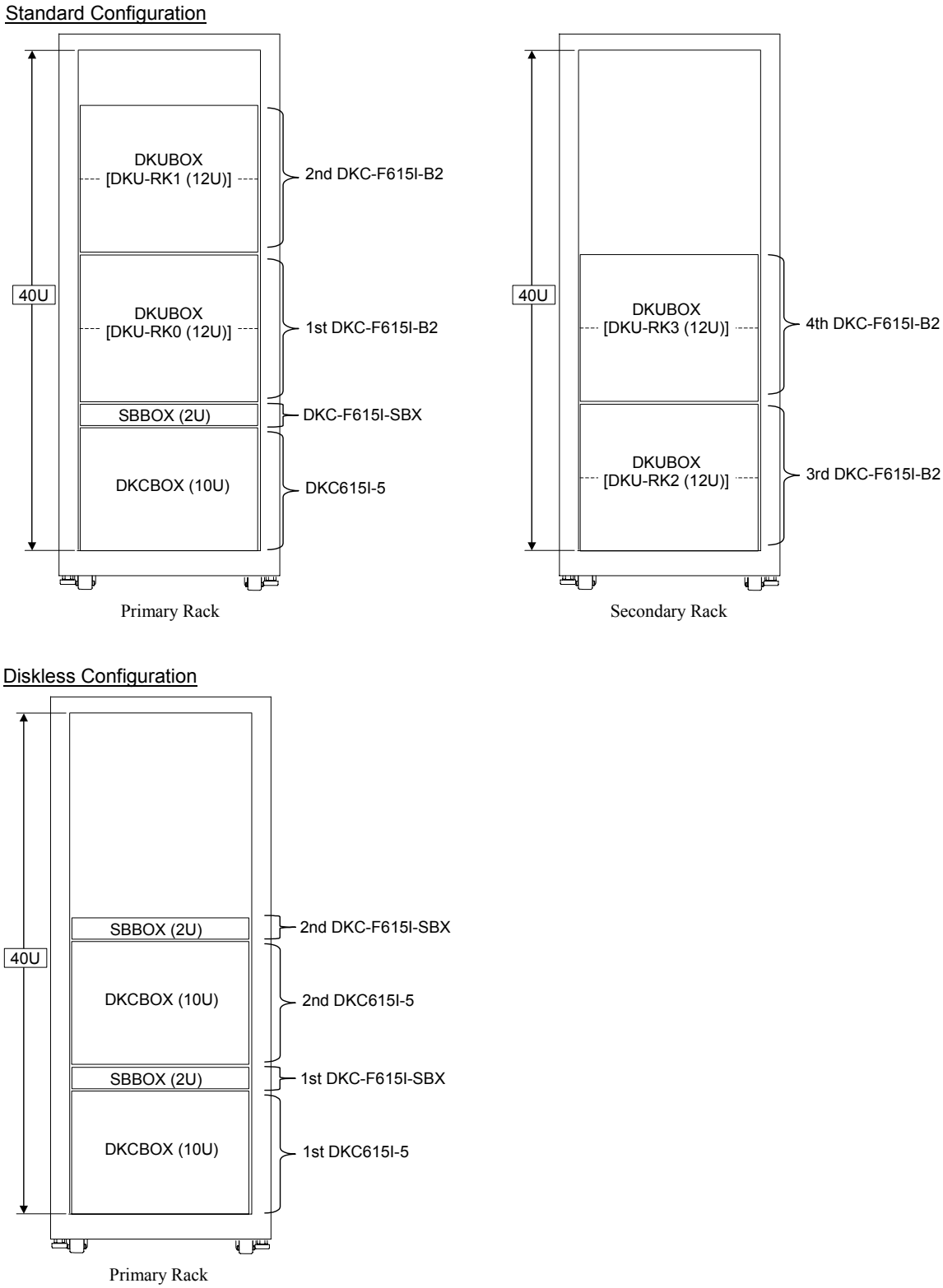
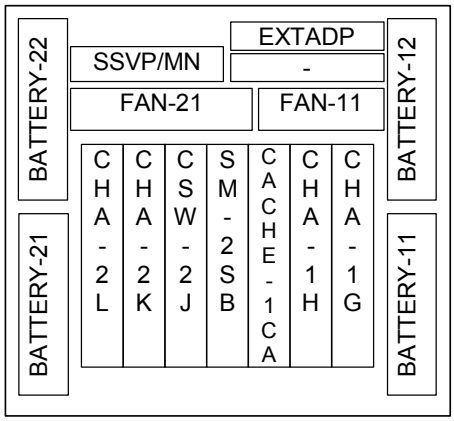
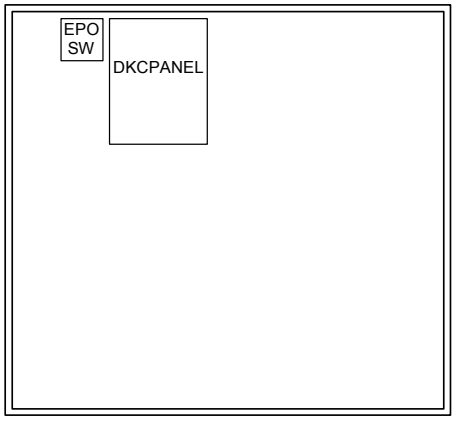


Fig. 2.1-1 configuration example of main parts

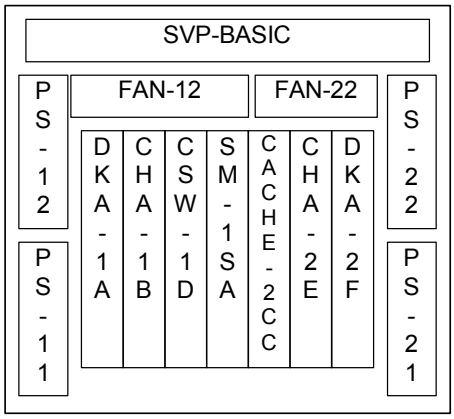
2.2 DKCBOX (10U)



Front View of DKCBOX
(Cover is opened.)



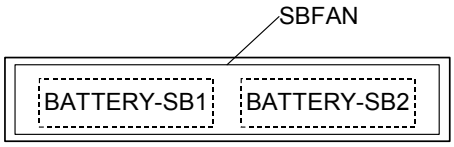
Front View of DKCBOX
(Cover is closed.)



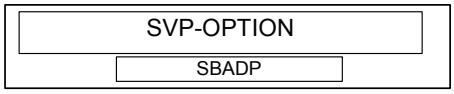
Rear View of DKCBOX

Fig. 2.2-1 Parts Location of DKCBOX

2.3 SBBOX (2U)



Front View of SBBOX



Rear View of SBBOX

Fig. 2.3-1 Parts Location of SBBOX

2.4 DKUBOX (12U)

The number (DKU-RK×) of DKUBOX doesn't indicate the installation location of DKUBOX, but indicates the order of installation. Therefore, while performing process to DKUBOX, it is necessary to confirm location with the location label put on DKUBOX, and be careful not to make a mistake of target location.

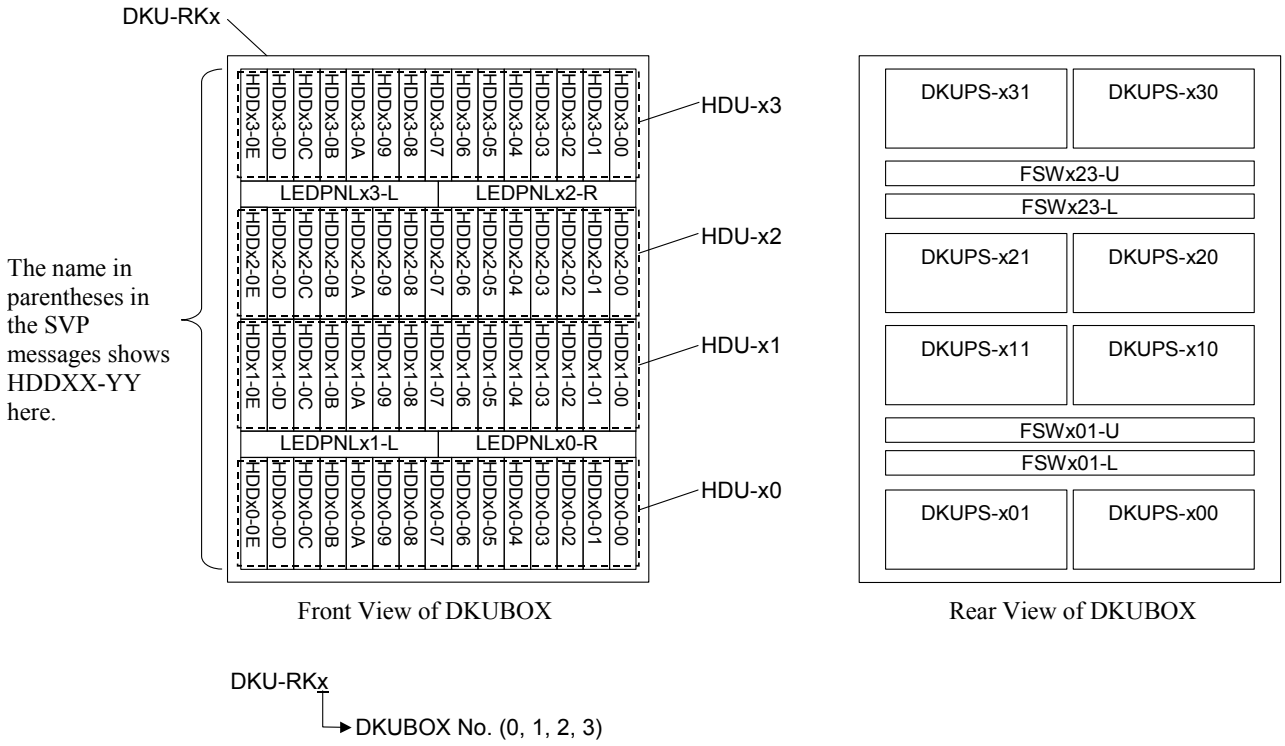


Fig. 2.4-1 Parts Location of DKUBOX

2.5 PCB Location

1. DKCBOX PCB Location

DKCBOX PCB LOCATION (FRONT)

CL2				CL1		
2L	2K	2J	2SB	1CA	1H	1G
1st CHA	2nd CHA	WP630 | A	WP652 | A	WP641 | A	2nd CHA	1st CHA
*C	*C		*A	*B	*C	*C
CHA-2L	CHA-2K	CSW-2J	SM-2SB	CACHE-1CA	CHA-1H	CHA-1G
Basic	Option 1	Basic	Basic	Basic	Option 1	Basic

DKCBOX PCB LOCATION (REAR)

CL1				CL2		
1A	1B	1D	1SA	2CC	2E	2F
DKA	3rd CHA	WP630 | A	WP652 | A	WP641 | A	3rd CHA	DKA
*D	*C		*A	*B	*C	*D
DKA-1A	CHA-1B	CSW-1D	SM-1SA	CACHE-2CC	CHA-2E	DKA-2F
Basic	Option 2	Basic	Basic	Basic	Option 2	Basic

*A: DKC-F615I-SX
*B: DKC-F610I-CX

*C: Description of CHA PCBs

CL1/CL2 (1B, 1G, 1H, 2E, 2K or 2L)											
WP6104 | B×1	SH44 | A×2	WP6104 | A×1	SH44 | A×2	WP6123 | A×1	SH43 | C×2	WP6114 | A×1	SH44 | A×2	WP6114 | B×1	SH44 | A×2	WP6144 | B×1	SH44 | B×2
*1		*2		*3		*4		*5		*6	

*1: DKC-F610I-8FS
*2: DKC-F610I-16FS
*3: DKC-F610I-8S
*4: DKC-F610I-8MFS
*5: DKC-F610I-8MFL
*6: DKC-F610I-8US

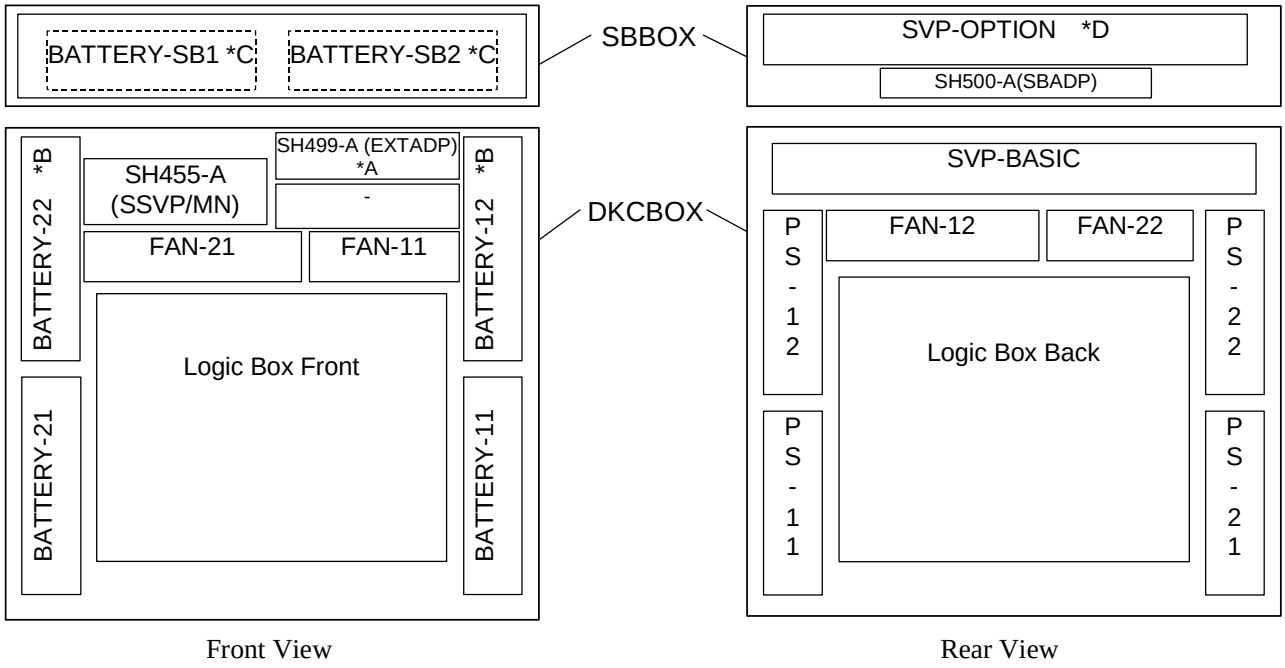
*D: Description of DKA PCBs

CL1/CL2 (1A or 2F)			
WP6204 | A×1	SH44 | A×2	WP6204 | B×1	SH44 | A×2
*1		*2	

*1: DKC-F610I-DKA
*2: DKC-F610I-EDKA

Fig. 2.5-1 PCB Location

2. Other PCB and Battery Location



*A: DKC-F615I-SBX
*B: DKC-F615I-LGAB 1 set
*C: DKC-F615I-LGAB 2 sets
*D: DKC-F610I-SVP/SVPV

Fig. 2.5-2 Other PCB and Battery Location

2.6 Shared Memory Module Location

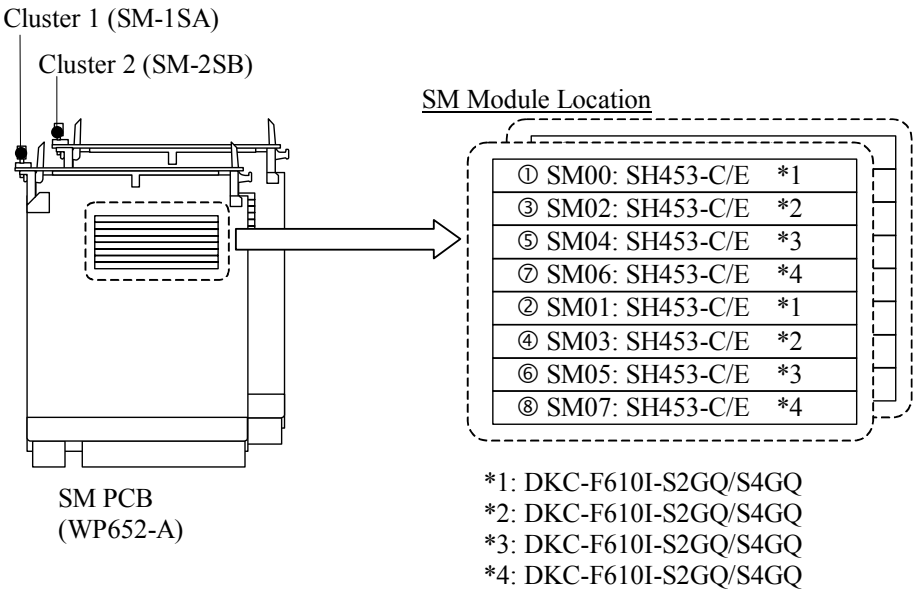
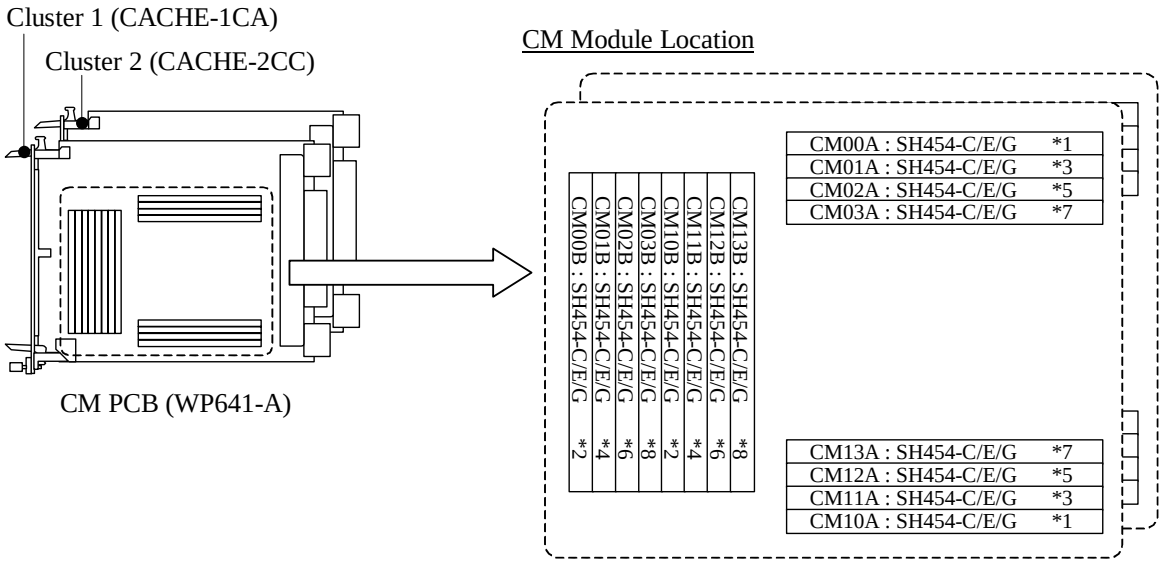


Fig. 2.6-1 Shared Memory (SM) Module Location

2.7 Cache Memory Module Location



*1: DKC-F610I-C4G/C8G/C16G × 1 set
*2: DKC-F610I-C4G/C8G/C16G × 2 sets
*3: DKC-F610I-C4G/C8G/C16G × 3 sets
*4: DKC-F610I-C4G/C8G/C16G × 4 sets
*5: DKC-F610I-C4G/C8G/C16G × 5 sets
*6: DKC-F610I-C4G/C8G/C16G × 6 sets
*7: DKC-F610I-C4G/C8G/C16G × 7 sets
*8: DKC-F610I-C4G/C8G/C16G × 8 sets

Fig. 2.7-1 Cache Memory (CM) Module Location

3. Panel

3.1 Operator Panel

[1] Operator Panel

Fig. 3.1-1 and Table 3.1-1 show the Operator Panel and its functions respectively. Circled numbers in Fig. 3.1-1 correspond to the numbers in Table 3.1-1.

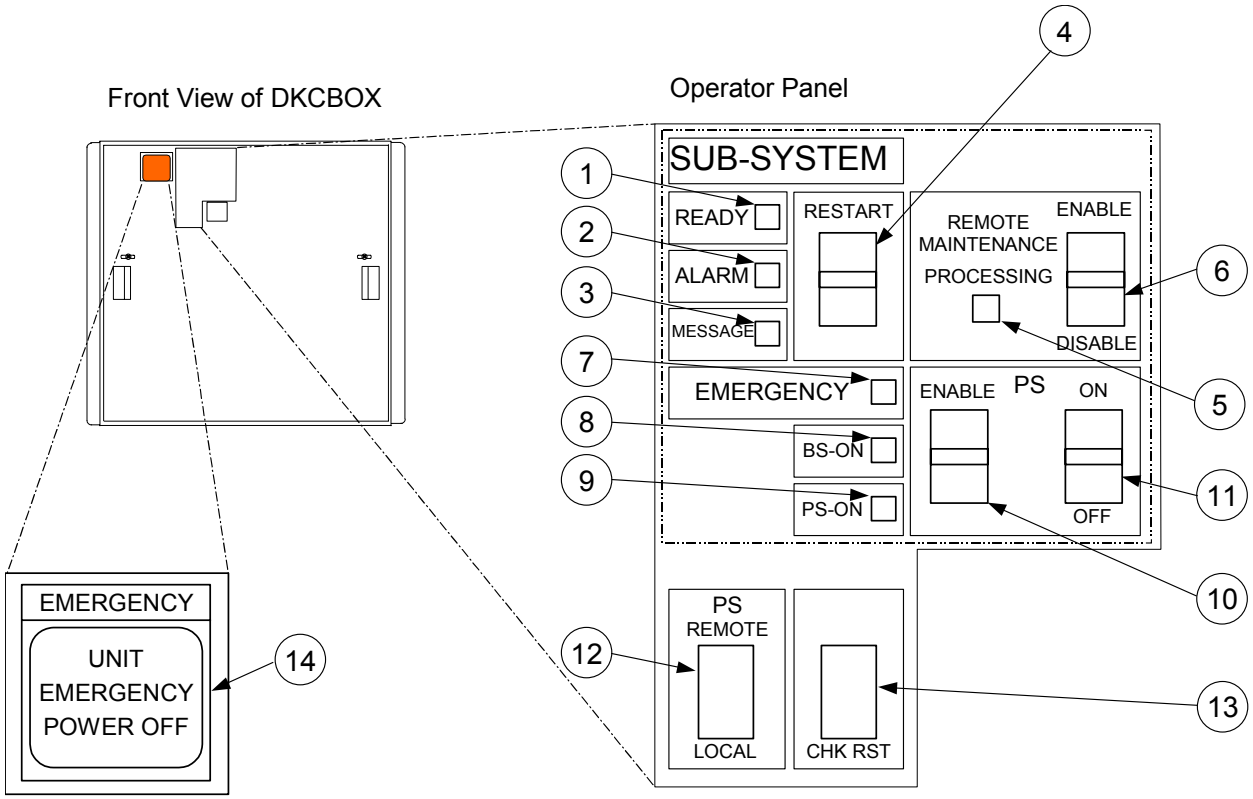


Fig. 3.1-1 Operator Panel

Table 3.1-1 Part Function on Operator Panel

No.	Parts Name	Class	Function
①	SUBSYSTEM READY	LED (Green)	Indicates that input/output operation on the channel interface is enabled.
②	SUBSYSTEM ALARM	LED (Red)	ON: Indicates DC under voltage of DKC part, DC over current, abnormally high temperature, or an unrecoverable failure occurred.
③	SUBSYSTEM MESSAGE	LED (Amber)	ON: Indicates that a SIM (Message) was generated from either of the clusters. Applied to both storage clusters. Blinking: Indicates that the SVP failure has occurred.
④	SUBSYSTEM RESTART	Switch	Used to recover a FICON/ESCON port failure. (See "19. Mainframe Port Error Recovery")
⑤	REMOTE MAINTENANCE PROCESSING	LED (Amber)	Indicates that remote maintenance is being processed.
⑥	REMOTE MAINTENANCE ENABLE/DISABLE	Switch	Used to permit remote maintenance.
⑦	EMERGENCY	LED (Red)	This LED shows status of EPOSW on the rear door. OFF: Indicates that the EPOSW is off. ON: Indicates that the EPOSW is on.
⑧	BS ON	LED (Amber)	Indicates that the Sub-PS is on. (CL 1 or CL 2)
⑨	PS ON	LED (Green)	Indicates that the subsystem is powered on.
⑩	PS SW ENABLE	Switch	Used to enable the PS ON/PS OFF switch. To enable the PS ON/PS OFF switch, turn the PS SW ENABLE switch to the ENABLE position.
⑪	PS ON/PS OFF	Switch	To switch on/off the subsystem, use this switch while turning the PS SW ENABLE switch to the ENABLE position.
⑫	PS REMOTE/LOCAL	Switch	REMOTE position: Subsystem is powered on/off by the instructions from the CPU. LOCAL position: Subsystem is powered on/off by PS ON/PS OFF switch.

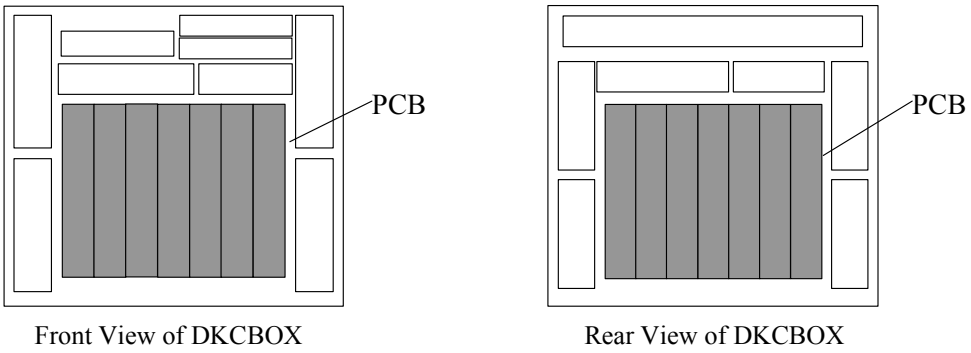
(To be continued)

(Continued from preceding page)

No.	Parts Name	Class	Function
⑬	CHK RESET	Switch	The PS ALARM and TH ALARM are reset.
⑭	EMERGENCY POWER OFF	Switch	Used to power off the storage subsystem in an emergency situation.

3.2 Other Switches and LEDs

Fig. 3.2-1 and Table 3.2-1 show the other switches and LEDs and their functions respectively. Circled numbers in Fig. 3.2-1 correspond to the numbers in Table 3.2-1.



Front View of DKCBOX Rear View of DKCBOX

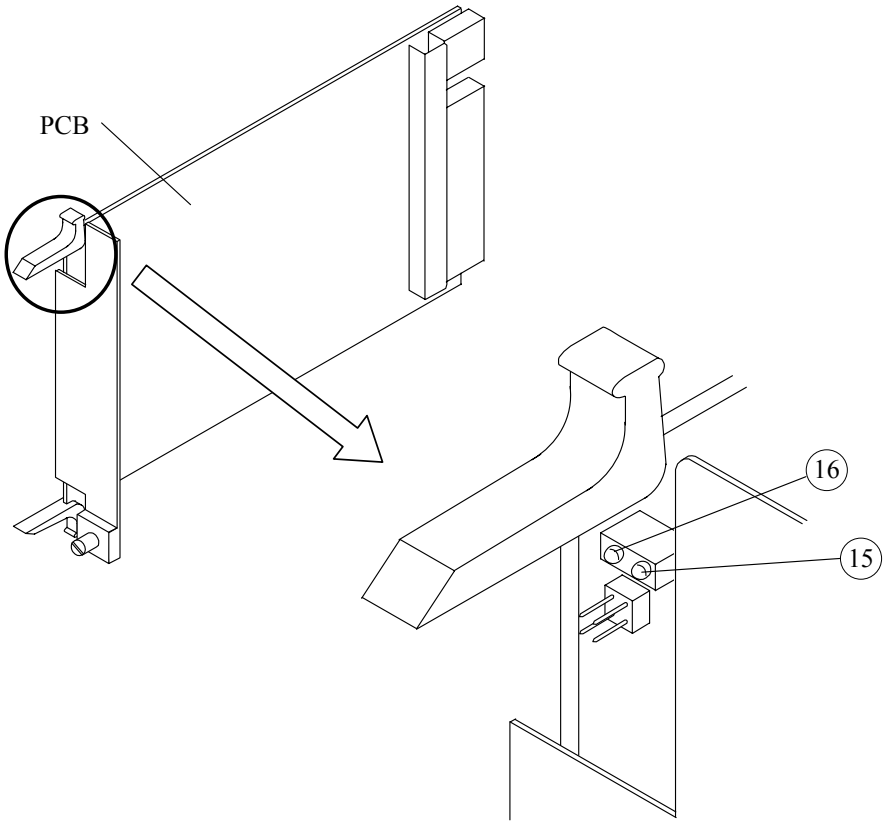
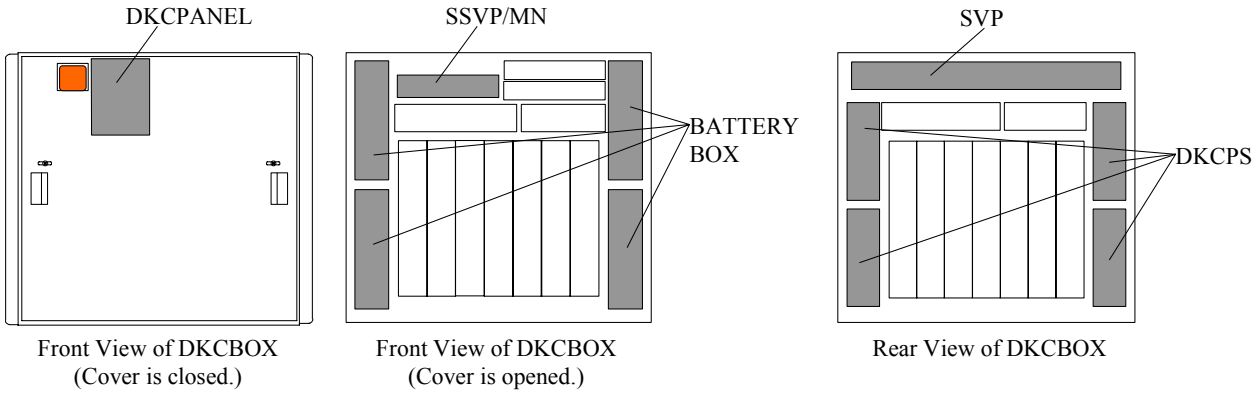
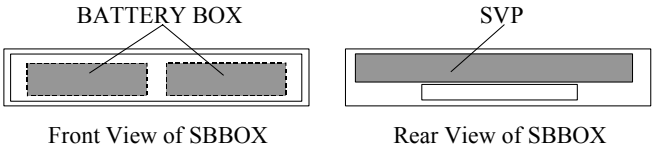
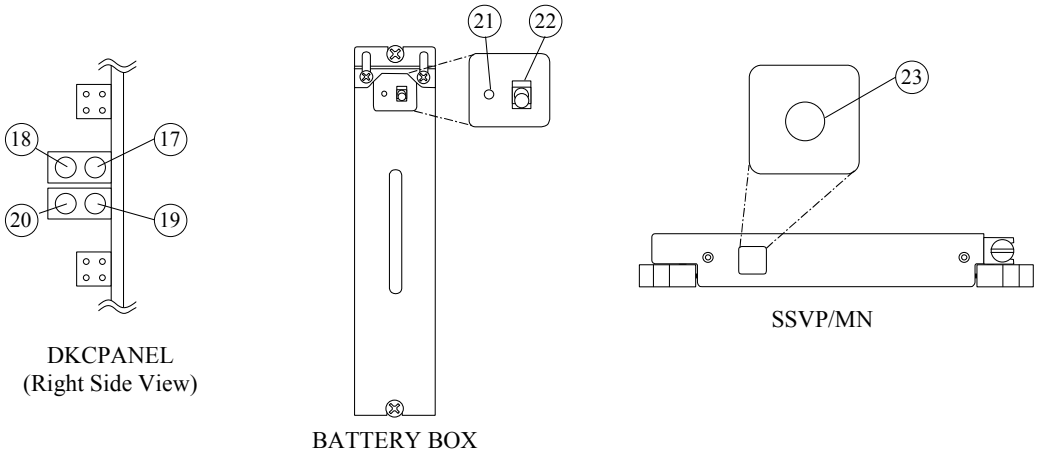
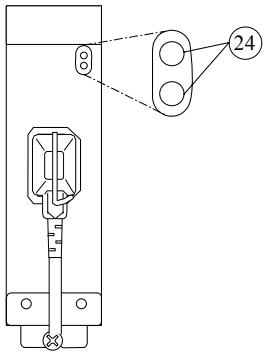


Fig 3.2-1 Other Switches and LEDs (1/4)









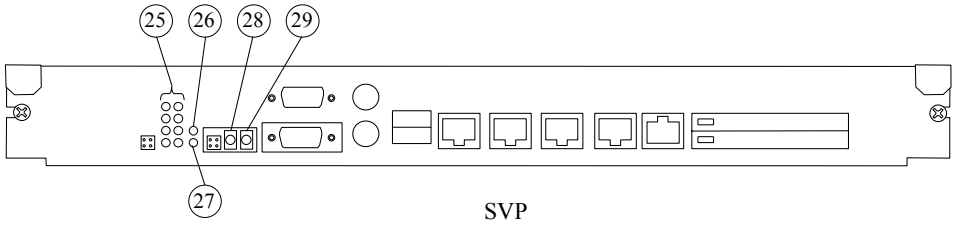
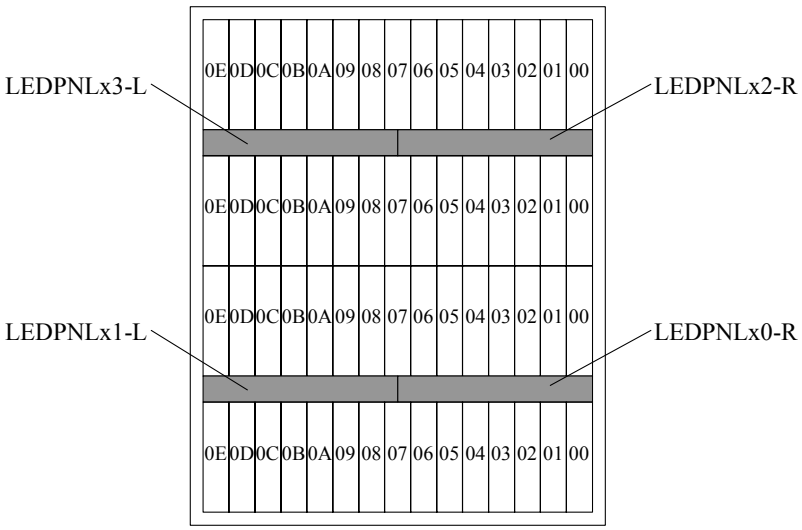


Fig 3.2-1 Other Switches and LEDs (2/4)



Front View of DKUBOX

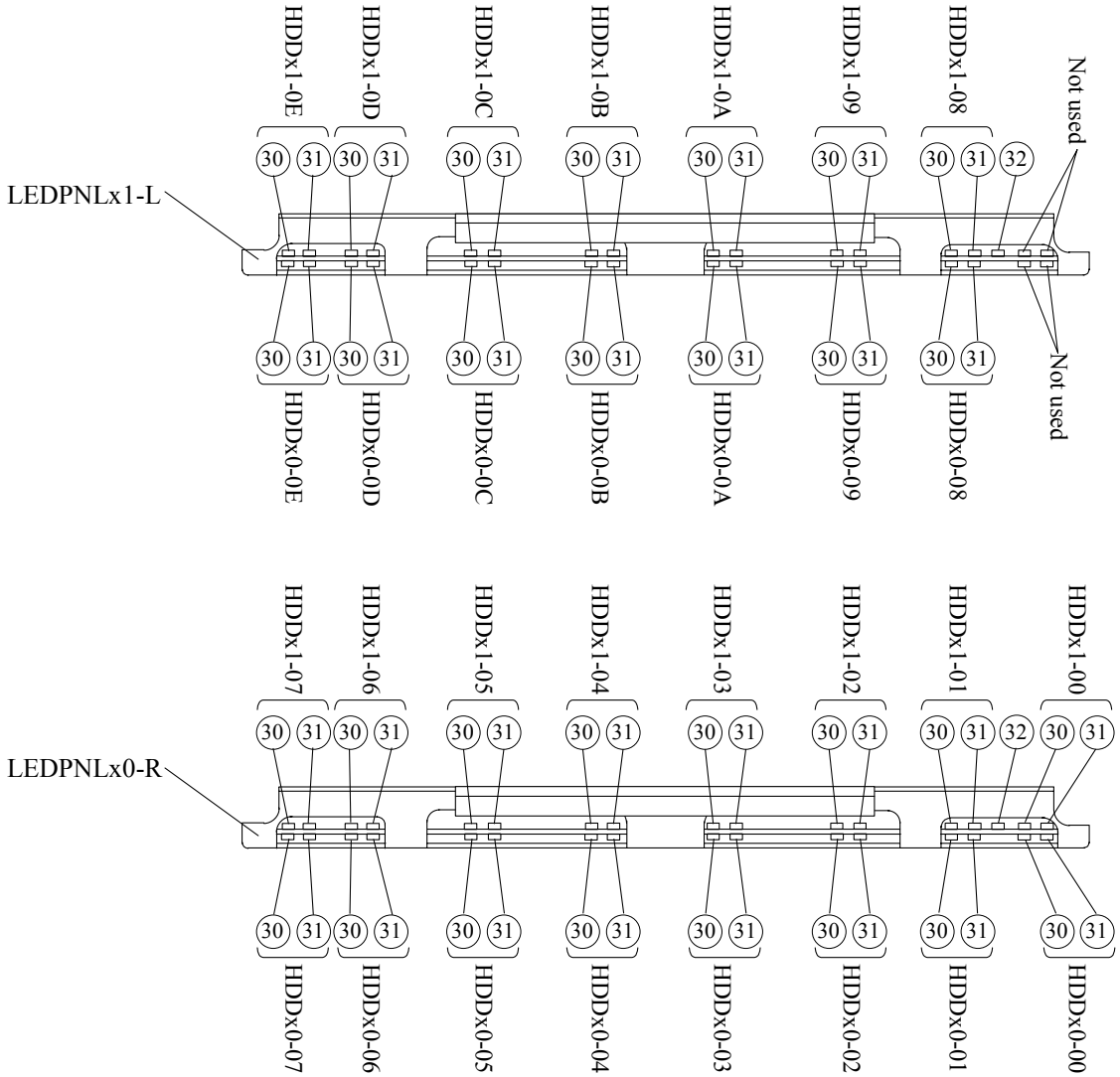
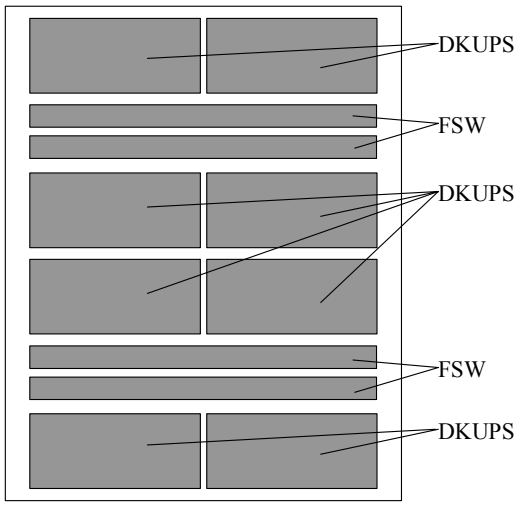
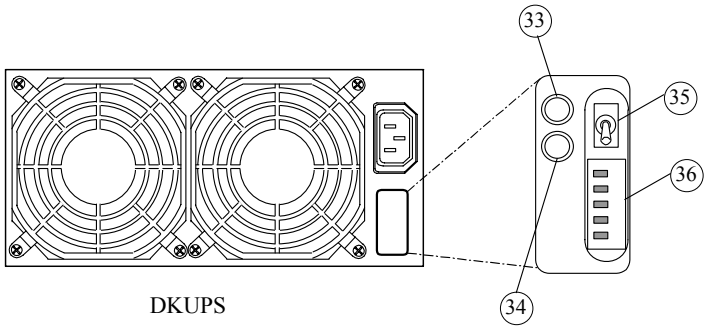


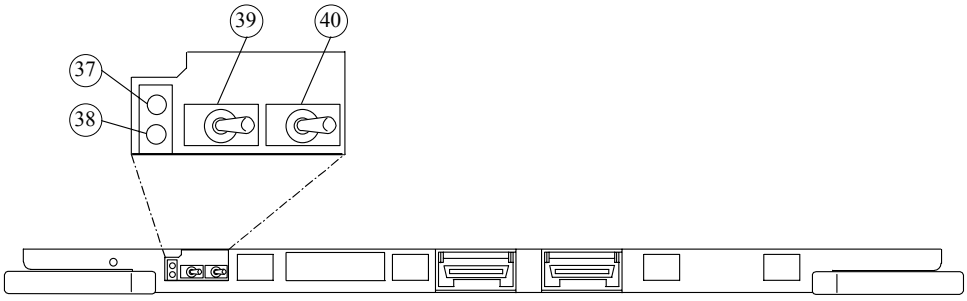
Fig 3.2-1 Other Switches and LEDs (3/4)



Rear View of DKUBOX



DKUPS



FSW

Fig 3.2-1 Other Switches and LEDs (4/4)

Table 3.2-1 Function of Other Switches and LEDs

No.	Parts Name	Class	Function
⑮	Shut Down LED	LED (Red)	Indicates that the removal of the PCB is possible when the subsystem is powered on.
⑯	PS Failure LED	LED (Amber)	Indicates that the voltage in the PCB is abnormal.
⑰ ⑱ ⑲ ⑳	SSVP ALARM SSVP LED SSVP LED SSVP LED	LED (Red)	Indicates the status of SSVP by the combination of ⑰, ⑱, ⑲ and ⑳. The LED indicates the following statuses. ○: Indicates that the light is off. ●: Indicates that the light is on. ◘: Indicates that the light is blinking. ⑰ ⑱ ⑲ ⑳ ○ ○ ○ ○ Normal status ○ ○ ○ ● Self-contradiction of SSVP microprogram or hardware abnormality is detected. ● ● ● ○ During the memory test ● ● ● ● Memory system hardware error ○ ● ● ○ During the DUMP collection ○ ● ● ● DUMP terminated abnormally. ○ ○ ○ ◘ DUMP collection is completed ○ ○ ● ○ During microprogram replacement ○ ○ ● ● Microprogram replacement error
㉑	BATTERY CHARGE LED	LED (Green)	This LED shows the state of BATTERY. Lighting ----------The battery charge is completed. Fast Blinking (Lighting about one second, Going out about one second) ----------The battery is charging. Slow Blinking (Lighting about one second, Going out about five seconds)----------The battery is discharging. Going out ----------• Power off • The state that the discharge of BATTERY is completed • Trouble of BATTERY After the power is turned on, the Battery Box is started to be charged and the LED blinks. Though the LED becomes kept on after the charge is completed, it repeats the operation that indicates the refilling charge (blink) and completion of the refilling charge (being kept on) after that.
㉒	BATTERY ON/OFF	Switch	Used to power on/off the BATTERY.
㉓	SSVP/MN ENABLE	LED (Green)	Indicates that the SSVP/MN is powered on.
㉔	PS Enable	LED (Green)	Indicates that the PS is providing output voltage.

(To be continued)

(Continued from preceding page)

No.	Parts Name	Class	Function
㉕	SVP STATUS	LED (Green)	Indicates a status of the SVP using the SVP microprogram. The LED indicates the following status usually. ○: Indicates that the light is off. ●: Indicates that the light is on. ◘: Indicates that the light is blinking. ● ○ ○ ○ } The LED status at the time of ○ ○ ○ ◘ } Master SVP. ○ ● ○ ○ } The LED status at the time of ○ ○ ○ ◘ } Standby SVP For the other LED display, see " 1.11 SVP LED display specification" (SVP01-210 ~ 220).
㉖	SVP POWER	LED (Green)	Indicates that the power of the SVP is has been turned on. • Power of the built-in Hub in the SVP has been turned on. • Power of the PC in the SVP is turned on.
㉗	SVP DCIN	LED (Green)	Indicates that the DC power is supplied to the SVP. • Power of the built-in Hub in the SVP is turned on. • Power of the PC in the SVP is kept off.
㉘	SVP PS ON	Switch	A pressing of this switch turns on the power of the PC in the SVP.
㉙	SVP PS OFF	Switch	A pressing of this switch quits Windows and then turns off the power of the PC in the SVP. When this switch is pressed with the SVP PS ON switch (No. 28) at the same time, Windows is quit forcibly and then the power of the PC in the SVP is turned off.
㉚	HDD Shut Down LED	LED (Red)	Indicates that the removal of the HDD/SSD is possible when the subsystem is powered on.
㉛	HDD ENABLE	LED (Green)	Lighting or Blinking: Indicates that the HDD/SSD is active. Note: The interval of blinking may be different in HDD and SSD, however it is not abnormal.
㉜	LEDPNL Shut Down LED	LED (Amber)	Indicates that the removal of the LEDPNL is possible when the subsystem is powered on.
㉝	DKUPS ENABLE	LED (Green)	Indicates that the DKUPS is powered on.
㉞	DKUPS Shut Down LED	LED (Red)	Indicates that the removal of the DKUPS is possible when the subsystem is powered on.
㉟	PS Enable/Disable	Switch	Used to power on/off the PS.
㊱	ID Setting Switch	Switch	Set this switch according to the position in the DKUPS SW1…….DKU ID SW2, SW3...HDD BOX ID SW4, SW5…ALPA

(To be continued)

(Continued from preceding page)

No.	Parts Name	Class	Function
㊲	FSW Shut Down LED	LED (Red)	Indicates that the removal of the FSW is possible when the subsystem is powered on.
㊳	FSW ENABLE	LED (Green)	Indicates that the FSW is powered on.
㊴	FSW SW2	Switch	The address of FSW is set up.
㊵	FSW SW1	Switch	

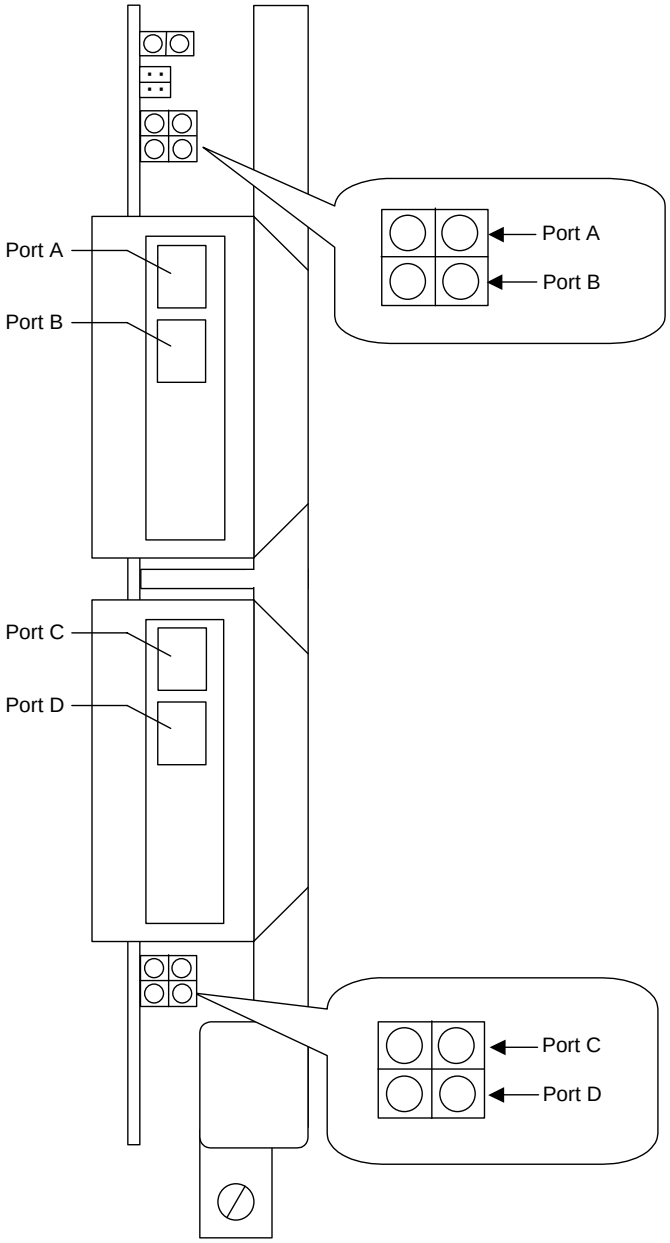


Fig 3.2-2 Channel Port LED Indication : 8FS/8US

Table 3.2-2 Channel Port LED Indication : 8FS/8US

LED Condition			State	Description
○	○	OFF + OFF	Not Ready	Link activity is unavailable, due to power-down or initialization not completed.
●	○	ON + OFF	Ready	Link is available by initialization completion, but connection to the host has not been established.
●	●	ON + ON	Link Up	Interface operation with the host is available by the connection establishment.
●	●	ON + ON (Same as Link Up)	Active	Interface operation is active between the hosts.

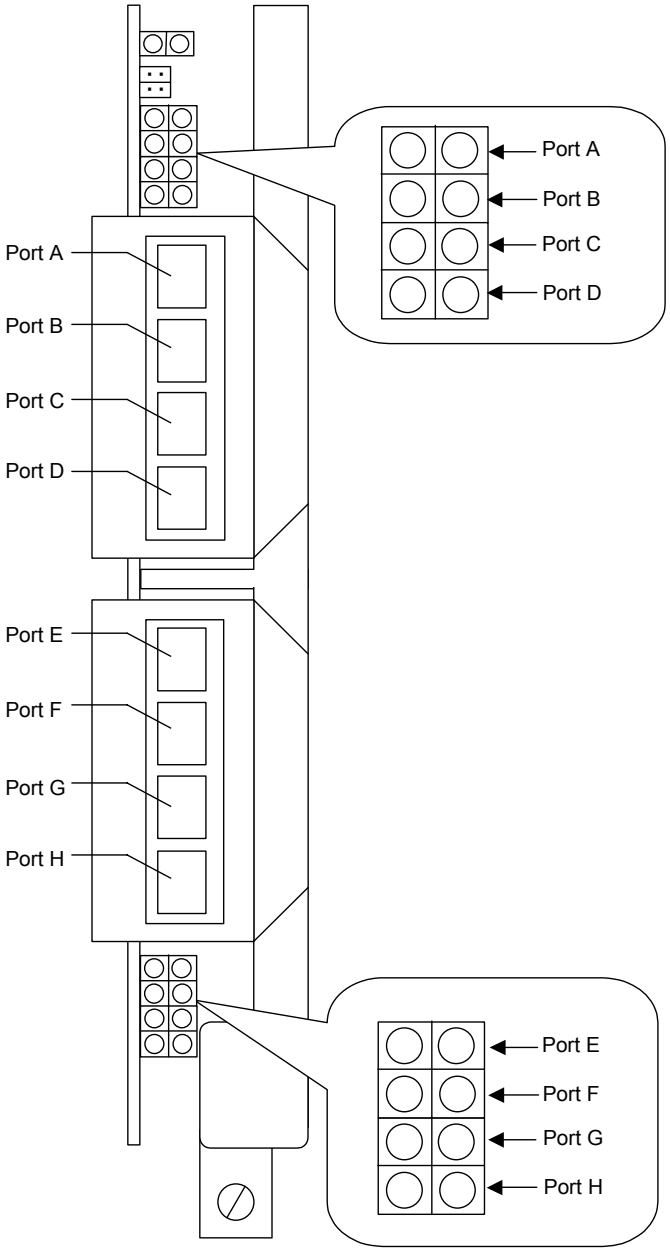


Fig 3.2-3 Channel Port LED Indication : 16FS

Table 3.2-3 Channel Port LED Indication : 16FS

LED Condition			State	Description
○	○	OFF + OFF	Not Ready	Link activity is unavailable, due to power-down or initialization not completed.
●	○	ON + OFF	Ready	Link is available by initialization completion, but connection to the host has not been established.
●	●	ON + ON	Link Up	Interface operation with the host is available by the connection establishment.
●	●	ON + ON (Same as Link Up)	Active	Interface operation is active between the hosts.

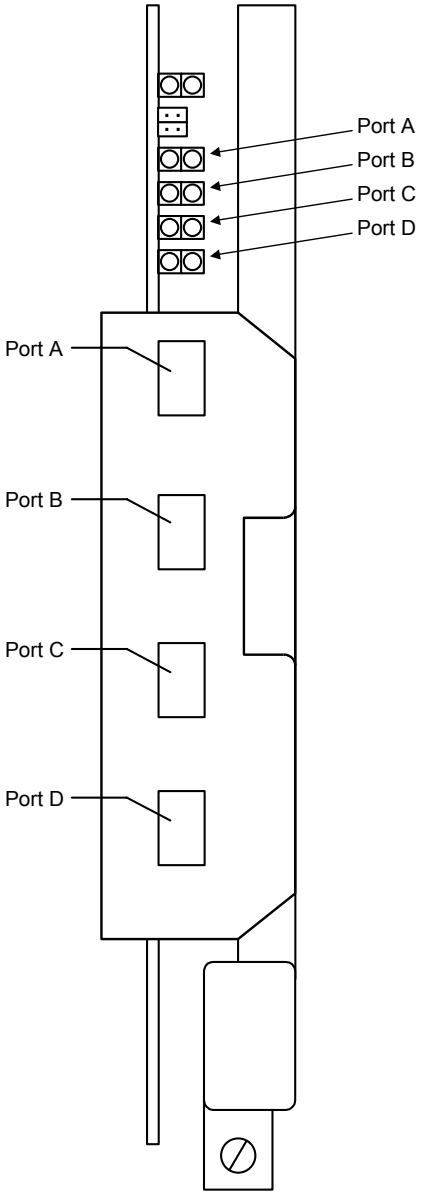


Fig 3.2-4 Channel Port LED Indication : 8S

Table 3.2-4 Channel Port LED Indication : 8S

LED Condition			State	Description
○	○	OFF + OFF	Not Ready	Link activity is unavailable, due to power-down or initialization not completed.
◘	○	Blink + OFF (Slow)	Ready	Link is available by initialization completion, but connection to the host has not been established.
●	○	ON + OFF	Link Up	Interface operation with the host is available by the connection establishment.
◘	○	Blink + OFF (Fast)	Active	Interface operation is active between the hosts.

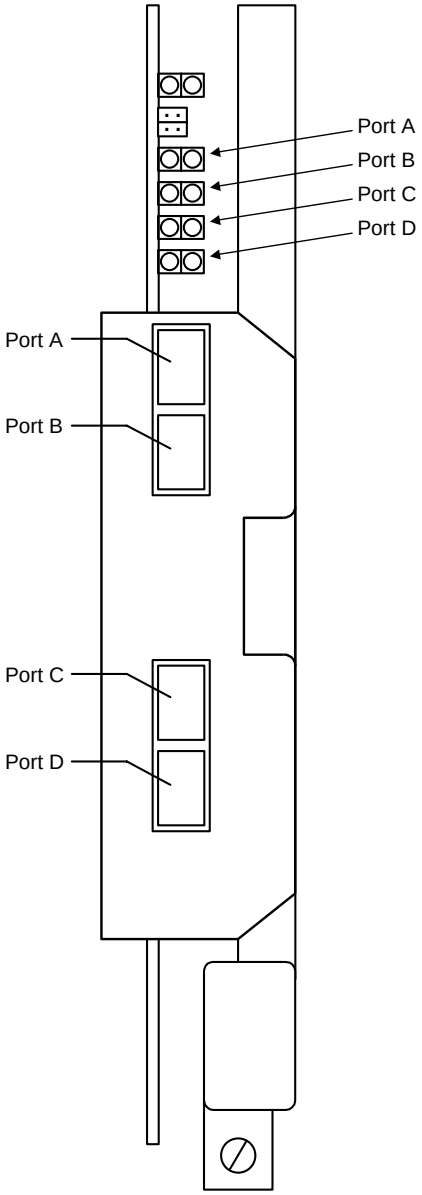


Fig 3.2-5 Channel Port LED Indication : 8MFS/8MFL

Table 3.2-5 Channel Port LED Indication : 8MFS/8MFL

LED Condition			State	Description
○	○	OFF + OFF	Not Ready	Link activity is unavailable, due to power-down or initialization not completed.
○	◘	OFF + Blink (Slow)	Ready	Link is available by initialization completion, but connection to the host has not been established.
○	●	OFF + ON	Link Up	Interface operation with the host is available by the connection establishment.
○	◘	OFF + Blink (Fast)	Active	Interface operation is active between the hosts.

Note: The left side LED is for maintenance purpose. Regarding failure content, please refer to SIM log.

Blank Sheet

4. Connection of External Cable

4.1 Channel Interface

1. Fibre 4-port CHA PCB (DKC-F610I-8FS/8US)

Caution: Wear a wrist strap until the work is finished. (Refer to INST03-01-70 for how to wear the wrist strap.)

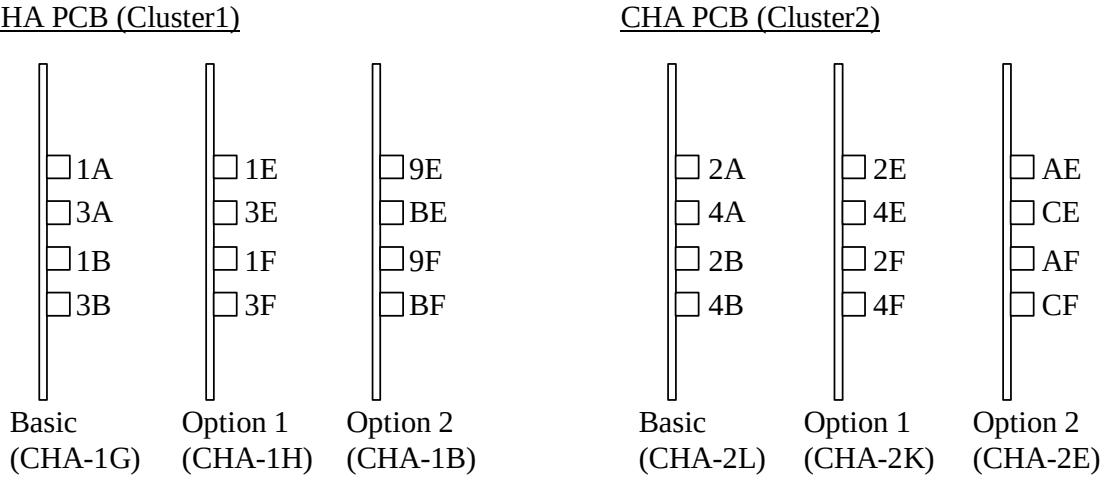


Fig.4.1-1 Port Number of Fibre 4-port CHA PCB

2. Fibre 8-port CHA PCB (DKC-F610I-16FS)

Caution: Wear a wrist strap until the work is finished. (Refer to INST03-01-70 for how to wear the wrist strap.)

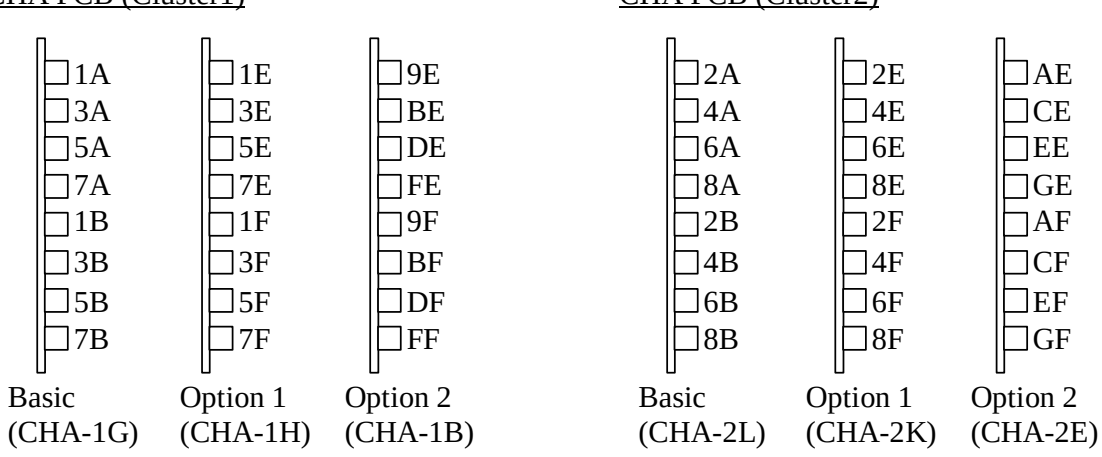


Fig.4.1-2 Port Number of Fibre 8-port CHA PCB

3. Serial 4-port CHA PCB (DKC-F610I-8S)

Caution: Wear a wrist strap until the work is finished. (Refer to INST03-01-70 for how to wear the wrist strap.)

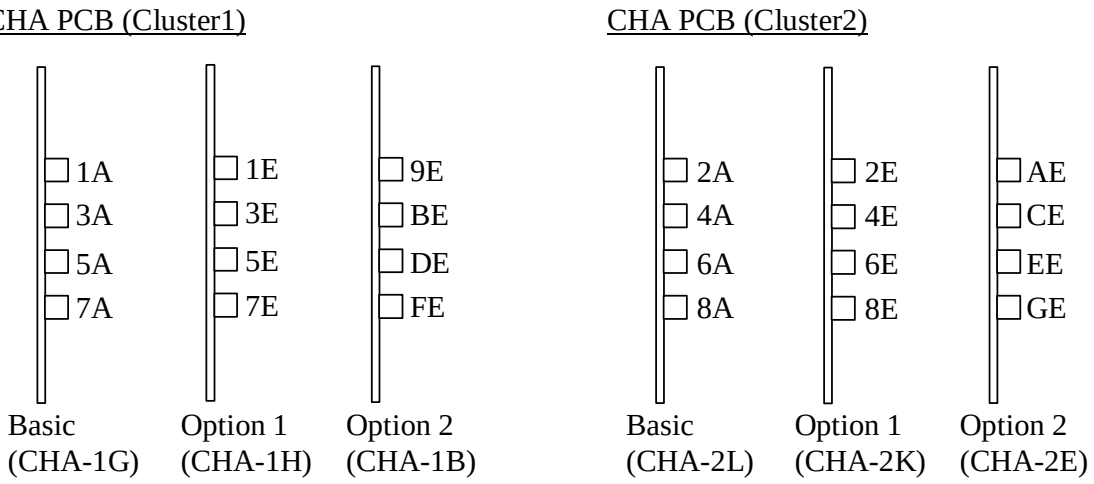


Fig.4.1-3 Port Number of Serial 4-port CHA PCB

4. MF Fibre 4-port CHA PCB (DKC-F610I-8MFL/8MFS)

Caution: Wear a wrist strap until the work is finished. (Refer to INST03-01-70 for how to wear the wrist strap.)

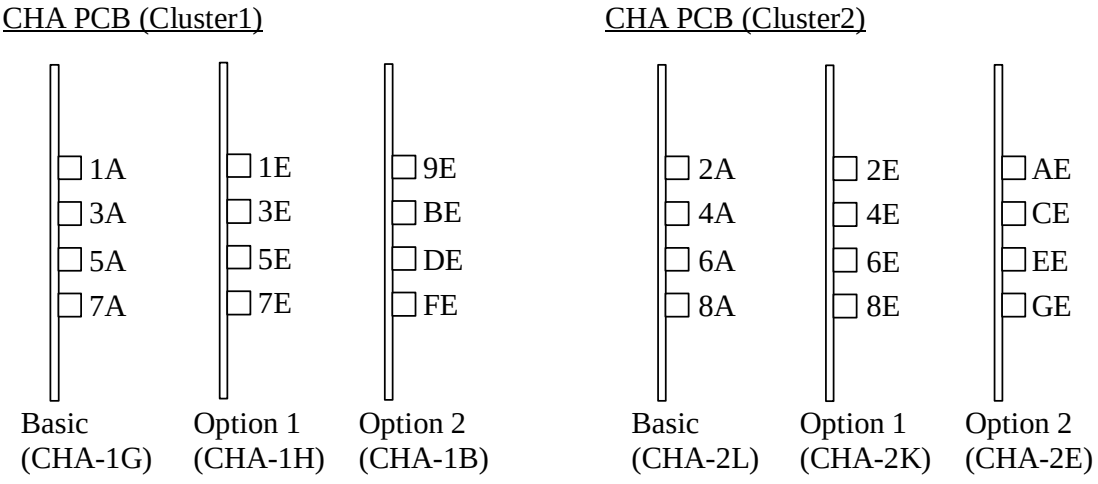
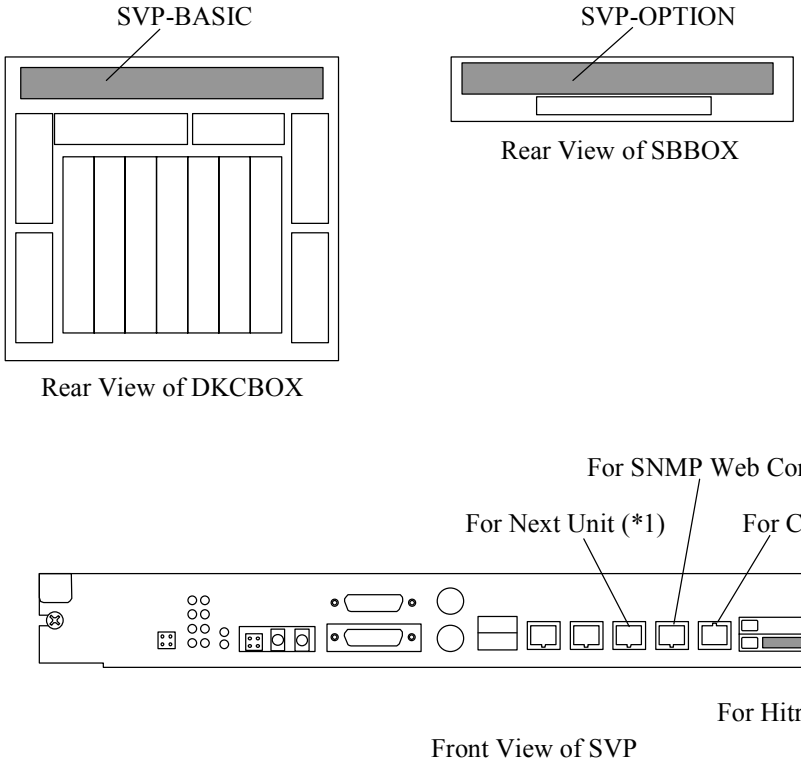


Fig.4.1-4 Port Number of MF Fibre 4-port CHA PCB

Blank Sheet

4.2 SVP Interface



*1: Connect cable only to SVP-BASIC. It is unnecessary to connect to SVP-OPTION.
*2: The cables are connected to both SVP-BASIC and SVP-OPTION.
*3: Connect Console PC only to SVP-BASIC. Connect Console PC to SVP-OPTION only when a trouble occurs on SVP-BASIC.

Fig.4.2-1 SVP Interface

5. Subsystem Cable Diagram

5.1 Cable Diagram

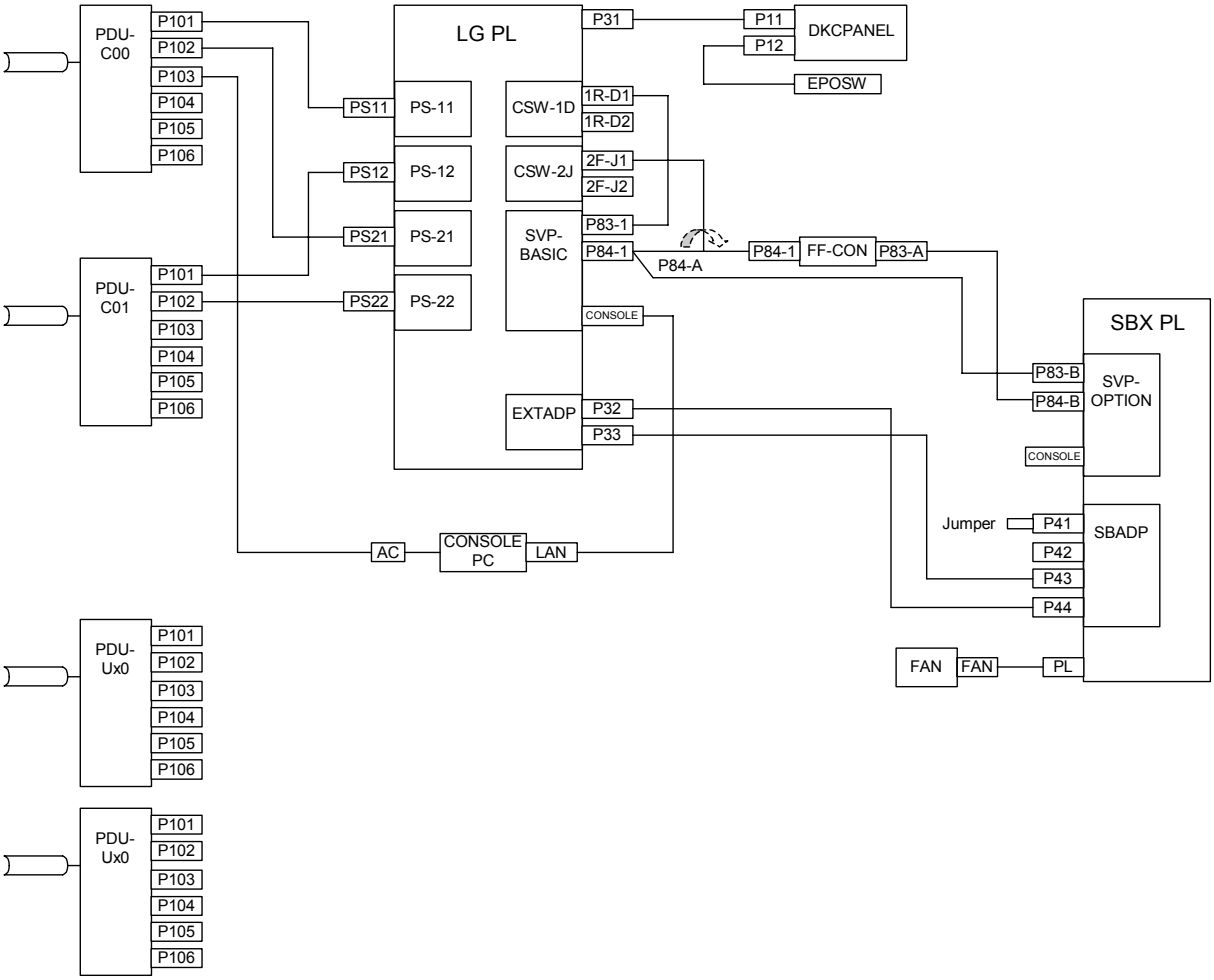


Fig. 5.1-1 Cable Diagram

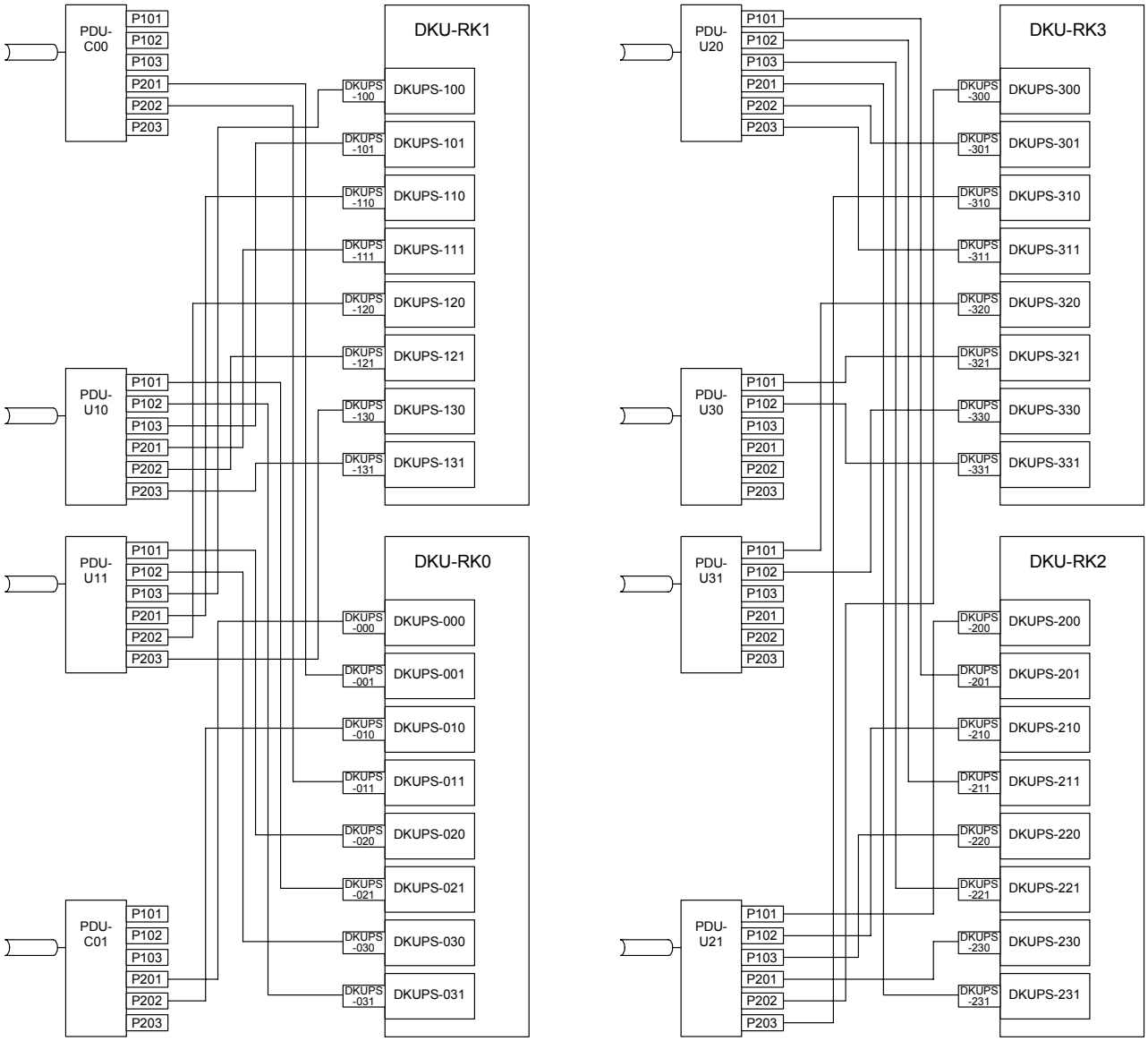


Fig. 5.1-2 Cable Diagram

DKA to DKU-RK0

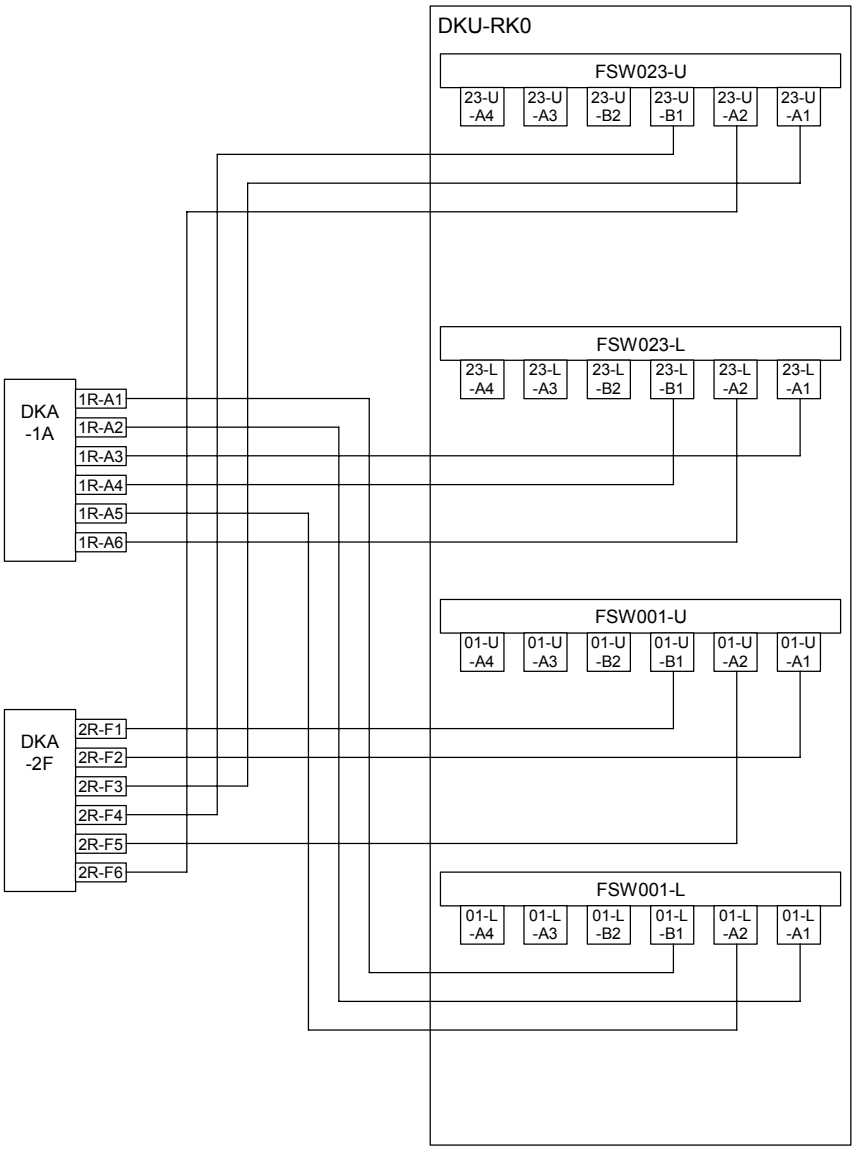


Fig. 5.1-3 Cable Diagram (UC0)

DKU-RK0 to DKU-RK1

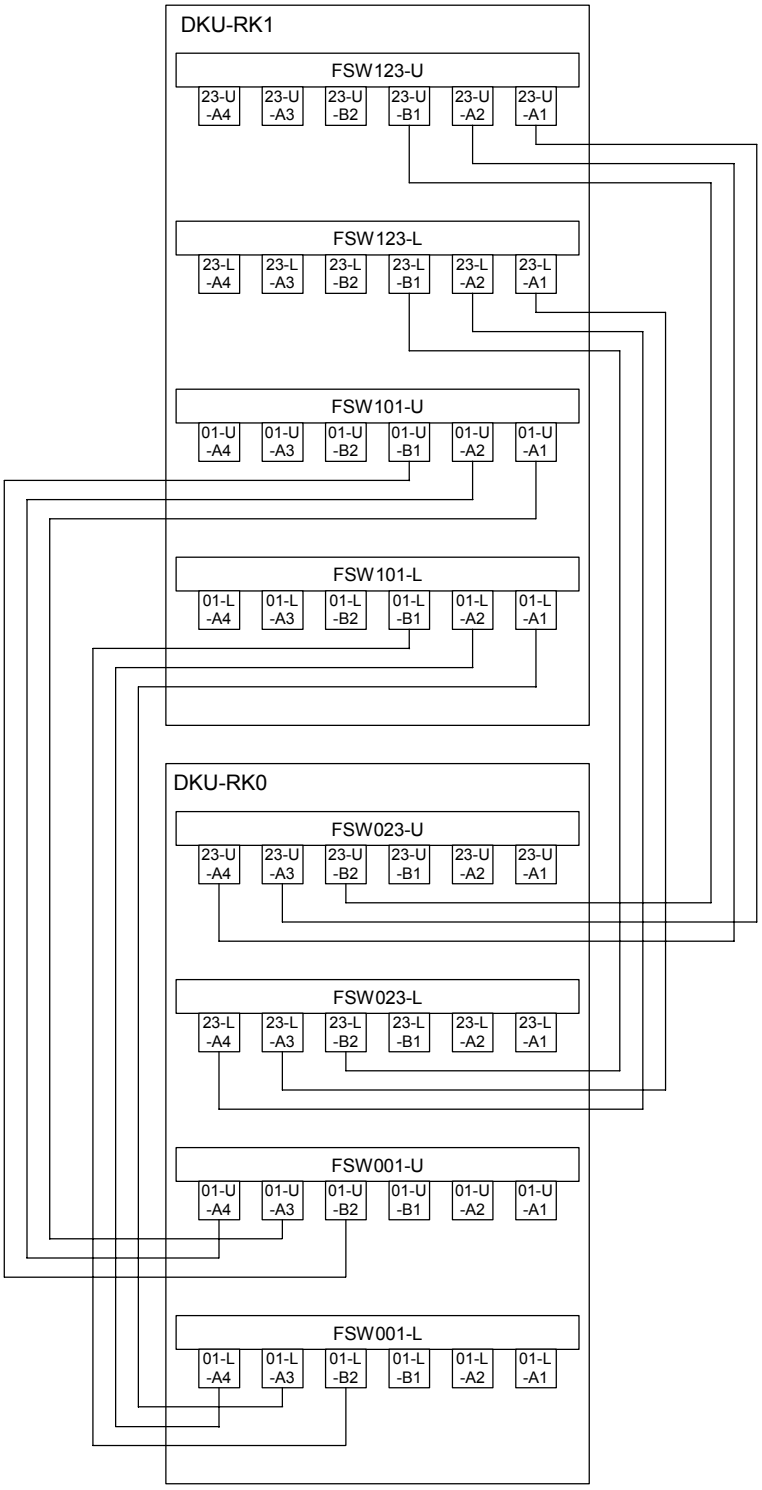


Fig. 5.1-4 Cable Diagram (UC1/EXC0)

DKU-RK1 to DKU-RK2

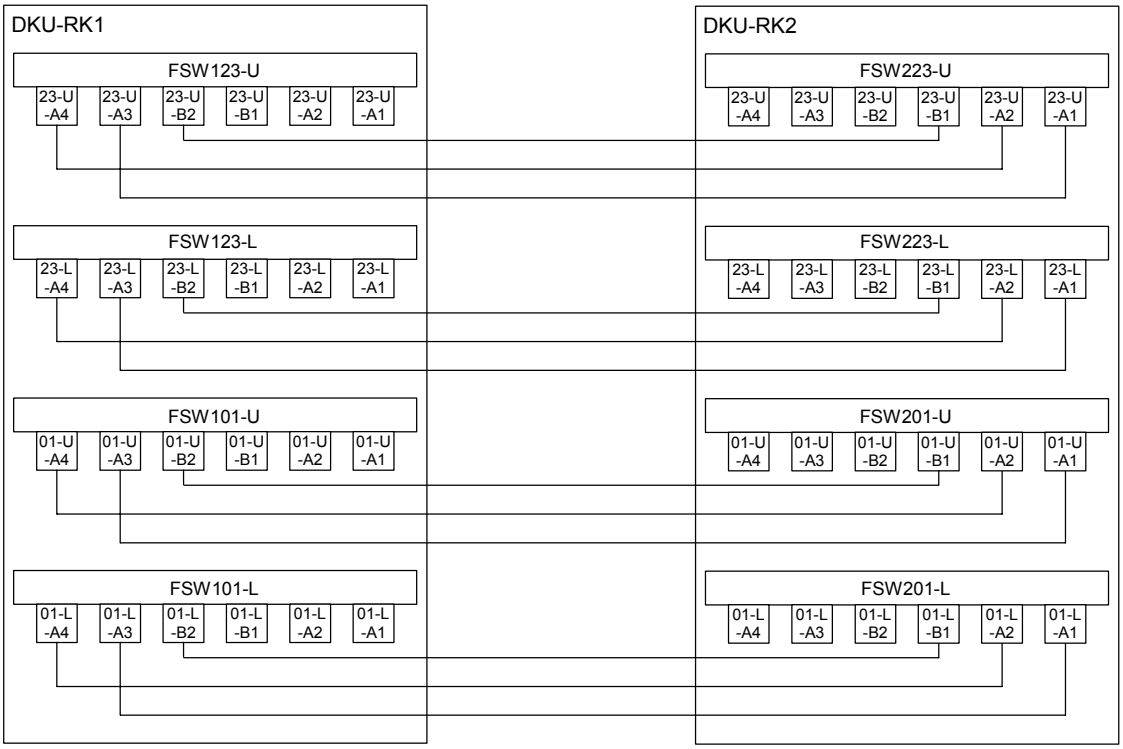


Fig. 5.1-5 Cable Diagram (UC1/EXC0)

DKU-RK2 to DKU-RK3

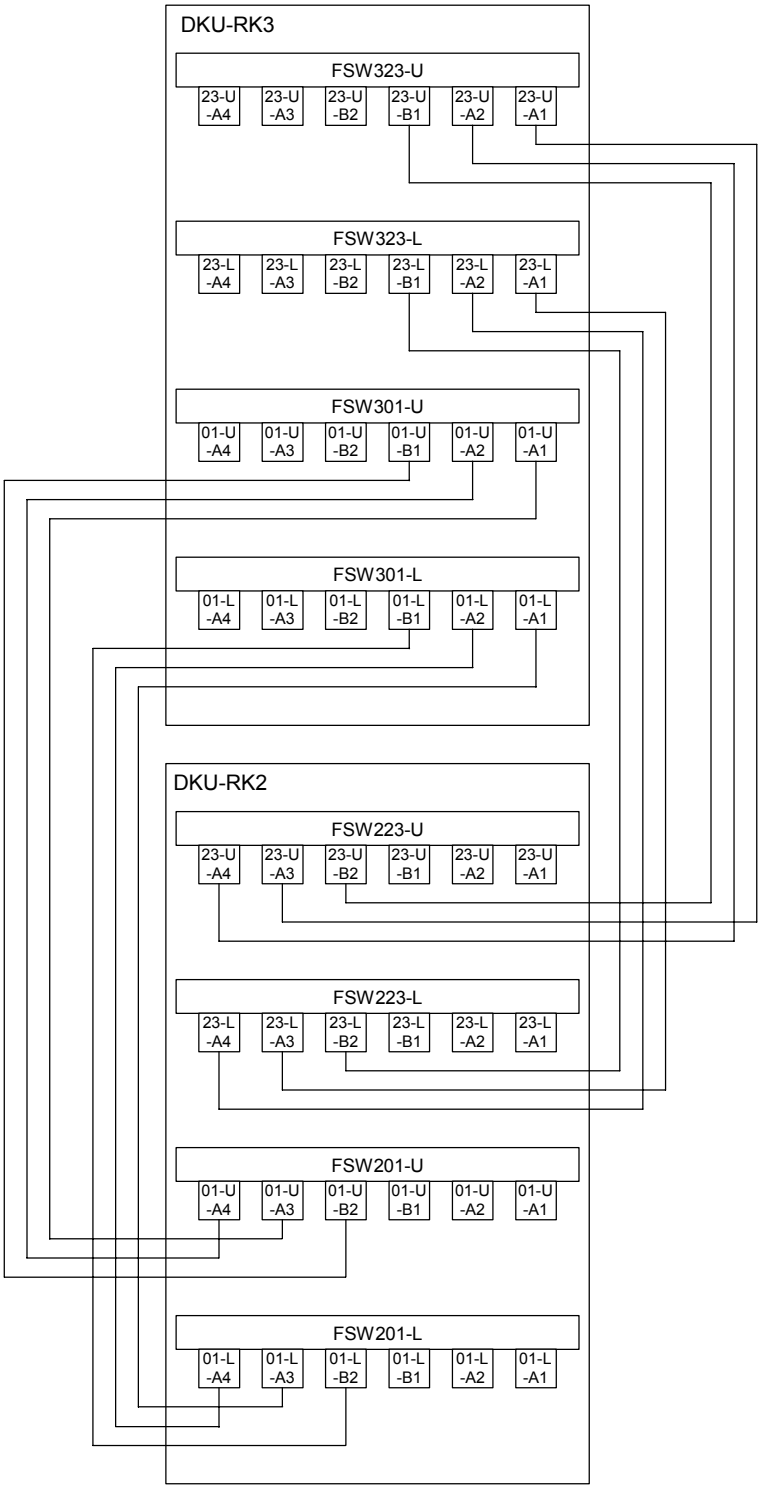
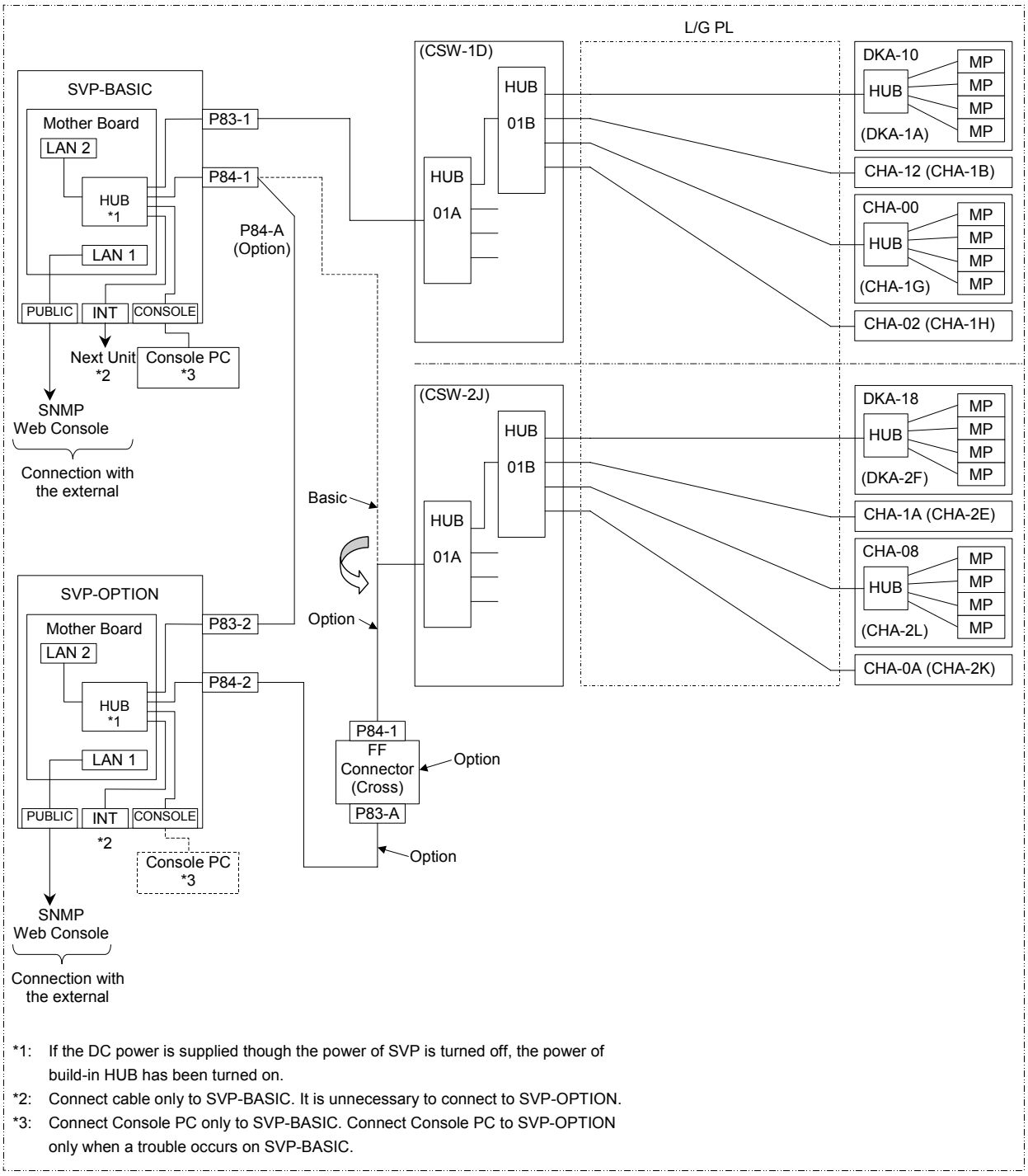


Fig. 5.1-6 Cable Diagram (UC1)

5.2 LAN Cable Diagram



*1: If the DC power is supplied though the power of SVP is turned off, the power of build-in HUB has been turned on.
*2: Connect cable only to SVP-BASIC. It is unnecessary to connect to SVP-OPTION.
*3: Connect Console PC only to SVP-BASIC. Connect Console PC to SVP-OPTION only when a trouble occurs on SVP-BASIC.

Fig.5.2-1 LAN Cable Diagram

6. Jumper Setting

6.1 Shut Down Jumpers

[1] DKCBOX

Check that the Shut Down LED is turned on. If not, connect the Shut Down Jumper (Maintenance Jumper) to the Shut Down Connector. (Only hot replace procedure)

⚠ CAUTION

A system down may be caused if the Maintenance jumper is inserted in a PCB other than that to be replaced. Make sure that it is the PCB to be replaced.

Table 6.1-1 Shut Down Jumpers List

No.	Function Name	Function	Remarks
1	CHA	Shut down jumper	
2	DKA		
3	CACHE		
4	SM		
5	CSW		(*1)

*1: When the CSW is forcibly replaced without the SVP operation by the Shut Down Jumper, a dummy replacement by the SVP operation is required to restore the paths.

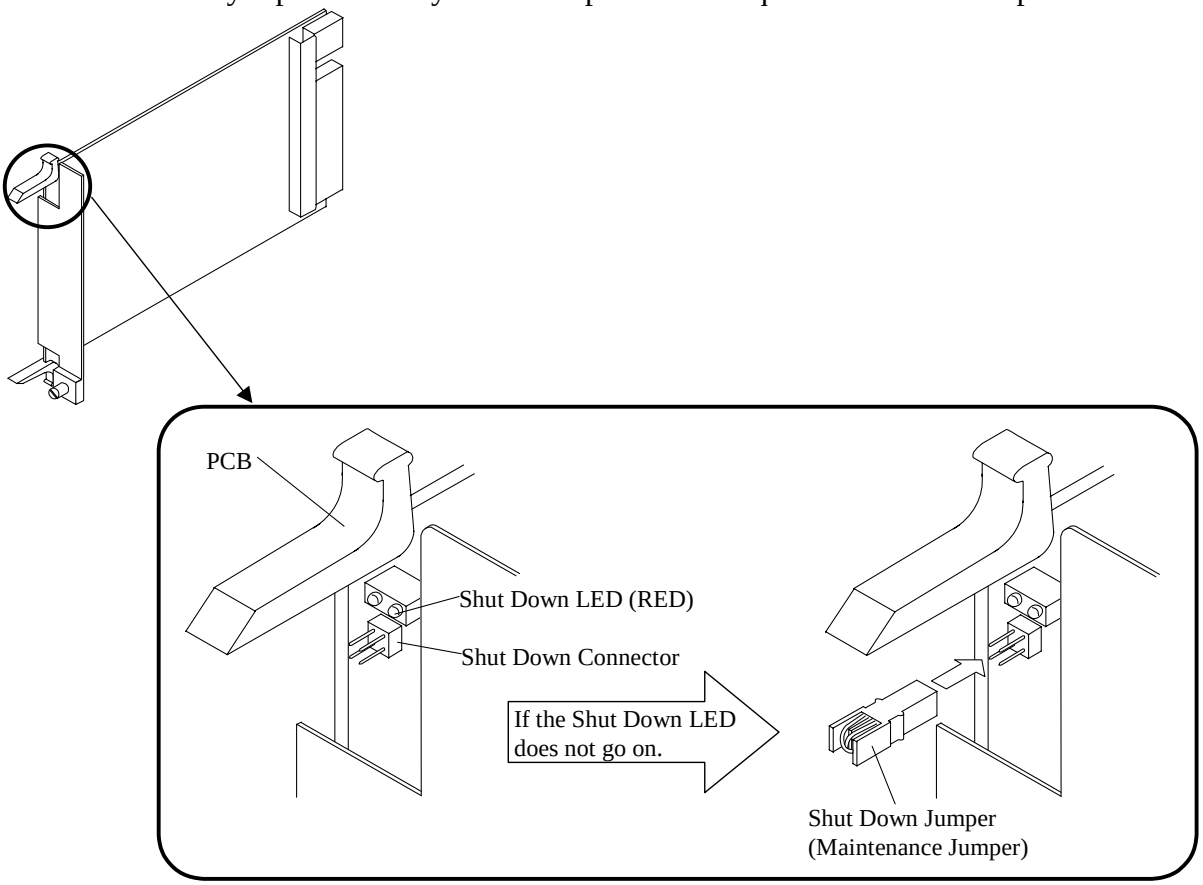


Fig. 6.1-1 Installation of Shut Down Jumper in the DKCBOX

6.2 Other Jumpers

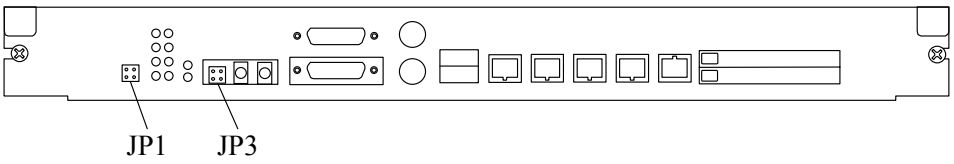
Table 6.2-1 Jumper Setting List

No.	Function Name	Jumper No.	Settings	Remarks
1	SVP	JP1	SVP PS Control Inhibition	
		JP3	SVP Initialization	
2	BATTERY	Switch	BATTERY PWR ON/OFF	
3	DKCPANEL	JP1	Cluster 1 PS ON	
		JP2	BATTERY MODE	
		JP3	FORCE POWER OFF	
		JP4	Cluster 2 PS ON	
		JP5	AUTO PWR ON	
		JP6	Not used	
		JP8	SSVP ALARM RESET	
		JP9	SSVP DUMP	
4	DKUPS	SW1	Specification of DKU ID	
		SW2, SW3	Specification of HDD BOX ID	
		SW4, SW5	Specification of ALPA	
5	FSW	SW1, SW2	Specification of FSW Address	
6	CSW	J2, J6	Specification of CE MODE	

[1] SVP

Table 6.2-2 Setting of Jumper Socket on the SVP

Function Name	Jumper No.	Settings	Remarks
SVP	JP1	The SVP Power ON/OFF Function of SSVP is inhibited by inserting Jumper.	
	JP3	The SVP setup is initialized by inserting Jumper.	



SVP

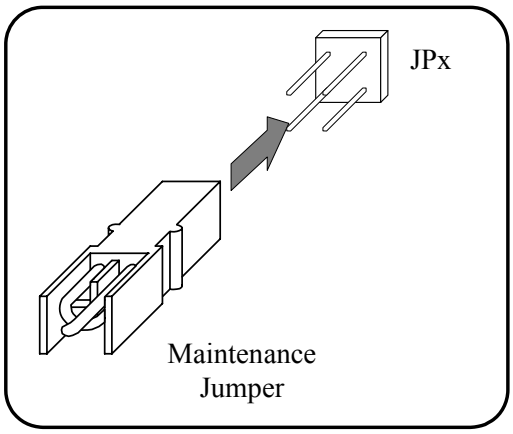


Fig. 6.2-1 Setting of Jumper on the SVP

[2] BATTERY BOX

CAUTION

When the battery switch is not set, data on the cache memory and shared memory are not assured when a power failure occurs. As a result, all the data on the cache memory and shared memory are lost causing a destruction of user data.
Be sure to set the battery switch.

When the subsystem power is to be turned off for longer than battery backup duration time, the battery switch must be turned off to protect the battery from deterioration. In this case, turn off the battery switch after making sure that the powering off process of the subsystem has been completed normally.

This switch is set in order to validate the battery when an AC power failure occurs.

Table 6.2-3 Battery Backup Duration Time

No.	Memory to be backed up	Maximum backup duration time
1	Shared Memory/Cache Memory	36 Hours (1.5 days)

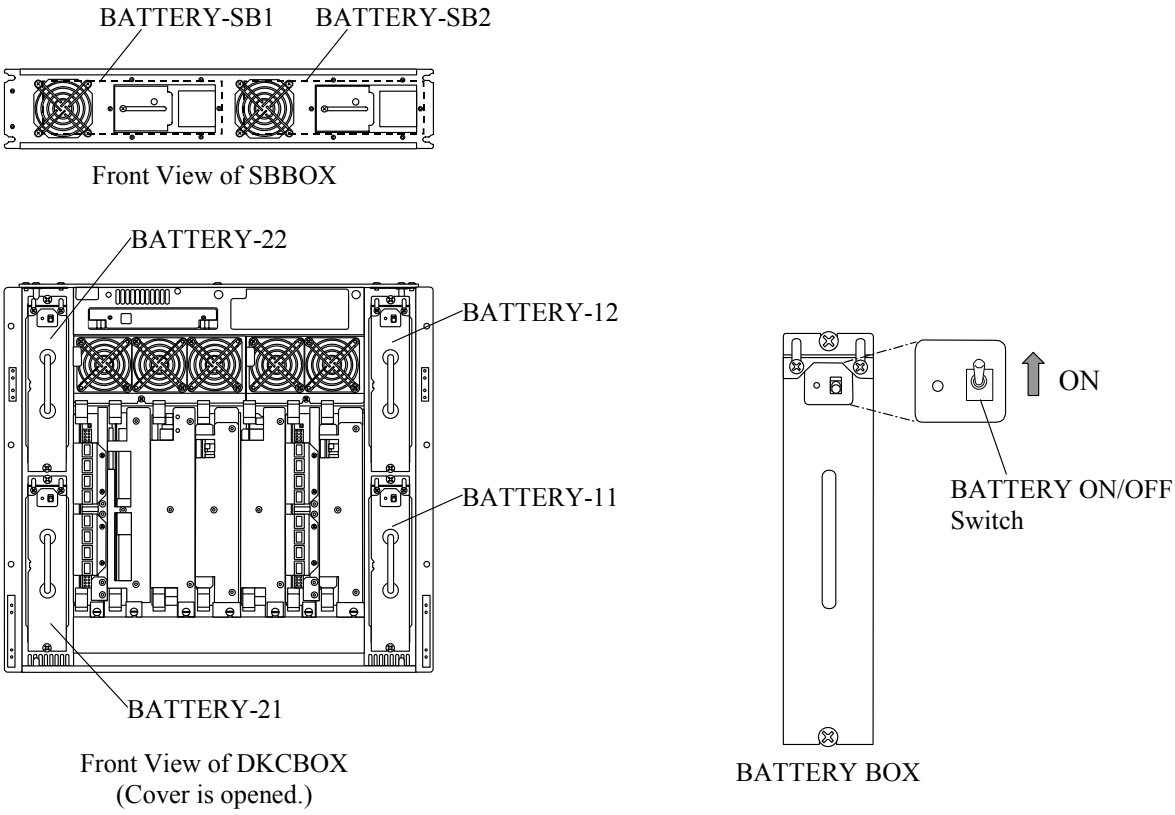


Fig. 6.2-2 Switch Setting of Battery Box

[3] DKCPANEL

Table 6.2-4 Setting of Jumper Socket on DKCPANEL PCB

Function Name	Jumper No.	Settings	Jumper Setting
DKCPANEL	JP1	The PS on the cluster 1 side is forcibly powered on when the jumpers are set up.	JP1 Maintenance Jumper
	JP2	The battery operation mode at the time of a power failure is set to the back-up mode.	JP2 Jumper
	JP3	This jumper is used to turn off the DKC/DKU power forcibly. It assumes a special case, so that do not use it unless otherwise instructed. (Refer to TRBL16-10 to 20 for the detailed procedure.)	JP3 Maintenance Jumper
	JP4	The PS on the cluster 2 side is forcibly turned on when the jumpers are set up.	JP4 Maintenance Jumper
	JP5	The subsystem is powered on through on operation of the PS ON/PS OFF switch or the PCI control after the AC power is turned on. (Initial setting)	Disable Setting JP5 Jumper
		The subsystem is powered on automatically after the AC power is turned on.	Enable Setting JP5 Jumper
	JP6	Not used	
	JP8	When the jumper is set, the SSVP detection alarm is reset. Then IMPL of the SVP is executed.	JP8 Maintenance Jumper
	JP9	When the jumper is set, the data in SVP memory is written to the HDD.	JP9 Maintenance Jumper

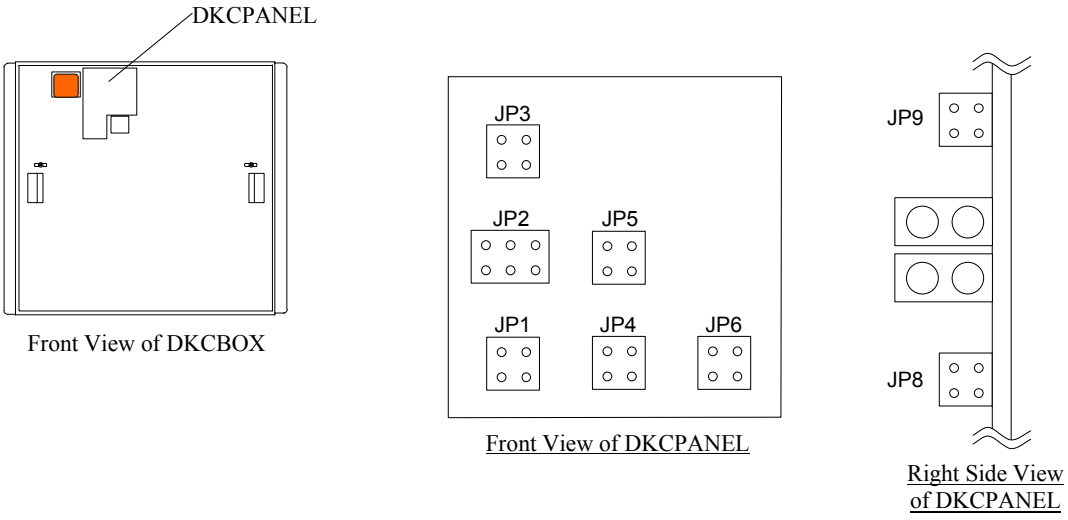


Fig. 6.2-3 Setting of Jumper Socket on DKCPANEL PCB

[4] DKUPS

Table 6.2-5 Switch Setting of DKUPS

Function Name	Switch No.	Settings	Remarks
DKUPS-xn1	SW1	DKU ID is set up.	
	SW2, SW3	HDU Box ID is set up.	
	SW4, SW5	ALPA is set up.	

Note: • Use something sharp (ex. a pen or a mini screwdriver etc) when set the DKUPS switches
• Since DKUPS-xn0 switch setting is unnecessary, leave it in the initial setting state.

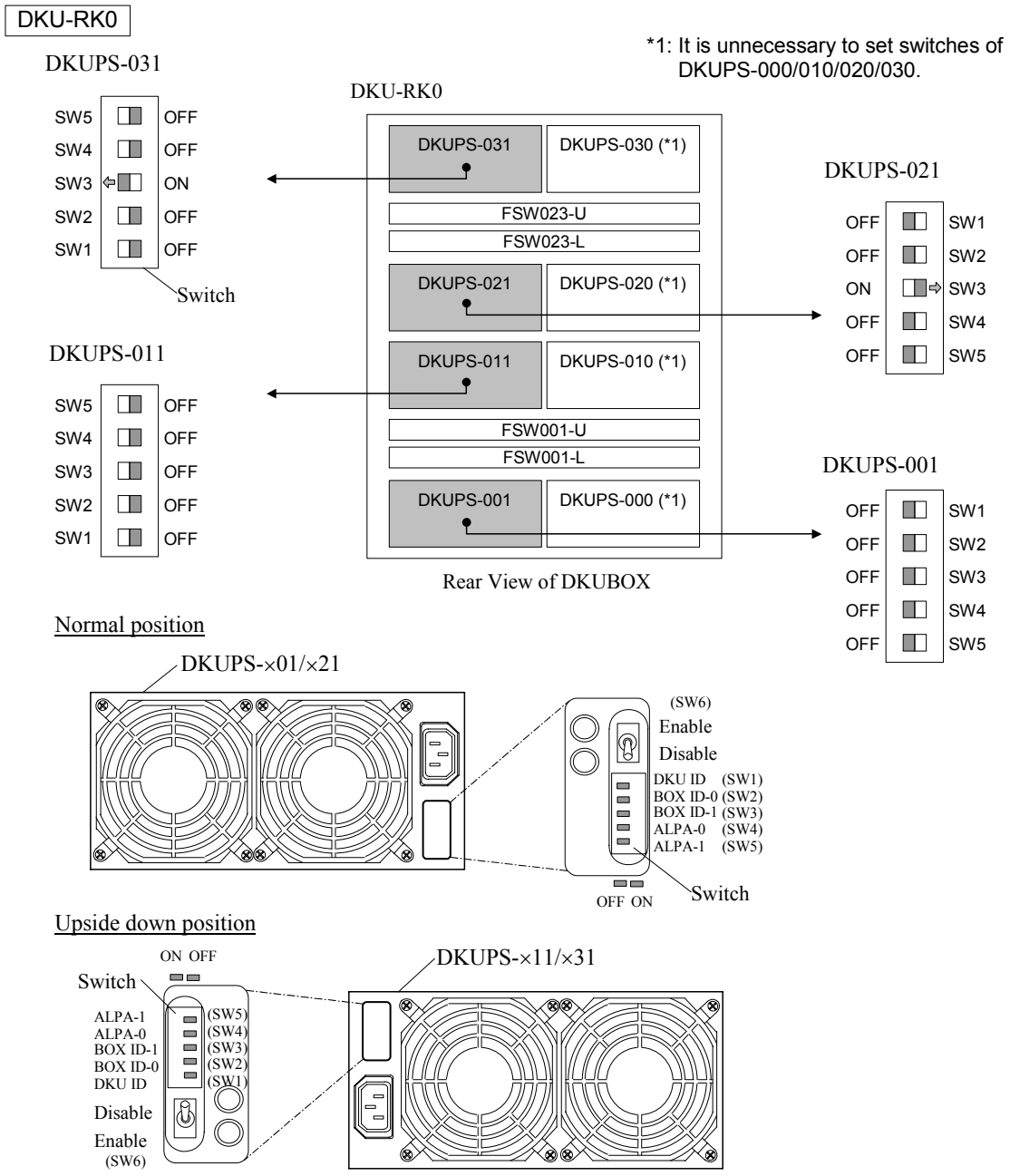


Fig. 6.2-4 Switch Setting of DKUPS (DKU-RK0)

DKU-RK1

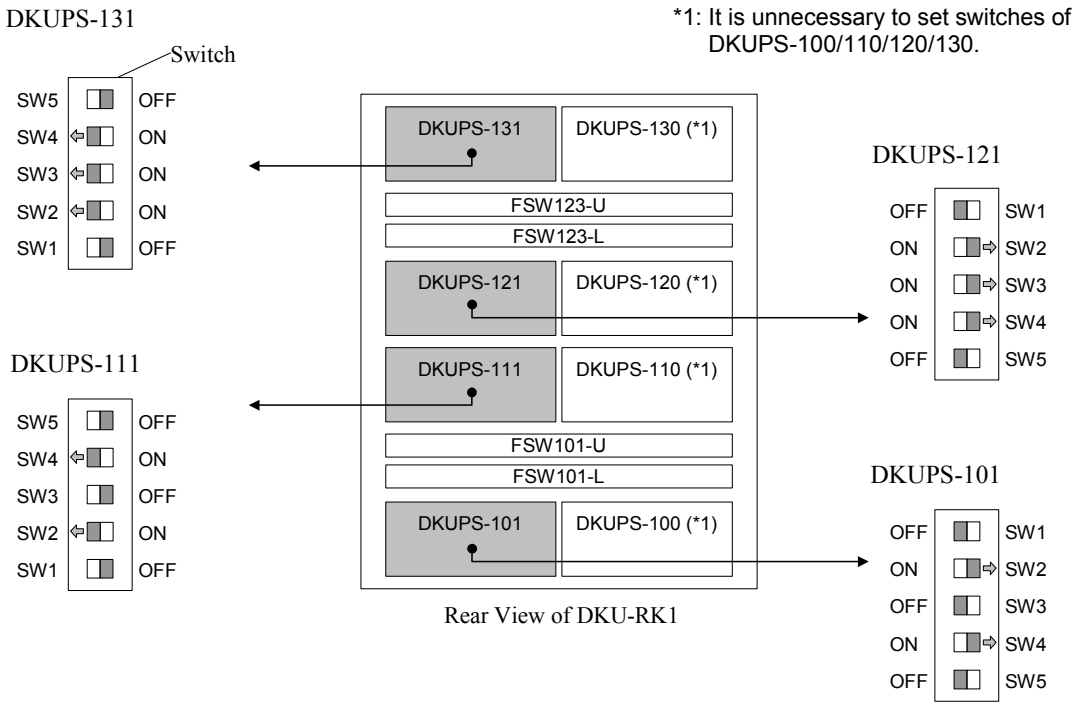


Fig. 6.2-5 Switch Setting of DKUPS (DKU-RK1)

DKU-RK2

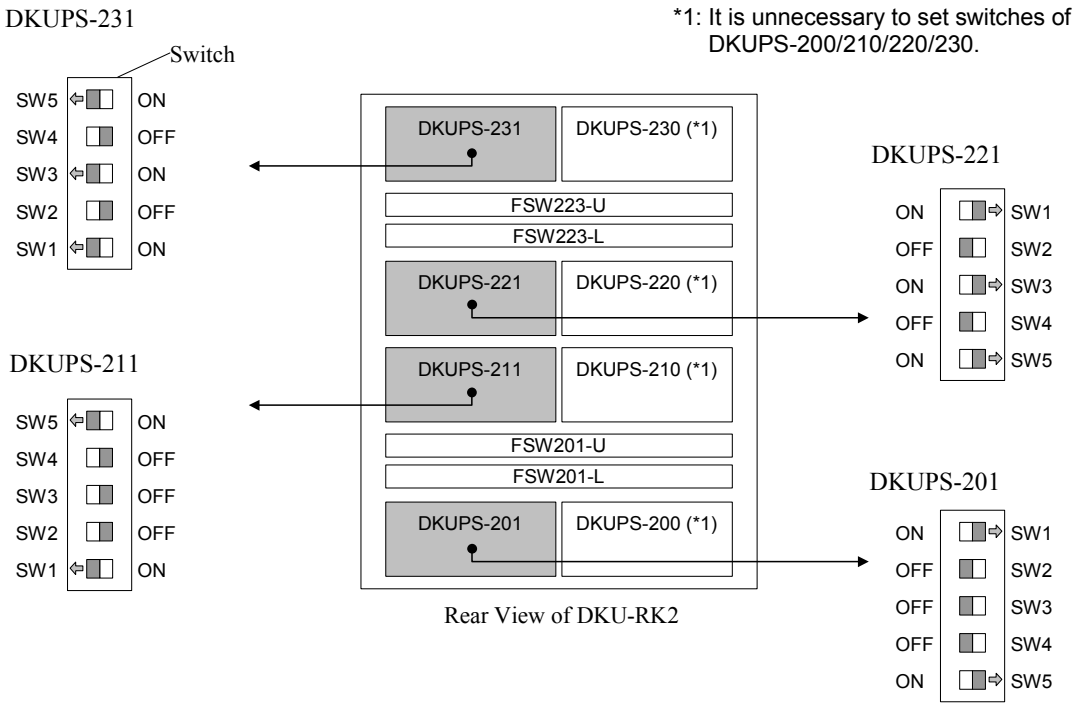


Fig. 6.2-6 Switch Setting of DKUPS (DKU-RK2)

DKU-RK3

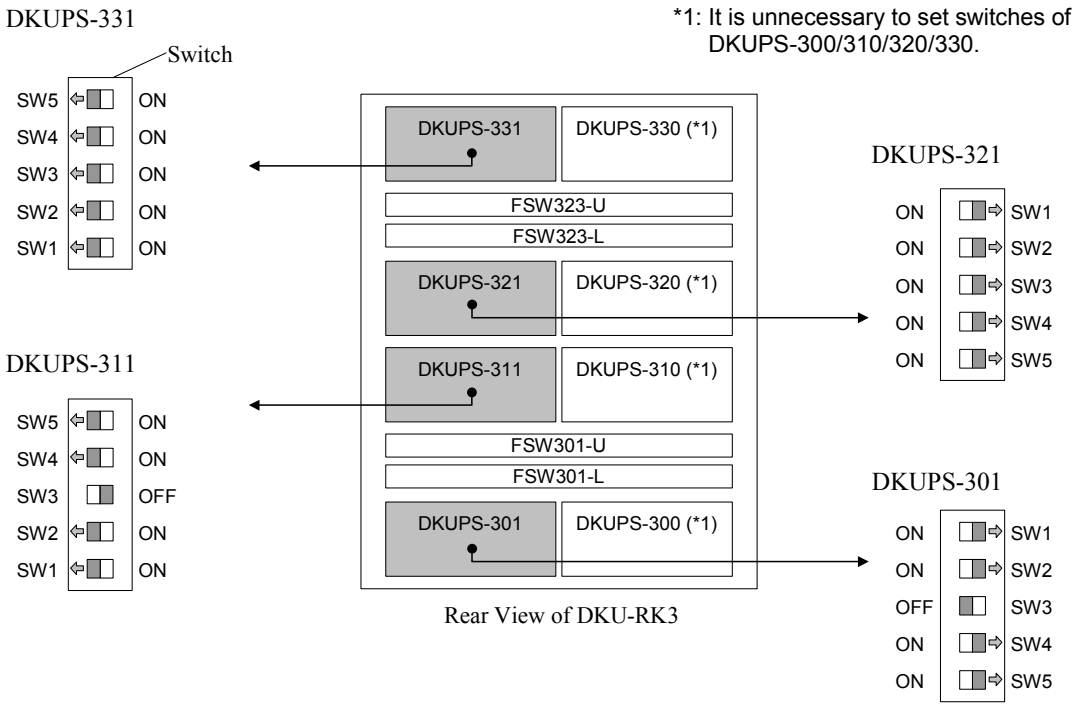


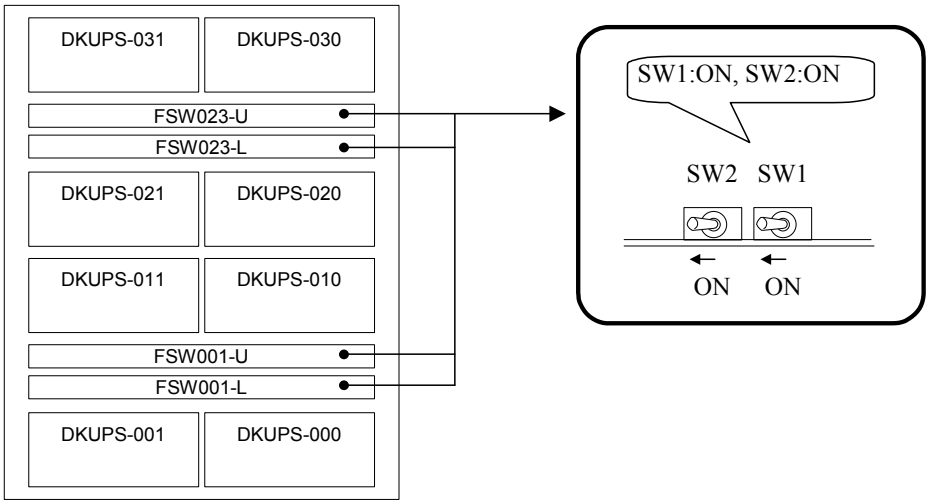
Fig. 6.2-7 Switch Setting of DKUPS (DKU-RK3)

[5] FSW

Table 6.2-6 Switch Setting of FSW

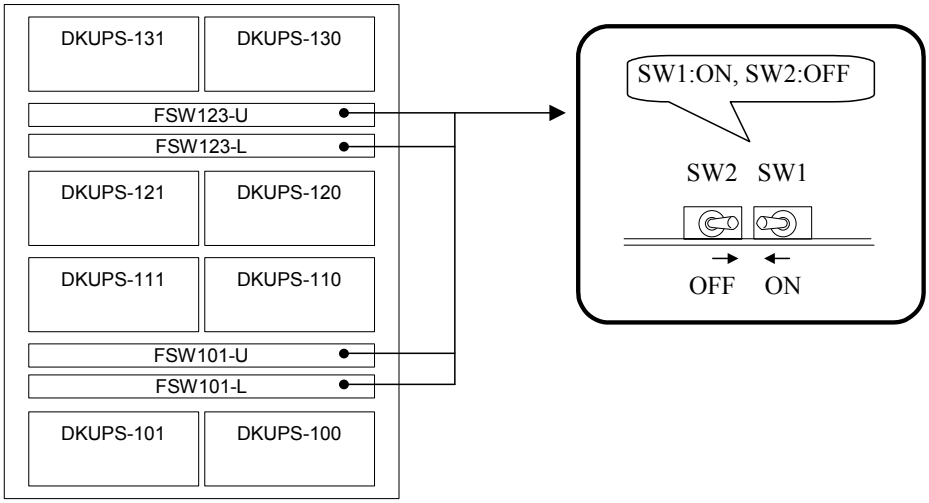
Function Name	Jumper No.	Settings	Remarks
FSW	SW1, SW2	The address of FSW is set up.	

DKU-RK0



Rear View of DKU-RK0

DKU-RK1



Rear View of DKU-RK1

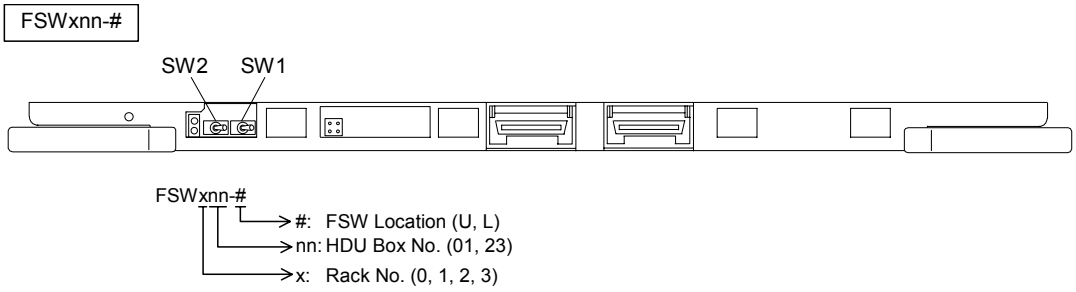
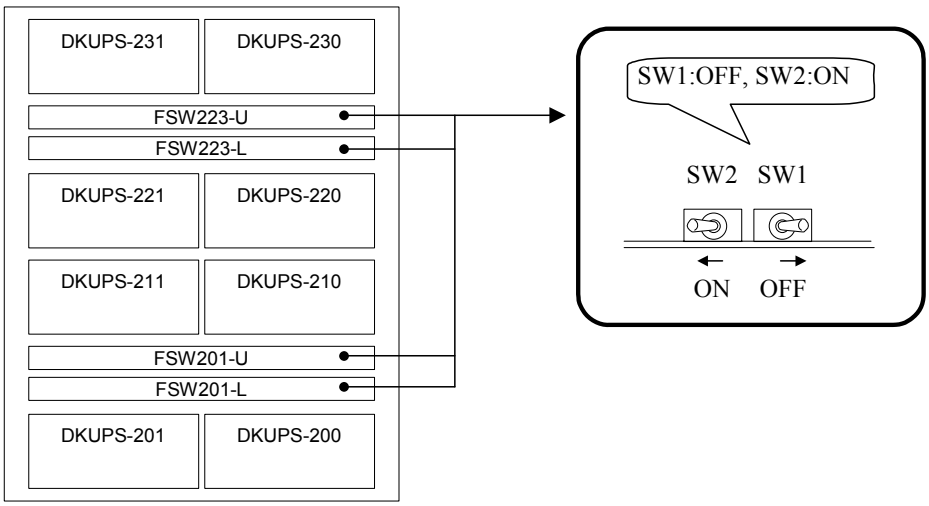


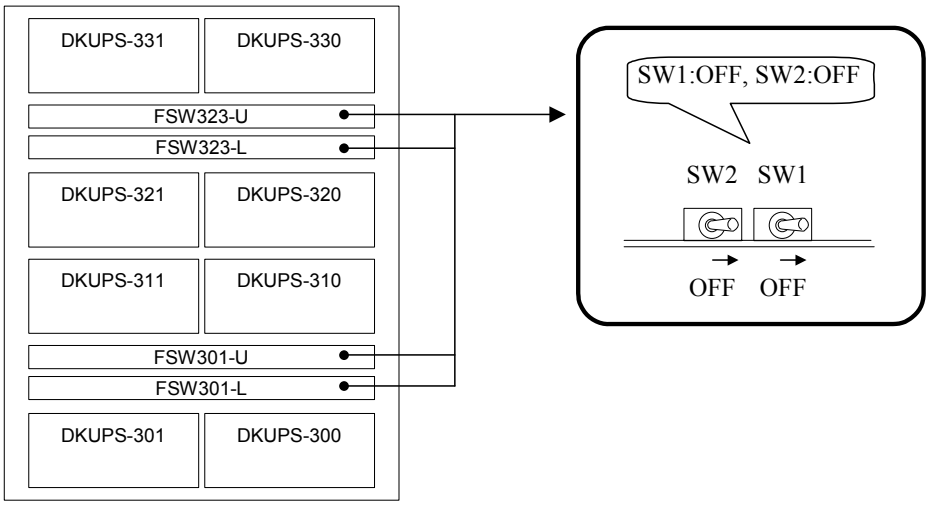
Fig. 6.2-8 Switch Setting of FSW

DKU-RK2



Rear View of DKU-RK2

DKU-RK3



Rear View of DKU-RK3

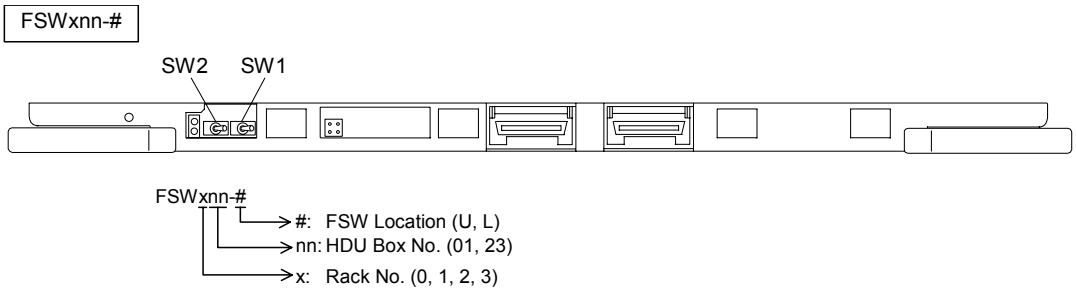


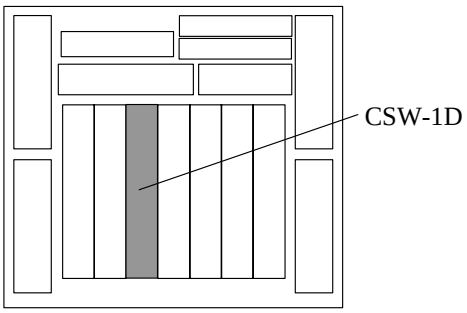
Fig. 6.2-9 Switch Setting of FSW

[6] CSW

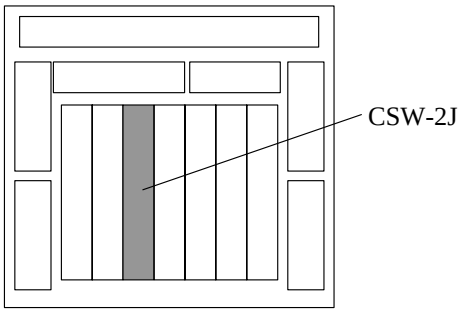
Table 6.2-7 Installation of Jumper in CSW

Function Name	Jumper No.	Settings	Remarks
CSW-1D/2J	J1 (Shut Down Connector)	When the Shut Down LED of replaced PCB is not lighted, the PCB can be forcibly blocked by inserting the jumper.	Shut Down Jumper (Maintenance Jumper) (*1)
	J2, J6	All PCBs corresponding to the cluster are set to CE mode.	Maintenance Jumper (Refer to INST02-320 step (10).)

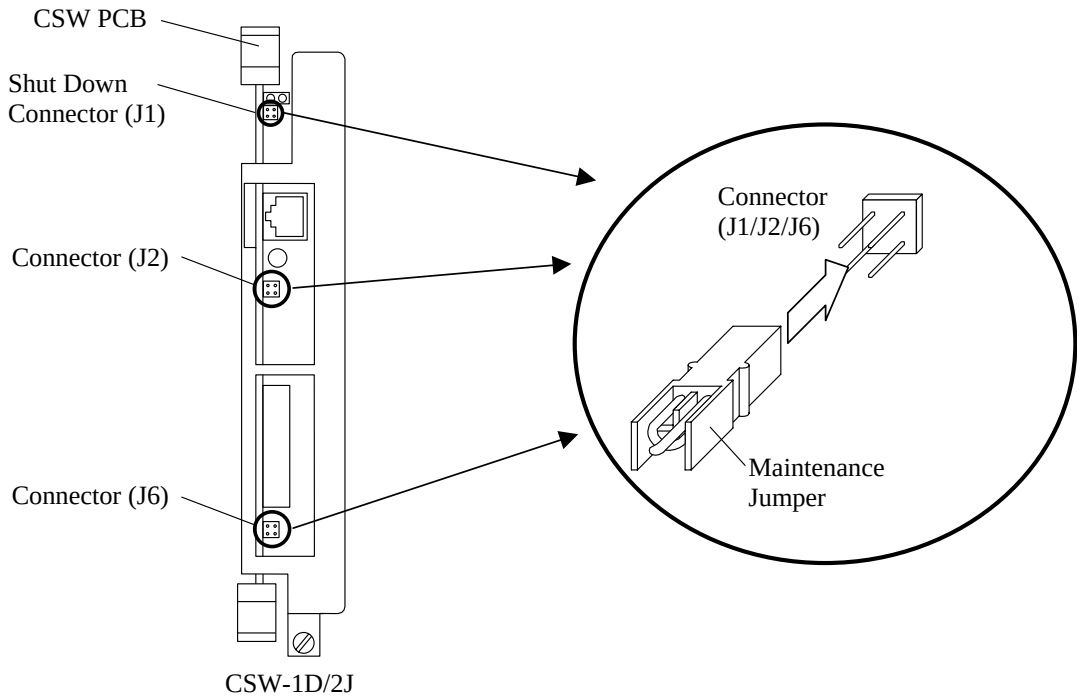
*1: When the CSW is forcibly replaced without the SVP operation by the Shut Down Jumper, a dummy replacement by the SVP operation is required to restore the paths.



Front View of DKCBOX



Rear View of DKCBOX



CSW-1D/2J

Fig. 6.2-10 Installation of Jumper in CSW