

SANUPS

HYBRID UPS

E11A

Uninterruptible Power Supply

1kVA, 2kVA, 3kVA

200V Model

Instruction Manual

SANYODENKI



Introduction

Thank you for choosing the SANUPS E11A.

SAVE THESE INSTRUCTIONS

This manual contains important instructions for E11A that should be followed during installation and maintenance of the UPS*¹ and batteries to protect the safety of the service technician*² and the customers. To use the UPS correctly and safely, read this manual before using the UPS. Please be sure to also read the *User Settings Guide* for details about user setting menus. After reading, please keep these handy for convenient reference.

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)

*¹ UPS is an abbreviation for Uninterruptible Power Supply.

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*² Service technician

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.

Notes about UPS Model

This manual is for the following UPS Models. Confirm your UPS Model before using the UPS.

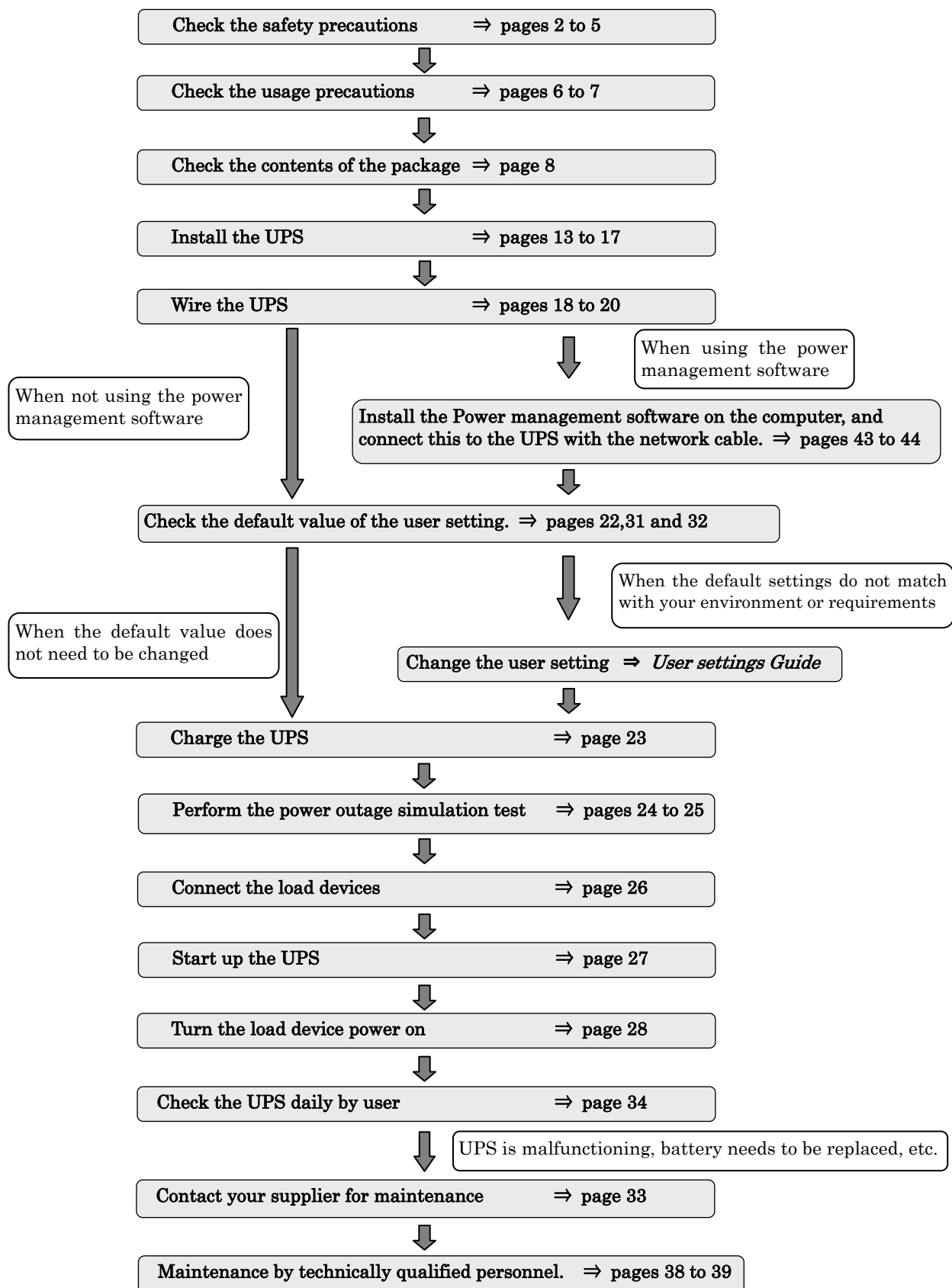
UL Model	UPS Model name*3	Capacity	Backup time
E11A102U002	E11A102U	1kVA	5 minutes
E11A102U002J			
E11A202U002	E11A202U	2kVA	5 minutes
E11A202U002J			
E11A302U002	E11A302U	3kVA	5 minutes
E11A302U002J			

*3 In the explanation by each capacity class in this manual, UPS names are abbreviated to the Model name shown in this column.

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§1. Before Use

The procedures to use the UPS are shown in the following. Be sure to proceed as follows to use the UPS safely and properly.



§2. Safety Precautions

PRECAUTIONS (IMPORTANT SAFETY INSTRUCTIONS)

This Manual contains important instructions for operating and maintaining the E11A Series and the batteries to protect the safety of the service technician and the customers.

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

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

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

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

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

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

1. Relocation and Transportation Precautions



CAUTION

- Be careful to avoid falling or dropping the UPS during relocation or transportation, as bodily injury could result.
- Be careful to avoid back strain when handling the UPS.
- To avoid bodily injury caused by dropping the UPS, do not tilt it more than 10 degrees to either side when moving the UPS 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

- The UPS should be installed only by technically qualified personnel. Improper installation can 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.
 - 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 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 the UPS may be subject to vibration or physical shock.
 - e. Near a device that may emit sparks.
 - f. In the presence of dust, salt or corrosive or flammable gas.
 - g. Outdoors
- Be careful not to block the air intake and exhaust vents of the UPS. Keep the front and back of the UPS at least 20 cm (8 inches) away from the wall. If you mount the UPS in a rack, mount it in a rack that can be well ventilated, and be careful not to 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 deterioration resulting in a fire. For maintenance, the UPS requires at least 1 m (40 inches) space at the front and 50 cm (20 inches) at the back.
- The space around the UPS must be ventilated. Unless the ventilation airflow is maintained, gas produced by battery charging could result in rupture or explosion of the case.
- Install the UPS on a stable surface capable of bearing the weight (refer to the table) of the UPS in the correct manner specified in this manual. If the UPS is installed incorrectly, impact or vibration could cause it to fall or move inadvertently, resulting in bodily injury. Be careful to avoid back strain.
- Move packaging such as plastic bags and film and accessories such as screws to a place that is out of reach of children. If a child, for example, places film over his or her head or swallows a screw, there is a danger of suffocation.
- The socket-outlet shall be installed near the equipment and shall be easily accessible.



Model	Weight	kg	lbs
E11A102U		17	37.5
E11A202U		29	63.9
E11A302U		39	85.9

3. Wiring Precautions



CAUTION

- Wiring should be performed only by technically qualified personnel. Incorrect wiring can result in electric shock and/or fire.
- Protection in 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. Failure to connect the grounding cable may result in electric shock. Have a qualified electrician 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 terminal. Failure to connect the grounding cables correctly may result in electric shock.



* Load devices are devices such as computers that are 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.
- To avoid electric shock, do not open the cover of the UPS. Do not detach the cover of the options, except when you use some options. There is danger of electric shock and equipment damage.



PROHIBITED

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



Contact your sales representative if you need to use the 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 the other environment, for example, a general home environment where a technically qualified personnel is not in.
- Do not smoke or use an open flame near the UPS, as it 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, as bodily injury could result if the UPS was to fall.
- Do not operate the switches with wet hands. There is danger of electric shock.
- All repairs and modifications to the UPS are prohibited. The UPS contains high voltage and no user serviceable parts. Opening the cover, exchanging the battery, parts exchange, and repair can result in electric shock and damage to the UPS when performed by anyone other than qualified service personnel. All such repairs and modifications will void the warranty.



CAUTION

- The following table shows the UPS states resulting from operation of the **INV. ON/STAND BY** switch and **MAIN SW** or **MAIN MCCB** breaker. Check the indicators before and after operating. Do not touch the **INV. ON/STAND BY** switch and **MAIN SW** or **MAIN MCCB** breaker unless necessary. If power is supplied incorrectly, an electric shock or bodily injury could result.

UPS Status		Power Output Status	LEDs
MAIN MCCB	INV. ON/STAND BY	OUTPUT	
OFF	STAND BY	Stopped	INPUT (off-green), OUTPUT (off-green)
ON	STAND BY	Stopped	INPUT (on-green), OUTPUT (off-green)
OFF	ON	Power supplied from inverter	INPUT (blinking-green), OUTPUT (lit-green)
ON	ON	Power supplied from inverter	INPUT (lit-green), OUTPUT (lit-green)

- 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 you hear thunder 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 technically qualified personnel. Electric shock, bodily injury and burns, fuming, or fire could otherwise result.
- Contact your nearest sales representative or authorized service center to have the UPS checked out or to replace defective parts. Opening the cover carelessly can result in an electric shock or burn.
- Replace the batteries periodically (once every 4.5 years when operated at 25°C (77° F)). Using batteries after their service life has expired may cause a fire.
- Never use organic chemicals such as gasoline, thinner, benzene or detergent to clean batteries. These can cause the casing to crack and leak, resulting in fire.
- Do not allow sharp metallic objects or fingers to touch the battery connectors of the UPS. Doing so may result in an electric shock.
- Do not touch any parts inside the UPS, even when AC input is removed. Voltage produced from the batteries can still cause an electric shock.



6. Radio Frequency Interference



CAUTION

- 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



CAUTION

- Battery servicing should be performed by technically qualified personnel. Keep unqualified personnel away from batteries.
- Replace batteries only with the same model and brand: HRL1234WF2FR manufactured by CSB BATTERY Co., LTD. Risk of explosion if battery is replaced by an incorrect type.
- The batteries in this product are lead type batteries which are a reusable resource. Please cooperate by recycling when replacing or disposing of used batteries. Dispose of used batteries according to the instructions. Customers should not dispose of used batteries themselves. To dispose of used batteries, contact your nearest sales representative, an authorized industrial waste handling company, or repack them in their original cartons and send them to your supplier or SANYO DENKI.
- 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, so that power will not be supplied to the load when a power outage occurs.
- Batteries pose hazards for electrical shock and dangerous short-circuit current. The following precautions should be observed when working with 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.
 - f. Determine whether the batteries have been inadvertently grounded, and if so, remove the source of grounding. Contact with any part of a grounded battery can result in electric shock.
- Do not attempt to open or disassemble batteries. The electrolyte is harmful to the skin and eyes. The battery contains diluted sulfuric acid, which is extremely toxic. If a battery leaks, take appropriate measures to prevent any battery fluid contacting your skin or clothing. Diluted sulfuric acid may cause blindness if it gets into the eye, may burn skin upon contact. It is electrically conductive and corrosive. Observe the following procedures if electrolyte spills:
 - 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) bicarbonate of soda in one gallon (4 liters) of water. The bicarbonate of soda solution should be applied until evidence of reaction (foaming) has ceased. The resulting liquid should be flushed with water and the area dried.
- Lead acid batteries can present a risk of fire due to generation of hydrogen gas. The following procedures should always be followed:
 - a. DO NOT SMOKE when near batteries.
 - b. DO NOT allow flames or sparks near batteries.
 - c. Before working with batteries, discharge static electricity from the body by first touching a grounded metal surface before touching the batteries.
- If a fire occurs near a battery, do not use water to extinguish it. Use only a powder-extinguishing agent (ABC). Using water can cause the fire to spread.
- Do not dispose of batteries in fire, as they could explode.
- Strictly observe the following precautions when handling the batteries. Failure to do so may cause battery leakage, overheating or explosion.
 - a. Do not solder to any part of the battery directly.
 - b. Do not charge the battery 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. Clean batteries with water-moistened cloth squeezed hard. Do not use organic compounds such as gasoline, thinner, benzene or detergent.
 - g. Electrical energy may remain in a battery even after its service life has expired. Do not allow sparks near used batteries, and protect them from short-circuiting.



§3. For Proper Operation

§3.1 UPS Input Power Supply

(1) Input Power Requirements

The input power of this UPS is shown in the following table. Adjust the output voltage of the UPS to match the AC input voltage*¹ of the region where you are using the UPS.

MODEL	AC input voltage	AC input frequency	Input capacity	Recommended capacity of breaker (UL standard*4)	
E11A102U002	208V (+15%,-20%)	50 or 60Hz (±8% *2)	0.9 kVA	10A	
E11A202U002			1.8 kVA	15A	
E11A302U002			2.7 kVA	15A	
E11A102U002J	200, 220, 230, 240V *1 (+15%,-20%)		0.9 kVA	10A	
E11A202U002J			1.8 kVA	15A	
E11A302U002J			2.7 kVA	15A	

*1. The output voltage is same as the rated value of AC input voltage. See the *User Settings Guide* to change the setting.

*2. The range of which the AC input frequency can be synchronized with the inverter varies according to the setting of “Setting UPS Operation Mode” in the user setting menu as follows. When the AC input frequency exceeds ±8%, UPS operation switches to the battery operation.

- When “Double conversion” is set, the synchronization range is ±1%. *³
- When “Auto” or “Economy” is set, the synchronization range is selectable. User can select synchronization range from ±1%, ±3% or ±5%. *³

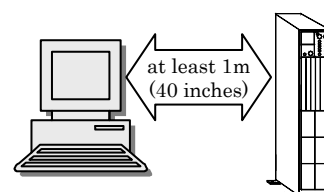
*3. See “Setting Frequency Sync Range” in the *User Settings Guide* to change the setting. The factory default setting is 3%.

*4. Protect branch circuits by using the breaker (UL489 compliant breaker) of the specified capacity on distribution panels. To meet the requirements of UL standards, always protect both polarities.

§3.2 Installation Precautions

* Be sure to install the UPS in accordance with the National Electric Code Articles 110-17 and 110-18.

- (1) Carefully consider the leakage current when a leakage circuit breaker is installed on the input side.
The maximum leakage current of the E11A102U is 3mA, E11A202U and 302U is 3.5mA.
- (2) Keep the UPS at least 1 m (40 inches) 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 a clearance specified in §6.2 “Installation Space Check” at the front and back of the UPS to permit free airflow at the air intake and exhaust vents.
- (4) When the AC input power is single-wire grounded, always connect the ground phase to the N terminal (phase) side of the IEC connector on the UPS. See §7.2 “Input Plug Connection” for details.



§3.3 Usage Precautions

- (1) Never short-circuit the output terminals.
Doing so causes preventing output with protective functions to activate, or the circuit breakers to trip, or the fuses to blow.
- (2) Unsuitable load devices
Do not connect laser printers, plain paper fax machines, copy machines, or overhead projectors, cleaners, or hair-dryer as load devices. Such devices are subject to high transient current surges. This may cause an overload that could prevent battery backup operation when an outage occurs, and could damage the UPS.
- (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 not 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 (refresh charge) in accordance with the UPS storage environment as shown in the table below. See §9.2 “UPS Charge” to recharge the UPS.

Storage Temperature	Charge Interval	Operation
25°C	Once every 6 months	At least 20 hours
30°C	Once every 4 months	At least 20 hours
40°C	Once every 2 months	At least 20 hours

- (5) Insulation testing
Before testing indoor wiring insulation, shut down the UPS and disconnect the input and output cables. Conducting an insulation test with the UPS connected may damage electronic components such as the built-in arrester.
- (6) Rack support rails (not supplied) are required to mount the UPS on a rack. For details, contact your supplier or SANYO DENKI representative.

§4. Checking the Contents of the Package

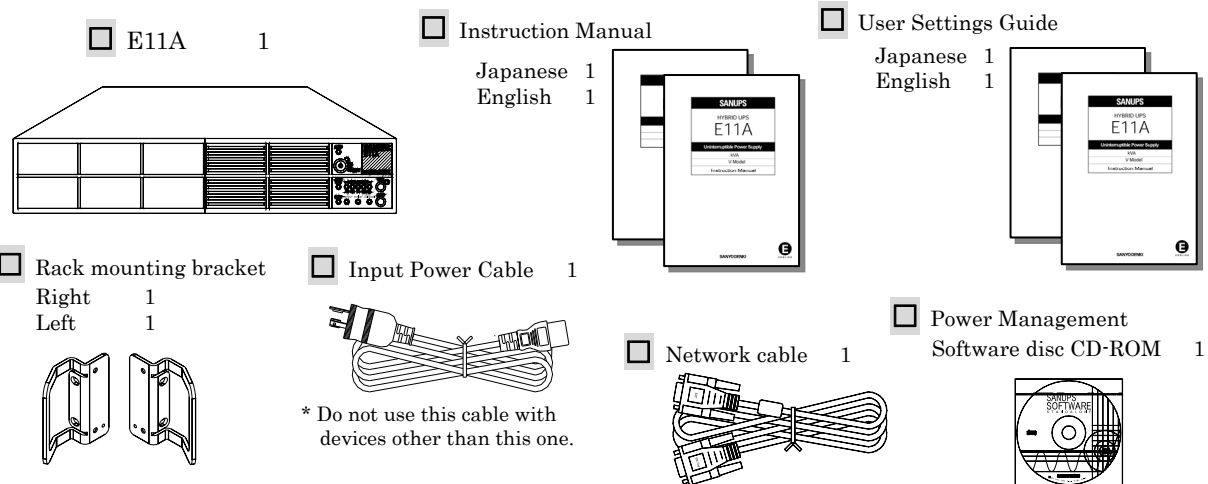
After opening the package carton, check to be sure that it contains all of the following items.

Are UPS and all accessories in ?

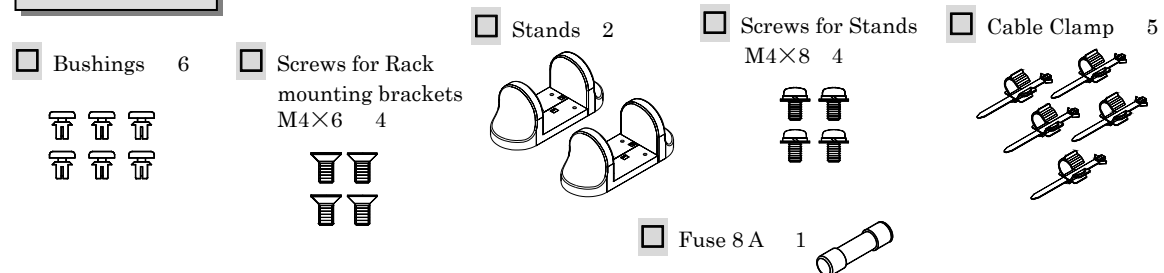
Is there no visible damage on the UPS?

Check and put the mark in ☒ .

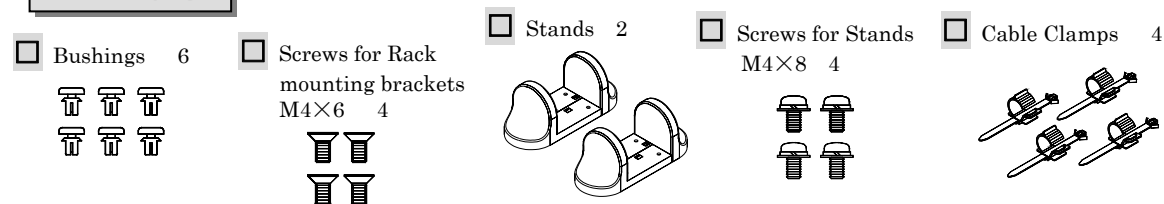
If any item is missing, contact your supplier or SANYO DENKI.



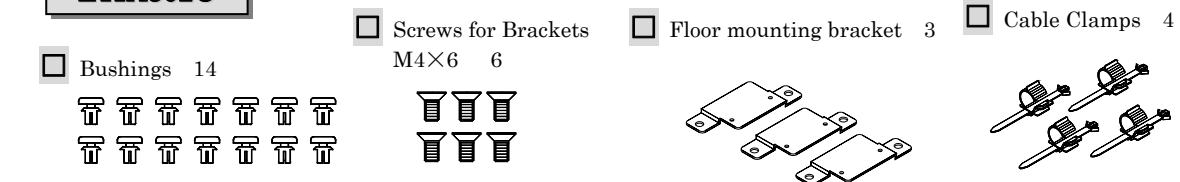
E11A102U



E11A202U



E11A302U

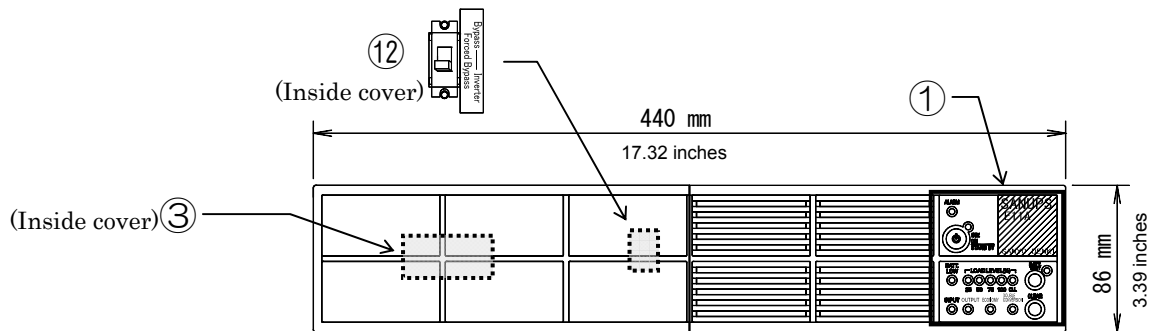


Note about sale or transfer of ownership

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

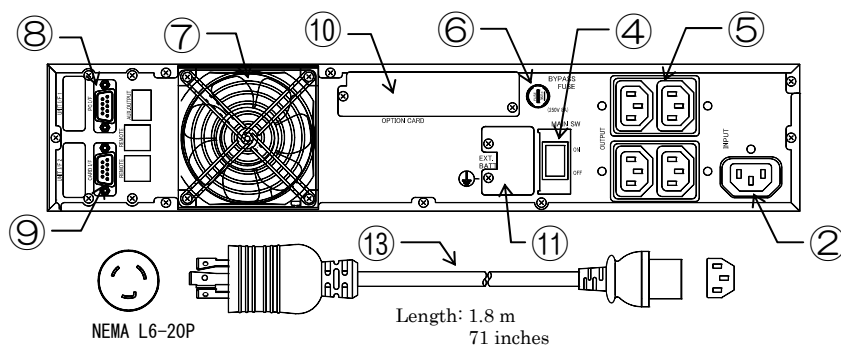
§5. External Dimensions and Part Names

§5.1 Front and Back Panels of UPS



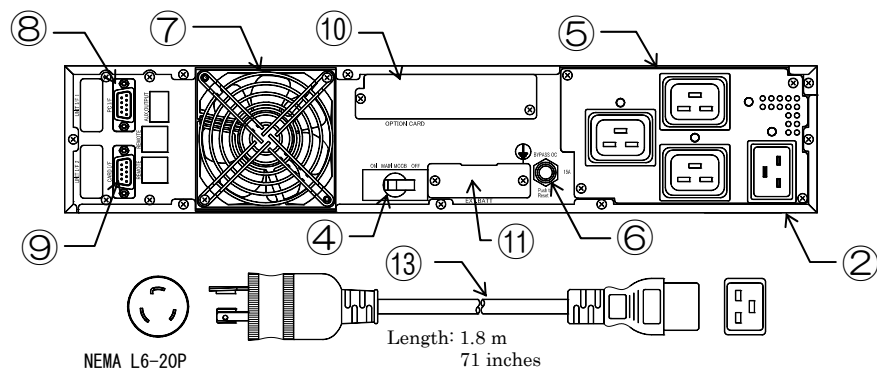
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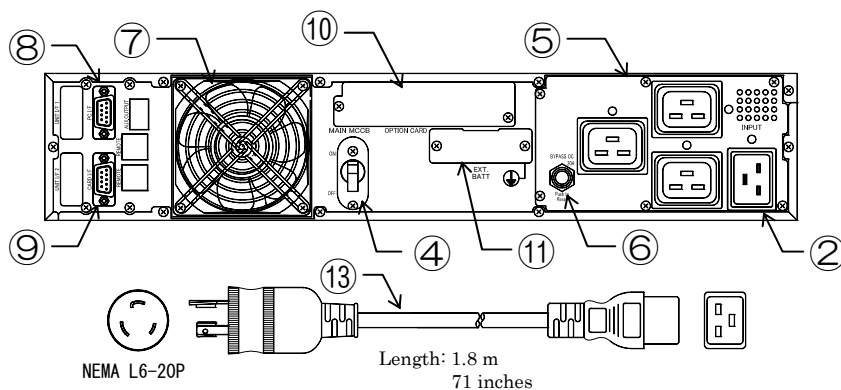
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E11A302U002

E11A302U002J



No.	Name	Label	Function
①	Control panel and indicators	—	Control panel for control operations, UPS status display, and function settings
②	Input power plug	—	Input power plug
③	Battery connector	—	Battery connector
④	Input switch ^{*1}	MAIN SW	E11A102U
	Input breaker ^{*1}	MAIN MCCB	E11A202U, 302U
⑤	Output terminals	OUTPUT	Power output terminals
⑥	Bypass fuse	BYPASS FUSE	E11A102U
	Bypass breaker	BYPASS OC	E11A202U, 302U
⑦	Exhaust vent for cooling fan	—	Ventilation inside UPS
⑧	PC interface	PC I/F	Connector for the Power Management software
⑨	Card interface	CARD I/F	Connector for the LAN interface card (optional) ^{*2}
⑩	Option card slot	OPTION CARD	LAN interface card ^{*2} slot
⑪	Battery connector	EXT.BATT	Battery connector for external battery(optional) ^{*2}
⑫	Forced bypass switch ^{*3}	Forced Bypass	Switch to bypass power supply during maintenance connecting the maintenance bypass unit (optional) ^{*2}
⑬	Input cable	—	Input cable

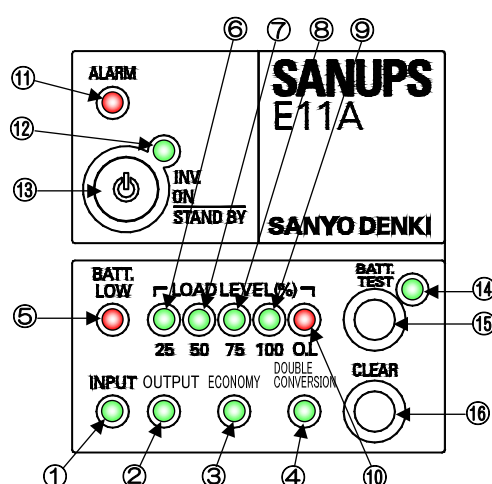
Note

- *1. In this manual, the switches or breakers are indicated by a frame as **MAIN MCCB** .
In case of E11A102U, the breaker described as **MAIN MCCB** indicates **MAIN SW** switch.
- *2. Contact your supplier or a Sanyo Denki representative for more information about optional equipment.
Refer to the Instruction Manual of the optional equipment for details about installation procedures and specifications.
- *3. Activate the **Forced Bypass** switch when using a maintenance bypass unit (optional). Normally, do not change the position of this switch. Leave it set to "Inverter".
- *4. In this manual, when the model name is not specified on the rear views, it shows the examples of E11A202U model.

The weight and depth dimension of UPS are as follows.

Model	Weight		Depth	
	kg	lbs	mm	inches
E11A102U002	17	37.5	408	16.06
E11A102U002J				
E11A202U002	29	63.9	565	22.24
E11A202U002J				
E11A302U002	39	85.9	750	29.53
E11A302U002J				

§5.2 Control Panel and Indicators



Indications of LED in this manual

The LEDs on the control panel are described as “Green INPUT” or “Red ALARM”. The LEDs state are indicated as follows:

☀ : LED lights. ✨ : LED blinks.

No.	Label	Functions			
		Status display	Lit	Not lit	Blink
①	INPUT	UPS input power status	Normal input	-	Input error
②	OUTPUT	UPS output power status	UPS outputting power supply	OFF	Power supply bypassing
③	ECONOMY	Operation mode	Economy mode operation ※1	OFF ※3	-
④	DOUBLE CONVERSION	Operation mode	Double conversion mode operation ※2	OFF ※3	-
⑤	BATT. LOW	Battery status	Battery power low	Battery power normal	Battery exhausted
⑥	LOAD LEVEL (%)	25	Load level 25%	Load 25% or more	Load under 25% ※4
⑦		50	Load level 50%	Load 50% or more	Load under 50% ※4
⑧		75	Load level 75%	Load 75% or more	Load under 75% ※4
⑨		100	Load level 100%	Load 100% or more	Load under 100% ※4
⑩		0. L.	Overload display	Load 105% or more	Load under 105% ※4
⑪	ALARM	Failure status	Serious failure detected	No failure	-
⑫	INV. ON STAND BY	Operation status	UPS outputting power supply	OFF	Power supply bypassing
⑬	INV. ON STAND BY	UPS ON/OFF switch			
⑭	BATT. TEST	Battery test	Result: Normal	-	Testing ↓ Blinking speed changes. Result: Error
⑮	BATT. TEST	Battery test operation			
⑯	CLEAR	Stop buzzer, clear result of battery test			

Operation mode of the UPS and indication of LED

※1. Economy mode operation ··· When power conditions are good, UPS supplies this power to the load.

※2. Double Conversion Mode Operation ··· When power conditions fluctuate, UPS converts to the stable power, and supplies to the load.

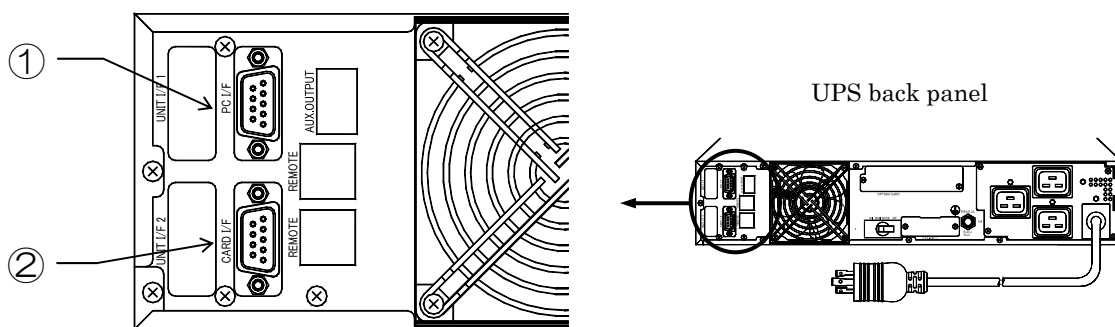
※3. Active Filter Mode operation ··· When the “Green DOUBLE CONVERSION” and the “Green ECONOMY” are both off, the UPS is in Active Filter Mode.

※4. For about 5 seconds after **MAIN MCCB** is turned on, the LED that indicates the output voltage setting of UPS blinks as shown in the following table.

Output voltage setting	Blinking LED
200V	Green LOAD LEVEL 25
220V	Green LOAD LEVEL 50
230V	Green LOAD LEVEL 75
240V	Green LOAD LEVEL 100
208V	Red O.L

For example, when the output voltage of the UPS is set to 240V, after **MAIN MCCB** is turned on, “Green LOAD LEVEL 100” blinks for about 5 seconds.

§5.3 External Interfaces



No.	Name	Function
①	PC I/F PC interface (RS-232C)	Allows you to control the UPS from a computer (personal computer or workstation) by using the supplied power management software. Install the power management software on the computer, and connect the computer to the UPS with the supplied network cable. For details on the operating procedure, see §16 “How to Use Power Management Software”. Set “Interface” in the user setting to the “Workstation” mode. For details on the setting procedure, see the <i>User Settings Guide</i>. For details on the power management software, see the user guide on the CD-ROM. Signal names D-sub9-pin Male Fixing screw inch
②	CARD I/F Card interface	Allows you to connect an optional SANYO LAN interface card (option). Set “Interface” in the user setting to the “Workstation” mode. For details on the setting procedure, see the <i>User Settings Guide</i>. For details on the power management software, see the user guide on the CD-ROM. Signal names D-sub 9-pin Female Fixing screw inch This connector is for use with SANYO LAN interface cards only.

Usage note for the external interface connectors.

The CARD I/F and PC I/F connectors cannot be used at the same time.

§6. Installation



- When installing the UPS, carefully follow the instructions in this Instruction Manual. Improper installation can result in electric shock, bodily injury, and/or fire.
- Install the UPS on a stable surface that can bear the weight (see the table). This surface should be flat, so the UPS cannot fall and cause bodily injury. The possibility of vibration and shock should be minimized at the installation location.
- All work that involves lifting the UPS, such as mounting it in a rack or attaching the stand, should be carried out by at least 2 persons. For safety, put on protective shoes. Be careful to avoid straining your lower back when moving and installing the UPS.
- There is a danger that the UPS could fall or be dropped during relocation or installation. Always hold the bottom side of the UPS firmly with both hands. Failure to do so can result in bodily injury or damage to the UPS.

Model	Weight	
	kg	lbs
E11A102U	17	37.5
E11A202U	29	63.9
E11A302U	39	85.9

§6.1 Installation Environment Check

Suitable installation environment:

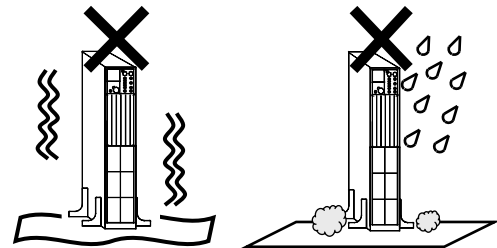
- Ambient temperature: 0 to 40°C (32 to 104°F)
- Relative humidity: 20 to 90%

Do not install the UPS in the following locations:

- Where the ambient temperature exceeds 40°C (104°F).
- Where high humidity may occur.
- Where corrosive gas or salt spray may be present.
- Where it may be subject to vibration and shock.
- Where dust may accumulate.
- When the UPS is rack mounted, in a poorly ventilated rack.

Note

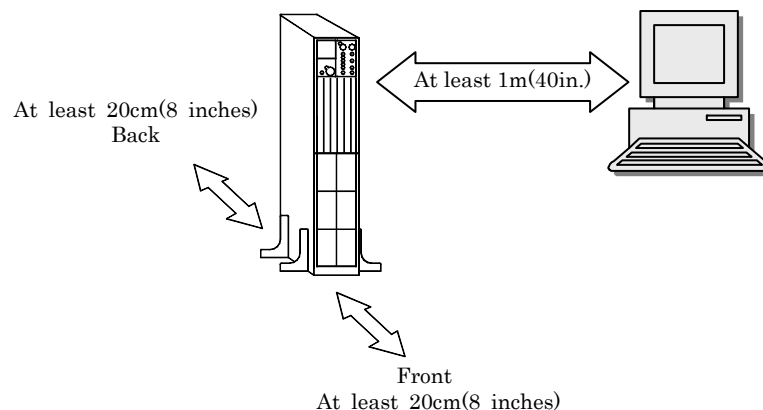
Battery service life will be foreshortened if the UPS is used in an environment where the ambient temperature exceeds 30°C (86°F). For optimum battery life, install the UPS where the ambient temperature remains between 20 to 25°C (68 to 77°F).



§6.2 Installation Space Check

During installation, provide the following space around the UPS.

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



Note for installation

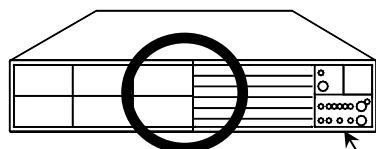
For maintenance of the UPS allow for the space at least 1 meter (40 inches) at the front and 50 cm (20 inches) at the back when needed.

§6.3 Horizontal Installation

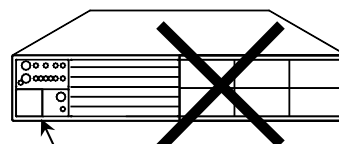


- Do not sit, step or lean on the UPS, as bodily injury could result if the UPS was to fall.
- The UPS weight is as shown in the table in §6. All work that involves lifting the UPS should be carried out by at least 2 persons. For safety, put on protective shoes. Bodily injury can result if the UPS falls. Be careful to avoid straining your lower back when moving and installing the UPS.
- Be careful not to get your hands caught when installing the stand.

When the UPS is horizontally installed, always place with the control panel on the right. Do not place other objects on top of the UPS. Doing so can damage the UPS.



Control panel



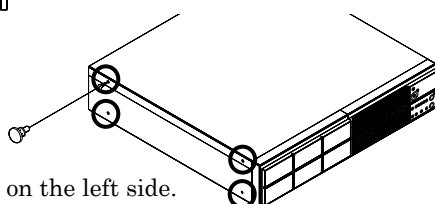
Control panel

- ① Prepare the bushings supplied.
- ② Insert the supplied bushings into the holes on the left side and right side.

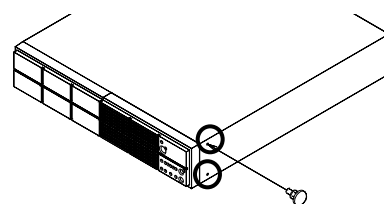
E11A102U, 202U



Bushings 6

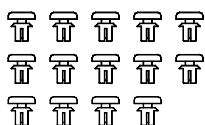


Four holes on the left side.

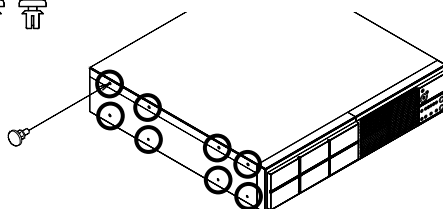


Two holes on the right side

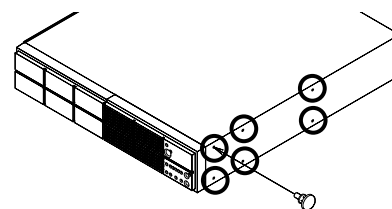
E11A302U



Bushings 14



8 holes on the left side.



6 holes on the right side

- ③ Place the UPS on installation location.

This completes horizontal installation.

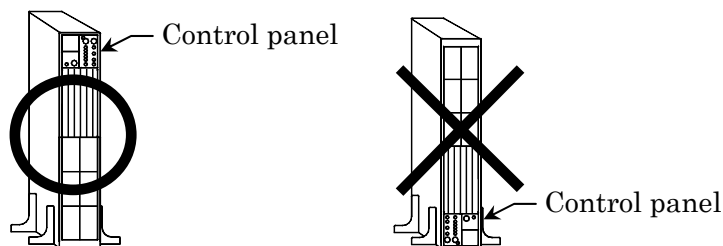
§6.4 Vertical Installation



- Attach the stands to the UPS securely. Unless the UPS is secured solidly in place, it can shift or fall during seismic events (earthquakes) or when it is subjected to shock or vibration, possibly causing bodily injury.
- The UPS weight is as shown in the table in §6. All work that involves lifting the UPS, such as attaching the stand, should be carried out by at least 2 persons. For safety, put on protective shoes. Bodily injury can result if the UPS falls. Be careful to avoid straining your lower back when moving and installing the UPS.
- Be careful not to get your hands caught when installing the stand.

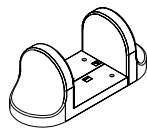
When the UPS is vertically installed, attach two supplied stands.

Always place with the left side of the UPS on the bottom, and the control panel on the top.

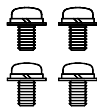


E11A102U, 202U

- ① Prepare two stands, four screws, and two bushings supplied.



Stands 2

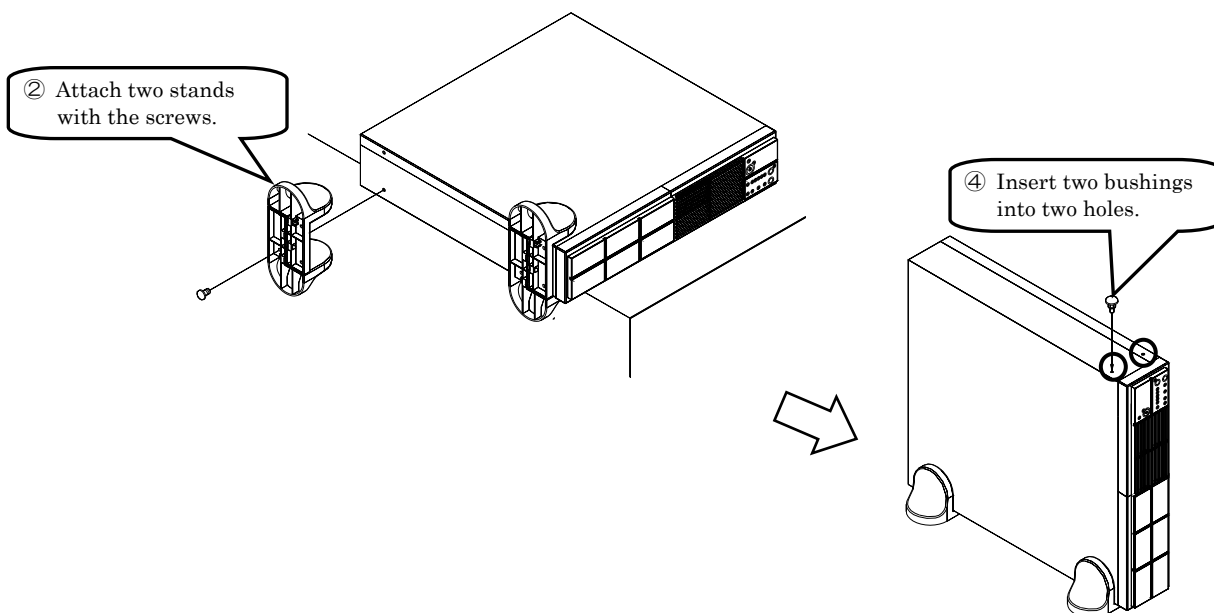


Screws for Stands
M4×8 4



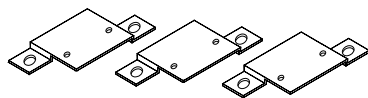
Bushings 2

- ② Place the UPS on the table and then use screws to attach the stand to the holes on the left side.
- ③ Place the UPS with the stand on the bottom, and the control panel on the top.
- ④ Insert two bushings into the holes on the UPS.



E11A302U

- ① Prepare three floor mounting brackets, six screws, and four bushings supplied.



Floor mounting brackets 3

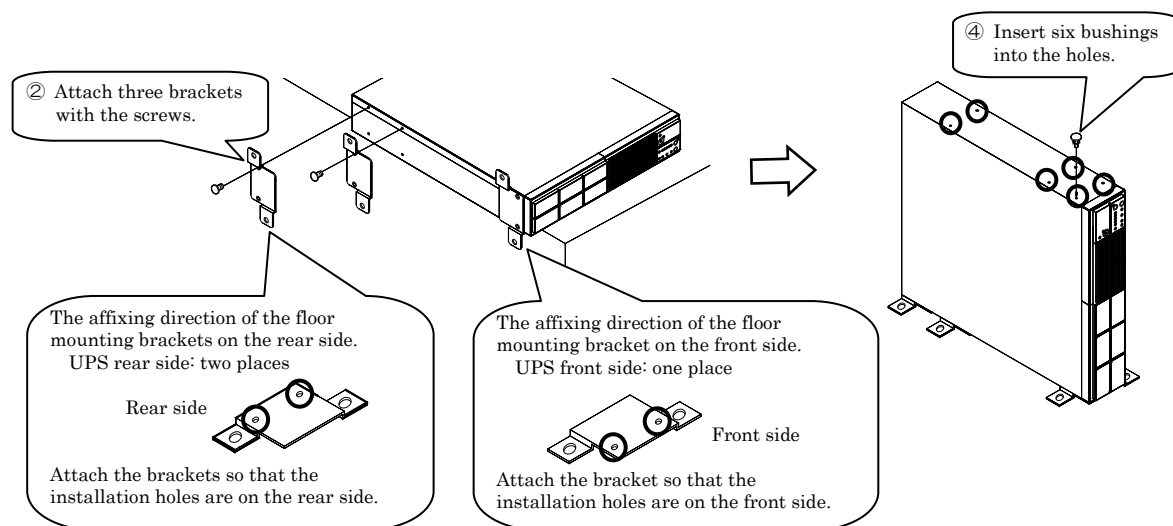


Screws for brackets
M4×6 6



Bushings 6

- ② Place the UPS on the table and then use screws to attach the brackets to the holes on the left side.
 ③ Place the UPS with the brackets on the bottom, and the control panel on the top.
 ④ Insert six bushings into the holes on the UPS.
 ⑤ Place the UPS on installation location.
 ⑥ For safety, fixing the UPS on the floor with a bolt is recommended.



This completes vertical installation.

§6.5 Rack Mounting



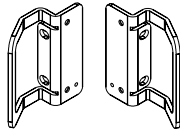
- Attach the rack mounting brackets to the UPS and mount it to the rack securely. Unless the UPS is secured in the rack, it can shift or fall during seismic events (earthquakes) or when it is subjected to shock or vibration, possibly causing bodily injury.
- The UPS weight is as shown in the table in §6. All work that involves lifting the UPS, such as mounting it in a rack, should be carried out by at least 2 persons. For safety, put on protective shoes. Bodily injury can result if the UPS falls. Be careful to avoid straining your lower back when moving and installing the UPS.
- For safety, use L-type rails (support rails) when mounting the UPS in a rack. (Contact the manufacturer of your rack for more information about L-type rails.)

The UPS is designed for mounting in 19-inch racks only. Refer to §6.2 “Installation Space Check” and make sure you secure enough ventilation space in front of and behind the UPS. Do not place other objects on top of the UPS. Doing so can damage the UPS. The UPS is heavy, installation at the very bottom of the rack is recommended. Always use L-type rails (support rails) when mounting the UPS in a rack. (Contact the manufacturer of your rack for more information about L-type rails.)

- ① Prepare the left and right rack mounting brackets, four screws, and two bushings supplied.

Rack mounting bracket

Left 1
Right 1



Screws for rack mounting bracket
M4×6 4



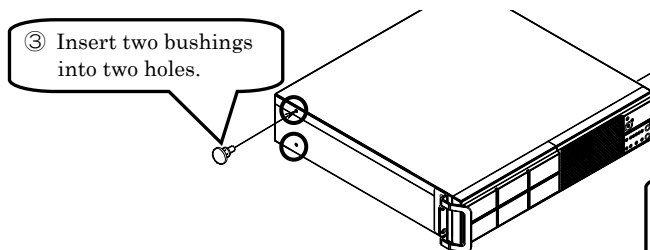
Bushings 2



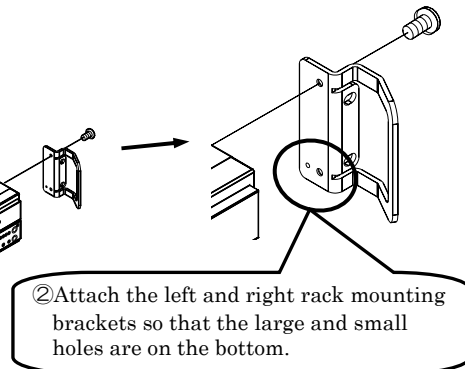
- ② Attach the left and right rack mounting brackets to the UPS using the screws.
- ③ Insert two bushings into the holes on the UPS.

E11A102U, 202U, 302U

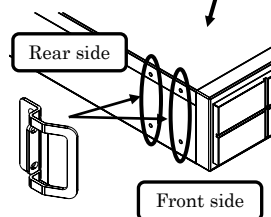
③ Insert two bushings into two holes.



② Attach the left and right rack mounting brackets so that the large and small holes are on the bottom.



E11A302U

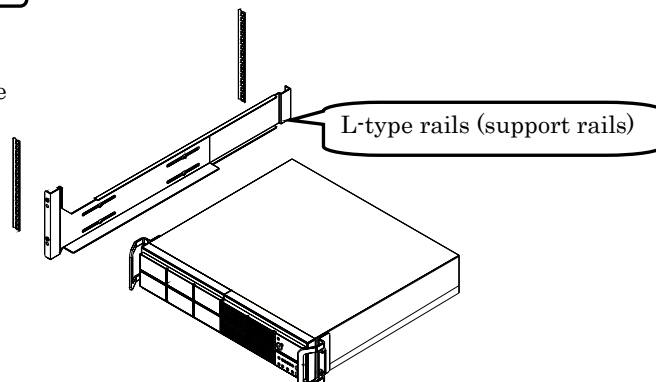


Tip for E11A302U

The holes of both positions shown in the figure are available to attach the rack mounting brackets. Use the holes so that the rack mounting brackets match to the using rack.

- ④ Mount the UPS in the rack using the L-type rails (support rails).

Note
L-type rails are not supplied.



This completes rack mounting.

§7. Wiring

§7.1 Battery Connector Connection



CAUTION

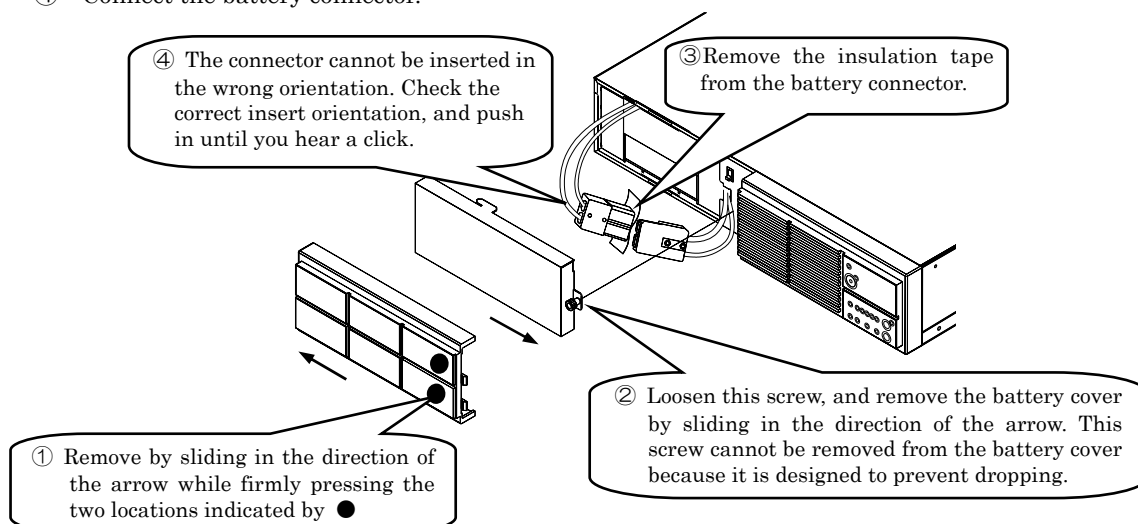
- Wear insulated gloves and take other precautions when connecting the batteries. Otherwise electric shock can result.
- There is a constant voltage (refer to the table) at the battery terminals. Do not touch them with your hands or short circuit them. Bodily injury can result.
- The battery connector cannot be inserted in the wrong orientation. If it does not go in, do not try to force it. Doing so can damage the connector and result in electric shock.
- Be careful not to get your hands caught when securing the cover.



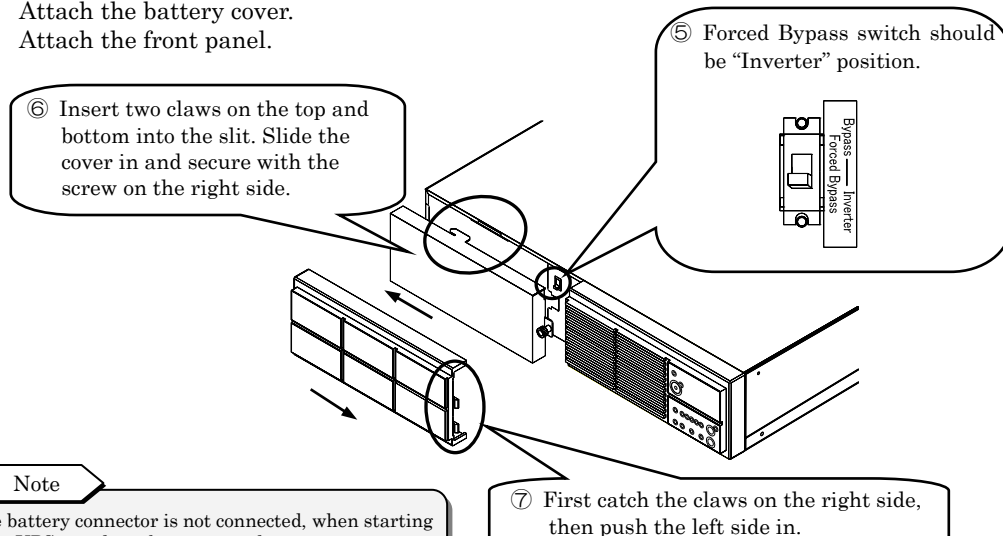
Model	Voltage (max.)
E11A102U	approx. 24 V
E11A202U	approx. 48 V
E11A302U	approx. 72 V

Connect the battery connectors inside the front cover.
Proceed as follows to connect the battery connectors.

- ① Remove the front panel of the UPS.
- ② Remove the screw on the right side of the battery cover, and then remove the battery cover.
- ③ Remove the insulation tape from the battery connector of the battery pack side.
- ④ Connect the battery connector.



- ⑤ Verify that **Forced Bypass** is set to "Inverter".
- ⑥ Attach the battery cover.
- ⑦ Attach the front panel.



Note

If the battery connector is not connected, when starting up the UPS, an alarm buzzer sounds.
In this case, stop the UPS, and firmly connect the battery connector.

This completes the battery connector connection.

§7.2 Input Plug Connection

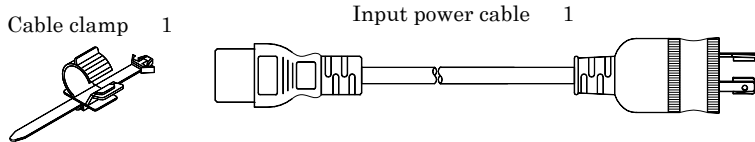


- Wiring should be performed only by technically qualified personnel. Incorrect wiring can result in electric shock and/or fire.
- Check that the input power plugs are firmly seated. Failure to do so can result in electric shock, fire, or bodily injury.
- The input power plug must be grounded. Failure to ground it can result in electric shock. Never use the UPS in the place where the UPS input power plug cannot be grounded.

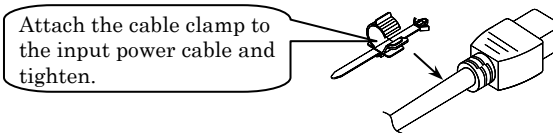


Proceed as follows to connect the input power plug of the UPS.

- ① Prepare the supplied input power cable and cable clamp.

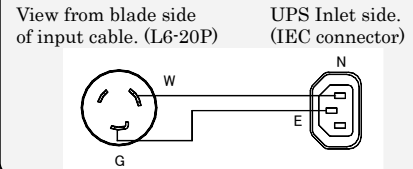


- ② Attach the cable clamp to the UPS inlet side of the input power cable.



Input power cable connections

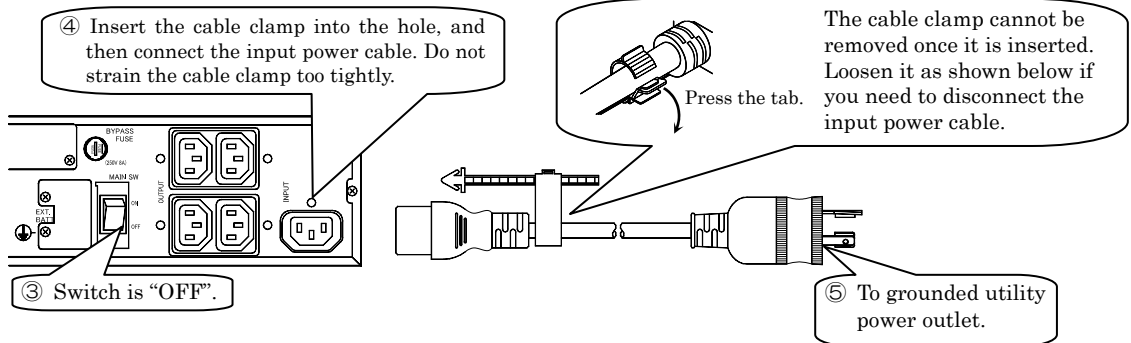
The figure below shows the connections of the input power cable.



- ③ Check that **MAIN MCCB** is in the "OFF" position.
- ④ Connect the input power cable to the "INPUT" of the UPS.
- ⑤ Connect the input power plug of the UPS to a utility power outlet.

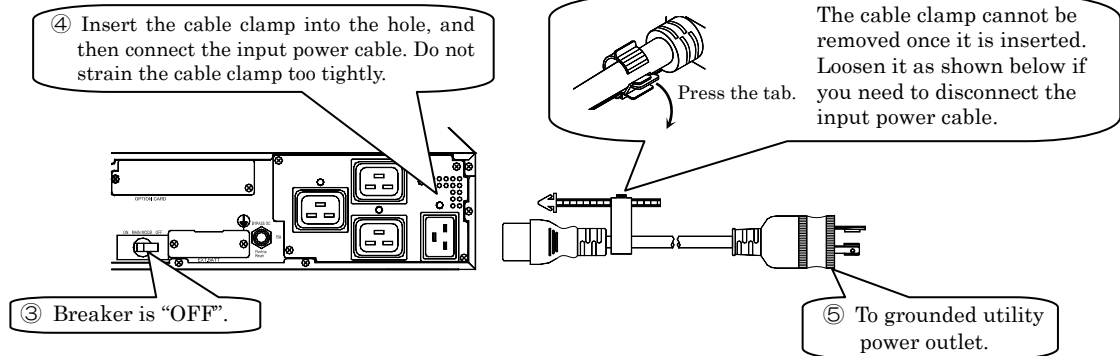
E11A102U002

E11A102U002J



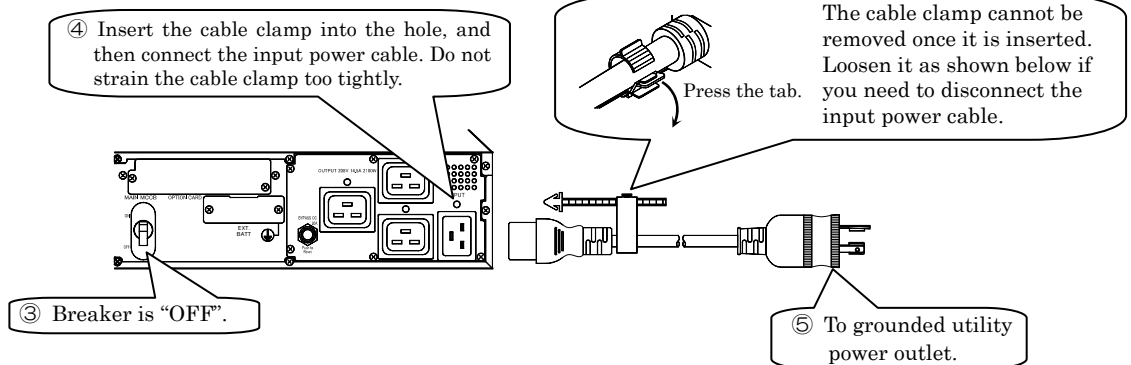
E11A202U002

E11A202U002J



E11A302U002

E11A302U002J



Proper UPS input power cable connections

Connect as shown below, according to the type of grounding in the area where you are installing the UPS.

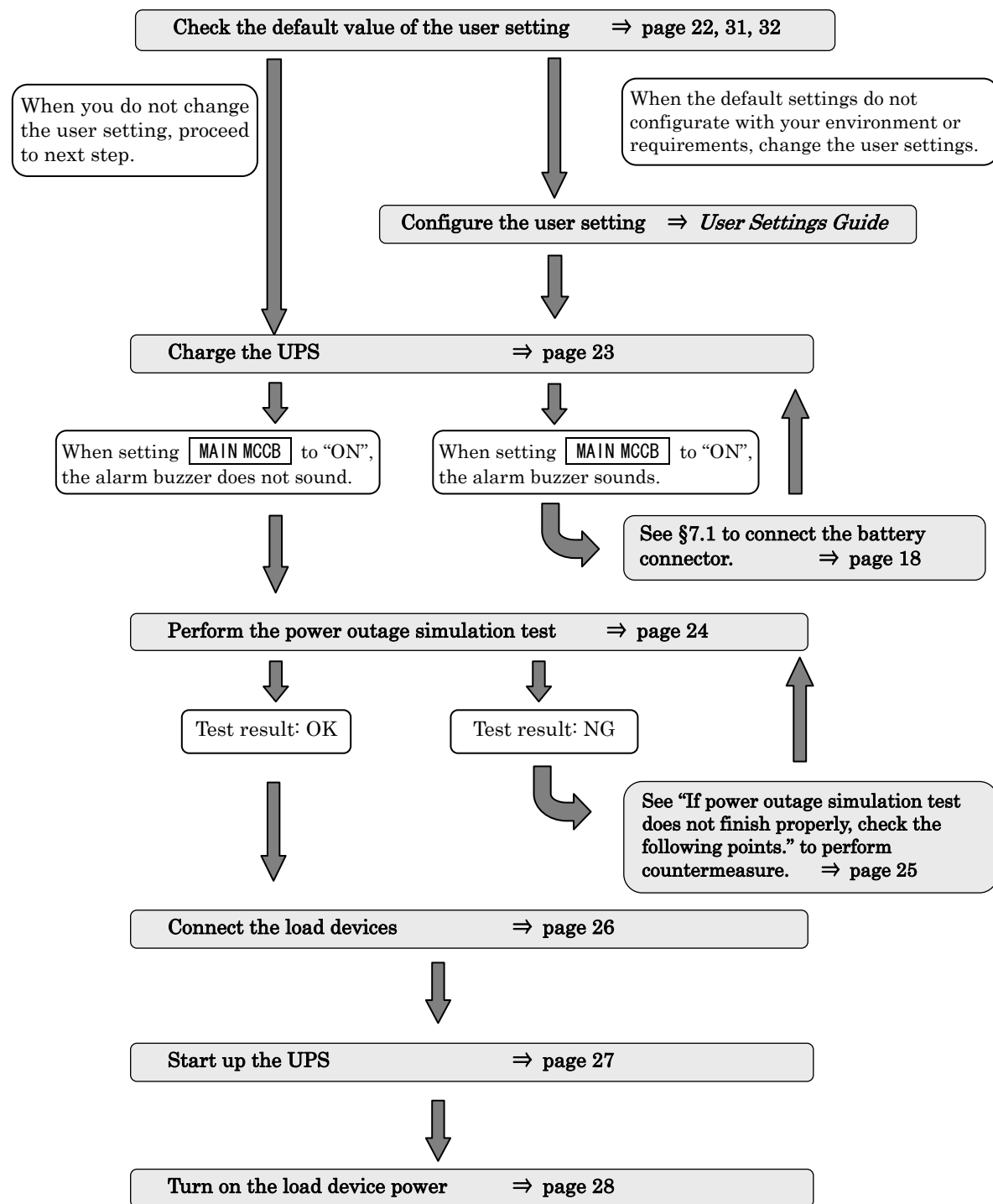
Areas	Plug shape	Note
Areas which do not have single-line grounding (North America)	NEMA TYPE L6-20P (View from blade side)	"W" terminal (phase) is connected with "N" of the IEC connector on this UPS.
Areas which have single-line grounding		When the AC input power is single-wire grounded, always connect the ground phase to the W terminal (phase) side of the input cable. "W" terminal (phase) is connected with "N" of the IEC connector on this UPS.

This completes wiring of the UPS.

§8. Procedure Until Load Device Operation

The procedure outline until turning on the load devices is as follows.

Be sure to follow the procedure outline below to backup the load devices during power outage.



The backup function is available during power outage.

§9. Preparation Before Operation

§9.1 User Settings Check

- ① Check the user settings of the UPS.

See §12.2 “Setup Menu List” to check the setting value. The factory default settings of the UPS are indicated by the “*” mark in the “Default Setting” column in the “Setup Menu List”.

When you use the UPS without changing the user settings, proceed to next step.

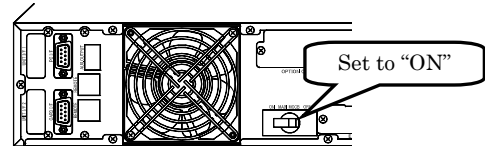


Proceed to §9.2 “UPS Charge”.

When the load specification, requirement or your environments do not configure with the default setting of the UPS, change the user setting.

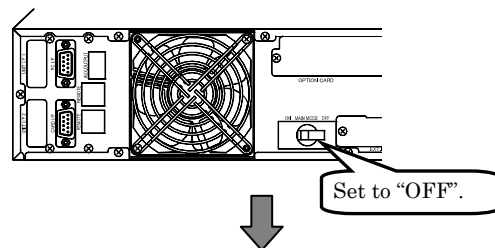


- ② Set **MAIN MCCB** to “ON”.



- ③ Configure the user settings. Refer to each item in the *User settings Guide*.

- ④ Set **MAIN MCCB** to “OFF”.



Proceed to § 9.2 “UPS Charge”.

Tip

You can also change the user settings after starting load device operation. However, the UPS needs to be restarted for items indicated by RESTART in the “Menu” column of the §12.2 “Setup Menu List”. Setting such items at the preparation stage prior to UPS operation is recommended because the load devices need to be stopped when the UPS is restarted.

§9.2 UPS Charge

At initial startup or when the UPS is not operated for long period, the UPS should be charged for at least 12 hours before operation.
Proceed as follows before connecting the load devices.

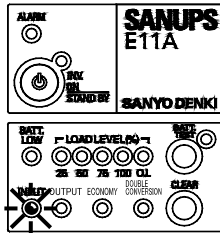
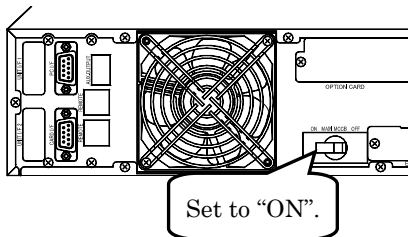
Indications of Switch and LED in this manual.

The switches or breakers are indicated by a frame .
Example: **INV. ON/STAND BY** .

The LEDs on the control panel are described as “Green INPUT” or “Red ALARM”.
The LEDs state are indicated as follows:

 : LED lights.  : LED blinks.

- ① Set **MAIN MCCB** on the back panel of the UPS to “ON”.



LEDs	
Green INPUT	Blinking
Green INV.ON/STAND BY	Off
Green OUTPUT	Off
↓	
Green INPUT	Lit
Green INV.ON/STAND BY	Off
Green OUTPUT	Off

- ② Check that the alarm buzzer (7 beeps, pose, 7 beeps, pose...) does not sound.

If the alarm buzzer sounds, the battery connector inside the front panel might not be connected. Set **MAIN MCCB** to “OFF”, then connect the battery connector. See §7.1 “Battery connector connection”. After connecting the battery connector, proceed to step 1 again. If the alarm buzzer sounds again, contact your supplier or a Sanyo Denki representative.

- ③ Check that the “Green INPUT” stops blinking and remains lit.

Charging of the UPS starts automatically.

- ④ Operate the UPS for at least 12 hours in this state.

Note on the charging time

The UPS should be charged for at least 12 hours to ensure backup in the event of a power outage, but load devices can be connected for use when the UPS is first activated even if there is insufficient charge because the battery will be charged during operation of the UPS. However, if a power outage occurs at that stage, the full capacity of the backup function may not be available.

* The UPS should be charged as follows when the battery modules (optional) are connected.

Battery module				Charge time
Type	Connected UPS	Connecting unit qty.	Backup time	
20-minute backup Battery module for E11A	E11A102U E11A202U E11A302U	1	20 min.	At least 36 hours
		2	40 min.	At least 60 hours
		3	60 min.	At least 84 hours
30-minute backup Battery module for E11A		1	30 min.	At least 48 hours
		2	60 min.	At least 84 hours

This completes the charging of the UPS.

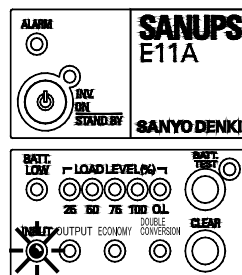
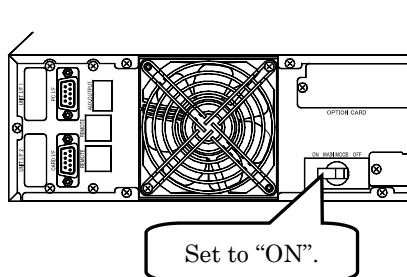
§9.3 Outage Simulation Test

Perform a power outage test to confirm whether the UPS is working properly. Be sure to perform this test prior to connecting the load devices.

Tip

Step ① is not necessary if the procedure in §9.2 “UPS Charge” was performed beforehand.

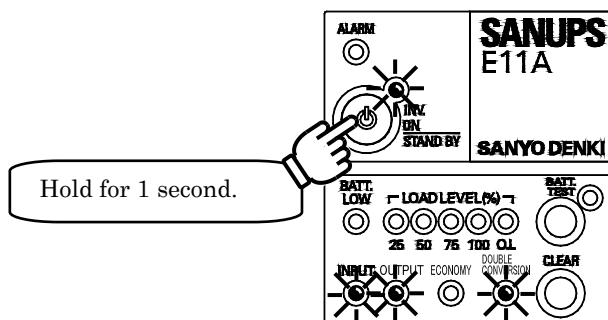
① Set **MAIN MCCB** on the back panel of the UPS to “ON”.



LEDs	
Green INPUT	Blinking
Green INV.ON/STAND BY	Off
Green OUTPUT	Off
↓	
Green INPUT	Lit
Green INV.ON/STAND BY	Off
Green OUTPUT	Off

Check that the “Green INPUT” stops blinking and remains lit, and then proceed to step ②.

② Press and hold  for at least 1 second.



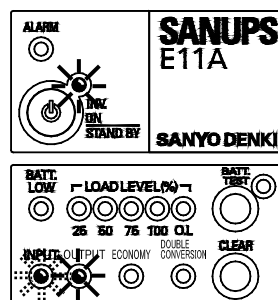
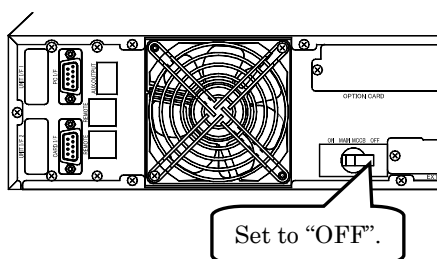
Buzzer
Musical trill

LEDs	
Green INPUT	Lit
Green INV.ON/STAND BY	Lit
Green OUTPUT	Lit
Green DOUBLE CONVERSION	Lit

After “Green DOUBLE CONVERSION” lights, it might go off depending on the input power condition.

When the UPS is working properly, the buzzer sound and LED state will be as indicated in steps ③ and ④.

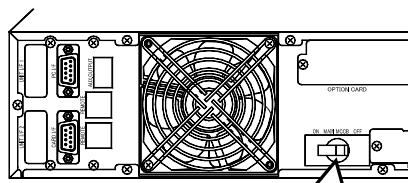
③ Set **MAIN MCCB** to “OFF”.



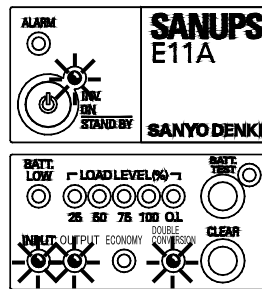
Buzzer
2 beeps..., 2 beeps..., repeated

LEDs	
Green INPUT	Blinking
Green INV.ON/STAND BY	Lit
Green OUTPUT	Lit

④ Set **MAIN MCCB** to “ON”.



Set to “ON”.



Buzzer
Silent

LEDs

Green INPUT	Lit
Green INV.ON/STAND BY	Lit
Green OUTPUT	Lit
Green DOUBLE CONVERSION	Lit

After “Green DOUBLE CONVERSION” lights, it might go off depending on the input power condition.

If power outage simulation test does not finish properly, check the following points.

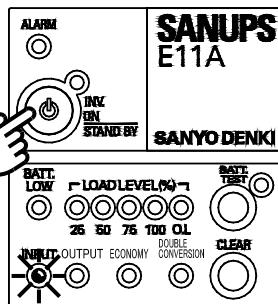
Possible cause	Countermeasure
The battery connector is not connected.	Connect the battery connector. ⇒ See §7.1 “Battery Connector Connection”.
The Forced Bypass switch is set to “Bypass”.	Set to “Inverter”. ⇒ See the step ⑤ in §7.1 “Battery Connector Connection”. After setting to “Inverter”, press and hold  for 1 second.
“Green OUTPUT” does not light.	Press and hold  for 1 second. ⇒ See the step ② in §9.3 “Outage Simulation Test”.
“Red ALARM” lights.	Contact your supplier.

Contact your supplier or SANYO DENKI when the “Red ALARM” lights or when the UPS does not operate properly even if you perform the countermeasure above.

Check that the UPS operates properly, and then proceed to step ⑤.

⑤ Press and hold  for at least 1 second.

Hold for 1 second.

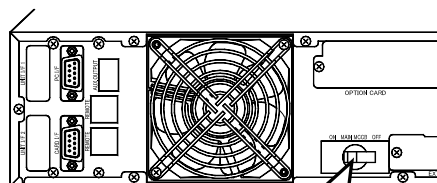


Buzzer
Musical trill

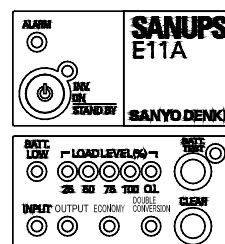
LEDs

Green INPUT	Lit
Green INV.ON/STAND BY	Off
Green OUTPUT	Off

⑥ Set **MAIN MCCB** to “OFF”.



Set to “OFF”.



All of the
LEDs go off.

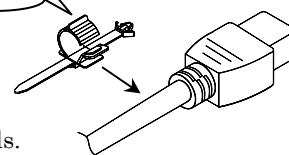
This completes outage simulation test.

§10. Load Devices Connection

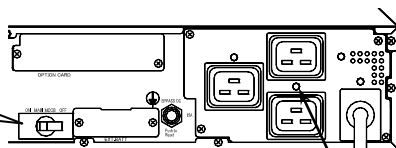
Connect the load devices.

- ① Attach the supplied cable clamps to the input power plug of the load device to be connected.
- ② Check that the input breaker **MAIN MCCB** is set to “OFF”.
- ③ Connect the input power plugs of the load devices to the output terminals.

Attach the cable clamp to the input plug of the load.



② Breaker is “OFF”.

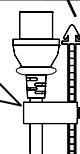


The cable clamp cannot be removed once it is inserted. Loosen it as shown below if you need to disconnect the input power cable.



Press the tab.

③ Insert the cable clamp into the hole, and then connect the input power cable of the load device. Do not strain the cable clamp too tightly.



Model	Outlet Capacity	Receptacle
E11A102U002 E11A102U002J	The total load connected to the receptacles must not exceed 1.0kVA (0.7kW) . AC250V 15A receptacle IEC60320- C13 × 4	
E11A202U002 E11A202U002J	The total load connected to the receptacles must not exceed 2.0kVA (1.4 kW) . AC250V 20A receptacle IEC60320- C19 × 3	
E11A302U002 E11A302U002J	The total load connected to the receptacles must not exceed 3.0kVA (2.1kW) . AC250V 20A receptacle IEC60320- C19 × 3	

Note for proper load device connections

Connect as shown below, according to the type of grounding in the area where you are installing the UPS.

- **Areas which do not have single-line grounding:** If the load device input plug is a NEMA-type plug, connect the W (N) terminal of the load device input plug to the N terminal of the UPS. (See the above figure.)
- **Areas which have single-line grounding:** If the load devices are a single-wire grounded connection, always connect the ground phase to the N terminal (phase) side. (See the above figure.)

Never connect the following types of load devices to the UPS.

Load devices	Details
Copy machines, Laser printers, Plain paper fax machines, Overhead projectors, Hair-dryer, Cleaner and so on.	Since such devices are subject to high transient current surges, the UPS will detect the excess current and backup will not be possible when there is a power outage. There is also the risk of the UPS malfunctioning.
Medical equipment, control equipment for elevators and the like, computer systems of public importance.	Special considerations such as system redundancy, installation of emergency power generation facilities, need to be given to operation, maintenance, and management.

This completes the load devices connection.

§11. Operating Procedures

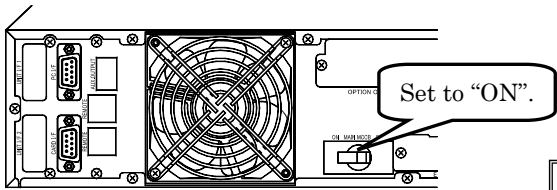
§11.1 UPS Startup

Proceed as follows to start up the UPS.

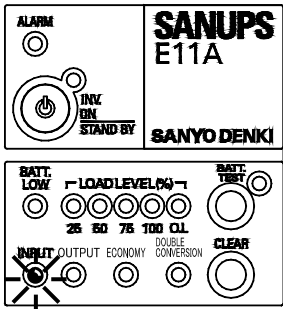
Indications of Breaker and LED in this manual.

The switches or breakers are indicated by a frame .
Example:  INV. ON/STAND BY .
The LEDs on the control panel are described as “Green INPUT” or “Red ALARM”.
The LEDs state are indicated as follows:
: LED lights. : LED blinks.

① Set  MAIN MCCB on the back panel of the UPS to “ON”.



Left figure shows rear view of E11A202U.
When using E11A102U, operate  MAIN SW .



LEDs

LED that indicates the output voltage setting of UPS blinks. (See §5.2 “Control panel and Indicators”).

↓ after 5 seconds

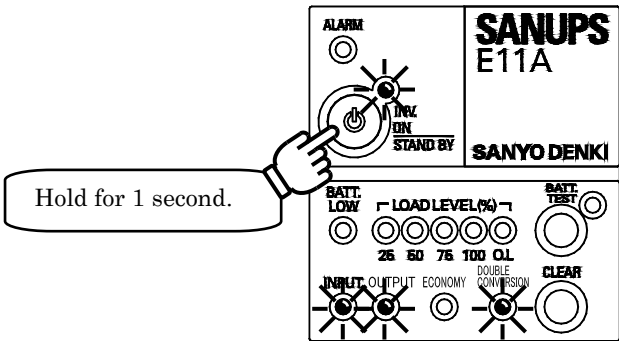
Green INPUT	Blinking
Green INV.ON/STAND BY	Off
Green OUTPUT	Off

↓

Green INPUT	Lit
Green INV.ON/STAND BY	Off
Green OUTPUT	Off

Check that the “Green INPUT” stops blinking and remains lit, and then proceed to step ②.

② Press and hold  for at least 1 second.



Buzzer

Musical trill

LEDs

Green INPUT	Lit
Green INV.ON/STAND BY	Lit
Green OUTPUT	Lit
Green DOUBLE CONVERSION	Lit

After “Green DOUBLE CONVERSION” lights, it might go off depending on the input power condition or the load device condition.

Note for the UPS operation mode and LED indicators.

➤After performing step ②, the “Green DOUBLE CONVERSION” lights regardless of the UPS operation mode. And then the LEDs will be in the following state according to the operation of the UPS depending on the “UPS operation mode” in the user setting.

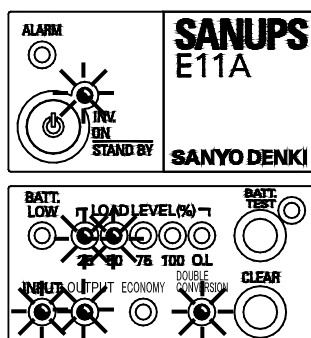
↓

➤The “Green ECONOMY” lights when the UPS is in Economy Mode.

➤The “Green DOUBLE CONVERSION” lights when the UPS is in Double Conversion Mode.

➤When the “Green DOUBLE CONVERSION” and the “Green ECONOMY” are both off, the UPS is in Active Filter Mode.

At this step, turn the load device power on.



LEDs

Green INPUT	Lit
Green INV.ON/STAND BY	Lit
Green OUTPUT	Lit
Green LOADLEVEL 25 -100%	Lit
Green DOUBLE CONVERSION	Lit

After “Green DOUBLE CONVERSION” lights, it might go off depending on the input power condition or the load device condition.

Note for the load capacity

- “Green LOAD LEVEL 25 - 100%” will light depending on the connected load capacities.
- If the “Red O.L.” lights and the buzzer sound is emitted (four short beeps followed by another four short beeps), the load devices connected to the UPS exceed the rated capacity of the UPS. Reduce the number of load devices connected.

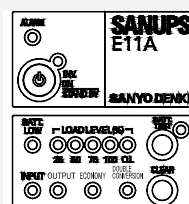
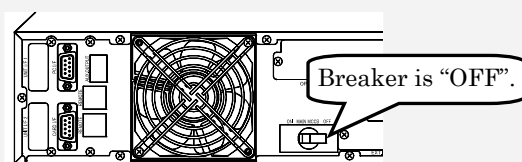
UPS Battery Power Startup

You can operate the UPS even when the state of the AC input power supply is not good.

You can follow the procedure below to operate the UPS when the AC input power supply is in an abnormal state (power outage, voltage drop, etc.).

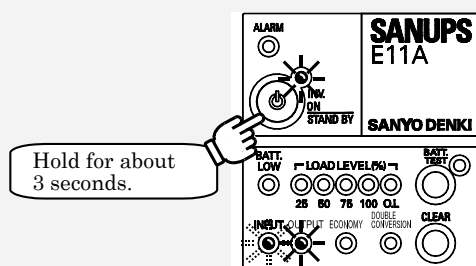
Since power is supplied to the load devices from the battery in the UPS when this procedure is used, use the devices for a period of time less than the possible backup time of the UPS.

- ① Check that **MAIN MCCB** is set to “OFF”.



All of the LEDs go off.

- ② Press  and hold until the buzzer sounds. Release it when the buzzer sounds.



Buzzer Musical trill	
LEDs	
LED that indicates the output voltage setting of UPS blinks. (See §5.2 “Control panel and Indicators”).	
↓ after 5 seconds	
Green INPUT	Blinking
Green INV.ON/STAND BY	Off
Green OUTPUT	Off
↓ after 1 to 2 seconds	
Green INPUT	Blinking
Green INV.ON/STAND BY	Lit
Green OUTPUT	Lit

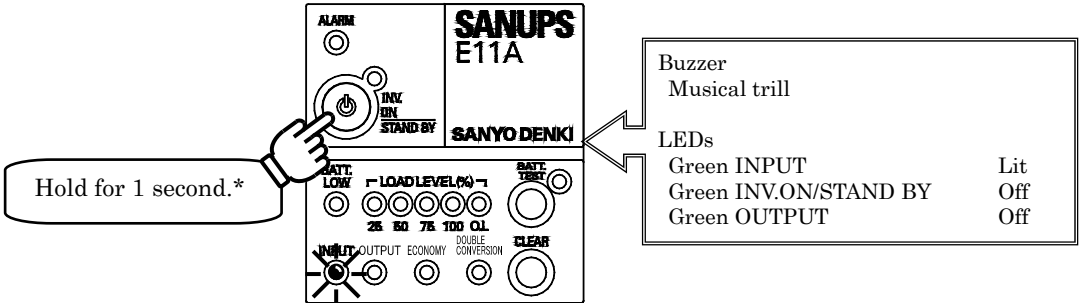
* The default setting of the output frequency at UPS startup by this procedure is shown in the right table. Change the setting according to the using load devices if needed. See §3.4 “Setting Battery Power Startup Frequency” in the *User Settings Guide* for details. However, the setting cannot be changed if **MAIN MCCB** is not set to “ON”, so preset this setting when there is a normal AC input power supply during UPS operation.

Model	Default setting
E11A***U002	60Hz
E11A***U002J	50Hz

§11.2 UPS Shutdown (Daily)

Perform the following operation to shut down the UPS daily. Be sure to shut down the load devices prior to shutting down the UPS.

- ① Press and hold  for at least 1 second.



* Operation varies depending on the user setting of “Shutdown operation”. See §3.9 “Setting UPS Shutdown Operation” in the *User Settings Guide* for details.

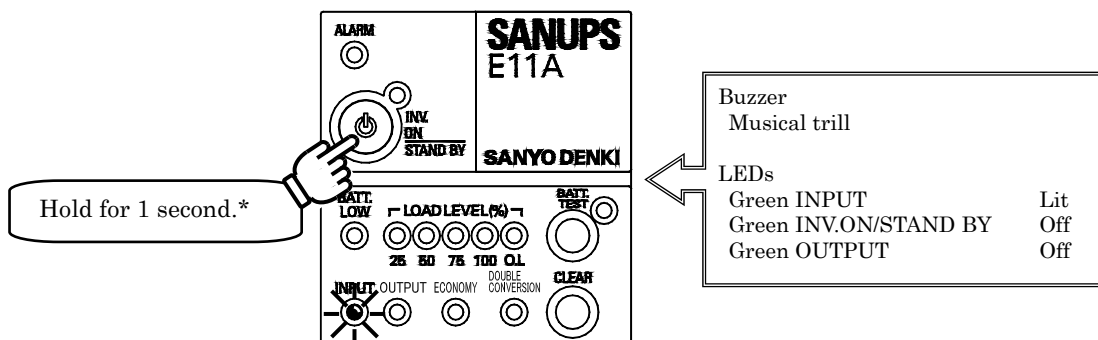
Note

Do not touch **MAIN MCCB** when you perform a daily shutdown. Leave it set to “ON”.

§11.3 UPS Shutdown (If Not to Be Used for More Than a Week)

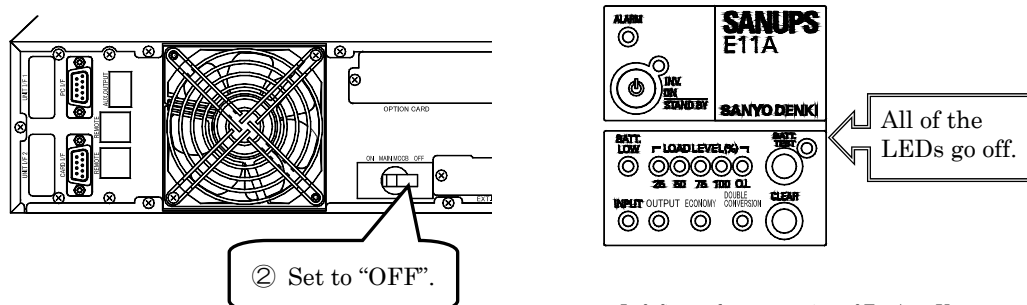
Perform the following operation if the UPS is not to be used for at least a week. Be sure to shut down the load devices prior to shutting down the UPS.

- ① Press and hold  for at least 1 second.



* Operation varies depending on the user setting of “Shutdown operation”. See §3.9 “Setting UPS Shutdown Operation” in the *User Settings Guide* for details.

- ② Set **MAIN MCCB** to “OFF.”



Left figure shows rear view of E11A202U.
When using E11A102U, operate **MAIN MCCB**.

Note

- If input power is shut off while the UPS is operating, the batteries are discharged as if a power outage occurred. Be aware that when the input supply is restored, the full capacity of the backup function will not be available until the batteries have had time to recharge.
- Recharge the UPS periodically, when you store the UPS for a long period, after shutting off the UPS by procedures above. See (4) in §3.3 “Usage Precautions” to recharge the UPS.

§12. User Settings

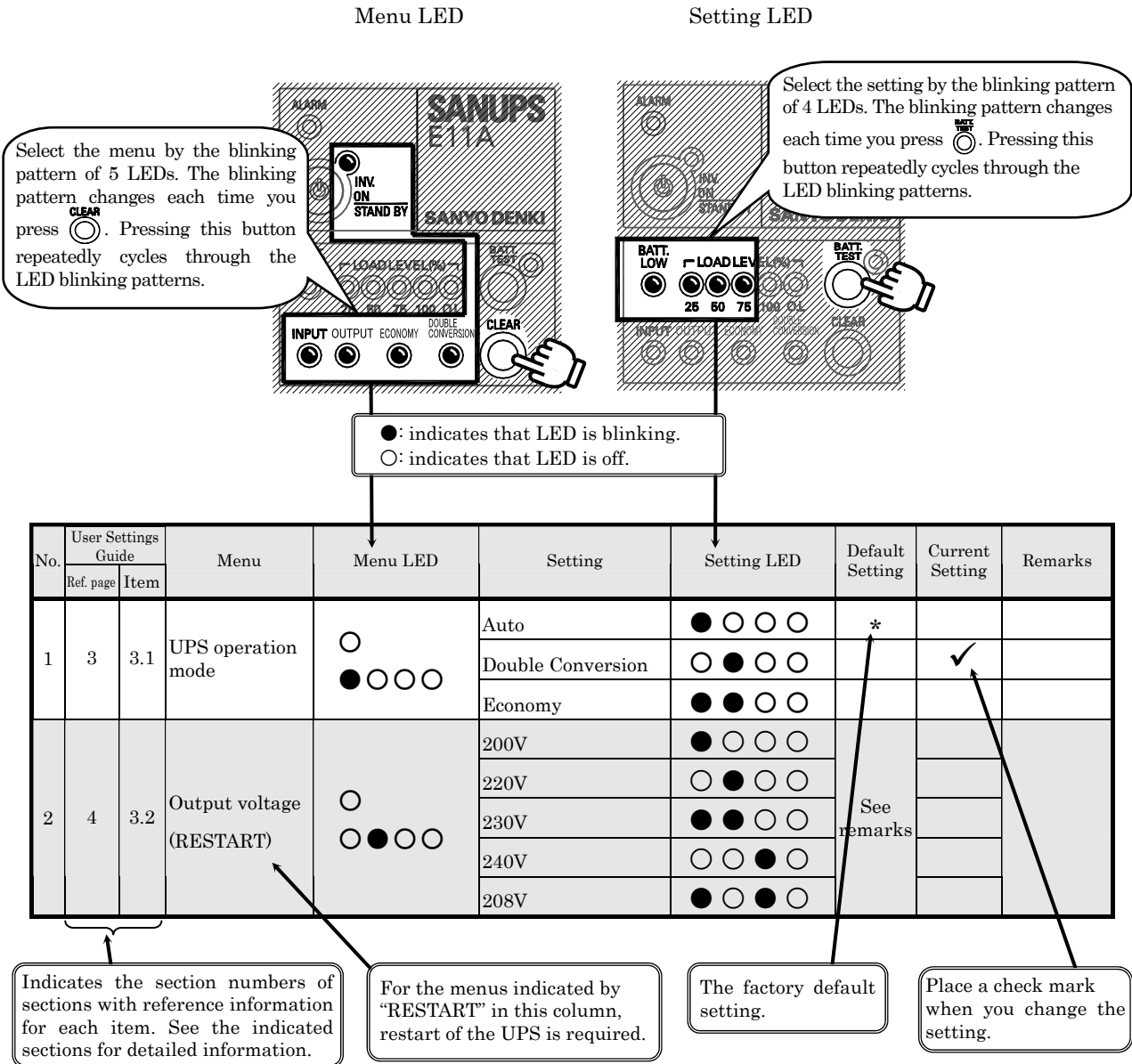
§12.1 Prior to Modifying the User Settings

The UPS has a user settings menu, described in §12.2 “Setup Menu List”. The factory default setting of the UPS is indicated by the “*” mark in the “Default Setting” column. You can set the various menu items to configure the UPS according to your environment, your applications, and the specifications of the connected load devices. Whenever you change a menu item setting, we recommend that you place a check mark in the “Current Setting” column field of the Setup Menu List.

For details of setup operations of each menu, see the *User Settings Guide*.

All of the user setting menu items can be selected and set by display LED blinking pattern.

Setup menu list and the blinking pattern of indicators on the control panel are illustrated in the following figure.



Note

When you change the setting of the menus indicated by RESTART in the “Menu” column, its changes do not take effect until you restart the UPS. If a restart is required, be sure to power off the load devices before resetting. See §11.3 “UPS Shutdown (If Not to Be Used for More Than a Week)” about how to shut down the UPS, and §11.1 “UPS Startup” for information about how to start the UPS.

§12.2 Setup Menu List

●: indicates that LED is blinking.

○: indicates that LED is off.

No.	User Settings Guide		Menu	Menu LED	Setting	Setting LED	Default Setting	Current Setting	Remarks
	Ref. page	Item							
1	3	3.1	UPS operation mode	○ ●○○○	Auto	●○○○	*		Switch the UPS operating mode automatically.
					Double Conversion	○●○○			Set the UPS operating mode to Double Conversion mode.
					Economy	●●○○			Set the UPS operating mode to Economy mode
2	4	3.2	Output voltage (RESTART)	○ ○●○○	200V	●○○○	See remarks		Default setting of E11A***U002J
					220V	○●○○		—	
					230V	●●○○		—	Set the rated Output voltage. Same as Input voltage.
					240V	○●○○		—	
					208V	●○○○			Default setting of E11A***U002
3	5	3.3	Frequency sync range (RESTART)	○ ●●○○	1%	●○○○	*		±1%
					3%	○●○○			±3%
					5%	●●○○			±5%
4	6	3.4	Battery power startup frequency (RESTART)	○ ○○●○	50Hz	●○○○	See remarks		Default setting of E11A***U002J
					60Hz	○●○○			Default setting of E11A***U002
5	7	3.5	PC interface	○ ●○○○	—	●○○○	*		Do not use this setting.
					Workstation	○●○○			Set when using a power management software, LAN card or UPS remote ON and One-touch system shutdown.
					Serial Login	●●○○			Shutdown by serial login.
					—	○●○○			Do not use this setting.
6	8	3.6	Serial baud rate	○ ○●○○	9600	●○○○	*		9600 bps.
					4800	○●○○			4800 bps.
					2400	●●○○			2400 bps.
7	9	3.7	UPS operation upon power recovery	○ ●●○○	Auto	●○○○	*		Auto restart
					OFF	○●○○			The UPS stays off.
					30%	●●○○			Auto restart when battery charge reaches 30%.
					50%	○●○○			Auto restart when battery charge reaches 50%.
					80%	●●○○			Auto restart when battery charge reaches 80%.
8	10	3.8	Buzzer sound	○ ○○○○	All patterns	●○○○	*		All sounds
					Pattern 1	○●○○			Emit sounds on serious failure, battery trouble and key click sounds.
					Pattern 2	●●○○			Emit sounds on serious failure and key click sounds.
					OFF	○●○○			Emit key click sounds only.
9	11	3.9	Shutdown operation	○ ●○○○	1 second	●○○○	*		Turn the UPS off when pressed for 1 second.
					3 seconds	○●○○			Turn the UPS off when pressed for 3 seconds.
					Special operation	●●○○			Turn the UPS off on special operation.
10	12	3.10	Overload recovery operation	○ ○○○○	Auto return	●○○○	*		Auto recovery when a certain period of time has elapsed.
					Bypass	○●○○			Fixed as bypass power supply on overload.
11	13	3.11	UPS operation at  OFF (RESTART)	○ ●○○○	OFF	●○○○	*		The UPS stays off.
					Bypass	○●○○			Bypass power supply
12	14	3.12	Low battery voltage warning timing	○ ○○○○	Battery voltage	●○○○	*		When low battery voltage level is detected.
					2 minutes	○●○○			When remaining battery duration is 2 minutes.
					3 minutes	●●○○			When remaining battery duration is 3 minutes.
13	15	3.13	Battery backup time	○ ●○○○	5 minutes	●○○○	*		Set the UPS backup time on power outage. An external battery must be connected for settings of 20 minutes or higher.
					20 minutes	○●○○			
					30 minutes	●●○○			
					40 minutes	○●○○			
					60 minutes	●●○○			
					90 minutes	○●○○			
					120 minutes	●●○○			
14	16	3.14	Battery type	○ ○○○○	5 years	●○○○	*		5 years lifetime type
					10 years	○●○○			10 years lifetime type
					3 years	●●○○			3 years lifetime type
					180 days	○●○○			Test batteries every 180 days.
15	17	3.15	Battery test schedule	○ ●○○○	90 days	○●○○	*		Set the interval (number of days) for the automatic battery check.
					30 days	●●○○			The check is carried out automatically when the specified number of days has elapsed.
					None	○●○○			No battery check.
16	18	3.16	Reset battery information	● ○○○○	Keep Batt. Info.	●○○○	*		Keep the battery information as the current condition.
					Reset	○●○○			Reset the battery information when you replace the battery.

§13. Maintenance



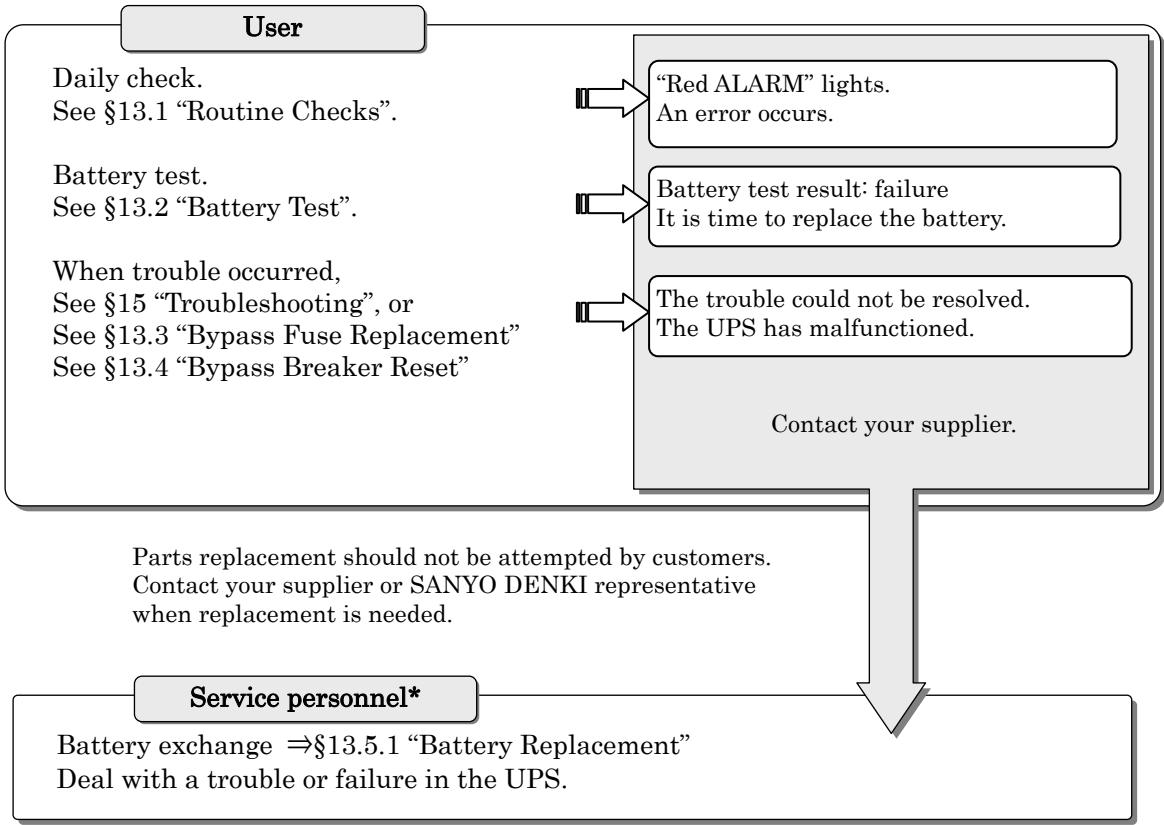
CAUTION

- Internal maintenance and inspection should be performed only by technically qualified personnel. Electric shock, injury, burning, fuming or fire could otherwise result.
- Before beginning inspection, shut down the UPS completely, and remove the input power. Failure to do so may result in an 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.
- Batteries should be replaced periodically.
- Batteries used after their service life has passed may cause a fire.



The projected service life of the UPS is 7 years. During this period, the battery must be replaced periodically. If you intend to continue using the UPS after its projected service life, components other than the battery also need to be replaced (a fee will be charged). Contact your supplier. If these components are not replaced at the end of the service life, the UPS may not function properly.

There are routine checks to be performed by the user and maintenance to be performed by service personnel. Some maintenance items are not able to be performed by the user, so be sure to submit a request for such work to your supplier when maintenance is required.



*** What are service personnel?**
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.

§13.1 Routine Checks

 CAUTION	• Be sure not to inspect the inside of the UPS. Doing so may result in an electric shock, burn, injury, smoke, or fire. • Do not touch the fan on the back panel of the UPS when cleaning the UPS or anywhere around the UPS. Doing so may result in an injury. • Do not use, for example, a wet cloth for cleaning. Doing so may result in an electric shock. • When cleaning, do not connect a vacuum cleaner to the output terminal of the UPS. Doing so may result in smoke or fire.	  
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Routinely check the following items.

- ① **Is the control panel LED lighting state abnormal?**
⇒ See §15 “Troubleshooting” to perform the countermeasure.
- ② **Is the buzzer sounding?**
⇒ If any buzzer sounds, see §14 “Buzzer Sounds” to 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 things like humidity and temperature within the specified ranges?
⇒ See §6.1 “Installation Environment Check”.
- ⑥ **Has the specified amount of space been provided at the front and back of the UPS?**
If the air intake or exhaust vent is blocked, the internal temperature of the UPS rises, which could result in a damage of the UPS.
⇒ See §6.2 “Installation Space Check”.
- ⑦ **Remove any dust or dirt adhering to the intake and exhaust vents.**
Dust or dirt adhering to parts inside the UPS may cause it to malfunction.
- 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 change the setting to “None”, periodically perform a manual battery backup test. Refer to §13.2 “Battery Test”. Depending on the results of the test, exchange the battery.

Estimated battery replacement interval

Battery service life is affected by operating conditions such as ambient temperature and the number of discharge cycles.

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

Average Ambient Operating Temperature	Projected Service Life	Battery Replacement Interval
25°C (77°F)	5 years	4.5 years
30°C (86°F)	3.5 years	3 years
35°C (95°F)	2.5 years	2 years
40°C (104°F)	1.7 years	1.5 years

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

§13.2 Battery Test

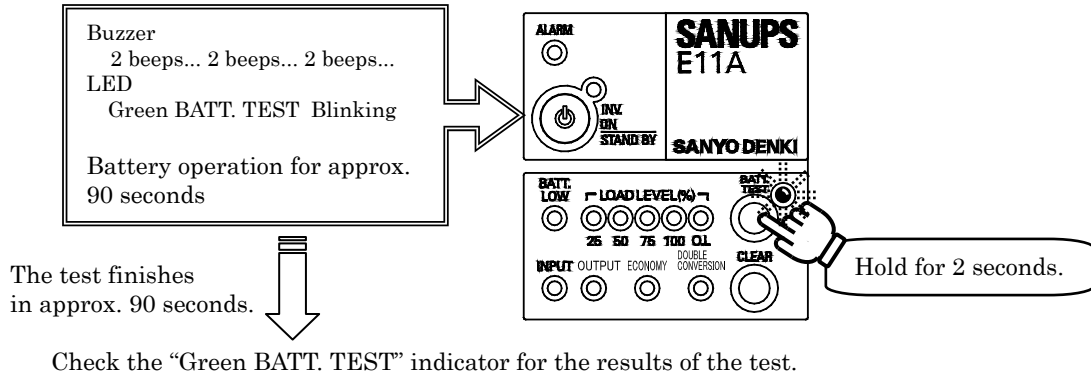
You can perform tests of the built-in and externally connected batteries. You can do this without stopping the load devices connected to the UPS.

When it is shipped from the factory, the UPS is set up to perform an automatic battery test once every 180 days. To change the automatic battery test schedule, see §3.5 “Setting Test Schedule” in the *User Settings Guide*.

Follow the procedure below when conducting a manual battery test. However, if the UPS has performed a backup operation within 12 hours prior to the test, the result may show an error. The test should, therefore, be conducted when the UPS has not performed a backup operation within the last 12 hours.

- ① Press  and hold it for at least 2 seconds.

The “Green BATT. TEST” indicator starts blinking, and the battery test starts.



Battery Test Results

Green BATT. TEST	lit	blink
Buzzer	—	***** 7 beeps ... ***** 7 beeps
Confirmed Backup Time	90 seconds or more	Less than 90 seconds
Result	The batteries are OK.	Replacing the battery early is recommended. Contact SANYO DENKI.

- ② After the battery test has finished and the “Green BATT. TEST” indicator lights or blinking, press .

The “Green BATT. TEST” indicator goes off and returns to its normal indication.

Note for the battery test

The results of the test are only an approximate guide. If the batteries have reached their replacement interval, an early replacement is recommended even if the results of the test are OK. See “Estimated battery replacement interval” in the previous page for more information.

Condition for battery test

- Battery test cannot be performed under the following conditions.
1. Inverter is stopped.
 2. Bypass power supply is active.
 3. Input voltage or input frequency is out of range.
 4. Shutdown under remote control is in progress.
 5. UPS is defective.
 6. When load factor is less than 20% in the economy mode operation or the active filter mode operation.

Stopping battery test

- To stop the battery test while it is underway,

Press  for at least 2 seconds ⇒ The UPS returns to normal operation.

- The battery test stops if any of the following 1-4 occur or if any of the following 5-8 is operated while it is underway.

1. Input power error (voltage or frequency).
2. Mechanical failure
3. Output power overload
4. If the load level will be less than 20% when the UPS operates in Active Filter Mode or Economy Mode.
5. Switching of **Forced Bypass** switch
6. Setting **MAIN MCCB** to “OFF”
7. Pressing  for 1 second or longer
8. Executing the battery test stop by the power control software

The “Green BATT.TEST” indicator does not display the results of the test if the test is interrupted.

§13.3 Bypass Fuse Replacement



For safety, always power the UPS off and unplug the input power cable before exchanging the bypass fuse. Failure to do so can cause electric shock.

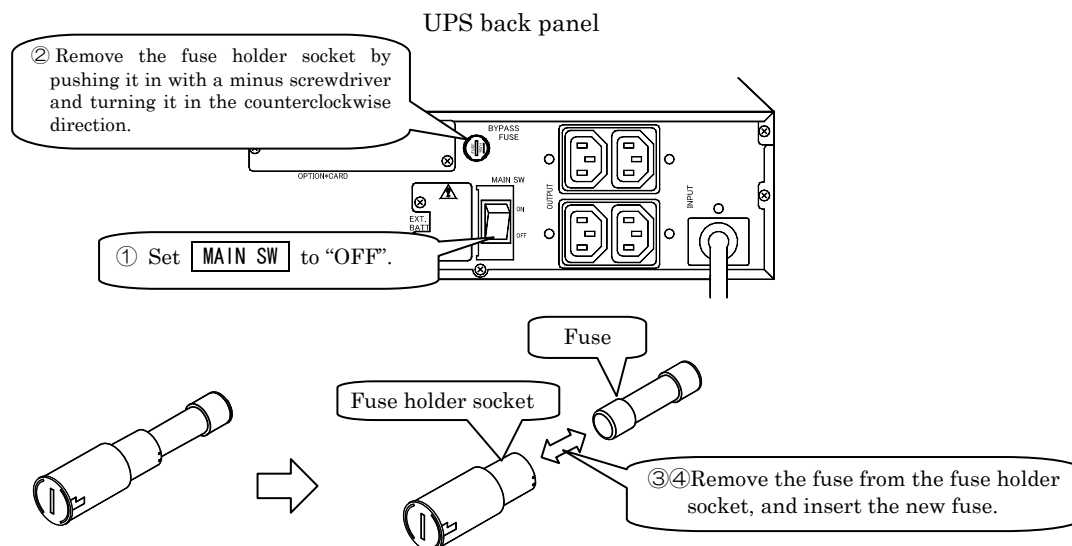


E11A102U002

E11A102U002J

If the bypass fuse blows, the “Red ALARM” indicator lights and output from the output terminal stops. Proceed as follows to replace the fuse with a new fuse (supplied).

- ① Stop the UPS by setting **MAIN SW** to “OFF”, and disconnect the input power plug of the UPS from the utility power outlet.
- ② Remove the fuse holder socket on the back panel of the UPS by pushing it in with a minus screwdriver and turning it in the counterclockwise direction.
- ③ Remove the fuse from the fuse holder socket.



- ④ Insert the new supplied fuse (250V 8A) to the fuse holder socket.
- ⑤ Return it to the original location by turning it in the clockwise direction.
- ⑥ Connect the input power plug of the UPS to the utility power outlet.
- ⑦ Set **MAIN SW** to “ON”, and then start the UPS by pressing  and holding it for at least 1 second. For details about UPS startup, see §11.1 “UPS Startup”.

Note

- If you replace the bypass fuse while the UPS is powered on, the “Red ALARM” indicator will remain lit until you turn the UPS off. Always turn the UPS off before replacing the fuse.
- Discard the old fuse as non-combustible industrial waste by a local rule.

This completes the bypass fuse replacement.

§13.4 Bypass Breaker Reset

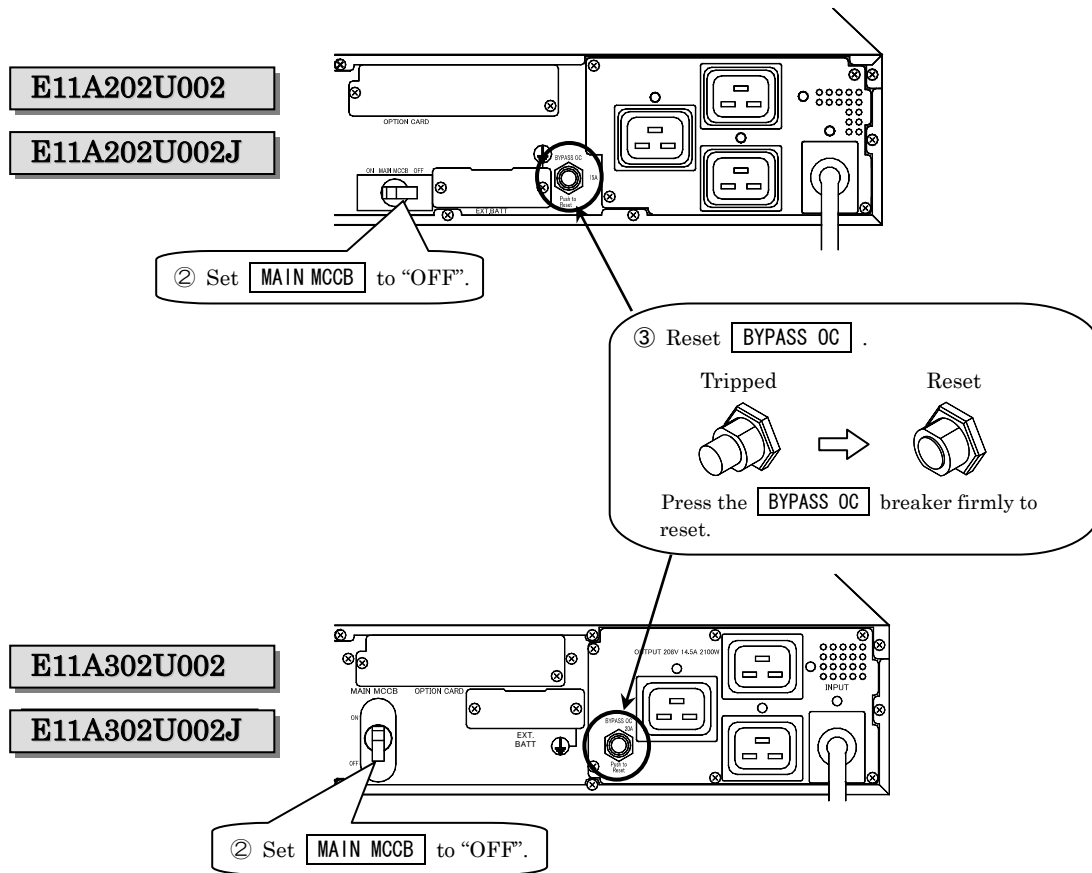


Always power the UPS off before resetting the bypass breaker.
Failure to do so can cause electric shock.



If the bypass breaker trips, the red ALARM indicator lights and output from the output terminals stops. Proceed as follows to reset the bypass breaker.

- ① Stop the UPS by setting **MAIN MCCB** to “OFF”.
- ② Examine if there are neither a problem nor a trouble in the equipment of the load.
- ③ Press the bypass breaker on the back panel of the UPS.



- ④ Set **MAIN MCCB** to “ON”, and then start the UPS by pressing  and holding it for 1 second. For details about UPS startup, see §11.1 “UPS Startup (Normal Operation)”.

Note

If you reset the bypass breaker while the UPS is powered on, the “Red ALARM” indicator will remain lit until you turn the UPS off. Always turn the UPS off before resetting the bypass breaker.

This completes the bypass breaker reset.

§13.5 Maintenance by Service Personnel

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

 CAUTION	- Internal maintenance and inspection should be performed only by technically qualified personnel. Electric shock, injury, burning, fuming or fire could otherwise result. - Batteries should be replaced periodically. Batteries used after their service life has passed may cause a fire. - Never use organic chemicals such as gasoline, thinner, benzene or detergent to clean batteries. These can cause the casing to crack and leak, resulting in fire or current leakage. - Do not touch the rotating fan at maintenance. Doing so may result in bodily injury. - Never use a wet cloth to clean the UPS. Doing so may result in an electric shock. - When cleaning, do not connect a vacuum cleaner to the output terminal of the UPS. Doing so may result in smoke or fire.	 
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§13.5.1 Battery Replacement

You can replace the batteries without stopping the load devices. However, this should be done as quickly as possible, because the UPS will be unable to provide backup power in the event of a power outage.

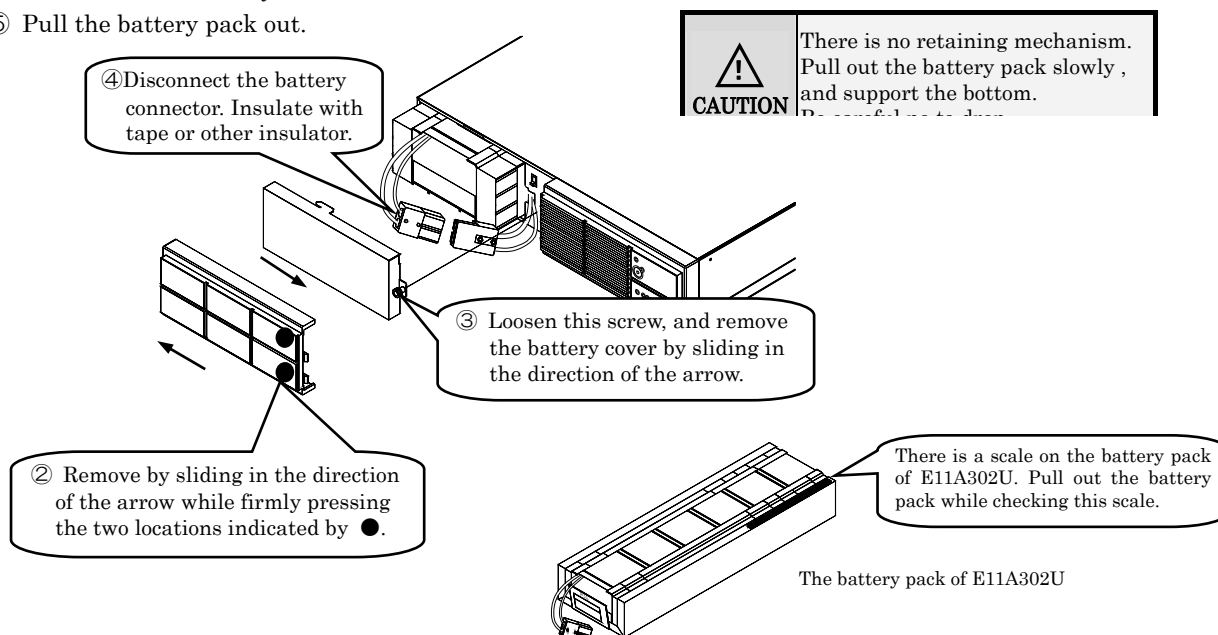
 CAUTION	- The battery pack weight is shown in the following table. Be careful not to drop it on your feet. Bodily injury can result. - There is a constant voltage shown in the table at the battery terminals. Do not touch them with your hands or short-circuit them. Bodily injury can result.
--	---

UPS Models	Battery pack	Weight (approx.)		Voltage (max.)
	Model	kg	lb	
E11A102U	BPE11A102A00	6	13.2	approx. 24V
E11A202U	BPE11A202A00	12	26.5	approx. 48V
E11A302U	BPE11A302A00-2	20	44.1	approx. 72V

Note on battery replacement

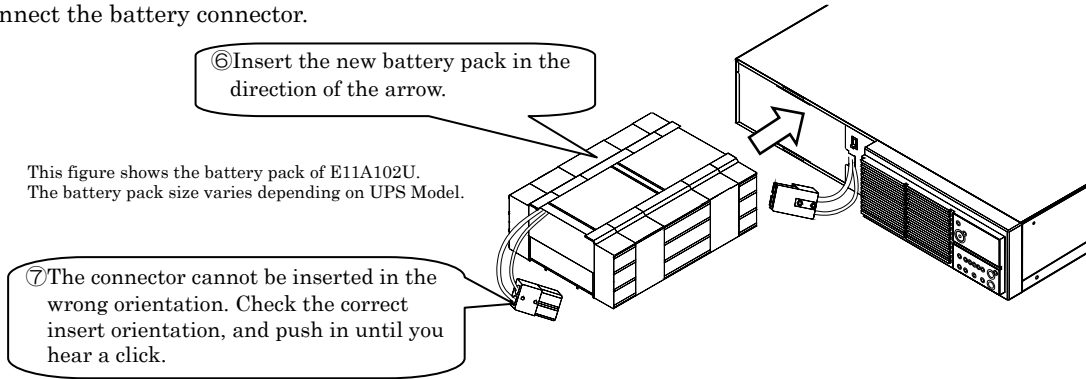
Since this battery is designed specifically for these UPS, do not use a different battery. Do not substitute with any other type, and do not mix new and old batteries, as shortened battery life, leakage, and heat could result.

- ① Check the replacement battery model name. See the table above.
- ② Remove the front panel of the UPS.
- ③ Loosen the screw on the right side of the battery cover, and then remove the battery cover.
- ④ Disconnect the battery connector.
- ⑤ Pull the battery pack out.



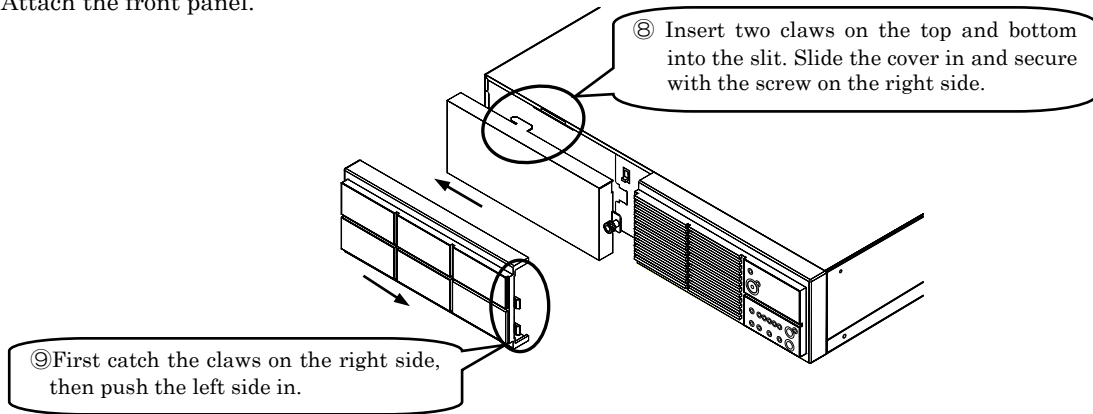
- ⑥ Insert the new battery pack so that the connector faces forward.
- ⑦ Connect the battery connector.

This figure shows the battery pack of E11A102U.
The battery pack size varies depending on UPS Model.



- The battery connector cannot be inserted in the wrong orientation. If it does not go in, do not try to force it. Doing so can damage the connector and result in electric shock.
- Be careful not to get your hands caught when securing the cover.

- ⑧ Attach the battery cover.
- ⑨ Attach the front panel.



- ⑩ Set the backup time in the user setting. See §3.13 “Setting Battery Backup Time” in the *User Settings Guide*.
- ⑪ Set the battery type in the user setting. See §3.14 “Setting Battery Type” in the *User Settings Guide*.
- ⑫ Reset the battery information in the user setting. See §3.16 “Resetting Battery Information” in the *User Settings Guide*.

Note on the used battery

The batteries used in this product are lead type batteries which are a reusable resource. Please cooperate by recycling when replacing or disposing of used batteries. Dispose of used batteries according to the instructions. To dispose of used batteries, contact your nearest sales representative, an authorized industrial waste handling company, or repack them in their original cartons and send them to your supplier. (An extra charge is required.)

This completes the battery exchange.

§14. Buzzer Sounds

The buzzer sounds to indicate an UPS status error or change.
Check the sound pattern and refer to the following table for the steps to take.

Tip
Press  to stop the buzzer.

Sound Pattern	LED Status	UPS Status	What to Do
Continuous tone * _____	Red ALARM lit	This is a mechanical failure.	Contact your supplier.
	Red ALARM lit	【When UPS starts】 【During bypass operation】 The bypass fuse is blown, or bypass breaker tripped or is set to “OFF”.	Replace the bypass fuse, see §13.3 “Bypass Fuse Replacement”. Or reset the bypass breaker, see §13.4 “Bypass Breaker Reset”.
	Red ALARM lit Red BATT.LOW lit	The battery is exhausted.	When utility power is restored, the UPS will restart automatically depending on the setting value of “UPS Operation Upon Power Recovery” in the user setting. See §3.7 “Setting UPS Operation Upon Power Recovery” in the <i>User Settings Guide</i> .
2 seconds ** ** ... 2 beeps 2 beeps	Green INPUT blinking	Power is being supplied from the battery because of an input voltage or frequency error.	Verify that the input voltage and input frequency are within the rated range. Refer to §17.4 “Specifications”.
	Green INPUT blinking	MAIN MCCB was set to “OFF” during UPS power supply.	Set MAIN MCCB to “ON”.
	Green BATT.TEST blinking	The UPS is performing a battery check.	Wait for the battery check to end. You can stop the battery check by pressing  and holding it for at least 2 seconds.
Continuous beeps ***** ...	Red BATT.LOW lit	The battery voltage is low.	- Verify that the input voltage and input frequency are within the rated range. Refer to §17.4 “Specifications”. MAIN MCCB may be set to “OFF”. If MAIN MCCB is “OFF”, set it to “ON”.
3 seconds **** **** ... 4 beeps 4 beeps	Red O.L lit	The load devices connected to the output terminal exceed the rated capacity of the UPS.	Connect fewer load devices to the output terminal.
2 seconds ***** ***** ... 7 beeps 7 beeps	Green BATT.TEST blinking	【When UPS starts】 The battery connectors are not connected.	Stop the UPS, refer to §7.1 “Battery Connector Connection”, and firmly connect the battery connectors. After connecting the battery connectors, start the UPS, and check to make sure that buzzer sounds are not heard and that “Green BATT.TEST” does not blink.
		The battery check result was an error.	Perform the battery test. Refer to §13.2 “Battery Test”. When the same result persists, the battery must be replaced. Contact your supplier.
2 seconds ***** ***** ... 5 beeps 5 beeps	—	Remaining battery service life is six months.	A battery replacement is recommended. Contact your supplier. You can press  to stop the buzzer sound. But the buzzer sound will start again the next time the UPS is powered on. This will continue until you replace the battery.
	Red BATT.LOW blinking	The battery has reached its service life.	The battery must be replaced. Contact your supplier. You can press  to stop the buzzer sound, but “Red BATT. LOW” blinking continues. The buzzer sound and LED blinking will start again the next time the UPS is powered on. This will continue until you replace the battery.

Note

Contact your supplier if any other failure occurs in the UPS.

§15. Trouble shooting



- Internal maintenance and inspection should be performed only by technically qualified personnel. Electric shock, injury, burning, fuming or fire could otherwise result.
- Before beginning inspection, shut down the UPS completely, and remove the input power. Failure to do so may result in an electric shock.
- While the batteries are connected to the UPS, hazardous voltage is present. Never touch any parts with your hand. Doing so may result in an electric shock.

If a problem occurs, check the condition of the UPS and perform countermeasures listed in the table below.

UPS Status	LED Status	Countermeasure
When the UPS starts, the buzzer sounds and “Green BATT.TEST” blinks.	Green BATT.TEST blinking	• Check that the battery connectors are connected properly. Stop the UPS, refer to §7.1 “Battery Connector Connection”, and firmly connect the battery connectors. • After connecting the battery connectors, start the UPS, and check to make sure that buzzer sounds are not heard and that “Green BATT.TEST” does not blink.
No output power is supplied from the output terminal of the UPS.	Green OUTPUT off	• Check whether the input wiring has been performed correctly. Refer to §7 “Wiring”. • Verify that the input voltage and input frequency are within the rated range. See §17.4 “Specifications”. • must be pressed for at least 1 second. See §11.1 “UPS Startup” for the correct startup procedure.
	All off	• Check that MAIN MCCB is set to “ON”. See §11.1 “UPS Startup” for the correct startup procedure.
	Green INPUT blinking	• Check whether the output voltage is set correctly. See §3.2 “Setting Output Voltage” in the <i>User Settings Guide</i>. • Verify that the input voltage and input frequency are within the rated range. See §17.4 “Specifications”.
	Red ALARM lit	• The bypass fuse may be blown. See §13.3 “Bypass fuse replacement”. • The bypass breaker may be tripped. See §13.4 “Bypass breaker reset”.
Output power from the output terminal of the UPS does not stop.	Green OUTPUT lit	• must be pressed for at least 1 second. See §11.2 “UPS Shutdown” for the correct shutdown procedure. However, bypass power supply continues if bypass operation was started by changing over with the forced bypass switch, overload, or failure. • Check the setting of “UPS Shutdown Operation” in the user setting menu. It may be set to “3 seconds” or “Special operation”. The factory default setting is “1 second”. See §3.9 “Setting UPS Shutdown Operation” in the <i>User Settings Guide</i>.
	Green OUTPUT blinking	• Check the setting of “UPS Operation at OFF” in the user setting menu. It may be set to “Bypass”. The factory default setting is “OFF”. See §3.11 “Setting UPS Operation at OFF” in the <i>User Settings Guide</i>.
Output power from the output terminal of the UPS stops during operation.	Green INPUT lit	• may be turned off by accidental operation. Press for at least 1 second to turn on.
	Red ALARM lit	• Check whether the bypass fuse is blown, or the bypass breaker is tripped. It may have been blown or tripped by an overload or short circuit. Check the total load and the possibility of a short circuit. When the total load is high, reduce the number of load devices connected to the UPS. See §13.3 “Bypass fuse replacement” or §13.4 “Bypass Breaker Reset”.
Output power from the output terminal of the UPS stops during power outage.	Red ALARM on, Red BATT.LOW lit	• Check whether the battery has deteriorated. Check the time to replace the battery. The battery service life will differ depending on the ambient temperature. Earlier battery replacement is recommended. • Check whether there was a power outage within the last 12 hours. The battery level may be low. Sufficiently charge the UPS.
Alarm buzzer sounds.	–	• The alarm buzzer sounds when an error, abnormal state, or alarm condition is detected in the UPS. See §14 “Buzzer Sounds”.

UPS Status	LED Status	Countermeasure
Alarm buzzer does not sound.	—	The alarm buzzer sound may be set to “OFF”. Check the setting of “Buzzer Sound” in the user setting menu. See §3.8 “Setting Buzzer Sound” in the <i>User Settings Guide</i>.
Battery power supply continues. Power supply switches to battery power frequently.	Green INPUT blinking	- Check whether MAIN MCCB on the back panel of the UPS is set to “ON”. (If MAIN MCCB is set to the “OFF” during normal operation, the same operation as for a utility power source failure will be triggered.). - Verify that input voltage and input frequency are within the rated limits. See §17.4 “Specifications”.
UPS does not switch from bypass power supply to UPS power supply.	Green OUTPUT blinking, Green INV.ON/STANDBY blinking	- Check Forced Bypass is set to “Inverter”. This switch is located inside the front panel of the unit. Remove the front panel to check. See §7.1 “Battery Connector Connection”, step 5. If Forced Bypass is set to “Bypass”, set it to “Inverter”, then press  for at least 1 second. - When “Overload Recovery Operation” in the user setting menu is set to “Auto return”: The UPS switches to UPS power supply every 2.5 seconds, and switches back to bypass power supply if the overload condition still persists. This cycle is repeated. See §3.10 “Setting Overload Recovery Operation” in the <i>User Settings Guide</i>. - When “Overload Recovery Operation” in the user setting menu is set to “Bypass”: If the utility power voltage is low and the load current is 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 <i>User Settings Guide</i>.
Cannot perform battery test.	—	- A battery test cannot be performed when: ① Inverter is stopped. ② Bypass power supply is active. ③ Input voltage or input frequency is out of range. ④ Shutdown under remote control is in progress. ⑤ UPS is defective. ⑥ When load factor is less than 20% in the economy mode operation or the active filter mode operation.
When using the power management software, serial communication fails.	—	- Check that “Interface” in the user setting menu is set to “Workstation”. See §3.5 “Setting PC Interface” in the <i>User Settings Guide</i> and §5.3 “External Interfaces”. The factory default setting is “Workstation”. - Check the setting of “Serial Baud Rate”. See §3.6 “Setting Serial Baud Rate” in the <i>User Setting Guide</i>. The factory default setting is “9600”. Select the same setting value as the setting of power management software.
Automatic UPS restart does not occur after shutdown due to battery exhaustion following power outage.	—	Check the setting of “UPS Operation Upon Power Recovery” in the user setting menu. Automatic UPS restart does not occur if this item is set to “OFF”. If this item is set to “30%”, “50%”, or “80%”, the UPS does not start until the batteries are charged to the specified level. The factory default setting of this item is “Auto”. See §3.7 “Setting UPS Operation Upon Power Recovery” in the <i>User Settings Guide</i>.
The UPS does not automatically start at the time set for scheduled operation in the power management software.	—	If “When power failure recovered, automatically start the UPS” of the “Configuring the UPS control conditions” items described in the <i>User guide of the Power Management Software</i> is selected and the value “10 to 90” is set for the specified value (%), the UPS will not start even at a scheduled start time if the battery is not charged to the specified value. When scheduling operation for the UPS, set this specified value (%) to “0”. For details, refer to “Setting the Shutdown Conditions” in the <i>User Guide of the power management software</i>.
“Green DOUBLE CONVERSION” and “Green ECONOMY light and go off frequently at irregular intervals.	—	The UPS is switching frequently between operating modes because the utility power is unstable. Set the UPS operating mode to “Double Conversion”. For details, see §3.1 “Setting UPS Operation Mode” in the <i>User Settings Guide</i>. The factory default setting of this item is “Auto”.
“Red ALARM LED” is lit.	—	An alarm condition or error has occurred. Contact your supplier.

Note

When the troubles cannot be resolved even if you perform the countermeasures above, or when other failure occurs in the UPS, contact your supplier.

§16. How to Use Power Management Software

What is Power Management Software “SANUPS SOFTWARE STANDALONE” (supplied CD-ROM)?

This software is used for power supply control or management from the computer by communicating the UPS to a computer (personal computer or workstation).

Install power management software on your computer.

For more information, refer to the *Install Guide and User Guide* in the CD-ROM of the power management software.

The following is the minimum system configuration required for the setup and operation of the SANUPS SOFTWARE STANDALONE.

Computer: AT compatible

CPU: Pentium III® 500MHz (or greater)

Memory: Minimum of 32 MB (64 MB or more recommended)

Available disk space: Minimum of 95MB

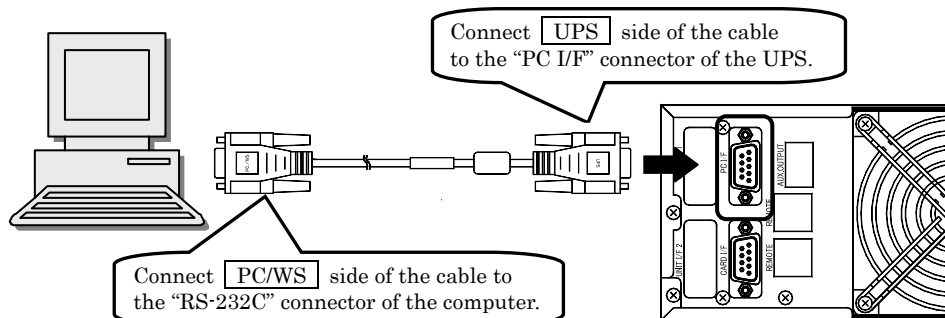
Display: Minimum 640 x 480 pixel resolution

Supported OS: Windows® NT 4.0 (*1), Windows® 2000, Windows® XP(x86, x64), Windows® Server 2003(x86, x64) (*2)

Windows® Vista(x86, x64), Windows® Server 2008(x86, x64) (*3), Windows® 7(x86, x64)

(*1) Service Pack 6 or above. (*2) Standard Edition or Enterprise Edition. (*3) Standard or Enterprise

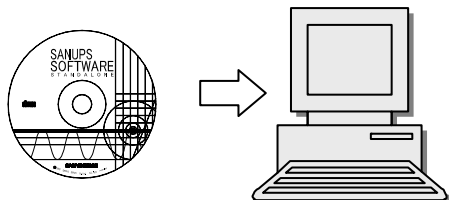
- ① Check that “Interface” in the user setting is set to “Workstation”. The factory default setting is “Workstation”. See §3.5 “Setting PC Interface” in the *User Settings Guide* for how to set.
- ② Connect the “PC/I/F” connector of UPS to the computer using the supplied Network cable.
- ③ Check that network cable connection is not loose.



Note

CARD I/F connector and PC I/F connector can not be used simultaneously.

- ④ Insert the SANUPS SOFTWARE STANDALONE CD-ROM into the CD-ROM drive to install this program.
The installation program starts automatically. Proceed as instructed on the screen.
- ⑤ After completing the software installation, reboot the computer.
- ⑥ Launch the SANUPS SOFTWARE STANDALONE from the Windows Start menu to set up.



Tip

If the installation program does not start automatically, double-click Setup.exe on the CD-ROM to start installation manually.

This completes preparation to use SANUPS SOFTWARE STANDALONE.

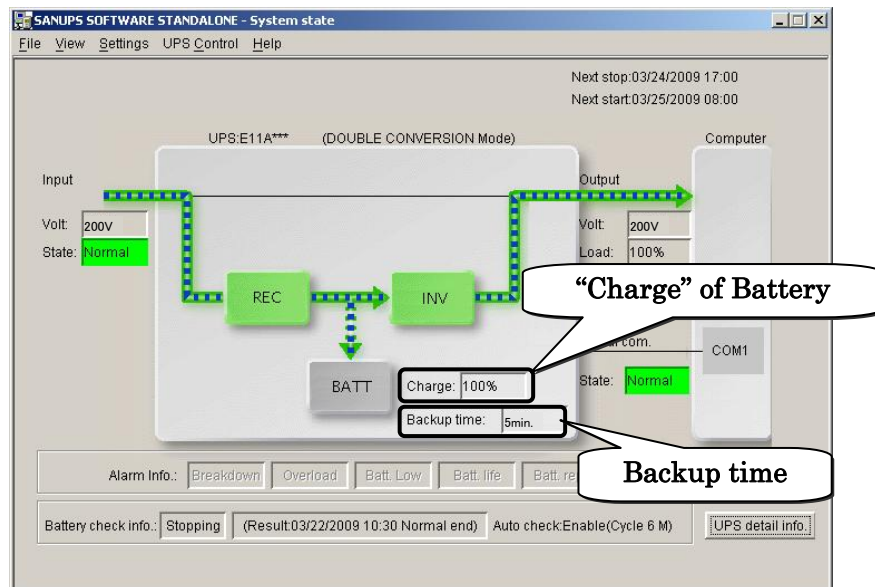
For more usage information, refer to the *Install Guide and User Guide* in the CD-ROM of the power management software.

Usage Notes for Power Management Software

When using the supplied “SANUPS SOFTWARE STANDALONE”, note the following instructions for the items on the main screen.

See §6.1 “Main Screen” in the *User Guide* of SANUPS SOFTWARE STANDALONE for details.

Main screen of SANUPS SOFTWARE STANDALONE



“Charge” of Battery

- (1) If UPS is not charged for 12 hours or more when the UPS first started, “Charge” is not displayed properly. See §9.2 “UPS Charge” to charge the UPS.
- (2) If the UPS is stopped and then restarted, even when the UPS is charged enough, “Charge” might be displayed as “80%” or “90%”. This occurs due to the operating conditions such as ambient temperature. In this case, “Charge” will be displayed properly, if UPS is operated normally for 1 or 2 hours.
- (3) Connect the battery connector correctly. If the UPS is operated without the batteries, “Charge” might show a value lower than the actual charge rate. Moreover, even if the battery connector is reconnected and operates the UPS, the proper charge rate is not displayed immediately. In this case, “Charge” will be displayed properly, if UPS is operated normally for 12 hours or more.
- (4) Display of “Charge” is only an approximation. An actual charge rate of the battery might differ slightly.

“Backup time” of Battery

- (1) In “Setting the shutdown trigger conditions” of SANUPS SOFTWARE STANDALONE, if “When the backup-time is under the specified value.” is selected as the shutdown trigger conditions, set the time more than 40% of the backup time displayed on the main screen. Refer to §6.4 “Setting the Shutdown Conditions” in the *User Guide* of SANUPS SOFTWARE STANDALONE for details.
- (2) If the “Load” displayed on the main screen is less than 30%, the backup time sometimes shows improper value.
- (3) “Backup time” displayed is only an approximation. An actual backup time might differ slightly.

§17. Characteristic of UPS

§17.1 Basic Operation

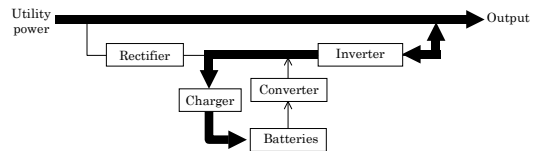
(1) Normal operation

In normal operation, the UPS switches automatically* between the three modes (a) to (c) depending on the state of the power.

* The UPS does not switch automatically when “UPS Operation Mode” in the user setting is set to “Double Conversion”.

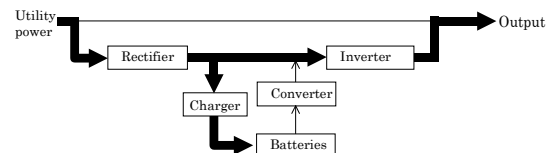
(a) Active Filter mode

The UPS operates in Active Filter mode when the input power voltage is within a certain range and the output power factor is below a certain value. In Active Filter mode, the UPS receives power from the utility power source and supplies it to the load. At the same time, it compensates for high frequencies in the input power at the inverter. The batteries are kept continually charged and ready in case a problem (outage or voltage drop) occurs in the utility supply.



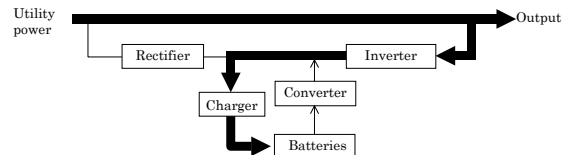
(b) Double Conversion mode

The UPS switches to Double Conversion mode when the input power voltage is outside a certain range. In Double Conversion mode, 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 input power source. The batteries are kept continually charged and ready in case a problem (outage or voltage drop) occurs in the utility supply.



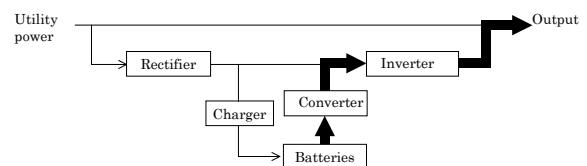
(c) Economy mode

The UPS switches to Economy mode when the input power voltage is within a certain range and the output power factor is above a certain value. In Economy mode, the UPS receives power from the utility power source and supplies it to the load. At the same time, the inverter is connected to the load and ready to activate. The batteries are kept continually charged and ready in case a problem (outage or voltage drop) occurs in the utility supply.



(2) On failure of utility power

When a fault or an outage occurs in the utility power source, the rectifier and charger cease operating while inverter operation continues, now using the batteries as a DC source to produce AC voltage, to ensure stable power supply to the load without even a momentary power dropout. At the same time, the buzzer sounds the battery operation alarm, and the “Green INPUT” indicator starts blinking.



(3) Upon recovery of utility power

When normal utility power is restored, rectifier and charger operations resume automatically, returning to the normal operating state described in §17.1 (1).

(4) When battery voltage declines

When low voltage or an outage in the utility power source continues, causing the battery voltage to decline to about value (1.85 V/cell) in the right table, the “Red BATT.LOW” indicator lights to indicate low battery voltage.

* When “Low Battery Voltage Warning Timing” in the user setting menu is set to “2 minutes” or “3 minutes”, the alarm is issued at the point when the remaining battery time drops to the specified level.

Model	Batter voltage
E11A102U	approx.22V
E11A202U	approx.44V
E11A302U	approx.67V

(5) Extended power outage

If a power outage persists and the battery voltage reaches the final discharge level, 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 automatically, operation is automatically resumed, returning to the normal operating state described in §17.1 (1).

* When “UPS Operation Upon Power Recovery” in the user setting menu is set to “OFF”, inverter output remains stopped. When it is set to “30%”, “50%”, or “80%”, the UPS restarts operation once the batteries are charged to the specified level and then returns to the normal operating state described in §17.1 (1).

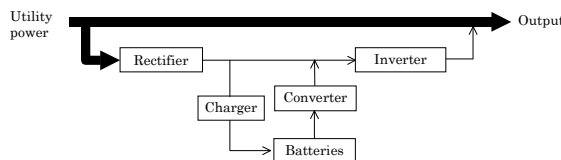
§17.2 Protective Functions

(1) Overload protection

If the UPS output is overloaded by exceeding the current capacity of the inverter, such as when a computer system boots up, the output selector automatically switches the source of AC power from the inverter to the bypass circuit, without interruption.

After a certain period of time has elapsed, the source of power to the load is switched back to the inverter without interruption (auto-return), as shown in §17.1(1).

* When “Overload Recovery Operation” in the user setting menu is set to “Bypass”, the UPS switches to inverter power supply without interruption when the overload is resolved.



(2) UPS fault protection

If a fault occurs in the UPS, the output selector activates automatically and switches to bypass power without interruption. The “Red ALARM” indicator lights, and the alarm buzzer sounds. The power supply route is the same as for an overload.

Output from the UPS will stop if a power outage occurs during bypass operation due to the UPS fault. Contact your supplier or SANYO DENKI as soon as possible.

§17.3 Protective Function Table

Indication of the marks in the table are as follows.

Lit LED :

Blinking LED :

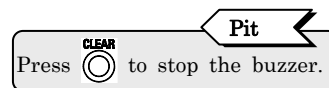
Buzzer Alarm : ① - ④

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

Item	Operation panel (front panel) indicators						Alarms Buzzer (*1)	Protective functions (UPS operations)	Notes
	Green INPUT	Green OUTPUT	Green INV.ON STAND BY	Red ALARM	Red O.L	Red BATT. LOW			
Preparation		(*2)	(*2)	-	-	-	-	Rectifier, charger, operation	Power up
Normal				-	-	-	-	Inverter operation	Power up, operation
Serious failure					-	-	①	Stop inverter Bypass supply	
Overload (effective value)				-		-	④	Bypass supply	Auto return
Forced bypass				-	-	-	-		Manual switch to bypass supply
Input over voltage				-	-	-	②	Stop rectifier and charger Inverter operation	Battery operation
Input over voltage (prolonged)				-	-		③		Battery operation (*3)
Power outage				-	-	-	②		Battery operation
Power outage (prolonged)				-	-		③		Battery operation (*3)
Input error (frequency)				-	-	-	②		Battery operation
Input error (prolonged)				-	-		③		Battery operation (*3)
Battery failure					-		①	Stop inverter Bypass supply	

(*1): Buzzer sound patterns:

- ① * _____ Continuous tone
 ② ** **
 ③ ***** Continuous beeps
 ④ **** ****



(*2): In this state, the LED blinks or is off, depending on the setting of “UPS Operation at OFF” in the user setting menu.

When this setting is set to “Bypass” :
 When this setting is set to “OFF” : -

(*3): Battery operation. Stops inverter operation when final battery discharge is reached.

§17.4 Specifications

Item		Standard or Performance						Notes	
MODEL		E11A102U		E11A202U		E11A302U			
		002	002J	002	002J	002	002J		
TYPE		E11A102A		E11A202A		E11A302A			
		002US(P)*	002USJ(P)*	002US(P)*	002USJ(P)*	002US(P)*	002USJ(P)*		
Output capacity		1kVA/0.7kW		2 kVA/1.4kW		3 kVA/2.1kW		(*7)	
Cooling system		Forced air cooling							
AC input	Input plug	NEMA L6-20P							
	Inlet	IEC60320-C14		IEC60320-C20					
	Phases	Single phase, 2-wire							
	Voltage	208V	See Notes	208V	See Notes	208V	See Notes	200,220,230,240V: User settable (*6) (Rated voltage same as output voltage)	
		-20% to +15%: Double conversion mode operation ±5%: Economy or Active Filter mode operation when Auto is set. ±8%: Economy mode operation when Economy is set.							
	Frequency	50Hz or 60Hz						±8%: Double Conversion mode ±1, 3, 5%: Economy /Active Filter mode	
	Power requirements	0.9kVA		1.8kVA		2.7kVA		Max. capacity during battery charging	
Input power factor		0.95 or more						During rated output (*2)	
AC Output	Outlet		IEC60320-C13 × 4		IEC60320-C19 × 3				
	Phases		Single phase, 2-wire						
	Voltage		208V	See Notes	208V	See Notes	208V	See Notes	200,220,230,240V: User settable (*6)
	Voltage regulation		Rated voltage ±2%						During Double Conversion mode operation
	Rated frequency		50Hz or 60Hz						Same as input frequency (auto selection)
	Battery power startup frequency		50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	User settable
	Frequency regulation		Rated frequency within ±1%: Double conversion setting. Rated frequency within ±1%, ±3% or ±5%: Auto or Economy setting.						1, 3, 5% selectable UPS free running operation ±0.5%
	Voltage waveform		Sine wave						
	Distortion factor of voltage waveform		Linear load: 3% or less 100% rectifier load: 7% or less						During rated output
	Transient voltage variation	Rapid load change	Rated voltage ±5 % (*7)						0% ⇔ 100% at transient or output switch
		Power outage, recovery							During rated output
		Rapid input voltage change							±10% variation
	Response time		5 cycles or less (*7)						
	Load power factor (lag)		0.7 (lag)						Variation range 0.7 (lag) to 1.0
	Overcurrent protection		Auto switch to bypass circuit at 105% or more						With auto return function
	Overload capability	Inverter	105%						200ms
		Bypass	8A (fuse)		15A (supplementary breaker)		20A		200% 30 sec., 800% 2 cycle (reference)
Batteries	Type		Small-sized valve regulated lead-acid battery						
	Number		2		4		6		12V per battery, series
	Rated capacity		68W		136W		204W		15 minute-rate
	Backup time		5 minutes						At 25°C (77°F) ambient temperature, rated load
Generated heat		125W		270W		460W		During Double Conversion mode operation	
Input leakage current		3mA or less		3.5mA or less					
Operating environment		Ambient temperature: 0 to 40°C (32 to 104°F) Relative humidity: 20 to 90%						(*3)	
Acoustic noise		40 dB or less		45 dB or less				1 m (approx. 40 inches) from UPS front panel, 'A' characteristics (linear load) At Economy mode operation	
Safety standard		UL1778-4th/C22.2 No.107.3-05-2nd:2005, CE: EN62040-1-1:2003							
Emission		FCC Part15 Sub partB Class-A EN50091-2:1995, EN55022:1994/A1:1995/A2:1997 Class-A(VCCI Class-A compliant)							
Immunity		EN50091-2:1995, EN55024:1998/A1:2001/A2:2003							

(*1) The inverter is capable of operation synchronized with AC input frequency and instantaneous switchover provided that the AC input frequency is within the rated frequency, and the AC input voltage is within the rated voltage.

(*2) When input voltage waveform distortion is under 1%.

(*3) The UPS contains batteries. Battery service life will be foreshortened if the UPS is used in an environment where the ambient temperature exceeds 30°C (86°F).

(*4) If grounded, the ground phase of the input and output must match according to UPS specifications.

(*5) The above table lists standard specifications. Some specifications are different for units with long backup times. For details, refer to the external battery specification instruction manual.

(*6) Voltage settable function is available for the E11A***U002J model only. Default setting is 200V. E11A***U002 model is designed for a 208V AC power supply. This Model is authorized as UL Model.

(*7) During Double Conversion mode operation. When UPS operates in Economy mode or Active Filter mode, these depend on utility power.

§16. Warranty

Warranty for use in Japan: 1 year

Warranty for use Overseas: 1 year

Warranty for use in North America: 3 years*

* Valid only when the UPS is purchased from a vendor recognized by SANYO DENKI.

1. In the above areas, this product is warranted for the specified periods against electrical failures due to materials or workmanship.
2. Free repair or replacement by a product with equivalent functions will be made when it is determined that failure has occurred because of defects in materials or workmanship.
3. This warranty is void in the event of any modification or change to the product supplied by SANYO DENKI.
4. This warranty is void in the event of any improper use of the product supplied by SANYO DENKI, or failure to use the product as specified in this Instruction Manual.
5. This warranty does not apply when the product is used aboard a ship or in another area subject to vibrations.
6. This warranty 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 (chloride 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 DENKI 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.