



# **SANUPS**

ON LINE UPS

# A11J

**10 kVA**

**Instruction Manual**

**SANYO DENKI**

## Preface

Thank you for choosing the SANUPS A11J.

### SAVE THESE INSTRUCTIONS

This manual contains important instructions for A11J that should be followed during installation and maintenance of the UPS<sup>\*1</sup> and batteries to protect the safety of the customer and the service technician<sup>\*2</sup>. To use the UPS correctly and safely, read this manual before using the UPS. For details on the functions and operation of the LCD panel, see the separate *LCD Panel Operating Manual*. After reading, please keep this manual handy for convenient reference together with the *LCD Panel Operating Manual*.

This UPS is intended for installation in a temperature-controlled indoor environment free of conductive contaminants. Operating temperature: 0 to 40°C (32 to 104°F)

<sup>\*1</sup> UPS is an abbreviation for Uninterruptible Power Supply.

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#### <sup>\*2</sup> Service technicians

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

## UPS Models

This instruction manual is for the UPS model numbers in the table below. Check the model number of your UPS. If you have purchased a model that supports long-term backup, see the instruction manual provided with the extension battery for extension battery related items.

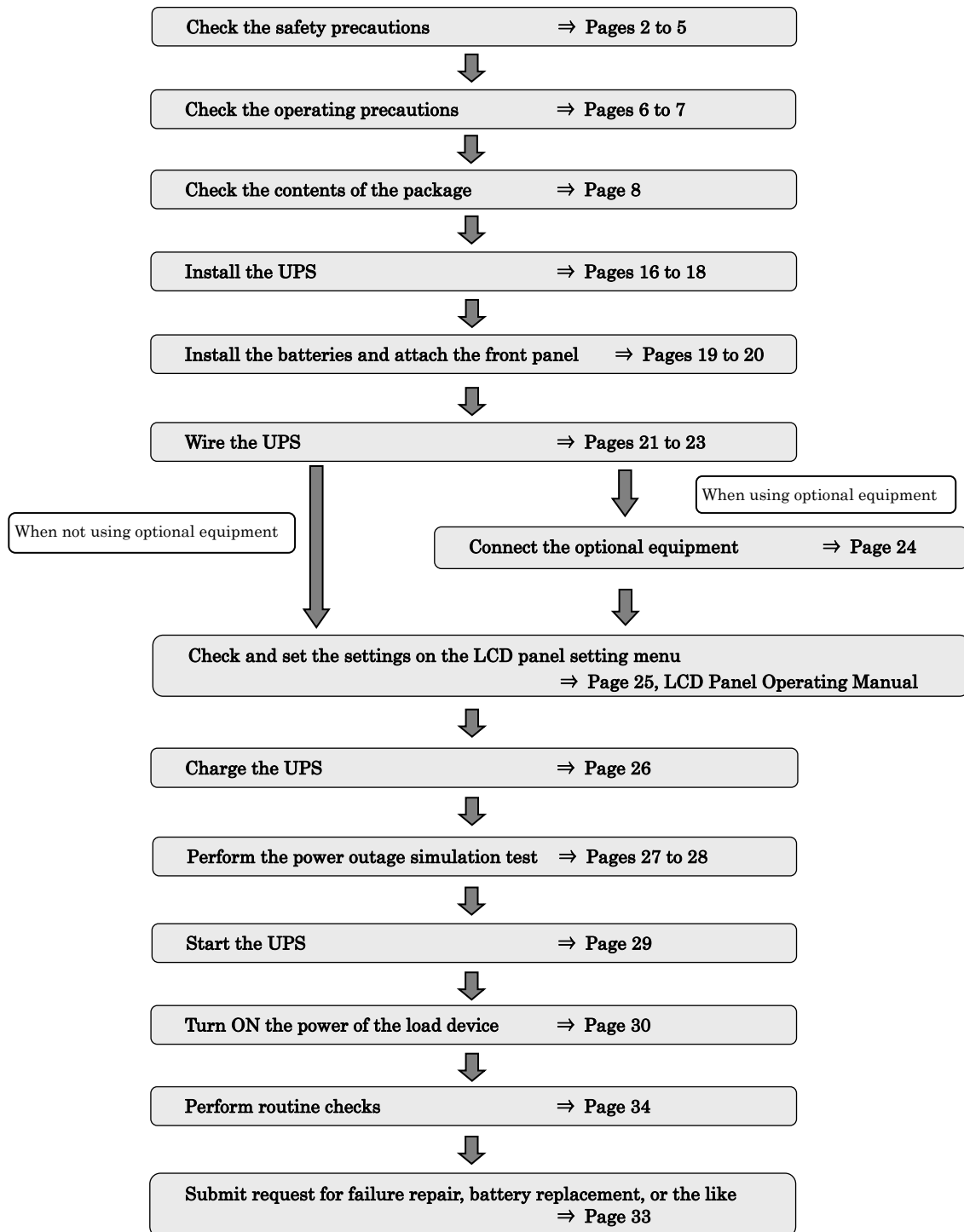
| Output Capacity | Model Number | Unit Type* |                                                                   |
|-----------------|--------------|------------|-------------------------------------------------------------------|
| 10 kVA          | A11J103A002T | UPS unit 1 | Without terminal block<br>(Unit with output outlet only)          |
|                 |              | UPS unit 2 | With terminal block<br>(Unit that connects an input power supply) |

\*In this manual, a name in the table above may be used to refer to the UPS unit, depending on the item described.

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# §1. Before Using the Product

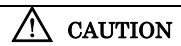
This chapter describes the procedures for using the UPS. Be sure to follow the procedures described in the instruction manual to ensure safe and proper use of the UPS.



## §2. Safety Precautions

This instruction manual contains important instructions to protect the safety of customers and service technicians. Before UPS installation, operation, maintenance, or inspection, be sure to read this instruction manual carefully to obtain a clear understanding of the information related to UPS operation, safety, and important precautions. This instruction manual uses two safety warning levels, WARNING and CAUTION, as described below.

| Label                                                                             | Explanation                                                                                                                   |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
|  | Denotes <b>immediate hazards which WILL probably cause severe bodily injury or death, as a result of incorrect operation.</b> |
|  | Denotes <b>hazards which COULD cause bodily injury and product or property damage, as a result of incorrect operation.</b>    |

Additionally, even those hazards denoted by  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 in the manual indicate prohibited and mandatory actions.

| Symbol                                                                              | Explanation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | Indicates actions that <b>must not be taken (prohibited actions)</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|  | Indicates actions that <b>must be taken (mandatory actions)</b> .<br>Specific information appears within the graphic symbol or in an explanation nearby.<br> : This symbol signifies a mandatory action.<br> : This symbol signifies that the equipment must be securely grounded.                                                                                                                                          |
|  | Indicates <b>CAUTION (including WARNING)</b> .<br>Specific information appears within the graphic symbol or in an explanation nearby.<br> : This symbol signifies a general caution.<br> : This symbol signifies that there is danger of electric shock.<br> : This symbol signifies that there is danger of a fire or smoke generation. |

## 1. Relocation, Transportation, and Moving Precautions



### CAUTION

- Be careful to avoid falling or dropping the UPS during relocation and transportation. It may cause injury.
- Be careful to avoid back strain when handling the UPS.
- To avoid bodily injury or a malfunction caused by dropping the UPS, do not tilt the UPS more than 10 degrees to either side when moving it vertically. Take preventative measures to avoid dropping the UPS if it must be tilted more than 10 degrees when moving it.

## 2. Installation Precautions



### CAUTION

- Request a service technician to install the UPS. Improper installation may result in electric shock, bodily injury, and/or fire.
- Never operate or store the UPS in the following environmental conditions. Doing so may cause the UPS to malfunction, sustain damage, or deteriorate, which could result in a fire or other accidents.
  - a. In ambient environmental conditions other than those specified in the product brochure and instruction manual (temperature 0 to 40°C (32 to 104°F), relative humidity 20 to 90%), such as in an extremely high or low temperature and high humidity
  - b. Where the UPS is exposed to direct sunlight.
  - c. Where the UPS is directly exposed to the heat from a heat source, such as a stove.
  - d. Where grounding is not possible
  - e. Where the UPS may be subject to vibration or physical shock
  - f. Near a device that may emit sparks
  - g. In the presence of dust, salt or corrosive or flammable gas.
  - h. Outdoors
  - i. On a poorly ventilated rack (when the UPS is rack mounted.)
- Do not block the air intake and exhaust vents of the UPS. Keep the front of the UPS at least 20 cm and the back is at least 15 cm away from a wall or other object. If you mount the UPS on a rack, mount it on a rack that can be well ventilated, and do not block the air intake and exhaust vents of the rack and UPS. If the air intake or exhaust vent is blocked, the internal temperature of the UPS rises, which could cause battery or other deterioration, resulting in a fire. For maintenance, the UPS requires at least 1 m of space at the front, and at least 50 cm at the back.
- The area around the UPS must be ventilated. The ventilation airflow is 13 m³/h. Unless the specified ventilation airflow is maintained, the gas produced by the battery during charging could result in case rupture or explosion.
- Install the UPS in a location capable of bearing the UPS weight as specified in this manual. For the weight of the UPS, refer to the table in "§5.1 UPS." If the UPS is installed incorrectly, the UPS may fall, resulting in bodily injury. Be careful to avoid back strain when handling the UPS.
- Move packaging such as plastic bags and film and accessories such as screws to a place that is out of reach of children. For example, if a child places film over his or her head or swallows a screw, there is danger of suffocation.



## 3. Wiring Precautions



### CAUTION

- Request a service technician to wire the UPS. Incorrect wiring may result in electric shock and/or fire.
- Protection for primary circuits against over currents, short circuits, and earth faults is not provided inside this UPS. 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 (input/output terminal block). This UPS requires class D grounding work. Failure to connect the grounding cable may result in electric shock. Ask a qualified electrician to perform any grounding work that may be required. (A fee will be charged.)
- The grounding cables of all load devices\* connected to the output of the UPS must be securely connected to the grounding terminals. Failure to connect the grounding cables of the load devices correctly may result in electric shock.



\*Load devices are devices such as computers connected to the UPS.

## 4. Operating Precautions



### WARNING

- Immediately shut the UPS 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 UPS. Do not detach the cover of the optional connecting area on the back of the UPS except when you are connecting optional devices. There is danger of electric shock or other accidents.



### PROHIBITED

- Never use the UPS in applications such as the following:
  - 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 or SANYO DENKI if you need to use the UPS 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 UPS is used with loads affecting life-support or public infrastructure-dependent applications.

- This UPS must be installed, operated, and maintained by technically qualified personnel in an industrial environment. This UPS should not be used in any other environment; for example, a general home environment where a technically qualified personnel is not present.
- Do not smoke or use an open flame near the UPS. Doing so could cause the UPS to explode or rupture, resulting in injury or fire.
- Do not place containers of liquid, such as a flower vase, on the UPS. If the container was to spill, the liquid could cause a short circuit, resulting in sparks or fire inside the UPS.
- Do not sit, step, or lean on the UPS. Bodily injury may occur if the UPS falls.
- Do not operate the switches with wet hands. There is danger of electric shock.
- Do not modify, disassemble, or repair the UPS. There are high voltage sections inside the UPS. Opening the UPS cover, replacing the battery, and repair can result in electric shock or other accidents when performed by anyone other than service technicians. Such action will void the warranty.



### CAUTION

- Check the safety of the load side before starting the UPS, and operate the UPS in accordance with the instruction manual. The UPS state resulting from operating the **MAIN MCCB** or **ON/OFF** button is as shown in the table below. Check the display and do not touch the **MAIN MCCB** or **ON/OFF** button unless necessary. If power is supplied incorrectly, electric shock or bodily injury could result.

| UPS Condition |        | Output Status   | LED Display                               |
|---------------|--------|-----------------|-------------------------------------------|
| MAIN MCCB     | ON/OFF | OUTPUT          |                                           |
| OFF           | OFF    | Stop            | INPUT (green) OFF, OUTPUT (green) OFF     |
| ON            | OFF    | Stop            | INPUT (green) ON, OUTPUT (green) OFF      |
| OFF           | ON     | Inverter output | INPUT (green) Flashing, OUTPUT (green) ON |
| ON            | ON     | Inverter output | INPUT (green) ON, OUTPUT (green) ON       |

- Avoid inserting sharp objects or fingers into the fan. Doing so may result in bodily injury.
- Do not touch the UPS, including the cables, if thunder occurs nearby. There is danger of electric shock from a lightning strike.



## 5. Maintenance and Inspection Precautions



### CAUTION

- Maintenance and repair of the inside of the UPS should be performed only by service technicians. Electric shock, bodily injury, burns, fuming, or fire may otherwise result.
- Contact your sales representative or SANYO DENKI for UPS repair or defective part replacement. Opening the cover can result in an electric shock or burn.
- Replace the batteries periodically (every 4.5 years at 25°C). Using batteries after their service life has expired may cause a fire.
- Never use organic solvents such as gasoline, thinner, or benzene, or commercial detergents to clean the batteries. These can cause the casing to crack and leak, resulting in electric leakage or fire.
- Do not insert metal objects or fingers into the battery connectors, extension battery connector area (option), or battery pack connectors of the UPS. Doing so may result in an electric shock or burn.
- Do not touch any parts inside the UPS, even when the AC input is removed and the batteries are removed. There is the danger of electric shock from high voltage that remains in parts.



## 6. Radio Frequency Interference



- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in the residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## 7. Battery Handling Precautions



- Battery servicing and checking should be performed only by service technicians. Keep unqualified personnel away from batteries.
- Replace batteries only with the same model and brand as the ones used for this UPS. There is risk of explosion if the batteries are replaced by an incorrect type.
- Do not dispose of used batteries yourself. To dispose of used batteries, contact your nearest sales representative, a service company, or a business office. The batteries in this UPS are lead type batteries. Lead type batteries are recyclable resources. Please recycle when replacing or disposing of used batteries.
- Do not use batteries after their service life has expired. Doing so may result in fuming or fire. Additionally, the battery backup function may fail to operate with such batteries, resulting in failure to supply power to load devices when a power outage occurs.
- Batteries pose hazards for electrical shock and dangerous short-circuit current. The following precautions should be observed when servicing or checking batteries.
  - a. Remove watches, rings, and other metal objects.
  - b. Use insulated tools.
  - c. Wear rubber gloves and boots.
  - d. Do not lay tools or metal parts on top of batteries.
  - e. Disconnect the charging source prior to connecting or disconnecting battery terminals.
- Do not attempt to open or cut batteries. The battery contains diluted sulfuric acid. The sulfuric acid is extremely toxic and harmful to the skin and eyes. If a battery leaks, take appropriate measures to prevent any battery fluid from contacting your skin or clothing. Diluted sulfuric acid may cause blindness if it gets into the eye, and may burn skin upon contact. Additionally, it is electrically conductive and corrosive. Observe the following precautions:
  - a. Wear full eye protection and protective clothing.
  - b. If sulfuric acid contacts the skin, wash it off immediately with water.
  - c. If sulfuric acid contacts the eyes, flush thoroughly and immediately with water, and seek medical attention.
  - d. Spilled sulfuric acid should be washed down with a suitable acid-neutralizing agent, such as a solution of approximately one pound (500 grams) of bicarbonate of soda in one gallon (4 liters) of water. The resulting liquid should be flushed with water and the area dried.
- Lead-acid batteries can present a risk of fire due to the generation of hydrogen gas. Observe the following precautions:
  - a. DO NOT SMOKE near batteries.
  - b. DO NOT allow flames or sparks near batteries.
  - c. Before working with batteries, discharge static electricity.
- If a fire occurs near a battery, do not use water to extinguish it. Use only a powder-extinguishing agent (ABC). Using water may cause the fire to spread.
- Do not dispose of batteries in fire. The batteries may explode.
- It may cause battery leakage, overheating or explosion. Observe the following precautions:
  - a. Do not solder to any part of a battery directly.
  - b. Do not charge the batteries with reversed positive (+) and negative (-) terminal polarity.
  - c. Do not mix different battery types, brands, or versions.
  - d. Do not attempt to peel off or break the outer covering of a battery.
  - e. Do not subject batteries to strong physical shock, or throw them away.
  - f. Do not use organic solutions such as gasoline, thinner, or benzene, or detergent to clean the batteries.
  - g. Electrical energy may remain in a battery even after its service life has expired. Do not allow sparks near used batteries.



## §3. Operating Precautions

### §3.1 UPS Input Power Supply

(1) Input Power Supply and Power Supply Capacity

The following table shows the rated AC input power of this UPS. For the voltage and frequency variation ranges, see “§12.4 Specifications.”

| Model Number | AC Input Voltage Rating                         | AC Input Frequency Rating | Input Capacity | Input Distributor Board Breaker |
|--------------|-------------------------------------------------|---------------------------|----------------|---------------------------------|
| A11J103A002T | 200, 220, 230, 240, 208V*1<br>(Factory setting) | 50Hz or 60Hz*2            | 11 kVA         | 80A or more                     |

\*1. When the UPS is shipped from the factory, this is set to 200 V. The settings can be changed from the LCD panel setting menu to match the AC voltage of the area in which the UPS is to be used. For the setting procedure, see the LCD Panel Operating Manual.

\*2. When the UPS is shipped from the factory, it is set to automatically detect the AC input frequency (50 or 60 Hz).

(2) To ensure that the correct ground potential is used for the computer system and power supply device, connect to the UPS in accordance with the type of AC input power supply as shown in the table below.

① AC input power supply check

Check in advance whether or not the AC power supply that will be used corresponds to one of those shown in the table. If you are unsure, use a tester or other device to measure the voltage to ground and then make a judgment.

② Input wiring work

To ensure that the mark in the “Applicable” columns becomes ○ or △, select the connection wires (phase) to the UPS input terminals L and N when carrying out the wiring work.

a. The ○ mark in the “Applicable” column indicates a standard connection of an ungrounded power supply or single-wire grounded power supply.

b. The △ mark indicates that voltage to ground (both wires) is occurring (not excessive) in the UPS output terminal, so care needs to be taken because the power supply will be short circuited if a single-wire ground is used on the load.

c. The X mark indicates that voltage to ground of the UPS output terminal is excessive, and may cause the load device to malfunction. Furthermore, using a single-wire ground on the load device side will cause the power supply to be short circuited, so change the wiring to ○ or △, or add an insulation transformer to the output side.

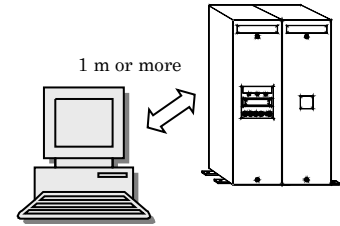
|   | Input Power Supply Type                                   | Connection to UPS |                  | Applicable | UPS Output Voltage to Ground *2  |                | Notes                                                                                                                                                                                                                                                                                                     |
|---|-----------------------------------------------------------|-------------------|------------------|------------|----------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                                                           | L                 | N                |            | U-G                              | V-G            |                                                                                                                                                                                                                                                                                                           |
| 1 | 3-phase ungrounded power supply                           | A<br>B<br>C       | B<br>A<br>C      | ○          | Refer to notes                   | Refer to notes | The voltage to ground value is unstable because there is a floating voltage.<br>Voltage to ground output<br>$V_{U-G} + V_{V-G} = \text{Approx. } 200 \text{ V}$                                                                                                                                           |
| 2 | Single-phase ungrounded power supply                      | A<br>B            | B<br>A           | ○          | Refer to notes                   | Refer to notes |                                                                                                                                                                                                                                                                                                           |
| 3 | 3-phase grounded power supply                             | A<br>B<br>C       | B<br>A<br>C      | ○          | Approx. 200 V                    | Approx. 0 V    | 1. Connect the ground phase to the N terminal side of the UPS input.<br>2. If the N terminal is not the ground phase:<br>(1) The voltage to ground of the UPS output rises during non-synchronized operation.<br>(2) If the UPS output side is single-wire grounded, a power supply short circuit occurs. |
| 4 | Single-phase grounded power supply                        | A<br>B            | B<br>A           | ○          | Approx. 200 V                    | Approx. 0 V    |                                                                                                                                                                                                                                                                                                           |
| 5 | Intermediate grounded power supply<br>Single-phase 3-wire | A<br>B            | B<br>A           | △          | Approx. 100 V<br>(Approx. 300 V) | Approx. 100 V  | 1. The voltage to ground of the UPS output rises during non-synchronized operation.<br>2. If the UPS output side is single-wire grounded, a power supply short circuit occurs.                                                                                                                            |
| 6 | Intermediate grounded power supply<br>3-phase 4-wire      | A<br>B<br>C<br>A  | B<br>A<br>B<br>C | △          | Approx. 120 V<br>(Approx. 320 V) | Approx. 120 V  |                                                                                                                                                                                                                                                                                                           |
| 7 | Intermediate grounded power supply<br>3-phase 3-wire      | A<br>B<br>C       | B<br>A<br>C      | ○          | Approx. 100 V<br>(Approx. 380 V) | Approx. 180 V  | 1. The voltage to ground of the UPS output rises during non-synchronized operation.<br>2. If the UPS output side is single-wire grounded, a power supply short circuit occurs.                                                                                                                            |
|   |                                                           | A<br>B<br>C       | B<br>A<br>C      | △          | Approx. 100 V<br>(Approx. 300 V) | Approx. 100 V  |                                                                                                                                                                                                                                                                                                           |

\*1. The voltage values in the table above are when the input/output voltage is 200 V. The values in parentheses are the maximum values during non-synchronized operation.

\*2. Nonstandard input power supply types are also shown in the table above.

## §3.2 Installation Precautions

- (1) Carefully consider the operating current when installing a leakage circuit breaker on the input side.  
The maximum leakage current is 8 mA.
- (2) Keep the UPS at least 1 m away from CRT displays.  
Other devices which may be sensitive to magnetic flux should be kept away from the UPS as it emits a slight amount of magnetic flux.
- (3) The UPS employs a fan for forced-air cooling. Provide the clearances specified in “§6.1.2 Checking the Installation Space” to permit free air flow at the air intake and exhaust vents.
- (4) When the AC input power supply is single-wire grounded,  
always connect the ground phase to the N terminal of the UPS.  
For details, see “§6.3 Wiring the UPS.”



## §3.3 Handling Precautions

- (1) Never short-circuit the output circuits.  
Doing so will cause the protective functions of the UPS 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, or hair dryers to the UPS. Since such devices are subject to high transient current surges, the UPS will detect current surges and the battery backup operation will become no longer possible when a power outage occurs. There is also the danger of the UPS malfunctioning.
- (3) Power supply environment  
If the UPS is used in an environment subject to long and frequent power outages (more than once a week), the batteries may not receive sufficient charge, which could result in foreshortened battery life and premature battery failure.
- (4) If the UPS is stored without being operated for a long period, the batteries may require recharging. If the batteries in the UPS are left uncharged, their service life will be greatly foreshortened. Recharge the batteries in accordance with the UPS storage environment as shown in the table below.  
For the time required to recharge the batteries, see “§7.2 Charging the UPS.”

| Storage Temperature | Recharge Interval   |
|---------------------|---------------------|
| 25°C (77°F)         | Once every 6 months |
| 30°C (86°F)         | Once every 4 months |
| 40°C (104°F)        | Once every 2 months |

### Recharging procedure

- ① Set **MAIN MCCB** on the front of the UPS to ON.
- ② Check that “Green INPUT” is lit.  
↓ Recharging starts.
- ③ Continue operation as is for the specified time or longer.
- ④ After the specified time or longer elapses, set **MAIN MCCB** to OFF.

- (5) Insulation testing  
Before testing the indoor wiring insulation, shut down the UPS and disconnect the input and output cables. Conducting the test with the UPS connected may damage electronic components such as the built-in arrester.
- (6) L-type rails (support rails) are required to mount the UPS on a rack.  
For more information, contact the manufacturer of your rack, your sales representative, or SANYO DENKI.

# §4. Checking the Contents of the Package

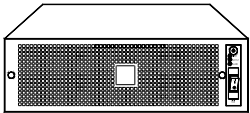
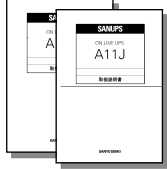
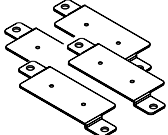
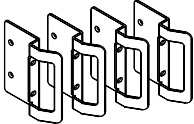
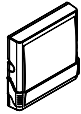
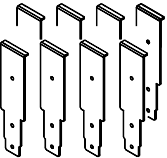
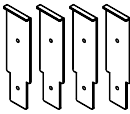
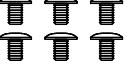
After you open the package, check the package contents.

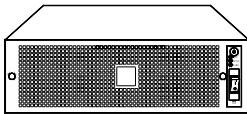
Do you have all components and accessories for the UPS? Is there any external damage or anomaly?

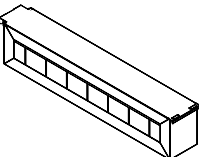
Place a check mark in the ☒ boxes to confirm.

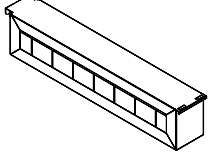
Contact your sales representative or SANYO DENKI if anything is missing.

Figure is a rough indication. The actual shapes of the UPS and accessories may differ.

| UPS unit 1                                                                                                                                                               |                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> UPS unit 1<br>1<br>                                            | <input type="checkbox"/> Instruction Manual 1<br><input type="checkbox"/> LCD Panel Operating Manual 1<br> |
| <input type="checkbox"/> Floor mounting bracket 4<br>                                   | <input type="checkbox"/> LCD panel connection cable 1<br>                                                |
| <input type="checkbox"/> Rack mounting bracket 4<br>                                    | <input type="checkbox"/> LCD panel 1<br>                                                                  |
| <input type="checkbox"/> Connection bracket: 2<br>                                    | <input type="checkbox"/> Screw C: For securing LCD panel M3x6 2<br>                                      |
| <input type="checkbox"/> Support bracket A: For attaching bracket 8<br>               | <input type="checkbox"/> Unit-to-unit output cable (3-pole connector) 1<br>                              |
| <input type="checkbox"/> Support bracket B: For attaching rack mounting bracket 4<br> | <input type="checkbox"/> Unit-to-unit input cable (6-pole connector) 1<br>                              |
| <input type="checkbox"/> Screw B: For attaching bracket M4x6 14<br>                   | <input type="checkbox"/> Unit-to-unit interface cable 1<br>                                            |
|                                                                                                                                                                          | <input type="checkbox"/> Screw A: For attaching bracket M4x6 6 (Black)<br>                             |

| UPS unit 2                                                                                                                   |                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> UPS unit 2 1<br> | <p>The UPS unit 2 does not come with any accessories.<br/>Parts required for installation are provided with UPS unit 1.</p> |

| Battery Pack A x 2 sets                                                                                                          |                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Battery pack A 1<br> | <input type="checkbox"/> Battery replacement date label 1<br> |
|                                                                                                                                  | <input type="checkbox"/> Label Usage Procedure Manual 1<br>   |

| Battery Pack B x 2 sets                                                                                                           |                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Battery pack B 1<br> | <p>Battery pack B does not come with a battery replacement date label or label usage procedure manual.</p> |

When using a UPS with a long-term backup battery panel, the battery packs are not supplied.

## Note on transferring or selling the UPS

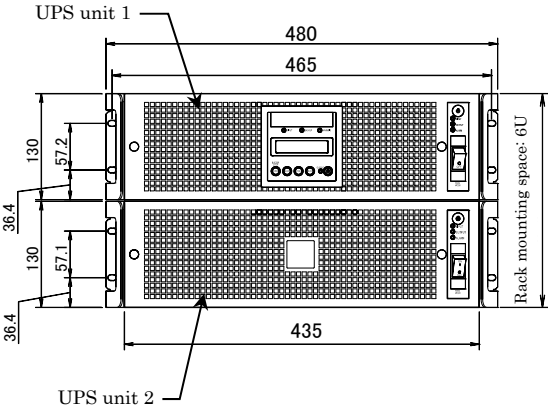
If you sell the UPS or transfer ownership to a third party, transfer or sell all the accessories and other items supplied with the UPS.

# §5. External Dimensions and Part Names

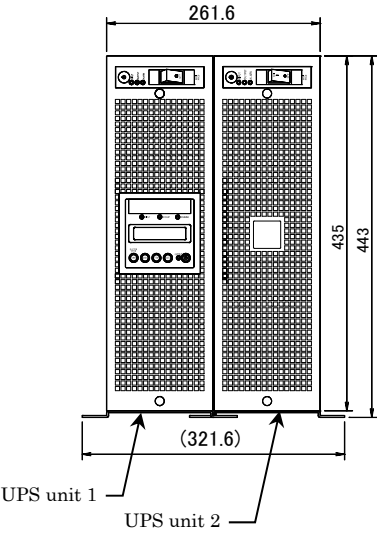
## §5.1 UPS

Unit: mm

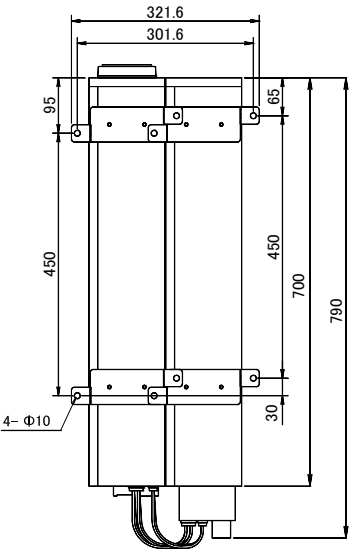
Mounting on Rack



Mounting Vertically



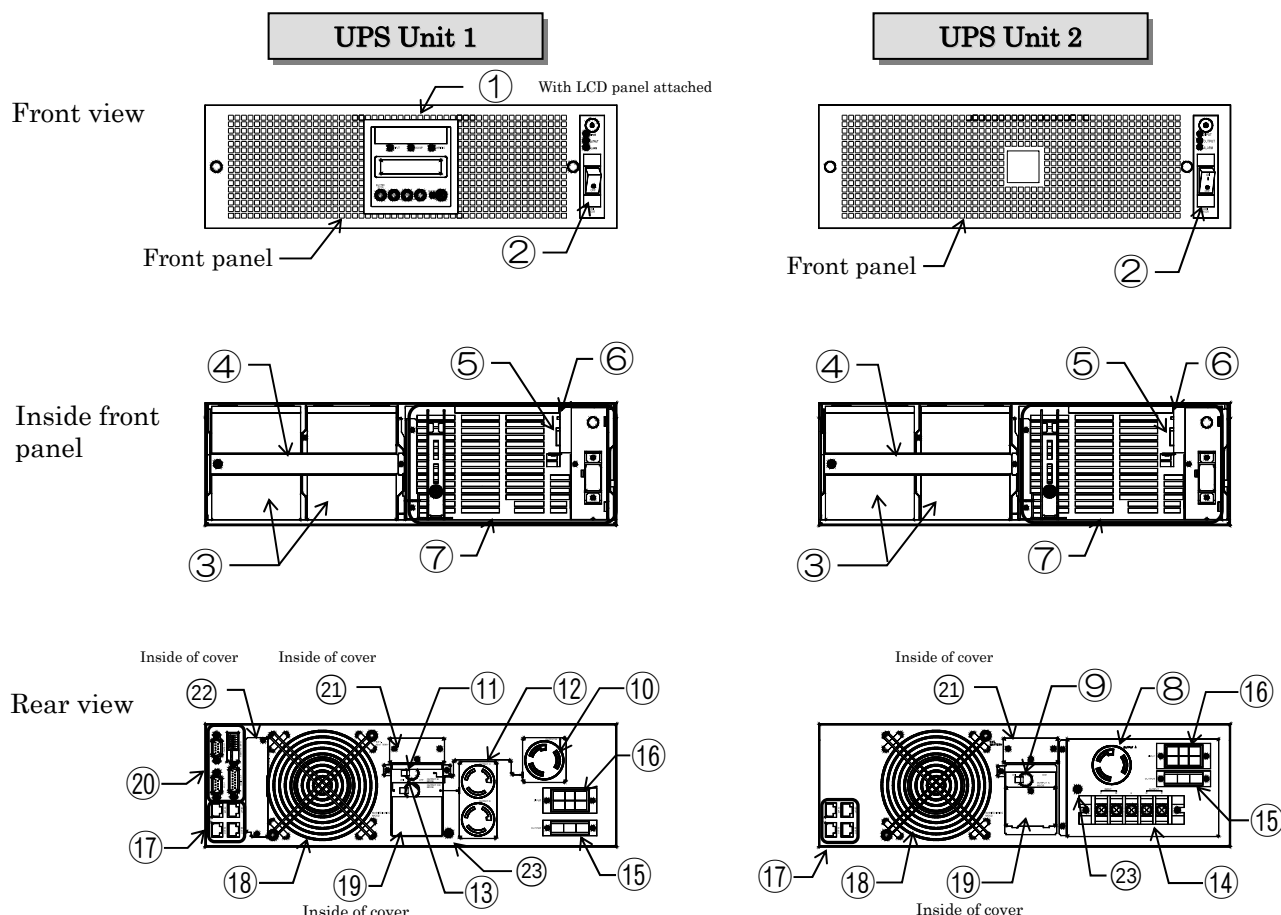
External Dimensions when Fixed to Floor



The following table shows the weight and depth.

| UPS Unit   | Weight (kg) |       | Depth (mm)*                                  |
|------------|-------------|-------|----------------------------------------------|
|            | Unit        | Total |                                              |
| UPS unit 1 | 61          | 124   | 700                                          |
| UPS unit 2 | 63          |       | 790<br>(including 90-mm terminal block area) |

\*Excluding protrusions.



| No. | Name                                           | Display on the unit | Function                                                                                           |
|-----|------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------------|
| ①   | LCD panel                                      | See Section §5.2.   | For displaying the UPS status and measurements, and for various settings and operations            |
| ②   | UPS Unit control panel                         | See Section §5.3.   | For displaying the UPS status and operations                                                       |
| ③   | Battery pack* <sup>1</sup>                     | -                   | Backup batteries                                                                                   |
| ④   | Battery pack securing bracket                  | -                   | For securing battery packs                                                                         |
| ⑤   | LCD panel connector                            | -                   | For connecting the LCD panel                                                                       |
| ⑥   | Forced bypass switch* <sup>2</sup>             | Forced Bypass       | For switching to maintenance bypass circuits (used in conjunction with maintenance bypass breaker) |
| ⑦   | Inverter module                                | -                   | Rectifier, charger, inverter, bypass circuit                                                       |
| ⑧   | Output outlet A                                | OUTPUT A            | For connecting a load device (NEMA L6-30R)                                                         |
| ⑨   | Breaker for output outlet A                    | OUTPUT A MCCB       | For protecting output outlet A                                                                     |
| ⑩   | Output outlet B                                | OUTPUT B            | For connecting a load device (NEMA L6-30R)                                                         |
| ⑪   | Breaker for output outlet B                    | OUTPUT B MCCB       | For protecting output outlet B, C, and D                                                           |
| ⑫   | Output outlets C and D                         | OUTPUT C, OUTPUT D  | For connecting load devices (NEMA L6-20R) x 2                                                      |
| ⑬   | Breaker for output outlets C and D             | OUTPUT C, D MCCB    | For protecting output outlets C and D                                                              |
| ⑭   | Input/output terminal block                    | INPUT E OUTPUT      | For connecting the input power supply, ground, and load devices                                    |
| ⑮   | Output connectors for connecting between units | OUTPUT              | For connecting UPS unit outputs                                                                    |
| ⑯   | Input connectors for connecting between units  | INPUT               | For connecting UPS unit inputs                                                                     |
| ⑰   | Unit interface                                 | UIF A1, A2, B1, B2  | For connecting UPS units                                                                           |
| ⑱   | Exhaust vent for cooling fan                   | -                   | For cooling the UPS interior                                                                       |
| ⑲   | Maintenance bypass breaker                     | MAINTENANCE MCCB    | For turning ON/OFF and protecting the maintenance bypass circuits                                  |
| ⑳   | External interface                             | See Section §5.4.   | For connecting external devices                                                                    |
| ㉑   | Extension battery connector                    | EXT. BATTERY        | For connecting an extension battery* <sup>3</sup>                                                  |
| ㉒   | Optional card slot                             | OPTION CARD         | For inserting an optional card* <sup>3</sup>                                                       |
| ㉓   | Extension battery ground terminal              | -                   | For connecting the ground of an extension battery* <sup>3</sup>                                    |

## Note

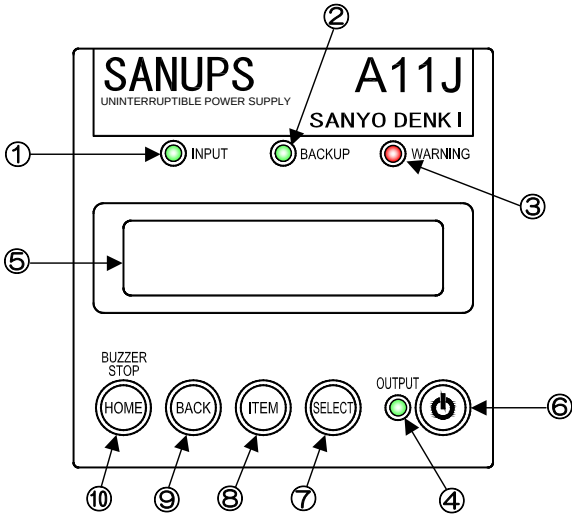
\*1. When using a UPS with a long-term backup battery panel, the battery packs are not mounted.

\*2. The forced bypass switch **Forced Bypass** is used when using the maintenance bypass breaker **MAINTENANCE MCCB**. Normally, leave the switch set to "Inverter" and do not change the setting.

\*3. For the various optional devices, contact your sales representative or SANYO DENKI.

\*4. In this manual, breakers and switches are displayed enclosed in   like **MAIN MCCB**.

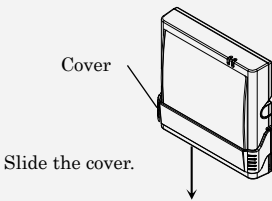
§5.2 LCD Panel



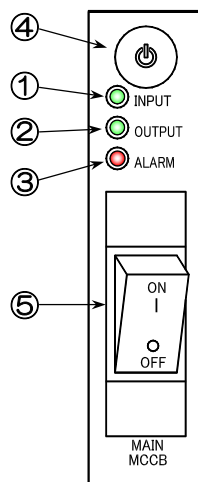
| No. | Name          | Label               | Color | Function                                                                                                                      |                                                            |
|-----|---------------|---------------------|-------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| ①   | Input LED     | INPUT               | Green | Lit                                                                                                                           | When input power is normal.                                |
|     |               |                     |       | Blinking                                                                                                                      | When input power is abnormal.                              |
| ②   | Backup LED    | BACKUP              | Green | Lit                                                                                                                           | When the battery is operating.                             |
| ③   | Warning LED   | WARNING             | Red   | Lit                                                                                                                           | Caution/warning, malfunction, or end of battery discharge. |
| ④   | Output LED    | OUTPUT              | Green | Lit                                                                                                                           | When supplying power by inverter operation.                |
|     |               |                     |       | Blinking                                                                                                                      | When supplying power by bypass operation.                  |
| ⑤   | LCD screen    | -                   | -     | Displays UPS status information, measurement values, maintenance support information, various setting values, operation, etc. |                                                            |
| ⑥   | ON/OFF button | -                   | -     | Starts and stops inverter operation.                                                                                          |                                                            |
| ⑦   | SELECT key    | SELECT              | -     | Selects and accepts LCD display items or contents.                                                                            |                                                            |
| ⑧   | ITEM key      | ITEM                | -     | Switches LCD display items or contents.                                                                                       |                                                            |
| ⑨   | BACK key      | BACK                | -     | Cancels the selection and returns to previous LCD display (menu) level.                                                       |                                                            |
| ⑩   | HOME key      | BUZZER STOP<br>HOME | -     | Returns the LCD display (menu) level to the home menu.<br>When the buzzer is sounding, stops the buzzer.                      |                                                            |

Notes on the LCD panel

- For details on the operating procedure and functions of the LCD panel, see the LCD Panel Operating Manual.
- About indications of LEDs  
LEDs are displayed in this manual as “Green INPUT” and “Red WARNING”, and the lighting state is indicated as follows:  
✱: LED lights. ✱✱: LED blinks.
- About the cover of the LCD panel control section  
To operate the ON/OFF button and keys, slide the cover downwards.  
After you finish operation, return the cover to its original position to prevent accidental operation.



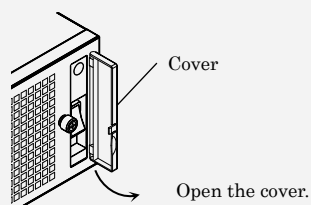
## §5.3 UPS Unit Control Panel



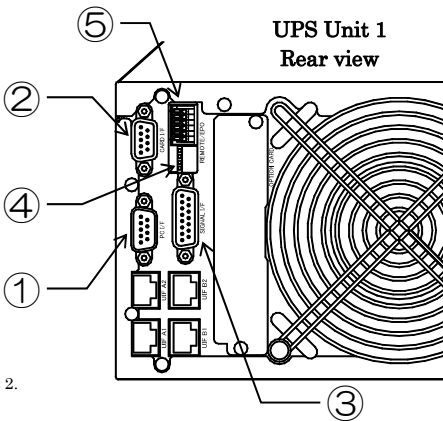
| No. | Name          | Label     | Color | Function                                                                                 |                                                             |
|-----|---------------|-----------|-------|------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| ①   | Input LED     | INPUT     | Green | Lit                                                                                      | When input power is normal.                                 |
|     |               |           |       | Blinking                                                                                 | When input power is abnormal.                               |
| ②   | Output LED    | OUTPUT    | Green | Lit                                                                                      | When supplying power by inverter operation.                 |
|     |               |           |       | Blinking                                                                                 | When supplying power by bypass operation.                   |
| ③   | Alarm LED     | ALARM     | Red   | Lit                                                                                      | When there is a malfunction or battery discharge has ended. |
| ④   | ON/OFF button | -         | -     | Starts and stops inverter operation.                                                     |                                                             |
| ⑤   | Main breaker  | MAIN MCCB | -     | Turns ON/OFF and protects the UPS input power.<br>Protects the internal bypass circuits. |                                                             |

### Notes on the UPS Unit control panel

- In this manual, breakers are displayed enclosed in MAIN MCCB like MAIN MCCB.
- About indications of LEDs  
LEDs are displayed in this manual as “Green INPUT” and “Red WARNING”, and the lighting state is indicated as follows:  
☀: LED lights. ☀: LED blinks.
- About the cover of the operation section  
To operate the MAIN MCCB and ON/OFF button, open the cover.  
After you finish operation, return the cover to its original position to prevent accidental operation.



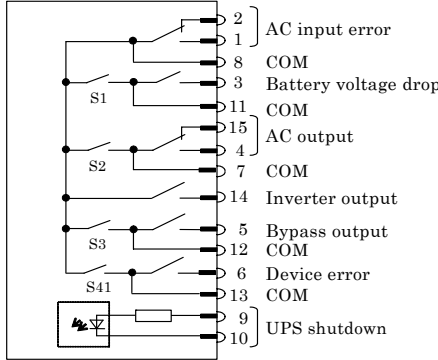
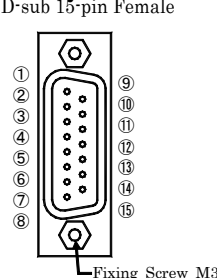
§5.4 External Interfaces



Not provided with UPS unit 2.

**Note**  
The PC interface connector and card interface connector cannot be used at the same time.

| No. | Name                                           | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | PC I/F<br><br>PC interface connector (RS-232C) | <p>When using SANYO DENKI power management software (option), connect the dedicated communications cable.</p> <p>This interface functions as follows depending on the setting of “Interface” in the LCD panel setting menu.</p> <p>Select the interface according to the function to be used. For the setting procedure, see “§3.5 Setting PC Interface” in the LCD Panel Operating Manual.</p> <p>1. Interface setting: <b>WS</b> (work station) (default setting)</p> <p>➤ Use software such as the optional power management software to manage the power and shut down the computer by performing communication between the UPS and computer (personal computer, work station, etc.). For details on power management software, contact your sales representative or SANYO DENKI.</p> <p>2. Interface setting: <b>Standalone</b></p> <p>➤ Use the standard UPS service function of the operating system (NetWare, Windows NT, etc.) to shut down the UPS automatically.</p> <div><p><b>Note</b></p><p>When using a combination of the UPS service function and the power management software (option) with a serial connection, set the interface to <b>WS</b> (work station). If the UPS is used when the setting is set to “standalone,” the UPS may shut down suddenly when there is a power outage.</p></div> <div><div>Signal Names</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div>1 DCD<br/>2 RXD<br/>3 TXD<br/>4 DTR<br/>5 GND<br/>6 DSR<br/>7 RTS<br/>8 CTS<br/>9 RI</div></div><div><div>External Appearance</div><div><div>D-sub 9-pin Male</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div>⑤<br/>④<br/>③<br/>②<br/>①</div><div>⑨<br/>⑧<br/>⑦<br/>⑥</div></div><div>Fixing Screw (inch)</div></div></div></div> |
| ②   | CARD I/F<br><br>Card interface connector       | <p>Connect the connection cable of an optional SANYO DENKI LAN interface card.</p> <p>When connecting a LAN interface card, set the interface to <b>WS</b> (work station). For the interface setting procedure, see “§3.5 Setting PC Interface” in the LCD Panel Operating Manual.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| No.           | Name                                                 | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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-|
| ③             | SIGNAL I/F<br><br>Contact signal interface connector | <div>Outputs status information of the UPS such as a power outage or voltage drop.</div> <div>External Transmission Signals and Shutdown Input Signals</div> <table><thead><tr><th></th><th>Signal Name</th><th>Description</th><th>Pin No. and Status when Operating</th></tr></thead><tbody><tr><td rowspan="6">Output Signal</td><td>AC input error</td><td>This signal is output when there is a power outage or voltage error of the utility power supply.</td><td>1-8: ON<br/>2-8: OFF</td></tr><tr><td>Battery voltage drop</td><td>This signal is output when the battery voltage drops to or below the specified value (approx. 178 V).</td><td>3-11: ON</td></tr><tr><td>AC output</td><td>This signal is output when AC output is being supplied to a load device.</td><td>4-7: ON<br/>15-7: OFF</td></tr><tr><td>Inverter output</td><td>This signal is output when inverter output is being supplied to a load device.</td><td>14-8: ON</td></tr><tr><td>Bypass output</td><td>This signal is output when the utility power supply is being supplied from the bypass circuit.</td><td>5-12: ON</td></tr><tr><td>Device error</td><td>This signal is output when a UPS error occurs.</td><td>6-13: ON</td></tr><tr><td>Input Signal</td><td>UPS shutdown</td><td>The UPS is shut down as a result of receiving 5 V DC (pulse signal of at least 4 sec.) during battery operation when there is a power outage. Current flows at approximately 5 mA when the power is on. This is enabled when the interface is set to Standalone. For the setting procedure, see “§3.5 Setting PC Interface” in the LCD Panel Operating Manual.</td><td>9-10</td></tr></tbody></table> <div>External Transmission Signals and Electrical Characteristics</div> <div>Interface: Relay non-voltage contact signal</div> <div>Contact rating: 100 V AC / 50 V DC, 0.1 A</div> <div>Note</div> <div>When connecting an inductive/capacitive load, make sure the contact rating is not exceeded.</div> <div>Terminal Names</div> <div>External Appearance</div> <div><p>S1 to S4 —: Switches for independent contact signals (see ④)</p></div> <div><p>D-sub 15-pin Female</p><p>Fixing Screw M3</p></div> <tr><td>④</td><td>Switches for independent contact signals</td><td><div>Setting these switches to “OFF” makes each contact of the external transmission signals independent.</div><div>Refer to contact interface connector ③, and set to “ON” or “OFF” according to how the UPS will be used by the customer. The switches are all set to “ON” at the time of shipment from the factory.</div><div>External Appearance</div><div><p>When all of 1 to 4 are in the “ON” state.</p><div>Set them to "OFF" when using each contact signal as an independent circuit.</div><div>Set them to "ON" when using each contact signal as a common COM circuit.</div></div></td></tr> |                                   | Signal Name | Description | Pin No. and Status when Operating | Output Signal | AC input error | This signal is output when there is a power outage or voltage error of the utility power supply. | 1-8: ON<br>2-8: OFF | Battery voltage drop | This signal is output when the battery voltage drops to or below the specified value (approx. 178 V). | 3-11: ON | AC output | This signal is output when AC output is being supplied to a load device. | 4-7: ON<br>15-7: OFF | Inverter output | This signal is output when inverter output is being supplied to a load device. | 14-8: ON | Bypass output | This signal is output when the utility power supply is being supplied from the bypass circuit. | 5-12: ON | Device error | This signal is output when a UPS error occurs. | 6-13: ON | Input Signal | UPS shutdown | The UPS is shut down as a result of receiving 5 V DC (pulse signal of at least 4 sec.) during battery operation when there is a power outage. Current flows at approximately 5 mA when the power is on. This is enabled when the interface is set to Standalone. For the setting procedure, see “§3.5 Setting PC Interface” in the LCD Panel Operating Manual. | 9-10 | ④ | Switches for independent contact signals | <div>Setting these switches to “OFF” makes each contact of the external transmission signals independent.</div> <div>Refer to contact interface connector ③, and set to “ON” or “OFF” according to how the UPS will be used by the customer. The switches are all set to “ON” at the time of shipment from the factory.</div> <div>External Appearance</div> <div><p>When all of 1 to 4 are in the “ON” state.</p><div>Set them to "OFF" when using each contact signal as an independent circuit.</div><div>Set them to "ON" when using each contact signal as a common COM circuit.</div></div> |
|               | Signal Name                                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Pin No. and Status when Operating |             |             |                                   |               |                |                                                                                                  |                     |                      |                                                                                                       |          |           |                                                                          |                      |                 |                                                                                |          |               |                                                                                                |          |              |                                                |          |              |              |                                                                                                                                                                                                                                                                                                                                                                |      |   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Output Signal | AC input error                                       | This signal is output when there is a power outage or voltage error of the utility power supply.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1-8: ON<br>2-8: OFF               |             |             |                                   |               |                |                                                                                                  |                     |                      |                                                                                                       |          |           |                                                                          |                      |                 |                                                                                |          |               |                                                                                                |          |              |                                                |          |              |              |                                                                                                                                                                                                                                                                                                                                                                |      |   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|               | Battery voltage drop                                 | This signal is output when the battery voltage drops to or below the specified value (approx. 178 V).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3-11: ON                          |             |             |                                   |               |                |                                                                                                  |                     |                      |                                                                                                       |          |           |                                                                          |                      |                 |                                                                                |          |               |                                                                                                |          |              |                                                |          |              |              |                                                                                                                                                                                                                                                                                                                                                                |      |   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|               | AC output                                            | This signal is output when AC output is being supplied to a load device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 4-7: ON<br>15-7: OFF              |             |             |                                   |               |                |                                                                                                  |                     |                      |                                                                                                       |          |           |                                                                          |                      |                 |                                                                                |          |               |                                                                                                |          |              |                                                |          |              |              |                                                                                                                                                                                                                                                                                                                                                                |      |   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|               | Inverter output                                      | This signal is output when inverter output is being supplied to a load device.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 14-8: ON                          |             |             |                                   |               |                |                                                                                                  |                     |                      |                                                                                                       |          |           |                                                                          |                      |                 |                                                                                |          |               |                                                                                                |          |              |                                                |          |              |              |                                                                                                                                                                                                                                                                                                                                                                |      |   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|               | Bypass output                                        | This signal is output when the utility power supply is being supplied from the bypass circuit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5-12: ON                          |             |             |                                   |               |                |                                                                                                  |                     |                      |                                                                                                       |          |           |                                                                          |                      |                 |                                                                                |          |               |                                                                                                |          |              |                                                |          |              |              |                                                                                                                                                                                                                                                                                                                                                                |      |   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|               | Device error                                         | This signal is output when a UPS error occurs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 6-13: ON                          |             |             |                                   |               |                |                                                                                                  |                     |                      |                                                                                                       |          |           |                                                                          |                      |                 |                                                                                |          |               |                                                                                                |          |              |                                                |          |              |              |                                                                                                                                                                                                                                                                                                                                                                |      |   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Input Signal  | UPS shutdown                                         | The UPS is shut down as a result of receiving 5 V DC (pulse signal of at least 4 sec.) during battery operation when there is a power outage. Current flows at approximately 5 mA when the power is on. This is enabled when the interface is set to Standalone. For the setting procedure, see “§3.5 Setting PC Interface” in the LCD Panel Operating Manual.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 9-10                              |             |             |                                   |               |                |                                                                                                  |                     |                      |                                                                                                       |          |           |                                                                          |                      |                 |                                                                                |          |               |                                                                                                |          |              |                                                |          |              |              |                                                                                                                                                                                                                                                                                                                                                                |      |   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ④             | Switches for independent contact signals             | <div>Setting these switches to “OFF” makes each contact of the external transmission signals independent.</div> <div>Refer to contact interface connector ③, and set to “ON” or “OFF” according to how the UPS will be used by the customer. The switches are all set to “ON” at the time of shipment from the factory.</div> <div>External Appearance</div> <div><p>When all of 1 to 4 are in the “ON” state.</p><div>Set them to "OFF" when using each contact signal as an independent circuit.</div><div>Set them to "ON" when using each contact signal as a common COM circuit.</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |             |             |                                   |               |                |                                                                                                  |                     |                      |                                                                                                       |          |           |                                                                          |                      |                 |                                                                                |          |               |                                                                                                |          |              |                                                |          |              |              |                                                                                                                                                                                                                                                                                                                                                                |      |   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| No. | Name                                         | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ⑤   | REMOTE/EPO<br><br>External control terminals | <p>Use these terminals for controlling the UPS with a non-voltage contact from an external device.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>REMOTE/EPO Terminal Names</b></p> <p>6 COM<br/>5 EPO<br/>4 COM<br/>3 Remote OFF<br/>2 COM<br/>1 Remote ON</p> <p>EPO terminals<br/>REMOTE terminals</p> </div> <div style="text-align: center;"> <p><b>External Appearance</b></p> </div> </div> <p><b>REMOTE Terminals</b> (Terminal Nos. 1 to 4)</p> <p>Connect a remote switch for performing the ON/OFF operation of the UPS and shutting down a computer from a remote location. The operation is as follows depending on the interface setting value.</p> <ol style="list-style-type: none"> <li>Interface setting: <b>WS</b> (work station) (default setting) <ul style="list-style-type: none"> <li>Remote ON of UPS/One-touch Shutdown of System<br/>The OFF operation of the remote switch enables the computer connected to the UPS to be shut down with one touch from a remote location, and then the UPS to be stopped.</li> </ul> </li> <li>Interface setting: <b>Standalone</b> <ul style="list-style-type: none"> <li>Remote ON of UPS/Remote OFF of UPS</li> </ul> </li> </ol> <p>Select the interface according to the function to be used. For the setting procedure, see “§3.5 Setting PC Interface” in the LCD Panel Operating Manual.</p> <p><b>EPO Terminals</b> (Terminal Nos. 5 and 6)</p> <p>EPO stands for “Emergency Power Off.”</p> <p>Connect, for example, a switch for an emergency stop of UPS output.</p> <p>If the switch is pressed when there is an emergency, the EPO terminals will enter the short-circuit state and UPS output will stop.</p> <p>After an emergency stop of the UPS has been performed, the UPS remains in the emergency stop state even if the emergency output stop switch is released. Also, the remote ON function cannot be enabled in the event of an emergency stop (when the EPO terminals are in a short-circuited state). To resume operation of the UPS, release the emergency output stop switch (short-circuited state), and press  on the UPS Unit control panel for at least 1 second.</p> <p>For how to connect to the terminals, see “§6.4 Connecting Optional Devices.”</p> <p>This function will work regardless of whether the interface setting is set to “Standalone” or “WS” (work station).</p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p><b>Notes on contact of, for example, switch to connect to terminals</b></p> <p>A switch for connecting to the terminals is not provided as an option for the UPS. Check the following specifications and then connect and use, for example, a switch or a contact of the customer's system that matches the terminal specifications.</p> <p><b>Terminal specifications</b></p> <ul style="list-style-type: none"> <li>Circuit voltage: +5 V DC</li> <li>Flowing current when short-circuited: Approx. 10 mA</li> <li>Operating conditions <ul style="list-style-type: none"> <li>REMOTE: Short-circuit between terminals for at least 1 second.</li> <li>EPO: Short-circuit between terminals for at least 0.2 seconds.</li> </ul> </li> <li>Terminals: One-touch terminal block</li> <li>Compatible wires: AWG 26 to 20</li> </ul> <div style="display: flex; align-items: center;"> </div> <p>When using a transistor or other semiconductor switch, connect terminal Nos. 2, 4, and 6 to the - (minus) pole side as shown in the figure on the right.<br/>(In the case of a non-polar switch, there is no specified connection direction.)</p> </div> |

## §6. UPS Installation and Wiring

Install the UPS in the installation location, and then insert the batteries, attach the LCD panel, and perform the wiring work. This work must be carried out following the instructions in this instruction manual.

### §6.1 UPS Installation



- Installation should be performed only by service technicians. Installation of the UPS must be carried out following 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 UPS on a surface that can bear the UPS weight (124 kg). This surface should be flat so that the UPS cannot topple or fall. The possibility of vibration and shock should be minimized at the installation location. Vibration and shock such as an earthquake may cause the UPS to move or fall, possibly resulting in bodily injury.
- Wear safety shoes during the installation. All work that involves lifting the UPS, such as mounting the UPS on a rack or attaching brackets, should be carried out by at least two persons. Bodily injury may occur if the UPS is dropped. Take care not to strain your back.
- Take care not to get your fingers caught when attaching brackets and installing the UPS.
- There is the danger that the UPS could topple during relocation or installation. Always hold the bottom side of the UPS firmly with both hands. Failure to do so may result in injury or damage to the UPS.

#### §6.1.1 Checking the Installation Environment

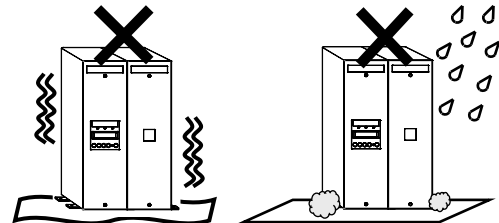
Suitable installation environment: Temperature 0 to 40°C (32 to 104°F),  
relative humidity 20 to 90%

Do not install the UPS in following locations.

- In ambient environmental conditions other than those specified in the product brochure and instruction manual, such as in an extremely high or low temperature and high humidity.
- Where the UPS is exposed to direct sunlight.
- Where the UPS is directly exposed to the heat from a heat source, such as a stove.
- Where grounding is not possible.
- Where the UPS may be subject to vibration or physical shock.
- Near a device that may emit sparks.
- In the presence of dust, salt or corrosive or flammable gas.
- Outdoors
- On a poorly ventilated rack (when the UPS is rack mounted.)

#### Note

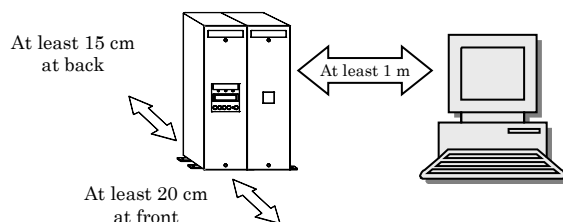
The battery service life will be foreshortened if the UPS is used in an environment where the ambient temperature exceeds 30°C. We recommend that the UPS is normally used and maintained at a temperature between 20 to 25°C (68 to 77°F).



#### §6.1.2 Checking the Installation Space

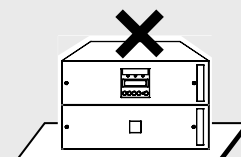
During installation, provide the following space around the UPS.

- At least approx. 20 cm at the front and at least approx. 15 cm at the back:  
As air intake or exhaust space for the cooling fan.
- At least 1 m from CRT displays:  
There is slight leakage of magnetic flux.  
Allow some space from devices which might be affected by magnetic flux.



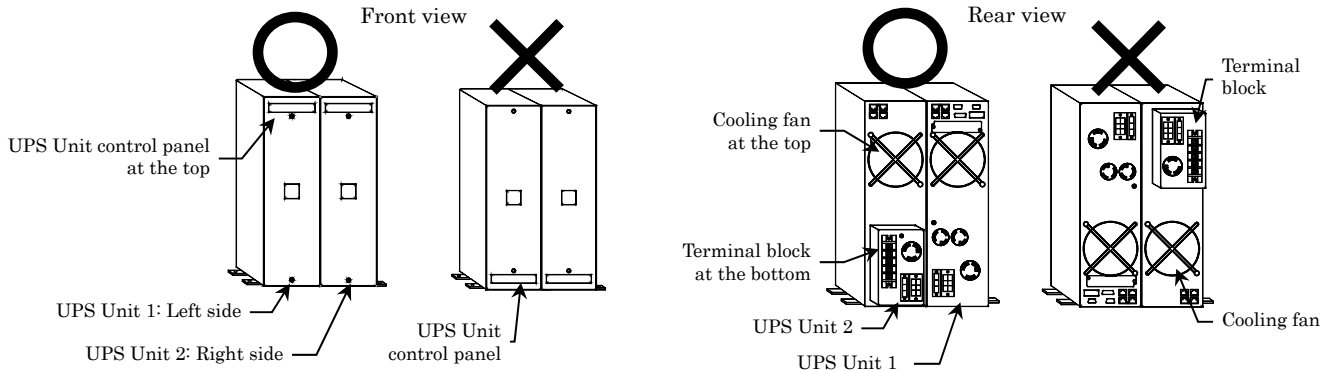
#### Notes on UPS installation

- For installation and maintenance of the UPS, provide space of at least 1 m at the front and at least 50 cm at the back.
- Using the UPS horizontally requires dedicated brackets. Contact your sales representative or SANYO DENKI. Do not use the UPS in an unsecured state. There is the danger that the UPS will topple or fall.

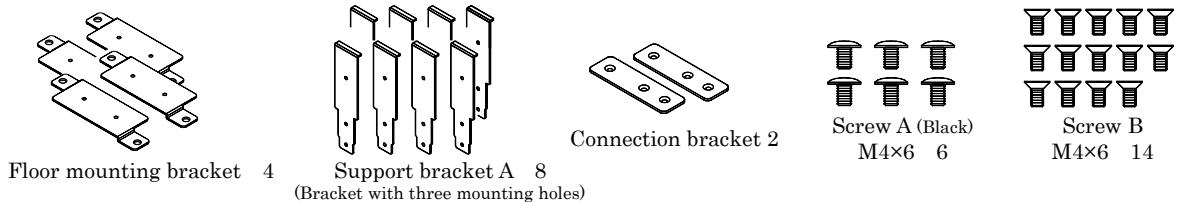


## §6.1.3 Installing the UPS Vertically

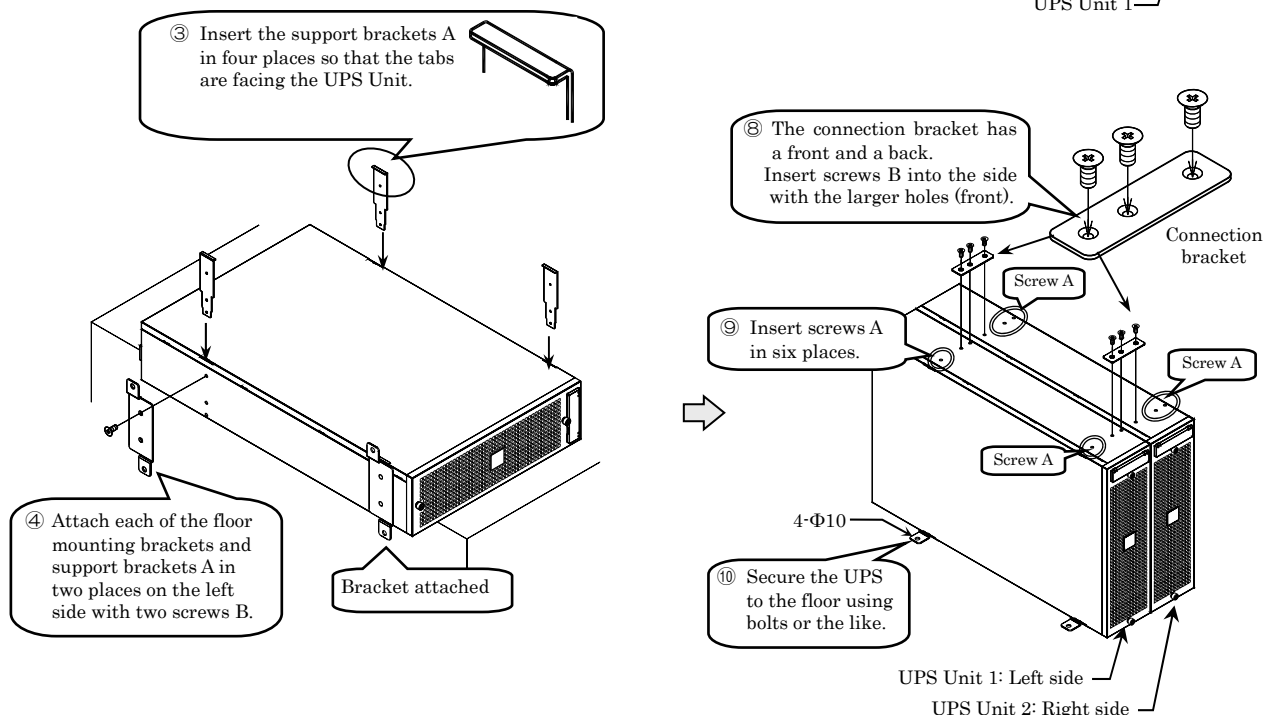
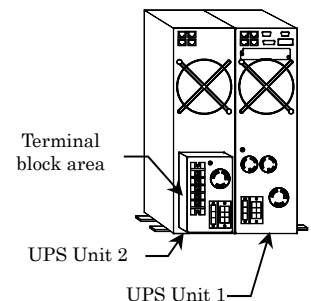
When installing the UPS vertically, attach the supplied floor mounting brackets. Verify UPS Unit 1 and UPS Unit 2 (with terminal block) on the back of the UPS Units, and arrange them as shown under the “O” in the figure below.



- ① Prepare the following items supplied with the product.



- ② Place UPS Unit 1 horizontally on a table or other surface.
- ③ Insert the support brackets A in four places on the left and right sides of the UPS Unit so that the tabs at the top are facing the sides of the UPS.
- ④ Align the floor mounting brackets with the mounting holes on the left side, and secure them with two screws B each.
- ⑤ Check that the brackets are firmly secured.
- ⑥ Similarly, attach the floor mounting brackets to UPS Unit 2.
- ⑦ Place the UPS Unit upright with the floor mounting brackets facing downward in the installation location.  
Verify UPS Unit 1 and UPS Unit 2 on the back of the UPS Units, and arrange them in the orientations shown in the figure.
- ⑧ Align the connection brackets with the two mounting holes at the top of UPS Units 1 and 2, and secure them with three screws B each.
- ⑨ Attach six screws A in the locations specified in the figure below.
- ⑩ For safety, we recommend securing the UPS to the floor with bolts or the like.  
For the dimensions when the UPS is secured to the floor, see “§5.1 UPS.”



## §6.1.4 Mounting the UPS on a Rack

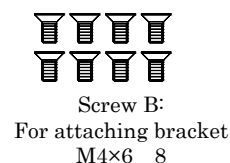
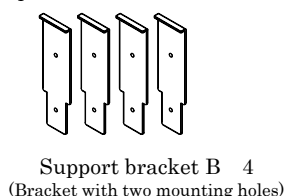
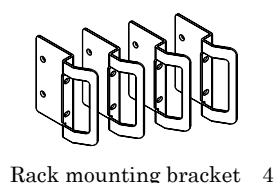


- For safety, use L-type rails (support rails) when mounting the UPS on a rack. For more information on L-type rails, contact your rack manufacturer or sales representative.

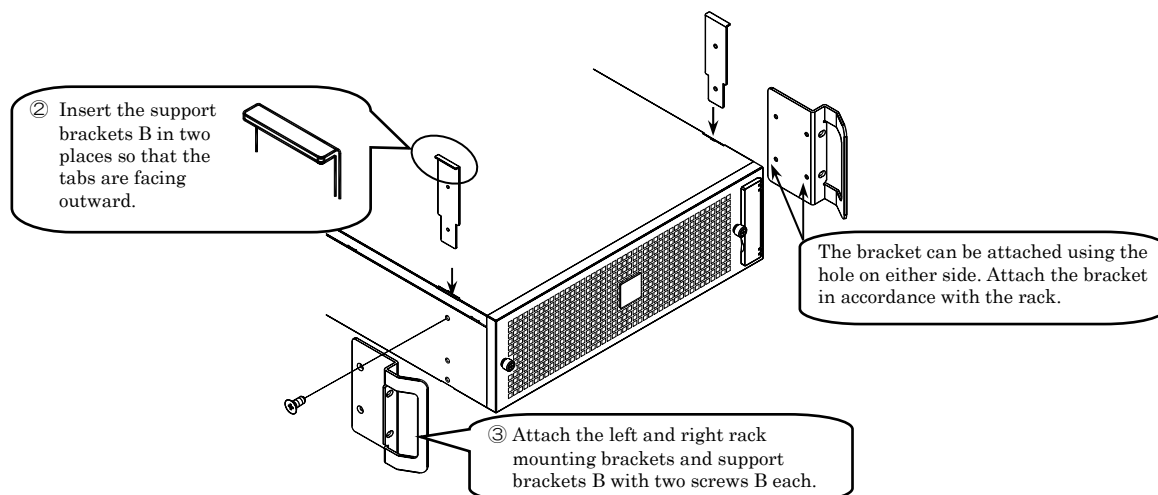
See “§6.1.2 Checking the Installation Space” and make sure you secure enough ventilation space at the front and the back of the UPS. Do not place objects on top of the UPS. Doing so may damage the UPS.

The UPS is heavy so we recommend mounting it on the very bottom of the rack. Use L-type rails (support rails) when mounting the UPS in the rack. For more information on L-type rails, contact your rack manufacturer or sales representative.

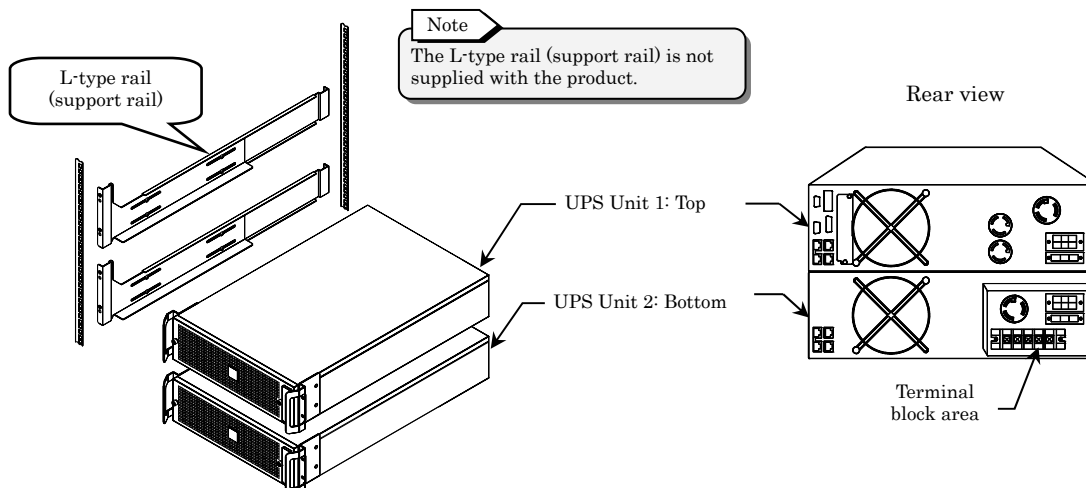
- ① Prepare the following items supplied with the product



- ② Insert the support brackets B in two places at the left and right of the front panel of the UPS Unit 1 so that the tabs at the top are facing outward.  
③ Align the rack mounting brackets with the mounting holes on the sides, and secure them with two screws B.  
④ Similarly, attach the rack mounting brackets to UPS Unit 2.

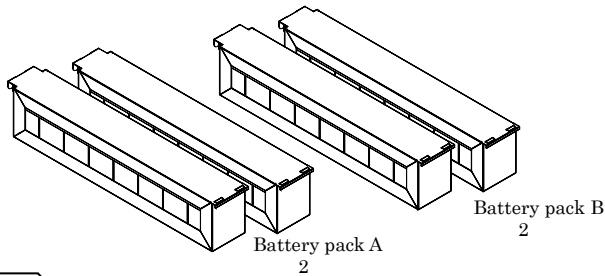


- ⑤ Verify UPS Unit 1 and UPS Unit 2 on the back of the UPS Units, and mount the units so that Unit 1 is on the top and Unit 2 is on the bottom using the L-type rails (support rails). Use the L-type rails for each of the two UPS Units.



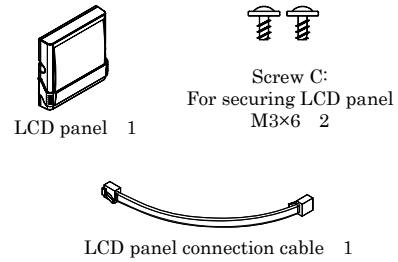
## §6.2 Installing the Battery Packs and Attaching the Front Panel

- ① Prepare the following items supplied with the product.



**Note**

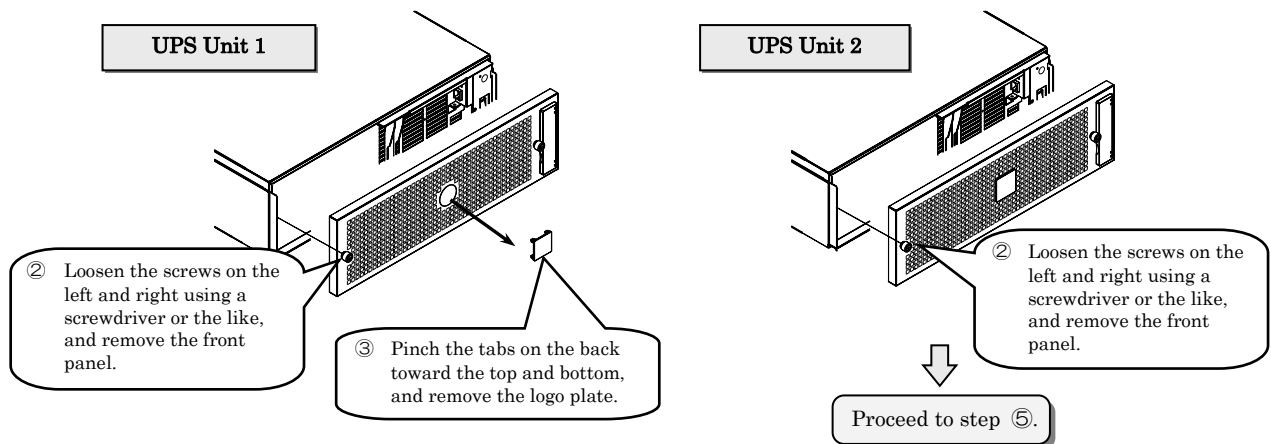
When using a UPS with a long-term compatible UPS battery unit (30/60 minutes), the battery packs are not supplied.



- ② Loosen the screws in two places on the left and right of the front panel, and remove the front panel from the UPS Unit.

**Tip**

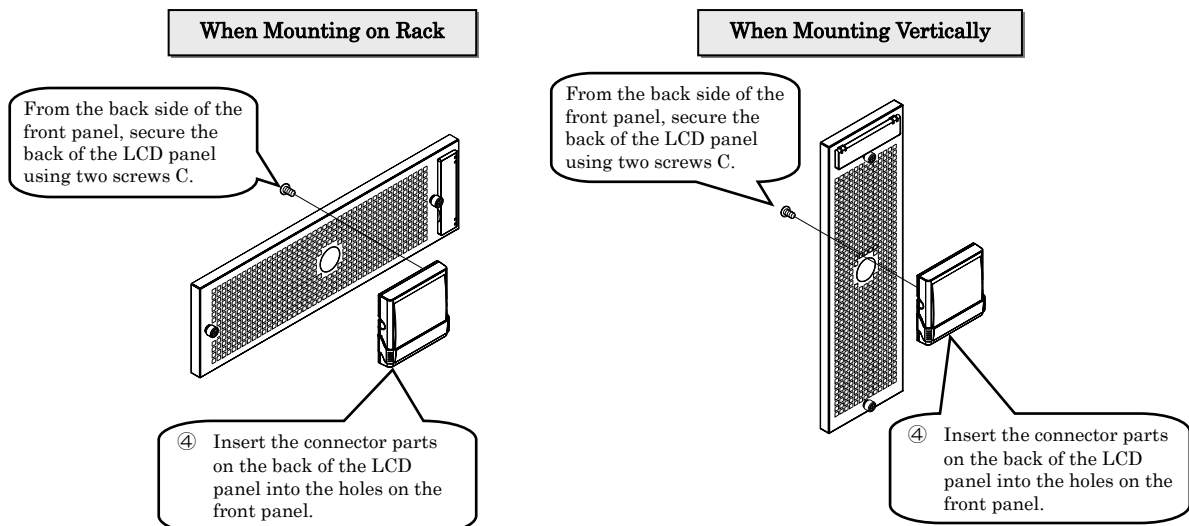
The following describes the procedure for attaching the LCD panel to UPS Unit 1. The LCD panel can be attached to either unit 1 or unit 2, but we recommend attaching it to Unit 1.



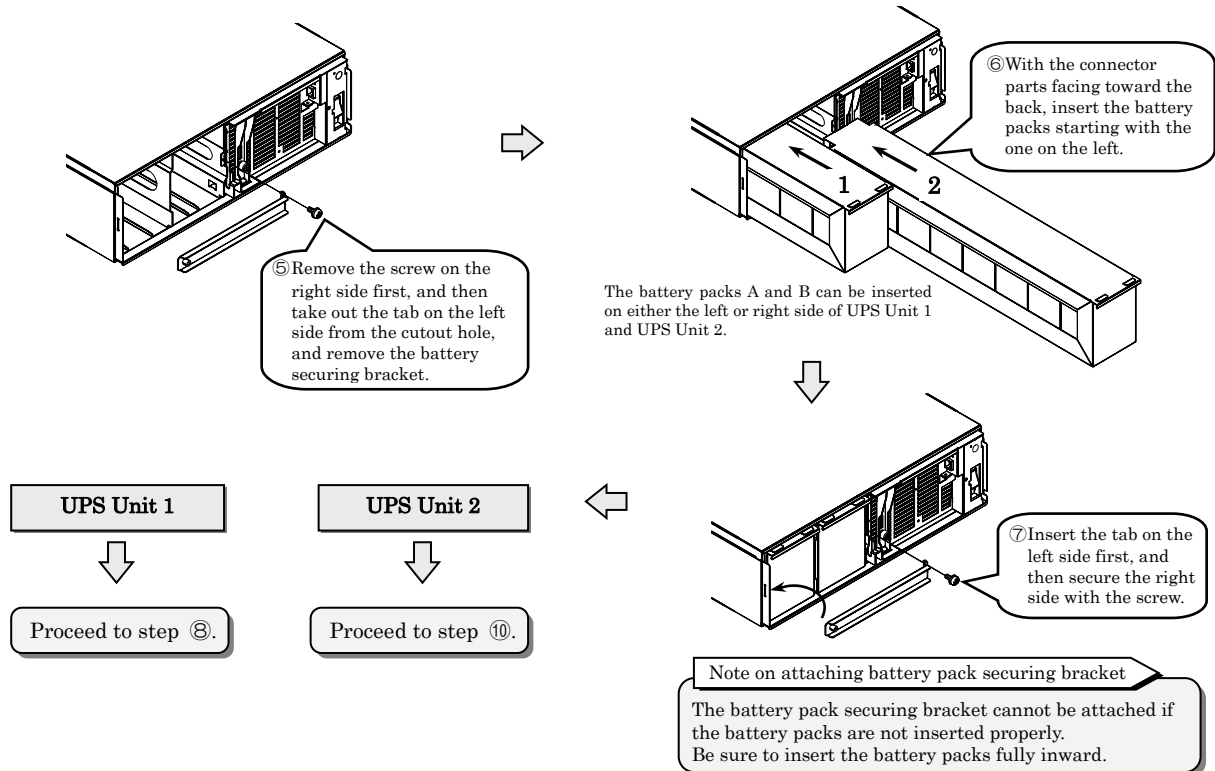
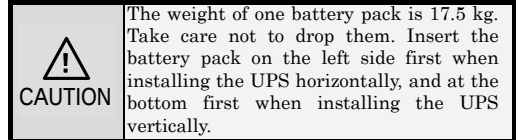
- ③ Remove the logo plate from the front panel of UPS Unit 1.

- ④ Attach the LCD panel to the front panel.

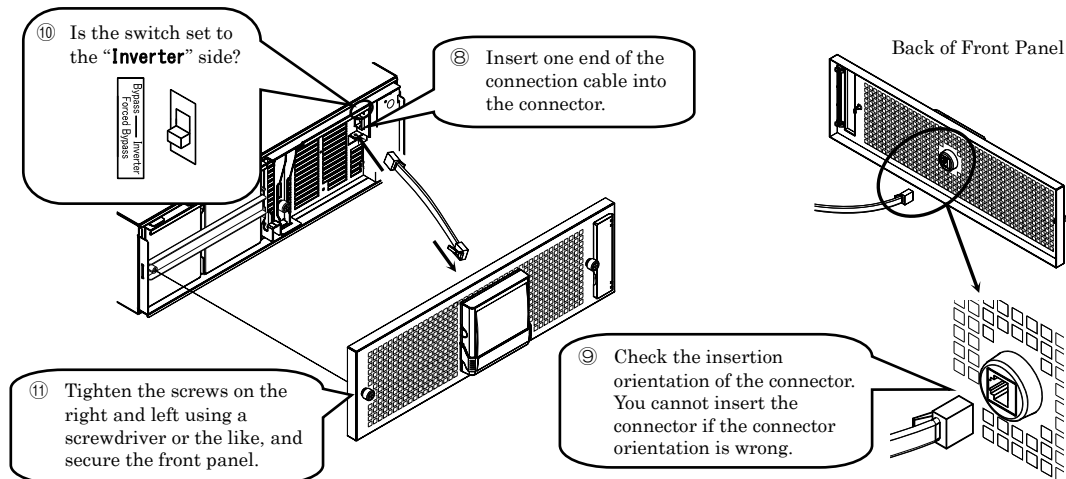
The LCD panel is secured by magnets, but also secure it with the screws C in two places if there is the risk of it falling off.



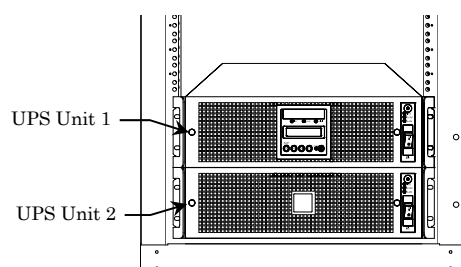
- ⑤ Remove the battery securing bracket.
- ⑥ Insert two battery packs into the unit.
- ⑦ Attach the battery pack securing bracket that you removed in step ⑤.



- ⑧ Insert one end of the LCD panel connection cable into the connector at the position shown in the figure.



- ⑨ Insert the other end of the cable connected in step ⑧ into the connector on the back of the front panel.
- ⑩ Check that the forced bypass switch **Forced Bypass** located above the connector is set to the "Inverter" side. Check the two UPS Units.
- ⑪ Secure the front panel using the two screws on the left and right.



## §6.3 Wiring the UPS



- Wiring should be performed only by service technicians. UPS wiring must be carried out following the instructions in this instruction manual. Incorrect wiring may result in electric shock and/or fire.
- Take precautionary measures when wiring such as wearing insulated gloves. There is danger of electric shock.
- Make sure that connections of the UPS terminal block and insertions into plugs are not loose. Failure to do so may result in electric shock, injury, and/or a fire.
- Be sure to ground the UPS. There is danger of electric shock. Do not install the UPS in a location where it cannot be grounded.



### §6.3.1 Wiring Between UPS Units

- ① Prepare the following items supplied with the product.

Unit-to-unit input cable (6-pole connector) 1



Unit-to-unit output cable (3-pole connector) 1



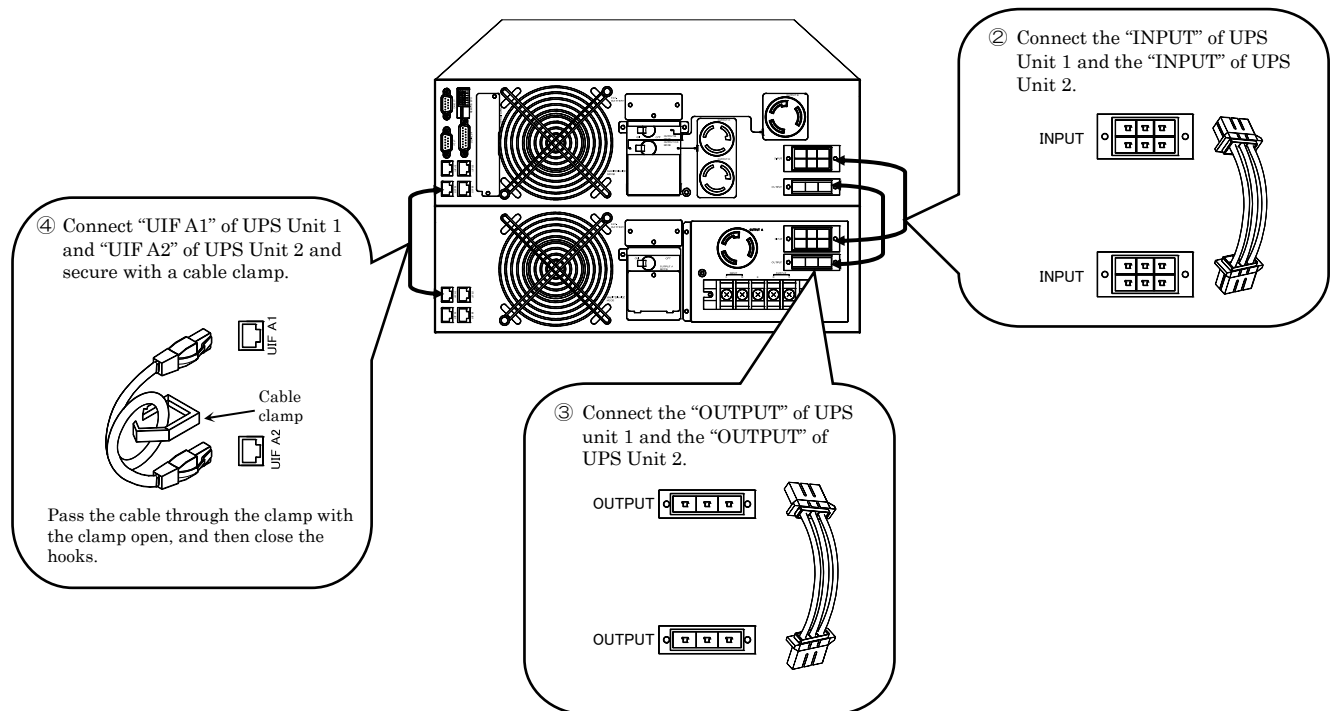
Unit-to-unit interface cable 1



- ② Connect the “INPUT” connectors of UPS Unit 1 and UPS Unit 2 using the unit-to-unit input cable.
- ③ Connect the “OUTPUT” connectors of UPS Unit 1 and UPS Unit 2 using the unit-to-unit output cable.
- ④ Connect the “UIF A1” connector of UPS Unit 1 and the “UIF A2” connector of UPS Unit 2 using the unit-to-unit interface cable. If there is danger of the cables being caught on something, wind and secure the cables using cable clamps as shown in the figure.

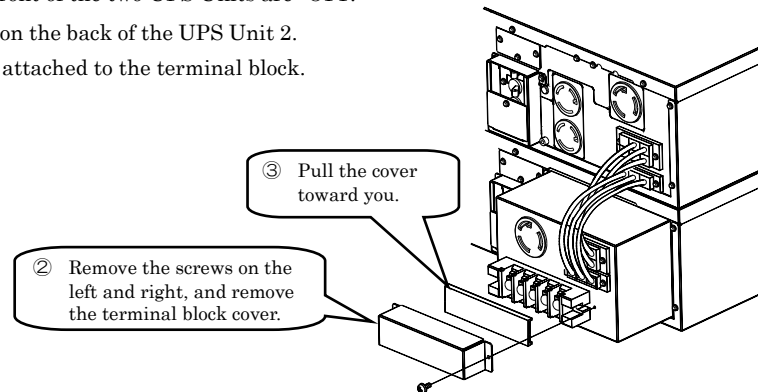
#### Notes on wiring

A connector cannot be inserted if it is not oriented properly. Check the insertion orientation.

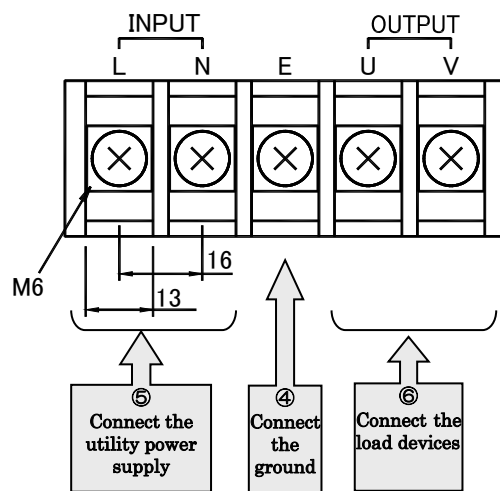


## §6.3.2 Wiring to the Terminal Block

- ① Check that **MAIN MCCB** on the front of the two UPS Units are “OFF.”
- ② Remove the terminal block cover on the back of the UPS Unit 2.
- ③ Remove the terminal block cover attached to the terminal block.



- ④ Connect the ground to the “E” terminal of the terminal block. Use class D grounding for the ground.
- ⑤ Connect the utility power supply to the “INPUT L and N” input terminals.
- ⑥ Connect the customer's load to the “OUTPUT U and V” output terminals.



See the table below and connect the wires of the specified sizes.

| Terminal Type    | Label      | Wire Size          |
|------------------|------------|--------------------|
| Input terminals  | INPUT L,N  | 22 mm <sup>2</sup> |
| Ground terminal  | E          | 14 mm <sup>2</sup> |
| Output terminals | OUTPUT U,V | 22 mm <sup>2</sup> |

The indicated wire diameters are for when 600-V cross-linked polyethylene (CV ) cables are used.

### Notes on terminal block wiring

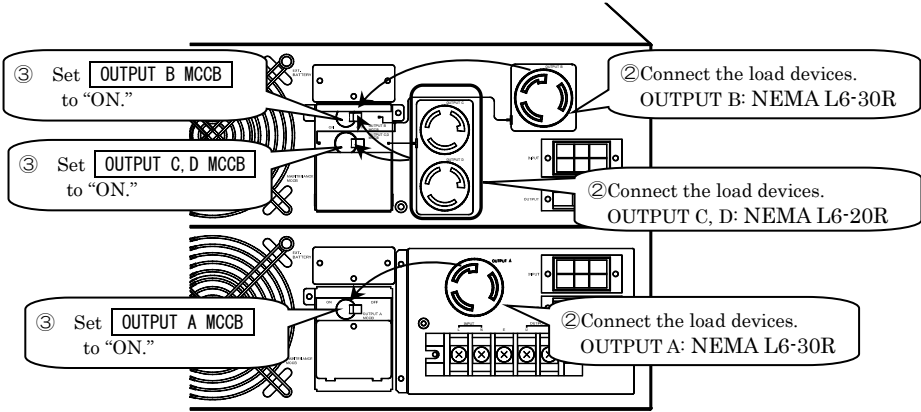
- When disconnecting wires, disconnect the ground last.
- Be careful of the polarity of the input power when performing wiring work.  
When the input is single-wire grounded, make sure you connect the ground phase to the N terminal.
- If the load device to be connected is single-wire grounded, be sure to connect the ground phase to the V phase side.

- ⑦ When you have finished the wiring, check that the connections are not loose.
- ⑧ Reattach the terminal block cover.

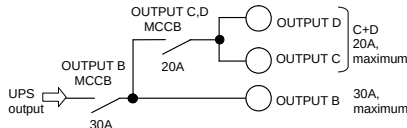
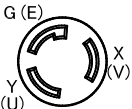
§6.3.3 Connecting to Output Outlets

- ① Check that **MAIN MCCB** on the front of the two UPS Units are “OFF.”
- ② Connect the input plugs of the load devices to be connected to the output outlets of the UPS.
- ③ Set the output outlet breakers **OUTPUT A MCCB**, **OUTPUT B MCCB**, and **OUTPUT C, D MCCB** corresponding to the output outlets that connect the load devices to “ON.”

**Note**  
The operated output outlet breaker differs according to the output outlet that connects the load device. Check the breaker to be operated using the table below. If the breaker corresponding to the output outlet that connects the load device is not set to “ON,” output will not be supplied from the output outlet.



Make sure that the total capacity of the load devices to be connected to the terminal block and output outlets does not exceed **10 kVA (9 kW)**.

| Output outlet                            | OUTPUT A                                                                                                                                 | OUTPUT B                                                                                                                             | OUTPUT C                                                                                                                  | OUTPUT D                                                 |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Breaker for output outlet to be operated | <div>OUTPUT A MCCB</div>                                                                                                                 | <div>OUTPUT B MCCB</div>                                                                                                             | <div>OUTPUT B MCCB</div> and <div>OUTPUT C, D MCCB</div>                                                                  | <div>OUTPUT B MCCB</div> and <div>OUTPUT C, D MCCB</div> |
| Outlet capacity                          | Rating: 250 V, 30 A<br>NEMA L6-30R                                                                                                       | Rating: 250 V, 30 A<br>NEMA L6-30R                                                                                                   | Rating: 250 V, 20A<br>NEMA L6-20R                                                                                         | Rating: 250 V, 20A<br>NEMA L6-20R                        |
|                                          | Make sure the current of the load device connected to OUTPUT A does not exceed <b>30 A</b> .                                             | Make sure the current of the load device connected to OUTPUT B does not exceed <b>30 A</b> .                                         | Make sure the total current of the load devices connected to the two outlets OUTPUT C and D does not exceed <b>20 A</b> . |                                                          |
|                                          |                                                                                                                                          | Make sure that the total current of the load devices connected to the three outlets OUTPUT B, C, and D does not exceed <b>30 A</b> . |                                      |                                                          |
|                                          |                                                                                                                                          |                                                   |                                                                                                                           |                                                          |
| CAUTION                                  | If the load device to be connected is single-wire grounded, <u>be sure to connect the ground phase to the X terminal (V phase) side.</u> |                                                                                                                                      |                                                                                                                           |                                                          |

Prohibited load devices

Do not connect the following types of load devices to the UPS.

| Load Device                                                                                 | Reason                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Laser printers, plain paper faxes, copiers, OHPs, vacuum cleaners, dryers, etc.             | Since such devices are subject to high transient current surges, the UPS will detect current surges and the battery backup operation will become no longer possible when a power outage occurs. There is also the danger of the UPS malfunctioning. |
| Medical instruments, control devices for elevators, computer systems of public significance | Special considerations need to be given to operation, maintenance, and management, such as system redundancy and the installation of emergency power generation facilities.                                                                         |

## §6.4 Connecting Optional Devices

Connect to the external interface if you are using communication cables or optional devices. For details on the functions of the external interface area, see “§5.4 External Interface.”

Connect optional devices before starting the UPS. If you want to connect optional devices after starting the UPS, completely stop the UPS, turn OFF the power supply, and then connect the devices.

For details on wiring and settings, see the instruction manuals of the optional devices. For details on optional devices, contact your sales representative or SANYO DENKI.

### Connecting REMOTE/EPO terminals

Connect and use, for example, a switch or a contact of the customer's system that matches the terminal specifications.

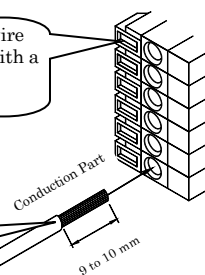
For details on terminal functions, see “§5.4 External Interface,” Section ⑤.

#### Connecting to the terminal

- ① Peel off the outer coating at the end of the wire by approximately 9 to 10 mm.
- ② Insert the wire into the terminal while pressing the tab with a flat-head screwdriver.
- ③ Pull the inserted wire to make sure that it does not come out.

Insert and remove the wire while pressing the tab with a flat-head screwdriver or similar tool.

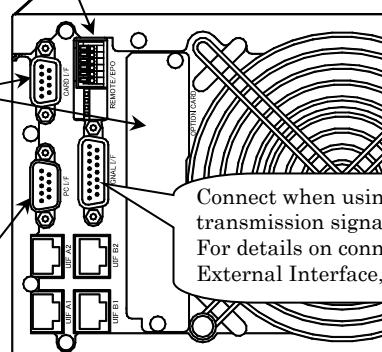
Good connection cannot be made if the conductive part is too short.



Compatible wires: AWG26 to 20

Back of UPS Unit 1

Connect a SANYO DENKI LAN interface card (option).  
For details, see the instruction manual of the LAN interface card.

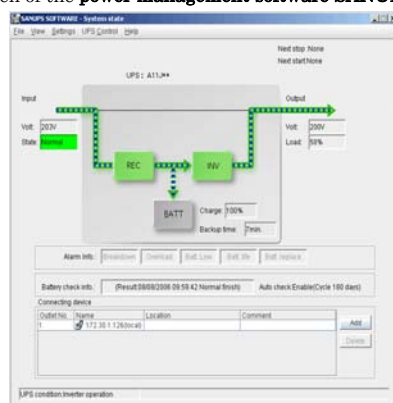


Connect when using the external transmission signal functions.  
For details on connector functions, see “§5.4 External Interface,” Section ③.

Connect the dedicated communication cable to use the SANYO DENKI power management software.

With UPS and computer communication, you can manage the power supply from a computer. For details, see the instruction manual of the power management software.

#### Main screen of the power management software SANUPS SOFTWARE



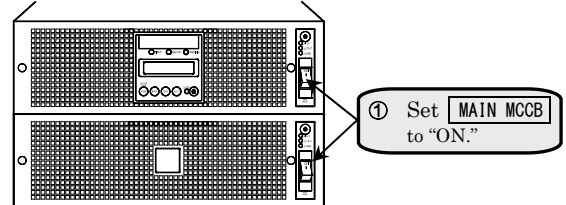
This completes installation and wiring of the UPS.

# §7. Preparation Before Operation

## §7.1 Checking and Setting UPS Settings

① Set **MAIN MCCB** of the two UPS Units to "ON."

At this time, the state becomes as shown below depending on the setting state of the UPS.  
Proceed to the corresponding procedure based on the state of the UPS.

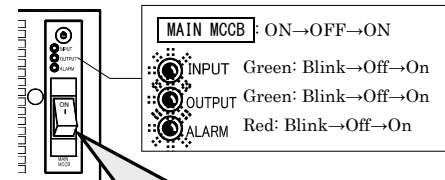


When the LEDs do not blink

When the LEDs on the UPS Unit control panel blink

② Restart the UPS Unit with the blinking LEDs following the procedure below.

1. Set **MAIN MCCB** of the UPS Unit with the blinking LEDs to "OFF."
2. Check that all LEDs of this UPS Unit have turned off.
3. Check that the interface cable for connecting between units on the back of the UPS is connected properly. See step ④ of §6.3.1.
4. Set **MAIN MCCB** to "ON."
5. Check that the LEDs turn on.



If the LEDs start blinking again even after performing step ②, contact your sales representative or SANYO DENKI.

③ Check the settings in the setting menu of the UPS.

See "List of Settings" in "§3. Setting UPS" of the LCD Panel Operating Manual.

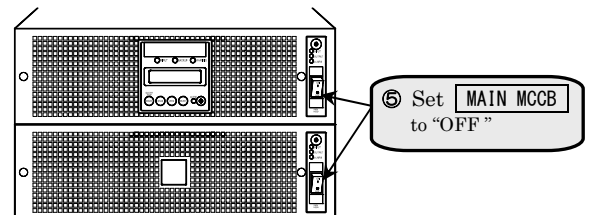
The factory default settings of the UPS are marked with an asterisk (\*) in the Default Setting column of the "List of Settings."

When the default settings do not match your environment, application, load specifications, or other requirements, change the settings in step ④.

④ Change the settings.

See each item in "§3. Setting UPS" of the LCD Panel Operating Manual.

⑤ Set **MAIN MCCB** of the two UPS Units to "OFF."



### Tip

You can also change the settings after starting load device operation. However, the UPS needs to be restarted for the setting items marked with "★" in the Default Setting column of the "List of Settings" in the LCD Panel Operating Manual. Setting such items at the preparation stage prior to UPS operation is recommended because the load devices also need to be stopped when the UPS is restarted.

## §7.2 Charging the UPS

At initial startup or when the UPS has not been operated for a long period, the batteries installed in the UPS should be charged for at least 18 hours as described in the following procedure.

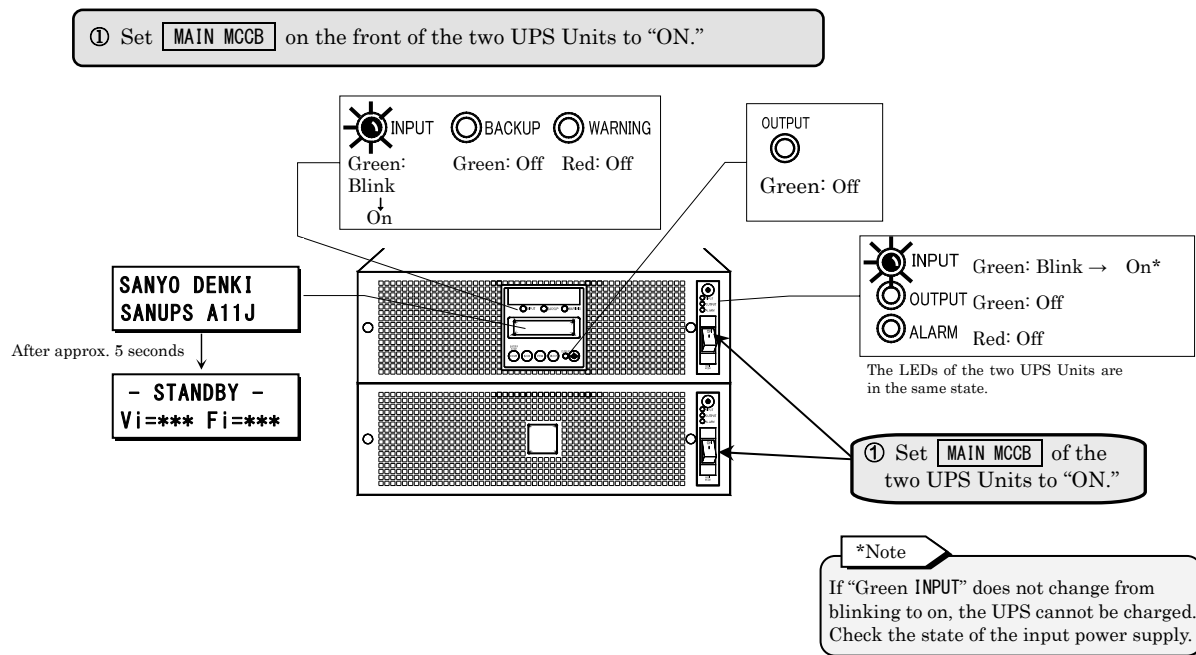
Be sure to charge the UPS before operating the load devices.

Indication of breakers, LEDs, and LCD in this manual

Breakers are displayed enclosed in    like MAIN MCCB. the LEDs of the LCD panel and UPS Unit control panel are indicated as “Green INPUT” and “Red ALARM”, and the lighting states are indicated as follows.

☀: LED lights. ☀☀: LED blinks.

The states and measurement values of the UPS are indicated as “\*\*\*” on the LCD screen.



② Check that “Green INPUT” has changed from blinking to on.

The charging of the batteries starts automatically.

③ Operate the UPS in this state for at least 18 hours.

### Notes on charging time

The UPS should be charged for at least 18 hours to ensure backup in the event of a power outage, but the UPS can be used when it is first started even if there is insufficient charge because the batteries will be charged during UPS operation. However, if a power outage occurs at that stage, the full capacity of the backup function may not be available. When an optional extension battery is used, extra charging time is required for the extension battery. See the instruction manual of the extension battery.

This completes the charging of the UPS.

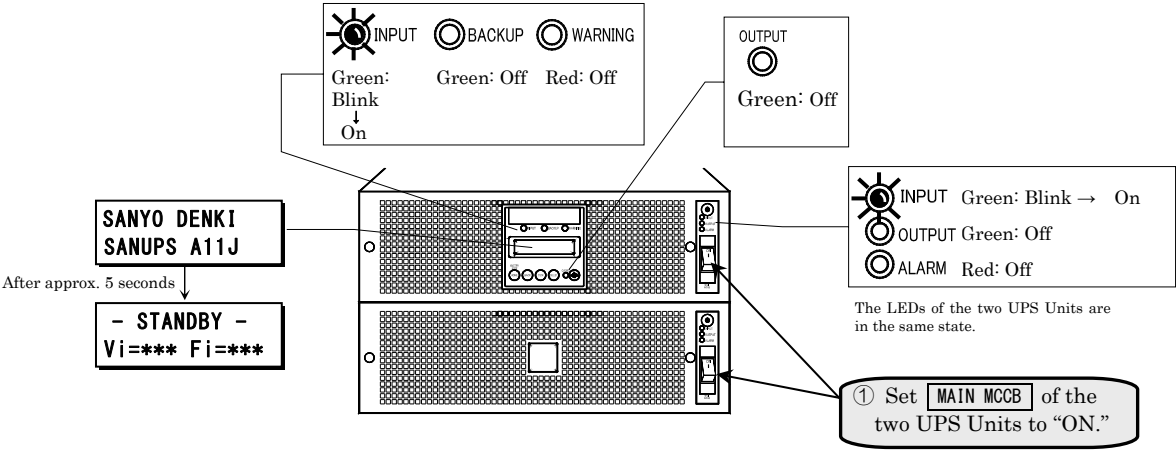
# §7.3 Power Outage Simulation Test

Perform a power outage test to confirm whether the UPS is working properly.

① Set **MAIN MCCB** on the front of the two UPS Units to “ON.”

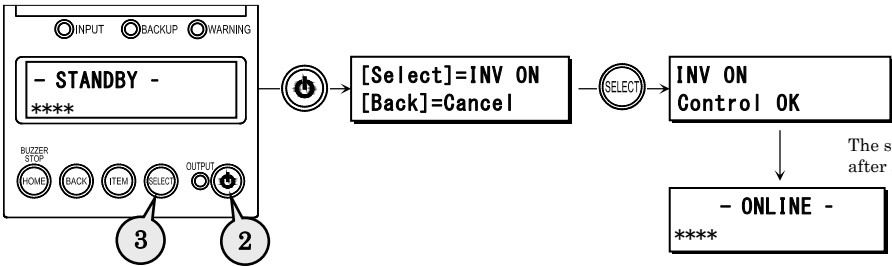
Check that Green **INPUT** has changed from blinking to on, and then proceed to ③.

**Tip**  
Step ① is not necessary if you are continuing from “§7.2 Charging the UPS.”

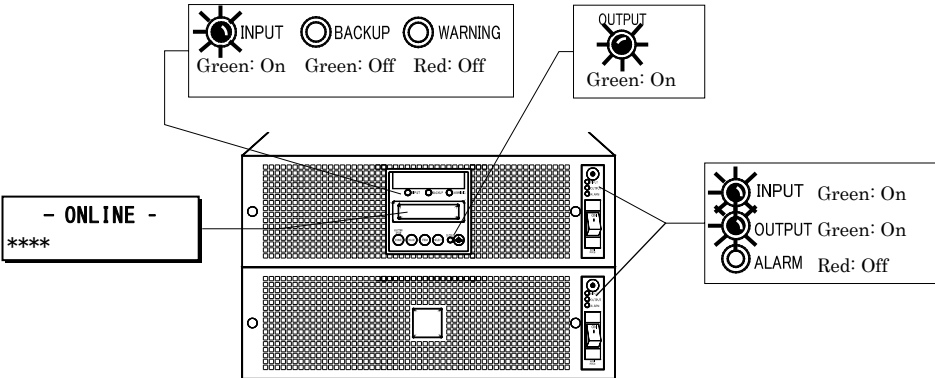


② Press **POWER**.

③ Press **SELECT**.

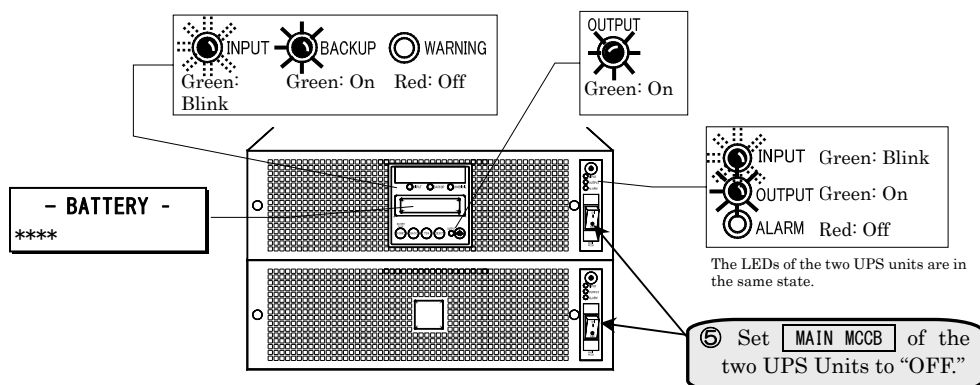


④ Check that the LCD display and LEDs are in the states shown in the figure below.



⑤ Set **MAIN MCCB** of the two units to "OFF."

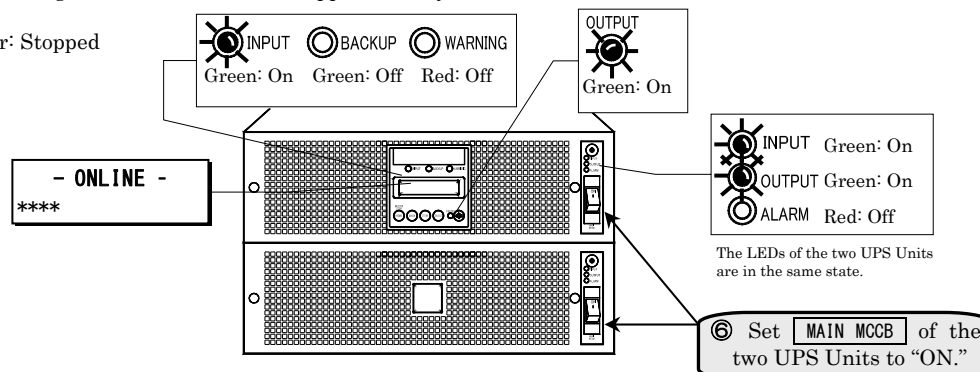
Buzzer: Beep-beep, beep-beep, beep-beep . . .



⑥ Set **MAIN MCCB** of the two units to "ON."

The state changes as shown below after approximately 5 seconds.

Buzzer: Stopped



When the UPS is working properly, the buzzer sound, LCD display, and LED state will be as indicated in steps ⑤ and ⑥.

When the power outage simulation test does not finish properly

Check the possible causes and countermeasure in the table below, and then conduct the power outage simulation test again from step ①.

| Cause                                                                      | Countermeasure                                                                                                          |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Are the battery packs installed properly in the two UPS Units?             | Install the battery packs.<br>⇒ "§6.2 Installing the Battery Packs and Attaching the Front Panel"                       |
| Is the forced bypass switch <b>Forced Bypass</b> set to the "Bypass" side? | Set the switch to the "Inverter" side.<br>⇒ Step ⑩ of "§6.2 Installing the Battery Packs and Attaching the Front Panel" |
| Are the cables on the back of the UPS connected properly?                  | Connect the cables properly.<br>⇒ "§6.3.1 Wiring Between UPS Units"                                                     |
| Is the "Green OUTPUT" off?                                                 | Perform the ON operation properly.<br>⇒ Steps ② and ③ of "§7.3 Power Outage Simulation Test"                            |
| Are "Red ALARM" and/or "Red WARNING" on?                                   | Contact your sales representative or SANYO DENKI.                                                                       |

Contact your sales representative if "Red ALARM" and/or "Red WARNING" are on or when the UPS does not operate properly even if you perform the corresponding countermeasure above.

⑦ Check that the two UPS Units operate properly.

This completes the power outage simulation test.

# §8. Operation Procedures

## §8.1 Starting the UPS

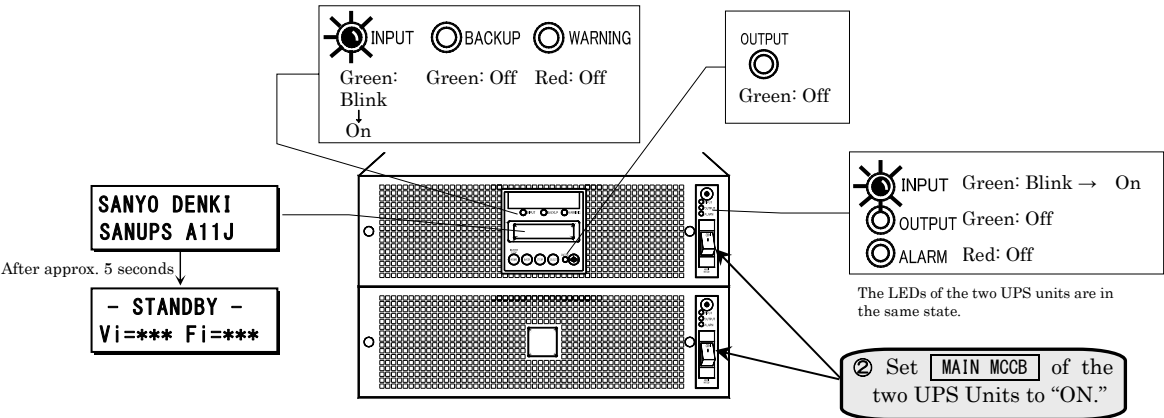
Follow the procedure below to start the UPS.

Indication of breakers, LEDs, and LCD in this manual

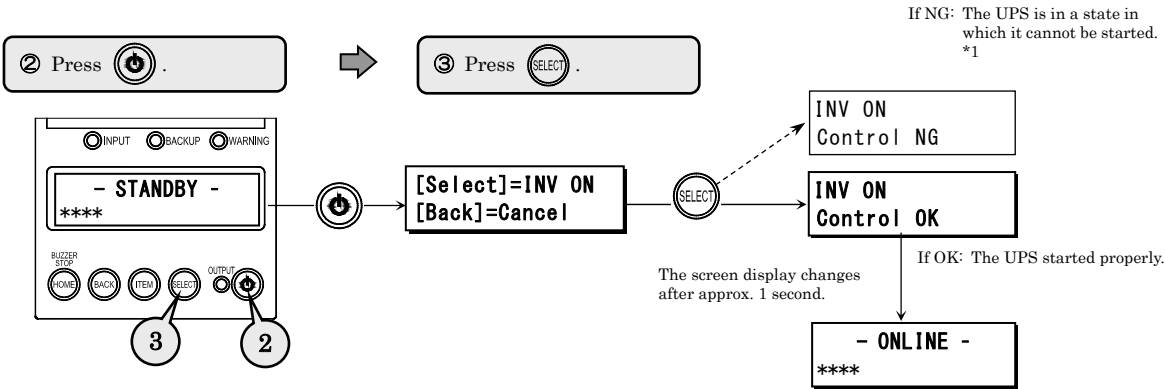
Breakers are displayed enclosed in    like MAIN MCCB.  
the LEDs of the LCD panel and UPS Unit control panel are indicated as “Green INPUT” and “Red ALARM”, and the lighting states are indicated as follows.  
☀: LED lights. ✨: LED blinks.  
The states and measurement values of the UPS are indicated as “\*\*\*\*” on the LCD screen.

① Set MAIN MCCB on the front of the two UPS Units to “ON.”

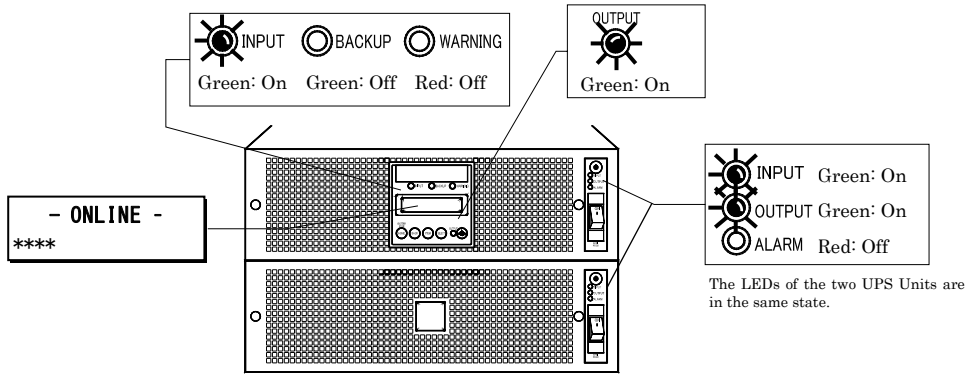
Check that Green INPUT has changed from blinking to on, and then proceed to ②.



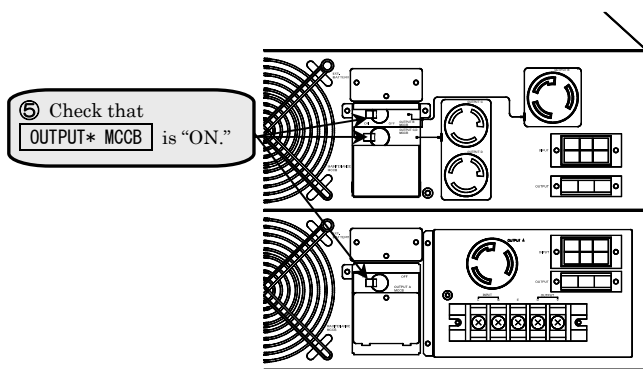
**Note**  
A long beep will sound if the interval between setting MAIN MCCB of the two UPS Units to “ON” is 30 seconds or longer. The buzzer stops when the MAIN MCCB of the two UPS Units are set to “ON.”



④ Check that the LCD display and LEDs are in the states shown in the figure below.



⑤ Check that the output outlet breakers **OUTPUT\* MCCB** corresponding to the outlets that connect the load devices are "ON."



Note

If the **OUTPUT\* MCCB** corresponding to the outlets that connect the load devices are not set to "ON," output will not be supplied from the OUTPUT\* outlet. Check the corresponding breaker using the table below.

| Output Outlet Connected to Load | Breaker for Corresponding Output Outlet          |
|---------------------------------|--------------------------------------------------|
| OUTPUT A                        | <b>OUTPUT A MCCB</b>                             |
| OUTPUT B                        | <b>OUTPUT B MCCB</b>                             |
| OUTPUT C                        | <b>OUTPUT B MCCB</b> and <b>OUTPUT C, D MCCB</b> |
| OUTPUT D                        | <b>OUTPUT B MCCB</b> and <b>OUTPUT C, D MCCB</b> |

Next, turn ON the power of the load devices. <sup>\*2</sup>

Notes on UPS startup

\*1. If "CONTROL NG" is displayed, the UPS cannot be started because there is an input power supply error or the like. Check the status of "STATUS" in the home menu of the LCD panel and see "§11. Troubleshooting."

\*2. Load capacity

If "OVER LOAD" is displayed on the LCD screen and a beep-beep-beep-beep beep-beep-beep-beep buzzer sound can be heard when the power of the load devices is turned "ON," the load devices connected to the UPS exceed the rated capacity of the UPS. Reduce the number of connected load devices.

If this state persists even after reducing the load devices to the UPS rated capacity or less, check that all of the unit-to-unit output cables on the back of the UPS Units are connected properly. If there is a unit without a cable connected, the total capacity will be reduced by an amount equivalent to the capacity of that unit, and an overload state will occur even at a load capacity that is not above the UPS rated capacity.

See "§6.3.1 Wiring Between UPS Units," and connect it correctly.

## §8.2 Shutting Down the UPS

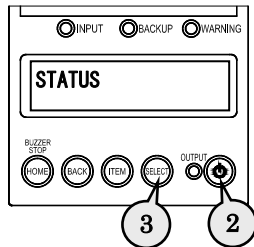
Follow the procedure below to shut down the UPS. Be sure to shut down the load devices before shutting down the UPS.

① Press any key on the LCD panel to display the screen.

② Press .



③ Press .



[Select]=INV OFF  
[Back]=Cancel

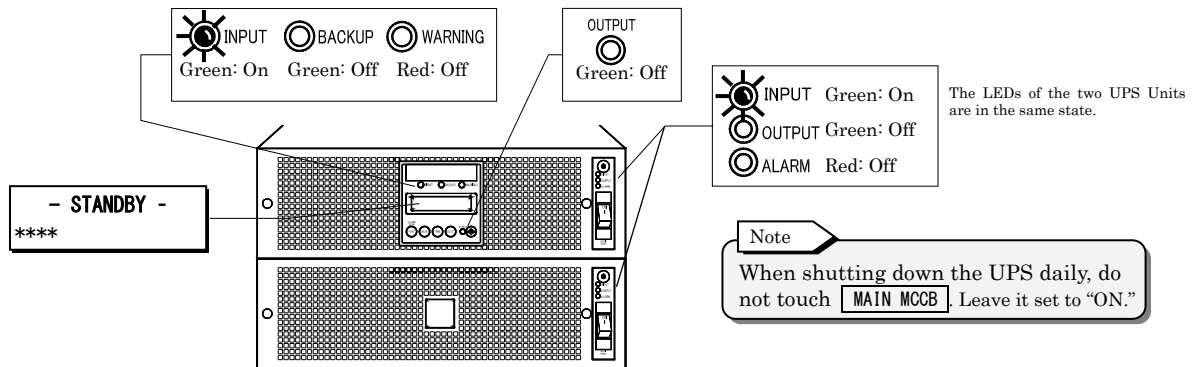


INV OFF  
Control OK

The screen display changes after approx. 1 second.

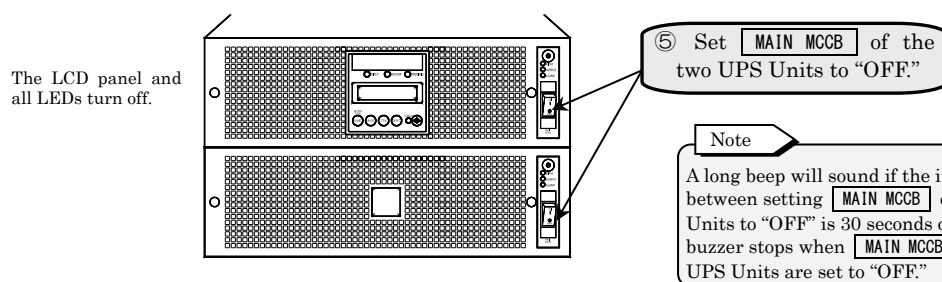
- STANDBY -  
\*\*\*\*

④ Check that the LCD display and LEDs are in the states shown in the figure below.



If the UPS will not be used for one week or more, proceed to step ⑤.

⑤ Set **MAIN MCCB** of the two UPS Units to "OFF."



### Note

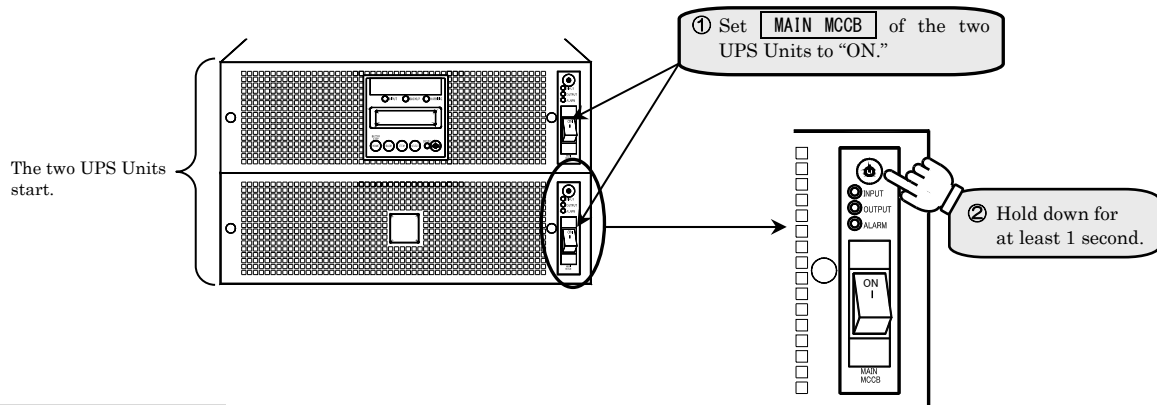
- If **MAIN MCCB** is set to "OFF" while the UPS is operating, the batteries are discharged as if a power outage occurred. Be aware that when operation resumes, the full capacity of the backup function will not be available.
- If the operation above is performed, the entire UPS will stop. To stop just one of the UPS Units, perform the procedure described in "Shutdown Operation" of "§8.3 Operation Using the UPS Unit Control Panel."
- Recharge the batteries periodically if you store the UPS for a long period after shutting down the UPS using the procedure above. For details on charging, see (4) of "§3.3 Handling Precautions."

## §8.3 Operation Using the UPS Unit Control Panel

You can use the control panel on the right side of the front of the UPS to start up and shut down the UPS. The UPS Unit control panel can be used to operate individual UPS Units, so you can use it, for example, to shut down only a UPS that has malfunctioned.

### Startup Operation

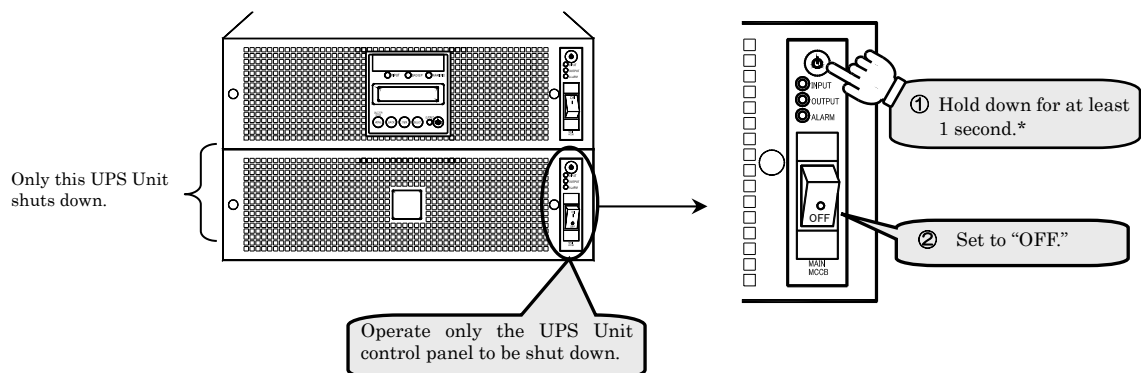
- ① Set **MAIN MCCB** of the two UPS units to “ON.”
- ② Hold down the  switch on either of the UPS Units for at least 1 second.  
The two UPS Units start.



### Shutdown Operation

#### To shut down either of the UPS Units

- ① Hold down the  switch of the UPS Unit to be shut down for at least 1 second.\*  
Only the UPS Unit for which the shutdown operation was performed enters the standby state.
- ② Set **MAIN MCCB** of this UPS Unit only to “OFF.”  
Only the UPS Unit for which the shutdown operation was performed shuts down.



#### Note

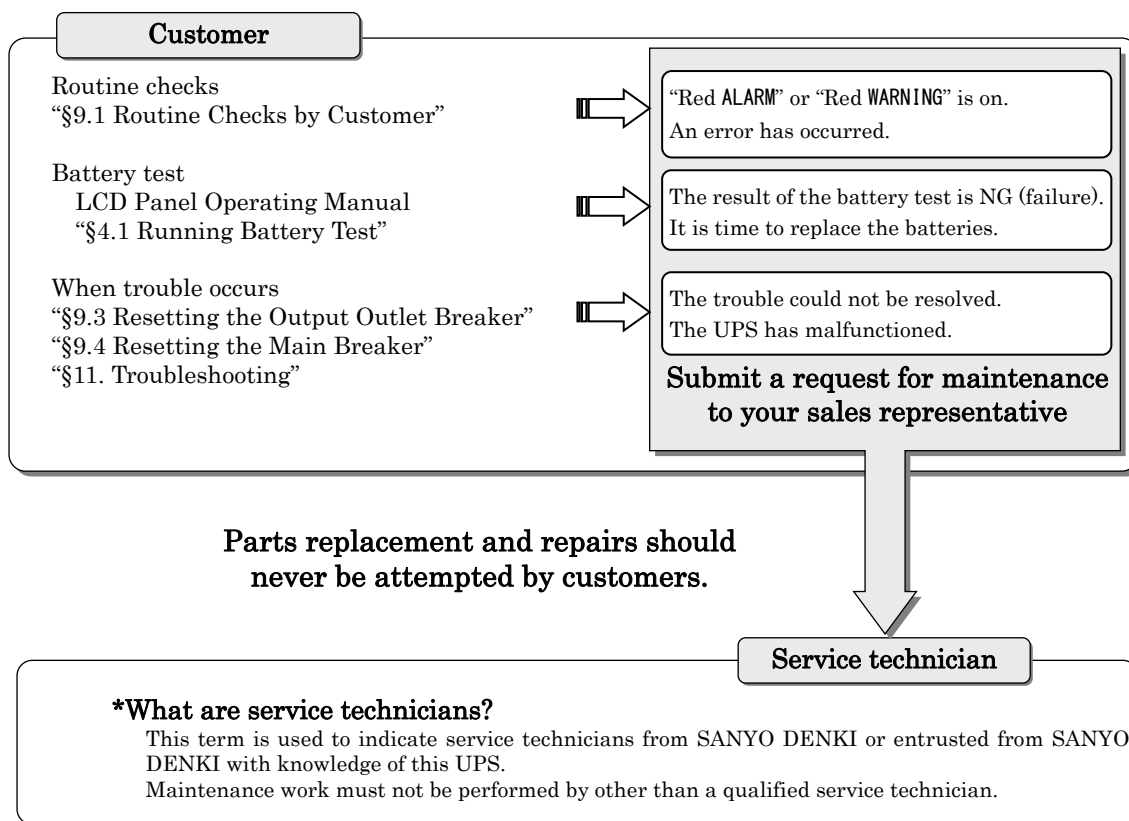
- If  is operated while **MAIN MCCB** of the UPS Unit control panel is “ON,” the UPS operation is as follows.
  - Startup operation: If  of either of the stopped UPS Units is operated, the two stopped UPS Units start.
  - Shutdown operation: If  of either of the running UPS Units is operated, only the UPS Unit for which the operation was performed shuts down, and the other UPS Unit continues running.
- Do not continue operation for a long period when there is a mixture of running and stopped UPS Units.
- Asterisk Mark (\*)  
In the case of the shutdown operation only, the operating procedure differs depending on the setting of “ OFF Operation of UPS Unit Control Panel” in the LCD panel setting menu. For details, see “§3.9 Setting UPS Shutdown Operation” in the LCD Panel Operating Manual.

## §9. Inspection and Maintenance

|                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br><b>CAUTION</b> | <ul style="list-style-type: none"> <li>Internal inspection and maintenance of the UPS should be performed only by service technicians.<br/>Electric shock, bodily injury, burns, fuming, or fire may otherwise result.</li> <li>Before beginning inspection, shut down the UPS completely and remove the input power.<br/>There is danger of electric shock.</li> <li>While the batteries are connected to the equipment, hazardous voltage is present. Never touch any parts with your hand. Doing so may result in an electric shock.</li> <li>Replace the batteries periodically.<br/>Using batteries after their service life has expired may cause a fire.</li> </ul> | <br><br> |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

The projected service life of this UPS is 10 years. During this period, the batteries must be replaced periodically.

There are routine checks to be performed by the user and maintenance to be performed by a service technician. Some maintenance items cannot be performed by the user, so be sure to submit a request for such work to your sales representative or SANYO DENKI when maintenance is required.



## §9.1 Routine Checks by Customer

|                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br><b>CAUTION</b> | <ul style="list-style-type: none"> <li>• Be sure not to inspect the inside of the UPS. Doing so may result in an electric shock, burn, injury, fuming, or fire.</li> <li>• Do not touch the fan on the back of the UPS when cleaning the UPS or anywhere around the UPS. It may cause injury.</li> <li>• Do not use, for example, a wet cloth for cleaning. There is danger of electric shock.</li> <li>• When cleaning, do not connect a vacuum cleaner to the output terminal of the UPS. Doing so may result in smoke and/or fire.</li> </ul> | <br><br> |
|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Check the following items on a daily basis.

- ① **Is the display state of the LCD panel and UPS unit control panel abnormal?**  
⇒ See “§11. Troubleshooting” and perform the countermeasure.
- ② **Is the buzzer sounding?**  
⇒ If the buzzer sounds, see “§10. When a Buzzer Sounds” and perform the countermeasure.
- ③ **Is the exterior of the UPS in any way damaged or deformed?**
- ④ **Is an unusual sound or odor emitted from the UPS?**
- ⑤ **Is the installation environment of the UPS suitable?**  
**Are the humidity and temperature within the specified ranges?**  
⇒ See “§6.1.1 Checking the Installation Environment.”
- ⑥ **Has the specified amount of space been provided at the front and back of the UPS?**  
If the air intake space of the fan is blocked, the internal temperature of the UPS will rise, which may result in a malfunction of the UPS.  
⇒ See “§6.1.2 Checking the Installation Space.”
- ⑦ **Remove any dust or dirt adhering to the air intake and fan exhaust vents.**  
Dust or dirt adhering to parts inside the UPS may result in malfunction of the UPS.
- ⑧ **Perform the battery backup time test periodically.**  
When the UPS is shipped from the factory, it is set up to perform an automatic battery test once every 180 days. If you changed the setting for the schedule of the automatic battery test in §3.14 of the LCD Panel Operating manual to “None,” see “§4.1 Running Battery Test” in the LCD Panel Operating Manual and periodically perform a manual battery backup test. Depending on the result of the test, request battery replacement.

### Estimated battery replacement interval

The battery service life is reduced by operating conditions such as ambient temperature and the number of discharge cycles.

Ambient temperature has a particularly strong impact as indicated in the following table.

| Operating Temperature Environment | Expected Battery Service Life | Battery Replacement Interval |
|-----------------------------------|-------------------------------|------------------------------|
| 25°C                              | 5 years                       | 4. 5 years                   |
| 30°C                              | 3. 5 years                    | 3 years                      |
| 35°C                              | 2. 5 years                    | 2 years                      |
| 40°C                              | 1. 7 years                    | 1. 5 years                   |

Using a battery after its service life has expired may result in battery leakage and, in the worst case, smoke and fire. Request that the battery be replaced early as preventive maintenance.

## §9.2 Testing the Batteries

Test the batteries. You can do this without stopping the load devices.

When the UPS is shipped, it is set up to perform an automatic battery test once every 180 days. To change the schedule of the automatic battery test, see “§3.14 Setting Battery Test Schedule” in the LCD Panel Operating Manual.

If the UPS has performed a backup operation within 12 hours prior to the test, the result may show an error. In such a case, conduct the test again when the UPS has not performed a backup operation within the last 12 hours.

To perform a manual Battery test:

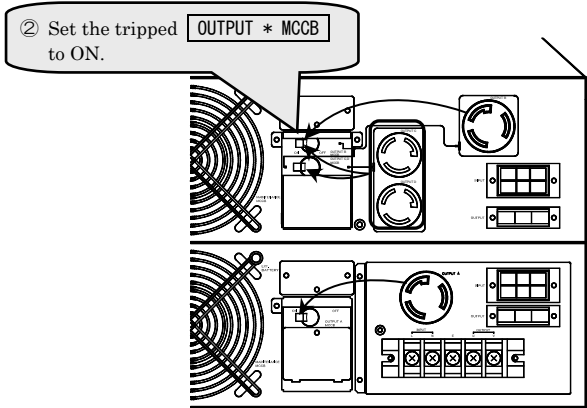


See “§4.1 Running Battery Test” in the LCD Panel Operating Manual.

### §9.3 Resetting the Output Outlet Breaker

If the output outlet breaker trips, output from the outlet corresponding to the tripped breaker stops. Follow the procedure below to reset the breaker.

- ① Check that there is no abnormality with the connected load devices, and reduce the load capacity.
- ② Reset the tripped output outlet breaker on the back of the UPS unit.



Note

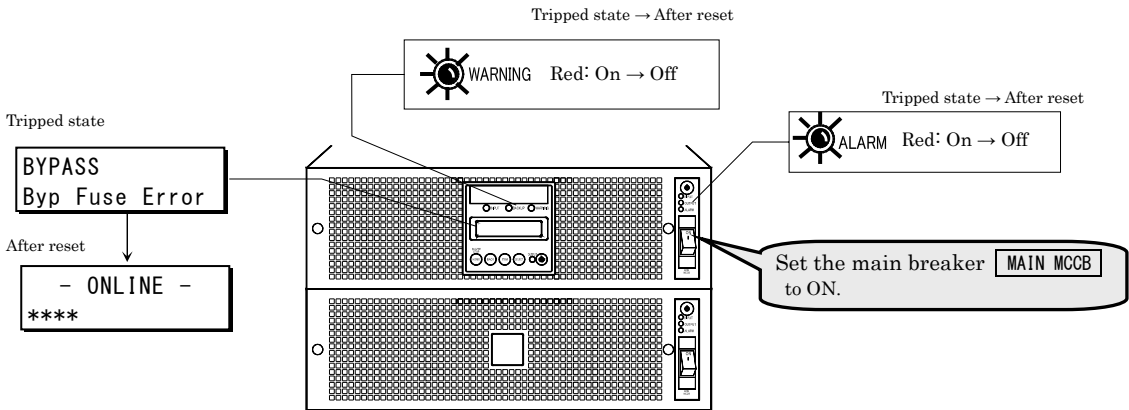
If the output outlet breaker **OUTPUT\* MCCB** corresponding to the outlet that stopped output is not reset, output will not be supplied. Check the breaker to be reset using the table below.

| Output Outlet | Breaker for Output Outlet to Be Operated         |
|---------------|--------------------------------------------------|
| OUTPUT A      | <b>OUTPUT A MCCB</b>                             |
| OUTPUT B      | <b>OUTPUT B MCCB</b>                             |
| OUTPUT C      | <b>OUTPUT B MCCB</b> and <b>OUTPUT C, D MCCB</b> |
| OUTPUT D      | <b>OUTPUT B MCCB</b> and <b>OUTPUT C, D MCCB</b> |

### §9.4 Resetting the Main Breaker

If the total capacity of the load devices connected to the UPS exceeds the rated capacity of the UPS, the UPS enters the overload state and the main breaker **MAIN MCCB** of the UPS Unit control panel trips. If the main breaker trips, output stops. Follow the procedure below to reset the breaker. After the reset, restore normal operation.

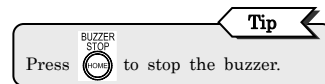
- ① Check that there is no abnormality with the connected load devices, and reduce the load capacity.
- ② Set the main breaker on the UPS Unit control panel to ON.
- ③ Check that the display on the LCD panel and UPS Unit control panel is as shown in step ④ of "§8.1 Starting the UPS."

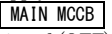
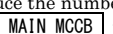
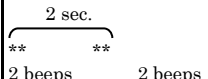
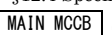
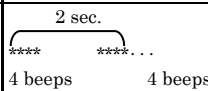
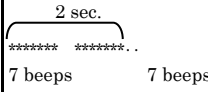
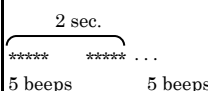


# §10. When a Buzzer Sounds

The buzzer sounds to indicate a UPS status error or change.

Check the sound pattern and see the following table for the countermeasure to be taken.



| Sound Pattern                                                                       | LCD Indication                                                 | LED Status                                   | UPS Status                                                                                                                           | Countermeasure                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Continuous tone<br>* _____                                                          | Total Unit# Err<br>Fatal Error                                 | Red ALARM: On<br>Red WARNING: On             | The number of connected UPS Units and the setting value differ.                                                                      | <ul style="list-style-type: none"> <li>Set the number of connected UPS Units properly. See “§3.19 Setting Number of UPS Units Connected in Parallel” in the LCD Panel Operating Manual.</li> <li>Check that the unit-to-unit interface cable is connected properly. See “§6.3.1 Wiring Between UPS Units.”</li> </ul>                                                                                                      |
|                                                                                     | Fatal Error                                                    | Red ALARM: On<br>Red WARNING: On             | The UPS has malfunctioned.                                                                                                           | Contact your sales representative or SANYO DENKI.                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                     | Byp Fuse Error                                                 | Red ALARM: On<br>Red WARNING: On             | [During bypass power supply]<br> has tripped (OFF). | Check the load capacity and whether there is a short circuit.<br>If the load capacity is high, reduce the number of connected load devices and set  to “ON.”<br>See “§9.4 Resetting the Main Breaker.”                                                                                                                                  |
|                                                                                     | AUX2 Error                                                     | Red ALARM: On<br>Red WARNING: On             | The auxiliary power supply has failed.                                                                                               | Contact your sales representative or SANYO DENKI.                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                     | LCD Error                                                      | Red WARNING: On                              | The LCD panel has malfunctioned.                                                                                                     | Contact your sales representative or SANYO DENKI.                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                     | Batt Vol End                                                   | Red ALARM: On<br>Red WARNING: On             | Battery discharge has ended.                                                                                                         | When the utility power is restored, the UPS will restart automatically depending on the setting value of “UPS Operation Upon Power Recovery” in the LCD panel setting menu. See “§3.7 Setting UPS Operation Upon Power Recovery” in the LCD Panel Operating Manual.                                                                                                                                                        |
|   | Input Error<br>Input Freq Err<br>Input Vol Hi<br>Input Vol Low | Green INPUT:<br>Blinking<br>Green BACKUP: On | Power is being supplied from the batteries because of an input voltage or input frequency error.                                     | <ul style="list-style-type: none"> <li>Check that the input voltage and input frequency are within rated ranges. See “§12.4 Specifications.”</li> <li>Is  set to “OFF”? If it is set to “OFF,” set it to “ON.”</li> </ul>                                                                                                              |
|                                                                                     | Test Condition<br>Testing                                      | -                                            | The UPS is performing a battery test.                                                                                                | Wait for the battery test to end.<br>To stop the battery test, see “§4.1 Running Battery Test” in the LCD Panel Operating Manual.                                                                                                                                                                                                                                                                                          |
| Continuous beeps<br>***** ...                                                       | Batt Vol Low                                                   | Green INPUT:<br>Blinking<br>Green BACKUP: On | The battery voltage is low.                                                                                                          | <ul style="list-style-type: none"> <li>Check that the input voltage and input frequency are within rated ranges. See “§12.4 Specifications.”</li> <li>Is  set to “OFF”? If it is set to “OFF,” set it to “ON.”</li> </ul>                                                                                                             |
|  | Over Load                                                      | -                                            | The load capacity of the devices connected to the terminal block or output outlets of the UPS exceeds the rated capacity of the UPS. | Reduce the number of load devices connected to the terminal block or output outlets of the UPS.                                                                                                                                                                                                                                                                                                                            |
|  | Batt Vol Error                                                 | -                                            | [When UPS starts]<br>The batteries are not connected.                                                                                | See “§6.2 Installing the Battery Packs and Attaching the Front Panel” and securely install the battery packs.                                                                                                                                                                                                                                                                                                              |
|                                                                                     | Last Result<br>BATTST: NG<br>BATTST:<br>Suspended              | -                                            | [When performing battery test]<br>The battery check result was an error.                                                             | See “§7.2 Charging the UPS,” charge the batteries for at least 12 hours, and then see “§4.1 Running Battery Test” in the LCD Panel Operating Manual and perform the battery test again. If the result is the same, the batteries need to be replaced. Contact your sales representative or SANYO DENKI.                                                                                                                    |
|  | Batt Life Warn                                                 | -                                            | The remaining battery service life is six months.                                                                                    | Battery replacement is recommended.<br>Contact your sales representative or SANYO DENKI early.<br><br>Press  to stop the buzzer.<br>The buzzer will sound again each time you start the UPS. This will continue until you replace the batteries. |
|                                                                                     | Batt Life End                                                  | -                                            | The battery service life has ended.                                                                                                  | The batteries need to be replaced.<br>Contact your sales representative or SANYO DENKI.<br><br>Press  to stop the buzzer.<br>The buzzer will sound again each time you start the UPS. This will continue until you replace the batteries.        |

## Note

If any other trouble occurs or you think there is a malfunction, contact your sales representative or SANYO DENKI.

# §11. Troubleshooting



- Internal inspection and maintenance of the UPS should be performed only by service technicians. Electric shock, bodily injury, burns, fuming, or fire may otherwise result.
- Before beginning inspection, shut down the UPS completely and remove the input power. There is danger of electric shock.
- While the batteries are connected to the equipment, hazardous voltage is present. Never touch any parts with your hand. Doing so may result in an electric shock.

Check the status of the UPS and see the following table for the countermeasure to take.

1/3

| UPS Status                                                                | LCD Indication                                                 | LED Status                                                             | Countermeasure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The UPS does not start.                                                   | -                                                              | Green INPUT: Off                                                       | <ul style="list-style-type: none"> <li>• Is the input power supply connected to the input/output terminal block of the UPS properly?<br/>See “§6.3.2 Wiring to the Terminal Block,” and connect it properly.</li> <li>• Are all the cables between the UPS Units connected properly?<br/>See “§6.3.1 Wiring Between UPS Units,” and connect each of the cables properly.</li> <li>• Is <b>MAIN MCCB</b> set to “ON”?<br/>See “§8.1 Starting the UPS” and check the correct operating procedure.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                    |
| The buzzer sounds when the UPS starts                                     | Batt Vol Error                                                 | -                                                                      | <ul style="list-style-type: none"> <li>• Are the battery packs installed properly?<br/>Stop the UPS, see “§6.2 Installing the Battery Packs and Attaching the Front Panel,” and securely install the battery packs. After installing the battery packs, restart the UPS and check that the buzzer does not sound.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| When the UPS starts, all of the LEDs of the UPS Units blink.              | -                                                              | Green INPUT: Blinking<br>Green OUTPUT: Blinking<br>Red ALARM: Blinking | <ul style="list-style-type: none"> <li>• The settings of each UPS Unit differ.<br/>Stop the UPS, see “§7.1 Checking and Setting UPS Settings,” and restart the UPS Units.</li> <li>• Are the interface cables between the units connected properly?<br/>See step ④ of “§6.3.1 Wiring Between UPS Units,” and connect the interface cables between the UPS units properly.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| No power is supplied from the output outlet or terminal block of the UPS. | -                                                              | Green OUTPUT: Off                                                      | <ul style="list-style-type: none"> <li>• Is the input power supply connected to the UPS properly?<br/>See “§6.3.2 Wiring to the Terminal Block,” and perform the wiring properly.</li> <li>• Check that the input voltage and input frequency are within rated ranges.<br/>See “§12.4 Specifications.”</li> <li>• Was the startup operation performed in accordance with the correct procedure?<br/>See “§8.1 Starting the UPS” and check the correct operating procedure.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                           | -                                                              | All: Off                                                               | <ul style="list-style-type: none"> <li>• Is <b>MAIN MCCB</b> set to “ON”?<br/>See “§8.1 Starting the UPS” and check the correct operating procedure.</li> <li>• Has <b>MAIN MCCB</b> tripped (OFF) by an overload or short circuit state?<br/>Check the load capacity and whether there is a short circuit. If the load capacity is high, reduce the number of load devices connected to the outlets or terminal block of the UPS, and set <b>MAIN MCCB</b> to ON. See “§9.4 Resetting the Main Breaker.”</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                           | Input Error<br>Input Freq Err<br>Input Vol Hi<br>Input Vol Low | Green INPUT: Blinking                                                  | <ul style="list-style-type: none"> <li>• Is the voltage of the UPS set properly?<br/>See “§3.1 Setting Voltage” in the LCD Panel Operating Manual.</li> <li>• Check that the input voltage and input frequency are within rated ranges.<br/>See “§12.4 Specifications.”</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                           | -ONLINE-                                                       | Green OUTPUT: On                                                       | <ul style="list-style-type: none"> <li>• Is the output outlet breaker set to ON? Or, has the output outlet breaker tripped? See “§8.1 Starting the UPS” or “§9.3 Resetting the Output Outlet Breaker.”</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                           | Remote OFF                                                     | -                                                                      | <ul style="list-style-type: none"> <li>• The remote OFF signal is set to ON. See “5.4 External Interface.”</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                           | EPO ON                                                         | -                                                                      | <ul style="list-style-type: none"> <li>• The EPO signal is set to ON. See “5.4 External Interface.”</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Power from the output outlets or terminal block of the UPS does not stop. | -ONLINE-                                                       | Green OUTPUT: On                                                       | <ul style="list-style-type: none"> <li>• Was the shutdown operation performed in accordance with the correct procedure?<br/>See “§8.2 Shutting Down the UPS.” However, bypass power supply will continue during bypass operation if it was started by, for example, a changeover with the forced bypass switch, an overload, or malfunction.</li> <li>• If the shutdown operation was performed by pressing  on the UPS Unit control panel, was the shutdown operation performed in accordance with the setting value?<br/>Is “UPS Shutdown Operation” in the LCD panel setting menu set to “3 Sec.” (3 seconds) or “Unique” (special operation)?<br/>See “§3.9 Setting UPS Shutdown Operation” in the LCD Panel Operating Manual and check the setting value.<br/>The default setting is “1 Sec” (1 second).</li> </ul> |
|                                                                           | -BYPASS-                                                       | Green OUTPUT: Blinking                                                 | <ul style="list-style-type: none"> <li>• Is “UPS Operation at  OFF” in the LCD panel setting menu set to “BYPASS”?<br/>See “§3.11 Setting UPS Operation at  OFF” in the LCD Panel Operating Manual and check the setting value. The default setting is “OFF.”</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                           | Nothing is indicated.                                          | Red ALARM: On<br>All other LEDs are off.                               | <ul style="list-style-type: none"> <li>• The UPS has malfunctioned. Contact your sales representative or SANYO DENKI.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| UPS Status                                                                                            | LCD Indication                                                 | LED Status                        | Countermeasure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power from the output outlets or terminal block of the UPS stopped during operation.                  | -STANDBY-                                                      | Green INPUT: On                   | <ul style="list-style-type: none"> <li>Was  on the LCD panel or  on the UPS Unit control panel pressed accidentally and set to "OFF"? Perform the correct procedure to set it to "ON."</li> </ul>                                                                                                                                                 |
|                                                                                                       | -ONLINE-                                                       | Green INPUT: On                   | <ul style="list-style-type: none"> <li>Has the output outlet breaker tripped? The breaker may have tripped by an overload or short circuit. Check the load capacity and whether there is a short circuit. If the load capacity is high, reduce the number of load devices connected to the outlets or terminal block of the UPS. See "\$9.3 Resetting the Output Outlet Breaker."</li> </ul>                                                                                                                        |
|                                                                                                       | Byp Fuse Error                                                 | Red ALARM: On<br>Red WARNING: On  | <ul style="list-style-type: none"> <li>Has <b>MAIN MCCB</b> tripped? The breaker may have tripped by an overload or short circuit. Check the load capacity and whether there is a short circuit. If the load capacity is high, reduce the number of load devices connected to the outlets or terminal block of the UPS. See "\$9.4 Resetting the Main Breaker."</li> <li>Are the unit-to-unit output cables connected properly? See "\$6.3.1 Wiring Between UPS Units," and connect the cables properly.</li> </ul> |
|                                                                                                       | Remote OFF                                                     | Green INPUT: On                   | <ul style="list-style-type: none"> <li>Is the remote OFF signal being input? See "\$5.4 External Interface," and check whether the external control terminal is connected properly.</li> </ul>                                                                                                                                                                                                                                                                                                                      |
|                                                                                                       | EPO ON                                                         | Green INPUT: On                   | <ul style="list-style-type: none"> <li>Is the EPO signal being input? See "\$5.4 External Interface," and check whether the external control terminal is connected properly.</li> </ul>                                                                                                                                                                                                                                                                                                                             |
| An overload state occurs even though the connected load devices do not exceed the UPS rated capacity. | Over load                                                      | -                                 | <ul style="list-style-type: none"> <li>Are the unit-to-unit output cables connected to the back of the UPS Units properly? If there is a UPS Unit that is not connected, the output capacity will be reduced by an amount equivalent to the capacity of the unit. See "\$6.3.1 Wiring Between UPS Units," and connect it properly.</li> <li>Is <b>MAINTENANCE BYPASS</b> set to "ON"? If it is set to "ON," set it to "OFF." Set the switch to "OFF" for UPS operation.</li> </ul>                                  |
| Power from the output outlets or terminal block of the UPS stopped during a power outage.             | -                                                              | -                                 | <ul style="list-style-type: none"> <li>Have the batteries deteriorated? Check the time to replace the batteries. The battery service life will vary depending on the ambient temperature. Early battery replacement is recommended.</li> <li>Did a power outage occur within the last 12 hours? The remaining capacity of the batteries may be low. Sufficiently charge the UPS.</li> </ul>                                                                                                                         |
| The buzzer sounded.                                                                                   | -                                                              | -                                 | <ul style="list-style-type: none"> <li>The buzzer sounds when a state change, warning, or error occurs in the UPS. See "\$10. When A Buzzer Sounds."</li> </ul>                                                                                                                                                                                                                                                                                                                                                     |
| The buzzer does not sound.                                                                            | -                                                              | -                                 | <ul style="list-style-type: none"> <li>Is "Buzzer" in the LCD panel setting menu set to "SILENT" (stopped)? See "\$3.8 Setting Buzzer Condition" in the LCD Panel Operating Manual and check the setting value.</li> </ul>                                                                                                                                                                                                                                                                                          |
| Nothing is displayed on the LCD panel.                                                                | -                                                              | -                                 | <ul style="list-style-type: none"> <li>Are the UPS Unit and LCD panel connected properly with the connection cable? See "\$6.2 Installing the Battery Packs and Attaching the Front Panel."</li> </ul>                                                                                                                                                                                                                                                                                                              |
| Cannot operate the LCD panel.                                                                         | -                                                              | -                                 | <ul style="list-style-type: none"> <li>Are the UPS Unit and LCD panel connected properly with the connection cable? See "\$6.2 Installing the Battery Packs and Attaching the Front Panel."</li> </ul>                                                                                                                                                                                                                                                                                                              |
| The LEDs on the UPS Unit control panel do not turn on.                                                | -                                                              | All: Off                          | <ul style="list-style-type: none"> <li>Is <b>MAIN MCCB</b> set to "ON"? See "\$8.1 Starting the UPS" and check the correct operating procedure.</li> </ul>                                                                                                                                                                                                                                                                                                                                                          |
| The LEDs on the UPS Unit control panel of one UPS Unit do not turn on.                                | -                                                              | All LEDs on one UPS Unit are off. | <ul style="list-style-type: none"> <li>Is <b>MAIN MCCB</b> of the UPS Unit for which the LEDs do not turn on set to ON? See "\$8.1 Starting the UPS" and check the correct operating procedure.</li> </ul>                                                                                                                                                                                                                                                                                                          |
| Cannot operate the UPS Unit control panel.                                                            | -                                                              | Red ALARM: On                     | <ul style="list-style-type: none"> <li>The UPS has malfunctioned. Contact your sales representative or SANYO DENKI.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                      |
| The battery power supply continues. The power supply switches to battery power supply frequently.     | Input Error<br>Input Freq Err<br>Input Vol Hi<br>Input Vol Low | Green BACKUP: On                  | <ul style="list-style-type: none"> <li>Is <b>MAIN MCCB</b> set to "ON"? If it is set to "OFF," set it to "ON." (If MAIN MCCB is set to "OFF" during normal operation, the operation will become the same as for a utility power supply failure and the power supply will switch to battery power.)</li> <li>Check that the input voltage and input frequency are within rated ranges. See "\$12.4 Specifications."</li> </ul>                                                                                       |
| Cannot perform a battery test.                                                                        | -                                                              | -                                 | <ul style="list-style-type: none"> <li>A battery test cannot be performed when:               <ol style="list-style-type: none"> <li>The inverter is stopped.</li> <li>The bypass power supply is active.</li> <li>The battery operation is being performed.</li> <li>A shutdown is being performed by, for example, a remote operation.</li> <li>The UPS has malfunctioned.</li> <li>During asynchronous operation.</li> <li>The frequency setting is fixed to "50 Hz" or "60 Hz."</li> </ol> </li> </ul>          |

| UPS Status                                                                                                                                 | LCD Indication | LED Status                | Countermeasure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The UPS does not switch from bypass power supply to UPS power supply (inverter power supply).                                              | -              | -                         | <ul style="list-style-type: none"> <li>When “Auto” is set in “Setting frequency” in the LCD panel setting menu: Is the UPS in a state of asynchronous operation? The UPS cannot switch from bypass power supply to UPS power supply during asynchronous operation. See “§2 Viewing UPS Information” in the LCD Panel Operating Manual, and check the UPS operation status.<br/>When “50 Hz” or “60 Hz” is set in “Setting frequency”: The UPS cannot switch from bypass power supply to UPS power supply when the input frequency is not within the specified tracking range (<math>\pm 1\%</math>, <math>\pm 3\%</math>, or <math>\pm 5\%</math>) set in “§3.2 Setting Synchronous Frequency Tracking Range.” Check the input frequency.</li> <li>Check that the forced bypass switch <b>Forced Bypass</b> is set to “Inverter.”<br/>The forced bypass switch <b>Forced Bypass</b> is located inside the front panel of the UPS. Remove the front panel to check the switch. See step ⑩ in “§6.2 Installing the Battery Packs and Attaching the Front Panel.” If the forced bypass switch is set to “Bypass,” set it to “Inverter” and then press  again to switch to UPS power supply.</li> <li>If “Overload Recovery Operation” in the LCD panel setting menu is set to “Auto Ret BYP,” the UPS switches to bypass power supply when there is an overload, and after a certain period of time has elapsed, switches back to UPS power supply automatically. If the overload condition persists, the UPS switches to bypass power again, and this cycle is repeated. See “§3.10 Setting Overload Recovery Operation” in the LCD Panel Operating Manual.</li> <li>If “Overload Recovery Operation” in the LCD panel setting menu is set to “Stay on BYP,” bypass power supply continues when the overload condition continues. When the overload conditions is resolved, the UPS switches to UPS power supply.<br/>If the voltage of the utility power supply is low and the load current is at or below the overload detection threshold when the UPS switches to bypass power supply, the UPS continues to switch between UPS power supply and bypass power supply. See “§3.10 Setting Overload Recovery Operation” in the LCD Panel Operating Manual.</li> </ul> |
| The device connected to the external interface section does not work.                                                                      | -              | -                         | <ul style="list-style-type: none"> <li>Is the interface cable between the UPS Units connected to the back of the UPS Units properly?<br/>If this cable is not connected, the external interface section will not work. See “§6.3.1 Wiring Between UPS Units,” and connect the interface cable properly.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| When using the power management software (option), serial communication fails.                                                             | -              | -                         | <ul style="list-style-type: none"> <li>Is “Interface” in the LCD panel setting menu set to “WS” (work station)? See “§3.5 Setting PC Interface” in the LCD Panel Operating Manual. The default setting is “WS” (work station).</li> <li>Is “Serial baud rate” in the LCD panel setting menu set properly? See “§3.6 Setting Baud Rate” in the LCD Panel Operating Manual. The default setting is “9600 bps.” Set the same setting value as that of the power management software.</li> <li>Is the communication cable connected properly? Connect the computer and UPS properly.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| When the power recovers after the UPS has shut down due to battery exhaustion during a power outage, the UPS does not start automatically. | -              | -                         | <ul style="list-style-type: none"> <li>Check the settings of “UPS Operation Upon Power Recovery” in the LCD panel setting menu. If it is set to “STOP,” the inverter will not start automatically.<br/>If it is set to “BATT&gt;30%,” “BATT&gt;50%,” or “BATT&gt;80%,” the UPS will not start until the batteries are charged to the specified level. The default setting is “Auto.” See “§3.7 Setting UPS Operation Upon Power Recovery” in the LCD Panel Operating Manual.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| The UPS does not start automatically at the time set for scheduled operation in the power management software (option).                    | -              | -                         | <ul style="list-style-type: none"> <li>If “When power failure recovered, automatically start the UPS” of the “Configuring the UPS control conditions” item described in the User Guide of the power management software is selected and a value between “10 and 90” is set for the specified value (%), the UPS will not start even at a scheduled start time if the batteries are not charged to the specified value. When scheduling operation for the UPS, set this specified value (%) to “0.” For details, see “Setting the Shutdown Conditions” in the User Guide of the power management software.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| “Red ALARM” of one UPS Unit turned on.                                                                                                     | -              | Red ALARM of one UPS Unit | <ul style="list-style-type: none"> <li>The UPS for which “Red ALARM” is on has malfunctioned. Contact your sales representative or SANYO DENKI.<br/>Normally operating UPS Unit will continue running. In such a case, power supply may be repeatedly switched between bypass power supply and inverter power supply.<br/>See the “The UPS does not switch from bypass power supply to UPS power supply” item in “§11. Troubleshooting.”</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| “Red ALARM” turned on.                                                                                                                     | -              | Red ALARM                 | <ul style="list-style-type: none"> <li>When there is a power outage, “Red ALARM” turns on if the battery is exhausted.<br/>In cases other than the above, the UPS has malfunctioned. Contact your sales representative or SANYO DENKI.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Note

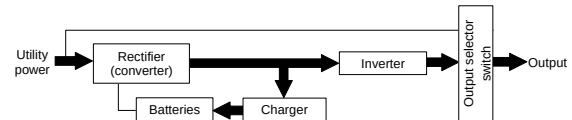
If the UPS does not operate normally even if you perform the countermeasures above, or if any other trouble occurs or you think there is a malfunction, contact your sales representative or SANYO DENKI.

# §12. UPS CHARACTERISTICS

## §12.1 Basic Operation

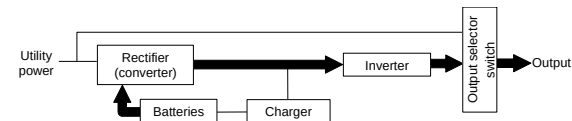
### (1) During normal operation

During normal periods, the UPS converts AC power from the utility power source into DC power through the rectifier, and reconverts this DC power back into AC power through the inverter and supplies it to the load. The output power is stable AC power synchronized with the utility power source. The batteries are kept continually charged by the charger and ready in case a problem (power outage or voltage drop) occurs with the utility supply.



### (2) When utility power fails

When a failure or power outage occurs at the utility power source, the rectifier and charger stop operating while inverter operation continues, now using the batteries as a DC source, to ensure stable power supply to the load without even a momentary power dropout. At the same time, the buzzer sounds and "Green INPUT" starts blinking.



### (3) When battery voltage drops

When a failure or power outage at the utility power source continues, the battery voltage drops to approximately 178 V or less, the buzzer sounds and "Batt Vol Low" is displayed on the LCD screen.

### (4) When utility power recovers

When normal utility power is restored, rectifier and charger operations resume, automatically returning to the normal operation state described in 12.1 (1).

### (5) Extended power outage.

If a power outage persists and the battery voltage reaches the final discharge level of approximately 168 V, a protective circuit shuts off the inverter to prevent over-discharging of the batteries. When normal utility power recovers after the inverter has been stopped, operation is automatically resumed\*, returning to the normal operation state described in 12.1 (1).

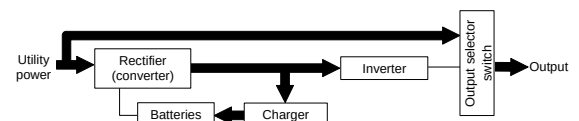
\* When "UPS Operation Upon Power Recovery" in the LCD panel setting menu is set to "STOP," inverter output remains stopped.

## §12.2 Protective Functions

### (1) Overload protection

If the UPS output is overloaded by the current capacity of the inverter being exceeded, such as when a computer system boots up, the output selector automatically switches the source of power from the inverter to bypass circuit without interruption. Once the overload state is resolved, the source of power is switched to the inverter, and operation returns to the normal operation state.

\* When "Overload Recovery Operation" in the LCD panel setting menu is set to "Auto Ret BYP," the UPS switches the source of power to the inverter without interruption after a set period of time has elapsed, and operation returns to the normal operation state.



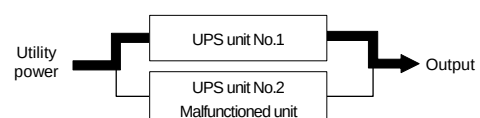
### (2) UPS Unit failure protection

In the unlikely event a failure occurs in the UPS, the unit in which the failure occurred is cut off automatically, and inverter power supply is continued from the normally operating unit. At the same time, "Red WARNING" on the LCD panel and the "Red ALARM" LED on the UPS Unit control panel of the malfunctioned UPS Unit turn on, and the buzzer sounds.

One of the following occurs depending on the size of the load current.

- ① If the load current does not exceed the total current of the normally operating unit, inverter power supply is continued.
- ② If the load current exceeds the total current of the normally operating unit, the source of power is switched from inverter power to bypass operation.

The operation becomes the same as that indicated by the asterisk (\*) mark in §12.2 (1) above in accordance with the LCD panel setting menu.



## §12.3 Protective Function Table

The following table shows the functions and operations to protect the UPS.

Indication of the marks in the table as follows.

Lit LED: 

Blinking LED: 

Buzzer alarms: ① to ⑥

Sending of transmission signal: ○

| Item                                                    |                         | Indicators/Indications of LCD Panel and UPS Unit Control Panel                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     | Alarm<br>Buzzer<br>*2     | Transfer Signal and Contact Signal Output |                |                      |           |                 |               | Protective Functions<br>(UPS Operations) | Notes                                                     |                                   |
|---------------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------|-------------------------------------------|----------------|----------------------|-----------|-----------------|---------------|------------------------------------------|-----------------------------------------------------------|-----------------------------------|
|                                                         |                         | Green INPUT                                                                         | Green OUTPUT                                                                        | Green BACKUP                                                                        | Red WARNING                                                                         | Red ALARM                                                                           |                           | LCD Indications<br>*1                     | AC Input Error | Battery Voltage Drop | AC Output | Inverter Output | Bypass Output |                                          |                                                           | Device Error                      |
| Preparation                                             |                         |    | -                                                                                   | -                                                                                   | -                                                                                   | -                                                                                   | -STANDBY-<br>*****        | -                                         | -              | -                    | -         | -               | -             | Rectifier and charger operation          | Receiving power                                           |                                   |
| Normal                                                  |                         |    |    | -                                                                                   | -                                                                                   | -                                                                                   | -ONLINE-<br>*****         | -                                         | -              | -                    | ○         | ○               | -             | Inverter operation                       | Receiving power                                           |                                   |
| Serious malfunction                                     | Normally Operating Unit |    |    | -                                                                                   |    | -                                                                                   | -SYS FAILURE-<br>*****    | ①                                         | -              | -                    | ○         | ○               | -             | ○                                        | Inverter operation                                        | *3                                |
|                                                         | Malfunctioning Unit     |    | -                                                                                   | -                                                                                   |    |    | -SYS FAILURE-<br>*****    | ①                                         | -              | -                    | ○         | ○               | -             | ○                                        | Inverter shutdown                                         |                                   |
| Overload                                                |                         |    |    | -                                                                                   | -                                                                                   | -                                                                                   | -BYPASS-<br>*****         | ④                                         | -              | -                    | ○         | -               | ○             | -                                        | Bypass power supply                                       | -                                 |
| Forced bypass                                           |                         |    |    | -                                                                                   | -                                                                                   | -                                                                                   | -BYPASS-<br>*****         | -                                         | -              | -                    | ○         | -               | ○             | -                                        |                                                           | Manual switch to bypass operation |
| High input voltage                                      |                         |    |    |    | -                                                                                   | -                                                                                   | -BATTERY-<br>*****        | ②                                         | ○              | -                    | ○         | ○               | -             | -                                        | Stop rectifier and charger<br>Continue inverter operation | Battery operation                 |
| High input voltage<br>(Prolonged, battery voltage drop) |                         |    |    |    | -                                                                                   | -                                                                                   | -BATTERY-<br>*****        | ③                                         | ○              | ○                    | ○         | ○               | -             | -                                        |                                                           |                                   |
| Power outage                                            |                         |  |  |  | -                                                                                   | -                                                                                   | -BATTERY-<br>*****        | ②                                         | ○              | -                    | ○         | ○               | -             | -                                        |                                                           |                                   |
| Power outage<br>(Prolonged, battery voltage drop)       |                         |  |  |  | -                                                                                   | -                                                                                   | -BATTERY-<br>*****        | ③                                         | ○              | ○                    | ○         | ○               | -             | -                                        |                                                           |                                   |
| Input error (Frequency)                                 |                         |  |  |  | -                                                                                   | -                                                                                   | -BATTERY-<br>*****        | ②                                         | ○              | -                    | ○         | ○               | -             | -                                        |                                                           |                                   |
| Input error<br>(Prolonged, battery voltage drop)        |                         |  |  |  | -                                                                                   | -                                                                                   | -BATTERY-<br>*****        | ③                                         | ○              | ○                    | ○         | ○               | -             | -                                        |                                                           |                                   |
| Complete Battery Discharge                              |                         |  |  | -                                                                                   |  |  | -BYPASS-<br>*****         | ①                                         | ○              | -                    | ○         | -               | ○             | -                                        | Inverter shutdown<br>Bypass power supply                  | -                                 |
| Battery voltage error                                   |                         |  |  | -                                                                                   | -                                                                                   | -                                                                                   | -*****-<br>Batt Vol Error | ⑥                                         | -              | -                    | ○         | ○               | -             | ○                                        | Inverter operation                                        | Batteries not connected           |
| Battery Remaining Service Life Warning                  |                         |  |  | -                                                                                   | -                                                                                   | -                                                                                   | -*****-<br>Batt Life Warn | ⑤                                         | -              | -                    | ○         | ○               | -             | -                                        |                                                           | -                                 |
| Battery life                                            |                         |  |  | -                                                                                   | -                                                                                   | -                                                                                   | -*****-<br>Batt Life End  | ⑤                                         | -              | -                    | ○         | ○               | -             | -                                        |                                                           | -                                 |

\*1. The "\*\*\*\*\*" indication on the LCD indicates the UPS status, etc.

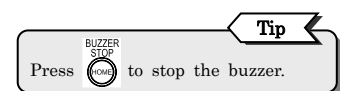
\*2. Buzzer sound patterns:

- ① \* ————— Continuous tone
- ② \*\*.....\*\*.....
- ③ \*\*\*\*\*..... Continuous tone
- ④ \*\*\*\*.....\*\*\*\*.....
- ⑤ \*\*\*\*\*.....\*\*\*\*\*.....
- ⑥ \*\*\*\*\*.....\*\*\*\*\*.....

See "§10. When A Buzzer Sounds" and perform the corresponding countermeasure.  
If the UPS has malfunctioned, contact your sales representative or SANYO DENKI.

\*3. In the following cases, the UPS switches to bypass operation when a serious failure occurs.

- When only one UPS Unit is connected.
- When all UPS Units have malfunctioned.
- When a malfunction occurs and operation with a normally operating UPS Unit will result in an operation overload state.



## §12.4 Specifications

| Item                  |                                       | Standard or Performance                                                             | Notes                                                                                              |
|-----------------------|---------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Model                 |                                       | A11J103A002T                                                                        |                                                                                                    |
| Output capacity       | N units setting                       | 10 kVA/9 kW                                                                         | Selectable                                                                                         |
|                       | N+1 units setting                     | 5 kVA/4.5 kW                                                                        | Default: N units setting                                                                           |
| Cooling system        |                                       | Forced air cooling                                                                  |                                                                                                    |
| AC input              | Input terminals                       | Terminal block M6                                                                   |                                                                                                    |
|                       | Number of phases                      | Single-phase 2-wire                                                                 |                                                                                                    |
|                       | Voltage                               | 200 V, 208 V, 220 V, 230 V, 240 V<br>(Allowable variation range: -40% to +15%)      | Selectable. Rated voltage same as output voltage.<br>Default: 200 V *1                             |
|                       | Frequency                             | 50 Hz or 60 Hz                                                                      | Auto-detect, fixed setting selectable.<br>Default: Auto-detect *2                                  |
|                       | Required capacity                     | 11 kVA                                                                              | Max. capacity during battery recovery charging *3                                                  |
|                       | Input power factor                    | 0.95 or more                                                                        | During rated input voltage *4                                                                      |
|                       | Output terminals                      | Terminal block M6, NEMA L6-30R ×2, NEMA L6-20R ×2                                   |                                                                                                    |
| AC output             | Number of phases                      | Single-phase 2-wire                                                                 |                                                                                                    |
|                       | Voltage                               | 200 V, 208 V, 220 V, 230 V, 240 V                                                   | Default: 200 V                                                                                     |
|                       | Voltage accuracy                      | Within rated voltage ±2%                                                            |                                                                                                    |
|                       | Frequency                             | 50 Hz or 60 Hz                                                                      | Same as the input frequency (auto-select)                                                          |
|                       | Frequency accuracy                    | Within rated frequency ±1, 3, or 5%                                                 | 1, 3, and 5% selectable<br>When free running operation or frequency fixed setting: Within ±0.5% *2 |
|                       | Voltage waveform                      | Sine wave                                                                           |                                                                                                    |
|                       | Distortion factor of voltage waveform | Linear load: 3% or less<br>Rectifier load: 8% or less                               | During rated output                                                                                |
|                       | Transient voltage variation           | Rapid load change                                                                   | 0↔100% at transient or output switch                                                               |
|                       |                                       | During power outage, recovery                                                       | During rated output                                                                                |
|                       |                                       | Rapid input voltage change                                                          | ±10% variation                                                                                     |
|                       | Load power factor                     | 0.9 (lag)                                                                           | Variation range 0.7 (lag) to 1.0                                                                   |
|                       | Overcurrent protection                | N units setting                                                                     | 110% or more                                                                                       |
|                       |                                       | N+1 units setting                                                                   | 220% or more                                                                                       |
|                       | Overload capability                   | N units setting                                                                     | 110% / 118%                                                                                        |
|                       |                                       | Inverter N+1 units setting                                                          | 220% / 236%                                                                                        |
|                       |                                       | N units setting                                                                     | 200% / 800%                                                                                        |
|                       |                                       | N+1 units setting                                                                   | 400% / 1600%                                                                                       |
| Batteries             | Type                                  | Small-sized valve regulated lead-acid battery                                       |                                                                                                    |
|                       | Quantity                              | 32                                                                                  | 16 in serial for each UPS Unit (12 V/battery)                                                      |
|                       | Rated capacity                        | 5 Ah/battery                                                                        | 20 hour rate                                                                                       |
|                       | Backup time                           | 5 minutes when load power factor is 0.8,<br>4 minutes when load power factor is 0.9 | At 25°C ambient temperature, initial value *6                                                      |
|                       | Expected service life                 | 5 years                                                                             | At 25°C ambient temperature                                                                        |
|                       | Generated heat                        | 730 W                                                                               | During rated output                                                                                |
| Input leakage current |                                       | 8 mA                                                                                |                                                                                                    |
| Ambient conditions    |                                       | Ambient temperature: 0 to 40°C,<br>relative humidity: 20 to 90%                     | No condensation *7                                                                                 |
| Acoustic noise        |                                       | 50 db or less                                                                       | 1 m from front of UPS, A characteristics                                                           |

- \*1. The allowable voltage range of AC input is as follows.

| Condition                         | Allowable Voltage Range |
|-----------------------------------|-------------------------|
| • When load factor is 70% or less | -40% to +15%            |
| • When load factor exceeds 70%    | -20% to +15%            |
| • At UPS startup                  | -20% to +15%            |

When load factor is 70% or less, voltage error detection point is -40%, and voltage recovery detection point is -20%.

- \*2. When the frequency auto-detect setting is set, you can select a synchronous frequency tracking range from ±1%, ±3%, and ±5%. (Default: ±3%)

Additionally, the allowable range for the input frequency is ±8% on the auto-detect setting. When the fixed setting is set, the output frequency is fixed to the set frequency (50 Hz or 60 Hz) regardless of the input frequency. The allowable range for the input frequency at the time is 40 Hz to 120 Hz. When the input frequency recovers from being outside the allowable range, the range is ±8% regardless of the setting. Also, even when either setting is set, the inverter will not start if the input frequency is not within the range of the values (±1%, ±3%, or ±5%) set for the synchronous frequency tracking range.

- \*3. When N+1 unit is set, the value becomes as shown in the table below.

|                   |                 |
|-------------------|-----------------|
| Model             | A11J103A002T    |
| Load capacity     | 5 kVA           |
| Required capacity | 6.2 kVA or less |

- \*4. When the distortion factor of the input voltage waveform is less than 1%.

- \*5. The inverter is capable of operation synchronized with AC input frequency and switchover operation without interruption provided that the AC input frequency is within the rated frequency range, and the AC input voltage is within the rated voltage range.

- \*6. Some of the specifications for a UPS with long backup times differ from the specifications listed in the above table. See the extension battery specifications instruction manual.

- \*7. The UPS contains batteries. The battery service life will be foreshortened if the UPS is used in an environment where the ambient temperature exceeds 30°C.

## §13. WARRANTY

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1. This product is warranted for 1 year 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 modifications or changes 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 does not apply when the product is operated under extraordinary conditions, for example periodic complete discharge of the batteries.
7. This warranty is void in the event that the product supplied by SANYO DENKI is installed in an inappropriate location.
8. This warranty does not apply to failures due to accidents, improper use, or use for other than the product's intended use.
9. 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 (sulfide gas), non-standard voltage or incorrect power sources other than those specified.
10. This warranty does not apply to defects or damages arising from mishandling, such as during transportation, relocation or dropping of the UPS by the customer after purchase.
11. SANYO DENKI reserves the right to determine whether damage to a load device connected to this product is due to faulty operation by this product. (In the event of any such claim, the affected load device must be sent to SANYO DENKI for inspection.)
12. Warranties for devices other than the product supplied by SANYO DENKI shall be the warranties provided by the manufacturers of those devices.
13. SANYO DENKI provides no warranty for products made by other manufacturers used or composed in the products manufactured by SANYO DENKI.
14. This warranty applies to the product specified by SANYO DENKI. It does not apply to any other device.
15. Sanyo disclaims all responsibility for damage to load device software, loss of data, lost profits, and lost opportunities.
16. This warranty does not apply to medical or industrial devices connected to this product.