

SANUPS

D11A

Type R

DC Input Small Capacity AC Power Supply

1 kVA

100 V Model

Instruction Manual

SANYO DENKI

Introduction

Thank you for choosing the SANUPS (D11A Type R).

SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during operation, installation, and maintenance of the DC-AC Inverter to protect the safety of the service technician* and the customers. To use the DC-AC Inverter correctly and safely, read this manual before using the DC-AC Inverter. After reading, please keep it handy for convenient reference.

This DC-AC Inverter is intended for installation in a temperature-controlled indoor environment free of conductive contaminants.

- Operating temperature: 5 to 40°C (41 to 104°F)

Table of Contents

§1. Safety Precautions	1
§2. For Proper Operation	4
§2.1 Input Power Supply	4
§2.2 Installation Precautions	5
§2.3 Usage Precautions	6
§2.4 Troubleshooting	6
§2.5 Rack Mounting Precautions	6
§3. Checking the Contents of the Package	7
§4. External Dimensions and Part Names	9
§4.1 Unit	9
§4.2 Parallel Operation Cabinet	11
§4.3 Transfer Signal Terminal Block	13
§4.4 Alarm Test/Operation Selector	14
§5. Installing a Cabinet	15
§5.1 Checking the Installation Environment	15
§5.2 Checking the Input Power Supply	15
§5.3 Checking the Installation Space	15
§5.4 Transportation and Installation	16
§6. Cabinet Wiring	17
§6.1 Wiring the Input and Output Terminal Block	17
§6.2 Wiring the Transfer Signal Terminal Block	20
§7. Procedure Until DC-AC Inverter Operation	21
§8. Preparations Before Installing Units	22
§8.1 Checking Units	22
§8.2 Affixing Unit Number Labels	22
§8.3 Checking the Dip Switch	23
§9. Installing Units	24
§10. Preparations Before Operation	26
§10.1 Setting the Overload Alarm Level	26

* Service technician

This term is used to indicate service technicians from SANYO DENKI or entrusted from SANYO DENKI with knowledge of this DC-AC Inverter.
Maintenance work must not be performed by other than a qualified service technician.

Models

This instruction manual is intended to be used for the following models. Check the model name of the DC-AC Inverter before use.

Inverter Unit Model Name	Parallel Operation Cabinet Model Name	Number of Installable Units	Bypass Circuit
D11A102B001US	PD-D11AB03US	3	Unavailable
	PD-D11AB05US	5	
	PD-D11AB06US	6	
D11A102B011US	PD-D11AB13US	3	Available
	PD-D11AB15US	5	
	PD-D11AB16US	6	

§11. Operating Procedures	27
§11.1 D11A102B001US Operating Procedures	27
§11.2 D11A102B011US Operating Procedures	28
§12. Operation and Protective Functions	29
§12.1 D11A102B001US Basic Operation	29
§12.2 D11A102B011US Basic Operation	31
§12.3 D11A102B011US Special Function Operation	33
§12.4 Protective Function Table	34
§13. Inspection and Maintenance	36
§13.1 Routine Checks by Customer	36
§13.2 Maintenance by Service Technician	37
§13.2.1 Procedure to Remove the Unit	38
§13.2.2 Procedure to Install the Unit	39
§13.2.3 Procedure to Install an Additional Unit	40
§13.2.4 Procedure to Replace the Display Unit	41
§13.2.5 Resetting the Bypass Breaker	43
§13.2.6 Procedure to Remove the Cabinet	44
§14. Wiring and Settings for Parallel and Standby Operation	46
§15. LCD Display and Operation	47
§15.1 LCD Part Names	47
§15.2 Display Content List	47
§15.3 Operating the LCD	48
§16. Specifications	49
§17. Warranty	50

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A

Translation:

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

VCCI-A

§1. Safety Precautions

PRECAUTIONS (IMPORTANT SAFETY INSTRUCTIONS)

This Manual contains important instructions for operating and maintaining the DC-AC Inverter to protect the safety of the service technician and the customers.

Before installing, operating, performing maintenance or inspecting the DC-AC Inverter, be sure to read this manual and accompanying documents carefully to obtain a clear understanding of the information related to its operation, safety and important precautions.

This manual described two warning levels, WARNING and CAUTION, as described below.

Label	Explanation
 WARNING	Denotes immediate hazards which WILL probably cause severe bodily injury or death, as a result incorrect operation.
 CAUTION	Denotes hazards which COULD cause bodily injury and product or property damage, as a result incorrect operation.

Additionally, even those hazards denoted by  **CAUTION** could lead to a serious accident, so the instructions should be strictly followed.

The following labels indicate particularly important instructions which must be carefully followed. The graphic symbols indicate prohibited and mandatory actions.

Symbol	Explanation
	Indicates actions that must not be allowed to occur (prohibited actions).
	Indicates actions that must be taken (mandatory actions).  : This example signifies the mandatory actions.  : This example signifies that the equipment must be securely grounded.
	Indicates CAUTION (including WARNING). Specific information appears within the graphic symbol or in an explanation nearby.  : This example signifies the general caution.  : This example signifies that there is danger of electric shock.  : This example signifies that there is danger of a fire or smoke generation.

1. Relocation and Transportation Precautions

CAUTION

- Be careful to avoid falling or dropping the DC-AC Inverter during relocation or transportation, as bodily injury could result.
- Be careful to avoid back strain when handling the DC-AC Inverter.

2. Installation Precautions

CAUTION

- The DC-AC Inverter should be installed only by a service technician. Furthermore, it should be installed in accordance with the instructions in the instruction manual. Improper installation can result in electric shock, bodily injury, and/ or fire. 
- Never operate or store the DC-AC Inverter in the following environmental conditions. Doing so may cause the DC-AC Inverter to malfunction, sustain damage or deteriorate, which could result in a fire.  
 - a. In ambient environmental conditions other than those specified in the product brochure and instruction manual (temperature 5 to 40°C (41 to 104° F), relative humidity 5 to 85%), such as in extremely high or low temperature and high humidity.
 - b. Where the DC-AC Inverter is exposed to direct sunlight.
 - c. Where the DC-AC Inverter is directly exposed to the heat from a heat source, such as a stove.
 - d. Where the DC-AC Inverter may be subject to vibration or physical shock.
 - e. Near a device that may emit sparks.
 - f. In the presence of dust, salt or corrosive or flammable gas.
 - g. Outdoors
- This DC-AC Inverter is for rack-mounted use only. Please consult our sales office or your distributor when the device needs to be removed from the rack.
- Be careful not to block the air intake and exhaust vents of the DC-AC Inverter. Mount the DC-AC Inverter in a rack that can be well ventilated, and keep the front and back of the DC-AC Inverter at least 20 cm (7.9 inches) away from the wall. Be careful not to block the air intake and exhaust vents of the rack and DC-AC Inverter. If the air intake or exhaust vent is blocked, the internal temperature of the DC-AC Inverter will rise, which may cause a fire. For maintenance, the DC-AC Inverter requires at least 1 m (39.4 inches) of space at the front, and at least 50 cm (20 inches) at the back. 
- The space around the DC-AC Inverter must be ventilated.
- In accordance with the instructions in the manual, install the DC-AC Inverter on a stable surface capable of bearing the weight (approximately 8 kg (17.6 lbs) for one unit, approximately 10 kg (22.1 lbs) for a parallel operation cabinet for 3 units, approximately 12 kg (26.5 lbs) for a parallel operation cabinet for 5 units, and approximately 13 kg (28.7 lbs) for a parallel operation cabinet for 6 units). If the DC-AC Inverter is installed incorrectly, it may fall or move inadvertently, resulting in bodily injury. Be careful to avoid back strain when handling the DC-AC Inverter.

3. Wiring Precautions

CAUTION

- Wiring should be performed only by technically qualified personnel. Furthermore, it should be performed in accordance with the instructions in the manual. Incorrect wiring can result in electric shock and/or fire.  
- A readily accessible disconnect device shall be incorporated external to the equipment.
- Protection in primary circuits against over currents, short circuits and earth faults is not provided inside this DC-AC Inverter. Protection in primary circuit against over currents short circuits and earth faults shall be provided as part of the building installation. 
- Connect the grounding cable securely in the manner specified. This DC-AC Inverter requires class D grounding work. Failure to connect the grounding cable may result in electric shock. 
- The grounding cables of all load devices connected to the output of the DC-AC Inverter must be securely connected to the grounding terminal. Failure to connect the grounding cables correctly may result in electric shock. 
- Install the disconnect device whose contact gap is 2 mm (0.08 inches) or more in DC Input.
- Install the disconnect device whose contact gap is 3 mm (0.12 inches) or more in AC Input. (In the case of the PD-D11AB13US, PD-D11AB15US and PD-D11AB16US model.)

4. Operating Precautions

WARNING

- Immediately shut the DC-AC Inverter off if it malfunctions, or if an unusual odor or noise is observed. Failure to do so may result in a fire.
- Do not open the cover of the DC-AC Inverter. There is danger of electric shock and equipment damage.



PROHIBITED

- Never use the DC-AC Inverter for the following types of loads:
 - a. Medical instruments used for life support.
 - b. Control units for trains or elevators, failure of which could cause bodily injury.
 - c. Computer systems upon which social or public infrastructure depends.
 - d. Devices which serve applications related to the above.



Contact your sales representative if you need to use the DC-AC Inverter in an application like the above. Special equipment, such as redundant devices or an emergency generator must be incorporated when operating, maintaining and controlling systems in which a DC-AC Inverter is used with loads affecting life-support or public infrastructure-dependent applications.

- This DC-AC Inverter must be installed, operated and maintained by technically qualified personnel with expertise in an industrial environment.
- Do not smoke or use an open flame near the DC-AC Inverter, as it could cause the DC-AC Inverter to explode or rupture, resulting in injury or fire.
- Do not place containers of liquid, such as a flower vase, on the DC-AC Inverter. If the container was to spill, the liquid could cause a short circuit, resulting in sparks or fire inside the DC-AC Inverter.
- Do not sit, step or lean on the DC-AC Inverter, as bodily injury could result if the DC-AC Inverter was to fall.
- Do not operate the switches with wet hands. There is danger of electric shock.
- All repairs and modifications to the DC-AC Inverter are prohibited. The DC-AC Inverter contains high voltage and no user serviceable parts. Opening the cover, parts exchange, and repair can result in electric shock and damage to the DC-AC Inverter when performed by anyone other than qualified service personnel. All such repairs and modifications will void the warranty.



CAUTION

- Before starting the DC-AC Inverter, check the load-side safety, and operate the DC-AC Inverter in accordance with the instructions in the manual. If power is supplied incorrectly, an electric shock or bodily injury could result.
- Avoid inserting sharp objects or fingers into the fan. Doing so may result in bodily injury.
- Do not touch the DC-AC Inverter, including the cables, if you hear thunder nearby. There is danger of electric shock from a lightning strike.
- When disposing of this DC-AC Inverter, dispose of it as industrial waste.



5. Maintenance and Inspection Precautions

CAUTION

- Maintenance and repair of the inside of the DC-AC Inverter should be performed only by technically qualified personnel. Electric shock, bodily injury and burns, fuming, or fire could otherwise result.
- Do not insert a metal object or fingers into the input and output terminal block of the DC-AC Inverter. There is danger of electric shock.
- Contact your supplier or Sanyo Denki to have the DC-AC Inverter repaired or to replace defective parts. Opening the cover carelessly can result in an electric shock or burn.



§2. For Proper Operation

§2.1 Input Power Supply

(1) DC Input Power Supply

The following table shows the DC input power supply for this DC-AC Inverter. Use the DC-AC Inverter according to its rated voltage.

Cabinet Model Name	Unit Model Name	Rated Voltage	Voltage Range
PD-D11AB*3US PD-D11AB*5US PD-D11AB*6US	D11A102B001US D11A102B011US	-48 V	-40.5 V to -57 V

(2) AC Input Power Supply

The following table shows the AC input power supply for this DC-AC Inverter. Adjust the output voltage of the DC-AC Inverter to the AC input power supply in the place where you use the DC-AC Inverter.

Cabinet Model Name	Unit Model Name	Output Voltage Setting	AC Input Voltage	AC Input Frequency
PD-D11AB13US PD-D11AB15US PD-D11AB16US	D11A102B011US	100 V	100 V (±15%)	50 or 60 Hz (±5%)
		120 V	120 V (±15%)	50 or 60 Hz (±5%)

(3) Input Power Supply Capacity

The following table shows the input capacity for this DC-AC Inverter. The input power supply capacity must be larger than the input capacity shown in the table below.

Number of Connected Units	Max. Input Current				Recommended capacity of Breaker (UL or IEC standard)	
	Increased Capacity Operation (N units)		Redundant Operation (N + 1 units)		DC Input (A)	AC Input (A) ※1
	DC Input (A)	AC Input (A) ※1	DC Input (A)	AC Input (A) ※1		
1	30.0	12.5	—	—	40	20
2	62.3	25.0	31.7	12.5	80	40
3	93.5	37.5	63.4	25.0	125	50
4	125.6	50.0	94.6	37.5	175	70
5	155.8	62.5	126.7	50.0	200	80
6	187.0	75.0	156.9	62.5	250	100

If you schedule the number of inverter units to be increased later, install the breaker (UL489 (For use in North America) or IEC 60947-2 (For Use Overseas) approval) of the capacity in which the number of inverter units is increased.

Protect branch circuit by using the breaker (UL489 (For use in North America) or IEC 60947-2 (For Use Overseas) approval) of the specified capacity on distribution panels. To meet the requirement of UL standards, always protect both polarities.

※1 Note

Items indicated with "※1" apply only to the D11A102B011US model. They do not apply to the D11A102B001US model.

§2.2 Installation Precautions

- (1) Installation must be in accordance with National Electric Code, Articles 110-16, 110-17 and 110-18.
- (2) This DC-AC Inverter is designed to permit the connection of the earthed conductor of the DC supply circuit to the earthing conductor at the equipment only use by restricted access locations. ※2

※2 RESTRICTED ACCESS LOCATION shows a location for equipment where both of the following paragraphs apply.

- Access can only be gained by service technician or by users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
- Access is through the use of a tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.

- (3) When you connect the DC input cables (to the cabinet terminal block: + (0 V) and - (-48 V)), check the polarity (+/-) and make sure you connect the cables to the correct terminals.
- (4) When the DC-AC Inverter receives DC input power, an inrush current of approximately 28 A (approximately 100 msec) flows for each unit and the DC-AC Inverter automatically enters the standby state. When you perform a test using a fuse for the DC input to check the equipment, be sure to use a fuse capable of withstanding this inrush current.
- (5) High leakage current. Connect the grounding line before connecting the power supply. When you install a leakage-current breaker for the power receiving circuit of the AC input terminal, be sure to use a breaker capable of protecting both the poles. Also, consider the leakage current. The maximum leakage current of the DC-AC Inverter is 3.5 mA per unit.※1
- (6) Keep the DC-AC Inverter at least 1 m (approximately 40 inches) away from CRT displays. Other devices which may be sensitive to magnetic flux should be kept away from the DC-AC Inverter.
- (7) The DC-AC Inverter employs a fan for forced-air cooling. Provide the clearances specified in §5.3 "Checking the Installation Space" at the front and back of the DC-AC Inverter to permit air to flow freely at the air intake and exhaust vents.
- (8) When the AC input power is single-wire grounded, always connect the ground phase to the S terminal side of the AC input terminal block.※1
- (9) Connect the grounding cables of load devices to the E terminal (earth terminal) of the DC-AC Inverter. If you must make a single-wire grounded connection on the input side of a load device, always connect the ground phase to the V terminal side of the AC output terminal block to prevent a power supply short circuit caused by grounding.

※1 Note

Items indicated with "※1" apply only to the D11A102B011US model. They do not apply to the D11A102B001US model.

§2.3 Usage Precautions

- (1) Never short-circuit the output terminals or connect a load with a short-circuit current.
Doing so will cause the protective functions to activate or the breaker to trip, preventing output.
- (2) Unsuitable load devices
Do not connect laser printers, plain paper fax machines, copy machines, overhead projectors, vacuum cleaners, construction drills, or dryers as load devices.
Such devices typically include heating elements that draw high current such as the starting current, so the DC-AC Inverter may be overloaded.
As a result, the output voltage becomes unstable, which may adversely affect other connected devices.
- (3) Insulation testing
Before testing the indoor wiring insulation, shut down the DC-AC Inverter and disconnect the input and output cables.
Conducting an insulation test with the DC-AC Inverter connected may damage electronic components such as the built-in arrester.

§2.4 Troubleshooting

If any of the failures described below occurs, contact your supplier or Sanyo Denki.

- ① When the INVERTER LED (blue) on the front panel of the unit does not turn on ※1.
- ② When the ALARM LED (red) on the front panel of the unit turns on.
When other events that are regarded as failures (unusual odor, noise, etc.) occur.
- ③ For details, see § 12.1 (3) or 12.2 (4) "When one unit fails."

※1 Note

If DC power is not received, or the DC input voltage is insufficient, the LED does not turn on.

§2.5 Rack Mounting Precautions

When you mount the cabinet and units on a 19-inch rack, you need to obtain support rails capable of bearing the weight of the units and parallel operation cabinet. The following table shows the weight of the cabinet and units.

Rack mounting support rails are not supplied with the DC-AC Inverter, as the dimensions of the support rails vary depending on the rack.

Contact your rack manufacturer for further information.

Weight of units and parallel operation cabinet

The following table shows the weight of the units and parallel operation cabinet. Check the weight of your DC-AC Inverter configuration.

DC-AC Inverter	Unit (Weight per unit)	Parallel Operation Cabinet			Total Weight
		For 3 units	For 5 units	For 6 units	
Single article	Approx. 8 kg (17.6lbs)	Approx. 10 kg (22.1 lbs)	Approx. 12 kg (26.5 lbs)	Approx. 13 kg (28.7 lbs)	—
When 3 units are mounted in a parallel operation cabinet for 3 units	Approx. 24 kg (52.9 lbs) (8 kg (17.6 lbs) x 3 units)	Approx. 10 kg (22.1 lbs)	—	—	Approx. 34 kg (75 lbs)
When 5 units are mounted in a parallel operation cabinet for 5 units	Approx. 40 kg (88.2 lbs) (8 kg (17.6 lbs) x 5 units)	—	Approx. 12 kg (26.5 lbs)	—	Approx. 52 kg (114.7 lbs)
When 6 units are mounted in a parallel operation cabinet for 6 units	Approx. 48 kg (105.8 lbs) (8 kg (17.6 lbs) x 6 units)	—	—	Approx. 13 kg (28.7 lbs)	Approx. 61 kg (134.5 lbs)

§3. Checking the Contents of the Package

After you open the package, check to make sure that it contains all of the following items.

Does it contain the DC-AC Inverter and all accessories?

Is the exterior of the DC-AC Inverter damaged or unusual?

Check and place a mark in .

If any item is missing or unusual, contact your supplier or Sanyo Denki.

(1) Parallel operation cabinet

<input type="checkbox"/> Parallel operation cabinet	1
Model name: PD-D11AB*3US (for 3 units)	
Model name: PD-D11AB*5US (for 5 units)	
Model name: PD-D11AB*6US (for 6 units)	
<input type="checkbox"/> Instruction manual (this manual)	1
<input type="checkbox"/> Unit number label sheet	1
<input type="checkbox"/> Warranty card	1

(2) Unit (the following items are included in each unit)

<input type="checkbox"/> Unit (D11A102B001US or D11A102B011US)	1
<input type="checkbox"/> Instruction manual (this manual)	1
<input type="checkbox"/> Warranty card	1

Note on transferring or selling the DC- AC Inverter

When you transfer or sell the DC-AC Inverter to a third party, transfer or sell all the accessories supplied with the DC-AC Inverter.

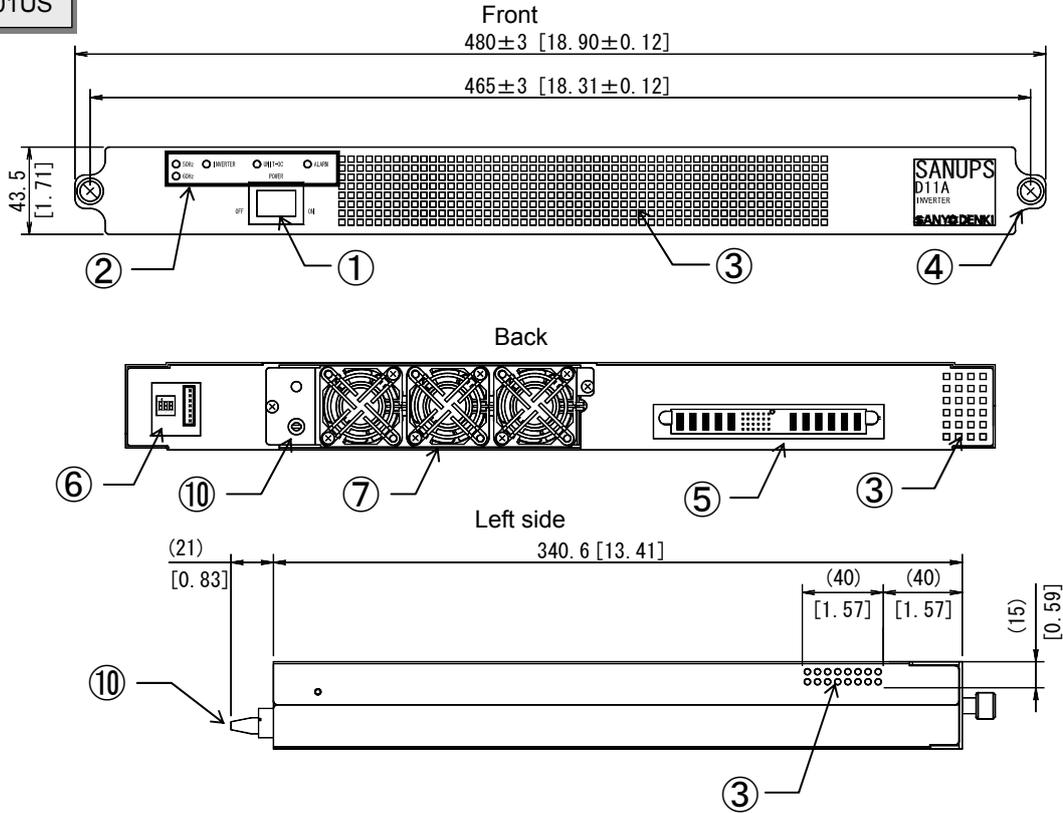
Blank page

§4. External Dimensions and Part Names

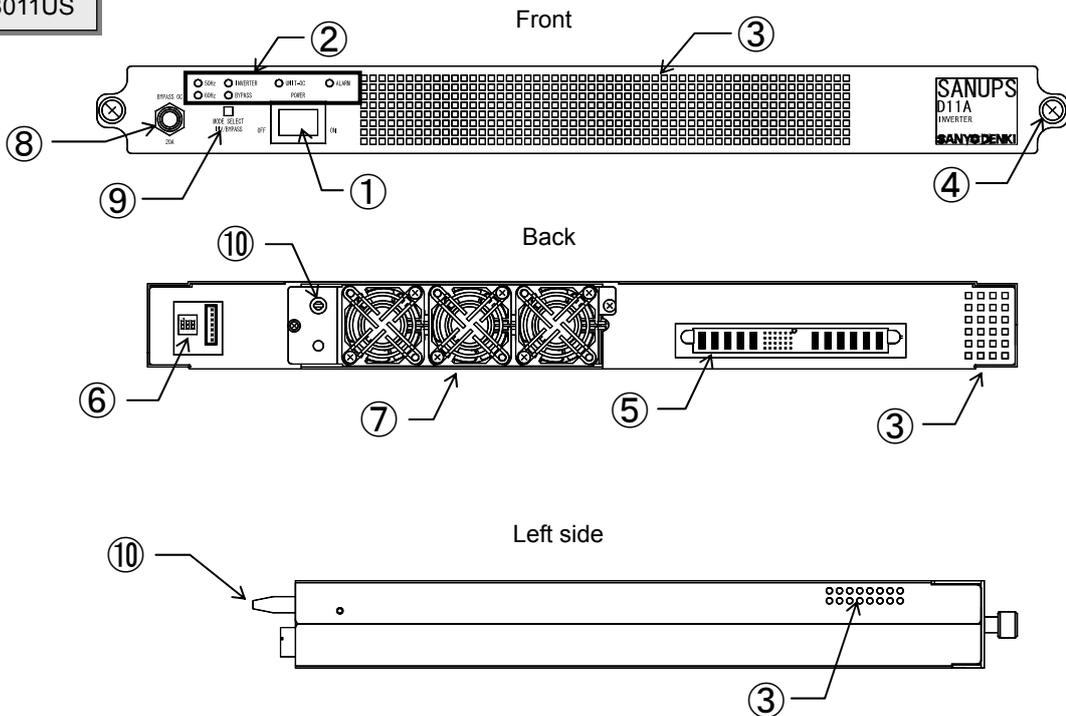
§4.1 Unit

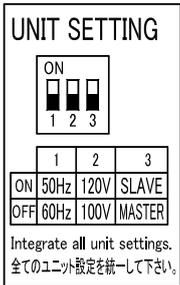
Unit: mm [inch]
Weight: Approx. 8 kg (17.6 lbs)

D11A102B001US



D11A102B011US



No.	Name	Label	Function	
①	Start/Stop Switch	POWER ON/OFF	Switch for starting and stopping the unit (with a switch cover)	
②	LED Display	INVERTER	Lit (blue) during output by inverter power supply	
		BYPASS	Lit (yellow) during output by bypass power supply ※ ¹	
		50 Hz 60 Hz	Output frequency lit (green)	
		UNIT-OC	Lit (red) while the unit is overloaded	
		ALARM	Lit (red) when the unit fails	
③	Air Intake Vent	—	For cooling. Secure enough space for ventilation.	
④	Screws for Fixing to Cabinet	—	For fixing to a cabinet, For pulling the unit out of a cabinet	
⑤	Connector for Connecting to Cabinet	—	Plug-in connector for connecting to a cabinet	
⑥	Unit Setting DIP Switch 	1	Setting of output frequency ON: 50 Hz OFF: 60 Hz*	
		2	Setting of output voltage ON: 120 V OFF: 100 V*	The factory default setting is the value indicated by the* mark.
		3	Setting of master/slave ※ ² ON: Slave OFF: Master* <u>Note: Do not change this switch.</u>	
⑦	Cooling Fan	—	For cooling the inside of the unit	
⑧	Bypass Breaker	BYPASS OC 20A	Bypass circuit protection ※ ¹	
⑨	Mode Select Switch	MODE SELECT INV/BYPASS	For switching between the inverter power supply and bypass power supply ※ ¹	
⑩	Guide Bar	—	For preventing the incorrect insertion of the unit	

Functions indicated with ※

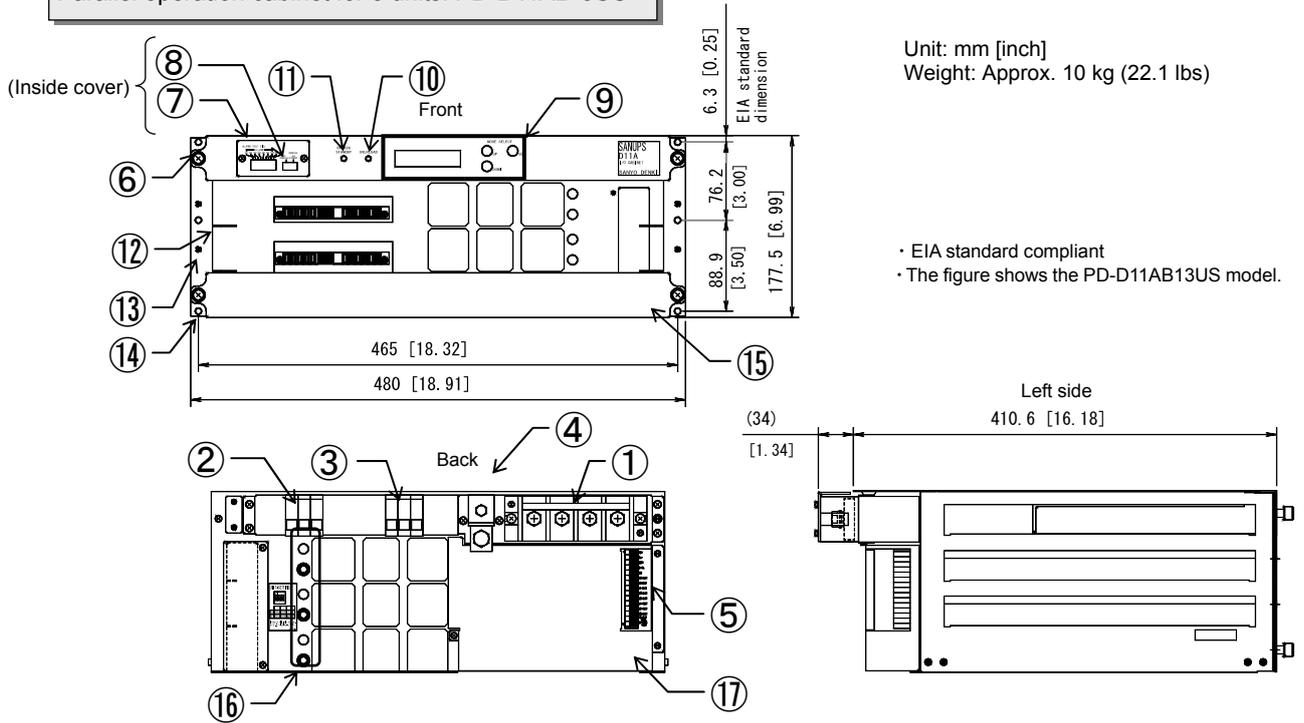
※¹: This function is available only for the D11A102B011US model. It is not available for the D11A102B001US model.

※²: If you want to operate the DC-AC Inverter in parallel and standby mode, set the Master/Slave setting to ON. To operate the DC-AC Inverter in parallel and standby mode, you need to change the power line for the cabinet and restart the power. In cases other than this, leave the setting set to OFF and never change the setting.

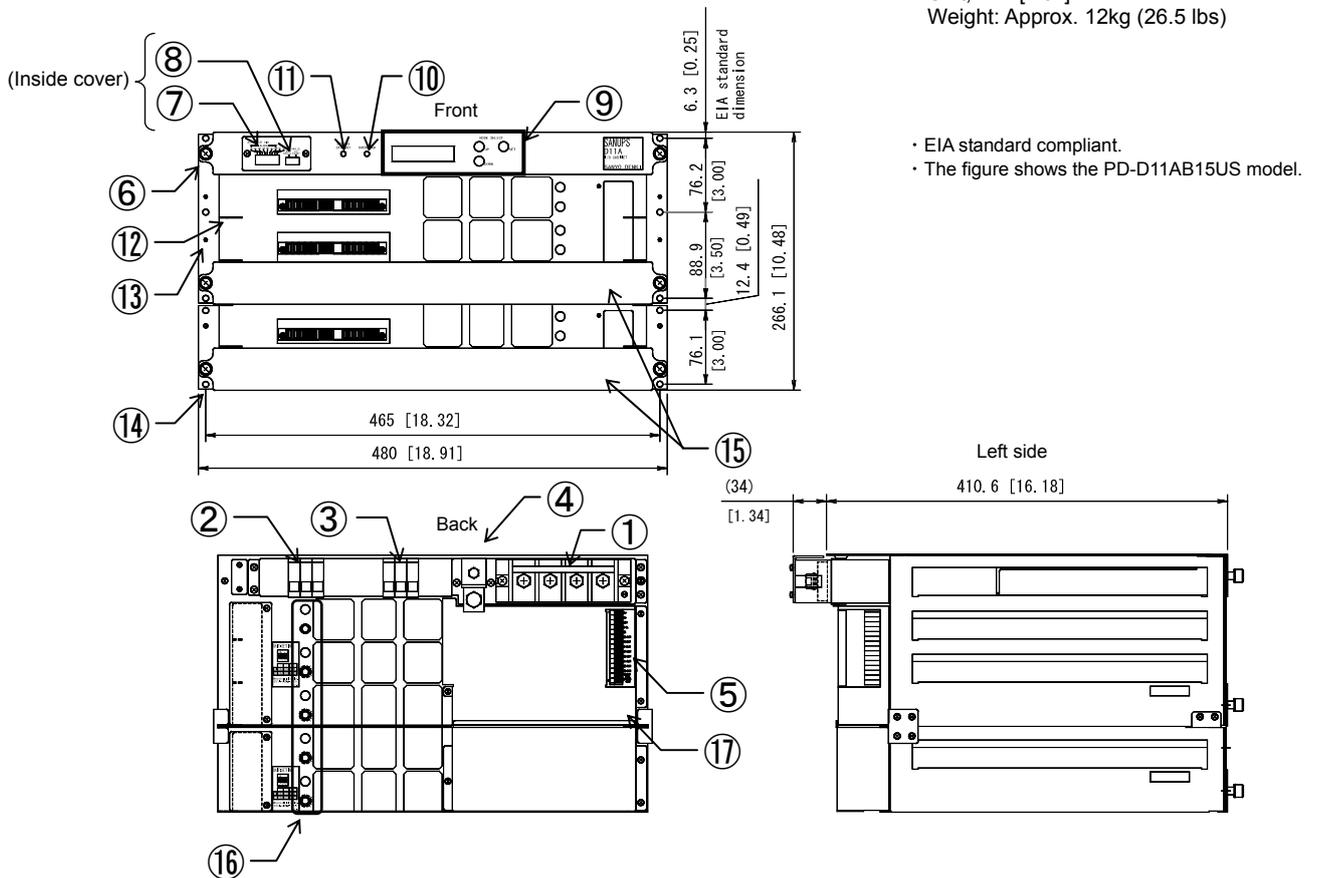
For details, see §14 "Wiring and Settings for Parallel and Standby Operation."

§4.2 Parallel Operation Cabinet

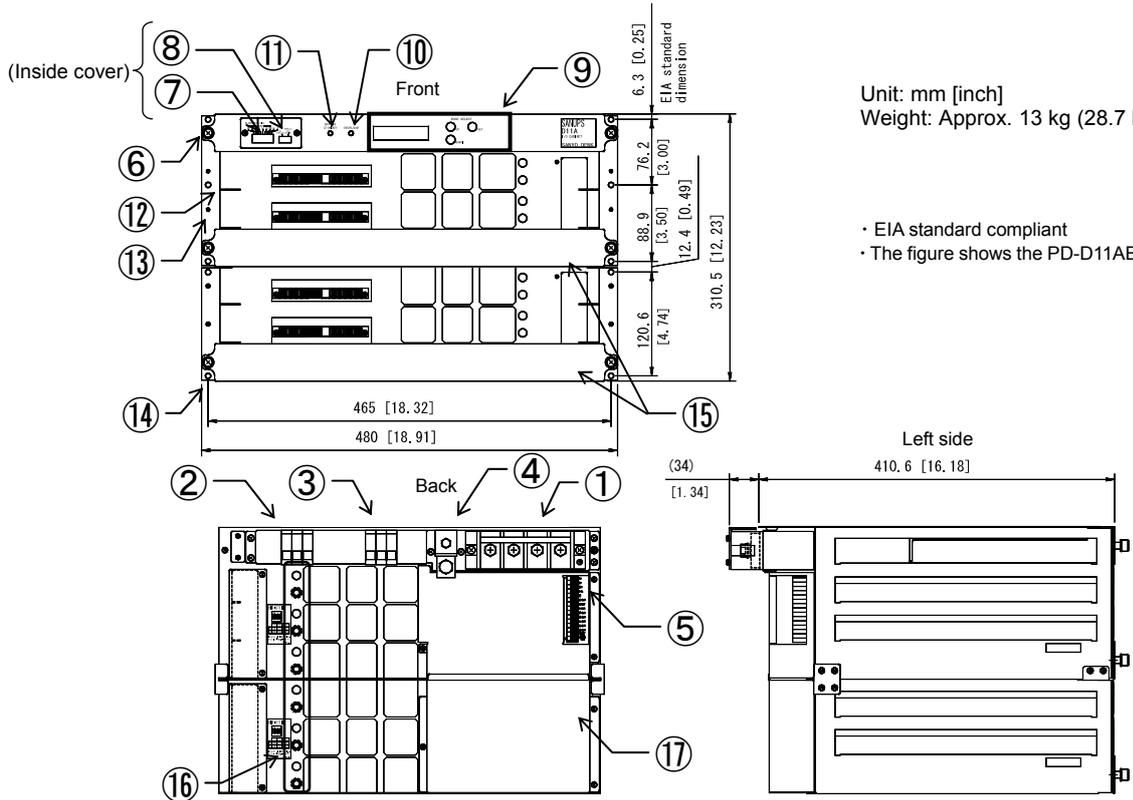
Parallel operation cabinet for 3 units: PD-D11AB*3US



Parallel operation cabinet for 5 units: PD-D11AB*5US



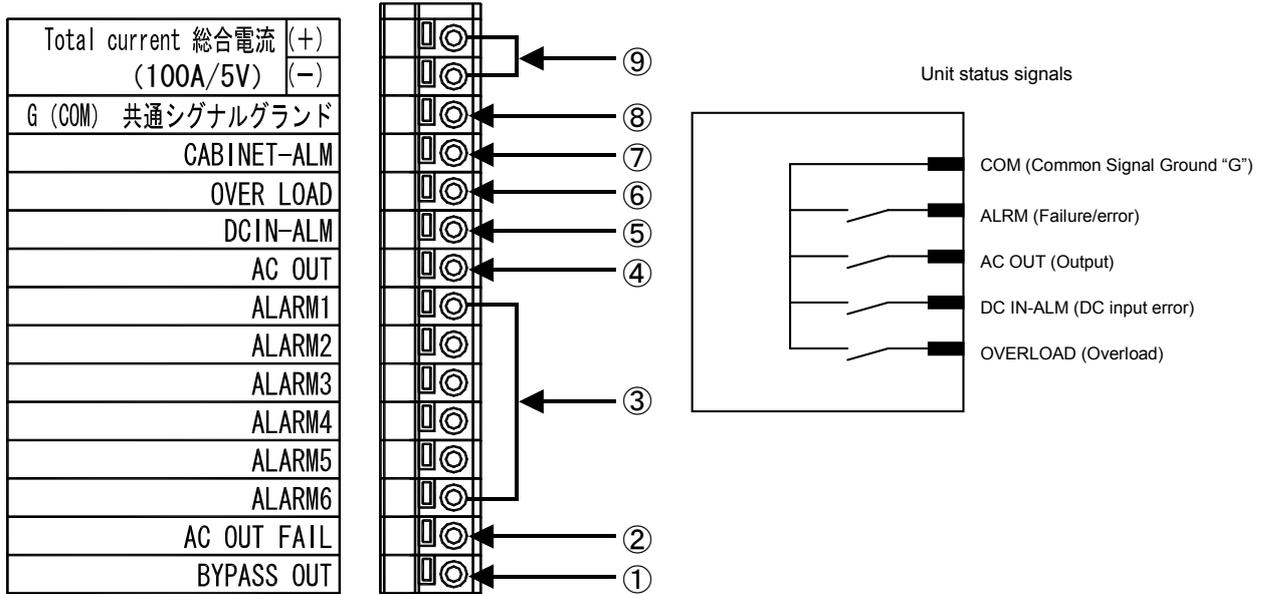
Parallel operation cabinet for 6 units: PD-D11AB*6US

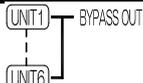
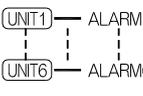
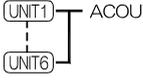
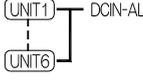


No.	Name	Label	Function
①	DC Input Terminal Block	+(0V), -(-48V)	DC input connection: Two + (0V) positive and two - (-48V) negative terminals
②	AC Output Terminal Block	U (L), V (N), G	Load device connection: 1 terminal each
③	AC Input Terminal Block ^{※1}	R (L), S (N), G	AC input connection: 1 terminal each
④	Ground Terminal	G	Ground cable connection
⑤	Transfer Signal Terminal Block	—	For contact signals. See §4.3 “Transfer Signal Terminal Block.”
⑥	Display Unit	—	Displays common information on the LCD/alarm test terminal
⑦	Alarm Test Terminal	ALARM TEST SIG	For simulated failure and overload alarm testing See §4.4 “Alarm Test/Operation Selector.”
⑧	Operation Selector	ALL PARALLEL/ PARALLEL and STANDBY	Redundant operation/parallel and standby operation selector See §4.4 “Alarm Test/Operation Selector.” <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">Note To set PARALLEL and STANDBY to ON, you need to change the power line for the cabinet and restart the power. So leave this switch set to ALL PARALLEL and never change this setting. For details, see §14 “Wiring and Settings for Parallel and Standby Operation.”</div>
⑨	LCD Display Display Select Button	MODE SELECT UP/DOWN/SET	Sets each unit’s status display, total output voltage and current display, and total output current overload warning level
⑩	Overload Display (LED)	OVERLOAD	Lit (red) when the total output current is larger than the overload warning level
⑪	Utility Bypass (LED) ^{*1}	BYPASS STANDBY	Lit (green) while the AC input is synchronized with the inverter AC output of each unit
⑫	Guide Rail	—	Unit guide rail
⑬	Holes for Fixing Unit	—	Holes for fixing unit
⑭	Holes for Mounting to Rack	—	Holes for mounting to a 19-inch rack (EIA Standard)
⑮	Blank Panel	—	Install a blank panel in a place where the unit is not inserted. Located in the following places at the time of shipment from the factory. PD-D11AB*3US (for 3 units): 3rd shelf PD-D11AB*5US (for 5 units): 3rd and 5th shelves PD-D11AB*6US (for 6 units): 3rd and 6th shelves
⑯	Cover for Preventing Incorrect Insertion	—	For preventing the incorrect insertion of D11A102B001US and D11A102B011US units
⑰	Protective Cover	—	For protecting the copper bar inside the cabinet

※1 Note
This function is only available for the PD-D11AB1*US model. It is not available for the PD-D11AB0*US model.

§4.3 Transfer Signal Terminal Block

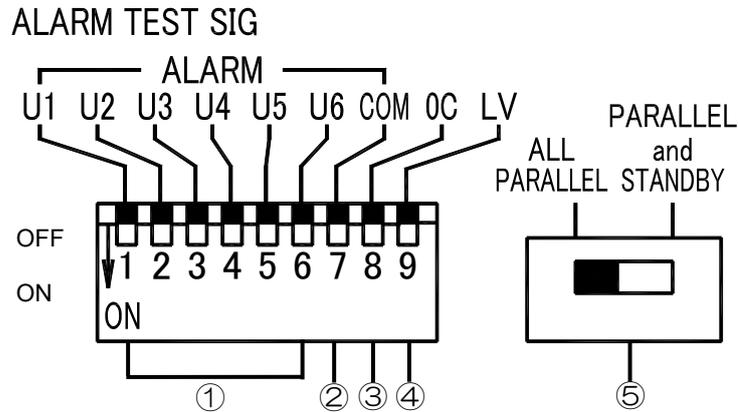


No.	Signal Name	Label	Connection	Definition
①	Bypass Output	BYPASS OUT		When the DC-AC Inverter supplies AC output power from the bypass power supply, BYPASS OUT and COMMON SIGNAL GROUND "G" (COM) become short-circuited. ※4
②	Output Fail	AC OUT FAIL		When the total output voltage drops, AC OUT FAIL and Common Signal Ground "G" (COM) become short-circuited. Normally open. ※2
③	Failure	ALARM1 to 6		When any of units 1 to 6 fails, the corresponding ALARM 1 to 6 and COMMON SIGNAL GROUND "G" (COM) become short-circuited. Normally open. (Only valid when the DC input is normal.) ※2
④	AC Output	AC OUT		When any of units 1 to 6 operates normally and supplies AC output power, AC OUT and COMMON SIGNAL GROUND "G" (COM) become short-circuited.
⑤	DC Input Error	DCIN-ALM		When DC input voltage is abnormal, DCIN-ALM and COMMON SIGNAL GROUND "G" (COM) become short-circuited. However, this signal is not sent until the power supply in unit and cabinet starts. Normally open.
⑥	Overload	OVER LOAD		When the total output current is overloaded, OVER LOAD and COMMON SIGNAL GROUND "G" (COM) become short-circuited. Normally open. ※2
⑦	Cabinet Failure	CABINET-ALM		When a cabinet failure occurs, CABINET-ALM and COMMON SIGNAL GROUND "G" (COM) become short-circuited. Normally open. ※2
⑧	Ground Terminal for External Transfer Signal	COMMON SIGNAL GROUND "G" (COM)	—	Common signal ground
⑨	Total Current	TOTAL CURRENT (100 A/5 V)	—	Outputs the output current value (AC 100 A/5 V) of the DC-AC Inverter. ※3

Notes

- ※1. Contact capacity is DC 60 V/0.3 A.
- ※2. Setting the ALARM TEST terminal of the cabinet to ON sends alarm signals AC OUT FAIL, ALARM 1 to 6, OVER LOAD, and CABINET-ALM in a pseudo fashion. Normally set the ALARM TEST terminal to OFF. See §4.4 "Alarm Test/Operation Selector."
- ※3. When performing monitoring with a transducer or the like, do so via the high impedance buffer circuit with the 0 V – 5 V setting.
- ※4. This function is only available for the PD-D11AB13US, 15US and 16US model. It is not available for the PD-D11AB03US, 05US and 06US model.

§4.4 Alarm Test/Operation Selector



No.	Signal Name	Label	Definition
①	Failure Test	ALARM U1 to U6	Switch for alarm testing of units 1 to 6 failure Setting the switch to ON sends the alarm signal in a pseudo fashion. <u>Normally set the switch for all units to OFF.</u>
②	Cabinet Failure Test	ALARM COM	Switch for alarm testing of cabinet failure Setting the switch to ON sends the alarm signal in a pseudo fashion. <u>Normally set the switch to OFF.</u>
③	Overload Test	OC	Switch for alarm testing of overload Setting the switch to ON sends the alarm signal in a pseudo fashion. <u>Normally set the switch to OFF.</u>
④	Output Fail Test	LV	Switch for alarm testing of output failure Setting the switch to ON sends the alarm signal in a pseudo fashion. <u>Normally set the switch to OFF.</u>
⑤	Parallel Redundant Operation/ Parallel and Standby Operation Selector	ALL PARALLEL/ PARALLEL and STANDBY	Selector for switching between parallel redundant operation and parallel and standby operation. Set to ALL PARALLEL when shipped from the factory. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note</p> <p>To set PARALLEL and STANDBY to ON, you need to change the power line for the cabinet and restart the power. So leave this switch set to ALL PARALLEL and never change this setting. For details, see §14 "Wiring and Settings for Parallel and Standby Operation."</p> </div>

§5. Installing a Cabinet



CAUTION

- When installing a cabinet and units, carefully follow the instructions in this instruction manual. Improper installation may result in electric shock, bodily injury, and/or fire.
- In accordance with the instruction manual, install the cabinet on a stable surface capable of bearing the weight (approximately 8 kg (17.6 lbs) for one unit, approximately 10 kg (22.1 lbs) for a parallel operation cabinet for 3 units, approximately 12 kg (26.5 lbs) for a parallel operation cabinet for 5 units, and approximately 13 kg (28.7 lbs) for a parallel operation cabinet for 6 units) that is flat so that the cabinet cannot fall, and subject to minimal vibration and shock. Failure to do so may cause a fall, resulting in bodily injury.
- For safety, put on protective shoes. All work that involves lifting the cabinet, such as mounting it in a rack, should be carried out by at least 2 persons. Failure to do so may cause the cabinet and units to fall, resulting in bodily injury. Be careful to avoid straining your lower back.
- There is a danger that the cabinet and units may fall or be dropped during relocation or installation. Always hold the bottom side of a unit firmly with both hands. Failure to do so may result in bodily injury or damage to the unit.




§5.1 Checking the Installation Environment

Suitable installation environment: Ambient temperature of 5 to 40°C (41 to 104°F) and relative humidity of 5 to 85%

Do not install the DC-AC Inverter in the following locations: Doing so may result in a failure.

- Where grounding is not possible.
- Where the ambient temperature exceeds 40°C (104°F).
- Where high humidity may occur.
- Where corrosive gas or salt spray may be present.
- Where it may be subject to vibration and shock.
- Where dust may accumulate.
- In a poorly ventilated rack.

§5.2 Checking the Input Power Supply

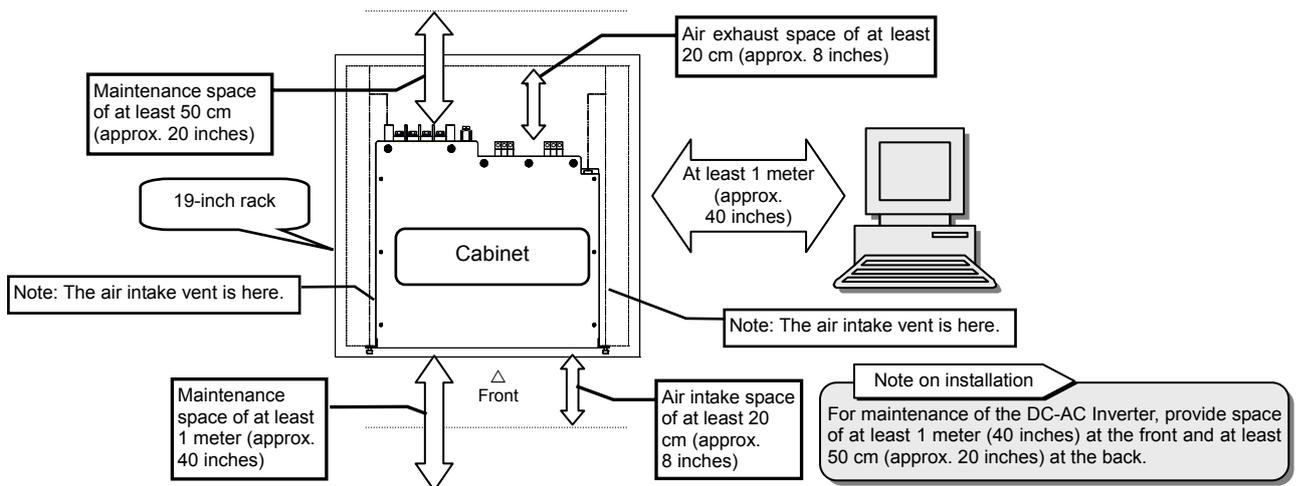
Check the input power supply in the place where the unit is to be installed.

Power Supply	Voltage	Frequency	Notes
DC Input	DC power supply DC-48 V	—	
AC Input	When the output voltage is set to 100 V: AC power supply AC 100 V ±15%	50/60 Hz	Cabinet PD-D11AB1*US Only when installed in combination with unit D11A102B011US
	When the output voltage is set to 120 V: AC power supply AC 120 V ±15%	50/60 Hz	

§5.3 Checking the Installation Space

During installation, provide the following space around the cabinet.

- At least 20 cm (approximately 8 inches) at the front and back:
As air intake or exhaust space for the cooling fan
- At least 1 meter (approximately 40 inches) from CRT displays:
To allow for slight leakage of magnetic flux.
Allow some space from devices which might be affected by magnetic flux.

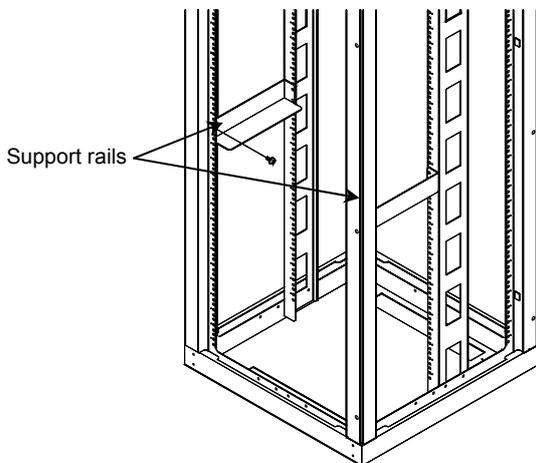


§5.4 Transportation and Installation

 CAUTION	<ul style="list-style-type: none"> In accordance with this instruction manual, install the cabinet on a stable surface capable of bearing the weight (approximately 8 kg (17.6 lbs) for one unit, approximately 10 kg (22.1 lbs) for a parallel operation cabinet for 3 units, approximately 12 kg (26.5 lbs) for a parallel operation cabinet for 5 units, and approximately 13 kg (28.7 lbs) for a parallel operation cabinet for 6 units) that is flat so that the cabinet cannot fall, and subject to minimal vibration and shock. Failure to do so may cause the cabinet to fall, resulting in bodily injury. There is a danger that the DC-AC Inverter may fall or be dropped during relocation or installation. Always hold the bottom of the DC-AC Inverter firmly with both hands. Failure to do so may result in bodily injury or damage to the unit. Be careful not to get your hands caught when mounting the DC-AC Inverter to the rack.
---	--

- (1) Transportation of the DC-AC Inverter should be performed only by a service technician.
- (2) The DC-AC Inverter should be transported while it is in the package.
- (3) Open the package near the installation location of the DC-AC Inverter.
- (4) Follow the procedure below to mount the cabinet to the 19-inch rack.

- ① Attach the support rails to the 19-inch rack.



Note

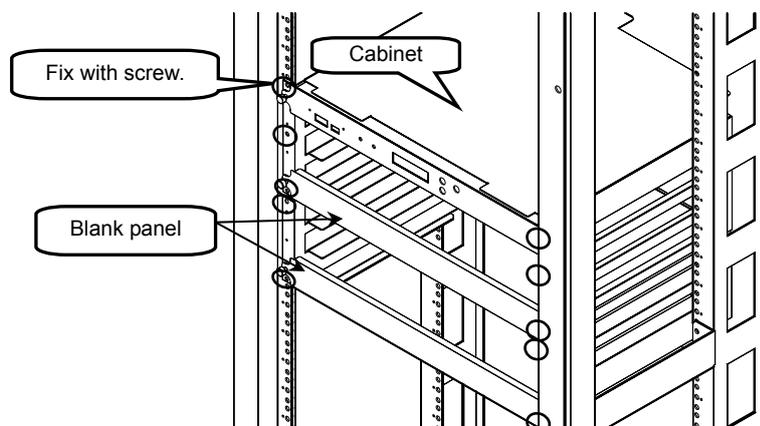
This DC-AC Inverter is compliant with the EIA standard.

However, it is not compliant with the JIS standard.

Note

19-inch rack mounting support rails are not supplied with the DC-AC Inverter, as the dimensions of the support rails vary depending on the rack.

- ② Mount the parallel operation cabinet to the 19-inch rack. Do not remove the blank panel.
- ③ Fix the cabinet to the 19-inch rack at the front.
 - Fix the 3-unit cabinet (PD-D11AB*3US) at 6 points with screws.
 - Fix the 5-unit cabinet (PD-D11AB*5US) at 10 points with screws.
 - Fix the 6-unit cabinet (PD-D11AB*6US) at 10 points with screws.



Note

The figure shows a 6-unit cabinet. Mount it to the 19-inch rack. Do not remove the blank panel. For details on how to handle the blank panel, see §9 "Installing Unit."

This completes the transportation and installation work.

§6. Cabinet Wiring

§6.1 Wiring the Input and Output Terminal Block



CAUTION

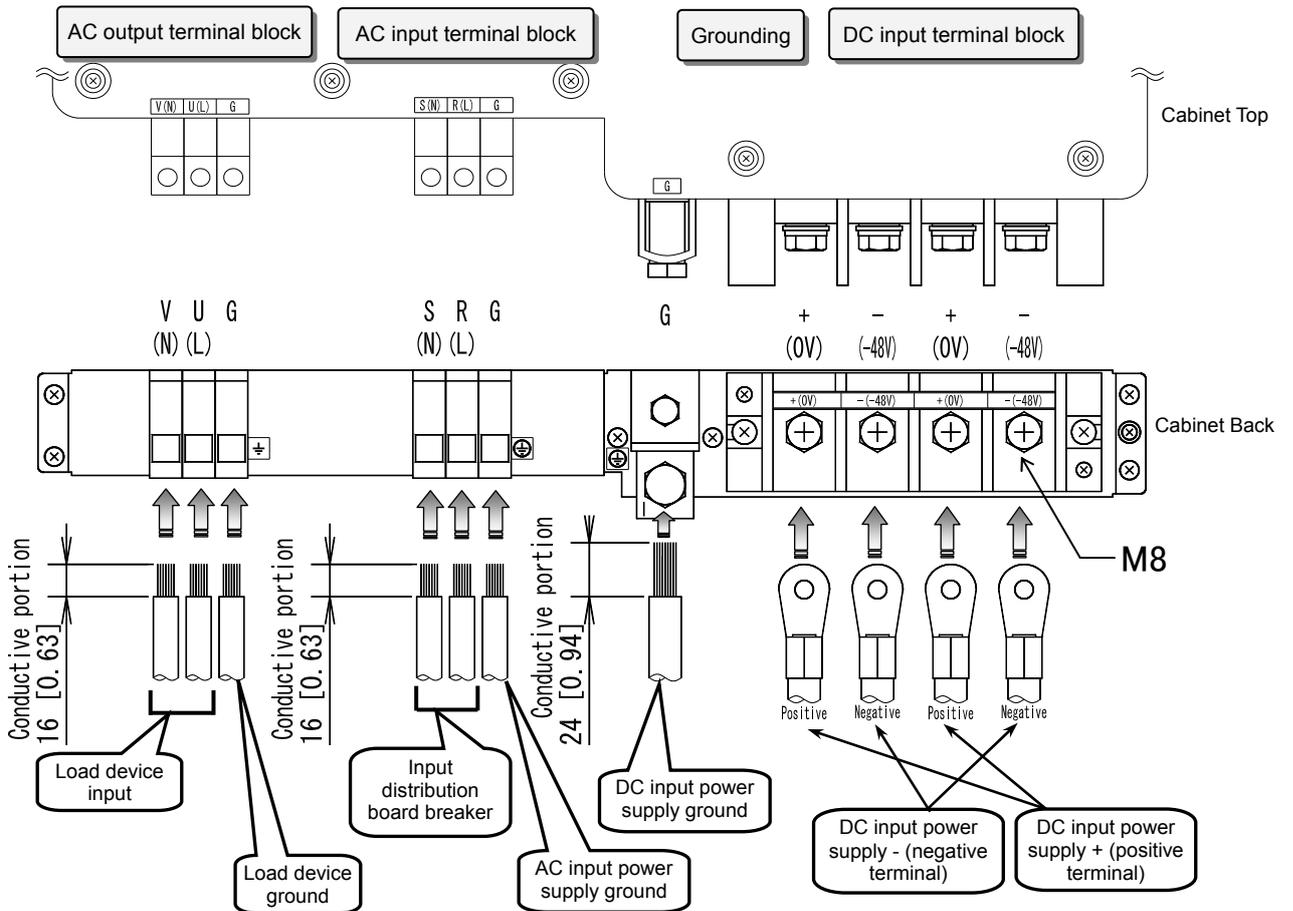
- Wiring should be performed only by a service technician. Incorrect wiring may result in electric shock and/or fire.
- A readily accessible disconnect device shall be incorporated external to the equipment.
- Make sure that the polarity is correct when wiring the DC input terminal block. Failure to do so may cause damage to the DC-AC Inverter.
- Make sure that the connections to the terminal block are not loose. Failure to do so may result in a failure or cause electric shock.
- This DC-AC Inverter requires class D grounding work. Failure to connect the grounding cable in accordance with the specified grounding class may result in electric shock.
- The grounding cables of all load devices connected to the output of the DC-AC Inverter must be securely connected to the G terminal (earth terminal). Failure to connect the grounding cables of the load devices correctly may result in electric shock.
- Install the disconnect device whose contact gap is 2 mm (0.08 inches) or more in DC input.
- Install the disconnect device whose contact gap is 3 mm (0.12 inches) or more in AC input. (In the case of the PD-D11AB13US, PD-D11AB15US and PD-D11AB16US model.)
- Install the back-feed protection device in AC input. (In the case of the PD-D11AB13US, PD-D11AB15US and PD-D11AB16US model.)







- ① Remove the protective cover of DC input terminal block.
 - ② Wire the input and output terminal block
- Securely connect the input plug of a load device to the AC output terminal block.
 Securely connect the input distribution board breaker to the AC input terminal block.
 Securely connect the DC input power supply plug to the DC input terminal block.



Notes on wiring

- The AC input terminal block is not available for the PD-D11AB0*US model.
- When the AC input power is single-wire grounded, connect the ground phase to the S (N) terminal side.
- When the load device input needs to be single-wire grounded, connect the ground phase to the V (N) terminal side.

Acceptable wire table for DC input.

Number of Connected Units	Connectable Cable AWG (mm ²) by ratings temperature of conductor						Connector	Tool for Terminal
	60°C (104° F)		75°C (167° F)		90°C (104° F)			
	Min.	Max.	Min.	Max.	Min.	Max.		
1	AWG 4 (22 mm ²)	AWG 1 (42 mm ²) ×2 parallel	AWG 4 (22 mm ²)	AWG 1 (42 mm ²) ×2 parallel	AWG 4 (22 mm ²)	AWG 1 (42 mm ²) ×2 parallel	For AWG 1 R60-8 (JST)	YA-5 (AD-955), YET-300 (TD-321, TD-311) YPT-60, YET-60 (TD-125, TD-113), YPT150, YET-150 (TD-225, TD-213), CYE-60 (TD-425, TD-413) CYE-125 (TD-525, TD-213)
2	AWG 3 (27 mm ²) or AWG 4 (22 mm ²) ×2 parallel	AWG 1 (42 mm ²) ×2 parallel	AWG 4 (22 mm ²)	AWG 1 (42 mm ²) ×2 parallel	AWG 4 (22 mm ²)	AWG 1 (42 mm ²) ×2 parallel		
3	AWG 4 (22 mm ²) ×2 parallel	AWG 1 (42 mm ²) ×2 parallel	AWG 1 (34 mm ²) or AWG 4 (22 mm ²) ×2 parallel	AWG 1 (42 mm ²) ×2 parallel	AWG 3 (27 mm ²) or AWG 4 (22 mm ²) ×2 parallel	AWG 1 (42 mm ²) ×2 parallel	For AWG 2 and AWG 3 R38-8 (JST)	YA-5 (AD-954) YPT-60, YET-60 (TD-124, TD-112) YPT-150, YET-150 (TD-224, TD-212) CYE-60 (TD-424, TD-412) CYE-125 (TD-524, TD-212)
4	AWG 3 (27 mm ²) ×2 parallel	AWG 1 (42 mm ²) ×2 parallel	AWG 4 (22 mm ²) ×2 parallel	AWG 1 (42 mm ²) ×2 parallel	AWG 1 (42 mm ²) or AWG 4 (22 mm ²) ×2 parallel	AWG 1 (42 mm ²) ×2 parallel	For AWG 4 R22-8 (JST)	YA-5 (AD-953) YPT-60, YET-60 (TD-123, TD-112) YPT-150, YET-150 (TD-223, TD-212) CYE-60 (TD-423, TD-412) CYE-125 (TD-523, TD-212)
5	AWG 1 (42 mm ²) ×2 parallel		AWG 3 (27 mm ²) ×2 parallel	AWG 1 (42 mm ²) ×2 parallel	AWG 3 (22 mm ²) ×2 parallel	AWG 1 (42 mm ²) ×2 parallel		
6	/		AWG 1 (42 mm ²) ×2 parallel		AWG 2 (27 mm ²) ×2 parallel	AWG 1 (42 mm ²) ×2 parallel		

Wire material: Copper only

Acceptable wire table for DC Ground.

Number of Connected Units	Connectable Cable AWG (mm ²) by ratings temperature of conductor						Exposed cable length
	60°C (104° F)		75°C (167° F)		90°C (104° F)		
	Min.	Max.	Min.	Max.	Min.	Max.	
1	AWG 2 (34 mm ²)	AWG 4/0 (107 mm ²)	AWG 2 (34 mm ²)	AWG 4/0 (107 mm ²)	AWG 2 (34 mm ²)	AWG 4/0 (107 mm ²)	24 mm (0.94 inches)
2	AWG 2 (34 mm ²)	AWG 4/0 (107 mm ²)	AWG 2 (34 mm ²)	AWG 4/0 (107 mm ²)	AWG 2 (34 mm ²)	AWG 4/0 (107 mm ²)	
3	AWG 1/0 (54 mm ²)	AWG 4/0 (107 mm ²)	AWG 2 (34 mm ²)	AWG 4/0 (107 mm ²)	AWG 2 (34 mm ²)	AWG 4/0 (107 mm ²)	
4	AWG 3/0 (85 mm ²)	AWG 4/0 (107 mm ²)	AWG 1/0 (54 mm ²)	AWG 4/0 (107 mm ²)	AWG 1 (42 mm ²)	AWG 4/0 (107 mm ²)	
5	AWG 4/0 (107 mm ²)		AWG 3/0 (85 mm ²)	AWG 4/0 (107 mm ²)	AWG 2/0 (67 mm ²)	AWG 4/0 (107 mm ²)	
6	/		AWG 4/0 (107 mm ²)		AWG 3/0 (85 mm ²)	AWG 4/0 (107 mm ²)	

Wire material: Copper only

Notes on DC Grounding

This equipment is designed to permit the connection of the earthed conductor of the DC supply circuit to the earthing conductor at the equipment. If this connection is made, all of the following conditions must be met:

- This equipment shall be connected directly to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode conductor is connected.
- This equipment shall be located in the same immediate area (such as adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system shall not be earthed elsewhere.
- The DC supply source shall be located within the same premises as this equipment.
- Switching or disconnecting devices shall not be in the earthed circuit conductor between the DC source and the point of connection of the earthing electrode conductor.

Acceptable wire table for AC input.

(These Terminal Blocks are only available for the PD-D11AB13US, PD-D11AB15US and PD-D11AB16US.)

Number of Connected Units	Connectable Cable AWG (mm ²) by ratings temperature of conductor						Exposed cable length	Screwdriver blade size
	60°C (104° F)		75°C (167° F)		90°C (104° F)			
	Min.	Max.	Min.	Max.	Min.	Max.		
1	AWG 12 (3.5 mm ²)	AWG 4 (22 mm ²)	AWG 12 (3.5 mm ²)	AWG 4 (22 mm ²)	AWG 12 (3.5 mm ²)	AWG 4 (22 mm ²)	16 mm (0.63 inches)	1.0 X 4.0 (Flat-head)
2	AWG 8 (8 mm ²)	AWG 4 (22 mm ²)	AWG 8 (8 mm ²)	AWG 4 (22 mm ²)	AWG 8 (8 mm ²)	AWG 4 (22 mm ²)		
3	AWG 6 (13 mm ²)	AWG 4 (22 mm ²)	AWG 8 (8 mm ²)	AWG 4 (22 mm ²)	AWG 8 (8 mm ²)	AWG 4 (22 mm ²)		
4	AWG 4 (22 mm ²)		AWG 6 (13 mm ²)	AWG 4 (22 mm ²)	AWG 8 (13 mm ²)	AWG 4 (22 mm ²)		
5	/		AWG 4 (22 mm ²)		AWG 6 (13 mm ²)	AWG 4 (22 mm ²)		
6			/		AWG 4 (22 mm ²)			

Wire material: Copper only

Acceptable wire table for AC output.

Number of Connected Units	Connectable Cable AWG (mm ²) by ratings temperature of conductor						Exposed cable length	Screwdriver blade size
	60°C (104° F)		75°C (167° F)		90°C (104° F)			
	Min.	Max.	Min.	Max.	Min.	Max.		
1	AWG 12 (3.5 mm ²)	AWG 4 (22 mm ²)	AWG 12 (3.5 mm ²)	AWG 4 (22 mm ²)	AWG 12 (3.5 mm ²)	AWG 4 (22 mm ²)	16 mm (0.63 inches)	1.0 X 4.0 (Flat-head)
2	AWG 10 (5.5 mm ²)	AWG 4 (22 mm ²)	AWG 10 (5.5 mm ²)	AWG 4 (22 mm ²)	AWG 10 (5.5 mm ²)	AWG 4 (22 mm ²)		
3	AWG 8 (8 mm ²)	AWG 4 (22 mm ²)	AWG 8 (8 mm ²)	AWG 4 (22 mm ²)	AWG 8 (8 mm ²)	AWG 4 (22 mm ²)		
4	AWG 8 (8 mm ²)	AWG 4 (22 mm ²)	AWG 8 (8 mm ²)	AWG 4 (22 mm ²)	AWG 8 (8 mm ²)	AWG 4 (22 mm ²)		
5	AWG 4 (22 mm ²)		AWG 6 (13 mm ²)	AWG 4 (22 mm ²)	AWG 6 (13 mm ²)	AWG 4 (22 mm ²)		
6	/		AWG 4 (22 mm ²)		AWG 6 (13 mm ²)	AWG 4 (22 mm ²)		

Wire material: Copper only

- ③ Check that the wiring is correct, and connections are not loose. Then reattach the protective cover detached by ①.

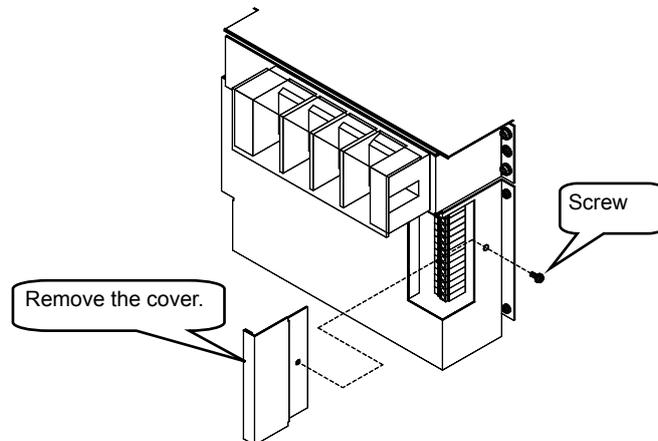
§6.2 Wiring the Transfer Signal Terminal Block

 CAUTION	<ul style="list-style-type: none"> Wiring should be performed only by a service technician. Incorrect wiring may result in electric shock and/or fire. Make sure that the connections to the terminal block are not loose. Failure to do so may result in a failure or cause electric shock. 	
---	--	---

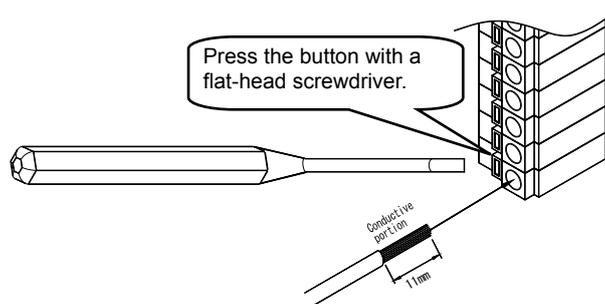
Use the following cables and tool to wire the transfer signal terminal block.

Applicable Cable	Single cable: \varnothing 1.2 (AWG16) Twisted cable: \varnothing 1.25 mm ² (AWG16) Conductor: Capper
Usable Cable Range	Single cable: \varnothing 0.4 to \varnothing 1.2 (AWG26 to AWG16) Twisted cable: 0.3 mm ² to 1.25 mm ² (AWG22 to AWG16)
Exposed Cable Length	11 mm (0.43 inches)
Applicable Tool for Pressing Button	Flat-head screwdriver (Axis diameter \varnothing 3, blade width 2.6)

- ① Remove the cover.



- ② Peel off the coating at the end of the cable to be connected by approximately 11 mm (0.43 inches).
 ③ Insert the cable while pressing the button on the terminal block with a flat-head screwdriver as shown in the figure.

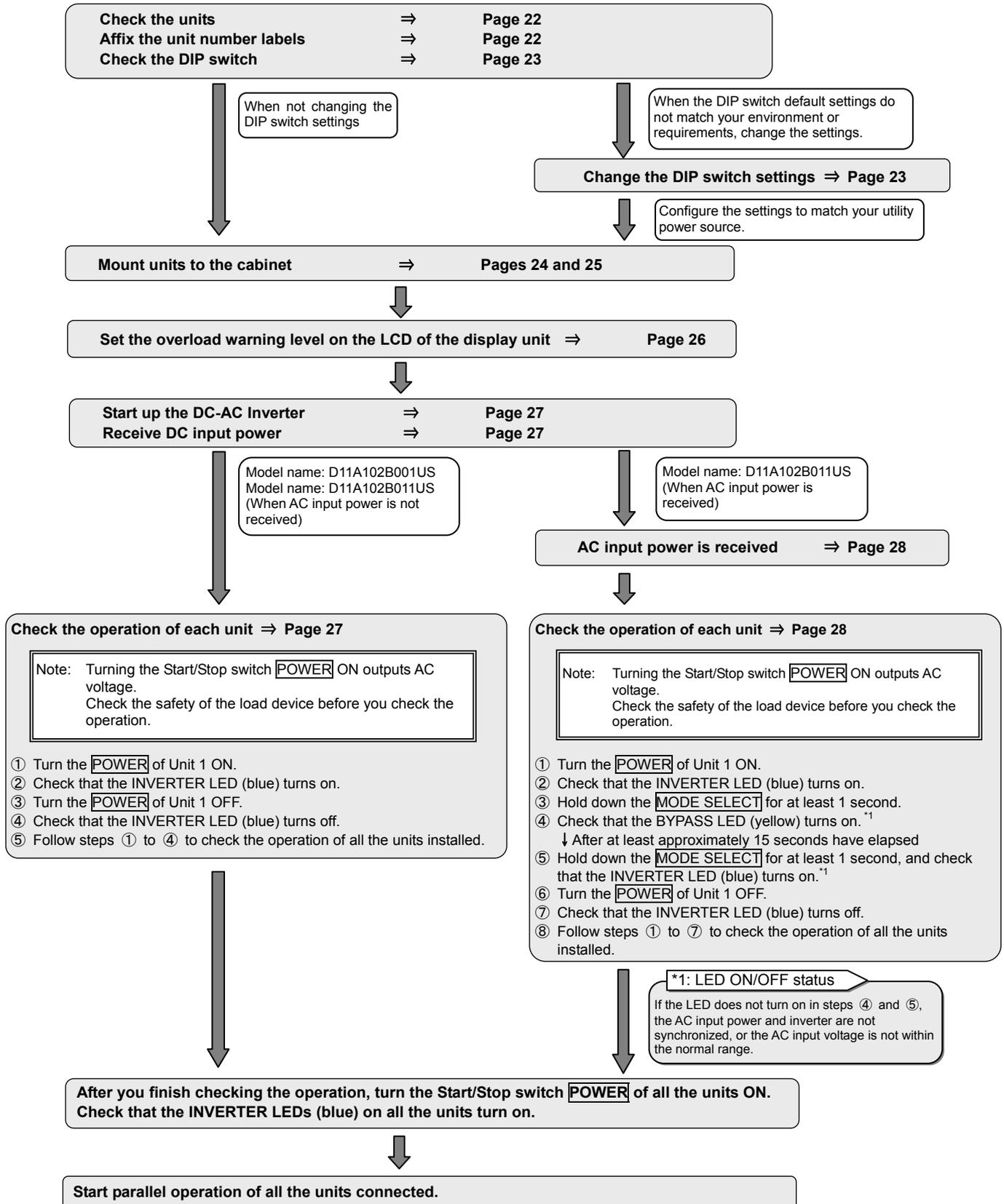


- ④ Check that the inserted cable does not come out. Then reattach the cover removed by ①.

This completes the wiring work.

§7. Procedure Until DC-AC Inverter Operation

The procedure until turning on the DC-AC Inverter is as follows. Be sure to perform the work in accordance with the procedure.



§8. Preparations Before Installing Units

§8.1 Checking Units

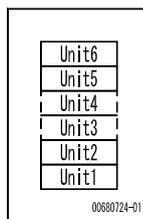
Check the following items.

Item	Description	Place Check Mark
Appearance	Is the exterior of the unit in any way damaged or deformed?	<input type="checkbox"/>
Start/Stop Switch POWER	Check that the POWER is OFF position.	<input type="checkbox"/>

§8.2 Affixing the Unit Number Labels

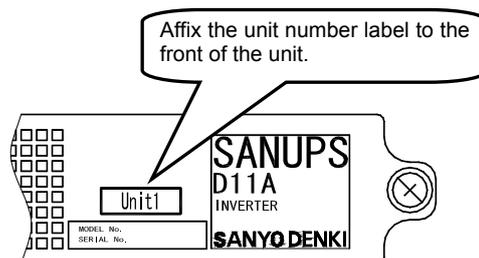
After you finish checking the units, follow the steps below to affix the supplied unit number labels to the units.

- ① Take the sheet of unit number labels out of the package.



Sheet of unit number labels

- ② Affix the labels in any position on the front of the units.
Affix the labels to the units from top to bottom in order, so that the unit on the top tier (under the display unit of the cabinet) is No.1, the unit under No.1 is No.2, and so on.



§8.3 Checking the DIP Switch

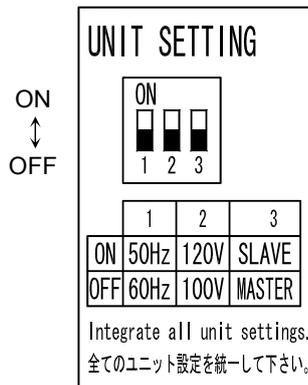
Check the DIP switch settings of the unit, and if they are not compatible with your utility power source, change the settings with ON/OFF of the DIP switch.

Item	Description (*: Default)		Check (Current settings)
			Unit 1 / 2 / 3 / 4 / 5 / 6
Unit Setting DIP Switch	1	Output frequency setting	ON: 50 Hz □/□/□/□/□/□
		OFF: 60 Hz*	□/□/□/□/□/□
	2	Output voltage setting	ON: 120 V □/□/□/□/□/□
		OFF: 100 V*	□/□/□/□/□/□
	3	Master/Slave setting	ON: SLAVE Do not set to ON.
		OFF: MASTER*	□/□/□/□/□/□

Notes on DIP switch

1. The factory default setting is indicated by the * mark.
2. Set the voltage and frequency to match your utility power source.
3. When you change the status setting, be sure to operate the switch while the unit power is completely shut down. If you change the status while DC input power is received, the change will not become effective. Either remove the unit out of the cabinet, or turn the DC input power OFF on the distribution board, and then change the setting. See §13.2.1 "Procedure to Remove the Unit" and §13.2.2 "Procedure to Install the Unit."
4. If the settings of any or all units are different, ALARM on any or all units will blink. If this happens, turn the DC input power OFF, set all the units to the same settings, and then turn the DC input power ON.
5. Leave the switch 3 (MASTER/SLAVE) set to OFF and never change the setting.

Unit Setting DIP Switch
(on the back panel of the unit)



1. Output frequency setting
2. Output voltage setting
3. Master/Slave setting
Leave the switch 3 set to OFF and never change the setting.

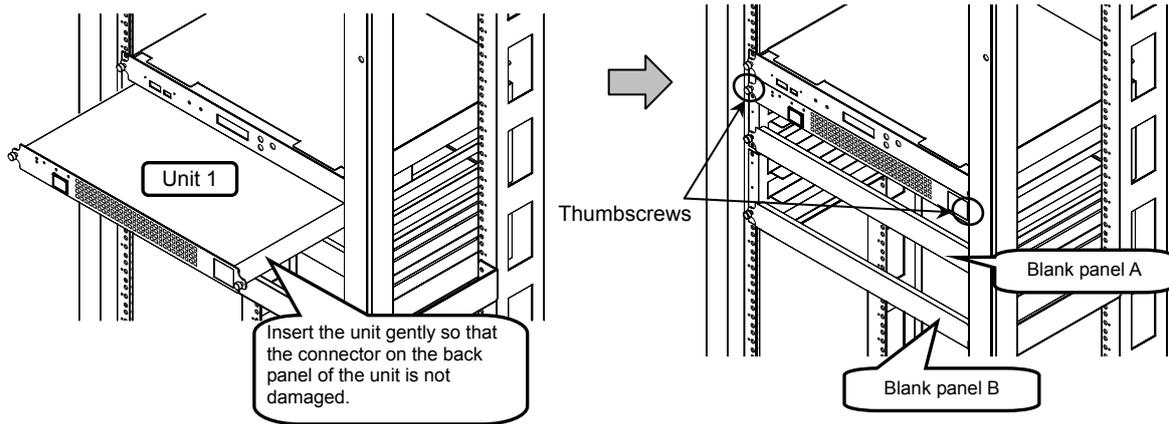
The figure above shows an example in which the switches 1, 2, and 3 are all set to OFF.

This completes the preparations before installing units.

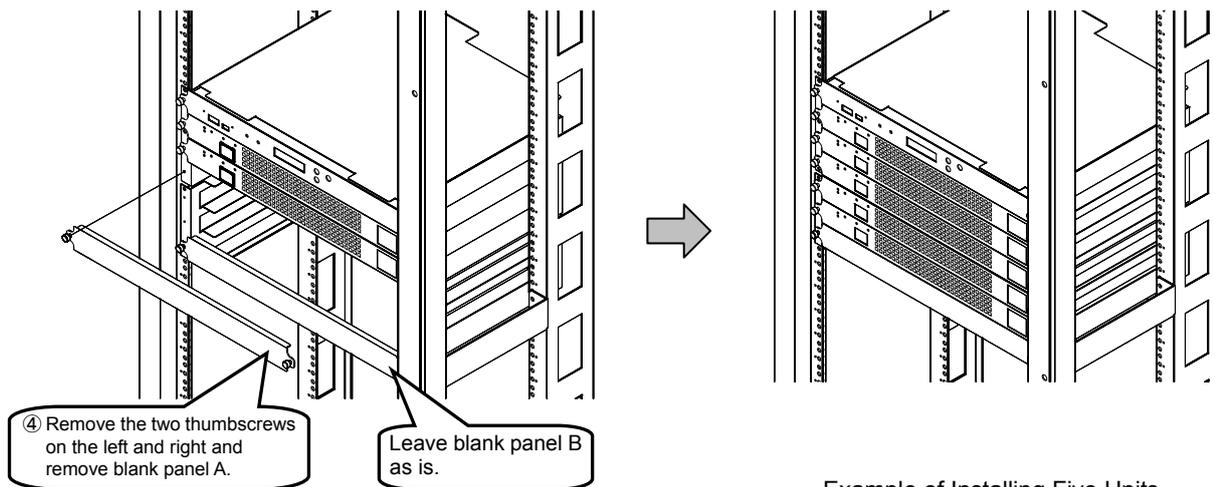
§9. Installing Units

The section describes how to install units in a cabinet mounted in a 19-inch rack. The following shows an example of installing units in a 6-unit cabinet.

- ① Insert Unit 1 under the display unit of the cabinet.
Insert the unit straight all the way in until the connector on the back panel of the unit is securely inserted into the connector of the cabinet.
- ② After the unit is inserted, tighten the thumbscrews on the left and right of the unit to fix the unit to the cabinet.



- ③ Insert the second unit under Unit 1.
Follow the same steps as for Unit 1 to install the unit.
- ④ When you install the third unit, remove blank panel A.
- ⑤ Insert the fourth and fifth units into the cabinet and tighten the left and right thumbscrews to fix the units to the cabinet.

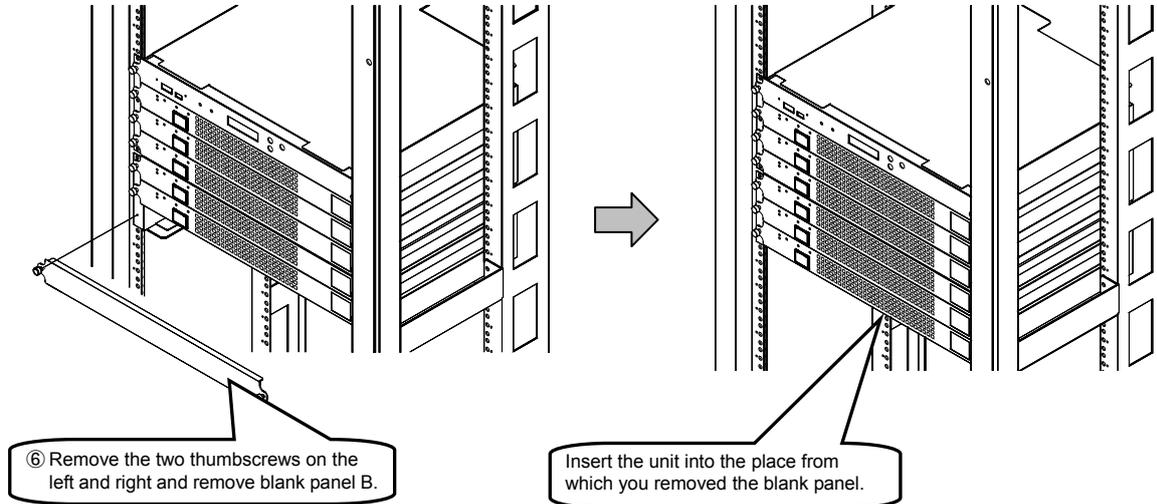


Note

After you install the cabinet in the 19-inch rack, remove the blank panel.

- ⑥ When you install the sixth unit, remove blank panel B.
- ⑦ Insert the unit into the place from which you removed the blank panel, and tighten the left and right thumbscrews to fix the unit to the cabinet.

Example of Installing Six Units



- ⑧ Check that all the connectors are securely inserted and all the thumbscrews are not loose.

Blank panels

- When you will not use a blank panel that you removed, keep it together with this manual.
- If there is a place in the cabinet in which you will not insert a unit, you can attach and use the blank panel you removed. If you need an additional blank panel, you can purchase it as option. For details, contact your supplier or Sanyo Denki.

This completes the installation of the units.

§10. Preparations Before Operation

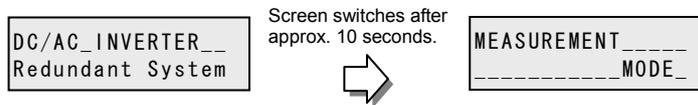
§10.1 Setting the Overload Warning Level

Tip

When you select the operation mode on the LCD, the overload warning level is set. When you select the redundant operation (N + 1 unit) or increased capacity operation (N units) mode, the load capacity is calculated according to the number of units to operate and the operation mode. 105% of the load capacity value calculated is set as the overload warning level. If the overload current exceeds this set value, OVER LOAD on the cabinet will light and a transfer signal will be sent out.

Operate the display select button on the display unit and set the overload warning level on the LCD. For details on the LCD functions and operation, see §15 "LCD Display and Operation."

- ① Check that the Start/Stop switch **POWER** for all the units is set to OFF. ※¹
- ② Turn the DC input power ON. ※²
- ③ Check that the LCD display on the display unit switches as follows to display MEASUREMENT MODE.



Notes

※¹: When DC input power is received while the Start/Stop switch **POWER** is in the ON position, AC voltage is output. Be sure to set the POWER to OFF.

※²: The cabinet has no breaker to turn the DC input power ON and OFF. Instead you can turn the DC input power ON and OFF on the distribution board.

- ④ Press the DOWN or UP key to display SETTING MODE, and then press the SET key.



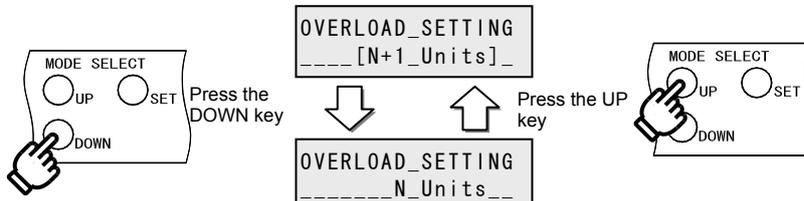
Tip

The current setting is indicated by the square brackets [].

N+1_Units: This is selected for the redundant operation mode.

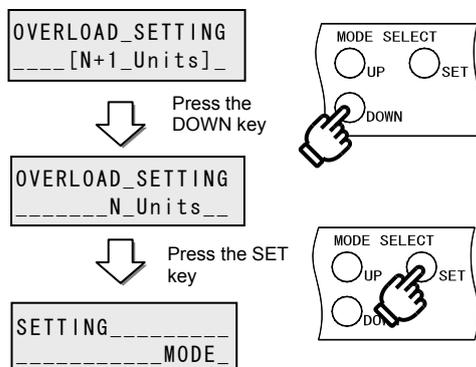
N_Units: This is selected for the increased capacity operation mode.

- ⑤ Press the DOWN or UP key and select the operation mode.



- ⑥ Press the SET key to confirm the operation mode.

Example of changing the setting from the redundant operation (N+1_Units) to the increased capacity operation (N_Units) mode.



Notes

· Selecting the operation mode and then pressing the SET key switches to the MODE screen.

To check the set value after it is changed, perform steps ⑤ and ⑥ again to display and check the set value indicated by the square brackets []. When you check it and then press the SET key on a screen showing a set value that is not indicated by [], the set value will be changed.

When you will not change the set value, press the SET key while the set value is indicated by [].

· Four minutes of inactivity causes the LCD screen display to disappear. Press any of the 3 keys to display the screen that disappeared.

- ⑦ When the setting is finished, turn the DC input power OFF.

This completes the preparations before operation.

§11. Operating Procedures

§11.1 D11A102B001US Operating Procedures

Note

After the DC-AC Inverter is installed, be sure to check the start and stop operations.

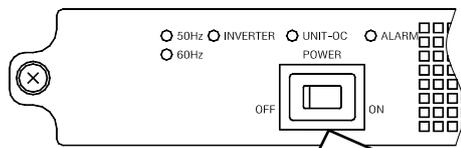
Note on before operating

See §2.2 (4) "Installation Precautions." when you perform a test using a fuse for the DC input before operating.

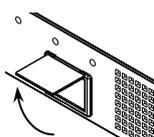
Start Procedure

Follow the procedure below to start the DC-AC Inverter.

Operating Procedure	Unit Status	Unit LED Display
1 Turn the DC input distribution board breaker ON.	①Cooling fan starts. ②Output stops	50 Hz or 60 Hz (green) turns on ^{※1}
2 Turn the Start/Stop switch POWER of the unit ON.	Output power is supplied (Inverter starts)	INVERTER (blue) turns on 50 Hz or 60 Hz (green) continues to be lit ^{※1}



Open the Start/Stop switch **POWER** cover and operate the switch. After you operate the switch, close the cover.



Notes on operating procedure

- ※1. The LED turns on according to the output frequency setting of the unit.
- ※2. This DC-AC Inverter performs parallel operation of 1 kVA units. Start all the units connected, and then turn the load device power ON. If you turn the load device power ON while any unit is not under operation, the protective function may cause the unit to stop due to drooping in the same way as with overload. For details, see §12.1 (2) "When overloaded."

Note on before output power is supplied to load device

Check the frequency in region where equipment is used is suitable for the 50Hz 60Hz LED (green) on the unit before output power is supplied to load device. Change the DIP switch settings on the back panel of the unit seeing §8.3 "Checking the DIP Switch." After checking the output power is not supplied to the load device when they are not suitable.

After confirming that the INVERTER LEDs (blue) are lit on all the connected units, turn the load device power ON.

Stop Procedure

Notes on stop procedure

- Before you stop the DC-AC Inverter, be sure to turn the load device power OFF.
- For safety sake, be sure to turn the distribution board breaker OFF.

Follow the procedure below to stop the DC-AC Inverter.

Operating Procedure	Unit Status	Unit LED Display
1 Turn the load device OFF.	Output power continues to be supplied	INVERTER LED (blue) turns on 50 Hz or 60 Hz (green) continues to be lit
2 Turn the Start/Stop switch POWER for all the connected units OFF.	①Output stops ②Fan continues to run	50 Hz or 60 Hz (green) continues to be lit
3 Turn the DC input distribution board breaker OFF.	Fan stops	All LEDs turn off

§11.2 D11A102B011US Operating Procedure

Note

After installation, be sure to check the start and stop operations.

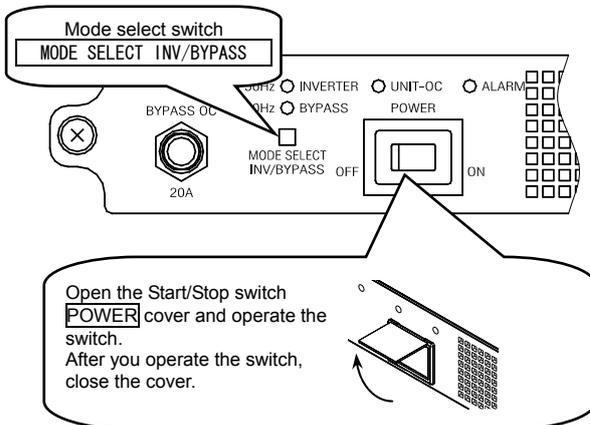
Note on before operating

- See §2.2 (4) "Installation Precautions." when you perform a test using a fuse for the DC input before operating.
- Check the bypass breakers of all units are not tripped. See §13.2.5 "Resetting the Bypass Breaker." If the bypass breaker is tripped.

Start Procedure

Follow the procedure below to start the DC-AC Inverter.

Operating Procedure	Unit Status	Unit LED Display
1 Turn the DC input distribution board breaker ON.	①Cooling fan starts running ②Output stops	50 Hz or 60 Hz (green) turns on ^{*1}
2 Turn the AC input distribution board breaker ON.	①Cooling fan continues to run ②Output continues to be stopped	50 Hz or 60 Hz (green) continues to be lit ^{*1}
3 Turn the Start/Stop switch POWER of the unit ON.	Output power is supplied (Inverter starts running)	INVERTER LED (blue) turns on 50 Hz or 60 Hz (green) continues to be lit ^{*1}
4 After confirming that INVERTER (blue) is lit, hold down the mode select switch MODE SELECT INV/BYPASS for at least 1 second.	Inverter operation → bypass operation	BYPASS LED (yellow) turns on ^{*2} 50 Hz or 60 Hz (green) continues to be lit ^{*1}
5 After confirming that BYPASS (yellow) is lit, hold down the mode select switch MODE SELECT INV/BYPASS for at least 1 second.	Bypass operation → inverter operation	INVERTER LED (blue) turns on ^{*2} 50 Hz or 60 Hz (green) continues to be lit ^{*1}



Note on operating procedure

- *1. The LED turns on according to the AC input frequency. When AC input power is not received, the LED turns on according to the output frequency setting of the unit.
- *2. If the LED does not turn on in steps (4) and (5), the AC input power and inverter output are not synchronized, or the AC input voltage is not within the normal range. When this happens, the inverter operation and bypass operation cannot be switched.
- *3. This DC-AC Inverter performs parallel operation of 1 kVA units. Start all the units connected, and then turn the load device power ON. If you turn the load device power ON while any unit is not under operation, the protective function will cause the unit to stop due to drooping in the same way as with overload. For details, see §12.2 (3) "When overloaded."

Note on before output power is supplied to load device

Check the frequency in region where equipment is used is suitable for the 50Hz 60Hz LED (green) on the unit before output power is supplied to load device. Change the DIP switch settings on the back panel of the unit seeing §8.3 "Checking the DIP Switch." After checking the output power is not supplied to the load device when they are not suitable.

After confirming that the INVERTER LEDs (blue) are lit on all the connected units, turn the load device power ON.

Notes on stop procedure

- Before you stop the DC-AC Inverter, be sure to turn the load device power OFF.
- For safety sake, be sure to turn the distribution board breaker OFF.

Stop Procedure

Follow the procedure below to stop the DC-AC Inverter.

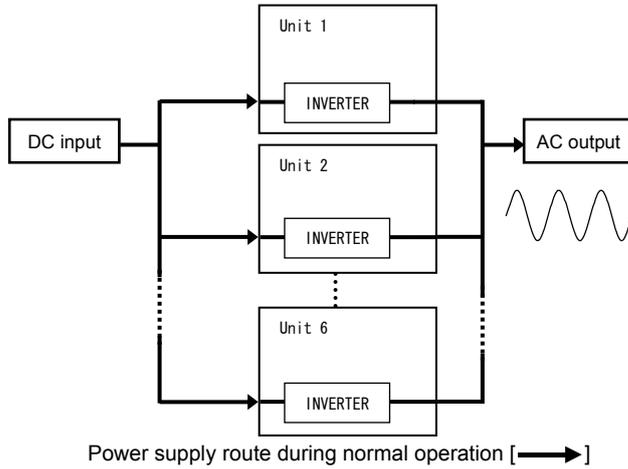
Operating Procedure	Unit Status	Unit LED Display
1 Turn the load device power OFF.	Output power continues to be supplied	INVERTER LED (blue) turns on 50 Hz or 60 Hz (green) continues to be lit
2 Turn the Start/Stop switch POWER for all the connected units OFF.	①Output stops ②Fan continues to be run	50 Hz or 60 Hz (green) continues to be lit
3 Turn the AC input distribution board breaker OFF.	①Output continues to be stopped ②Fan continues to be run	50 Hz or 60 Hz (green) continues to be lit
4 Turn the DC input distribution board breaker OFF.	Fan stops	All LEDs turn off

§12. Operation and Protective Functions

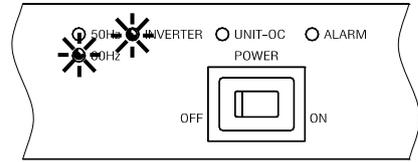
§12.1 D11A102B001US Basic Operation

(1) Normal operation

During normal operation, the DC input power is received and the AC power converted by the inverter is supplied to the load device.



LED display
The frequency display LED is set to 60 Hz in the example.
☀ : Indicates that the LED is lit.



(2) When overloaded

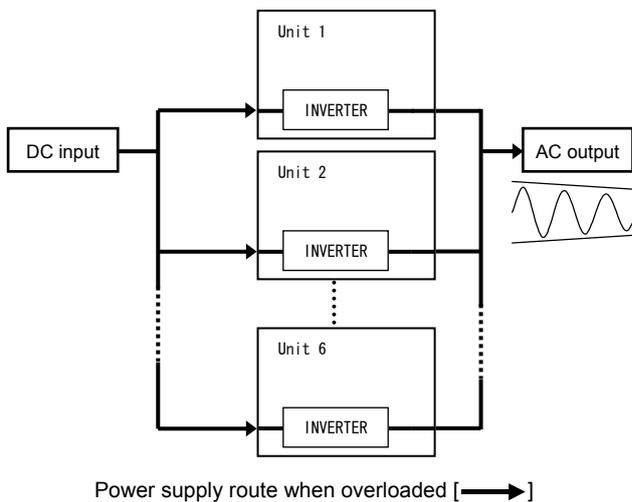
If the load current exceeds the capacity of the unit, and the unit becomes overloaded, the UNIT-OC LED (red) display turns on.

Reduce the load to make sure the DC-AC Inverter can be used safely.

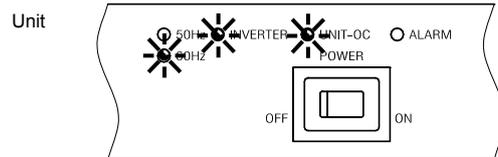
If the overload state continues, a droop circuit is activated to protect the DC-AC Inverter, and eventually a drop in the output voltage may cause the DC-AC Inverter to shut it down for protection, shutting off the output.

This DC-AC Inverter performs parallel operation of 1 kVA units, so first start all the connected units and then turn the load device power ON.

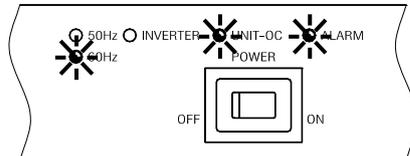
If you turn the load device power ON while any unit is not under operation, a droop circuit may be activated in the same way as with the overload to shut down the DC-AC Inverter to protect it.



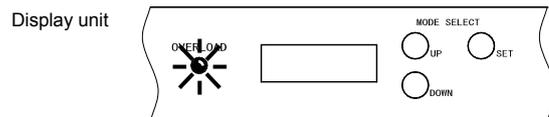
LED status when overloaded



LED status when output is shut off because overload continues



LED status when overloaded

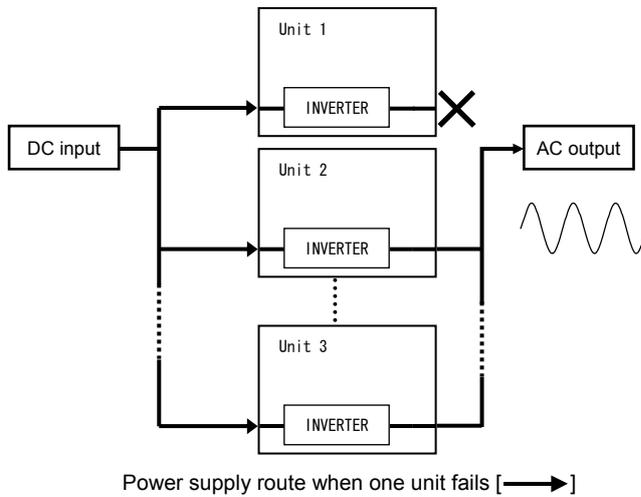


When N_Units is set in §10.1

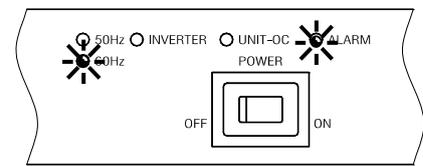
The UNIT-OC (red) and ALARM (red) of the unit turns on when overload continues, and output is shut off. This case is reset by turning ON after the Start/Stop switch **POWER** is turned OFF. Reset the Start/Stop switch **POWER** after reducing the load. So first start all the connected units and then turn the load device power ON.

(3) When one unit fails

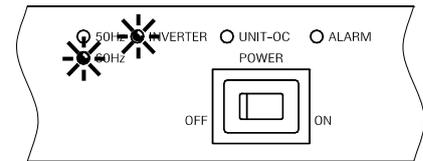
When one unit fails, the ALARM LED (red) of the failed unit turns on.
 The remaining normal units continue to supply power to the load device.
 However, if one unit fails and the remaining normal units become overloaded, the normal units will be run in the same manner as when overloaded as described in (2).



LED status when one unit fails



LED status for normal units



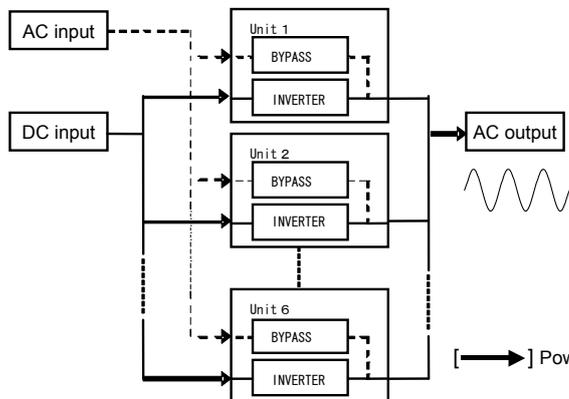
Note

1. When a DC-AC Inverter fails, contact your supplier or Sanyo Denki as soon as possible.
2. When you remove the unit, be sure to read §13.2.1 "Procedure to Remove the Unit" and follow the instructions.

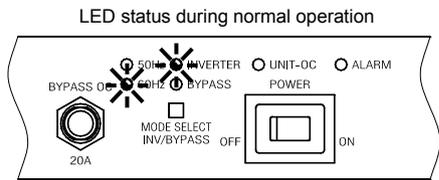
§12.2 D11A102B011US Basic Operation

(1) Normal operation

During normal operation, the DC input power is received and the AC power converted by the inverter is supplied to the load device.

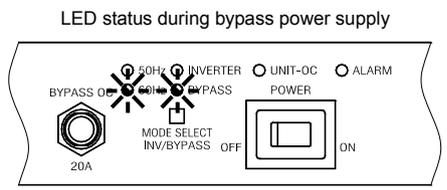
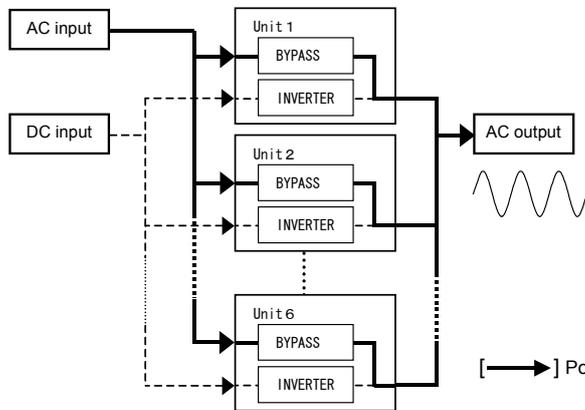


LED display
The frequency display LED is set to 60 Hz in the example.
☀️ : Indicates that the LED is lit.



[→] Power supply route during normal operation

(2) DC-AC Inverter output switching operation



[→] Power supply route during bypass power supply

① Operation for manual switching

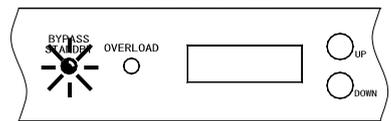
When you hold down the **MODE SELECT** on the front panel of the DC-AC Inverter for at least 1 second while the DC input and AC input power supplies are normal, the output of the DC-AC Inverter can be switched from inverter power supply to bypass power supply without interruption. When you hold down the **MODE SELECT** again for at least 1 second, the DC-AC Inverter output can be switched from bypass power supply to inverter power supply without interruption. This switching is only possible when the AC input power and inverter output are synchronized (when the **BYPASS STANDBY LED** (green) on the display unit is lit. When you operate the **MODE SELECT** switch in succession, wait for at least 15 seconds before you operate the switch again.

② Operation for automatic switching

If, for example, a power failure occurs with the AC input power supply during bypass power supply, the power automatically switches to inverter power supply. Once the failure is recovered, the power is automatically restored to bypass power supply. When you need to shut off the DC input power during inverter power supply, operate the **MODE SELECT** to switch to bypass power supply. Once the DC input power is received, the power switches to inverter power supply.

Display unit

LED status when AC input and inverter output are synchronized



Tip

- ① When you press the **MODE SELECT** of any one unit, all connected units switch to inverter power supply or bypass power supply.
- ② Once the AC input power is restored to normal, the DC-AC Inverter synchronizes the inverter output with the AC input power and then automatically switches to bypass power supply.

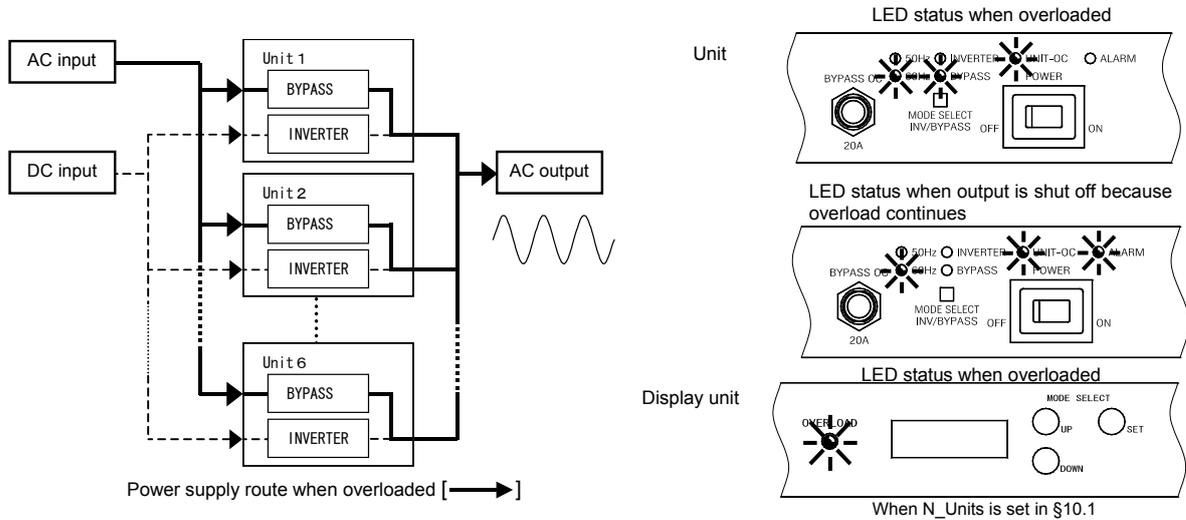
MODE SELECT Setting	Power Status	Unit Output Status	Switching Time
BYPASS	AC input failure occurrence	Bypass power supply → Inverter power supply	15 ms
	AC input recovery to normal	Bypass power supply ← Inverter power supply	0 ms

Note

If, for example, a power failure occurs with the DC input power supply during inverter power supply, the DC-AC Inverter shuts down and the output stops.

(3) When overloaded

When the load current exceeds the overload warning level set on the LCD of the display unit during inverter power supply, the OVERLOAD LED (red) on the display unit turns on, and all the units automatically switch to bypass power supply. Reduce the load to make sure the DC-AC Inverter can be used safely. Once the overload state is resolved, the inverter output of all the units synchronizes with the AC input power, and then automatically switches to the inverter power supply. When the overload state continues, the bypass breaker (BYBASS OC 20A) of the unit is tripped to protect the DC-AC Inverter. Note that when the bypass breakers of all the units are tripped, the output will be shut off.



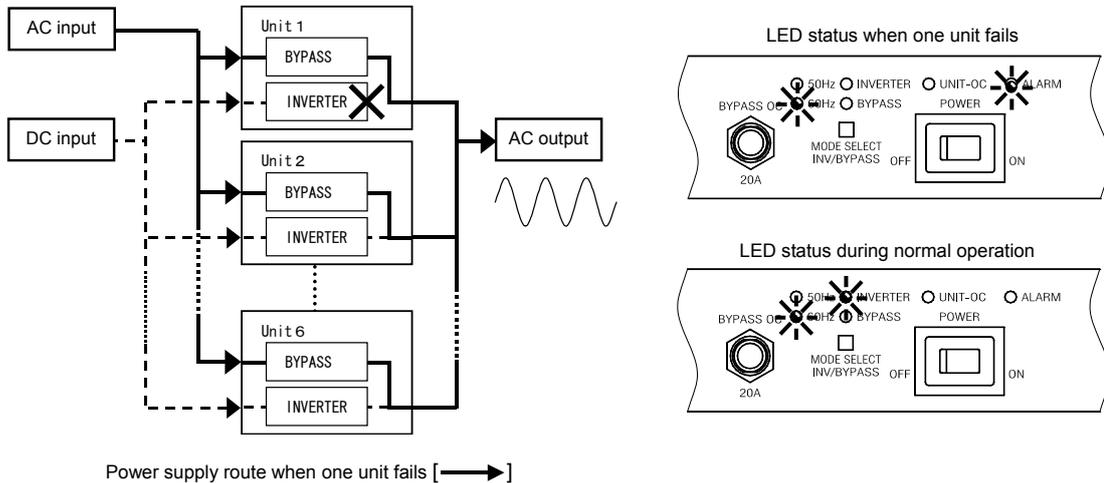
The UNIT-OC (red) and ALARM (red) of the unit turns on when overload continues, and output is shut off. This case is reset by turning ON after the Start/Stop switch [POWER] is turned OFF. Reset the Start/Stop switch [POWER] after reducing the load and check on bypass breaker. If the bypass breaker is tripped, see §13.2.5 "Resetting the Bypass Breaker." So first start all the connected units and then turn the load device power ON.

Note

When the bypass breaker is tripped by a DC input failure, the LED display of the unit turns off.

(4) When one unit fails

When one unit fails, the ALARM LED (red) of the failed unit turns on, and the unit fails to supply output power. At this point, when the load current exceeds the value set in §10.1 "Setting the Overload Warning Level," the OVERLOAD LED (red) on the display unit turns on, and the external transfer signal OVERLOAD is sent out. Regardless of whether you set the increased capacity operation (N units) or redundant operation (N+1 units), when the load current exceeds 105% of the load capacity of the N units, all the units switch to bypass power supply.



MODE SELECT Setting	Status	Unit Output Status	Switching Time
INV	Inverter failure occurrence	Inverter power supply → Bypass power supply	0 ms

Note

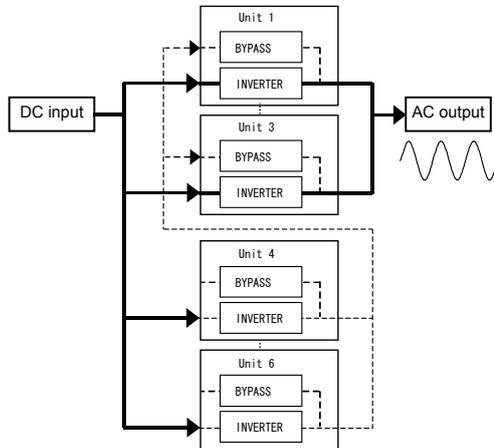
- When a DC-AC Inverter fails, contract your supplier or Sanyo Denki as soon as possible.
- When you remove the unit, be sure to read §13.2.1 "Procedure to Remove the Unit" and follow the instructions.

§12.3 D11A102B011US Special Function Operation

(1) Normal operation

Units installed in the upper part of the cabinet (parallel units 1 to 3) receive DC input power, and perform parallel operation while supplying AC power converted by the inverter to the load device.

Units installed in the lower part of the cabinet (standby units 4 to 6) receive DC input power, and perform parallel operation while supplying AC power converted by the inverter to the bypass input of parallel units 1 to 3.

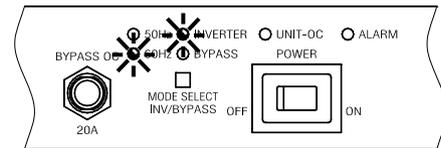


LED display

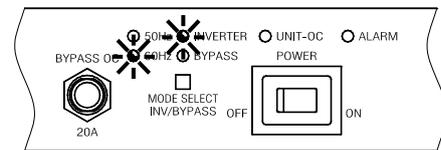
The frequency display LED is set to 60 Hz in this example.

: Indicates that LED is lit.

LED status during normal operation (parallel units 1 to 3)



LED status during normal operation (standby units 4 to 6)



(2) DC-AC Inverter output switching operation

① Operation for manual switching

When the DC input power and the AC output of the standby units are normal, and you press the **MODE SELECT** ^{※1} on the front panel of parallel units 1 to 3 for at least 1 second, the output can be switched from inverter power supply to bypass power supply without interruption. At this point, the AC output of the standby units connected to the bypass input of the parallel units is supplied to the load device. When you press the **MODE SELECT** again for at least 1 second, the output is switched from bypass power supply to inverter power supply without interruption, and the AC output of the parallel units is supplied to the load device.

② Operation for automatic switching

When the parallel units supply power from the AC output of the standby units by bypass switching, and a failure occurs with the AC output of the standby units, the parallel units automatically switch to inverter power supply ^{※2} and supply the AC output of the parallel units. Once the failure is recovered, the parallel units automatically switch back to the original bypass power supply, and supply the AC output of the standby units.

Tip

- ① When you press the **MODE SELECT** on any one unit of parallel units 1 to 3, all the connected parallel units switch to inverter power supply or bypass power supply
- ② When the AC output of the standby units is restored to normal, the parallel units synchronize the inverter output with the AC output of the standby units, and then automatically switch to bypass power supply.

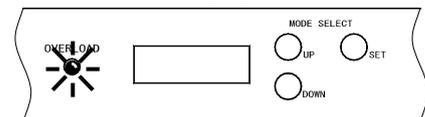
Notes

- ※1. When you operate the **MODE SELECT** switch in succession, wait for at least 15 seconds before you operate the switch again.
- ※2. Note that if, for example, a power failure occurs with the DC input power supply during inverter power supply, the DC-AC Inverter shuts down and the output stops.

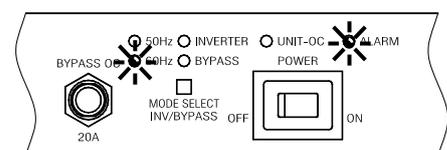
(3) When overloaded

When the load current exceeds the overload warning level set on the LCD of the display unit during inverter power supply, the OVERLOAD LED (red) on the display unit turns on, and all the parallel units automatically switch to bypass power supply. Reduce the load to make sure the DC-AC Inverter can be used safely. When the overload state continues for 20 seconds after switching to the standby units, the standby units stop running due to the failure caused by the overload.

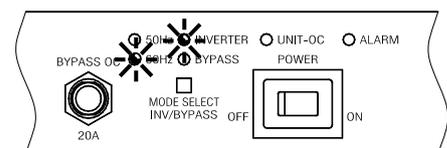
LED status when display unit is overloaded



LED status when a unit fails (parallel units 1 to 3)



LED status during normal operation (standby units 4 to 6)



(4) When one unit fails

When one unit fails, the ALARM LED (red) of the failed unit turns on, and the unit fails to supply output power. At this point, when the load current exceeds the value set in §10.1 "Setting the Overload Warning Level," all the parallel units automatically switch to bypass power supply, and supply power from the inverter AC output of the standby units to the load device.

§12.4 Protective Function Table

○: indicates that the LED turns on and transfer signal is

(1) In the case of the D11A102B001US unit model and the PD-D11AB03US, 05US, and 06US cabinet models, functions including the protective ones shown in the following table are available for each inverter unit and cabinet.

Item	Inverter Unit Front Panel LED Display			Cabinet LED Display	Cabinet External Transfer Signal						Function/ Protective Function	Other Unit's Operation	Notes	
	INVERTER (blue)	UNIT-OC (red)	ALARM (red)	OVERLOAD (red)	ACOUT FAIL (Output failure)	ALARM (Device failure)	AC OUT (AC output)	DCIN-ALM (DC input error)	OVER LOAD (Overload)	CABINET-ALM (Cabinet failure)				
00	DC power reception	—	—	—	—	○	—	—	—	—	—	Inverter spontaneous stop	Inverter spontaneous stop	
01	Unit setting error	—	—	○ Blink	—	○ / —	○	— / ○	—	—	—	Inverter unable to be started	All inverters unable to be started / Inverter power supply if under operation before the event	<ul style="list-style-type: none"> When all units receive power at the same time, all units cannot be started. When other units are already under operation, they continue to be run. When the settings are different from other units, reconfigure the settings and then turn on the DC power again or reinsert the unit to make the changed settings effective.
02	Normal	○	—	—	—	—	—	○	—	—	—	Inverter power supply	Inverter power supply	<ul style="list-style-type: none"> Dependent on the Start/Stop switch (POWER). DC power reception → POWER ON → Inverter power supply
03	Unit failure Note 1	—	—	○	—	—	○	○	—	—	—	Inverter Protective stop	Inverter power supply	<ul style="list-style-type: none"> The failed unit causes the ALARM to turn on and stop output. Power continues to be supplied from the inverter output of other units.
04	Cabinet failure Note 2	○	—	—	—	○	—	—	—	—	○	Inverter power supply	Inverter power supply	<ul style="list-style-type: none"> The unit status cannot be transferred because of a cabinet (common area) failure, but inverter power supply is continued.
05	Overload 100 V setting (About 10.5 A/unit)	○	○ Note 3	—	○ Note 3	—	—	○	—	○ Note 3	—	Inverter power supply Drooping operation	Inverter power supply Drooping operation	<ul style="list-style-type: none"> Inverter power supply (drooping) is continued. (Continued for 20 seconds.)
	120 V setting (About 8.75 A/unit)	—	○ Note 3	○	○ Note 3	○ *	○	— *	—	○ Note 3	—	Inverter Protective stop (After 20 seconds)	Inverter Protective stop (After 20 seconds)	<ul style="list-style-type: none"> After the drooping operation continues for 20 seconds, an output undervoltage is detected and a protective stop occurs. When operation becomes no longer possible and output stops because all of the units are overloaded, "AC OUT FAIL" is sent out.
06	DC input voltage failure (during inverter power supply)	○→—	—	—	—	○	—	—	○	—	— *	Inverter spontaneous stop	Inverter spontaneous stop	<ul style="list-style-type: none"> This is only sent out when the control power of the units and cabinet is within the operable range. When the control power is outside the operable range, it is not sent out and "CABINET-ALM" is sent out instead.

Note 1: Unit failure

- ① Inverter output voltage failure [undervoltage (LV), overvoltage (HV)]
- ② Converter output voltage failure [undervoltage (LV), overvoltage (HV)]
- ③ Semiconductor temperature failure

Note 2: Common area failure

- ① Power error or other failure of input/output cabinet

Note 3: OVER LOAD (red) is lit during an overload.

Example: When 6 units are connected and all 6 units are operating normally

Setting	OVER LOAD (Red) ON Level
N+1_Units (Parallel redundancy)	Exceeding 105% of the output capacity of 5 units causes the LED to turn on.
N_Units (Parallel)	Exceeding 105% of the output capacity of 6 units causes the LED to turn on.

Example: When 6 units are connected and 4 units are operating normally (the remaining 2 units are stopped or have failed)

Setting	OVER LOAD (Red) ON Level
N+1_Units (Parallel redundancy)	Exceeding 105% of the output capacity of 3 units causes the LED to turn on.
N_Units (Parallel)	Exceeding 105% of the output capacity of 4 units causes the LED to turn on.

○: indicates that the LED turns on and transfer signal is

(2) In the case of the D11A102B011US unit model and the PD-D11AB13US, 15US, and 16US cabinet models, functions including the protective ones shown in the following table are available for each inverter unit and cabinet.

Item	Inverter Unit Front Panel LED Display				Cabinet LED Display		Cabinet External Transfer Signal						Function/ Protective Function	Other Unit's Operation	Notes	
	INVERTER (blue)	BYPASS (orange)	UNIT-OC (red)	ALARM (red)	BYPASS STANDBY (green)	OVERLOAD (red)	BYPASS OUT (Bypass output)	ACOUT FAIL (Output failure)	ALARM (Device failure)	AC OUT (AC output)	DCIN-ALM (DC input error)	OVER LOAD (Overload)				CABINET-ALM (Cabinet failure)
00	DC power reception	—	—	—	—	—	—	○	—	—	—	—	—	Inverter spontaneous stop	Inverter spontaneous stop	
01	Unit setting error	—	—	—	○ Blink	—	—	—	○	—	—	—	—	Inverter unable to be started	All inverters unable to be started / Inverter power supply or bypass power supply	<ul style="list-style-type: none"> When all units receive power at the same time, all units cannot be started. When other units are already under operation, they continue to be run. When the settings are different from other units, reconfigure the settings and then turn on the DC power again to make the changed settings effective.
02	Normal (when DC input power is received for the first time)	○	—	—	—	—→○ Note 3	—	—	—	○	—	—	○→—	Inverter power supply	Inverter power supply	<ul style="list-style-type: none"> Dependent on the Start/Stop switch (POWER). DC power reception → POWER ON → AC power reception → Inverter power supply
03	Normal (when AC input power is received for the first time)	○	—	—	—	—→○	—	—	—	○	—	—	○→—	Inverter power supply	Inverter power supply	<ul style="list-style-type: none"> Dependent on the Start/Stop switch (POWER). AC power reception → POWER ON → DC power reception → Inverter power supply
04	「MODE SELECT」 → 「BYPASS」	○→—	—→○	—	—	○	—	—→○	—	—	○	—	—	Bypass power supply	Bypass power supply	<ul style="list-style-type: none"> When the AC input power is not received, the switching does not occur. Inverter power supply is continued. When the inverter and bypass are not synchronized, the switching does not occur. Inverter power supply is continued.
05	「MODE SELECT」 → 「INV」	—→○	○→—	—	—	○	—	○→—	—	—	○	—	—	Inverter power supply	Inverter power supply	<ul style="list-style-type: none"> When the inverter and bypass are not synchronized, the switching does not occur.
06	Unit failure Note 1	—	—	—	○	○	—	—	○	○	—	—	—	Inverter Protective stop	Inverter power supply	<ul style="list-style-type: none"> The failed unit causes the ALARM to turn on and stop output. Power continues to be supplied from the inverter output of other units.
07	Cabinet failure Note 2	○	—	—	—	—	—	—	○	—	—	—	○	Inverter power supply	Inverter power supply	<ul style="list-style-type: none"> Bypass cannot be switched (Manual/Auto) The unit status cannot be transferred because of a cabinet (common area) failure, but inverter power supply is continued.
08	Overload 100 V setting (About 10.5 A/unit) 120 V setting (About 8.75 A/unit)	—	○	○ Note 4	—	○ Note 3	○ Note 4	○	—	—	○	—	○	Bypass power supply Auto switching*	Bypass power supply Auto switching*	<ul style="list-style-type: none"> When AC input is not received or all units and bypass cannot be synchronized, the switching does not occur. If this happens, inverter power supply (drooping for approximately 20 seconds) is continued and then a protective stop occurs.
		—	—	○ Note 4	○	—	○ Note 4	—	○	—	—	○	—	Bypass MCCB trip	Bypass MCCB trip	<ul style="list-style-type: none"> When a heavy overload has continued, the bypass breaker of the inverter unit is tripped, inverter power supply (drooping for approximately 20 seconds) is continued, and then a protective stop occurs.
		—	—	○ Note 4	○	—	○ Note 4	—	○ *	○	— *	—	○ Note 3	—	Inverter protection stop (After 20 seconds)	Inverter protection stop (After 20 seconds)
09	DC input voltage failure (During inverter power supply)	○→—	—	—	○ Blink	—	—	—	○	—	—	○ *	— *	Inverter spontaneous stop	Inverter spontaneous stop	<ul style="list-style-type: none"> Switching to bypass power supply does not occur. This is only sent out when the control power of the units and cabinet is within the operable range. When the control power is outside the operable range, it is not sent out and "CABINET-ALM" is sent out instead.
10	DC input voltage failure (During bypass power supply)	—	○	—	○ Blink	—	—	○ *	○	—	○ *	○ *	— *	Bypass power supply	Bypass power supply	<ul style="list-style-type: none"> When DC input power is not received, the relay for the external transfer signal cannot be excited so it does not work. Once the DC input power is restored, switching to inverter power supply occurs.
11	AC input voltage failure (During bypass power supply)	○	—	—	—	—	—	—	—	○	—	—	—	Inverter power supply	Inverter power supply	<ul style="list-style-type: none"> Once the AC input voltage is restored to normal, the power automatically switches to bypass power supply.

Note 1: Unit failure ①Inverter output voltage failure [undervoltage (LV), overvoltage (HV)]
 ②Converter output voltage failure [undervoltage (LV), overvoltage (HV)]
 ③Semiconductor temperature failure

Note 2: Input/output cabinet failure ①Cabinet power supply failure, etc.

Note 3: When the AC input power is not received, the BYPASS STANDBY LED (green) does not turn on.

Note 4: OVER LOAD (red) is lit during an overload, and the level of auto switching to bypass power supply becomes as shown in the table below.

Example: When 6 units are connected and all 6 units are operating normally

Setting	OVER LOAD (Red) ON Level	Level of Auto Switching to Bypass Power Supply
N+1_Units (Parallel redundancy)	Exceeding 105% of the output capacity of 5 units causes the LED to turn on.	Exceeding 105% of the output capacity of 6 units causes the auto switching to occur.
N_Units (Parallel)	Exceeding 105% of the output capacity of 6 units causes the LED to turn on.	Exceeding 105% of the output capacity of 6 units causes the auto switching to occur.

Example: When 6 units are connected and 4 units are operating normally (the remaining 2 units are stopped or have failed)

Setting	OVER LOAD (Red) ON Level	Level of Auto Switching to Bypass Power Supply
N+1_Units (Parallel redundancy)	Exceeding 105% of the output capacity of 3 units causes the LED to turn on.	Exceeding 105% of the output capacity of 4 units causes the auto switching to occur.
N_Units (Parallel)	Exceeding 105% of the output capacity of 4 units causes the LED to turn on.	Exceeding 105% of the output capacity of 4 units causes the auto switching to occur.

§13. Inspection and Maintenance

 CAUTION	<ul style="list-style-type: none"> • Inspection and maintenance of the inside of the DC-AC Inverter should be performed only by a service technician. Electric shock, bodily injury, burn, smoke, or fire may otherwise result. • Inspection should be performed after shutting down the DC-AC Inverter completely and turning off the distribution board breakers for the DC and AC power supplies. There is danger of electric shock. 	
---	---	---

The projected service life of this DC-AC Inverter is 15 years. This DC-AC Inverter requires no special daily care, however, the following components need to be replaced over time (a fee will be charged).

Cooling fan	Once every 8 years	}	→	Submit a request for maintenance work when the replacement time
Fuse	Once every 8 years			

§13.1 Routine Checks by the Customer

 CAUTION	<ul style="list-style-type: none"> • Be sure not to inspect the inside of the DC-AC Inverter. Doing so may result in an electric shock, burn, injury, smoke, or fire. • Do not touch the fan on the back panel of the DC-AC Inverter when cleaning the DC-AC Inverter or anywhere around the DC-AC Inverter. Doing so may result in an injury. • Do not use a wet cloth for cleaning. Doing so may result in an electric shock. • When cleaning, do not connect a vacuum cleaner to the output terminal of the DC-AC Inverter. Doing so may result in smoke or fire. 	
--	--	--

Routinely check the following items.

- ① **Is the control panel LED lighting state abnormal?**
- ② **Is the exterior of the DC-AC Inverter in any way damaged or deformed?**
- ③ **Is an unusual sound or odor emitted from the DC-AC Inverter?**
- ④ **Is the installation environment of the DC-AC Inverter suitable?
Are the humidity and temperature within the specified ranges?**
⇒ See §5.1 "Checking the Installation Environment."
- ⑤ **Has the specified amount of space been provided at the front and back of the DC-AC Inverter?**
If the air intake or exhaust vent is blocked, the internal temperature of the DC-AC Inverter rises, which could result in a damage to the DC-AC Inverter.
⇒ See §5.3 "Checking the Installation Space."
- ⑥ **Remove any dust or dirt adhering to the intake and exhaust vents.**
Dust or dirt adhering to parts inside the DC-AC Inverter may cause it to malfunction.

§13.2 Maintenance by a Service Technician

The user must not perform the maintenance described in this section. Be sure to contact your service technician for maintenance.

 CAUTION	<ul style="list-style-type: none"> • Internal maintenance and inspection should be performed only by a service technician. Electric shock, bodily injury, burn, smoke or fire may otherwise result. • Do not touch the rotating fan during inspection and maintenance. Doing so may result in bodily injury. • Never use a wet cloth to clean the DC-AC Inverter. Doing so may result in an electric shock. • When cleaning, do not connect a vacuum cleaner to the output terminal of the DC-AC Inverter. Doing so may result in smoke or fire. 	 
---	--	--

(1) Periodic inspection

Periodic inspection should be performed by a service technician about once every 6 months.

(2) Removing the unit from the cabinet or installing the unit.

When you need to remove the unit for maintenance or due to a failure, be sure to follow the instructions in §13.2.1 “Procedure to Remove the Unit.”
Likewise, when you install the unit, follow the instructions in §13.2.2 “Procedure to Install the Unit.”

(3) Installing an additional unit in the cabinet

When you will need to increase the power capacity in order to expand your system, you will be able to install the maximum number of additional units as shown below.

- Cabinet for 3 units (PD-D11AB*3US): 3 units
- Cabinet for 5 units (PD-D11AB*5US): 5 units
- Cabinet for 6 units (PD-D11AB*6US): 6 units

When you install an additional unit, follow the instructions in §13.2.3 “Procedure to Install an Additional Unit.”

(4) Replacing the display unit of the cabinet.

When you replace the display unit because of a failure or other reason, follow the instructions in §13.2.4 “Procedure to Replace the Display Unit.”

Note on maintenance

- An incorrect procedure to install an additional unit, remove or install the unit, or replace the display unit may result in the shutdown of the DC-AC Inverter. Be sure to follow the procedures in this manual.
- An incorrect procedure to install an additional unit, remove or install the unit must work in each unit. Do not do those works with the unit install in the cabinet on the way. The finger is jammed or bodily injury may otherwise result.

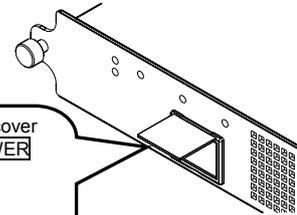
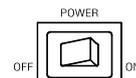
§13.2.1 Procedure to Remove the Unit

Step ① Check Current value: _____ A
 Check the output current of the DC-AC Inverter.
 If the current value is larger than the rated current of the units not to be removed, reduce the load.



Step ② Check
 Open the Start/Stop switch **POWER** cover on the front panel of the unit to be removed, and turn the switch OFF.
 After you operate the switch, close the cover.

Open the switch cover and turn the **POWER** switch OFF.

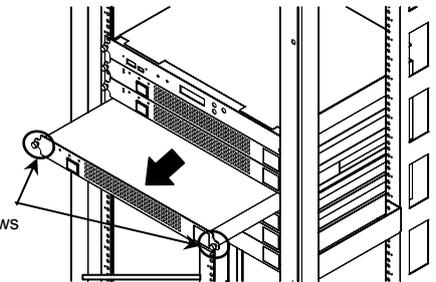


Note

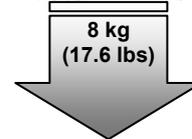
The weight of the unit is approximately 8 kg (17.6 lbs).
 Be careful not to drop the unit on your foot. Doing so may result in an injury.

Step ③ Check
 Loosen the thumbscrews on the left and right, hold the thumbscrews and pull the unit slightly out in the direction of the arrow.
 Pull the unit out far enough to hold the sides of the unit, and then hold the sides of the unit firmly and pull the unit all the way out.

Thumbscrews



8 kg
(17.6 lbs)



§13.2.2 Procedure to Install the Unit

Note

Even if you change the DIP switch settings after you start the unit, the changes will not become effective. Check the settings before you insert the unit into the cabinet.

Step ① Check

Check that the DIP switch settings of the unit to be installed are identical to those of the units that are already installed and operative. Confirm that the Start/Stop switch **POWER** is set to OFF.



Note

The weight of the unit is approximately 8 kg (17.6 lbs). Be careful not to drop the unit on your foot. Doing so may result in an injury.

Step ② Check

Insert the unit into the cabinet and push it in the direction of the arrow.



Step ③ Check

Push the unit far enough to align the thumbscrews with the positions to fix the unit to the cabinet, and tighten the thumbscrews to secure the unit to the cabinet. (At 2 points)
The cooling fan will start rotating.



Step ④ Check

Confirm that the INVERTER LEDs (blue) for all the installed units are lit.

When using the D11A102B011US model:

If the BYPASS LED (yellow) is lit, refer to §11.2 "D11A102B011US Operating Procedure" and switch to the inverter operation, and confirm that the INVERTER LED (blue) turns on.



Step ⑤ Check

Open the Start/Stop switch **POWER** cover on the front panel of the unit and turn the switch ON. After you operate the switch, close the cover.

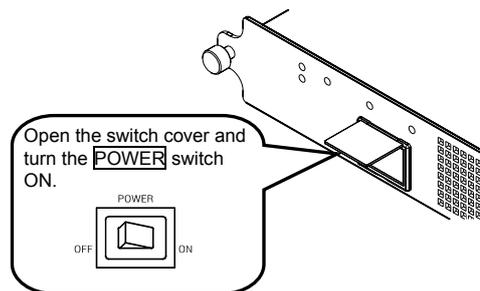
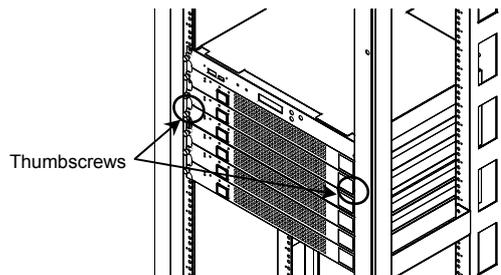
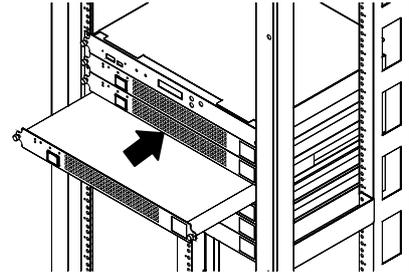


Step ⑥ Check

Confirm that the INVERTER LED (blue) on the front panel of the unit turns on.

Note

After starting the unit, be sure to run the unit for at least 10 minutes, and confirm that the ALARM LED on the front panel of the unit does not turn on.



§13.2.3 Procedure to Install an Additional Unit



- If you schedule the number of inverter units to be increased later, the breaker (UL489 approval) of the capacity in which the number of inverter units is increased.
- If the capacity of the breaker is insufficient after the number of inverter units is increased, change the breaker (UL489 approval). See §2.1 "Input Power Supply".

Note

Even if you change the DIP switch settings after you start the unit, the changes will not become effective. Check the settings before you insert the unit into the cabinet.

Step ① Check
 Check that the DIP switch settings of the unit to be added are identical to those of the units that are already installed and operative. Also confirm that the Start/Stop switch **POWER** is set to OFF.



Step ② Check
 Affix the unit number label included in the cabinet package to the unit to be added.



Note

The weight of the unit is approximately 8 kg (17.6 lbs). Be careful not to drop the unit on your foot. Doing so may result in an injury.

Step ③ Check
 Remove the blank panel, insert the unit into the cabinet, and push it in the direction of the arrow. Keep the removed blank panel together with this manual.



Step ④ Check
 Push the unit far enough to align the thumbscrews with the positions to fix the unit to the cabinet, and tighten the thumbscrews to secure the unit to the cabinet. (At 2 points)
 The cooling fan will start rotating.



Step ⑤ Check
 Confirm that the INVERTER LEDs (blue) for all the installed units are lit.

When using the D11A102B011US model:
 If the BYPASS LED (yellow) is lit, refer to §11.2 "D11A102B011US Operating Procedure" and switch the mode to the inverter operation, and confirm that the INVERTER LED (blue) turns on.



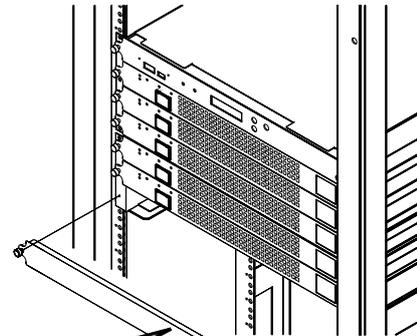
Step ⑥ Check
 Open the Start/Stop switch **POWER** cover on the front panel of the unit and turn the switch ON. After you operate the switch, close the cover.



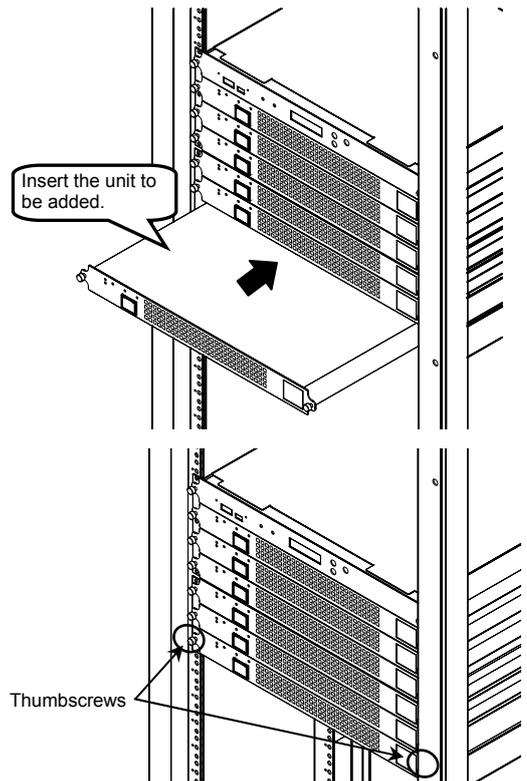
Step ⑦ Check
 Confirm that INVERTER LED on the front panel of the unit turns on.

Note

After starting the unit, be sure to run the unit for at least 10 minutes, and confirm that the ALARM LED on the front panel of the unit does not turn on.

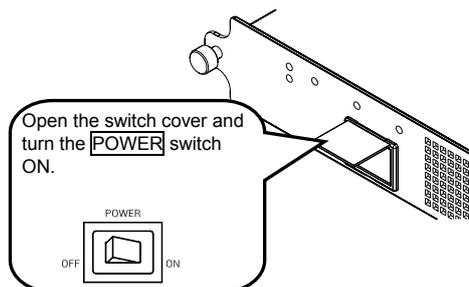


Remove the blank panel.

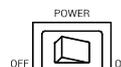


Insert the unit to be added.

Thumbscrews



Open the switch cover and turn the **POWER** switch ON.

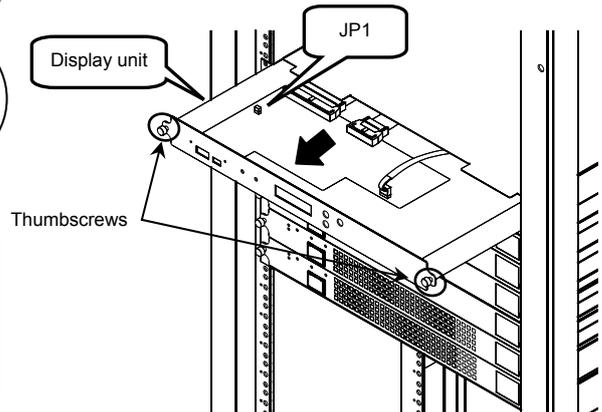


§13.2.4 Procedure to Replace the Display Unit

 CAUTION	<ul style="list-style-type: none"> Replacement should be performed only by a service technician. Electric shock, bodily injury, burn, smoke, or fire may result otherwise. The display unit should be replaced in accordance with the instructions in the instruction manual. Failure to do so may result in an electric shock and bodily injury. 	 
---	---	---

Note
 You can replace the display unit while the DC-AC Inverter is running. However, for safety sake, it is recommended to stop the operation of the DC-AC Inverter, turn the DC and AC input power OFF, and then replace the display unit.

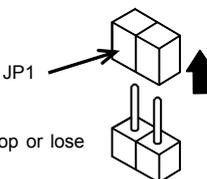
Step ① Check
 Loosen the thumbscrews on the left and right of the display unit, and pull the unit out in the direction of the arrow far enough for the short piece JP1 mounted on the circuit board to become visible.



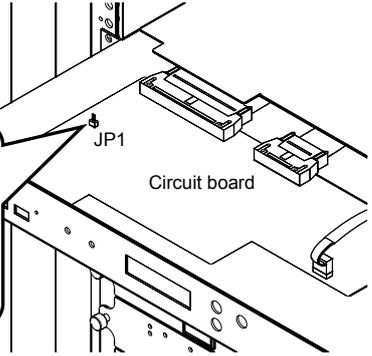
 CAUTION	<ul style="list-style-type: none"> Never touch parts mounted on the circuit board other than connectors. Failure to do so may result in an electric shock and bodily injury. When handling the JP1, either wear rubber gloves or use non-conductive pliers. Failure to do so may result in an electric shock. 	
---	---	---

Step ② Check
 Remove the short piece JP1 from the circuit board.

Remove the short piece JP1 from the circuit board.

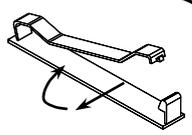


Be careful not to drop or lose removed parts.



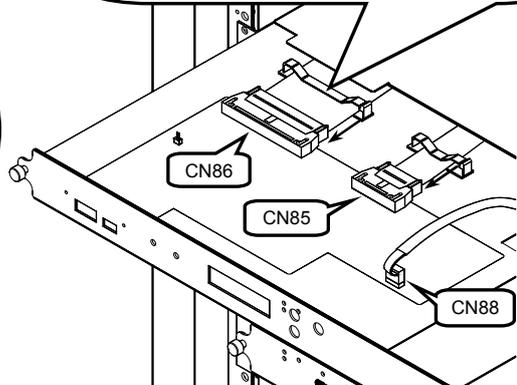
Step ③ Check
 Remove the CN88 connector from the circuit board.
 (At 1 point)

After removing the connector, remove the cable from the cable fixing clamp.



Release the claw in the direction of the arrow and lift it up.

Step ④ Check
 Remove the connectors from the circuit board.
 CN85 and CN86 at 2 points
 Be careful to remember the connector numbers of the cables.
 Remove the cables from the cable fixing clamp.
 CN85 and CN86 at 2 points
 After removing the connectors, pull the unit out.





Note

Be careful not to lose the short piece "JP1" after you remove it.

Step ⑤ Check
 Remove the short piece JP1 of the new display unit.
 After removing the JP1, insert the display unit about halfway into the cabinet.



Note

Be sure to lock the connectors CN85 and CN86.
 Check the direction of inserting the CN88 connector by referring to the figure on the right, and insert the pins in the correct direction.

Step ⑥ Check
 Pass the cable through the fixing clamp and attach the connector in the prescribed position.
 CN85 and CN86 at 2 points
 Stretch the cable to avoid slack and fix it with the fixing clamp.
 CN85 and CN86 at 2 points



Step ⑦ Check
 Attach the CN88 connector. (At 1 point)



Step ⑧ Check
 Attach the short piece JP1 you removed in step ⑤.

<p>CAUTION</p>	<ul style="list-style-type: none"> Never touch parts mounted on the circuit board other than connectors. Failure to do so may result in an electric shock and bodily injury. 	
	<ul style="list-style-type: none"> When handling the JP1, either wear rubber gloves or use non-conductive pliers. Failure to do so may result in an electric shock. 	



Step ⑨ Check
 Push the display unit all the way in.



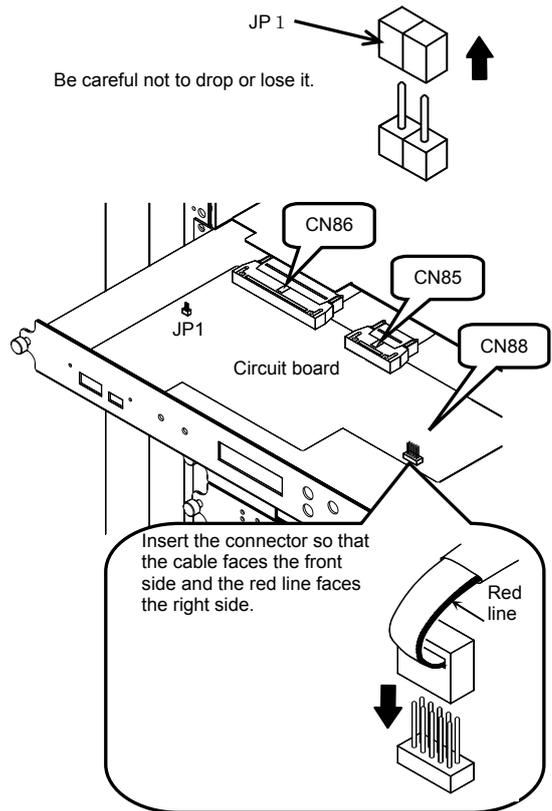
Step ⑩ Check
 Tighten the left and right thumbscrews to fix the display unit to the cabinet. (At 2 points)



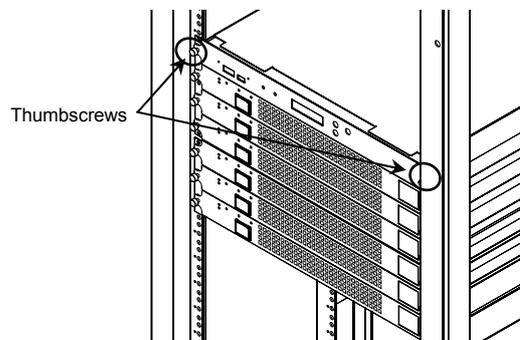
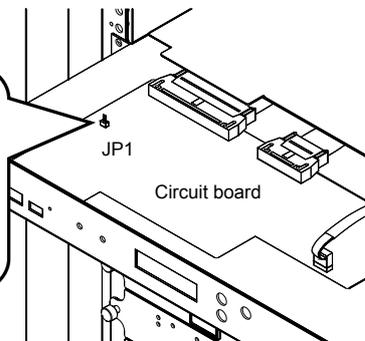
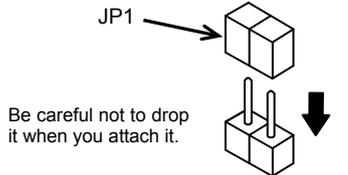
Step ⑪ Check
 Confirm that the LCD backlight is lit.

Remove the short piece "JP1."

Be careful not to drop or lose it.



Attach the short piece JP1.



§13.2.5 Resetting the Bypass Breaker



CAUTION

- Resetting of the bypass breaker should be performed only by a service technician. Failure to do so may result in an electric shock.
- Be sure to reset the bypass breaker after all units are shut down. Failure to do so may result in an electric shock.

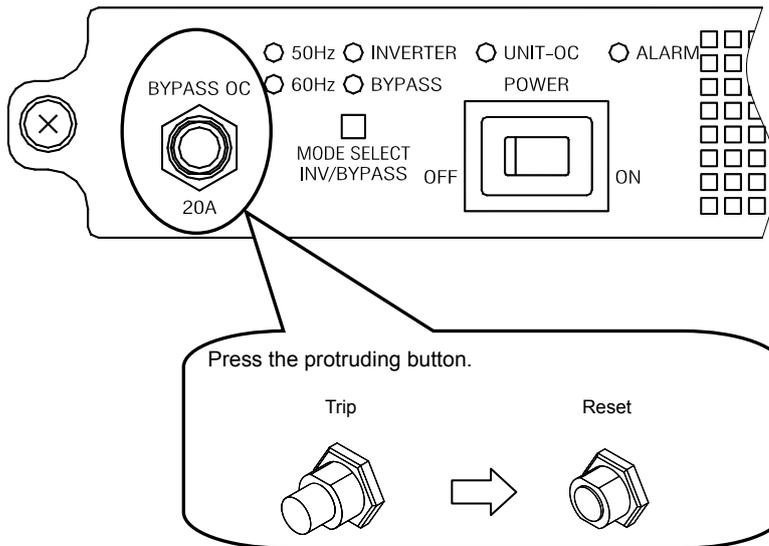
Notes

- The bypass breaker is available only for the D11A102B011US model. The breaker is not available for the D11A102B001US model.
- Before resetting the bypass breaker, be sure to check that there is no failure with the load devices.

Follow the procedure below to reset the bypass breaker.

- ① Turn the Start/Stop switch **POWER** OFF to shut down the units.
- ② Check to make sure that there is no failure with the connected load devices.
- ③ Press the **BYPASS OC 20A** on the front panel.
- ④ Turn the Start/Stop switch **POWER** ON to start the unit.

For details, see §11.2 "D11A102B011US Operating Procedure."



This completes the resetting of the bypass breaker.

§13.2.6 Procedure to Remove the Cabinet

Step ① Check
Turn the load device OFF.



Step ② Check
Open the cover for the Start/Stop switch **POWER** on the front panel of the all units and turn the switch OFF. After you operate the switch, close the cover.



Step ③ Check
Turn the AC input distribution board breaker OFF.^{※1}
Turn the DC input distribution board breaker OFF.

Notes

- ※1: This is not required for the D11A102B001US model.
- For safety sake, wrap an insulation tape around the exposed conductor of the removed cable.



Step ④ Check
Remove the all units.
For details, see §13.2.1 "Procedure to Remove the Unit."



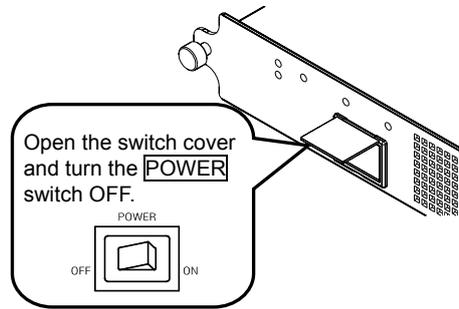
Step ⑤ Check
Disconnect the input and output cables on the back panel of the cabinet.
When you use transfer signals, disconnect all the cables from the terminal block.
Disconnect the earthing cables at the end.



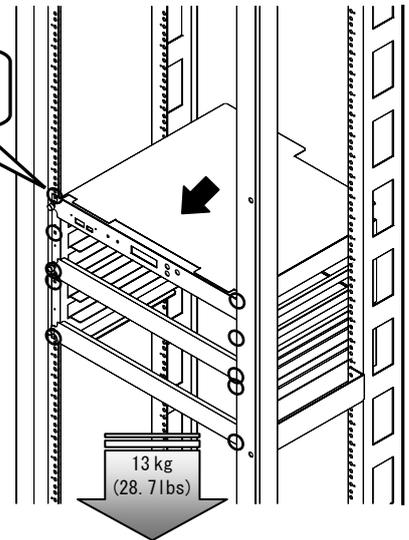
When removing the rack-fixing screws, hold the bottom of the cabinet securely and pull the rack gently out.
The weight of the cabinet is approximately 10 kg (22 lbs) (PD-D11AB*3US), 12 kg (26.5 lbs) (PD-D11AB*5US) or 13 kg (28.7 lbs) (PD-D11AB*6US). Be careful not to drop the unit on your foot. Doing so may result in an injury.

Step ⑥ Check
Remove the screws fixed to the rack at the front of the cabinet.

- The 3-unit cabinet (PD-D11AB*3US): Remove 6 screws.
- The 5-unit cabinet (PD-D11AB*5US): Remove 10 screws.
- The 6-unit cabinet (PD-D11AB*6US): Remove 10 screws.



Remove the screws at the front and pull the cabinet out.



Blank page

§14. Wiring and Settings for Parallel and Standby Operation

 CAUTION	<ul style="list-style-type: none"> Wiring work should be performed only by a qualified service technician. Incorrect wiring may result in electric shock and/or fire. Make sure that the connections to the terminal block are not loose. Failure to do so may result in a failure or cause electric shock. 	
---	---	---

Units installed on the upper part of the cabinet (units 1 to 3) and units installed on the lower part (units 4 to 6) can be run as parallel units and standby units, respectively.

If you cannot use your utility AC power source, this operation mode allows you to use the bypass switching function only with the DC input power supply to ensure reliability. To use this operation mode, you need to change the wiring on the copper bars of the cabinet, so you need to purchase the optional copper bars.

Follow the procedure below to change the wiring and settings. To change the wiring, you need to turn off the DC and AC input power and stop the load devices.

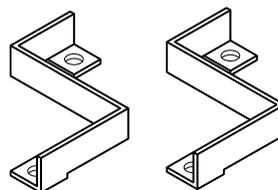
The user must not change the wiring. Changes to the wiring should be performed only by a service technician.

- ① Stop the load devices and turn the DC input power OFF.
- ② Remove the 2 protective covers on the back panel of the cabinet.
- ③ Remove the 4 copper bars in locations R, S, U, and V of the parallel operation cabinet.
- ④ Attach the 2 optional copper bars (Model No.: FM-D11AA01).
Attach the removed screws to the 4 terminals to which the copper bars are not attached.

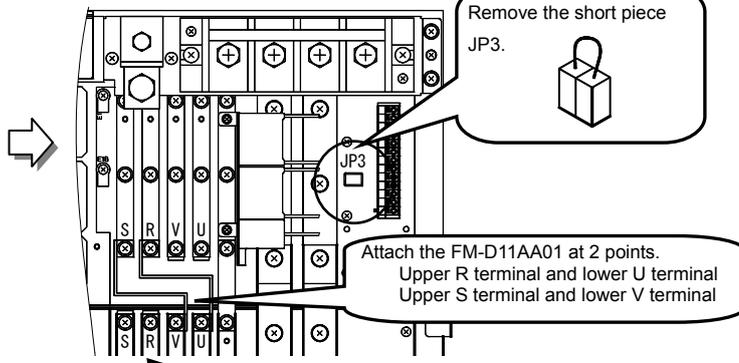
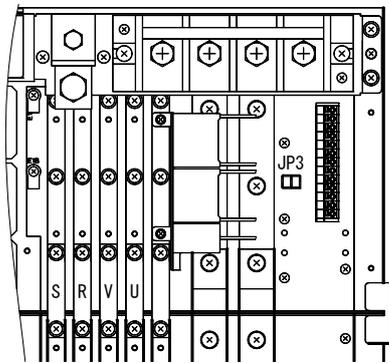
Removed copper bars and short piece
Keep the removed copper bars and short piece together with this manual.

Two copper bars (FM-D11AA01)

Cabinet Upper Connection Terminal	Cabinet Lower Terminal
R terminal	U terminal
S terminal	V terminal

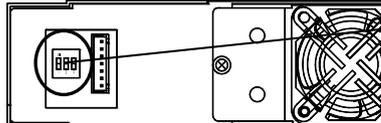


- ⑤ Remove the short piece JP3.



- ⑥ Attach the 2 protective covers of the cabinet you removed in ②.
- ⑦ Set DIP switch 3 on the back panel of units 4 to 6 to ON (SLAVE). Leave the DIP switch 3 on the units 1 to 3 to OFF (MASTER).

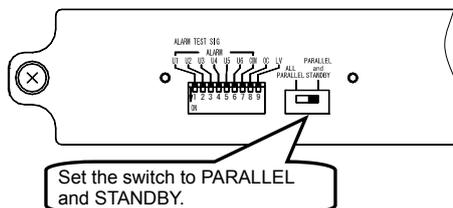
Back panel of the unit



Set the DIP switch 3 of units 4 to 6 to ON.

ON	1	2	3
OFF	10N	50Hz	120V SLAVE
	60Hz	100V	MASTER

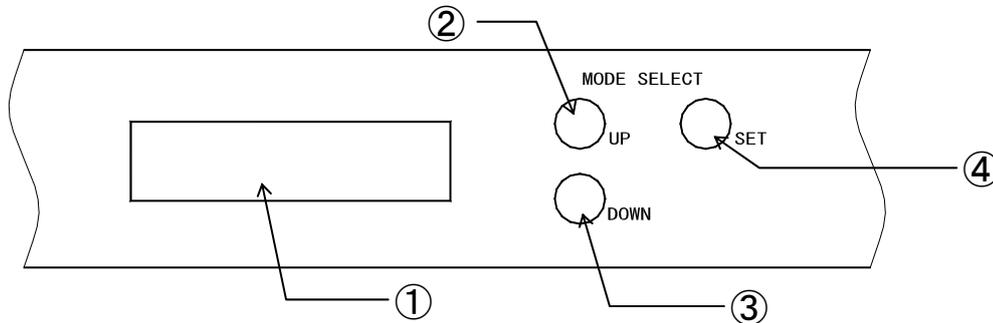
- ⑧ Remove the cover for the ALARM TEST terminal on the front panel of the cabinet, and switch the operation selector to PARALLEL and STANDBY.
- ⑨ Refer to §11.2 "D11A102B011US Operating Procedure" and start all the connected units.



This completes the wiring and changes to the settings.

§15. LCD Display and Operation

§15.1 LCD Part Names



No.	Name	Label	Function	
①	LCD Display	—	Sets the status display, total output voltage and current, and overload warning level of the unit	
②	Display	UP key	UP	Goes up to the next set value
③	select	DOWN key	DOWN	Goes down to the next set value
④	button	SET key	SET	Saves the set value and selects the display content

§15.2 Display Content List

The following table shows the LCD display.

Operate the LCD display following the instructions in §15.3 “Operating the LCD” and confirm the content. Even though the DC-AC Inverter status changes, the change is not automatically displayed on the LCD.

MODE Screen	Content Display Screen	Function
MEASUREMENT _____ _____MODE_ Measured value display function	OUTPUT_CURRENT __ _____**.*_A_	Displays the total output current
	OUTPUT_VOLTAGE __ _____***_V_	Displays the total output voltage
STATUS _____ _____MODE_ Unit status display function #*: Displays unit numbers 1 to 6.	UNIT#*: Empty _____	Indicates that the unit with the displayed number is not present in the cabinet
	UNIT#*: Stop _____	Indicates that the unit with the displayed number is stopped (waiting)
	UNIT#*: Alarm _____	Indicates that the unit with the displayed number has failed.
	UNIT#*: Inverter __	Indicates that the unit with the displayed number is running in inverter mode.
	UNIT#*: Bypass _____	Indicates that the unit with the displayed number is running in bypass mode.
SETTING _____ _____MODE_ Setting function	OVERLOAD_SETTING [N+1_Units]_	Sets the overload warning level in redundant operation mode
	OVERLOAD_SETTING _____N_Units__	Sets the overload warning level in increased capacity operation mode

LCD display when starting the UPS

When the cabinet receives DC input power, the “DC/AC INVERTER...” screen appears, and after approx. 10 seconds elapse, the screen switches to the MODE screen.

Four minutes of inactivity causes the LCD screen display to disappear.

DC/AC_INVERTER__
Redundant System

Screen switches after approx. 10 seconds.

MEASUREMENT _____
_____MODE_

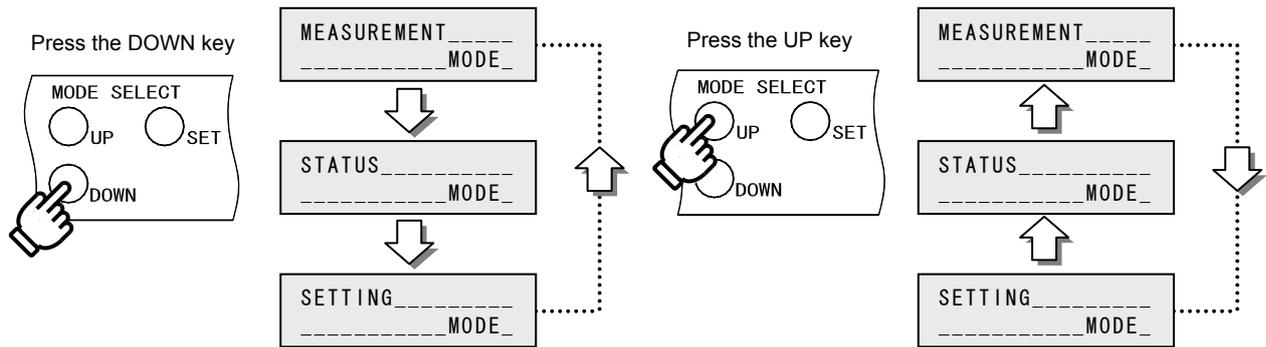
§15.3 Operating the LCD

Tip

Four minutes of inactivity causes the LCD screen display to disappear.
Press any of the 3 keys to display the screen that disappeared.

Follow the procedure below to operate the display select button.

- ① Press any one of the 3 keys to display the screen.
- ② Pressing the DOWN or UP key while the MODE screen is displayed switches between screens as follows.

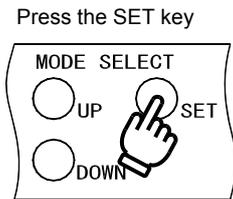


- ③ Press the SET key for the content you want to check, and confirm the MODE.
- ④ Press the DOWN or UP key to check the information.
- ⑤ After the check, press the SET key.

The MODE screen appears again. Approx. 4 minutes of inactivity causes the screen display to disappear.

Example of LCD operation

Press the SET key on the MEASUREMENT_MODE screen

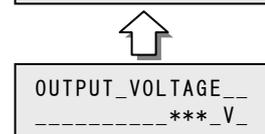
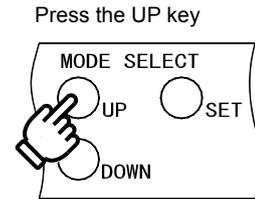
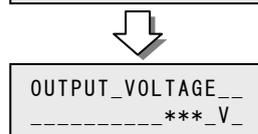
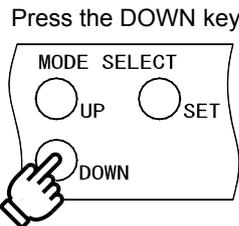


Pressing the SET key switches to the content display screen.



Pressing the SET key switches to the MODE screen.

Press the DOWN or UP key to check the information.



§16. Specifications

(1) Unit

Item		Standard or Performance		Notes
Model Name		D11A102B001US	D11A102B011US	
Output Capacity		1 kVA/1 kW		Apparent power and active power
Cooling System		Forced air cooling		
DC Input	Rated Voltage	-48 V		
	Variation Range	-40.5 V to -57 V		
	Max. Input Current	30 A		During rated output
	Input Feedback Noise	2 mV		Evaluated value (at rated input and output with a resistance load)
AC Input	Number of Phase	—	Single-phase, 2-wire	
	Voltage	—	100 V or 120 V	Dependent on the DIP switch setting ^{*1} (Rated voltage same as output voltage)
	Frequency	—	50 Hz or 60 Hz	
	Frequency Variation Range	—	±5%	Synchronization range
AC output	Number of Phase	Single-phase, 2-wire		
	Voltage	100 V or 120 V		Dependent on the DIP switch setting ^{*1}
	Voltage Regulation	Rated voltage ±2%		
	Frequency	50 Hz or 60 Hz		Dependent on the DIP switch setting ^{*1}
	Frequency Regulation	Rated frequency ±1% ^{*2}		
	Voltage Waveform	Sine wave		
	Distortion factor of voltage waveform	8% or less		During rated output
	Transit Voltage Variation	Rated voltage ±10%		0⇔100% load variation
	Response Time	100 ms or less		
	Load Power Factor	1.0		Variation range 0.7 (lag) to 1.0 Load power factor should not exceed 1 kVA at 0.7 (lag).
Overcurrent Protection	Output voltage droops at 105% or more	Auto switch to bypass circuit when exceeding 105% of N units		
Safety Standard	UL60950		File No. E203489	
Acoustic Noise	55 dB or less		1 meter (39.4 inch) in height at the front of the unit, A characteristic	

(2) Cabinet

Item		Standard or Performance			Notes
Model Name		PD-D11AB03US PD-D11AB13US	PD-D11AB05US PD-D11AB15US	PD-D11AB06US PD-D11AB16US	
AC output	Rated capacity 1 (in increased capacity operation mode)	3 kVA/3 kW	5 kVA/5 kW	6 kVA/6 kW	Apparent power and active power
	Rated capacity 2 (in redundant operation mode)	2 kVA/2 kW	4 kVA/4 kW	5 kVA/5 kW	Apparent power and active power
	Voltage	100 V or 120 V			Dependent on the DIP switch setting of the unit ^{*1}
Emission Standard	VCCI Class-A compliant IEC62040-2:2005 (EN62040-2:2006) and CISPR22:2005 Class-A compliant FCC Part15 SubB Class-A compliant				
Immunity Standard	IEC62040-2:2005 (EN62040-2:2006), CISPR24:1997/A1:2001/A2:2002 compliant				
Safety Standard	UL60950			File No. E203489	
Output Current Regulation (LED Display)	±5%			During rated output	

*1: When you change the DIP switch settings, be sure to do so before the DC power is received. Even if you change the settings after the DC power is received, the changes will not become effective.

*2: When the AC input power is received, the inverter output performs synchronization operation in the frequency variation range of ±5% of the AC input so the frequency regulation is ±5% of the rated frequency.

§17. Warranty

Warranty for use: 1 year

1. The product is warranted for the specified periods against electrical failures due to materials or workmanship.
2. Free repair or replacement by a product with equivalent functions will be made when it is determined that failure has occurred because of defects in materials or workmanship.
3. This warranty is void in the event of any modification or change to the product supplied by Sanyo Denki.
4. This warranty is void in the event of any improper use of the product supplied by Sanyo Denki, or failure to use the product as specified in this Instruction Manual.
5. This warranty does not apply when the product is used aboard a ship or in another area subject to vibrations.
6. This warranty is void in the event that the product supplied by Sanyo Denki is installed in an inappropriate location.
7. This warranty does not apply to failures due to accidents, improper use, or use for other than the product's intended use.
8. This warranty does not apply to defects or damages arising from fire, earthquake, storm or flood disaster, lightning or other natural disasters including pollution, salt disaster, gas disaster (chloride gas), non-standard voltage or incorrect power sources other than those specified.
9. This warranty does not apply to defects or damages arising from mishandling, such as during transportation, relocation or dropping of the DC-AC Inverter by the customer after purchase.
10. Sanyo Denki reserves the right to determine whether damage to a load device connected to this product is due to the faulty operation by this product.
(In the event of any such claim, the affected load device must be sent to Sanyo Denki for inspection.)
11. Warranties for devices other than the product supplied by Sanyo Denki shall be the warranties provided by the manufacturers of those devices.
12. Sanyo Denki provides no warranty for products made by other manufacturers used or incorporated in the products manufactured by Sanyo Denki.
13. This warranty applies to the product specified by Sanyo Denki. It does not apply to any other device.
14. Sanyo Denki disclaims all responsibility for damage to load device software, loss of data, lost profits, and lost opportunities.
15. This warranty does not apply to medical or industrial devices connected to this product.