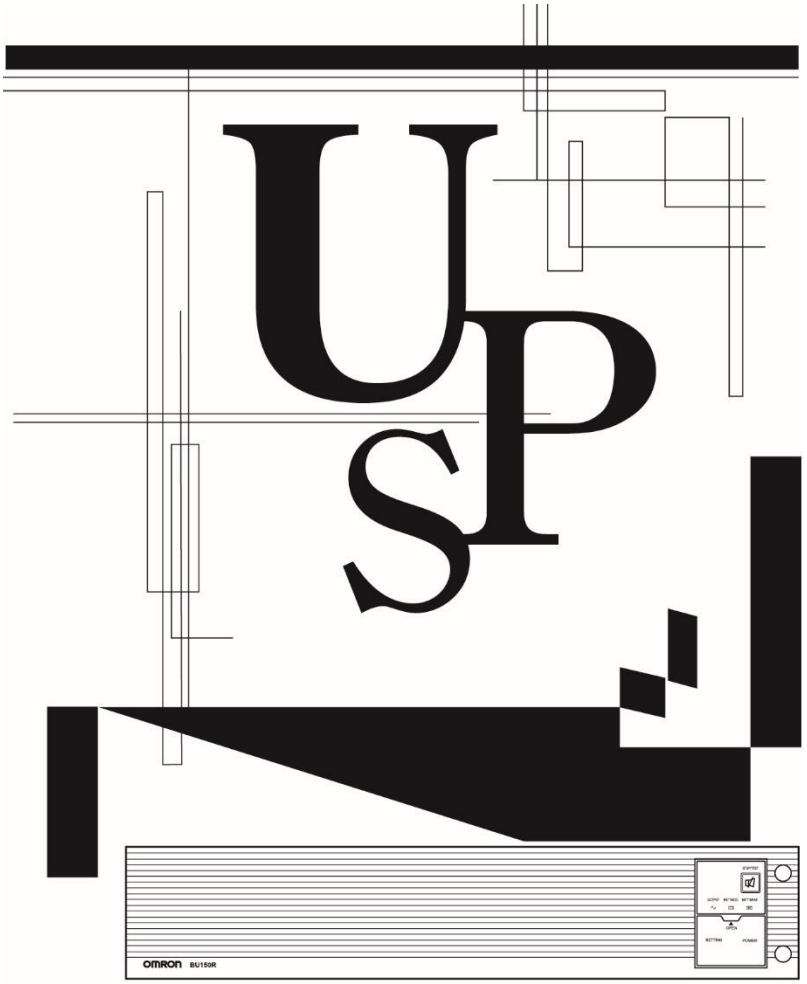
OMRON

Uninterruptible Power Supply UPS

BU150R

Instruction Manual



- This manual provides important safety-related information. Thoroughly read and understand this manual before installing and using the product.
- Keep this manual in a convenient location so that you can refer to it whenever necessary.
- The contents of this manual are subject to change without notice.
- The warranty is included with the product.

Introduction

Features of this product

Thank you for purchasing Omron's Uninterruptible Power Supply (UPS).

- The UPS protects computers and other devices from power failures, voltage variations, instantaneous voltage drops, and surge voltage such as that caused by lightning (a phenomenon in which extraordinary high voltage occurs instantaneously).
- Under normal conditions, commercial power is converted to direct current, and then it is converted back to a stable sine wave AC power before it is output.

  When a commercial power failure is detected, the unit switches to battery supply to provide continuous sine wave output. This is especially suitable for use where power supply conditions are poor (for example, when there are large variations in voltage)
- Output capacity is 1500VA/1200W for BU150R.

Notes on the use of the Backup Power Supply

- This product is designed and manufactured for use with FA or OA equipment.
  Do not use it when very high reliability and safety are required as listed below.
  - Medical equipment that may cause death directly
  - Applications that may cause injury (applications that directly affect the operation and control of planes, ships, railroads and so on)
  - Applications that are always subjected to vibration such as cars and ships
  - Applications in which a failure of this product may cause significant damage or effect to the society and public (important computer systems, main communication equipment, public transportation systems and so on)
  - Equipment with the same level of importance
- For equipment that greatly affects the safety of people and maintaining public functions, special considerations related to operation, maintenance, and management must be taken such as duplicating the system and emergency power generation facilities.
- Observe the contents of this manual such as the use conditions and environments.
- When you want to use this product for an important system that requires very high reliability, contact us.
- Do not modify/alter this product.

Disclaimers

We are not liable for any damage or secondary damage resulting from the use of our product, including malfunction and failure of equipment, connected devices, or software.
Make sure to read the safety precautions before using the unit.

- In the event you transfer or sell this unit to a third party, please include all of the documentation that came with this unit. This is to ensure that the unit is used in line with the conditions described in the included documentation.
- This manual contains important safety-related information. Please read and understand the contents of the manual before beginning operation.
  If you discover any omissions or errors in the manual, please contact the shop of purchase.

- Windows is the registered trademark of Microsoft Corporation in the United States and/or other countries.
- The names of other companies and products mentioned herein are the trademarks or registered trademarks of their respective owners.

IMPORTANT SAFETY INSTRUCTION

1. SAVE THESE INSTRUCTIONS.

This manual contains important instructions for BA75T/BA100T/BA100R that should be followed when using the UPS and batteries.

2. SYMBOL


This symbol indicates earth ground.


This symbol indicates turning on/off UPS.

3. INTERNAL BATTERY

Internal battery voltage is 24VDC for BA75T/BA100T/BA100R.

4. TEMPERATURE RATING

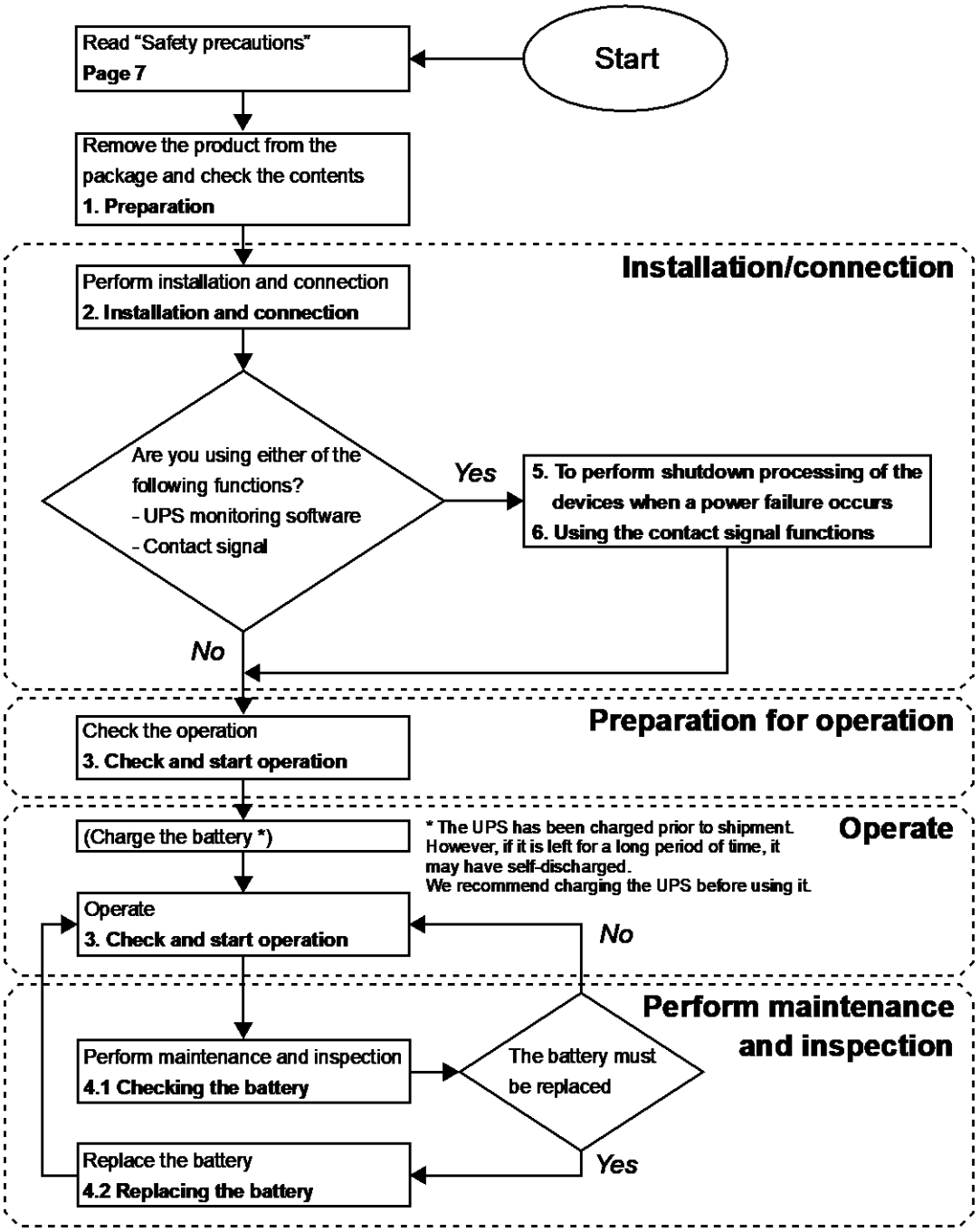
The maximum ambient temperature of the UPS is 40°C.

5. ENVIRONMENT

The unit is intended for installation in a temperature controlled, indoor area free of conductive contaminants.

Procedure from installation to operation

The procedure from installation to operation is shown below.



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Safety Precautions

Safety precautions — Important information for safe operation is described.
Be sure to read it before installation and start of use.

● The safety symbols and their meaning used in this manual are as follows:

 Warning	Misuse may cause death or serious injury.
 Caution	Misuse may cause injury or property damage.

* Property damage means damage to houses/household effects, livestock, and pets.

 : Indicates prohibition. For example,  indicates that disassembly is prohibited.

 : Indicates obligation. For example,  indicates that grounding is necessary.

Note that events categorized as a caution required matter also may cause more serious results under certain conditions.

⚠ Warning (for use of this product)

Do not use this unit when very high reliability and safety are required as listed below. This unit is designed and manufactured for use with FA or OA equipment such as personal computers.

- Medical equipment or system that may cause death directly.
- Applications that directly affect the safety of people (For example, the operation and control of cars and elevators).
- Applications in which a failure of the unit may cause significant damage to the society and public. (For example, essential computer systems and main communication equipment.)
- Applications with the same level of importance.

This is a category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.

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

⚠ Caution (for installation and connection)

Transportation, unpacking, and installation works must be carried out by more than one person. Carry the unit considering its weight and balance, and place it on a stable and robust base.

- Dropping or toppling the unit may cause injury.
- The approximate weight of the unit is 21kg.
- If you drop the unit, stop using it and have it inspected and repaired.

For repair, contact us.

Keep plastic package bags out of reach of children.

- Children may suffocate if they place their heads into plastic bags.

Make sure to connect the unit's AC input to a commercial power source with rated input voltage (100 VAC - 120 VAC) and 50/60 Hz frequency.

- Connecting to a commercial power source with a different rated input voltage or frequency may result in a fire.
- The unit may fail.

When an abnormality (unusual sound or smell) occurs, turn OFF the unit's "Power" switch to stop the output, and stop the supply of commercial power. The socket-outlet shall be installed near the equipment and shall be easily accessible (Be sure to pull out the AC input plug from the power outlet.).

- When performing maintenance on the connected devices, follow the above instructions to ensure safety.

Do not connect devices such as dryers, some solenoid valves, etc., which have a half-wave rectifier that allows only half-cycle AC power to flow through.

- Overcurrent may damage the UPS.

Connect to a commercial power source having a capacity of 15A or more.

To use the 15A plug (NEMA 5-15P) connected to the unit by factory default, the maximum power capacity connectable to an output terminal is approximately 1200VA or 1050W.

- If the unit is used at power consumption levels higher than the above, the input current may become 15A or over, causing a heat or fire.
- If the indication "OL (Overload)" is displayed, change the plug to a 20A AC input plug in the product package.

When changing the input cable, make sure to perform the connection as specified.

Make sure to stop the primary power supply before connecting the unit to the AC input terminal.

- There is a danger of an electrical shock or electric leak.

Provide secure grounding.

- Connect the terminal to a commercial power source and ground it. A failure or leak that occurs when the unit is not properly grounded may result in electric shock.

Do not disassemble, repair, or modify the unit.

- Doing so may cause an electric shock or a fire.

⚠ Caution (for installation and connection)

Do not install the unit in other than specified orientations.

- Dropping or toppling the unit may cause injury.
- If you install the unit in an orientation other than specified, the unit cannot be protected from a battery fluid leakage.

Do not use the unit where the maximum temperature exceeds 40°C.

- The battery deteriorates rapidly.
- Doing so may cause a failure or malfunction of the unit.

Do not exceed the ranges specified for environmental conditions during use/storage.

Do not install or store the unit in the places listed below.

- Do not store in places where the humidity is lower than 10% or higher than 90%.
- Do not use the unit in places where the ambient temperature is lower than 0°C or higher than 40°C. (With no condensation)
- Do not use in places where the humidity is lower than 25% or higher than 85%
- Do not install/store the unit in closed places such as cabinets with no clearance, places where there is flammable or corrosive gas, places with large amounts of dust, places exposed to direct sunlight, places exposed to shock or vibration, salty or wet places, or outdoors.
- Installation or storing the unit in such a place may cause a fire.

When you use plug strip and other plugs to connect additional devices, do not connect devices that exceed the current capacity of the available plugs.

- The current protection of the unit may operate, which may stop the output.
- The wiring of the plug strip heats up, which may cause a fire.

Do not pinch or sharply bend the cable.

Do not fold or knot the cable.

- Doing so may cause the cable to be damaged or heated, which may cause an electric shock or a fire.
- If the cable is damaged, stop using the unit and have the cable repaired.
- For repair, contact us.

All of the included accessories are designed to be used with the unit. Do not use the accessories with other devices.

- Doing so may compromise the safety of devices.

Do not block the air vents (front, rear, and sides).

- Doing so will cause the internal temperature to rise, which may cause the unit to fail and the battery to deteriorate.
- Leave at least 5 cm of space between the vent and the wall.

When installing the unit on a rack, place it on the lowermost shelf.

- Injury may result if the unit falls.

⚠ Caution (for installation and connection)

Make sure to use the mounting screws included with the brackets.

- Mounting screws other than those included may not be strong enough to support the unit, causing it to fall.
- If you attach the case using long screws other than those included with the product, you may damage the internal parts of the unit.

⚠ Caution (for use)

Do not allow the unit to come in contact with water.

If you drop the unit, stop using it.

- Doing so may cause an electric shock or a fire.
- If the unit becomes wet or is dropped, immediately stop using it, disconnect the AC input from the wall outlet (commercial power source) and have it inspected and repaired.
- For repair, contact us.

When the battery is dead, replace it immediately or stop using the unit.

- Continuing the use of it may cause fire or electric shock due to liquid leaks.

Ambient temperature	Expected life
40℃	1.7 years
30℃	3.5 years
25℃	5 years

* The values in the table are the expected life under standard use conditions and are not guaranteed.

Using a dry cloth, periodically wipe the dust from the power supply output receptacles.

- Accumulated dust may cause a fire.
- Before wiping off dust, stop all connected devices and the unit, and stop the supply of commercial power.

Do not use the unit in a closed place and do not cover the unit.

- Doing so may cause abnormal heating or a fire.
- Depending on the operating environment, hydrogen gas may be generated from the battery, resulting in a rupture or explosion. Ventilate the area around the unit.

If you notice an abnormal sound or smell, smoke, or leaking fluid, immediately turn OFF the unit's "Power" switch and stop the supply of commercial power.

- Using the unit under such conditions may cause a fire.
- If you notice such a condition, stop using the unit and contact us for inspection and repairs.
- A readily accessible disconnect device shall be incorporated external to the equipment.

⚠ Caution (for use)

If fluid (dilute sulfuric acid) leaks from the interior, do not touch the fluid.

- Doing so may cause blindness or burns.
- If the fluid contacts your eyes or skin, wash it out with lots of clean water and consult your doctor.

Do not place any objects on the unit, and do not drop heavy objects onto the unit.

- Doing so may cause distortion/damage to the case or a failure of the internal circuit, which may cause a fire

The unit is equipped with a bypass circuit which is able to supply electric power to connected devices even when the inner control circuit is broken down by defects or malfunctions.

If you want to stop the output, either stop the source of commercial power.

- Output is continuing even when all indicators of the front panel are off.
- Output ON/OFF cannot be controlled with the "Power" switch on the front panel.

Do not sit or stand on top of the product, use it as a step ladder, or lean against it.

- Doing so may cause the unit to fail or to fall over and result in injury.

⚠ Caution (for maintenance)

When maintaining the connected equipment, turn OFF the unit's "Power" switch to stop the output, and stop the supply of commercial power.

- Even if commercial power to the UPS is stopped while it is in operation, the power output of his unit does not stop and power is supplied from the receptacle.

Do not disassemble, repair, or modify the unit.

- Doing so may cause an electric shock or a fire.

If fluid (dilute sulfuric acid) leaks from the interior, do not touch the fluid.

- Doing so may cause blindness or burns.
- If the fluid contacts your eyes or skin, wash it out with lots of clean water and consult your doctor.

Do not throw the unit into fire.

- The lead battery in the unit may explode, or leak dilute sulfuric acid.

Do not insert metal objects into the power supply output receptacle of the UPS.

- Doing so may result in electric shock.

Do not insert metal objects into the battery connectors.

Do not short between the connector terminals.

- Doing so may result in electric shock.

⚠ Caution (for battery replacement)

Perform replacement on a stable and flat place.

- Handle the battery carefully so that you do not drop it.
- Risk of injury due to falling, or burns due to fluid leakage (dilute sulfuric acid).

Use a specified battery for replacement.

- Not doing so may cause a fire.
- Product model: Battery pack : BUB150RA

Do not replace the battery in a place where there is flammable gas.

- Spark may occur when connecting the battery, which may cause an explosion or fire.

If fluid (dilute sulfuric acid) leaks from the battery, do not touch the fluid.

- Doing so may cause blindness or burns.
- If the fluid contacts your eyes or skin, wash it out with lots of clean water and consult your doctor.

Do not disassemble or modify the battery.

- Doing so could cause dilute sulfuric acid leak, which could cause blindness and burns.

Do not drop the battery and do not expose it to strong impact.

- Dilute sulfuric acid may leak.

Do not short the battery with metal objects.

- Doing so could cause an electric shock, fire or burn.
- Some electrical energy still remains inside the spent battery.

Do not dispose of batteries in a fire.

- The batteries may explode.
- Dispose of used batteries according to the instructions.

Do not use a new battery and an old battery at the same time.

- Dilute sulfuric acid may leak.
- A battery can present a risk of electrical shock and high short circuit current.
- Contact with any part of a grounded battery can result in electrical shock.
- The following precautions should be observed when working on batteries:

a. Remove watches, rings, or other metal objects.
b. Use tools with insulated handles.
c. Wear rubber gloves and boots.
d. Do not lay tools or metal parts on top of batteries.
e. Disconnect charging source prior to connecting or disconnecting battery terminals.
f. Remove battery grounds during installation and maintenance to reduce likelihood of shock. Remove the connection from ground if any part of the battery is determined to be grounded.

- Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions.
  Keep unauthorized personnel away from batteries.

Notes

■Before using

Charge the battery soon after purchasing the unit.

- If you do not use the unit for a long time after the purchase, the battery may deteriorate and the battery may become unusable.
- The battery can be charged once the AC input is connected to commercial power.

When moving the unit from a cold place to a warm place, leave it for several hours before using it.

- If the unit is promptly turned ON after being moved to a warmer place, condensation may form inside the unit and cause it to fail.

Take measures for handling unforeseen accidents, such as data backup and system redundancy.

- The output may stop when there is failure in the UPS.

■Connecting

Do not connect a page printer (such as a laser printer) to the unit.

- The unit repeatedly and frequently switches between Commercial Power Mode and Battery Mode, which may shorten the life of the battery.
- The page printer has a large peak current, so an excess of the connection capacity or a power failure due to instantaneous voltage drop may be detected.

If this unit is used for an inductive device such as a coil, transformer or motor, check the operation beforehand.

- With some types of devices, the effect of inrush current may cause this unit to stop operating properly.

Check system operation beforehand if the unit is used in combination with a device whose power supply voltage and frequency fluctuate widely, such as a generator.

- If the generator's output voltage/frequency falls out of the unit's input voltage/frequency range, the unit will enter Battery Mode.

Do not short the output lines of the unit to each other, and do not short the output lines to the ground.

- The unit may fail.

In the event you transfer or sell this unit to a third party, please include all of the documentation that came with the unit. This is to ensure that the unit is used in line with the conditions described in the included documentation.

- This manual contains important safety-related information. Please read and understand the contents of the manual before beginning operation.

■Using

Before stopping the commercial power to the unit, turn OFF the "Power" switch of the unit.

- The unit enters Battery Mode when commercial power is stopped.

Do not use for an application that frequently requires Battery Mode.

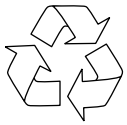
- The battery will deteriorate and fail to maintain the specified backup time.

Do not connect the AC input terminal of the unit to its Power Supply Output terminal during the Battery Mode.

- The unit may fail.

This unit uses lead acid batteries.

- Which are a valuable recyclable resource. Please recycle.



Pb

Before performing a withstand voltage test or insulation resistance test, remove the Grounding terminal screw from the back of the unit. When in use, make sure the Grounding terminal screw is securely fastened.

- Performing the withstand voltage test with the ground wire connected may damage the surge absorption element built into the power supply input circuit.

■Storing

Storing the battery in UPS, charge for at 4 hours, then turn off the "Power" switch of the unit.

Recharge the battery for at least 4 hours every 6 months when the storage temperature is 25°C or less, or every 2 months when the storage temperature is 40°C or less.

- The battery self-discharges even when it not being used, and it goes into overdischarge state if it is left for a long period of time. The backup time may become shorter or the battery may become unusable.
- We recommend keeping the temperature 25°C or less when storing the unit for long periods of time.
- Turn OFF the unit's "Power" switch when storing it.

Do not install or store the unit in a place exposed to direct sunlight.

- The rise of temperature may cause the built-in battery to deteriorate rapidly and become unusable.

1 Preparation

1-1 Unpacking the product

⚠ Caution (for installation and connection)

The approximate weight of the unit is 21 kg. Note the weight when unpacking and transporting the unit.

- Dropping may cause injury.

Open the package box and take out the UPS and accessories.

1-2 Checking the contents

Check whether all the package contents are included and there is no damage found on their appearance. If you should notice defects or anything wrong, contact us; OMRON Electronic Systems & Equipments Customer Support Center.

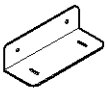
Connection cable (RS232C)	1
Remote ON/OFF connector	1
Replacing input plug for 20A (NEMA L5-20P)	1
Stand for vertical layout	2 per set
Screws for stand for vertical layout	4
Rubber feet for landscape layout	4 per set
19-Inch racks support angle	1
Label (How to determine operating status)	1
Precautions (Japanese/English/Chinese)	1
Battery replacement date label	1
Serial number label (2 per set)	1
Product warranty (Japanese)	1
Registration post card	1
User registration guide (Japanese)	1
Guidance for replace service	1
Shutdown software guide	1

1-2 Checking the contents

Connection cable (RS232C)

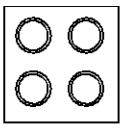
Remote ON/OFF connector

Replacing input plug for 20A (NEMA L5-20P)

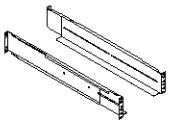


Stand for vertical layout

Screws for stand for vertical layout



Rubber feet for landscape layout



19-Inch racks support angle

Label (How to determine operating status)

Battery replacement date label

Serial number label (2 per set)

Product warranty (Japanese)

Registration post card

User registration guide (Japanese)

Guidance for replace service

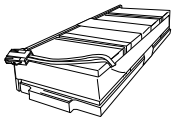
Precautions (Japanese/English/Chinese)

Shutdown software guide

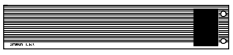
1-3 Related products

Description	Model Number
Replacement battery pack	BUB150RA※1
Expansion battery Unit	BUM150RA
SNMP/Web card	SC20G2
Contact signal I/O card	SC08
Cable (UPS service)	BUC26
Replacement fan	BUF150RA
Retaining metal clip	BUX150R

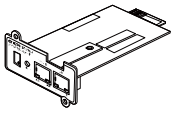
*1 Replacement battery pack (BUB150RA) information
a) 4 pcsof long life type
b) Nominal voltage of total battery string: 24VDC
c) Nominal capacity of total battery string: 34W



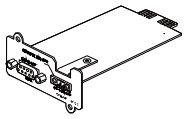
Replacement battery pack



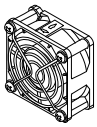
Expansion battery unit



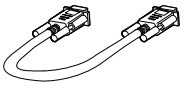
SNMP/Web card



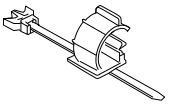
Contact signal I/O card



Replacement fan



Cable (UPS service)



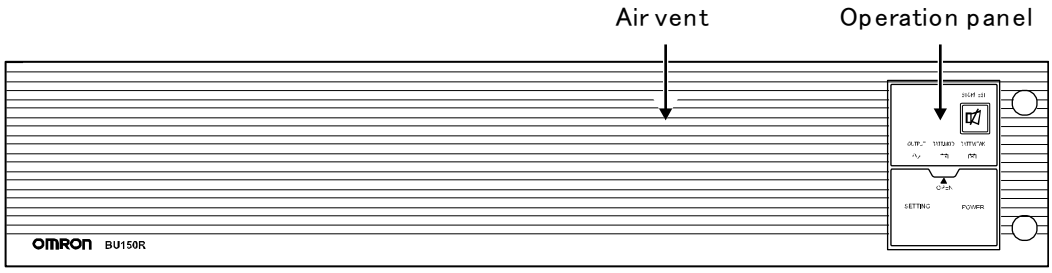
Retaining cable clamp

1-4 Name of each part

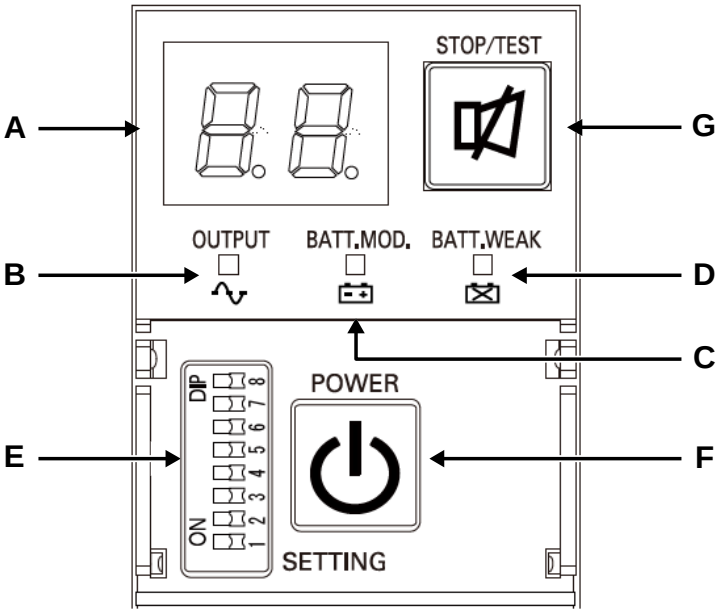
This section describes the name of each part of the UPS.

For information on the function of each part, refer to “2 Installation and connection” (P.21) and “3 Check and start operation” (P.33) that provides the details.

■Front view

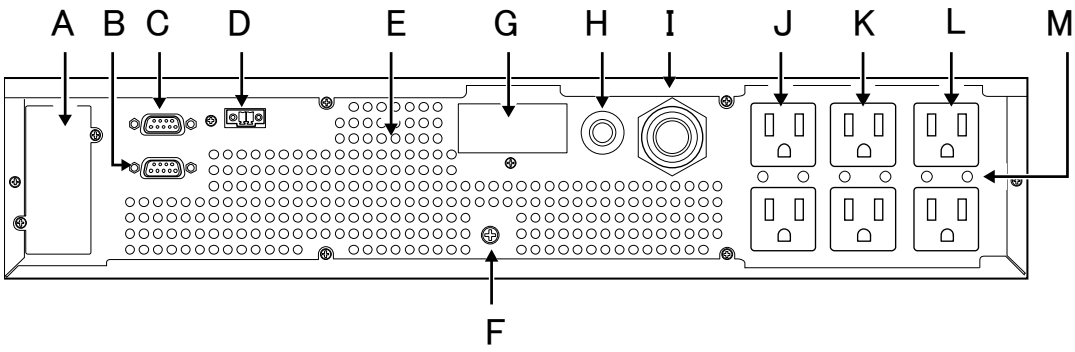


<Enlarged view of the operation panel>



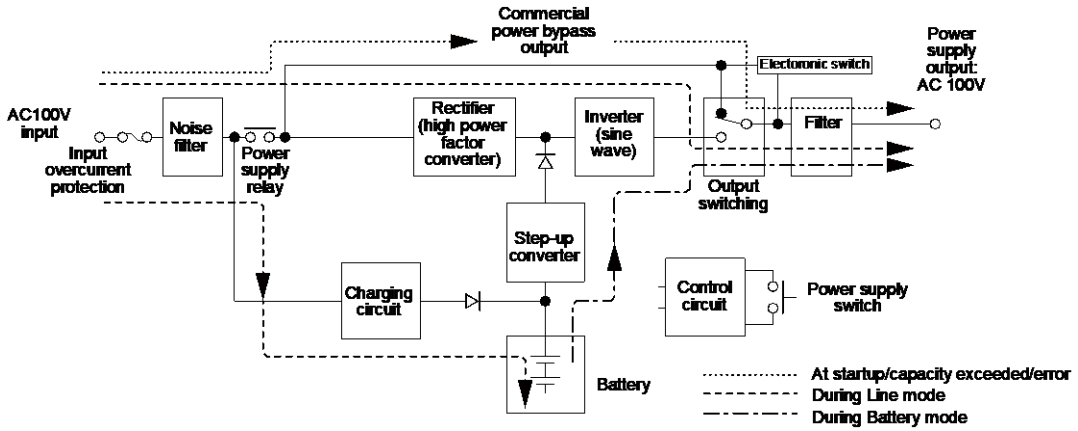
A: Status indicator
B: “Power supply output” LED
C: “Battery mode” LED
D: “Battery replacement” LED
E: “Setting switch”
F: “Power” switch
G: “Buzzer Pause/Test” switch

■Rear view



A: Option slot
B: Contact signal port
C: RS232C port
D: Remote ON/OFF port
E: Air vent
F: Ground terminal
G: Battery expansion connector
H: AC Input protection
I: AC input plug
J: Power supply output receptacle A
K: Power supply output receptacle B
L: Power supply output receptacle C
M: Hole for retaining cable clamp

1-5 Diagram of the Input/output circuit block



2 Installation and connection

2-1 Installation

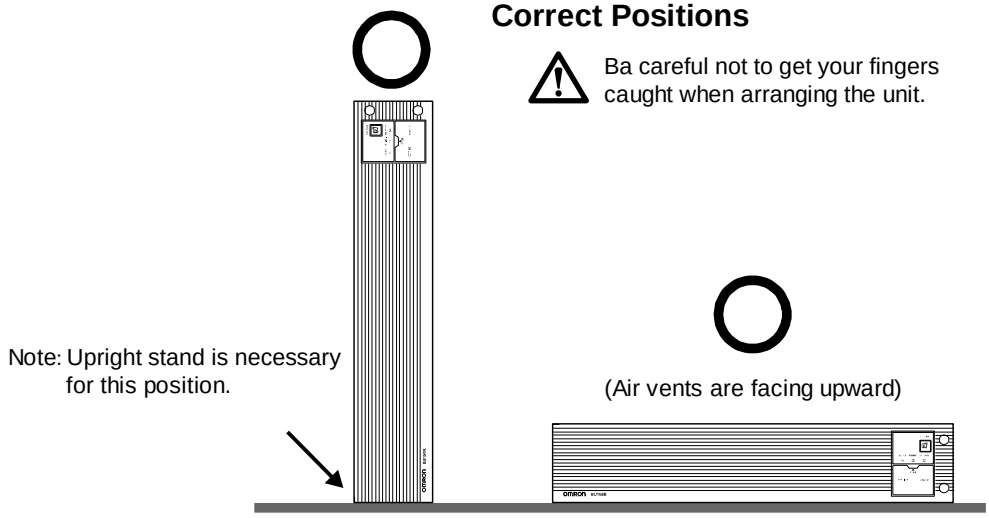
Install the UPS.

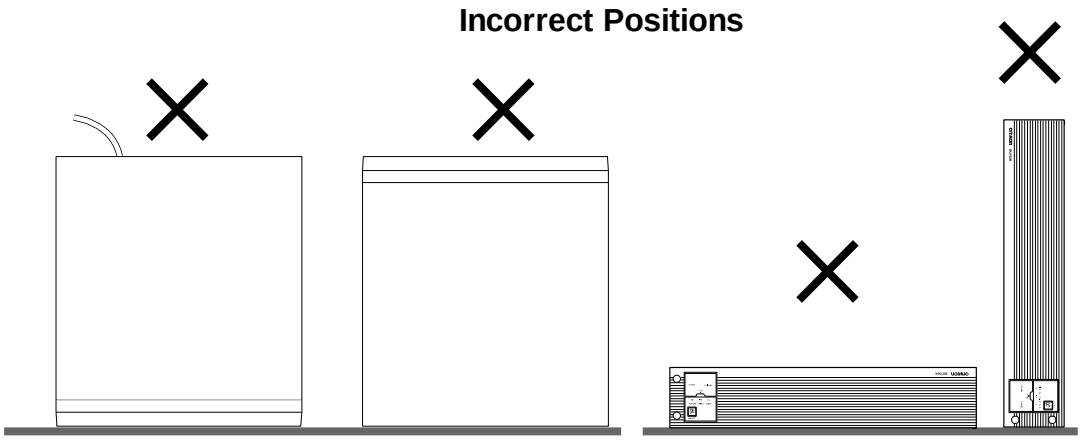
For cautions when installing the UPS, refer to "Caution (for installation and connection)" shown in the "Safety precautions" of the beginning of this manual.

Notes

- Before installing this device, make a record of the serial number of this device. The product serial number is required when contacting us about the device.
  The serial number (S/N) is inscribed on the rear panel. The product serial number label is also included.
- Allow sufficient space at the back for the AC input cables of the UPS unit and connected devices.

The UPS permits the following installing methods. Choose the one best suited for the environment.




Incorrect Positions

2-1-1 Rackmount installation (EIA/JIS 19-inch rack/server rack)

⚠ Caution (for installation and connection)

When performing rack installation, ensure that the UPS is supported and stabilized by using both the support angles and the table clamps that were rated.

- When installing on a rack, make sure that the UPS is supported by the each unit individually.
- When installing on a rack, make sure to use the support angles and table clamps included with the product. Without the support angles, the front clamp alone cannot support the weight of the UPS.
- The mass of each unit : Approx. 21kg

In a case where the UPS is to be mounted on a rack, place it on the lower part of the rack.

- Dropping it may result in injury.

Be sure to use the supplied mounting screws.

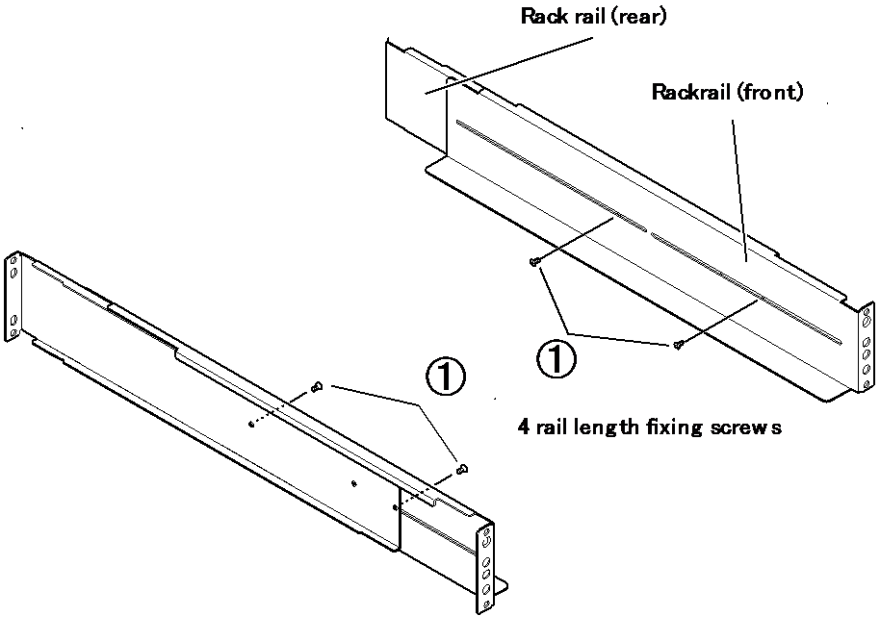
- Use of long screws other than those supplied for case mounting may damage inside the unit.
- When installing on a rack, make sure to use the support angles and table clamps included with the product. Without the support angles, the front clamp alone cannot support the weight of the UPS.
- Screws other than those supplied may not be strong enough to support the UPS, causing it to fall.

■Items included in the 19-inch rack support angle set

Rack rail (front) L	1
Rack rail (front) R	1
Rack rail (rear)	2
Ear brackets	2
Rail length fixing screws (M4 x 8)	4
Ear bracket mounting flat-head screws (M3 x 6)	8
EIA/JIS rack fixing screws (M5 x 16)	10
JIS rack fixing flat-head screws (M5 x 14)	2
EIA rack fixing nuts (M5)	10

●Rack mounting procedure

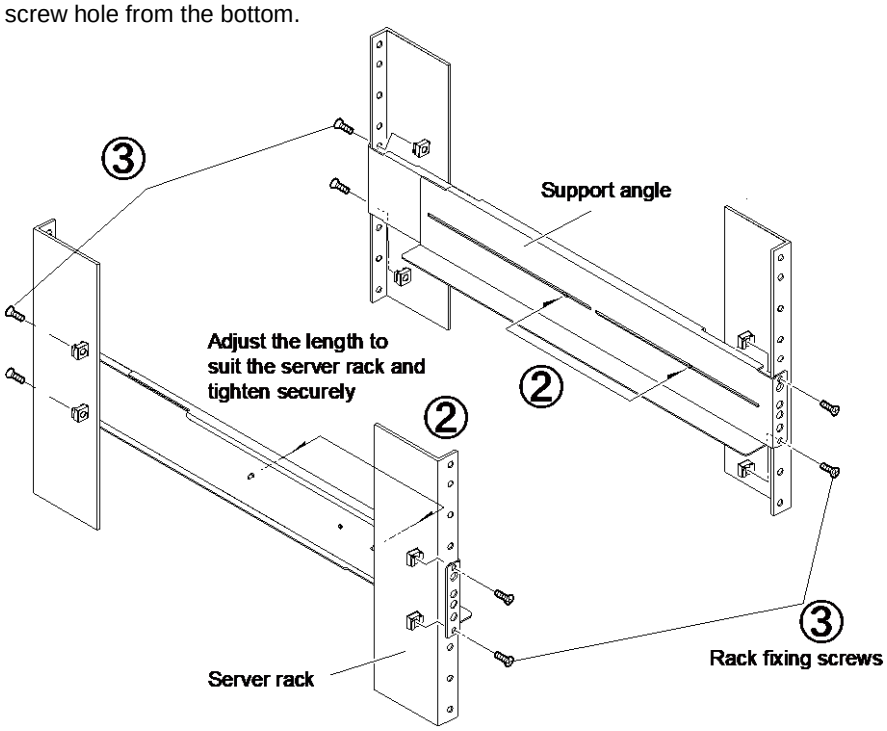
1. Insert the 4 included rail length fixing screws (M4) and half-tighten them to hold the front and rear rack rails in place. (①) There are 2 types of the front rack rail; left (L) and right (R). The rear rack rails are same.



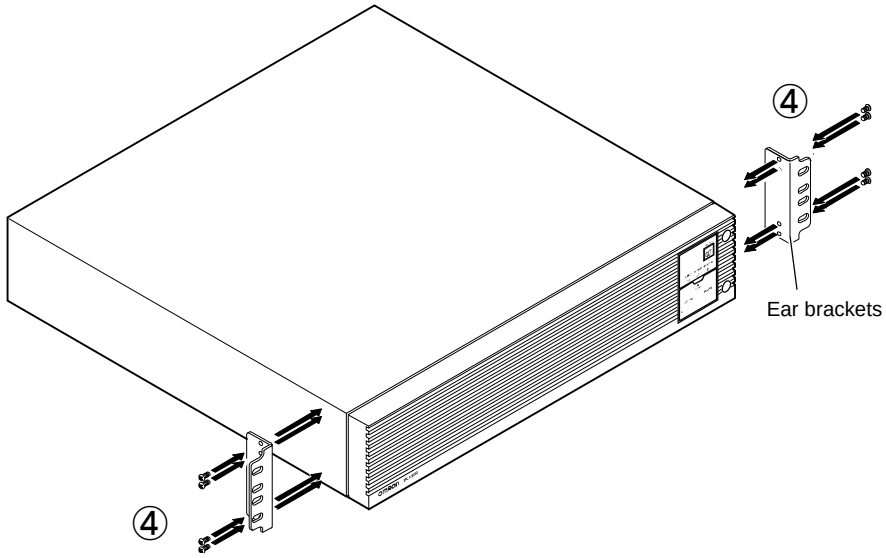
2. Adjust the length of support angles to suit the server rack, and then securely tighten the screws that were half-tightened in step 1. (②)

3. For EIA standard-compliant installation, use the 8 included EIA rack fixing nuts (M5) and 8 EIA/JIS rack fixing screws (M5) to securely fasten the front (the side displaying "L" or "R") and the back of the support angles to the server rack. (③) The screw holes are located at the top and bottom for both front and rear.

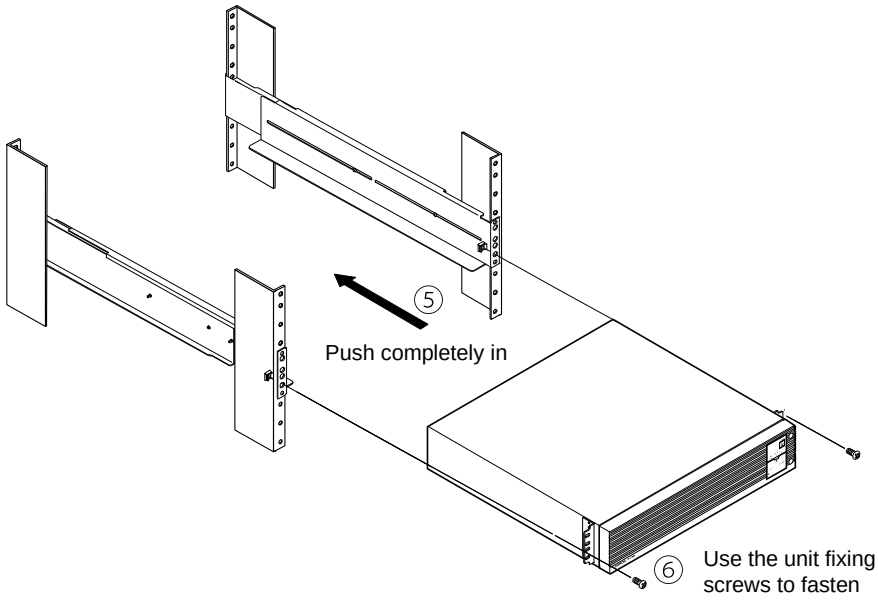
For JIS standards, use a total of 6 included screws to fix the rack; 1 JIS rack fixing flat-head screw (M5) at a front position of the each of right and left support angles, 2 EIA/JIS rack fixing screws (M5) at 2 rear positions. (③) The screw hole position for the front is at the second screw hole from the top, the rear is at the second screw hole from the bottom.



4. Use the 8 included ear bracket mounting flat-head screws (2 sets of 4 screws) to securely fasten the ear brackets to the left and right sides of the UPS. (④)



5. Place the UPS on the support angles and push it completely into the rack (⑤), and use the 2 included EIA/JIS rack fixing screws (M5) to securely fasten the ear brackets to the server rack. (⑥)



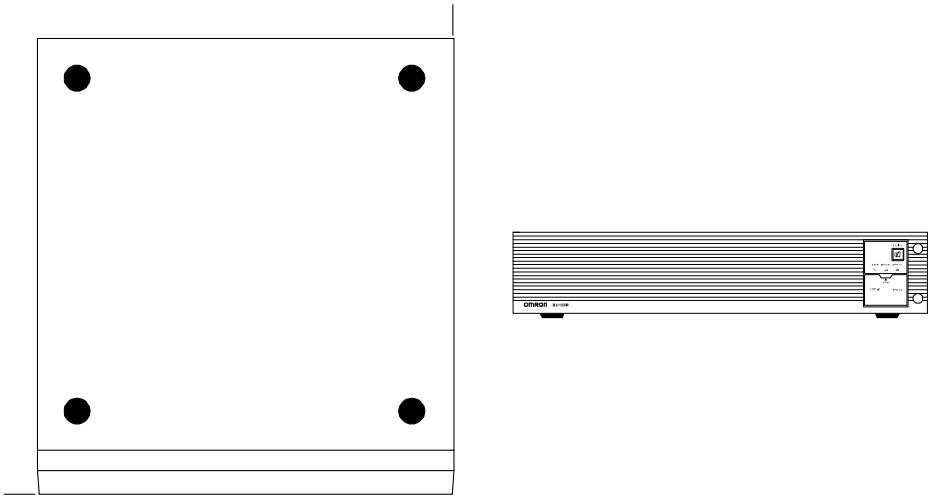
* Be sure to use the support angles.

2-1-2 Stationary installation

Install the product horizontally or vertically.

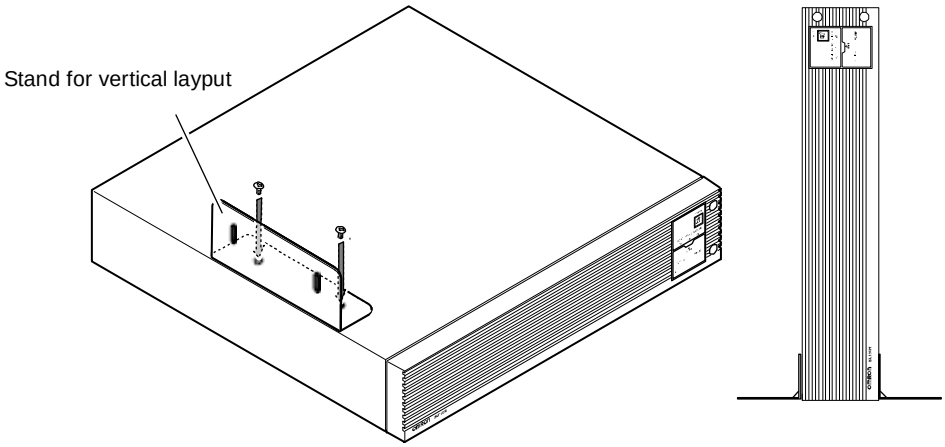
■Horizontal installation

Attach the included rubber feet for horizontal installation and position the unit horizontally. Make sure that this product does not slide or fall.



■Upright installation

Attach the rack stands for vertical layout provided with the product to the UPS unit on the left and right sides with M4 binding head 4 screws.



2-2 How to connect devices to back up

For cautions when connecting the UPS, refer to "Caution (for installation and connection)" shown in the "Safety precautions" of the beginning of this manual.

⚠ Caution (for connection)

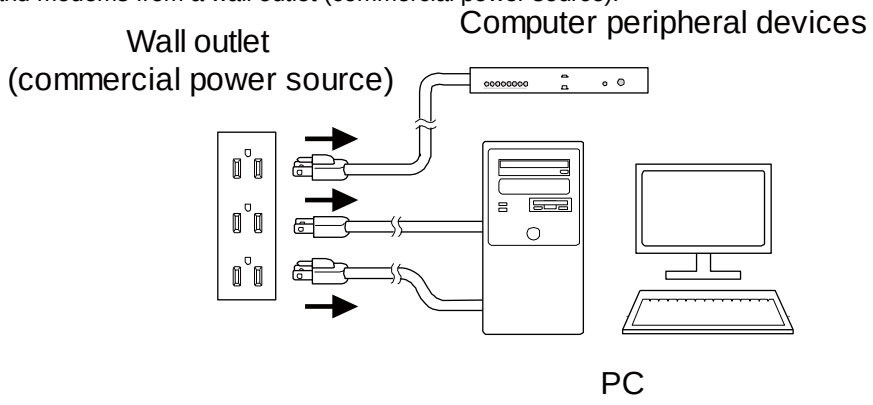
Do not connect devices, rated voltage is not 100-120VAC.

- The rated output voltage of this device is 100-120VAC.
- Overcurrent may damage the connected devices.

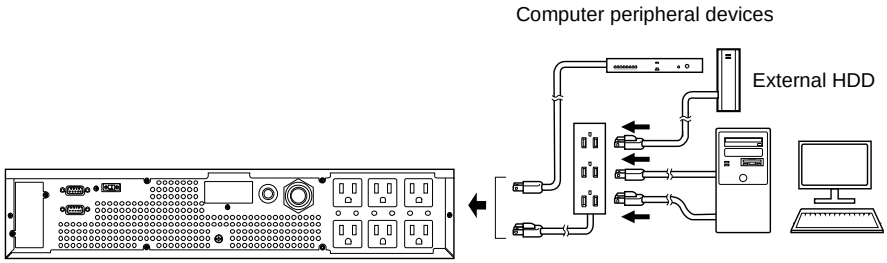
Make sure that the total power consumption of the devices connected to the "power supply output" receptacles does not exceed the output capacity rating. Reduce connected devices if overload (OL) is displayed.

Power supply output group	Output Receptacle
Group A	NEMA5-15R 2 (rated capacity15A)
Group B	NEMA5-15R 2 (rated capacity15A)
Group C	NEMA5-15R 2 (rated capacity15A)

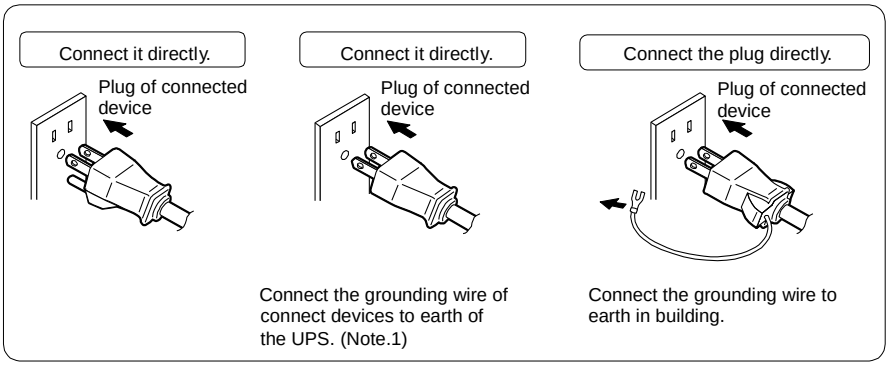
1. Disconnect the AC Input Plugs of all devices you want to back up such as your PC and modems from a wall outlet (commercial power source).



2. Connect the AC Input Plugs to the Power Supply Output Receptacles of the UPS.
* If you need more output receptacles than those of the UPS, use a plug strip.



- When the connected device has a 2-pin AC input plug, it can be connected directly to the power supply output receptacle. When using a 2-pin input plug with a grounding wire, connect the grounding wire to earth .
- When you want to use an AC adaptor, connect it to a Power Supply Output Receptacle of the UPS with space enough for the connection.



(Note.1) For use as a UL standards compliant product, this connection is not possible.

3. When using the UPS monitoring software, use the included RS232C cable. When using the Windows standard UPS service or the contact signal, use the rated connection cable (BUC26) to connect the PC.

See also "5 To perform shutdown processing of the devices" (P.78) and "6 The contact signal functions" (P. 85).

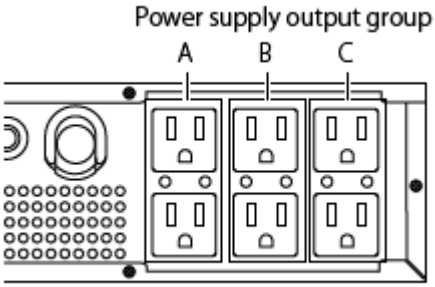
Note: If you do not use the UPS monitoring software and Contact Signal, this step is not required.

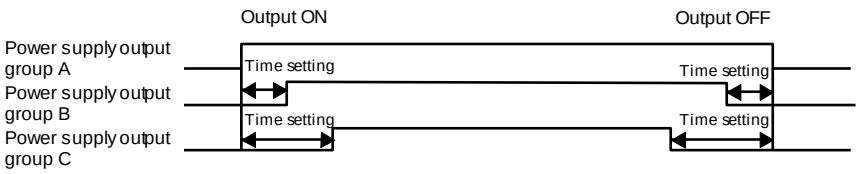
■Group-based control of "power supply output"

When the attached automatic shutdown software is used, you can use the power supply output group-based control function.
The power supply output receptacles of the UPS are divided into three groups, Groups A, B, and C.

- Each of "power supply output" Groups B and C can delay its output start time or hasten its output stop time independently of "power supply output" Group A.
- The output start and stop time control function can be controlled by the automatic shutdown software "PowerAct Pro" or "SNMP/Web card".
- While the UPS is running, ON/OFF control can be performed on power supply output from the automatic shutdown software.
- The above delay setting and ON/OFF control can be performed on each of "power supply output" Groups B and C independently.

The order in which such equipment as servers and peripherals starts up can be set by using this function.
In addition, forcible ON/OFF control on an output receptacle can be remotely performed.





■Fixing power cables

A connected power cable can be fixed with a retaining clip (BUX150R) provided as an option.
This clip prevents an input plug from being detached in such a case as when the cable is pulled.

2-3 Connecting the AC input

When installation and connection are complete, connect the unit's AC input plug to a wall outlet (commercial power source).

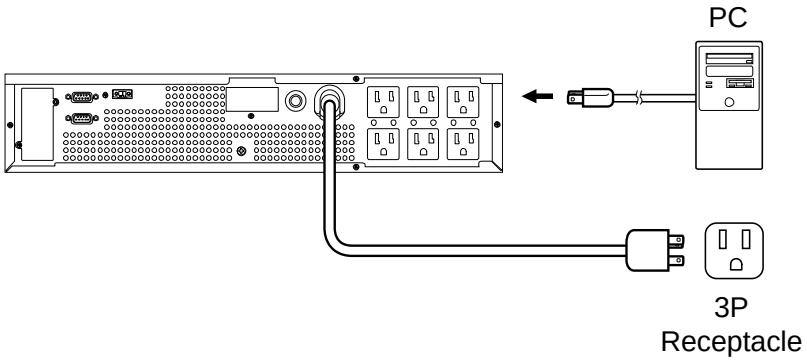
⚠ Caution (for installation and connection)

Make sure to connect the AC input of the unit into a wall outlet (commercial power source) with rated input voltage of 100/110/115/120V AC.

- Connecting to a wall outlet (commercial power source) of a different rated voltage may result in fire.
- The unit may fail.

For other cautions when connecting the UPS, refer to "Caution (for installation and connection)" shown in the "Safety precautions" of the beginning of this manual.

Connect the "AC input" plug to a 100 to 120VAC outlet (commercial power source).



Reference

- The UPS is shipped with its battery charged. However, when the UPS is used for the first time, its backup time may become short because the battery is left unused for a long time.

We recommend charging the battery before using the UPS.

- "3-2 Checking the operation" (P.40) can be performed also before charging the battery.

■How to use a 20A AC input plug (NEMA L5-20P)

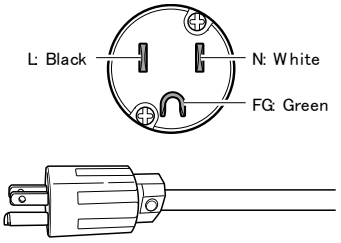
A 15A input plug (NEMA5-15P) is attached to the UPS by factory default. If the capacity is not sufficient, use a 20A input plug (NEMA L5-20P).
Use the "Setting" switch "8" (see "3-1-4 Setting Switch" (P.35)) to switch between 15A and 20A.

Remove the 15A plug and connects the attached 20A plug (NEMA L5-20P) as shown in the figure below.
Confirm the colors of the wires and fix with screws as shown in the figure.
Tighten with the tightening torque 1.57 Nm.

* Tightening with a torque other than the specified torque may lead to fire or burns.

●Using a 15A plug

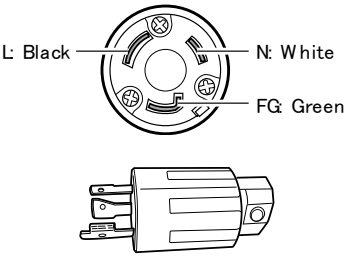
・It is possible to use a wall outlet (commercial power) with a basic 15A (NEMA 5-15) plug.
・It is possible to connect to a 2-pin outlet using the included 3P-2P adapter.



⚠ **In this case, make sure the grounding is connected separately.**

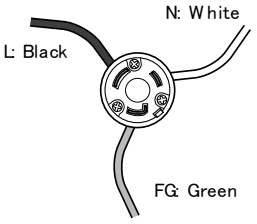
●Using a 20A plug

The maximum usable capacity is the rated output capacity of the BU150R.
・Provide a wall outlet (commercial power) suitable for the shape of the 20A plug (NEMA L5-20).
・Replace the AC input plug of the BU150R with the included NEMA L5-20 plug.



●If the input current exceeds 15A, replace the plug with the 20A plug that was included with the unit.

Changing the AC input cable
(1) Disconnect the 15A plug.
(2) Connect the NEMA L5-20 plug as shown in the diagram on the right.



⚠ **Make sure that the wire colors match those in the diagram before tightening the screw.**

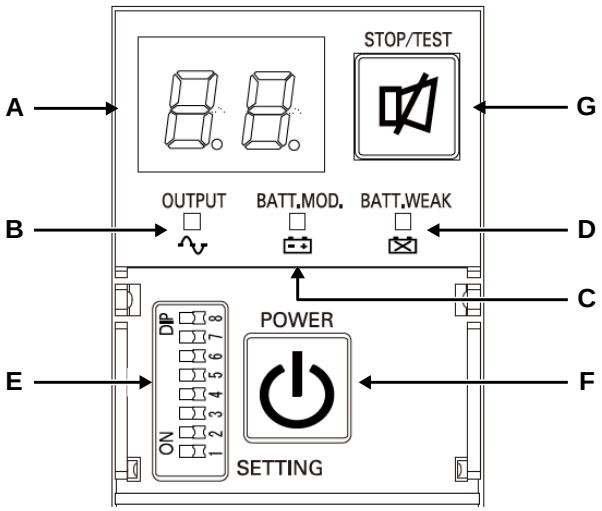
The maximum output capacity that can be connected is determined according to the settings of the setting switches (see "3-1-4 Setting Switch" (P.35)).

3 Check and start operation

3-1 The name and function for the operation and display

3-1-1 Name of each part

<Enlarged view of the operation panel>



A: Status indicator
B: “Power supply output” LED
C: “Battery mode” LED
D: “Battery replacement” LED
E: “Setting switch”
F: “Power” switch
G: “Buzzer Pause/Test” switch

3-1-2 The meaning of each LED

Sign of the figure	LED	Color	Name	Status	
				Lit.	Not lit.
B	OUTPUT	Green	"Power supply output" LED	The power supply output is ON.	The power supply output is OFF.
C	BATT.MOD.	Orange	"Battery mode" LED	Backup is operating. This status is called "Battery Mode".	Backup is not operating.
D	BATT.WEAK	Red	"Battery replacement" LED	Battery replacement is necessary due to the battery deterioration or the end of battery life.	Battery replacement is not necessary.

3-1-3 Switch

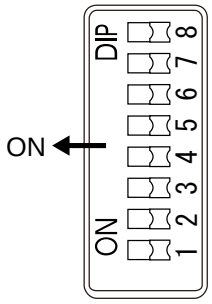
Sign of the figure	Label	Name	説明
F	POWER 	Power switch	ON: Press the "Power" switch of the UPS. The power output from the UPS begins. OFF: Press the "Power" switch of the UPS in ON state, then the power output from the UPS stops. Additional Information: If the AC input is connected to the commercial power source, then the battery will be charged regardless of the "Power" switch.
G	STOP/TEST 	Buzzer Pause/ Test switch	Stop the beeper by pressing for 0.5 seconds or longer

3-1-4 Setting Switch

After changing the "Setting" switch, follow the procedure described below.
After changing the "Setting" switch, turn off the AC input and pull off the AC input plug , wait until the status indicator is completely OFF, and then turn on the AC input.

Use a fine-pointed tool such as a small screwdriver to maneuver the switch's lever.

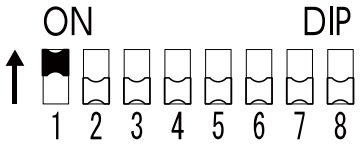
●Setting switch function list



Bit	Function to set	OFF side	ON side
1	Beeper sound in the event of power failure, etc.	Beeper sounds	Beeper does not sound
2	Auto startup after recovery from power failure	Auto startup is performed	Auto startup is not performed
3	ON/OFF the test once every 4 weeks	Test is performed	Test is not performed
4	Auto startup mode by BS signal	Mode A	Mode B
5	BS signal range	Always enabled	Enabled for backup operation only
6	Logic of Remote on/off signal	Normally opened	Normally closed
7	—	—	—
8	Select AC input plug	15Aplug	20APlug

●Setting for beeper sound in the event of power failure, etc. ("Setting" switch 1)

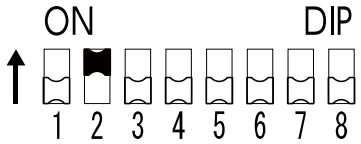
Factory setting: OFF



OFF：The beeper sounds when an alarm is necessary.

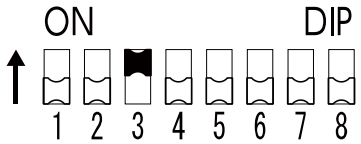
ON：The beeper does not sound for backup operation or battery replacement. The beeper sounds for other errors (connection capacity exceeded, operation error, etc.).

●Auto startup setting after recovery from power failure ("Setting" switch 2)
Factory setting: OFF



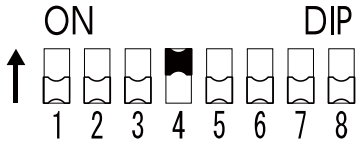
OFF : Automatically starts when power is restored.
After a power failure occurs and the unit shuts down using the shutdown software or contact signal(BS signal), the unit automatically starts and begins to output when the commercial power is restored.
ON: Does not automatically start when power is restored.
After the unit is shut down with the UPS monitoring software or contact signal (BS signal), it does not start up when commercial power is restored. Startup is performed by turning the "Power" switch OFF once, and then back ON again.

●Setting for whether or not to perform test once every 4 weeks ("Setting" switch 3)
Factory setting: OFF



OFF: The self-diagnostic test is automatically executed once every 4 weeks.
ON：Does not perform the auto test once every 4 weeks.
Use this setting to disable Battery Mode for the regularly performed test.

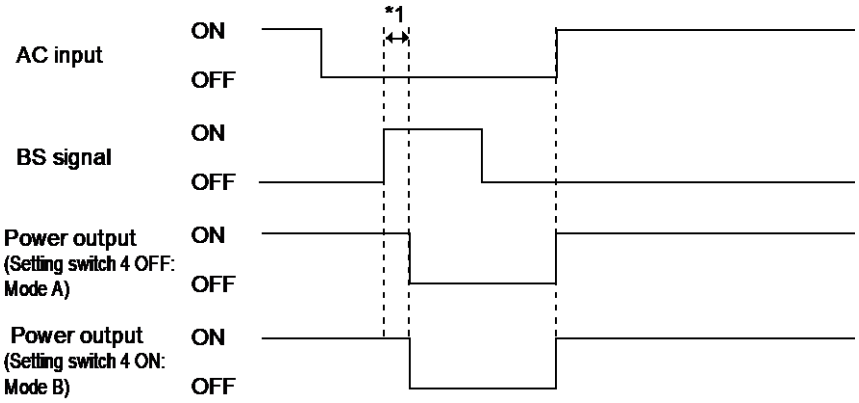
●Auto startup mode setting ("Setting" switch 4)
Factory setting: OFF



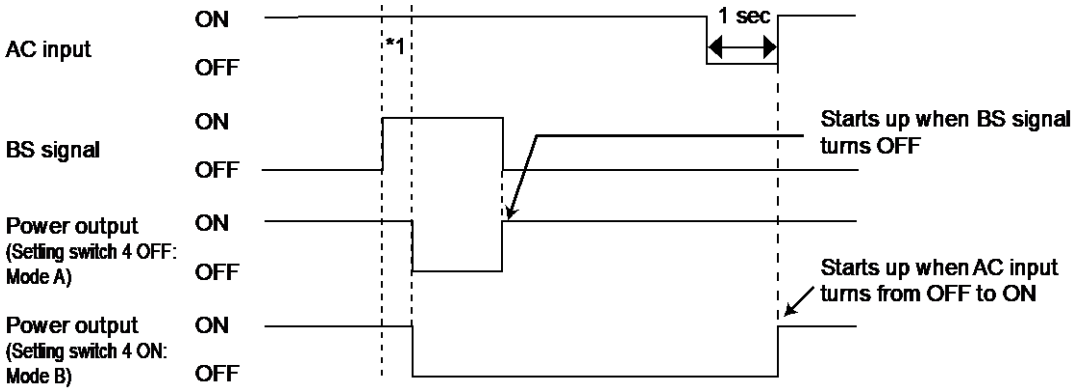
OFF: Mode A
After UPS stopped, the UPS is automatically started immediately when "ON" is detected for the AC input.
ON: Mode B
After UPS stopped, the UPS is automatically started in the AC input's "OFF to ON" timing that is detected.
(Definition of AC input OFF: When AC input is OFF for 1 second or more)

* "Setting" switch 4 is valid when the auto startup after recovery from power failure setting ("Setting" switch 2) is set to OFF (auto restart is performed).
* This setting mode is valid only after the UPS has been stopped by the contact signal backup stop signal (BS).
* When a cable is connected to the RS232C port and the UPS monitoring software is used, the unit operates in Mode A regardless of this setting.

1) When BS signal is used to stop the UPS after a power failure occurs.

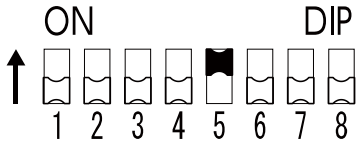


2) When BS signal is used to shut down the UPS when AC input is ON



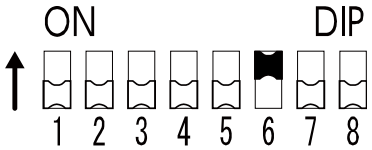
*1 For 10 seconds as a default setting.

●BSsignal range setting ("Setting" switch 5)
Factory setting: OFF



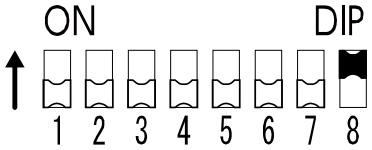
OFF: BS signal always effective (can be received)
The "power supply output" of the UPS can be stopped by turning the backup power supply stop signal (BS) "ON" for ten seconds or longer.
ON: BS signal effective (can be received) for backup operation only (cannot be received during commercial operation)
The "power supply output" of the UPS can be stopped by turning the backup power supply stop signal (BS) "ON" for 0.01 seconds (10 milliseconds) or longer.
When you do not want to stop the UPS even if the backup power supply stop signal (BS) comes in during commercial operation, make this setting.

●Logic of Remote on/off signal ("Setting" switch 6)
Factory setting: OFF



OFF: UPS start shutdown process when detecting close condition of remote input signal.
ON: UPS start shutdown process when detecting open condition of remote input signal.

●AC input plug selection ("Setting" switch 8)
Factory setting: OFF

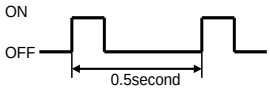
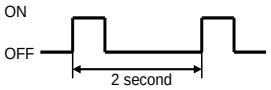
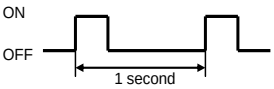
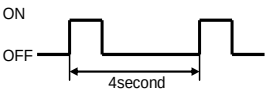


OFF: Use 15Aplug
ON：Use 20A plug

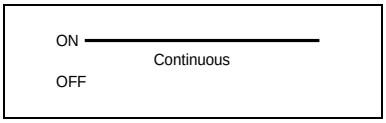
3-1-5 Beep sound

■Type of beep sound

・Intermittent

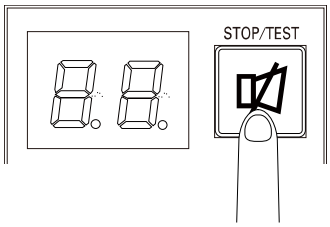
0.5-second intervals:		2-second intervals:	
1-second intervals:		4-second intervals:	

・Continuous



■Stopping the beep sound

When the beep is sounding, you can stop it by pressing and holding the "STOP/TEST" switch for 0.5 seconds or longer.



3-2 Checking the operation

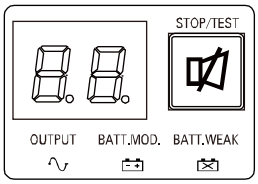
When you finish connecting the unit, check that the Battery Mode is performed normally according to the following procedure.

Pull out the "AC input" plug during operation and create the same situation as the occurrence of a power failure to check the operation.

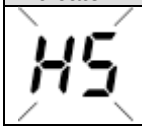
1. Press the unit's "Power" switch to turn ON the power.
When the power turns on, the beeper sounds and self diagnosis starts automatically.
* If the battery voltage is low, the self-diagnostic test is not performed.

2. When the self-diagnosis test finishes normally, the unit's operation switches to commercial power and the status indication below is displayed.

Status indicator	Description
	"Power" switch "ON" Operating normally



When the battery capacity is lower than the setting, the following display appears on 7 segment LED.
(: indicates blinking)

Status indicator	Description
	Battery charge is low, so the unit is waiting to start up.

3. Bring all the connected devices into operation. (Including devices connected to the AC outlet of your PC.)

* Operate the connected devices in a way that allows the power supply to be stopped at any time.

(Note)
The UPS has been charged prior to shipment. However, if it is left for a long period of time, it may have self-discharged.
We recommend charging the UPS before using it. When you connect it to a commercial power source, battery charging automatically starts regardless of the ON/OFF state of the "Power" Switch and charging completes within 8 hours.

4. Under this condition, check the unit's LED display and beep sound.

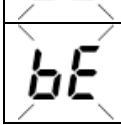
Status indicator	Beep	Power supply output receptacles
	None	Outputs power (connected devices are powered)

If the same as the one shown above	→	The operation is normal. Proceed to procedure 5.
If not the same as the one shown above	→	"3-4 Interpreting beeps and displays" (P.46) must apply. Take necessary measures and then proceed to 5.

5. Disconnect the unit's AC input from the commercial power.
The unit enters Battery Mode.

6. In Battery Mode, check the unit's LED display and beep sound.
Check the status indicator appear as one of those shown below.

(: indicates blinking)

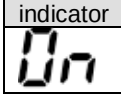
Status Indicator	Beep	Output	Description
	Intermittent 4-second intervals	ON	Backup is operating due to power failure or AC input error. Output will stop if Battery Mode continues.
	Intermittent 1-second intervals	ON	Backup is operating due to power failure or AC input error. Battery level is low, so output will stop soon.
	None	OFF	Battery is dead, so output stopped.

If not the same as one of those shown abov, operation is abnormal. Check the status of lamps and beep, and then press the "Power" switch to turn OFF the power.

- If the display is one of those shown in"3-4 Interpreting beeps and displays" (P.46) , take the necessary measures and then go back to procedure 1.
- If no Battery Mode is performed and the UPS and the devices connected to the UPS stop, this may be attributed to an insufficient battery charge.
  After connecting the AC input to the commercial power and charging the battery for at least 8 hours, go back to step 5.
- If the problem persists after checking the 2 points above, contact us.

* "Setting" switch 1 can be used to turn the beeper ON/OFF.

7. Reconnect the AC input to the commercial power source.
Status indicator returns to its normal state and the beeping sound stops.
(The status is as shown below.)

Status indicator	Description
	"Power" switch "ON" Operating normally

Checking the operation is now complete.

3-3 Start and stop procedures and basic operation

3-3-1 Start and stop procedures

For cautions when operating the UPS, including start and stop, refer to "Caution (for use)" shown in the "Safety precautions" of the beginning of this manual.

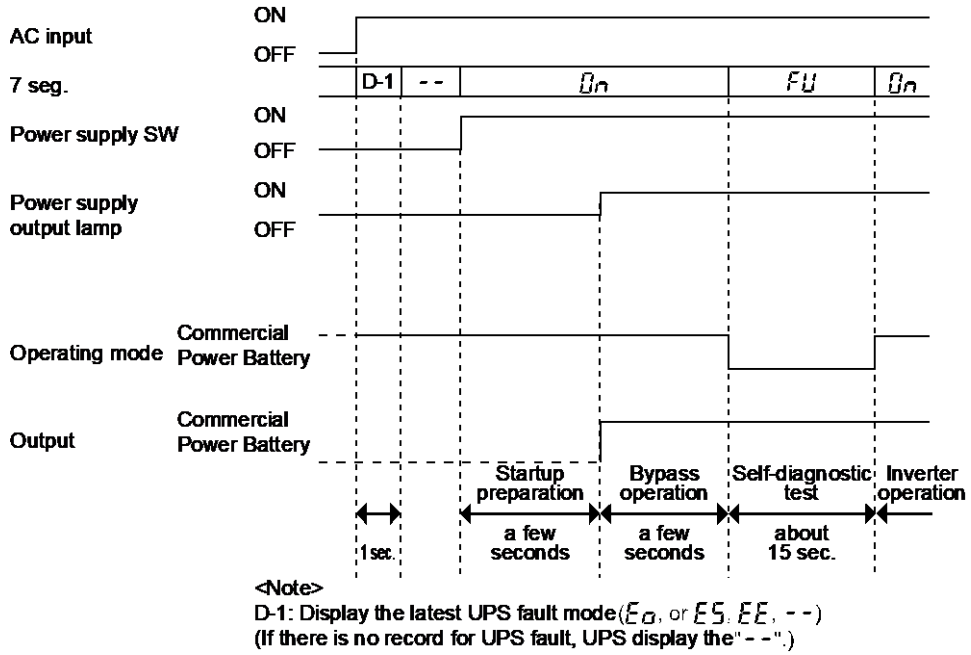
■Start procedure

Turn on the "Power" switch of the UPS.

- Output begins in Bypass Operation a few seconds after the switch is activated. (Status indicator "On")
- The status indicator displays "FU", and the self-diagnostic test is performed in Battery Mode for about 15 seconds. If the battery voltage is low, the self-diagnostic test is not performed. It is automatically executed after the battery is charged (approximately 8 hours). When the self-diagnostic test finishes successfully, switching to AC output from commercial power is performed and normal operation starts.
- When the self-diagnosis test finishes normally, the unit enters the normal operating state through inverter operation.
- When the self-diagnostic test is not performed, AC output begins immediately inverter operation.

Status indicator	Beep	Power supply output receptacles
On	None	Outputs power (connected devices are powered)

- During operation, the battery is charged automatically.



<Note>
D-1: Display the latest UPS fault mode(Eo, or ES, EE, - -)
(If there is no record for UPS fault, UPS display the"- -".)

■Operation when using

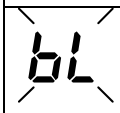
You may either leave the "Power" switch of the unit ON (operation status) or turn it OFF each time when stopping the connected system. Choose whichever operation method is more convenient.
We recommend turning OFF the "Power" switch when you do not use connected devices for a long time.
The battery can be charged once the AC input terminal is connected to a commercial power source.

■Operation after a power failure

- If a power failure or abnormal input power supply occurs, the UPS automatically switches to Battery Mode, continuing power output from the Power Supply Output Receptacles and output terminal block supplied from the battery.
- The status is displayed and the beeper sounds intermittently to alert the user.

* See also "Setting" switch 1 can be used to turn the beeper ON/OFF.

(☐☐ indicates blinking)

Icon	Beep	Output	Description
	Intermittent 4-second intervals	ON	Backup is operating due to power failure or AC input error. Output will stop if Battery Mode continues. Process the shutdown of the connected devices and stop the UPS.
	Intermittent 1-second intervals	ON	Backup is operating due to power failure or AC input error. Battery level is low, so output will stop soon. Process the shutdown of the connected devices and stop the UPS.
	None	OFF	Battery is dead, so output stopped. Charge the batery.

■Operation when a power failure is recovered

When charge of the battery remains

The unit automatically resumes output via commercial power if it recovers from a power failure/input power supply error while Backup is operating. The spent battery starts charging.

When charge of the battery does not remain

If a power failure or abnormal power input is resolved after the battery is discharged completely and power output is stopped, the UPS restarts automatically and resumes power output. The expended battery begins to charge.

Additional Information

When the power is restored after a power failure, the UPS is set by default to automatically restart and supply power.
If you do not want to restart the connected devices, "Setting" switch 2 can be used to select whether or not auto restart is performed, or turn OFF the "Power" switch of the connected devices (See also "3-1-4 Setting Switch" (P.35)).

■Operation when stopping

Note

Before stopping the commercial power to the unit, turn OFF the "Power" switch of the unit.

- When the AC Input Plugs are disconnected from a wall outlet (commercial power source), the unit enters Battery Mode. Before disconnection, turn off the “Power”.If you frequently use the unit in Battery Mode, the battery life may be significantly shortened.

Press and release the "Power" switch of the UPS, and then the "Power" switch turns OFF. The power output from the UPS stops at the same time.

Additional Information

Even if you turn off the "Power" switch, if AC is supplied from commercial power, the battery is automatically charged.

3-4 Interpreting beeps and displays

3-4-1 Displays and beeps in normal operations

○ indicates the display is OFF
● indicates the display is ON
◌ indicates blinking

(1) When "Power" switch is "OFF"

No.	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
1	88	○	○	○	None	OFF	No AC input. Operation stopped.	——
2	--	○	○	○	None	ON	There is AC input. "Power" switch is OFF.	——
3	--	○	○	◌	None	——	There is AC input. "Power" switch is OFF, or OFF⇒ON. Battery Disconnect.	Connect Battery.

(1) When "Power" switch is "OFF"

No.	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
4	On	●	○	○	None	ON	"Power" switch is ON. Operating normally.	——
5	HS	○	○	○	None	ON	Battery charge is low, so the unit is waiting to start up.	Continue charging the battery. You can change the settings with Simple Shutdown Software.

3-4-2 Displays and beeps while testing

No.	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
6	FU	●	●	○	None	OFF Discharging	Self-diagnostic test in progress.	——

NOT operation in bypass mode.

3-4-3 Displays and beeps during power failure or AC input error

(1) When "Power" switch is "ON"

No.	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
7	bU	●	●	○	Intermittent 4-second intervals	OFF Discharging	In Battery Mode due to power failure or AC input error. Output will stop if Battery Mode continues.	Check that the AC input cable is disconnect. If not resume, perform shutdown operations for the connected devices and stop them.
8	bL	●	●	○	Intermittent 1-second intervals	OFF Discharging	(Same as above.) Battery level is low, so output will soon stop.	(Same as above.)
9	bE	○	●	○	None	OFF Discharging	Battery is dead, so output stopped. (This is displayed only for a few seconds.)	Charge the battery.

NOT operation in bypass mode.

(2) When "Power" switch is "OFF"

No	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
10	HH	○	○	○	None	(ON)	AC input voltage and AC input frequency are too high.	Use within the AC input voltage/frequency range described in the specifications.
11	-H	○	○	○	None	(ON)	AC input frequency is too high.	
12	LH	○	○	○	None	(ON)	AC input voltage is too low and AC input frequency is too high.	
13	H-	○	○	○	None	(ON)	AC input voltage is too high.	
14	L-	○	○	○	None	(ON)	AC input voltage is too low.	
15	HL	○	○	○	None	(ON)	AC input voltage is too high and AC input frequency is too low.	
16	-L	○	○	○	None	(ON)	AC input frequency is too low.	
17	LL	○	○	○	None	(ON)	AC input voltage and AC input frequency are both too low.	

3-4-4 Displays and beeps when there is an equipment failure

(1) When "Power" switch is "ON"

No.	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
18	OL	●	○ or ●	○	Intermittent 0.5-second intervals	ON or Discharging	There are too many connected devices and the rated capacity is exceeded. If this state continues for as long as or longer than the times described below, commercial power continues to be supplied through bypass operation (Note 1) ・ When connection capacity is at 110% or higher: Bypass operation begins promptly.	Reduce the number of connected devices until the display appears as in status No. 4
19	OL blinking bP	● bypass	○	○	Intermittent 0.5-second intervals	ON		
20	CS	●	○	○	OFF	OFF	Battery charge stopped because the battery ambient temperature of 40°C or higher was detected.	Lower the ambient temperature to less than 40°C.
21	E0	○	○	○	Continuous	—— (Note 2)	Output stopped due to exceeded connection capacity.	Turn OFF the power switches of all devices connected to the unit reduce the number of connected devices, and turn the “Power” switch back ON again.
22	E5	○	○	○	Continuous	—— (Note 2)	Check that the connection capacity has not exceeded the rated capacity.	Check that the AC input of connected devices is not short-circuited, or that the connection capacity does not exceed the rated capacity.
23	EE	○	○	○	Continuous	OFF	Failure occurred. When the ″Buzzer Pause/Test″ switch is pressed, the details of the error are displayed (No. 26 to 31).	Turn OFF this unit and all connected devices. Then, turn the “Power” switch back ON for this unit only. If the display does not change, there is a problem with this unit. Contact the shop of purchase or our Electronic Systems & Equipments Customer Support Center.
24	EE blinking bP	--- (Note 2)	○	○	Continuous	—— (Note 2)		

No.	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
25	E1 blinking bP	● bypass	○	○	Continuous	—— (Note 2)	Switched to bypass operation due to abnormal rise in output voltage. (Note 1).	There is a problem with the UPS or the connected device. Contact our sales representative or Omron Electronic Systems & Equipment Customer Support Center.
26	E2 blinking bP	● bypass	○	○	Continuous	—— (Note 2)	Switched to bypass operation due to abnormal drop in output voltage. (Note 1).	There is a problem with the UPS or the connected device. Contact our sales representative or Omron Electronic Systems & Equipment Customer Support Center.

(1) When "Power" switch is "ON"

No.	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
27	E3 blinking bP	● bypass	○	○	Continuous	OFF	Stopped charging due to abnormal rise in battery charge voltage. When the battery discharges, bypass output is performed. (The display disappears completely.)	The UPS may be faulty. Ask for repair.
28	E4 blinking bP	● bypass	○	○	Continuous	OFF	Stopped charging due to abnormal drop in battery charge voltage. When the battery discharges, bypass output is performed. (The display disappears completely.)	(Same as above.)
29	E6 blinking bP	● bypass	○	○	Continuous	—— (Note 2)	Moved to bypass operation due to problem with the internal temperature (Note 1).	Stop the connected device. Power off the UPS, and start after a while.
30	E7 blinking bP	● bypass	○	○	Continuous	—— (Note 2)	Moved to bypass operation due to problem with the DC Bus voltage .(Note 1).	There is a problem with the UPS or the connected device. Contact our sales representative or Omron Electronic Systems & Equipment Customer Support Center.

No.	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
31	Ec blinking bP	● bypass	○	○	Continuous	—— (Note 2)	Moved to bypass operation due to problem with the half wave rectification load (Note 1) (Note 3)	Remove the half-wave rectifying load.
32	EF blinking bP	● bypass	○	○	Continuous	—— (Note 2)	External Fan Error.	Replace the fan with a spare (optional). For details on how to replace the fan, see "4-3 Replacing the fan" (P.74).

Note 1 In bypass operation, commercial power is output directly. Output stops when a power failure
(AC input OFF) occurs in bypass operation.
Note 2 The displays and operations vary according to the status.
Note 3 Devices such as dryers, some solenoid valves, etc., which have a half-wave rectifier.

（2）When "Power" switch is "OFF"

No.	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
33	EE	○	○	○	Continuous	OFF	Failure occurred. When the "Buzzer Pause/Test" switch is pressed, the details of the error are displayed.	There is a problem with the unit. Contact the shop of purchase or the OMRON Electronic Systems & Equipments Customer Support Center.
34	E3	○	○	○	Continuous	OFF	Stopped charging due to abnormal rise in battery charge voltage.	There is a problem with the UPS. Contact our sales representative or Omron Electronic Systems & Equipment Customer Support Center.
35	E4	○	○	○	Continuous	OFF	Stopped charging due to abnormal drop in battery charge voltage.	(Same as above.)
36	EF	○	○	○	Continuous	OFF	External Fan Error.	(Same as above.)

3-4-5 Display and beep for battery replacement

No	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
37	On	●	○	✱	Intermittent 2-second intervals	ON	The self-diagnosis test detected a weak battery (warning only, output continues).	Replace the battery. You can replace the weak battery with a separately purchased replacement battery as needed.See also "4-2 Replacing the battery"(P.66)
38	On	●	○	●	Intermittent 2-second intervals	ON	Battery life counter went off-scale. (Warning only. Outputs continue.)	(Same as above.)

No	Status indicator	Power supply output lamp	Battery mode lamp	Battery replacement lamp	Beep	Charging	Description	Solution
39	bU	—	—	—	None	—	Battery life counter has been reset.	Be sure to reset the battery life counter after replacing the battery. See also "4-2 Replacing the battery"(P.66)

3-5 UPS operation mode settings

3-5-1 Settable items and explanations

There are eight to select.

1) Output voltage setting
2) Maximum backup time setting
3) Reboot battery voltage setting
4) BS signal delay setting
5) BU signal delay setting
6) Dry contact logic setting
7) Dry contact test
8) Expansion unit count setting

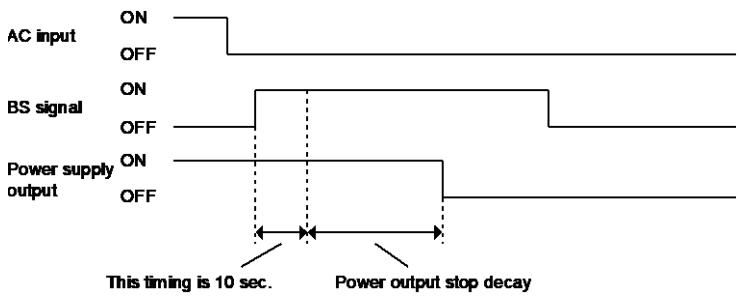
The settings available for this operation are shown below.

1. Output voltage setting (100V/110V/115V/120V)
   Four types of output voltage can be set.
   (Setting range: 100V/110V/115V/120V, Default setting: 100V)
   Output is performed at the set voltage, with no relation to the input voltage.

2. Maximum backup time setting
   Maximum backup time can be set.
   (Setting range: 0 to 90 minutes, Default setting: 0 minute)

3. Reboot battery voltage setting
   The limit battery capacity for wake-up can be set.
   (Setting range: 0 to 90%, Default setting: 0%)

4. BS signal delay setting
   It is possible to set the delay time for stopping the power supply output after the BS signal is received. (Setting range: 0 to 10 minutes, Default setting: 0 minute)



5. BU signal delay setting
   It is possible to set the delay time of BU signal after AC fail occur.
   (Setting range: 0 to 90 seconds, Default setting: 0 second)

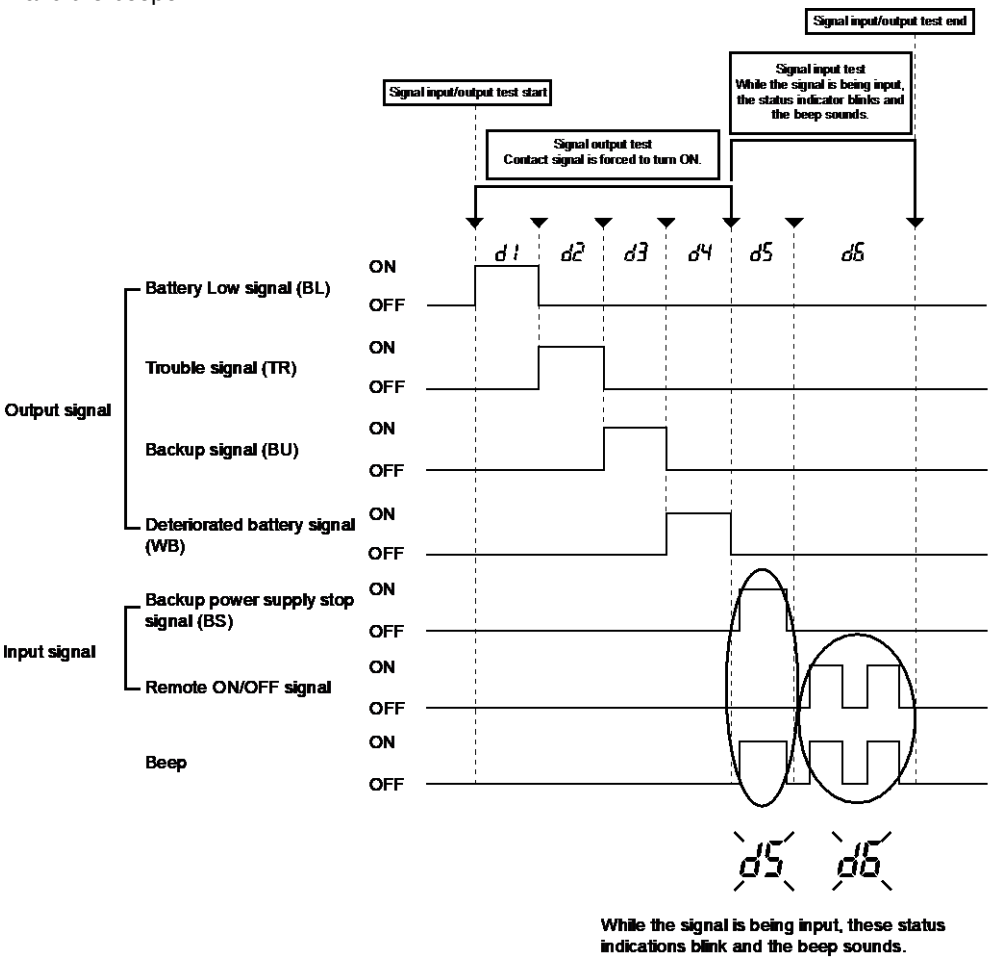
6. Dry contact logic setting (BU,BL,TR,WB)
   Four types of output signal can be set On/Off

(See also "6-1 Contact signal functions").

7. Dry contact test (BL/TR/BU/WB/BS/remote)

Four types of output signal can be forcibly turned ON.

The ON/OFF state of two types of input signal can be checked with the status indicator and the beeper.



8. Expansion unit count setting

The number of expansion batteries "BUM150RA" to be connected is set.

Be sure to set this when using expansion batteries.

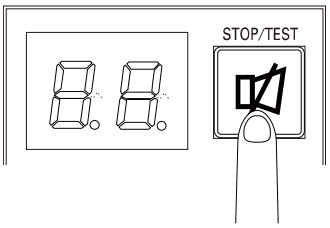
If the setting is not made correctly, it may cause a drop in backup time.

Setting range : 0 - 6 (Default setting : 0)

3-5-2 Settings

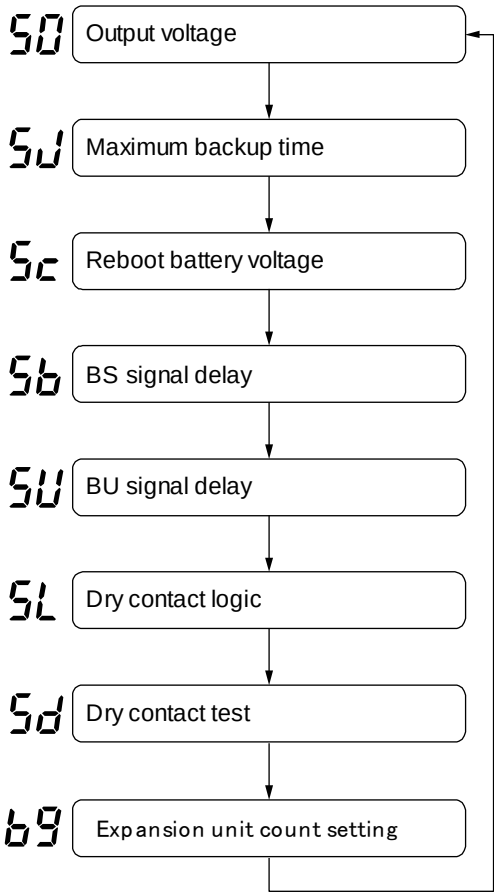
By using the following procedure, set the operation mode.

1. The "Power" switch is turned ON while the "Buzzer Pause/Test" switch is pressed. The UPS operation mode can be set.



Note: While in setting mode, output from the power supply output is OFF even if the "Power" switch is ON.

2. When the "Buzzer Pause/Test" switch is briefly pressed (for less than 1 second), the next item is displayed.
The setting items are displayed in the following order.



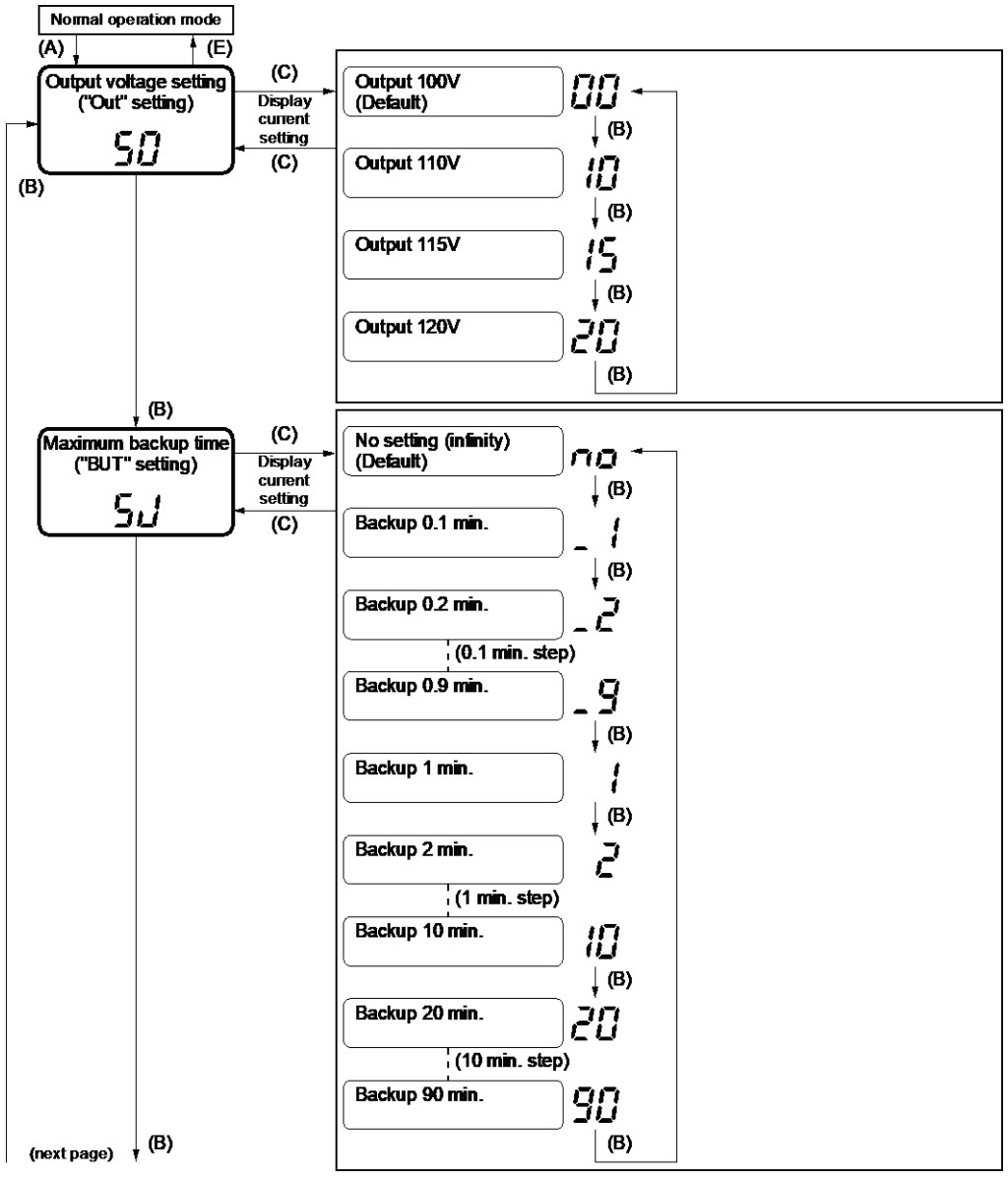
3. Hold down the "Buzzer Pause/Test" switch (for one second or longer) to enable the selected item.

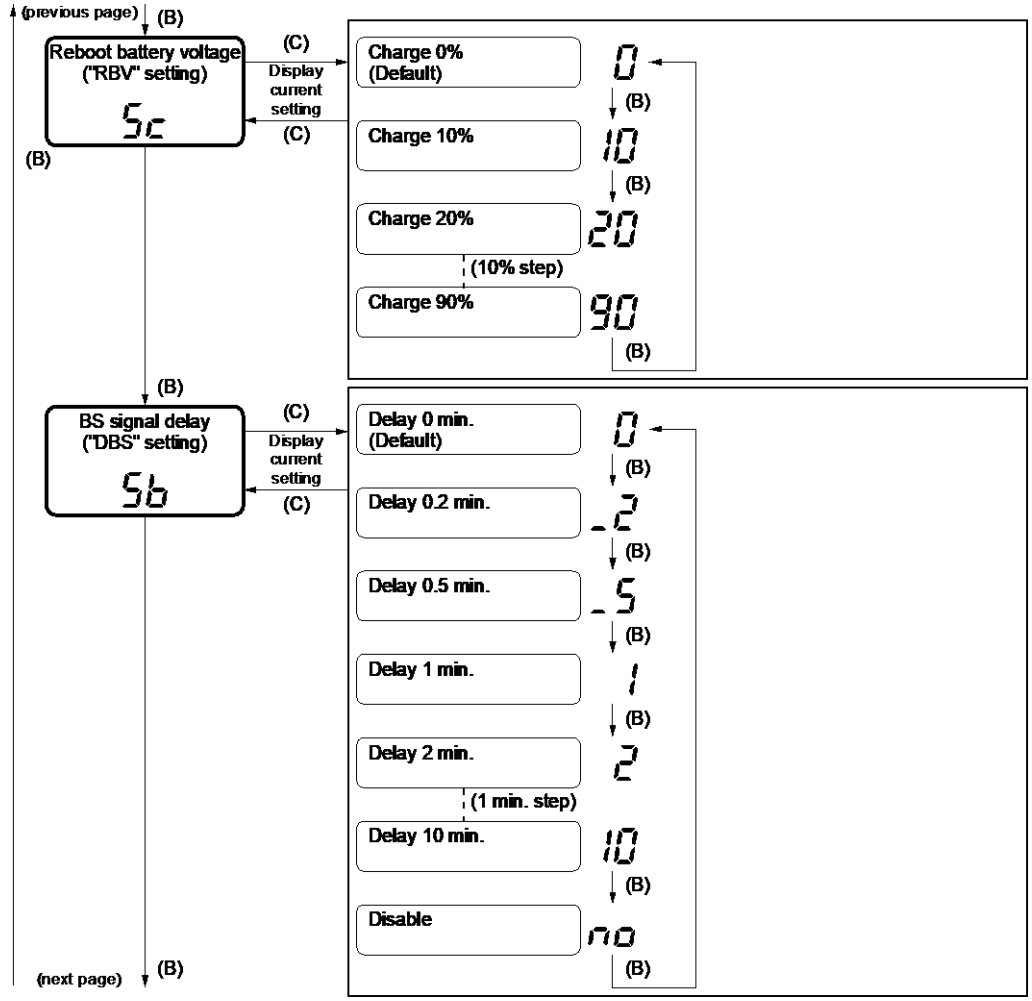
4. Shortly press the "Buzzer Pause/Test" switch (for one second or shorter) to select a parameter.

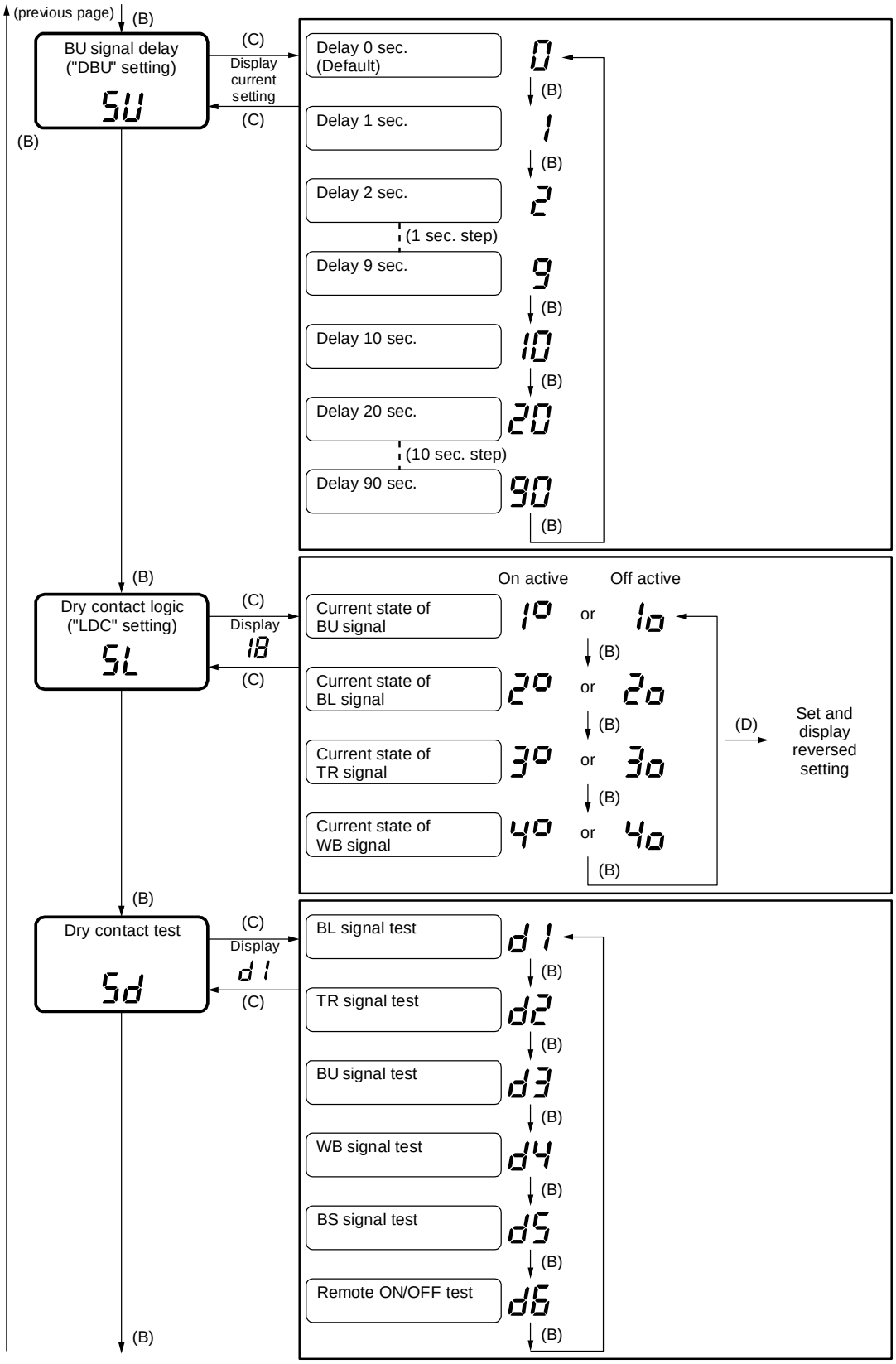
5. When the "Power" switch is turned OFF, the setting mode quits and the unit enters "Power" switch OFF status (status - -).
Press the "Power" switch again to start up the UPS.

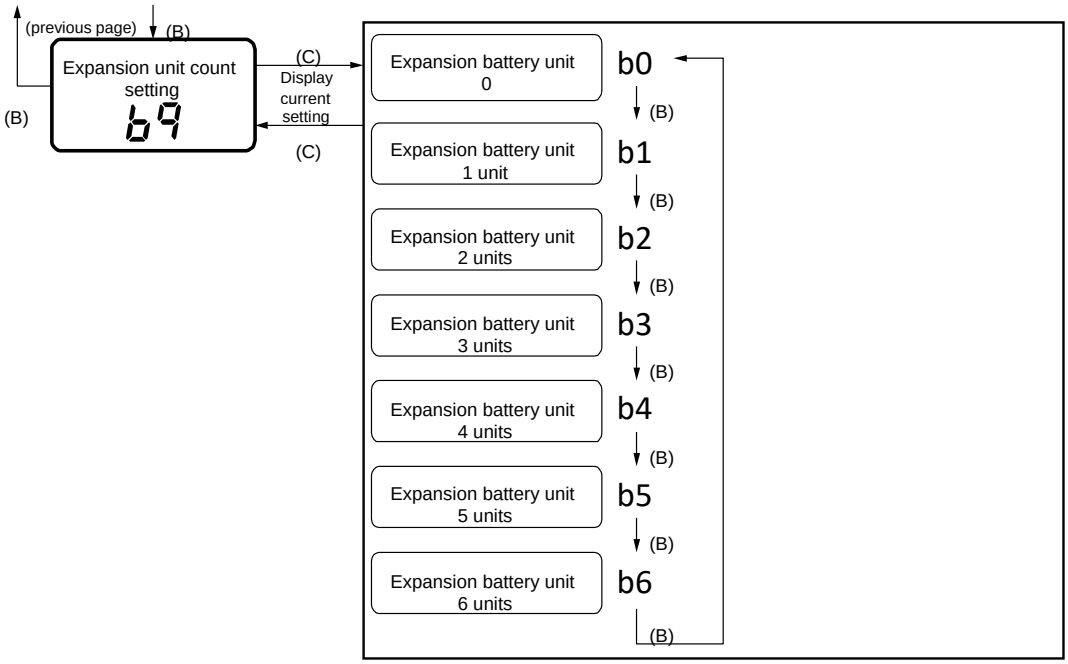
〈Operation symbols in the figure〉

Operation (A) : pressing the "Buzzer Pause switch" and turn on the "Power" switch.
Operation (B) : pressing the "Buzzer Pause switch" under 1 second and then release it.
Operation (C) : pressing the "Buzzer Pause switch" 1 to under 5 second and then release it.
Operation (D) : pressing the "Buzzer Pause switch" 5 second or more and then release it.
Operation (E) : turning off the "Power" switch.




(previous page)
(B)
Reboot battery voltage ("RBV" setting)
5c
(C)
Display current setting
(C)
(B)
Charge 0% (Default)
0
(B)
Charge 10%
10
(B)
Charge 20%
20
(10% step)
Charge 90%
90
(B)
(B)
BS signal delay ("DBS" setting)
5b
(C)
Display current setting
(C)
Delay 0 min. (Default)
0
(B)
Delay 0.2 min.
.2
(B)
Delay 0.5 min.
.5
(B)
Delay 1 min.
1
(B)
Delay 2 min.
2
(1 min. step)
Delay 10 min.
10
(B)
Disable
no
(B)
(next page)
(B)


(previous page)
(B)
BU signal delay ("DBU" setting)
5U
(C)
Display current setting
(C)
(B)
Delay 0 sec. (Default)
0
(B)
Delay 1 sec.
1
(B)
Delay 2 sec.
2
(1 sec. step)
Delay 9 sec.
9
(B)
Delay 10 sec.
10
(B)
Delay 20 sec.
20
(10 sec. step)
Delay 90 sec.
90
(B)
(B)
Dry contact logic ("LDC" setting)
5L
(C)
Display
18
(C)
On active
Off active
Current state of BU signal
1P
or
1o
(B)
Current state of BL signal
2P
or
2o
(B)
Current state of TR signal
3P
or
3o
(B)
Current state of WB signal
4P
or
4o
(B)
(D)
Set and display reversed setting
(B)
Dry contact test
5d
(C)
Display
d1
(C)
BL signal test
d1
(B)
TR signal test
d2
(B)
BU signal test
d3
(B)
WB signal test
d4
(B)
BS signal test
d5
(B)
Remote ON/OFF test
d6
(B)
(B)


(previous page)
(B)
Expansion unit count setting
b9
(B)
(C)
Display current setting
(C)
Expansion battery unit 0
b0
(B)
Expansion battery unit 1 unit
b1
(B)
Expansion battery unit 2 units
b2
(B)
Expansion battery unit 3 units
b3
(B)
Expansion battery unit 4 units
b4
(B)
Expansion battery unit 5 units
b5
(B)
Expansion battery unit 6 units
b6
(B)

4 Maintenance and Inspection

For cautions when maintaining the UPS, refer to "Caution (for maintenance)" shown in the "Safety precautions" of the beginning of this manual.

4-1 Checking the battery

The lead battery used in the unit has a limited lifespan.

The life varies depending on your storage/use environment and backup frequency.
*The nearer the end of the life is, the more rapidly deterioration proceeds.

4-1-1 Battery life expectancy

Ambient temperature	Battery life expectancy
25℃	5 years
30℃	3.5 years
35℃	2.5 years
40℃	1.7 years

* Not a guaranteed performance

4-1-2 Self-diagnosis test

This test performs a failure diagnosis on the unit and performs a test to check for battery deterioration.
Use the procedure below to check whether a circuit failure has occurred inside the unit and whether battery replacement is required.
There are two, automatic testing and manual testing, in the self-diagnosis test as follows.

■Automatic testing

The self-diagnosis test is automatically performed at the following timing in the state that the UPS is connected to a commercial power source and the charge of the battery has been completed.
User's operation to start the test is unnecessary.

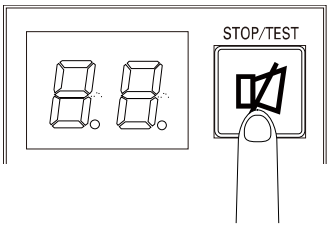
・When the "Power" switch is turned ON from OFF

・Performed with one time per four weeks on the condition that the "Power" switch is ON

When charge of the battery is not completed, the self-diagnosis test is not performed immediately.

* The automatic execution of a self-diagnostic test every four weeks can be turned ON/OFF using the "Setting" switch 3.

■Manual testing



This test can also be performed manually. Press and hold the "Buzzer Pause/Test" switch of the UPS for 5 seconds or longer. When the beeper begins to sound intermittently, release the Switch.
By performing the self-diagnosis test, backup operation is started automatically.
Status indicator "FU", No beep sounds.
After the test is completed, UPS automatically returns to the normal operation.

Additional Information

- Follow the directions for the solutions described in "3-4 Interpreting beeps and displaysInterpreting beeps and displays", "3-4-4 Displays and beeps when there is an equipment failure" (P.49) and "4-2 Replacing the battery" (P.66) .
- The self-diagnosis test can be performed also from attached UPS monitoring software. For more details, refer to the online help of UPS monitoring software.

4-1-3 How to measure backup time

1. Connect the "AC input" plug to an outlet (commercial power source) and charge the battery for eight hours or longer (for 24 hours or longer per an expantion battery unit when an expansion battery unit is connected).

2. Turn the power on for all the connected devices including the device connected to the power supply output receptacle of your computer.

* Operate the UPS in a state in which the power supply can be stopped for the connected devices in the middle of their operation.
* For WindowsServer2003/Vista/XP/Me/2000/WindowsNT/Linux/Mac, carry out this procedure when the hard disk (HD) is stopped.

3. Pull out the AC input plug and measure the backup time.
Measure the period of time from when the UPS automatically stops until all the indicators are turned off.

The backup time measured for the first time after purchasing the UPS becomes the "backup time initial value".

4-1-4 Estimated backup time

The backup time varies depending on the capacity of connected devices.
After calculating the total capacity of connected devices, refer to the graph of the backup time to obtain an estimation of the initial value of the backup time. (This is also applied to checking the battery.)

1. Convert the total capacity (power consumption) of the connected devices to watts (W).
For the indication of connected devices, check your computer and the rear of the display.
The indicator can show values in three different ways: volt-amperes (VA), amperes (A), and watts (W).
(Example)
AC100V、50/60Hz、145W
AC100V、50/60Hz、1.8A
AC100V、50/60Hz、150VA

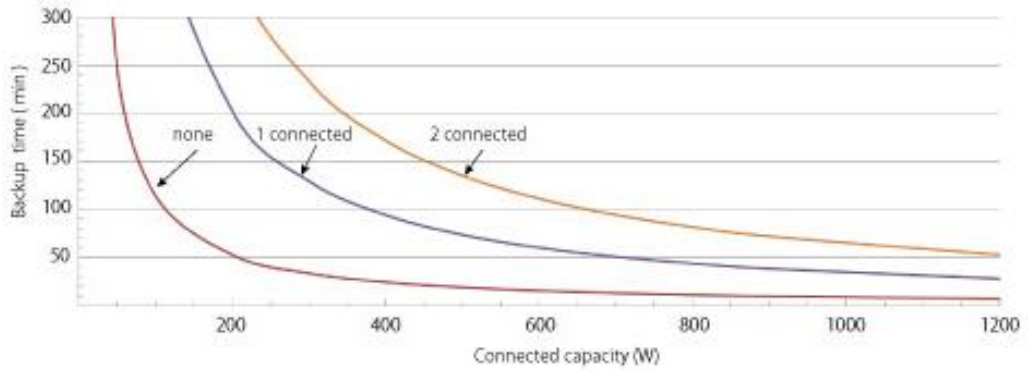
Indication	Value
A	A × power factor × 100 = W
VA	VA × power factor × 100 = W

For devices that use the VA or A indication, convert the capacity into W. Multiply the value indicated on devices by the value in the right table for conversion.
(When the power factor is unknown, enter "1". The power factor usually ranges between 0.6 and 1.)

2. Add the values converted into W to obtain the total capacity of the connected devices.

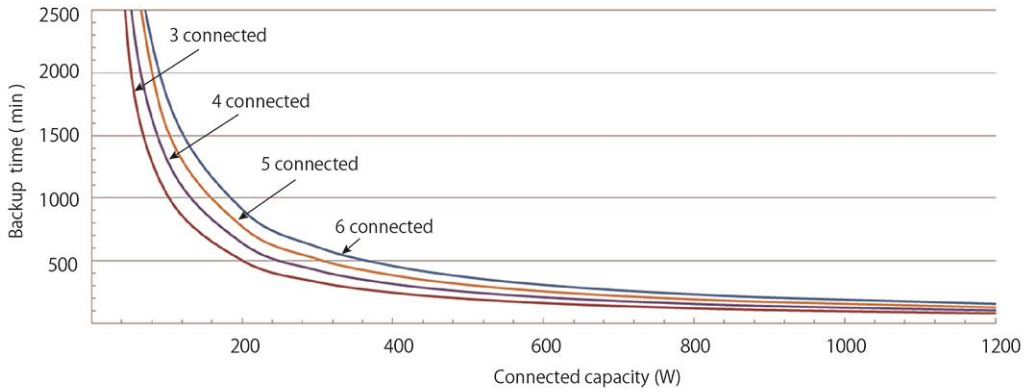
3. Calculate the initial value of the backup time for the total capacity of the connected devices from the graph on the next page.
* The smaller the capacity of connected devices becomes, the longer the backup time becomes.
* The smaller the capacity of connected devices becomes, the longer the backup time becomes.

Graph of backup time (graph of initial values for products that have not been used at 25°C).



Backup time (min)

Connected capacity (W)		50	100	200	300	400	500	600	700	800	900	1000	1200
Backup time (min)	none	241	126	65	41	29.5	22.5	18.5	14	13	10	8.4	6.5
	1 connected	750	438	235	153	107	83	67	55	47	40	35	29
	2 connected	1100	700	380	260	187	150	125	105	90	75	68	58



Backup time (min)

Connected capacity (W)		100	200	300	400	500	600	700	800	900	1000	1200
Backup time (min)	3 connected	1050	575	370	273	214	175	148	132	113	100	82
	4 connected	1300	720	482	355	283	235	194	167	145	130	108
	5 connected	1580	850	580	426	341	285	235	200	180	160	132
	6 connected	1680	1030	710	517	414	345	285	245	212	190	158

* These backup times are for reference only. Times may vary according to battery life and external environmental conditions (temperature, etc.).

4-2 Replacing the battery

The battery can be replaced while the unit is stopped (power supply output stopped).

Refer to the below-shown reference data "10-3 Battery life" for the details about the life of the battery.

⚠ Caution (for battery replacement)

Risk of explosion if battery is replaced by an incorrect type. When replacing batteries replace with the same type and number of batteries or battery packs.

Notes

- Be sure to reset the battery life counter after replacing the battery.
  Press and hold the "Buzzer Pause/Test" switch of the UPS for 10 seconds or longer to reset the battery life counter. Resetting is complete when "bJ" is displayed.
  * Reset the battery life counter with the "AC input" plug connected.
    - ・Stopping ("Power" switch OFF): When the beeper becomes a sustained beep, release the switch.
    - ・In Commercial Power Mode ("Power" switch ON): When the beeper changes from intermittent beeps to a sustained beep, release the switch.
      If you do not reset the battery life counter, a battery deterioration alarm may occur faster than the expected battery life.
- When the unit is used in compliance with UL standards, battery replacement should be performed or supervised by personnel familiar with the danger of batteries and the required precautions.
- If you replace the battery while operating, please conduct a self-diagnostic test. Press "buzzer stop / test" switch for 5 seconds to 9 seconds and release the switch when the buzzer beeps (intermittent sound). After the self-diagnostic test is started and the test is completed, it automatically returns to the operation mode.
- If an input power supply error such as a power failure occurs when replacing the battery while in operation, backup cannot be performed and output stops.
- Do not replace the battery while the UPS is operating in backup mode. Output will stop.
- Write the battery replacement date in the attached battery replacement date sticker provided with the replacement battery pack, and attach the sticker to the UPS.
  * We are collecting replaced and unneeded batteries at no cost provided that the costs of shipment to us are borne by the customers. For details, see the attachment " Guidance for replace service " provided with the replacement battery pack.

 Additional Information

When the battery replacement LED lights up/blinks and beeper sounds, press the "Buzzer Pause/Test" switch for 0.5 seconds to stop the beeper. (Lighting/blinking of "battery replacement" LED does not disappear.)

4-2-1 Notification that the battery needs to be replaced

This Battery life counter function notifies you with LED display and beep sound when the battery needs to be replaced.
The battery life is determined by the counter function. The battery life counter operates while commercial power is supplied after shipment. (When the ambient temperature of the battery is higher than 25°C, the value of the counter will be incremented at a faster pace.)

Notes

The lead battery used in the unit has a limited lifespan. The life varies depending on your storage/use environment and backup frequency.

- The nearer the end of the life is, the more rapidly deterioration proceeds.
- Refer to the below-shown reference data " 10-3 Battery life " for the details about the life of the battery.
- Even if battery is storage condition, deterioration proceeds. The higher the temperature i, the shorter battery life.

■Guidelines for how often to check the battery

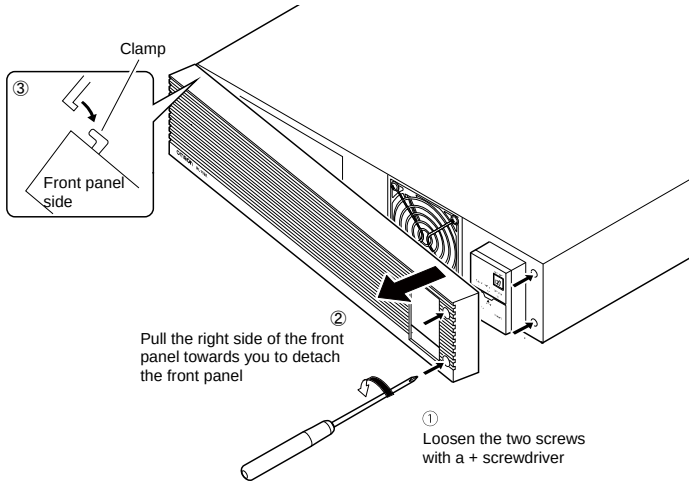
Average ambient temperature	6-month check	Monthly check
40℃	For the first 1 years after starting use	When 1 years or more have passed after starting use
30℃	For the first 3 years after starting use	When 3 years or more have passed after starting use
25℃	For the first 4 years after starting use	When 4 years or more have passed after starting use

4-2-2 Procedure for replacing the battery

For cautions when replacing the battery of the UPS, refer to "Caution for battery replacement)" shown in the "Safety precautions" of the beginning of this manual.

1. Loosen the two screws on the right side of the front panel with a + screwdriver (①). Pull the right side of the front panel towards you to detach the front panel (②).

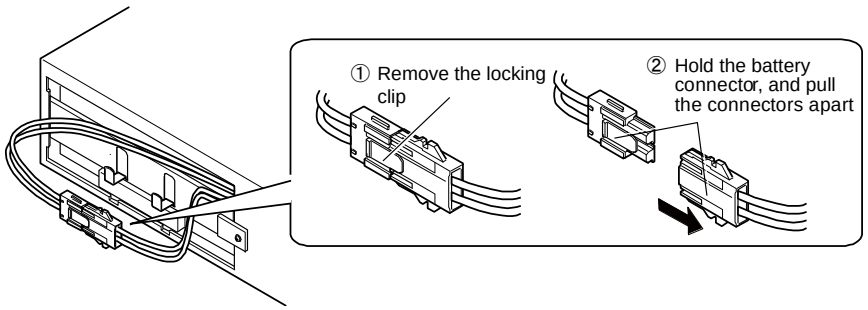
* Do not pull the front panel strongly towards you. The clamp may be damaged. Pull the front panel towards you a little first, and detach the front panel while sliding it to the right(③).



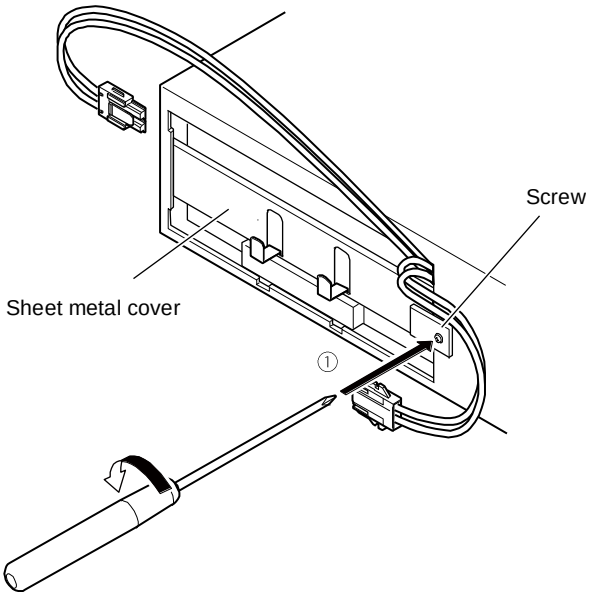
2. Remove the battery connectors from the cable holders.

Remove the locking clip of connectors (①).

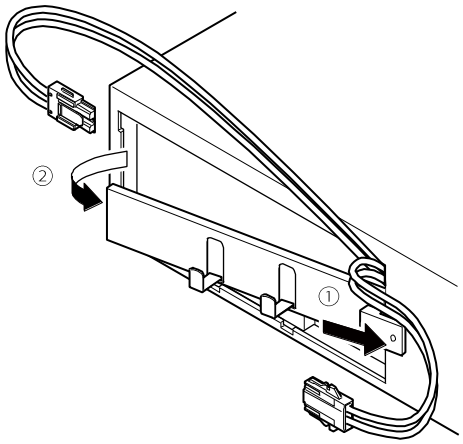
Hold the battery connector, and pull the connectors apart (②).



3. Remove the screw on the sheet metal cover (①).

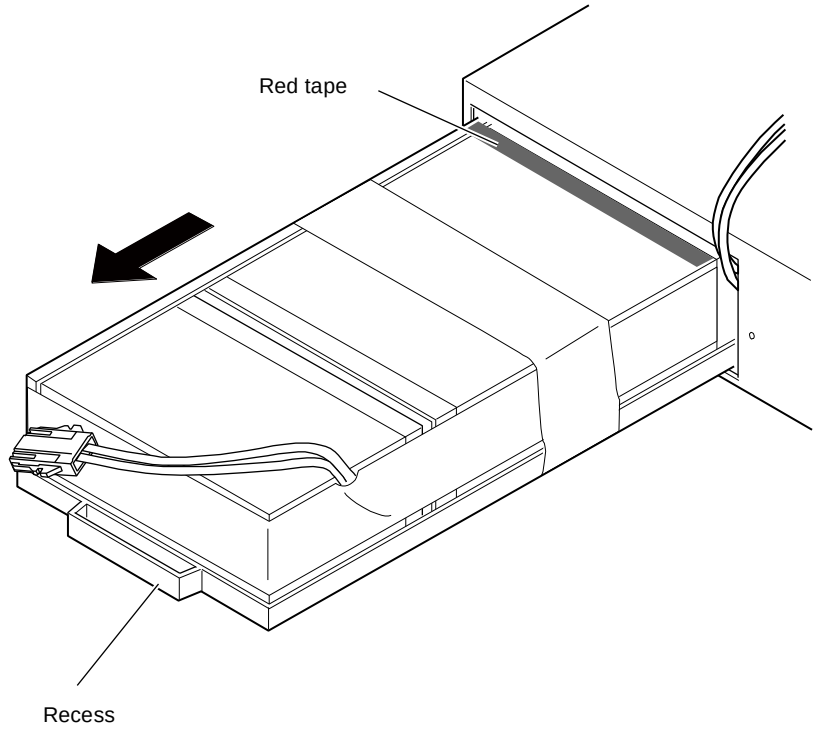


4. Lightly push in the sheet metal cover to the right (①) first, and pull the left side towards you to detach it (②).



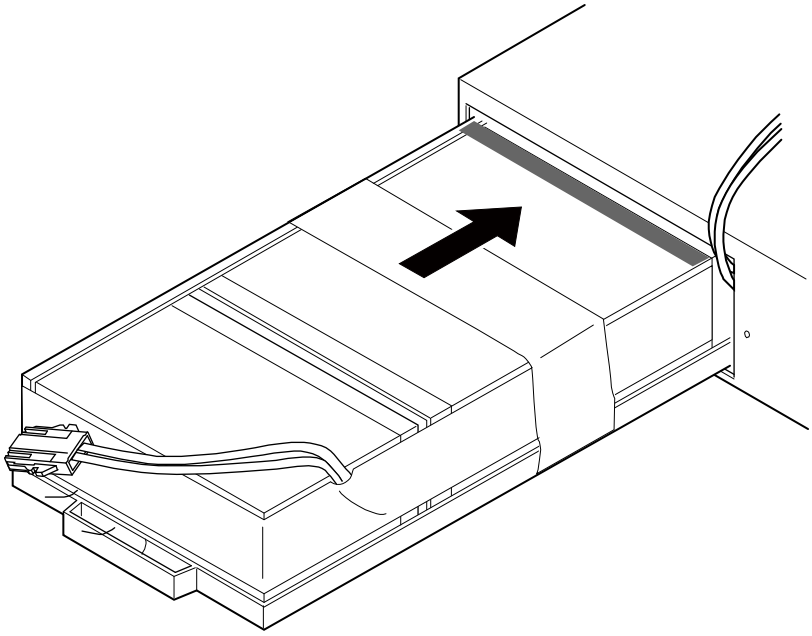
5. Put your finger into the recess at the bottom of the battery pack and pull the battery pack out. When the red tape attached to the top of the battery pack appears, you can completely remove the battery by pulling it towards you 10cm more. Hold the battery tight with both hands and be careful not to drop the battery.

* To pull out the battery pack, do not take hold of its connector or cable.
* Handle with care as the battery pack is heavy.

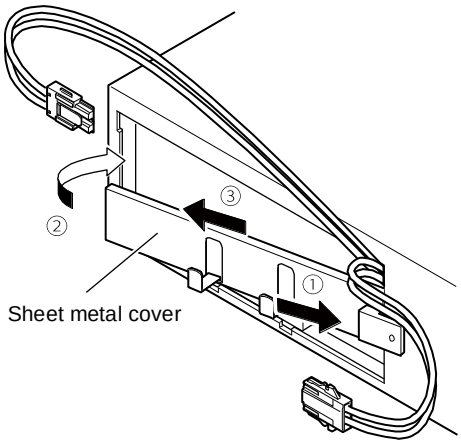


6. Insert a new battery into the UPS as far as it will go.

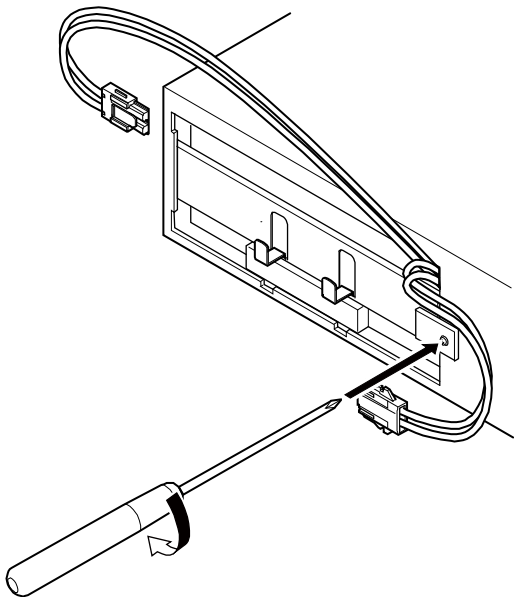
・Replacement battery pack : model : BUB150RA



7. Insert the right end of the sheet metal cover into the UPS unit (①), push the left side in (②), and attach it by sliding it to the left (③).



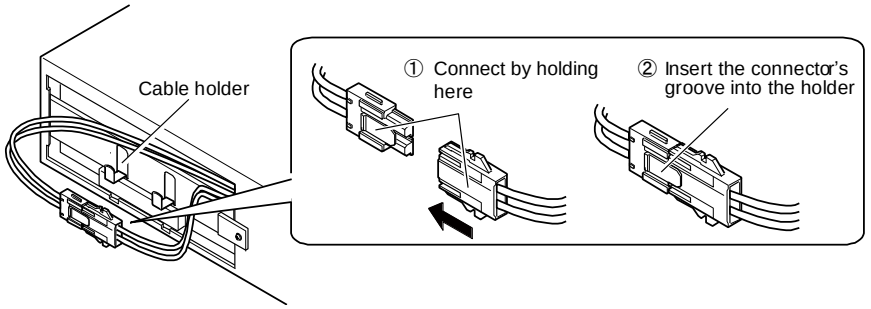
8. Fix the sheet metal cover with a screw.



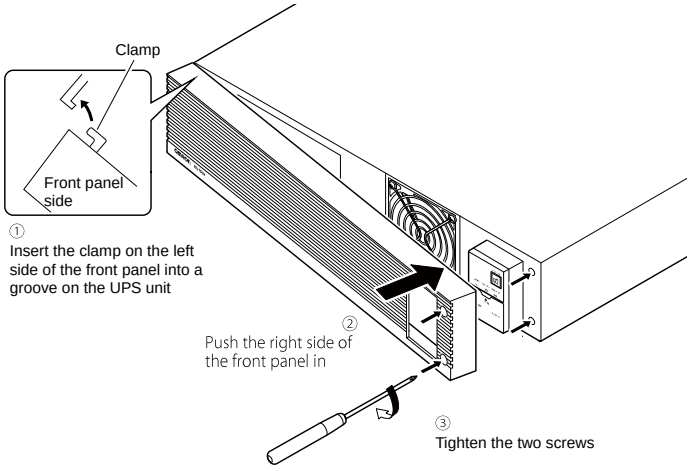
9. Connect the battery connector (①) and insert the connector's groove into the holder (②).

Attach the battery cable to the cable holder.

Note : You may hear a “pop” sound when you connect the battery if it is replaced after the unit’s operation is stopped, but this sound is not abnormal.



10. Attach the front panel to the unit.
Insert the clamp on the left side of the front panel into a groove on the UPS unit (①), and push the right side of the front panel in (②).
Securely tighten the two screws on the right side of the front panel with a + screwdriver (③)



Battery replacement is now complete.

4-3 Replacing the fan

The fan in the unit has an expected lifespan of approximately 5 years.

Replace it when the Error Lamp is lit and the fan is stopped.

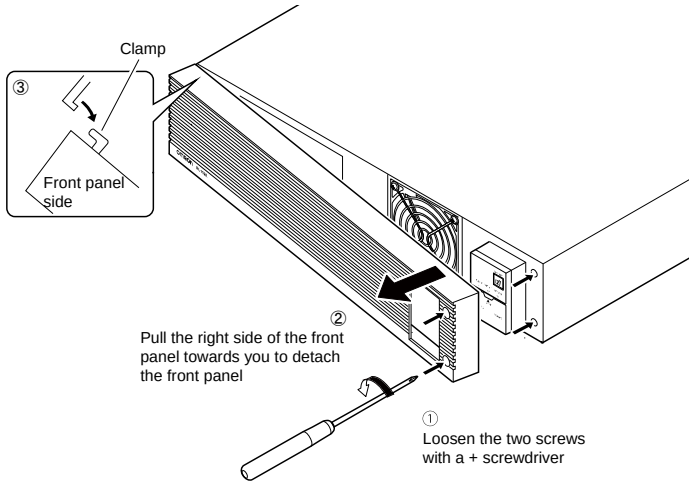
⚠ Caution (for replacing the fan)	
When this product is used in compliance with UL standards, do not replace the fan. ● Fan replacement does not comply with UL standards.	
Do not insert your hand or metal objects into the fan recess. ● Doing so may cause electric shock or short-circuit.	
Do not put your fingers into the fan. ● The fan spins when connecting the AC input. ● Doing so may result in injury.	
Before turn off the "Power", disconnect the AC Input Plugs from a wall outlet (commercial power source).	

4-3-1 Fan replacement procedure

* Make sure that UPS doesn't connect to any AC inputs and the fan stops.

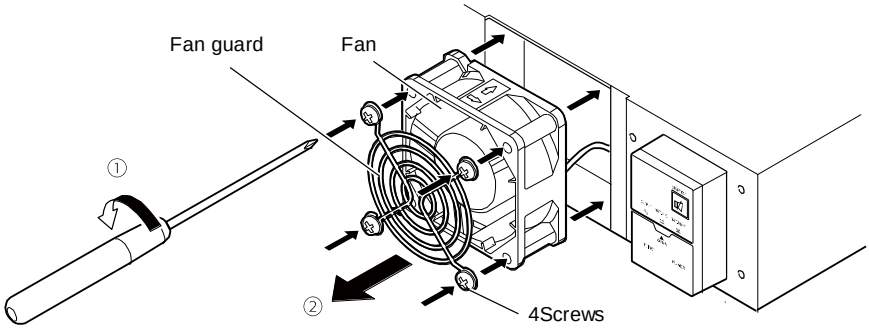
1. Loosen the two screws on the right side of the front panel with a + screwdriver (①). Pull the right side of the front panel towards you to detach the front panel (②).

* Do not pull the front panel strongly towards you. The clamp may be damaged. Pull the front panel towards you a little first, and detach the front panel while sliding it to the right(③).

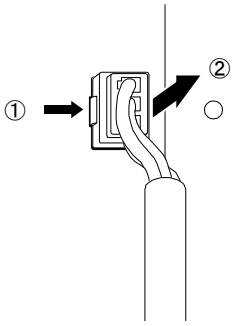


2. Remove the 4 cooling fan screws (①) and the fan guard.

Pull the fan toward you to remove it. (②)

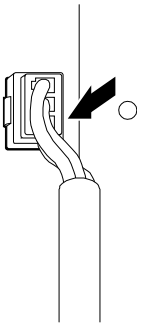


3. While pressing up on the tip of the fan connector (①), pull it toward you to disconnect it. (②)



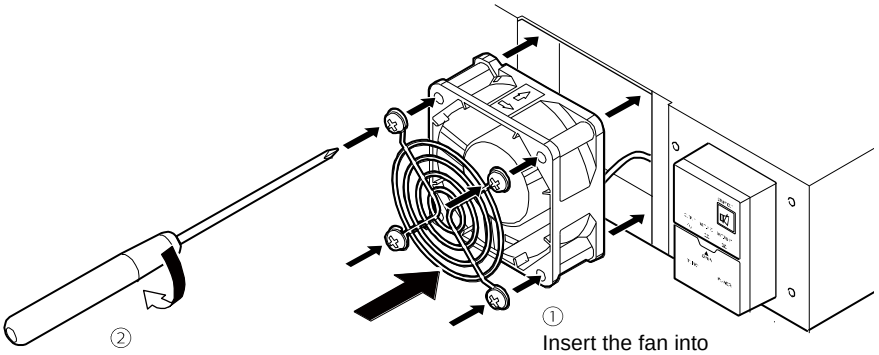
4. Insert the new fan connector until it clicks into place.

・Replacement fan : Model BUF150R

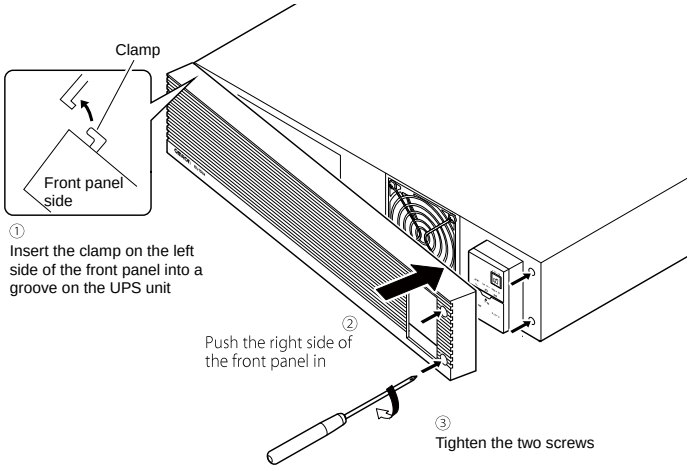


5. Insert the fan into the UPS unit. Place the fan guard (①) and fix the fan guard and the fan together with four screws (②).

* Make sure the cable does not become pinned under the fan's cover.
* Fix so that the label on the fan unit faces the back side.



6. Attach the front panel to the unit.
Insert the clamp on the left side of the front panel into a groove on the UPS unit (①), and push the right side of the front panel in (②).
Securely tighten the two screws on the right side of the front panel with a + screwdriver (③)



Fan replacement is now complete.

4-4 Cleaning

Moisten a soft cloth with water or detergent, squeeze it tightly, and wipe the product lightly. Do not use chemicals such as thinner and benzene. (They cause deformation or discoloration.)

5 To perform shutdown processing of the devices

5-1 The outline on the UPS monitoring software

Automatic shutdown software is a software application for controlling the connected computer such as performing end processing when the UPS detects an input voltage error (such as a power failure).

Notes

Restrictions on the commercial power interruption time during the scheduled operation by automatic shutdown software

- While the scheduled operation is set, if the UPS is not connected to a commercial power source for a long period of time, the internal timer will be reset.
  ・To keep the internal timer active, connect the UPS to a commercial power source in approximately three months.
  ※Battery deterioration over time reduces the period for keeping the internal timer active.

When manually starting during the scheduled operation using the UPS monitoring software

- To manually start up this unit after it has been stopped by a scheduled operation, turn OFF the "Power" switch and turn it back ON again.
  To stop the unit when it is in operation, turn OFF the "Power" switch.
  Auto restart after OS closing processing using the UPS monitoring software.

When the power is restored while auto shutdown processing is being performed

- If a power failure occurs and then the power is restored while auto shutdown is still in progress, UPS output will stop temporarily after the set time elapses. After shutdown is finished, do not turn on the computer until the UPS has finished restarting.

5-1-1 UPS monitoring software function list

This UPS supports automatic shutdown software. According to your usage, download necessary software from the Website as needed.

●: Supported, —: Unsupported

Functions / Software title			General applications (Simple functions, standalone)	Network management applications (Advanced functions, network support)
			Simple Shutdown Software	PowerAct Pro
Refer to the section number			Section 5-2	Section 5-2
Software functions (Refer to the reference following)	1.	Auto shutdown	●	●
	2.	UPS monitoring (operating status)	—	●
	3.	UPS monitoring (data)	—	●
	4.	Pop-up notification	—	●
	5.	Shutdown when OS is inactive	—	●
	6.	Schedule operation	—	●
	7.	UPS setting change	—	●
	8.	External command execution	●	●
	9.	Event log save	—	●
	10.	Data log save	—	●
	11.	Coordinated shutdown	—	●
	12.	Output receptacle control	—	●
	13.	Redundant power supply support	—	●
	14.	Remote UPS management	—	●
	15.	Mail send	—	●
	16.	SNMP management	—	●
	17.	Telnet connection	—	—
	18.	SYSLOG support	—	●

5 To perform shutdown processing of the devices

5-1 The outline on the UPS monitoring software

Additional Information

Explanation of software functions

	Function name	Description
1.	Auto shutdown	The computer can be shut down automatically when a problem occurs with the power supply.
2	UPS monitoring (operating status)	The operating status of the UPS can be monitored (in Commercial Power Mode/Battery Mode).
3.	UPS monitoring (data)	Monitoring can be performed for input voltage value, connection capacity, battery capacity, etc.
4.	Pop-up notification	When a problem such as a power failure occurs, a pop-up window that shows the details of the problem can be displayed depends on OS.
5.	Shutdown when OS is inactive	Shutdown can be performed when the computer is in an inactive state. The operating status is retained at shutdown in inactive state, so operation details are not lost.
6.	Schedule operation	Schedule settings can be made for UPS stop/start.
7.	UPS setting change	UPS settings (beep ON/OFF, etc.) can be changed. (Items that can be set vary according to the UPS.)
8.	External command execution	By executing commands at shutdown, items such as application programs can be launched.
9.	Event log save	Information of events that occur on the UPS (power supply problems, setting changes, occurrences of failure, etc.) are saved as a log.
10.	Data log save	Data of input/output voltage value, connection capacity, etc. is periodically saved as a log (the save frequency can be set).
11.	Coordinated shutdown	When a problem occurs with the power supply, multiple computers connected to the UPS can coordinate to perform auto shutdown.
12.	Output receptacle control	The UPS output receptacles can be individually set to ON/OFF.
13.	Redundant power supply support	Two or more UPS can be connected to computers equipped with redundant power supply. Shutdown is not performed when a power supply problem affects only one of the units. Shutdown is performed only when a power supply problem occurs with both UPS, so the system's operating rate is improved.
14.	Remote UPS management	The UPS can be managed remotely from a computer on the network.
15.	Mail send	When a problem such as a power failure occurs, a notification email describing the problem can be sent to the system administrator.
16.	SNMP management	UPS management information can be sent to the SNMP manager.
17.	Telnet connection	Settings such as shutdown parameters can be made via the Telnet connection.
18.	SYSLOG support	UPS management information can be recorded in SYSLOG.

5-1-2 The supported OS of the UPS monitoring software

Refer to the list below to check the supported OS of the UPS monitoring software.

OS	Shutdown software
・Windows 10 ・Windows 8.1 ・Windows Server 2012 R2 ・Windows Storage Server 2012 R2 ・Windows 8 ・Windows Server 2012 ・Windows Storage Server 2012 ・Windows Server 2008 R2 ・Windows Storage Sever 2008 R2 ・Windows Server 2008 ・Windows Storage Sever 2008 ・Windows 7 ・Windows Vista ・Windows Server 2003 R2 x64 Editions ・Windows Server 2003 x64 Edition (SP1) ・Windows XP Professional x64 Edition (SP1) ・Windows Server 2003 R2 ・Windows Server 2003 (SP1) ・Windows XP (SP1/SP2/SP3)	PowerAct Pro
・Windows 10 ・Windows 8.1 ・Windows Server 2012 R2 ・Windows 8 ・Windows Server 2012 ・Windows 7 ・Windows Server 2008 R2 ・Windows XP ・Windows Server 2003 ・Windows Server 2003 R2 ・Windows Vista ・Windows Server 2008	Simple Shutdown Software

The most recent version can be downloaded from our website
(https://www.oss.omron.co.jp/ups/support/download/download.html)

5-2 How to use the UPS monitoring software

5-2-1 What is the PowerAct Pro

The optional "PowerAct Pro" UPS monitoring software allows you to perform shutdown processing of your PC when a power failure occurs.

- It is possible to shut down multiple computers on the network.
- You can perform desired operation by setting the automatic start/stop of the UPS based on the schedule setting.

* Ensure that your PC completes shutdown within the backup time after a power failure occurs. For the backup time, refer to "4-1-4 Estimated backup time" (P.64) .
For more information, refer to the manual of this software.

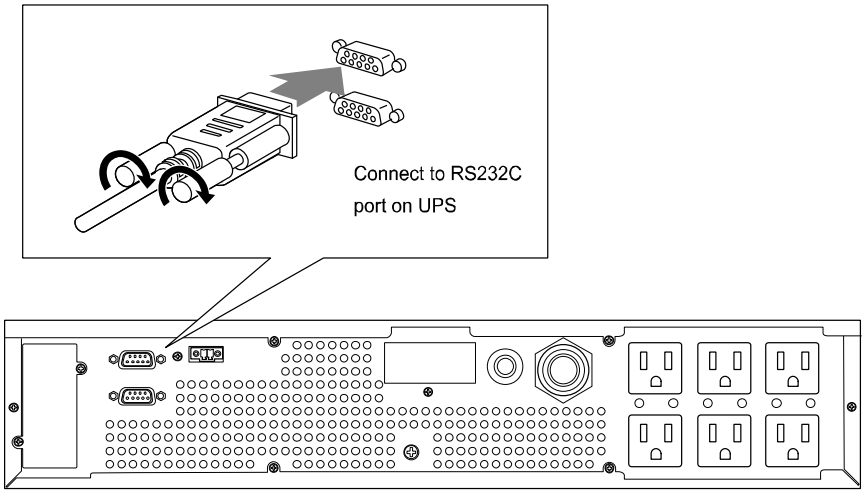
5-2-2 What is the Simple Shutdown Software

"Simple Shutdown Software" allows you to automatically shut down the PC when a power failure occurs. It can be downloaded from our website,
For more information, refer to the manual of this software.

You can download the manual of this software on our homepage.
https://www.oss.omron.co.jp/ups/support/download/download.html

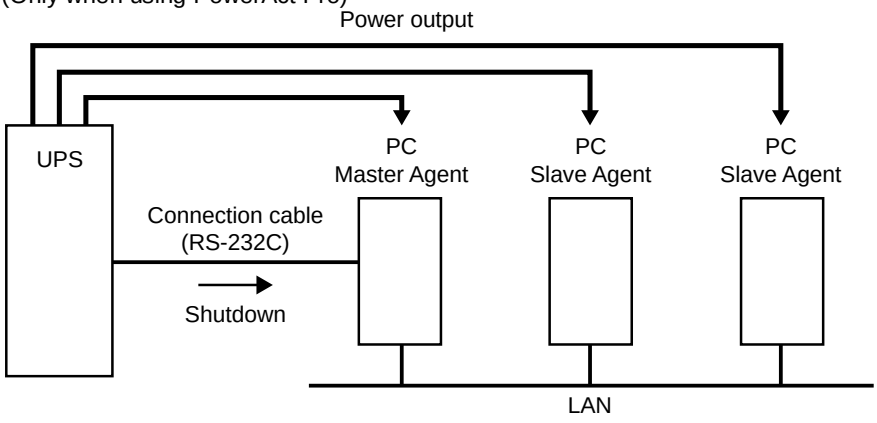
5-2-3 How to connect

1. Connect the UPS to a computer.
Cable: Included connection cable (RS232C)



When connecting 2 or more computers to the UPS

(Only when using PowerAct Pro)



2. Install the “PowerAct Pro” or “Simple Shutdown Software” to the PC you want to shut down.

<Installation method>
Refer to the “PowerAct Pro” installation guide.
Refer to the “Simple Shutdown Software” manual.

6 The contact signal functions

6-1 Contact signal functions

You can develop your unique system based on the following specifications to automate the process at a power failure. You can perform power-failure processing by allowing the system to detect the backup signal and also perform system shutdown processing by allowing the system to detect the Low battery level signal. Also, by inputting the backup stop signal from the system, you can stop the UPS with a sufficient battery level to prepare for the next occurrence of a power failure.

For the UPS, two types of contact signal I/O can be used: a contact signal I/O port provided as standard and an optional contact I/O card.
For details on an optional contact I/O card, see "7-2 Contact I/O card" (P.91).

6-1-1 Type of Output signals

The UPS has 4 kinds of output signals.
The output circuit consists of an open collector circuit using a photo coupler (a kind of electronic switch).

Signals	Descriptions
Backup Signal output (BU)	Stays ON during backup operation at a power failure.
Low battery level signal output (BL)	Goes ON when the battery becomes weak during backup operation at a power failure.
Trouble Signal output (TR)	Goes ON when an internal failure of the UPS occurs or when the battery life counter expires.
Battery Replacement Signal output (WB)	Goes ON when the test determines that battery replacement is necessary due to deterioration or when the battery life counter goes off-scale.

6-1-2 Type of Input signals

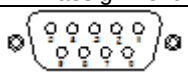
The UPS has 2 kinds of input signals.

Signals	Descriptions
Input of the UPS Stop Signal (BS)	When the BS signal is ON (High), the output of the UPS is stopped after the time period specified in advance has elapsed. (Note 1).
Remote ON/OFF Signal	Remote ON/OFF signals can be used to start and stop the UPS, by using either an externally connected contact or the ON/OFF status of the open collector circuit. When signal is OFF, the UPS will be turned on. When signal is ON, the UPS will be turned off. In the factory settings, the UPS stops operation when this is short-circuited. In addition, it is necessary to turn on the “Power” switch of UPS to use this function (Note 2).

Note1: BS Delay Time:
You can set the amount of time between when the BS signal is received and when the output of the UPS is stopped (See also "3-5-2 Settings" (P.56)).
You can stop the output of the UPS by inputting the voltage signal (HIGH) that lasts at least 10 seconds from the outside.

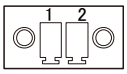
Note2: Connection terminals are at contact signal port pins 6, 7 and the remote ON/OFF port (See also "3-1-4 Setting Switch" (P.35)).

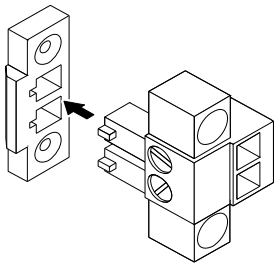
6-1-3 Contact signal port (female D-SUB 9 pin)

Pin assignment	Pin number	Item
 Front view Screw size: inch screw #4-40 UNC	1	Battery capacity LOW signal output (BL)
	2	Trouble signal output (TR)
	3	Backup power source stop signal input (BS)
	4	NC
	5	COMMON(COM)
	6	Remote ON/OFF input (-)
	7	Remote ON/OFF input (+)
	8	Backup signal output (BU)
	9	Battery Replacement Signal output (WB)

Note 1： When fixing the D-SUB(9 pin) connector by screw,
Please tighten manually without using the electric driver.

6-1-4 Remote ON/OFF port

Pin assignment	Pin number	Signal name
 Front view Screw size: Inch screw #4-40 UNC	1	Remote ON/OFF (+)
	2	Remote ON/OFF (-)



6-1-5 Contact Signal ratings

● Signal output (BL, TR, BU, WB)
Photo coupler ratings

Applicable voltage:	DC50V or less
Maximum current:	50mA

● Remote ON/OFF

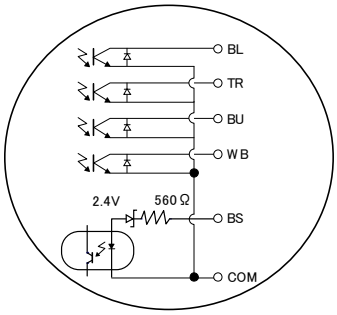
Voltage between terminals:	DC5V
Current when closed:	max.10mA

● UPS Stop Signal input (BS)

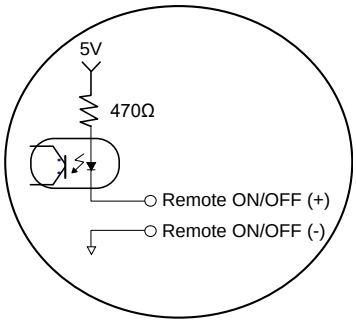
Input voltage:	High（ON）	DC5～15V
	Low（OFF）	DC0.5V or less
Input voltage:		2～18mA

6-1-6 Contact Signal circuit

● Signal output (BL, TR, BU, WB)
● UPS Stop Signal input (BS)

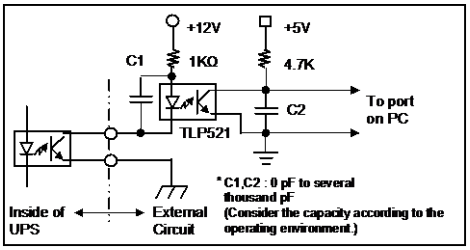


● Remote ON/OFF

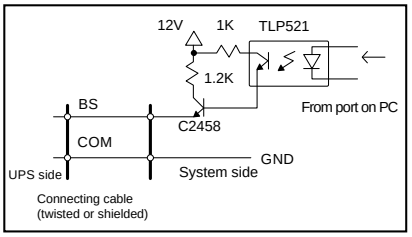


6-1-7 Example of the use of the Contact Signal circuit

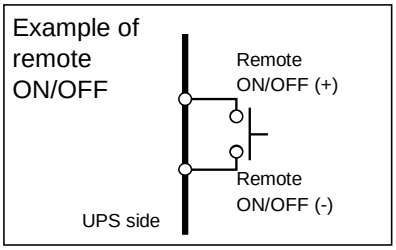
- Example of BU signal output circuit and the connected circuit



- Example of BS signal input circuit and the connected circuit



- Remote ON/OFF circuit



6-1-8 Notes for the use of the Contact Signal

When connecting a device such as a relay that generates counter electromotive force to the signal output circuit, connect diodes that prevent counter electromotive force to both ends of the relay.

Explanation:
When power is restored after the unit stopped automatically during a power failure, the unit automatically restarts and supplies power. If you do not want to start the connected devices, turn OFF their switches or set the auto startup setting after recovery from power failure ("Setting" switch 2) to ON (Auto startup is not performed).

7 How to use option cards

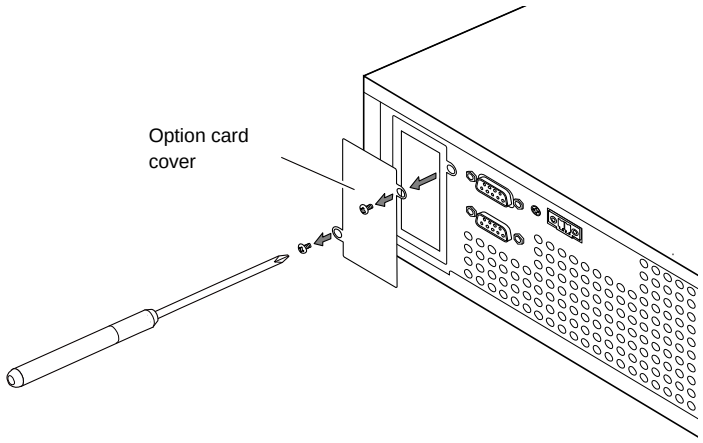
To control external equipment, the UPS is provided with a contact I/O card and SNMP/Web card as options.

7-1 How to mount an option card

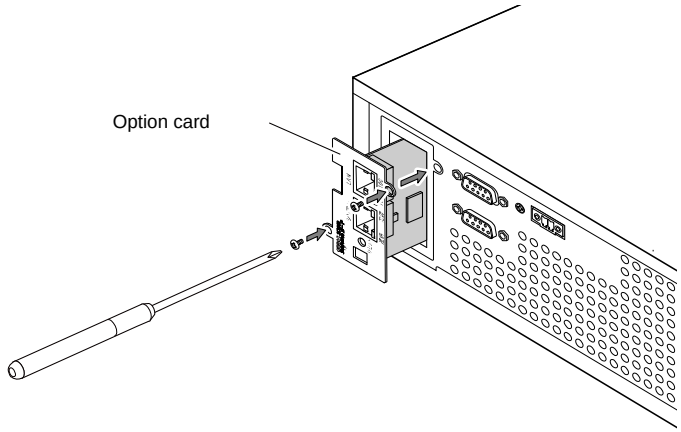
Mount an option card into the back of the UPS unit.

This section describes how to mount a SNMP/Web card as an example. The procedure is the same for a contact I/O card.

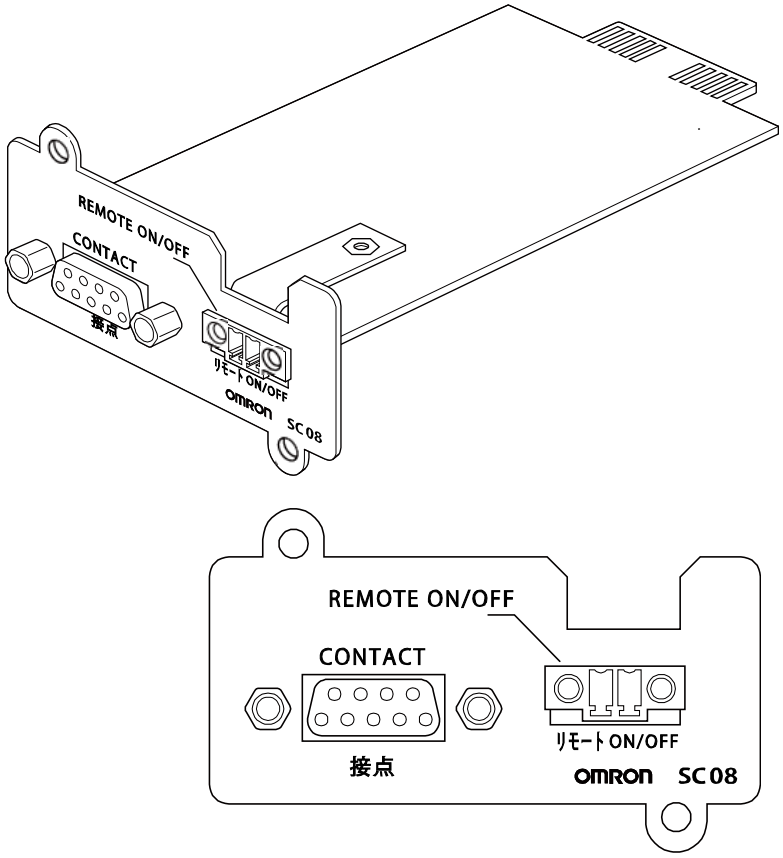
1. Turn the power of the UPS unit off.
Detach the option card cover on the back by removing two screws.



2. Insert the option card and fix it using the screws removed previously.
Insert the option card forward sufficiently so that it fits into the connector in the UPS unit.



7-2 Contact I/O card



7-2-1 Main features

The customer can automate processing to be performed in the event of a power failure by developing a system on their own using contact signal I/O. Power failure handling processing can be performed by detecting a backup signal or system shutdown processing can be performed by detecting a battery level drop signal.
In addition, by inputting a backup stop signal from the system, the UPS can be stopped while battery power still remains to respond to another power failure.

7-2-2 Specifications

Output signals ($\overline{\text{BU}}$ 、BU、 $\overline{\text{BL}}$ 、BL、 $\overline{\text{TR}}$ 、TR、 $\overline{\text{WB}}$ 、WB)

Relay ratings
Applicable voltage : DC30V or less
Maximum current : 2A (for resistive load)
1A (for inductive load)

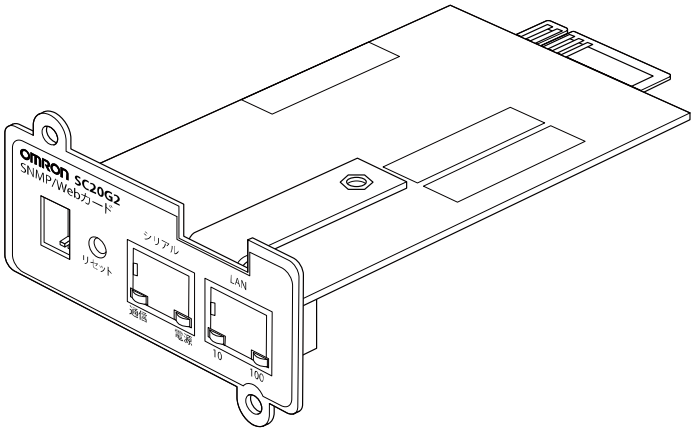
UPS Stop Signal input ($\overline{\text{BS}}$ 、BS)

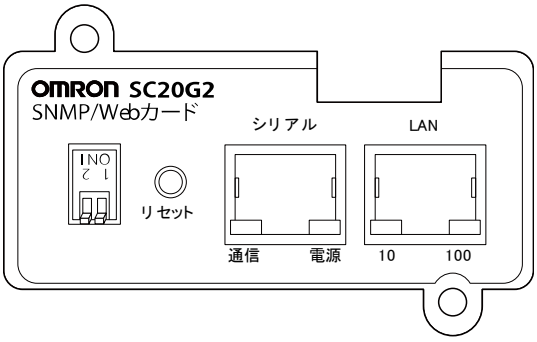
Input voltage : High (ON) DC8V - 24V (for the 24V setting)
DC5V - 12V（for the 12V setting）
LOW (OFF) DC0.7V or less

Remote ON/OFF
Voltage between terminals: DC5V
Current when closed: max. 10mA

* For details, see the manual attached to a contact I/O card.

7-3 SNMP/Web card





7-3-1 Main features

Directly connecting the UPS to a network

The UPS can be directly connected to a LAN. The UPS can be managed also from a computer not provided with a serial port.

Managing the UPS remotely

The UPS can be managed from a computer connected to a network using commercially available SNMP manager or Web browser software.

Possible to set UPS and SNMP/Web card functions from a computer on a LAN

UPS and SNMP/Web card parameters can be set via a SNMP management station or Web browser.

Functions as a SNMP agent can be set through Telnet or serial connection.

Reinforcing security functionality

Access control can be imposed on a per-IP basis for HTTP and SNMP connections.

Linked shutdown

Multiple UPS units can be shutdown by linking them together.

Log function

The UPS power status, battery level, and so on can be stored in the flash memory in a card. SYSLOG is supported.

Automatic shutdown function

Shutdown operation can be automatically performed when a power supply error occurs or at the predetermined time. Schedule d operation (automatic start, automatic stop) can be performed via a network.

UPS standard MIB(RFC1628） and Omron's proprietary MIB（swc mib） provided

Monitoring the power supply condition using a Java applet

The power supply condition is displayed in graph form, so that it can be visually checked.

7-3-2 Specifications

LAN port	10BASE-T / 100BASE-TX
Network protocol	SNMP, HTTP, APR, RARP, TFTP, ICMP
Other communication channels	Serial connection Asynchronous method (just by setting)
Number of controllable computers	32 sets maximum (when linked shutdown is enabled, a slave UPS is also included)
Supported MIB	UPSMIB (RFC1628) OMRON MIB
Other	Provided with a real-time clock
OS platforms supported by the shutdown software	WindowsNT4.0、Windows2000、WindowsXP、 Windows Server2003 RedhatLinux7.2/7.3/8.0 Red Hat Enterprise Linux AS/ES/WS（Redhat Linux Advanced Server2.1） Mac OS X v10.3 / Server 10.3*、Mac OS X v10.4 / Server 10.4 * Supported on Power PC CPU incorporated Macintosh computer

- For details, see the manual attached to a SNMP/Web card.
- The latest firmware can be downloaded from Omron's home page (https://www.oss.omron.co.jp/).
- For the latest specifications, check with Omron's homepage (https://www.oss.omron.co.jp/).

8 Connecting the battery unit

The backup time can be extended by connecting an optional expansion battery unit.
The following model is an expansion battery unit for this UPS.

Battery unit: BUM150RA

・A maximum of 6 expansion battery units can be connected.

・When one or more expansion battery units are connected, the charging time become longer 24 hours per an expantion battery unit

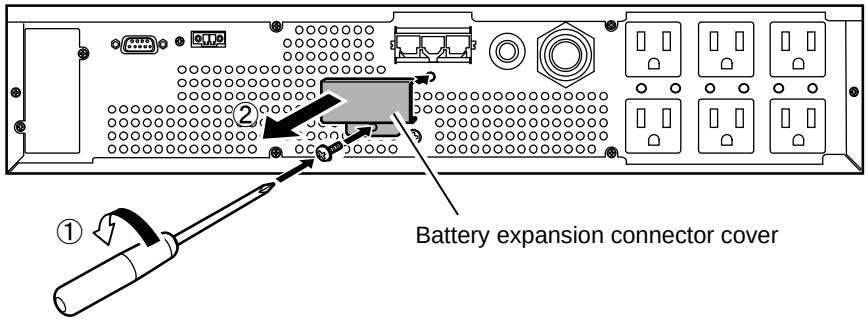
・For details on the backup time after expansion, see "4-1-4 Estimated backup time" (P.64).

8-1 Connecting the battery unit

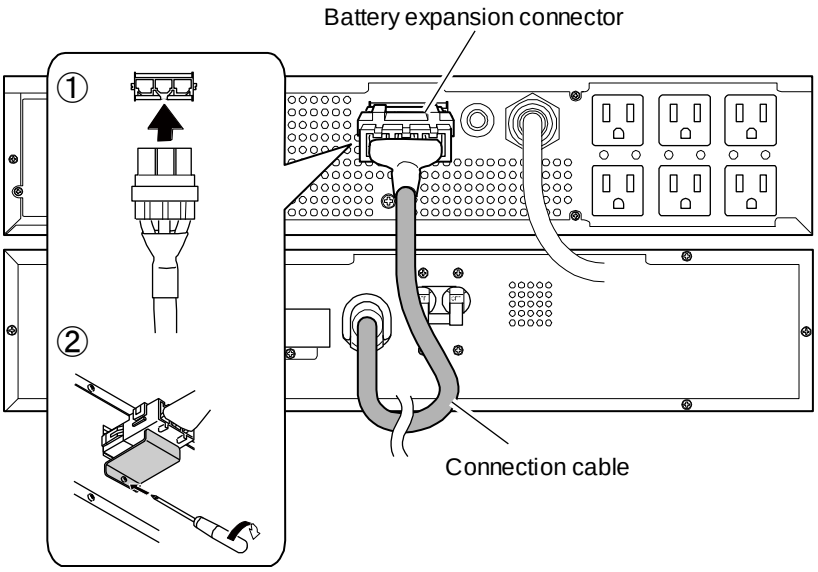
⚠ Caution (for connection)

- To connect an expansion battery unit, pull out the UPS's power cable to turn the power off.
- After expansion, set the number of expansion battery units in the operation mode settings (See "3-5 UPS operation mode settings" (P.54)).

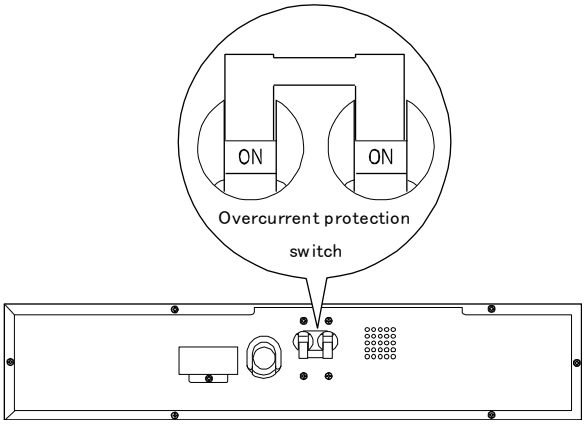
1. Detach the battery expansion connector cover on the back of the UPS unit.
Loosen one screw at the bottom of the battery expansion cover when detaching.



2. Connect the connection cable for the expansion battery unit to the battery expansion connector on the back of the UPS(①). And fix the connector cover of accessories(②).



3. Turn the overcurrent protection switch on the back of the UPS to the ON side.



※When the battery unit is connected correctly, the LED for checking expansion on the front of the expansion battery unit turns on.
If the LED does not turn on, check the connection condition.

4. Set the number of expansion batteries.
For the setting procedure, refer to "3-5 UPS operation mode settings " (P.54).

9 Troubleshooting

Perform the checks shown below if the unit is operating abnormally.
If the unit continues to operate abnormally, please contact our Electronic Systems & Equipments Customer Support Center.

9-1 Troubleshooting

Problem	Check and remedy
The LED does not appear when the AC input is connected to commercial power and the “Power” switch is turned ON.	1. Make sure the AC input is securely connected to commercial power. 2. AC input overcurrent protection is activated and power is cut. ● If the black INPUT PROTECTION button pops up, there are too many connected devices or there was a short-circuit with the connected devices. Disconnect all the connected devices, press the black INPUT PROTECTION switch (overcurrent protection switch), and turn on the “Power” switch. ● If the status indicator does not display properly after you perform the above operation, there is a problem with the unit. (See “3-4 Interpreting beeps and displays” (P.46))
Backup is not possible. The computer stops when a power failure occurs.	The battery may not be fully charged. Perform the test after charging the battery for at least 8 hours. The battery can be charged just by connecting the AC input to a wall outlet. The “Power” switch can be either ON or OFF.
Backup is performed too frequently. Frequent switching is performed although a power failure does not occur. You hear the sound of switching.	Variations (decrease) in the input power occur frequently. Or, noise may be included that significantly distorts the voltage waveform of the input power. ● Try and check what happens when connecting the unit to a different wall outlet (commercial power) located some distance away from the device consuming a large amount of power. ● This problem may occur also when you connect many devices to a plug strip or extension cord connected to the UPS if it is a long or thin cable.
Does not turn ON when “Power” switch is pressed.	The unit does not start up when the input power supply voltage/frequency is abnormal. (The status indicator displays “H-”, “-H”, “L-”, “-L”, “HH” or “LL”.) Check the voltage and frequency of the input power supply. See also “3-4 Interpreting beeps and displays” (P.46),
The battery replacement lamp blinks or is lit, and the buzzer beeps every two seconds continuously.	・Battery replacement lamp blinks: The battery is judged to be deteriorated in the self-diagnosis test. Backup operation lasts only for a short period of time. Replace the battery. (Refer to “4-1-2 Self-diagnosis test” (P.62)) ・Battery replacement lamp is lit: The battery life counter has counted up to the limit. The battery has been used up to its end-of-life. Replace the battery. (Refer to"4-2-1 Notification that the battery needs to be replaced" (P.67).)
The status indicator shows “OL”, and the beeper sounds at 0.5-second intervals.	There are too many connected devices. Reduce the number of connected devices until “On” is displayed on the status indicator. See also “3-4 Interpreting beeps and displays” (P.46)

Problem	Check and remedy
The status indicator blinks "E0", and the beeper sounds continuously	Output stopped due to exceeded connection capacity. Turn OFF all power to the unit and connected devices, and reduce the number of connected devices. Then, turn the power to the unit and connected devices back ON and check whether "On" is displayed on the status indicator. See also "3-4 Interpreting beeps and displays" (P.46),

10 References

10-1 Specifications

Method	Operation method		Full-time inverter supply method (Automatic Switching)
	Cooling method		Forced air cooling
Input	Rated input voltage		AC100V/110V/115V/120V
	Input voltage range		AC70V±2V～146V±2V (with less than 90% connection load)
	Frequency		50/60Hz±5.5Hz
	Input Maximum current *1		19.5A
	Phase		Single-phase, two-wire (grounded)
	Input protection		Non Fuse Breaker (20A)
	Input plug shape		NEMA 5-15P (*4)
Output	Rated output capacity		1500VA/1200W (*4)
	Voltage	Commercial Operation and Backup operation	100V mode: 100VAC±2%, 110V mode: 110VAC±2% 115V mode: 115VAC±2%, 120V mode: 120VAC±2%
	Frequency		Commercial operation: Synchronized with input frequency Backup operation: 50/60Hz±0.5%
	Waveform	Commercial operation	Sine wave
		Backup operation	Sine wave
		Distortion rate	6% max. (Rectified load, at rated output)
			3% max. (Resistance load, at rated output)
	Phase		Single-phase, two-wire (grounded)
	Output receptacle		NEMA 5-15R x 6
Battery	Type		Sealed lead battery
	Voltage / Capacity x Quantity		12V/7.2Ah×4
	Backup time (25°C, initial characteristics)		10min. (900W) 6min. (1200W)
	Charging time		8 hours
	Battery life	Expected life: 5 years	Expected life: 5 years

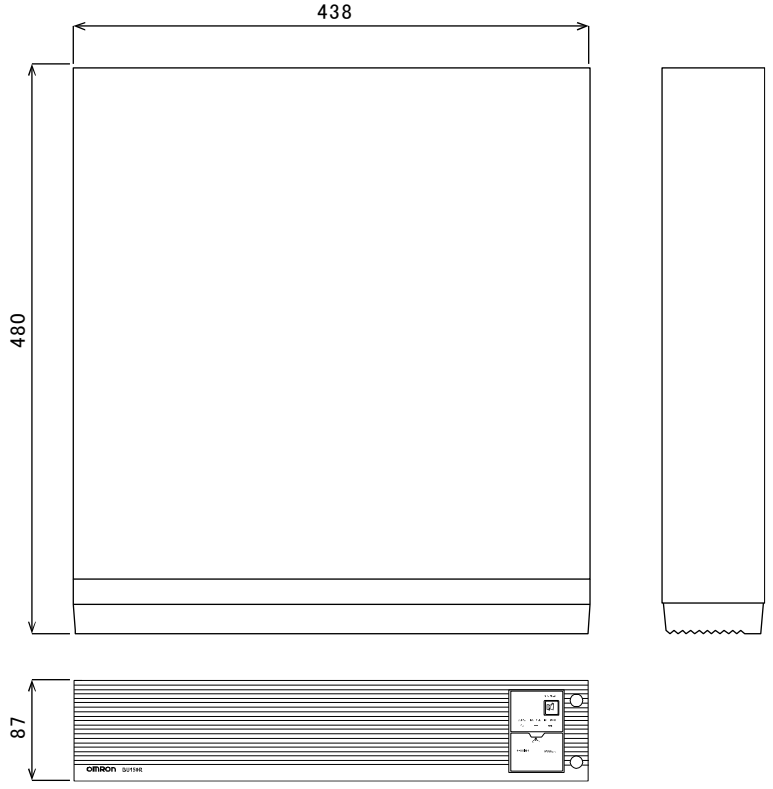
Environ-ment	Operating environment temperature/ humidity	0℃～40℃/25%～85%RH with no condensation
	Storage temperature	-15℃～50℃/10%～90%RH with no condensation
	Safety standard directive compliance	UL1778
	Disturbance voltage / Radiated interference field strength	VCCI Class A
	Internal power consumption (normal/maximum)	150W (*2)/225W (*3)
	Noise	50dB
Dimensions (W x D x H)		438mm×480mm×87mm
Weight of unit		Approx.21kg

*1: Minimum input voltage 70V for 100V mode with 90% load
*2: Rated load/ Rated input voltage/ When fully charged
*3: Rated load/ Rated input voltage/ When battery charge current is at maximum
*4: With an input plug provided as standard (NEMA 5-15P), the maximum output capacity is 1200VA/1050W. To use the UPS up to its maximum output capacity, use an attached 20A plug （NEMA L5-20P）.

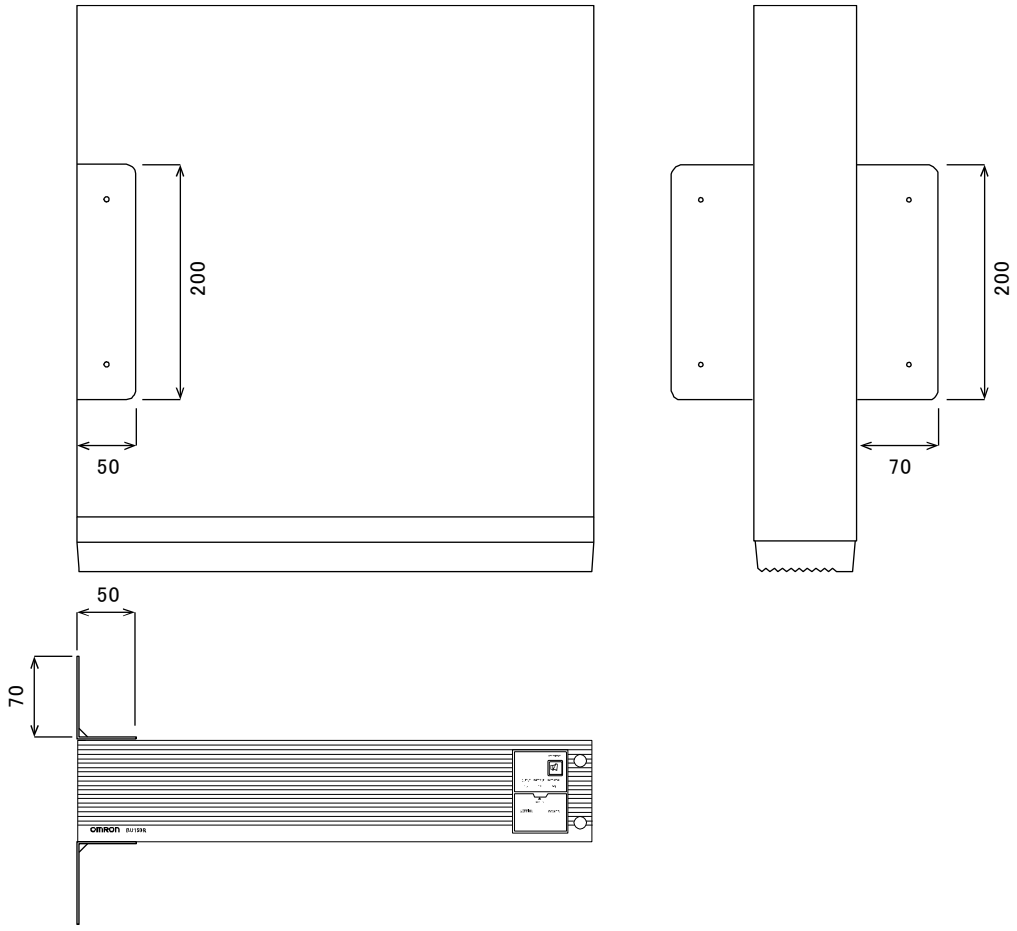
10-2 Dimensions

* Unit: mm/ Tolerance: ±2mm

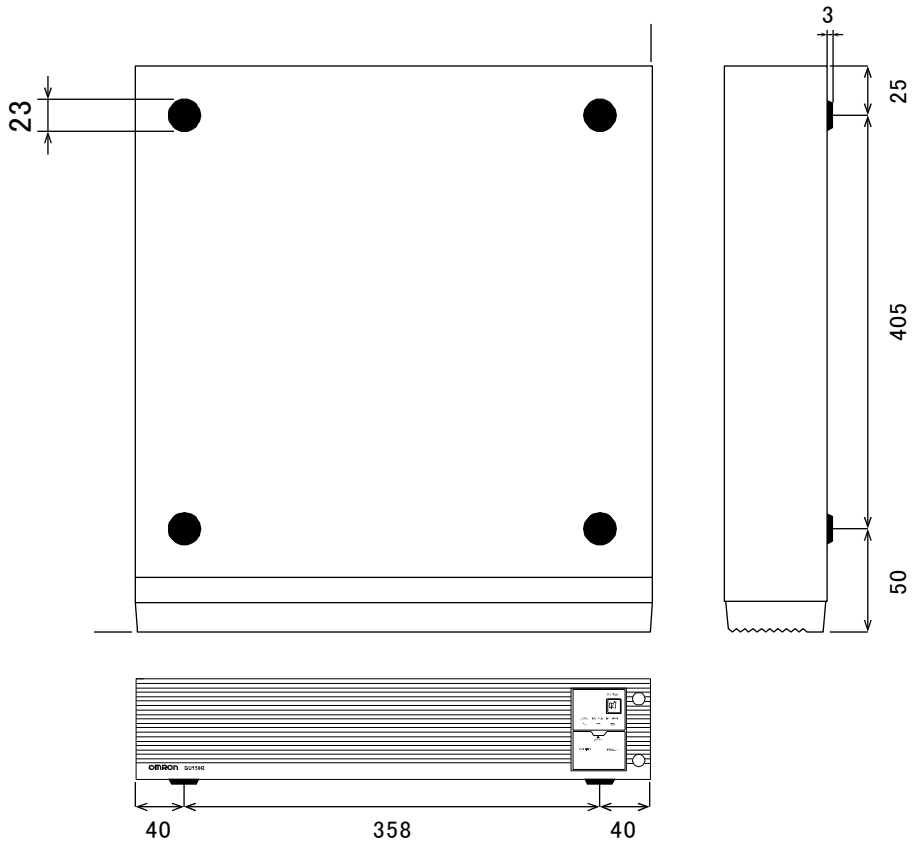
■BU150R



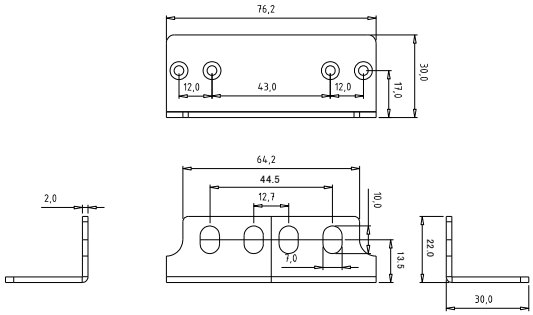
■Stand for vertical layput

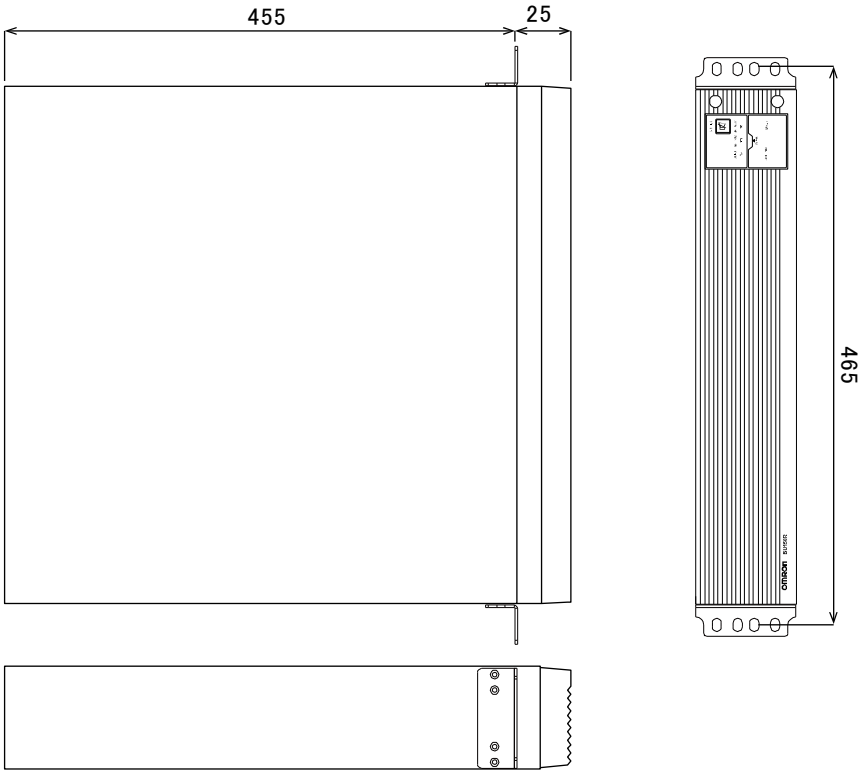


■Rubber feet



■Using Ear brackets





10-3 Battery life

■Battery life

Periodic checks of the lead battery used in the battery unit are required due to the battery limited lifespan. For the battery checking method, refer to "4-1 Checking the battery" (P.62). Battery replacement is recommended before the battery is expired.

Battery life
(The following is expressed based on the battery's trickle life, the service life of a battery under the condition where low-frequent (once or twice a month) rechargings and dischargings are performed.)

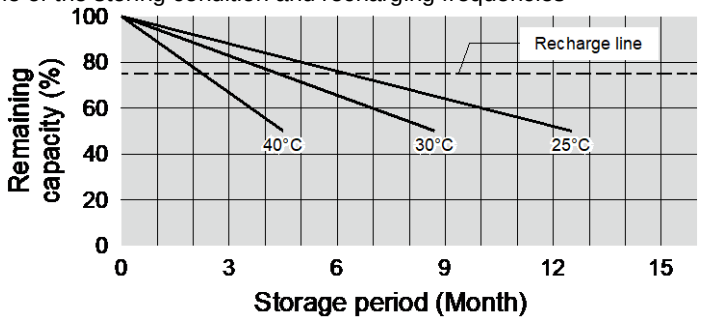
Battery type	Expected battery life (Ambient temperature 40°C)	Expected battery life (Ambient temperature 30°C)	Expected battery life (Ambient temperature 25°C)
Long-life battery	1.7 years	3.5 years	5 years

* Basically, the ambient temperature have a high influence on the battery life.

■The periodic recharges are required even if the battery is stored.

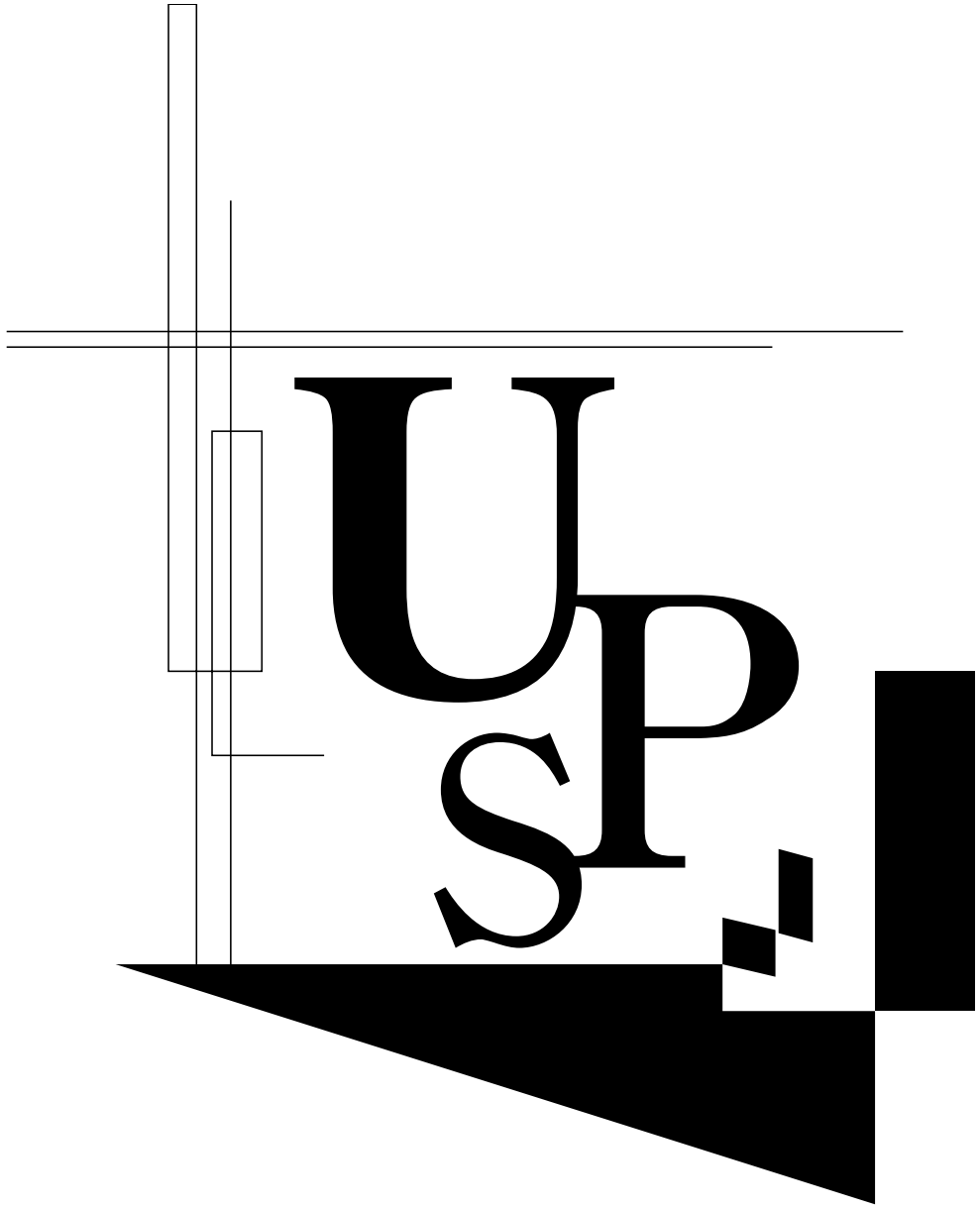
The battery self-discharges even if the UPS is not used (i.e., leaving the battery not charged), and it deteriorates the battery. In the worst case, the battery may become unusable.

Example of the storing condition and recharging frequencies



When the battery is stored at the storage temperature of 25°C, the battery self-discharges (and the battery level lowers) to approximately 80% over half a year, and to approximately 50% over a year.
Higher the storage temperature is, faster the battery will self-discharge.

Storage temperature	Auxiliary charging interval
40°C or less	2 months
30°C or less	4 months
25°C or less	6 months



OMRON SOCIAL SOLUTIONS CO.,LTD.

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