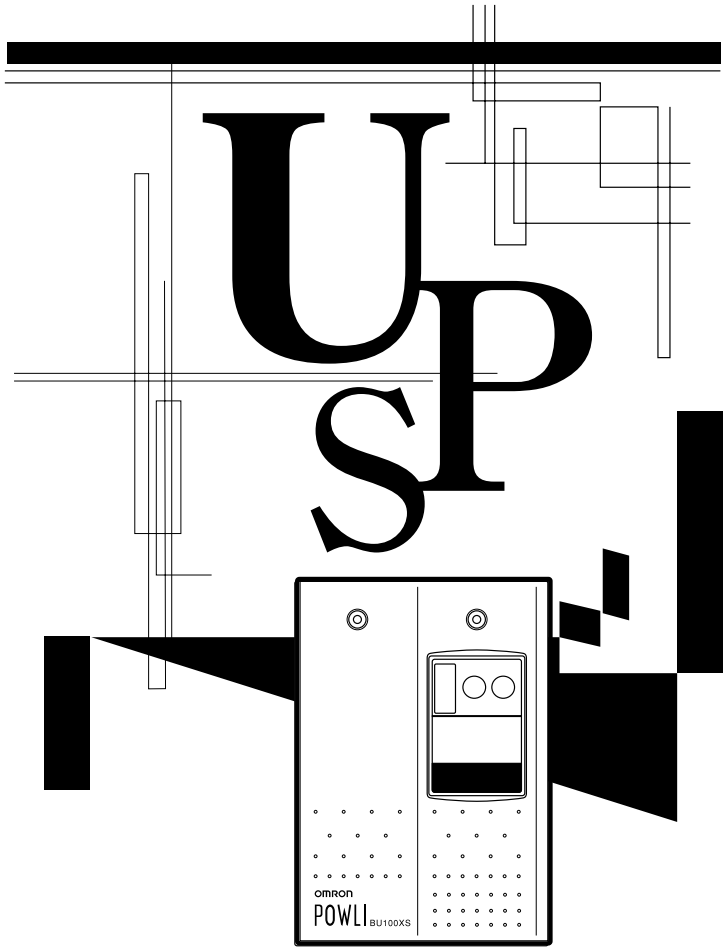
OMRON

Uninterruptible Power Supply (UPS)

POWLI BU50XS/BU70XS/BU100XS

Instruction Manual



- This manual gives you important information to use the BU50XS/BU70XS/BU100XS safely and therefore be sure to read it before installation and use.
- Keep this manual handy at the place where you install the BU50XS/BU70XS/BU100XS so that you can read it whenever necessary.

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/power failures, and surge voltage caused by thunders and so on (a phenomenon in which extraordinary high voltage occurs instantaneously).
- Under normal conditions, it converts the commercial power to a direct current once, reconverts it to a stable 100-VAC sine wave, and outputs it.
  When detecting a failure of the commercial power, it switches to battery-supplying to provide the continuous output of a sine wave. This is called On-line Power Method.
  It is suitable especially for use where power supply conditions are bad (for example, voltage variations are large).
- The output capacity is 500VA/350W for BU50XS, 700VA/490W for BU70XS and 1KVA/700W for BU100XS.
- It provides Network line surge protection function to protect communication devices such as modems from surge voltage that comes through the line (a phenomenon in which extraordinary high voltage occurs instantaneously).

Notes on the use of the Backup Power Supply

- This product is designed and manufactured for use for OA equipment such as personal computers.
  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, elevators, 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.

IMPORTANT SAFETY INSTRUCTION

1. SAVE THESE INSTRUCTIONS.

This manual contains important instruction for Model BU50XS/BU70XS/ BU100XS.

That should be followed during instruction of the UPS and batteries.

2. SYMBOL

This symbol indicates earth ground.

This symbol indicates turining on UPS.

This symbol indicates turining off UPS.

3. INTERNAL BATTERY.

Internal battery voltage is 24Vdc for BU50XS/BU70XS, 36Vdc for BU100XS.

4. TEMPERATURE RATING.

Maximun ambit temperature of UPS 40°C.

5. ENVIRONMENT

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

Table of Contents

Safety precautions

Important information for safety use 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 (things that you must not do). For example, indicates that disassembly is prohibited.

: Indicates compulsory (things that you must do). For example, indicates that grounding is necessary.

Notice that information provided as a caution may cause more significant results under certain conditions. The information described here is very important and must be observed strictly.

Warning

Do not disassemble, repair, or modify the product.

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

If liquid leaks from the product, do not touch it.

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

Warning (use of the product)

Do not use it when very high reliability and safety are required as listed below. (This product is designed and manufactured for use for 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 this product may cause significant damage or effect to the society and public (For example, important computer systems and main communication equipment.)
- Applications with the same level of importance

Caution (installation)

The weight of the product is 13kg (BU50XS/BU70XS)/15.5kg (BU100XS). Unpack/transport this product considering this weight.

- Dropping may cause injury.

Keep packing materials including plastic bags and films out of the reach of children.

- They may put their head into it or put it into their mouth, hindering their breathing.

⚠ Caution (installation)

Provide secure grounding.

- Connect the ground terminals of the UPS and the devices to be connected to the ground. (Refer to "2. Installation and connection" on page 12.)
  If a failure or leak occurs, it may cause an electric shock. Touching the UPS and other devices without grounding at the same time may cause an electric shock.
- When you use the 3P-2P conversion Plug for the AC Input Plug, be sure to perform grounding before connecting the AC Input Plug into a wall outlet (commercial power). On the other hand, be sure to disconnect the AC Input Plug from a wall outlet (commercial power) before disconnecting the grounding wire.
- Without grounding, the Power line surge protection and the Network line surge protection do not work.

The installation orientation is designated. Do not install the product in other orientations.

- Refer to "2-2 Installing the product" on page 14.
- Falling may cause injury.

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

- The battery becomes week rapidly, which may cause a fire.
- Doing so may cause a failure or malfunction of the UPS.

Concerning installation and storage of the products, follow the instructions listed below.

- Do not install the product in a place where humidity is lower than 20% or higher than 90%.
- Do not use the product in a place where humidity is lower than 25% or higher than 85%.
- Do not install the products at a closed place such as in a cabinet without clearance, at a place with flammable gas or corrosive gas exist and in the open air.
- Doing so may cause a fire.

Do not obstruct the air inlet and outlet in the side and rear of the product.

- Inside temperature increases, which may cause a failure of the UPS and the deterioration of the battery.
- Install the product at least 5 cm from the walls.

Do not install the product on an unstable base.

- Dropping or falling may cause injury.

⚠ Caution (connection)

Connect the UPS to a wall outlet (commercial power) with a current capacity larger than the maximum input current of the UPS.

- Otherwise, the power cord may be heated.
- When the equipment of the maximum capacity is connected, the maximum current that flows is 8A for the BU50XS, 10A for the BU70XS and 14A for the BU100XS.

Be sure to connect the input plug of the UPS to a wall outlet (commercial power) of 100 VAC (50/60Hz).

- Connecting it to a wall outlet (commercial power) of a different voltage may cause a fire.
- The UPS may fail.

⚠ Caution (connection)

Do not connect equipment that exceeds the output capacity of the UPS. You can use a plug strip and so on to connect extra equipment, but, in this case, do not connect equipment that exceeds the current capacity of the plug strip.

- The UPS may detect overload and stop the output.
- The wiring of the plug strip heats up, which may cause a fire.

⚠ Caution (use)

If the input plug is disconnected while the product is operating, never touch its metal part.

- Doing so may cause an electric shock.
- The leak current of this product itself is less than the value of the safety standard (leak current: 1 mA). However, leak current increases due to connected equipment. Therefore, never touch the metal part of the input plug.
- When the product is operating, voltage is generated at the metal part of the input plug via capacitors in the internal circuit regardless of elapsed time.

If the Battery Replacement Lamp goes on or the backup time becomes shorter than the required time, immediately replace the battery pack or stop using the UPS and discard the battery pack.

- Continuing the use of it may cause a fire.
- For information on how to inspect the battery, refer to "6. Maintenance and inspection" on page 29.

Ambient temperature	Expected life
20°C	4 to 5 years
30°C	2 to 2.5 years

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

If you notice abnormal sound or smell, smoke, or liquid from the inside, immediately press the Stop Switch of the UPS and disconnect the AC Input Plug from a wall outlet (commercial power).

- Using the product under these conditions may cause a leak or fire.
- If you notice such a condition, never use the product and contact the shop from which you purchased this product or our company for inspection and repair.
- Use the product under the conditions in which you can immediately disconnect the AC Input Plug from a wall outlet (commercial power) in the event of the occurrence of an abnormal condition.

When maintaining connected equipment, stop the UPS and disconnect the AC Input Plug from a wall outlet (commercial power).

- Even if you disconnect the AC Input Plug while the UPS is operating, supplying power is continued from the Power Supply Output Receptacles by the backup function.
- If the scheduled operation is enabled, supplying power is started when the operation start time is reached with the AC Input Plug connected to a wall outlet (commercial power).

⚠ Caution (use)

Do not put something on the product or do not drop metal objects onto the product.

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

Do not use the product in a closed place or do not cover the product.

- Doing so may cause abnormal heating or a fire.

Do not wet or pour water on the product.

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

Do not insert metal objects into the Power Supply Output Receptacles of the UPS.

- Doing so may cause an electric shock.

Do not insert metal objects into the Battery Connection Connector or the Expansion Connector.

- Doing so may cause an electric shock.

⚠ Caution (battery replacement)

Do not short the battery with metal objects.

- Doing so may cause burns or a fire.
- Some electrical energy remains inside the battery even if it is exhausted.

Do not put the battery into fire or do not break it.

- The battery may explode or dilute sulfuric acid may leak.

Do not use a replacement battery other than specified.

- Doing so may cause a fire.
- Product model: For BU50XS, BU70XS: BP70XS
  For BU100XS: BP100XS

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

- Dilute sulfuric acid may leak.

Do not drop the battery or do not give strong impact on it.

- Dilute sulfuric acid may leak.

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

- Sparking may occur when connecting the battery, which may cause a fire.

Notes

Charge the battery (for at least 8 hours) immediately after purchasing the product.

- If you do not use the product for a long time after purchase, the characteristics of the battery may deteriorate and become unavailable.
- When you connect the AC Input Plug of the UPS to a wall outlet (commercial power), the battery is automatically charged.

If you store the UPS, charge the battery for at least 8 hours before storage.

- Even if you do not use the battery, it discharges spontaneously and goes into over discharge status if it is left for a log time. The backup time may become shorter or the battery may become unavailable.
- The storable period of the built-in battery of the UPS is 6 months after charging it for at least 8 hours.
- If you want to store the battery longer than 6 months, connect the AC Input Plug of the UPS to a wall outlet for at least 8 hours before the limit is exceeded.
- Press the Stop Switch of the UPS to stop it during storage.

Do not reverse the connection of Line/Hub Side and Modem/TA/PC Side of the Network Line Surge Protection.

- If a failure of the protection circuit occurs, the line side (telephone/ISDN line) may be damaged.

Do not short the output lines of the UPS each other and the output lines to the ground.

- The UPS may fail.

Do not connect the AC Input Plug of the UPS to its Power Supply Output Receptacle.

- The UPS may fail.

Before cutting out commercial power by turning off the breaker or disconnecting the AC Input Plug, stop the UPS.

If you cannot stop the UPS, it is recommended to automatically stop it in the minimum backup time using the UPS monitoring software.

- When you stop commercial power, the battery mode starts. If you repeat charging and discharging in a way in which you stop commercial power and discharge the battery completely, the life of the battery decreases extremely.
  The less the amount of charging and discharging is, the less the effect on the lift becomes.

Do not connect a page printer to the UPS.

- The connection capacity may be exceeded repeatedly during operation using commercial power, which may cause the status in which the input voltage is outputted directly (bypass mode).
- The peak current of the page printer is large and it may be detected that the connection capacity is exceeded.

Do not perform a withstand voltage test.

- The input circuit of UPS has a built-in surge absorption device. A withstand voltage test may break it.
- When performing an insulation resistance test, use the 250 VDC range.

Notes

Recycling and Discarding the Battery

- The UPS uses a lead acid battery. It is recyclable, precious resources. Please recycle it when you replace it or discard the produce you do not use any more.

Installation and storage places

- Do not install or store the UPS in a place exposed to direct sunlight.
  The rise of temperature may cause the battery to deteriorate and become unavailable.

Explanation

Usual operation

- You may continue the operation of the UPS or stop it each time shutting down the connected system.
  You can choose either of the operation methods for your convenience.
- Connecting the UPS to a wall outlet (commercial power) charges the battery.

End of Battery mode

- If the time of a power failure is long, the voltage supply from the UPS stops. Shut down you computer using a proper procedure (for example, saving data) while the UPS supplies the voltage.

Reboot

- If the battery discharges completely during a power failure, the UPS stops. After the recovery from a failure of the power supply (for example, power failure), the UPS automatically restarts and supplies the voltage. If you do not want to start the connected equipment, turn off its power switch.
- The UPS monitoring software allows you to disable automatic restart.

Scheduled operation using the UPS monitoring software

- When performing scheduled operation in which the UPS is stopped and the commercial power is stopped using a breaker and so on at the same time, specify a period within 3 months for the start of the next operation. If you specify a period longer than 3 months, the internal timer is reset and the scheduled operation does not start.
  Notice that this period reduces to approximately half when the battery is dead.
  If 3 months are exceeded, you start operation by supplying commercial power and press the Start Switch. However, if the battery is dead, you may not be able to start operation. In this case, replace the battery according to "6-2 Replacing the battery" on page 29.

1. Preparation

1-1 Unpacking the product

⚠ Caution

The weight of the product is 13kg (BU50XS, BU70XS) / 15.5kg (BU100XS). Unpack/transport this product considering this weight.

● Dropping may cause injury.

Do not install the product on an unstable base.

● Dropping or falling may cause injury.

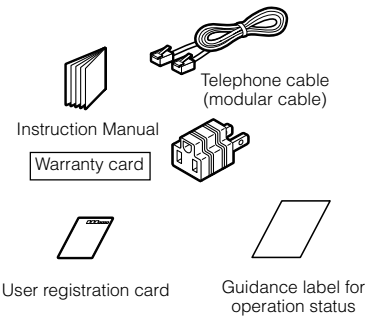
Open the package box and take out the UPS and accessories.

1-2 Checking the accessories

Check whether all the accessories are included and there is no damage to their outside.
If you should notice defects or something wrong, please contact us;

BU50XS/BU70XS/BU100XS

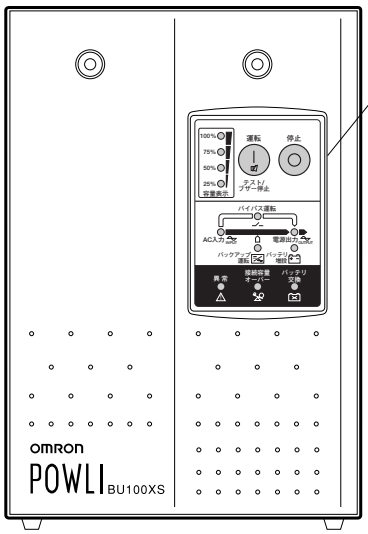
1. Instruction Manual (Japanese) 1
   (English) 1
2. Telephone cable (modular cable) 1
3. Warranty card 1
4. User registration card 1
5. 3P-2P conversion plug 1
6. Guidance label for operation status 1
7. Automatic shut down software set 1
   (including CD-ROM and RS232C Cable)



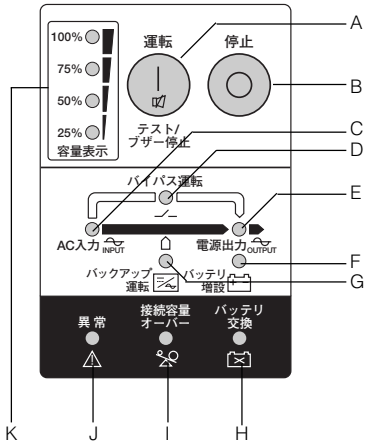
1-3 Name of each part

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" on page 12 and "3. Operating the UPS" on page 20 that provides the details.

Front view

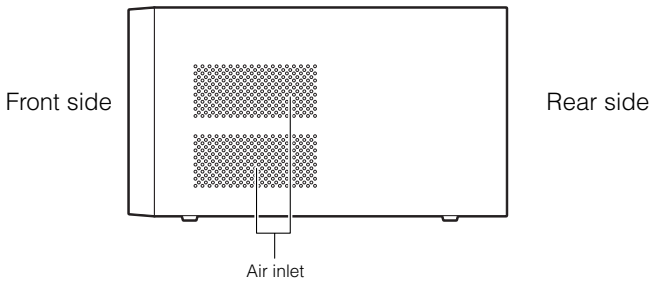


[Enlarged view of the operation part]

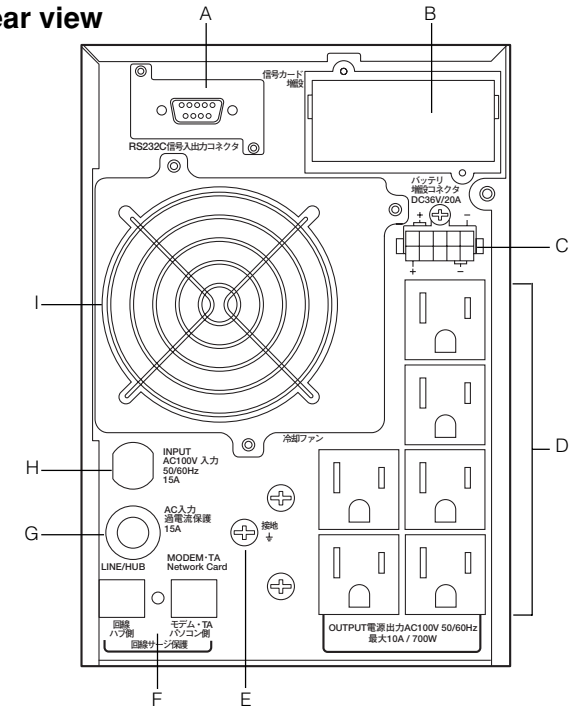


A. Start Switch
B. Stop Switch
C. AC Input Lamp
D. Bypass mode Lamp (The input voltage is outputted directly.)
E. Power Supply Output Lamp
F. Battery Expansion Lamp (BU100XS only)
G. Battery mode Lamp
H. Battery Replacement Lamp
I. Connection Capacity Exceeded Lamp
J. Error Lamp
K. Connection Capacity/ Battery Remain Level Meter

Side view



Rear view



A. RS232C Contact signal Connector
B. Signal Card Expansion Slot
C. Battery Expansion Connector (BU100XS only)
D. Power Supply Output Receptacle
(Backed up at a power failure)
E. Grounding Terminal
F. Network Surge Protection
G. AC Input Overcurernt Protection
H. AC Input Cable
I. Cooling Fan (air outlet)

1-4 Explanation of symbol used on unit

Symbol	Description
	Start the UPS.
	Stop the UPS.
	Suspend a beep.
	AC input power supplied to the UPS.
	UPS output power enable, supplied by operating on line mode, battery mode or bypass mode.
	UPS operating on battery mode.
	UPS operating on bypass mode.
	Expanding battery unit connecting to the UPS. (For BU100XS only.)
	UPS has Error.
	Connected Overload. Excess output capacity by connected devices.
	Batteries in end of useful life, necessary to replace the batteries.

2. Installation and connection

2-1 Precautions and notes on installation and connection

Precautions and notes on installation and connection are given below. Be sure to read them for correct use.

⚠ Caution

The weight of the product is 13kg (BU50XS, BU70XS) / 15.5kg (BU100XS). Unpack/transport this product considering this weight.

- Dropping may cause injury.

Keep packing materials including plastic bags and films out of the reach of children.

- They may put their head into it or put it into their mouth, hindering their breathing.

Provide secure grounding.

- Connect the ground terminals of the UPS and the devices to be connected to the ground. (Refer to "2. Installation and connection" on page 12.)
  If a failure or leak occurs, it may cause an electric shock.
  Touching the UPS and other devices without grounding at the same time may cause an electric shock.
- When you use the 3P-2P conversion Plug for the AC Input Plug, be sure to perform grounding before connecting the AC Input Plug into a wall outlet (commercial power). On the other hand, be sure to disconnect the AC Input Plug from a wall outlet (commercial power) before disconnecting the grounding wire.
- Without grounding, the Power Line Surge Protection and the Network Line Surge Protection do not work.

Connect the UPS to a wall outlet (commercial power) with a current capacity larger than the maximum input current of the UPS.

- Otherwise, the power cord may be heated.
- When the equipment of the maximum capacity is connected, the current that flows is 8A for the BU50XS, 10A for the BU70XS and 14A for the BU100XS.

Be sure to connect the AC Input Plug of the UPS to a wall outlet (commercial power) of 100 VAC (50/60Hz).

- Connecting it to a wall outlet (commercial power) of a different voltage may cause a fire.
- The UPS may fail.

⚠ Caution Prohibition (things that you must not do)

Do not use the product in a closed place or do not cover the product.

- Doing so may cause abnormal heating or a fire.

Concerning installation and storage of the products, follow the instructions listed below.

- Do not install the product in a place where humidity is lower than 20% or higher than 90%.
- Do not use the product in a place where humidity is lower than 25% or higher than 85%.
- Do not install the products at a closed place such as in a cabinet without clearance, at a place with flammable gas or corrosive gas exist and in the open air.
- Doing so may cause a fire.

Do not connect equipment that exceeds the output capacity of the UPS.

You can use a plug strip and so on to connect extra equipment, but, in this case, do not connect equipment that exceeds the current capacity of the plug strip.

- The UPS may detect overload and stop the output.
- The wiring of the plug strip heats up, which may cause a fire.

Do not insert metal objects into the Power Supply Output Receptacle of the UPS.

- Doing so may cause an electric shock.

Do not install the product in other orientations.

- Dropping or falling may cause injury.

Do not obstruct the air inlet and outlet in the side and rear of the product.

- Inside temperature increases, which may cause a failure of the UPS and the deterioration of the battery.
- Install the product at least 5 cm from the walls.

Notes

Do not short the output lines of the UPS each other and the output lines to the ground.

- The UPS may fail.

Do not connect the AC Input Plug of the UPS to its Power Supply Output Receptacle.

- The UPS may fail.

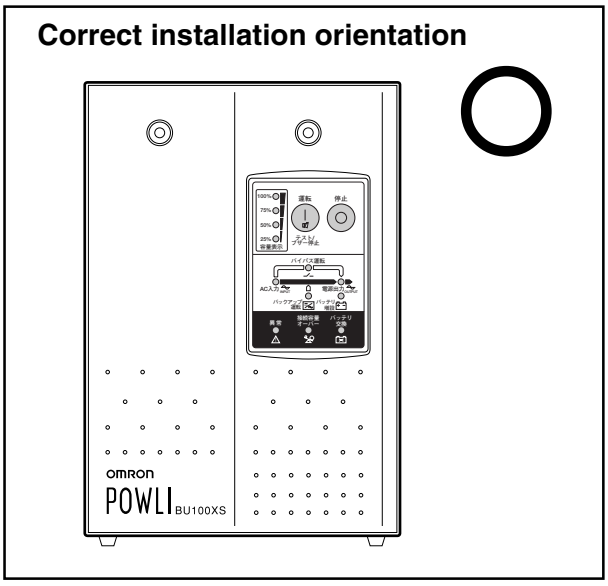
Do not connect a page printer to the UPS.

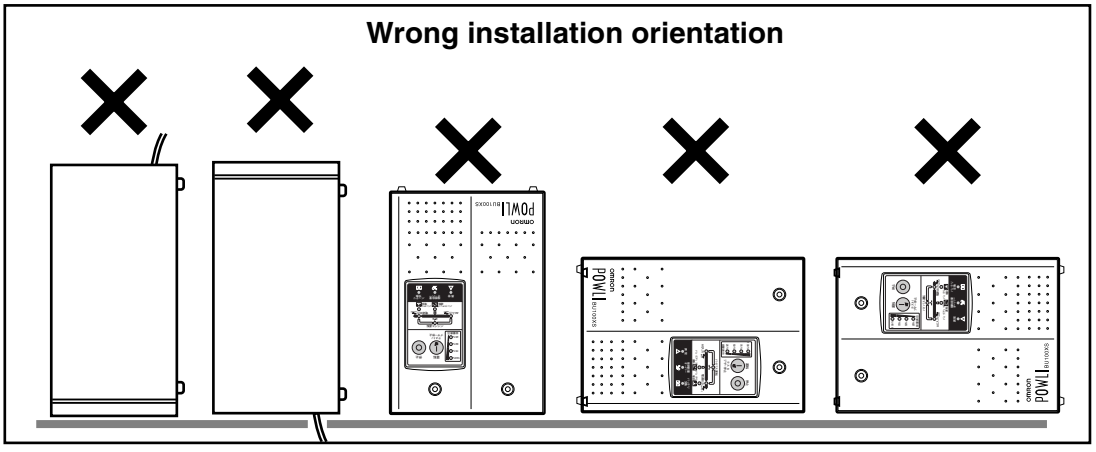
- The connection capacity may be exceeded repeatedly during operation using commercial power, which may cause bypass mode.
- It may be detected that the connection capacity is exceeded.

2-2 Installation

Install the UPS.

Do not use the product in an orientation other than the correct one shown in the figure below.



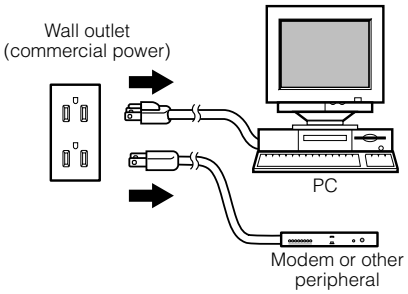


2-3 Connecting the equipment

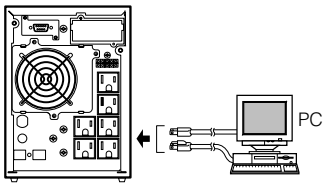
(1) Disconnect the AC Input Plugs of all devices you want to back up such as your PC and modems from a wall outlet (commercial power).

(2) Connect devices you want to back up to the Power Supply Output Receptacles of the UPS.

- If you need more output receptacles than those of the UPS, purchase a plug strip and so on separately and use it as extra output receptacles.

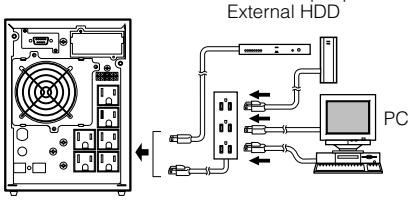


< Example of connection 1 >



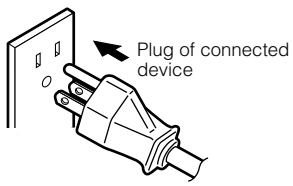
Modem or other peripheral
External HDD

< Example of connection 2 >

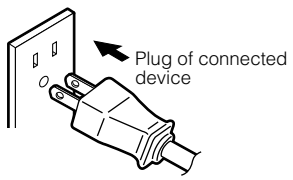


- Even if the input plug of a device you want to connect is 2-pin type, you can connect it directly to the Power Supply Output Receptacle of the UPS. Notice that the input plug is 2-pin type with the grounding wire, connect the grounding wire to the Grounding Terminal of the UPS.
- When you want to use an AC adaptor, connect it to a Power Supply Output Receptacle of the UPS with space enough for the connection.

Connect it directly.

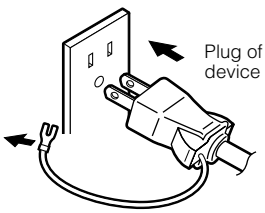


Connect it directly.



Connect the Grounding Terminal of the connected device to the Grounding Terminal of the UPS.

Connect the plug directly.



Connect the grounding wire to the Grounding Terminal of the UPS.

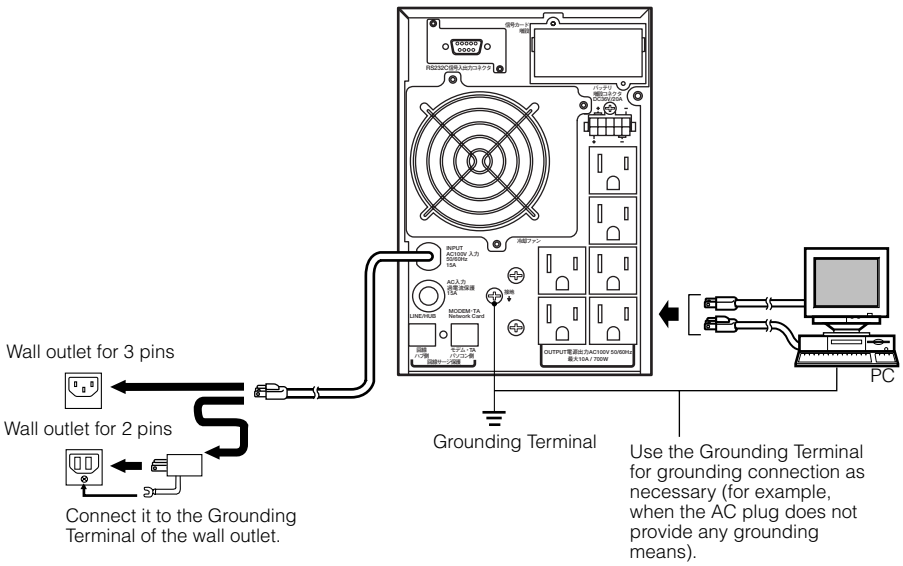
(3) Connect between the UPS and the surge protection circuit.

See also "7. Using the Network Line Surge Protection Function" on page 35
*** If you do not use the Network Line Surge Protection Function, this step is not required.**

(4) If you use the attached UPS monitoring software or the standard UPS service of Windows NT or Windows XP/2000 or if you use Contact Signal, connect the connecting cable between the UPS and your PC.

See also "8. Using the UPS monitoring software and Contact Signal" on page 36
*** If you do not use the UPS monitoring software and Contact Signal, this step is not required.**

(5) When the installation and connection is complete, connect the AC Input Plug of the UPS to a wall outlet (commercial power).



- **The UPS has been charged prior to shipment. However, the backup time becomes shorter when using it for the first time due to spontaneous discharge.**
  We recommend charging the UPS before using it.
  When you connect the AC Input Plug of the UPS to a wall outlet (commercial power), charging the battery is automatically started and it is fully charged for 8 hours or less.
- **You can perform "2-4 Checking the operation" on page 17 also before charging the battery.**

2-4 Checking the operation

Before use, check that the Battery mode is performed normally according to the following procedure.

This operation check simulates an occurrence of a power failure by disconnecting the AC Input Plug from a wall outlet.)

⚠ Caution

If the input plug is disconnected while the product is operating, never touch its metal part.

- Doing so may cause an electric shock.
- The leak current of this product itself is less than the value of the safety standard (leak current: 1 mA). However, leak current increases due to connected equipment. Therefore, never touch the metal part of the input plug.
- When the product is operating, voltage is generated at the metal part of the input plug via capacitors in the internal circuit regardless of elapsed time.

(1) Connect your PC and other devices to the UPS and then connect the AC Input Plug of the UPS to a wall outlet (commercial power).

(2) Press the Start Switch to start the operation of the UPS.

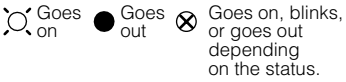
Bring all connected devices into operation at the start of the operation.

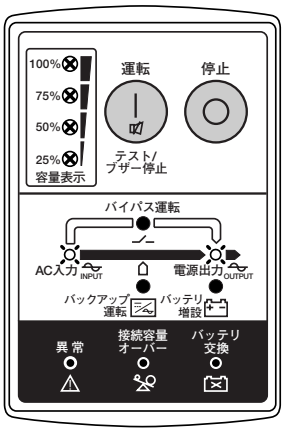
(Including devices connected to the AC outlet of your PC.)

Operate them in a way in which it is allowable that power supply to the connected devices stops.

(3) Under this condition, check the display lamps of the UPS.

Are they the same status in the right figure?





Yes

The operation is normal.

Proceed to (4).

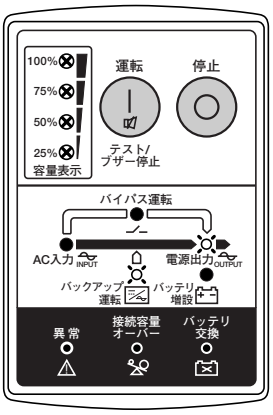
No

The operation is abnormal.

The display is one of them described in "C. Failure (display and beep when a failure occurs in equipment)" on page 23. Take necessary measures according to the remedy and then proceed to (4).

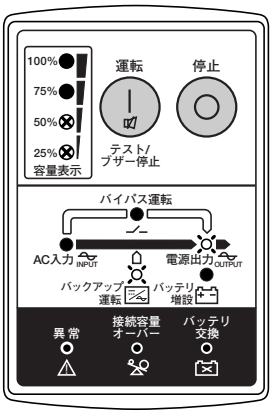
(4) Disconnect the AC Input Plug of the UPS from a wall outlet (commercial power) to bring it into backup status.
Under this condition, check the display lamps and a beep of the UPS.
Are they the same status in the below figure?

< When the battery is sufficient >



Beep	One beep at intervals of 4 second

< When the battery is low >



Beep	One beep at intervals of 1 second

Yes

The operation is normal.

Proceed to (5).

No

The operation is abnormal.

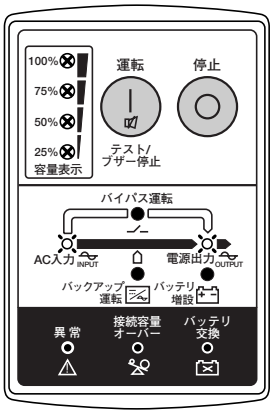
- If the display is one of them described in "C. Failure (display and beep when a failure occurs in equipment)" on page 23, take necessary measures according to the remedy and then go back to (4).
- If no Battery mode is performed and the UPS and the connected devices stop, insufficient charging of the battery is suspected.
  Connect the AC Input Plug of the UPS to a wall outlet (commercial power), charge the battery for at least 8 hours, and then go back to (4).

If the problem persists after checking the 2 points above, contact us please;

(5) Connect the AC Input Plug to a wall outlet (commercial power) again.
The Battery mode Lamp goes out, the AC Input Lamp goes on, and a beep stops.
(The status is as shown in the right figure.)

Checking the operation is now complete.

Goes on ● Goes out ⊗ Goes on, blinks, or goes out depending on the status.



2-5 Charging the battery

When you connect the AC Input Plug of the UPS to a wall outlet (commercial power), charging the battery is automatically started and it is fully charged for 8 hours or less.
(The UPS performs charging regardless of in operation or in pause.)

- The UPS has been charged prior to shipment. However, the backup time becomes shorter when using it for the first time due to spontaneous discharge.
  We recommend charging the UPS before using it.

2-6 Measuring the backup time

When "2-4 Checking the operation" is complete, you can start actual operation. However, in order to know the backup time in your use environment and use it as a guide for inspecting the battery, measure the initial value of the backup time.

See also "5-1 Measuring method of the backup time" on page 28.

3. Operating the UPS

3-1 Precautions and notes on operation

Notice the following for operation.

⚠ Caution

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

- The battery becomes week rapidly, which may cause a fire.
- Doing so may cause a failure or malfunction of the UPS.

Do not use the product in a closed place or do not cover the product.

- Doing so may cause abnormal heating or a fire.

Notes

Before cutting out commercial power by turning off the breaker or disconnecting the AC Input Plug, stop the UPS.

If you cannot turn off the UPS, it is recommended to automatically stop it in the minimum backup time using the UPS monitoring software.

- When you stop commercial power, the Battery mode starts. If you repeat charging and discharging in a way in which you stop commercial power and discharge the battery completely, the life of the battery decreases extremely.
  The less the amount of charging and discharging is, the less the effect on the lift becomes.

3-2 Start and stop procedures

● Start procedure

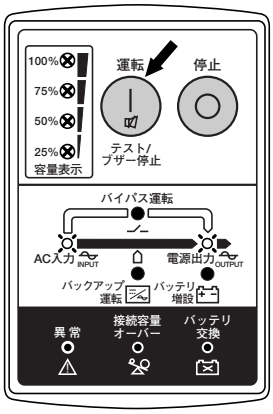
1. Connect the AC Input Plug of the UPS to a wall outlet (commercial power).
   After approximately 1 second, the AC Input Lamp goes on and the battery is being charged.
2. Press and hold the Start Switch of the UPS for at least 0.5 second.
   A beep sounds for 0.5 second, the Bypass mode Lamp and the Power Supply Output Lamp go on, and supplying power from the Power Supply Output Receptacle of the UPS starts. Then, the self-test is performed for approximately 10 seconds.
   The Capacity Display shows the power consumption of the connected devices in percent.
   BU50XS: Displayed in 4 levels, taking 500VA / 350W as 100%.
   BU70XS: Displayed in 4 levels, taking 700VA / 490W as 100%.
   BU100XS: Displayed in 4 levels, taking 1KVA / 700W as 100%.

If the value of the connected devices is 25% or less, the Capacity Display goes out.

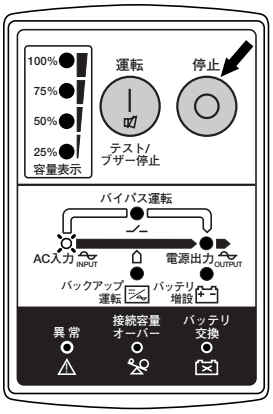
● Stop procedure

1. Press and hold the Stop Switch of the UPS for at least 2 seconds. A beep sounds for 2 seconds, output is stopped, all the lamps go out once, and the AC Input Lamp goes on again. (The display is the same as Step 1 in the start procedure.

< Display when the product is operating normally >



< Display when the product stops >



Goes on ● Goes out ⊗ Goes on, blinks, or goes out depending on the status.

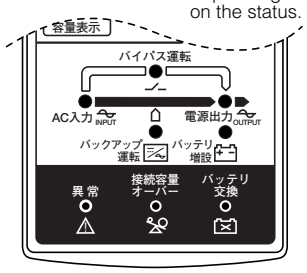
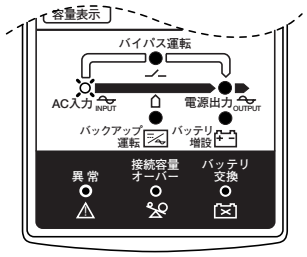
Explanation

Usual operation

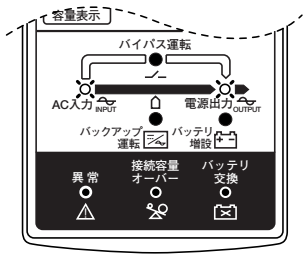
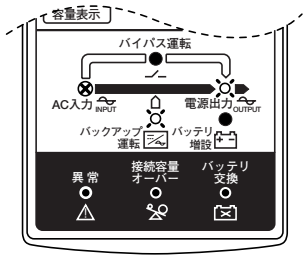
- You may continue the operation of the UPS or stop it each time shutting down the connected system. You can choose either of the operation methods for your convenience.
- Connecting the UPS to a wall outlet (commercial power) charges the battery.

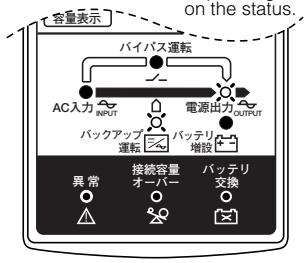
3-3 Interpreting a beep and display

A. Stop status

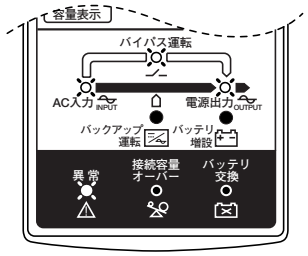
No.	Display	Beep	Output	Charge	Description
1	Goes on / Goes out / Goes on, blinks, or goes out depending on the status. 	None	Stop	Stop	Status: Operation is interrupted due to disconnection of the AC Input Plug abnormal input power supply. If the input voltage is 65 to 80V or 115 to 138V, the AC Input Lamp blinks. Remedy: Connect the AC Input Plug. Remove the abnormal input power supply. Or, wait for recovery.
2		None	Stop	ON	The AC Input Plug is connected, and the input power supply is normal. Operation is stopped. Remedy: None

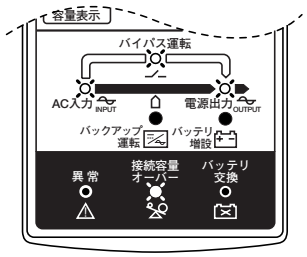
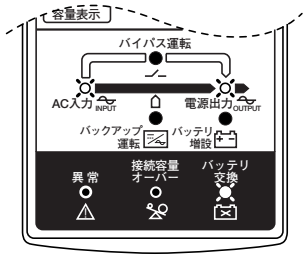
B. Operation status (display and beep when the product is operating normally and a power failure or abnormal input occurs)

No.	Display	Beep	Output	Charge	Description
1		None	ON	ON	Status: The AC Input Plug is connected, the input power supply is normal, and the product is operating. The connection capacity is displayed by the level meter. Remedy: None
2		At intervals of 4 seconds	ON	Stop (during discharge)	Status: Because a power failure occurs or the input voltage is 121V or more or 79V or less, power is being supplied to connected devices by Battery mode. The remain level of the battery is displayed by the level meter. If the input voltage is 79 to 80V or 115 to 121V, the AC Input Lamp blinks. Remedy: To avoid the consumption of the battery, perform the shutdown procedure for connected devices in use and stop them.

No.	Display	Beep	Output	Charge	Description
3	Goes on / Goes out / Goes on, blinks, or goes out depending on the status. 	At intervals of 1 seconds	ON	Stop (during discharge)	Status: Power is being supplied to connected devices by Battery mode. Because the battery is weak, output will stop soon. The remain level of the battery is displayed by the level meter. Remedy: To avoid the consumption of the battery, perform the shutdown procedure for connected devices in use and stop them.

C. Failure (display and beep when a failure occurs in equipment)

No.	Display	Beep	Output	Charge	Description
1		Continuous	ON	ON	Status: The UPS is stopped due to a failure of the internal circuit, short of output, or abnormal inside temperature. Remedy: ● Stop connected devices and stop the UPS. Disconnect all connected devices from the UPS and press the Start Switch again. If the status of B-1 on page 22 occurs, a short in connected devices is suspected. Check connected devices. ● If the same display appears after taking the above countermeasures, check whether the fan on the rear side is stopped. If the fan is stopped, replace it. (Refer to "6-3 Replacing the fan" on page 34.) If the fan is not stopped, stop the UPS for approximately 1 hour and then press the Start Switch again. If the status of B-1 on page 22 occurs, the temperature inside the UPS increased. Check whether ambient temperature is 40°C or less and the vent is not hindered. ◆ If the problem persists after checking the 2 points above, a failure of the internal circuit is suspected. Contact us; _____

No.	Display	Beep	Output	Charge	Description
2		Continu-ous	ON	ON	Status: The rated output capacity is exceeded due to too many connected devices. If this status continues for the following time or longer, commercial power is supplied by bypass mode. Connection 105% or more: 10 seconds Connection 120% or more: 10 seconds Remedy: Decrease connected devices until this display disappears and the status of B-1 on page 22 occurs.
3	Goes on ● Goes out ⊗ Goes on, blinks, or goes out depending on the status. 	Continu-ous	ON	ON	Status: Battery replacement is necessary. Remedy: ● Charge the battery for at least 8 hours. (For information on the charging method, refer to "2-5 Charging the battery" on page 19.) After charging, check whether the Battery mode is performed according to "2-4 Checking the operation" on page 17. If backup cannot be performed or the backup time is less that half the initial value, replace the battery because the battery is weak. (For information on the procedure to replace the battery, refer to "6-2 Replacing the battery" on page 29.) Press and hold the Stop Switch for at least 2 seconds to stop this product or perform the self-test after replacing the battery. This display will disappear. If you use a weak battery, the Battery mode is not performed and output is stopped even if a power failure occurs. If the Battery mode is performed normally, the battery is not charged sufficiently.

4. Functions of the UPS

4-1 Suspending a beep

You can suspend a beep by pressing and holding the Start Switch of the UPS while a beep is sounding for at least 0.5 second to suspend a beep.

You can suspend a beep in the following statuses. Press and hold the Start Switch for at least 0.5 second again to resume a beep.

- During Battery mode (the Battery mode Lamp is lit)

> **When the Battery mode is resumed and the battery goes weak, a beep sounds again.**
> In this case also, you can suspend a beep.

- When a failure occurs in equipment (the Error Lamp is lit)
- When battery replacement is required (the Battery Replacement Lamp is lit)

> **You cannot suspend a beep for connection-capacity-exceeded.**
> Take necessary countermeasures according to "C. Failure (display and beep when a failure occurs in equipment)" on page 22.

4-2 Testing the UPS (executing the self-diagnostic test)

You can use the following procedure to check whether replacing the battery inside the UPS is required and whether the internal circuit is at fault.

- **If the battery is not fully charged, the self-diagnostic test is not executed immediately. After charging is complete, it is automatically executed.**

(1) Connect your PC and other devices to the UPS and then press the Start Switch to start operation.

(2) Press and hold the Start Switch of the UPS for at least 10 second.
Release the start switch when a beep sounds. The Battery mode starts for testing purpose.

(3) After the 10-second test is complete, the normal operation automatically starts.

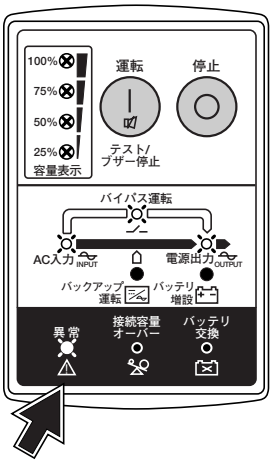
(4) If there is no error, the Error Lamp and the Battery Replacement Lamp do not go on and a beep does not sound.

(5) If the Error Lamp goes on and a beep sounds, take necessary countermeasures according to "1" of "C. Failure (display and beep when a failure occurs in equipment)" on page 23.

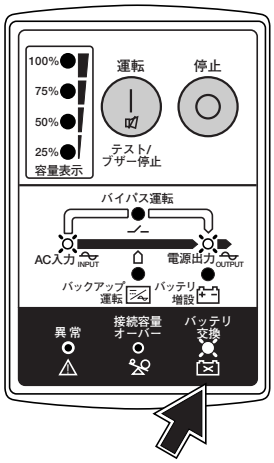
(6) If the Battery Replacement Lamp goes on and a beep sounds, immediate battery replacement is necessary as it indicates extreme battery deterioration. Replace the battery according to "6-2 Replacing the battery" on page 29.

*** You can execute this test from the attached UPS monitoring software. For more information, refer to the online help of the UPS monitoring software.**

< Display when the equipment is at fault >



< Display when battery replacement is required >



Goes on ● Goes out ⊗ Goes on, blinks, or goes out depending on the status.

4-3 Description of the auto battery test

This UPS has a function to test battery deterioration automatically and when battery replacement is required, the battery deterioration alarm is activated (No manual operation is required).

The automatic battery test is a built-in function of the UPS.

- It operates automatically without using UPS monitoring software.
- By using UPS monitoring software, you can disable the auto battery test.
- The auto battery test is automatically performed at intervals of 4 weeks.

  The auto battery test is performed only when the power supply switch is ON and the batteries are fully charged.

  If commercial power supply is distributed, the period is counted as the 4 weeks mentioned above even if the power supply switch is OFF in the period.

If you want to "disable the auto battery test," you can change the setting from the attached UPS monitoring software. For more information, refer to the online help of the UPS monitoring software. (The factory-shipped setting is "Enable the auto battery test.")

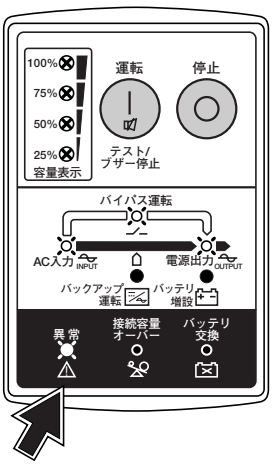
(1) When the auto battery test starts, the Battery mode automatically starts. (No beep sounds.)

(2) If there is no error, the Error Lamp and the Battery Replacement Lamp do not go on and a beep does not sound.

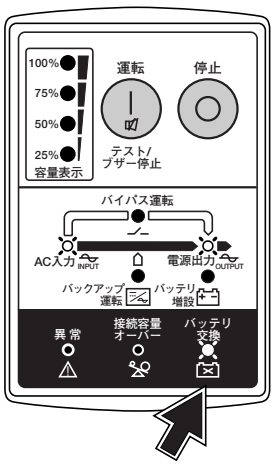
(3) If the Error Lamp goes on and a beep sounds, take necessary countermeasures according to "1" of "C. Failure (display and beep when a failure occurs in equipment)" on page 23.

(4) If the Battery Replacement Lamp goes on and a beep sounds, battery replacement is necessary. Replace the battery according to "6-2 Replacing the battery" on page 29.

< Display when the equipment is at fault >



< Display when battery replacement is required >



Goes on ● Goes out ⊗ Goes on, blinks, or goes out depending on the status.

5. Measuring the backup time

5-1 Measuring method of the backup time

⚠ Caution

If the input plug is disconnected while the product is operating, never touch its metal part.

- Doing so may cause an electric shock.
- The leak current of this product itself is less than the value of the safety standard (leak current: 1 mA). However, leak current increases due to connected equipment. Therefore, never touch the metal part of the input plug.
- When the product is operating, voltage is generated at the metal part of the input plug via capacitors in the internal circuit regardless of elapsed time.

(1) Connect the AC Input Plug of the UPS to a wall outlet (commercial power) and charge it for at least 8 hours. (Turn on the Start Switch. Connected devices may be in operation.)

(2) Bring all connected devices into operation.
(Including devices connected to the AC outlet of your PC.)
Operate them in a way in which it is allowable that power supply to the connected devices stops.

(3) Disconnect the AC Input Plug of the UPS to check that the Battery mode for the time you need or longer is possible.

*** The backup time you measure for the first time after purchase is the "initial value of the backup time."**
Initial value of the backup time: minutes seconds (Fill in the left blanks to note the measured time.)

5-2 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.

(1) Unify the total capacity (power consumption) of connected devices to W. Check the display of the connected devices.
There are 3 type of display: VA display, A display, and W display.
Example 1) 100VAC, 50/60Hz, 145W
Example 2) 100VAC, 50/60Hz, 1.8A
Example 3) 100VAC, 50/60Hz, 150VA

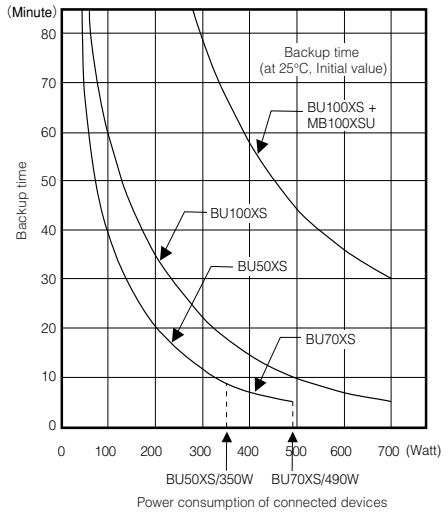
(2) Add the values converted in W to obtain the total capacity of the connected devices.

(3) Calculate the initial value of the backup time for the total capacity of the connected devices from the graph on the right.

Display	Watt Value
VA	W = Power Factor × VA
A	W = Power Factor × A × 100

∗ When the power factor is unknown, assume the power factor as 1.
∗ Usually, the power factor takes the value between 0.6 and 1.0.

* For devices that use the VA or A display, convert the capacity into W. Multiply the value displayed on devices by the value in the table below for conversion.



6. Maintenance and inspection

6-1 Checking the battery

The sealed lead-acid battery used in the UPS has its life. (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. Therefore, check the battery regularly by yourself.

1. Life of battery (estimated replacement timing)

Ambient temperature	Life of battery	Replacement estimation
20°C	4 to 5 years	4 years after staring use
30°C	2 to 2.5 years	2 years after staring use

2. Method to check the battery

Measure the backup time according to "5-1 Measuring method of the backup time" on page 28.
If the measured value is half of the "initial value of the backup time," battery replacement is necessary.

3. Guideline on the frequency of checking the battery (measuring the backup time)

Ambient temperature	Check at intervals of 6 months	Check at intervals of 1 month
20°C	Until 3 years from purchase	From after 3 years
30°C	Until 3 years from purchase	From after 1.5 years

*** The battery deteriorates even if it is stored. The higher the temperature is, the shorter the life becomes.**

6-2 Replacing the battery

You can change the battery of this UPS by yourself.

You can replace the battery of this product even while it is in operation (power is outputted). You can do it also while it is stopped (power output is stopped). You can choose either of the methods for your convenience.

* If you replace the battery during operation and a failure occurs in the input power such as a power failure when the battery is not connected, the product does not perform the Battery mode and stop.
* Do not replace the battery during the Battery mode.
The UPS stops.

⚠ Warning

An electric shock or short may occur.

- Do not put you hand into the opening for the battery when replacing the battery.
- Do not insert metal objects into the inside.

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

- Doing so may cause burns and, if it is put into your eye, blindness. If it touches your eyes or skin, wash it out with lots of clean water and consult your doctor.

⚠ Caution

Do not short the battery with metal objects.
- Doing so may cause burns or a fire.
- Some electrical energy remains inside the battery even if it is exhausted.

Do not put the battery into fire or do not break it.
- The battery may explode or dilute sulfuric acid may leak.

Do not use a replacement battery other than specified.
- Doing so may cause a fire.
- For BU50XS, BU70XS: BP70XS
- For BU100XS: BP100XS

Do not drop the battery or do not give strong impact on it.
- Dilute sulfuric acid may leak.

Perform replacement on a stable, flat base.
- Hold the battery securely with your both hands not to drop it.
- Not doing so may cause injury due to falling or burns due to leak of liquid (acid).

Do not carry the replaced battery pack upside down.
- If liquid (dilute sulfuric acid) leaks from the battery, there is a danger of burns or blindness.

Do not disassemble or modify the battery.
- Doing so may cause leak of dilute sulfuric acid, which may cause blindness and burns.

Notes

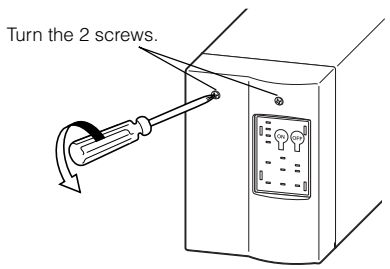
Recycling and Discarding the Battery
- The UPS uses a lead acid battery. It is recyclable, precious resources.
  Please recycle it when you replace it or discard the produce you do not use any more.

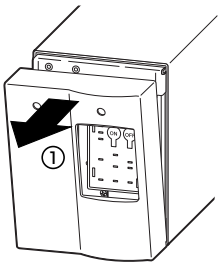
Pb

■ Procedure to replace the battery

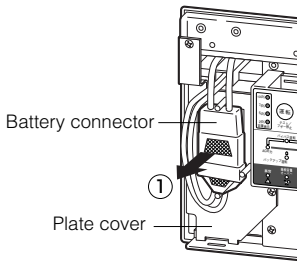
1. Turn the 2 screws at the top of the front panel of the UPS counterclockwise with a screwdriver until they turn freely. (The screws cannot be removed from the front panel.)

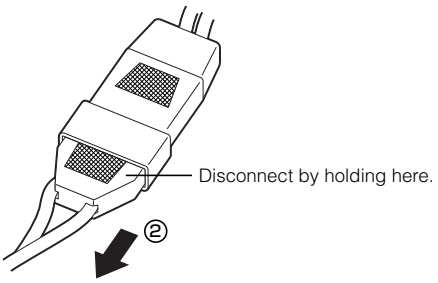
Remove the front panel towards you. ①



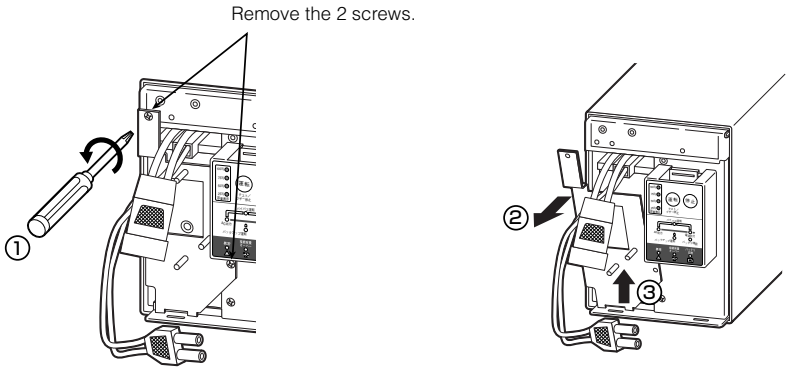


2. Remove the battery connector from the plate cover ① and disconnect the connector. ②





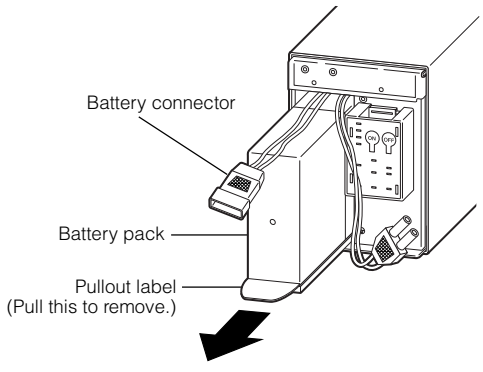
3. Turn the 2 screws that fix the plate cover counterclockwise to remove them. ①
Pull the plate cover towards you ② and lift it up to remove it. ③



4. Hold the pullout label at the bottom of the battery pack and remove the battery pack.

Do not hold the connector or cable of the battery pack.

If you see red tape stuck on the top of the battery pack, you can remove the battery completely by pulling it 10 cm further. Hold the battery securely with your both hands not to drop it.



5. Insert a new battery into the UPS as far as it will go. ①

● Replacement battery pack

For BU50XS: Model BP70XS
For BU70XS: Model BP70XS
For BU100XS: Model BP100XS

Important

Do not connect the connector until you insert the battery into the UPS completely.

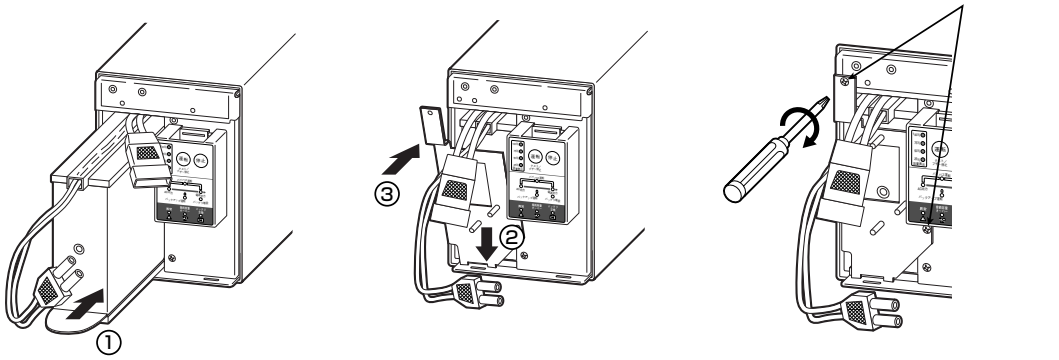
Attach the plate cover.

Insert the lug at the bottom of the cover into the hole in the main body ② and push it towards the main body. ③

Turn the 2 screws that you have removed clockwise with a screwdriver securely.

Do not pinch the cable by the plate cover.

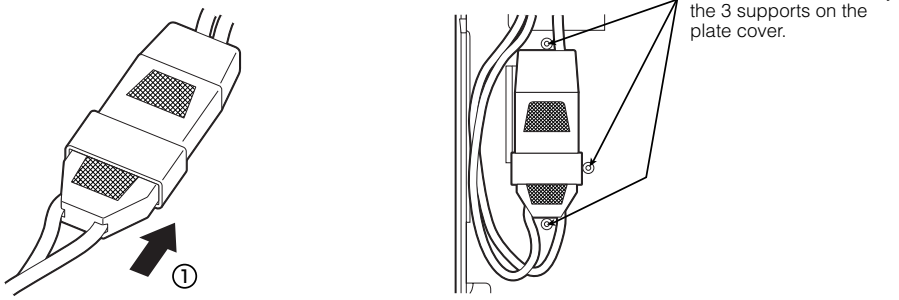
Tighten the 2 screws.



6. Insert the connector until it is locked. ①

Secure the connector to the plate cover. ②

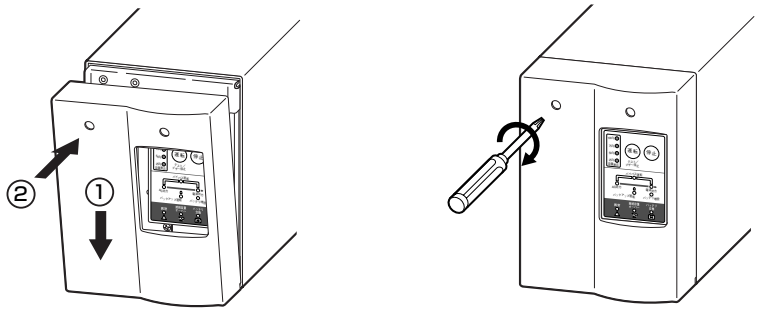
If you cannot secure the connector to the plate cover, the connector is not inserted completely.
Insert the connector again.



7. Attach the front panel.

Insert the lug at the bottom of the front panel into the hole in the main body ① and push it towards the main body. ②

Turn the 2 screws at the top of the font panel clockwise with a screwdriver securely.



8. Battery replacement is now complete.

- Fill in the date of replacement on the label on the top of the UPS.
- If you use the UPS monitoring software, enter the date of battery replacement to update it.
- After replacement, press and hold the Start Switch for at least 20 seconds to execute the self-diagnostic test after battery replacement.
  The beeper sounds as follows:
  - No beep sounds within 10 seconds after starting the press of the Start Switch.
  - A beep sounds at intervals of 1 second from 10 seconds to 20 seconds.
  - The beeper sounds continuously after 20 seconds.

  Release the Start Switch when the beeper sounds continuously.
  The 10-second self-diagnostic test starts.
  - If there is no error in the operation of the equipment after battery replacement, the Error Lamp and the Battery Replacement Lamp do not go on and a beep does not sound.
  - If the Error Lamp goes on and the beeper sounds continuously, take necessary countermeasures according to "1" of "C. Failure (display and beep when a failure occurs in equipment)" on page 23.
  - If the Battery Replacement Lamp goes on and the beep sounds continuously, the battery pack is not connected correctly. Check the connection of the battery connector again.

Notes

Discard the battery after replacement.

- If you keep it for a long time, dilute sulfuric acid may leak from the battery.
- For information on discarding the battery, contact us please;

6-3 Replacing the fan

The fan used in the UPS has its life. The life of the fan is approximately 5 years.

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

Don't replace the fan by yourself.
Contact us for replacing it;

6-4 Cleaning

1. Cleaning the UPS

Damp 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.)

2. Removing dust from the AC Input Plug of the UPS

Stop all the connected devices and the UPS and disconnect the AC Input Plug from a wall outlet (commercial power).

Then, remove dust with a dry cloth and make the connection again.

(For information on the connection, refer to "2. Installation and connection" on page 12.)

7. Using the Network Line Surge Protection Function

❑ Line Surge Protection Function

This function is to absorb surge voltage (abnormally high voltage) that may occur on the telephone line or network cable due to thunder. It protects your modem, TA, and network card from damage due to surge.

*** If you do not use the Network Line Surge Protection Function, this step is not required.**

The following 2 types of connectors are available for the Network Line Surge Protection Function.

• RJ45 (8 Pins) and RJ11 (2 Pins, 4 Pins, or 6 Pins)

7-1 When connecting to the telephone line

Connect the telephone line that comes out of the wall to the Line/Hub Side of the Network Line Surge Protection of the UPS.

Use the attached telephone cable (modular cable) to connect between the Modem/TA/PC Side of the Network Line Surge Protection of the UPS and your modem, FAX and so on.

7-2 When connecting to the ISDN line

Connect the ISDN line that comes out of the wall to the Line/Hub Side of the Network Line Surge Protection of the UPS.

Use the attached telephone cable (modular cable) to connect between the Modem/TA/PC Side of the Network Line Surge Protection of the UPS and your DSU (or terminal adaptor with built-in DSU).

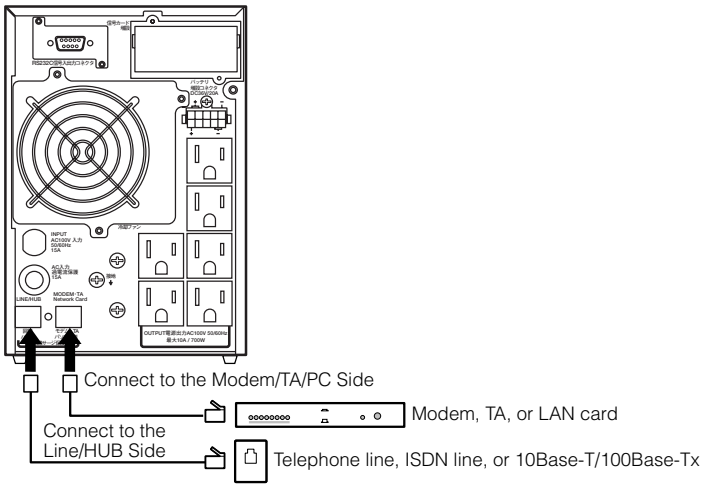
7-3 When connecting to LAN 10Base-T/100 Base-Tx

To protect your 10Base-T/100 Base-Tx (twisted pair cable without shielding) network interface, you need to separately purchase a cable equivalent to your cable in use.

Connect the 10Base-T/100Base-Tx cable from HUB to the Line/Hub Side of the Network Line Surge Protection of the UPS.

Connect between the Modem/TA/PC Side of the Network Line Surge Protection and the network interface of your PC with the cable you purchased separately.

7-4 Example of connection



8. Using the UPS monitoring software and Contact Signal

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

The RS232C/Contact Signal Connector at the rear of the UPS provides both the function to communicate with the UPS monitoring software and the Contact Signal function. There is no option that you need to purchase separately.

8-1 When performing the auto shutdown processing by the UPS monitoring software

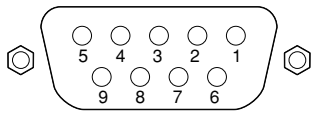
UPS monitoring software

The attached UPS monitoring software allows you to automatically save files and perform shutdown processing of your PC when a power failure occurs.

Also, you can perform desired operation by setting the automatic start/stop of the UPS based on the schedule setting and the functions in "10-2 Functions that can be set/change from the UPS monitoring software."

* The time between the occurrence of a power failure and the shutdown of your PC must be within the backup time measured in "5-1 Measuring method of the backup time" on page 28.
For more information, refer to the Instruction Manual and online help of the UPS monitoring software.

* The attached UPS monitoring software supports Japanese version environment only.

Pin assignment	Pin number	RS232C signal name
 Front view Screw diameter: inch screw #4-40UNC	1	
	2	T X D
	3	R X D
	4	P n P
	5	GND
	6	P n P
	7	P n P
	8	
	9	RING

Explanation

Scheduled operation using the UPS monitoring software

- When performing scheduled operation in which the UPS is stopped and the commercial power is stopped using a breaker and so on at the same time, specify a period within 3 months for the start of the next operation.
  If you specify a period longer than 3 months, the internal timer is reset and the scheduled operation does not start.
  Notice that this period reduces to approximately half when the battery is dead.
  If 3 months are exceeded, you start operation by supplying commercial power and press the Start Switch. However, if the battery is dead, you may not be able to start operation. In this case, replace the battery according to "6-2 Replacing the battery" on page 29.

Start of operation in scheduled operation using the UPS monitoring software

- In order to bring the UPS in pause due to scheduled operation into operation status with the Start Switch, press the Start Switch for at least 0.5 second. It goes into operation status after 15 seconds.
  To stop the operation, press the Stop Switch for at least 2 seconds.

Auto restart after OS closing processing using the UPS monitoring software

- For certain PCs(*1), they automatically restart immediately after the completion of OS closing processing by auto shutdown when a power failure occurs.
  In this case, the UPS stops during or after the restart of the PC and files and hard disk may be broken.
  You can avoid this phenomenon by disabling POWER MANAGEMENT in the BIOS settings of the PC.

*1) Certain PC: It is known that this phenomenon occurs for MICRON's Millennia Mme.

8-2 Details on Contact Signal

Contact Signal

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 battery low signal. Also, by inputting the backup stop signal from the system, you can stop the UPS with an enough battery amount to prepare for the next occurrence of a power failure.

1. Signal output

The UPS has 2 kinds of output signals. The output circuit consists of a transistor circuit insulated by a photo coupler.

- Backup signal output: BU

  Stays ON (LOW) during a power failure.
  As the output circuit is configured sharing with RS232C interface circuit, however, BU signal output circuit is connected with the internal circuit. (Refer to "Example of BU signal output circuit and the connected circuit" on page 39.)

- Battery low signal output: BL

  Goes ON when the battery becomes week during the Battery mode. It goes ON (LOW) at least 2 minutes before the backup stops. The time may become less than 2 minutes if the battery becomes weak and the backup time becomes shorter.
  The output circuit is an open collector circuit.

2. Input of the Backup Stop Signal (BS)

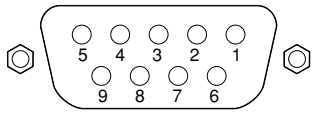
You can stop the UPS by inputting a voltage signal (HIGH) from the outside.

3. Connection to the system

Please make a cable to connect to the system by yourself.

(For an example of the use of the circuits, refer to "7. Example of the use of the Contact Signal circuit" on page 39.)

4. Contact Signal Connector (female DSUB9P)

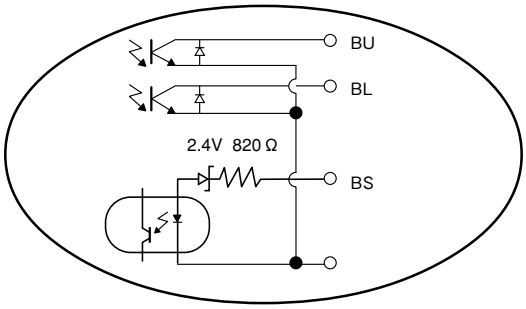
Pin assignment	Pin number	Input/output signal name
 Front view Screw diameter: inch screw #4-40UNC	1	BL
	2	
	3	BS
	4	
	5	GND
	6	
	7	
	8	BU
	9	

5. Contact Signal ratings

- Signal output (BU and BL)
  Signal output transistor ratings
  Applied voltage: 24 VDC or less
  Maximum current: 10mA
- Signal input (BS)
  Input voltage: HIGH 5 to 15 VDC, LOW 0.8 VDC or less
  Setting of accepting the UPS Stop Signal
  - Accept both during Line mode and during Battery mode.
    Stopped when a continuous voltage signal of 10 seconds or more is applied.
  - Accept only during Battery mode.
    Stopped when a continuous voltage signal of 0.01 second (10 ms) or more is applied.

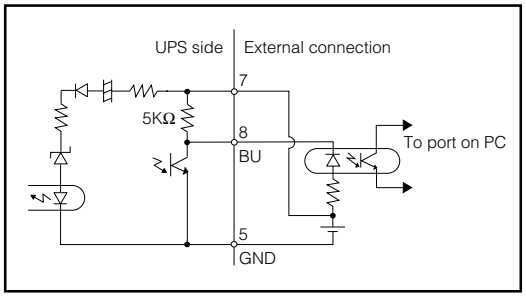
* For information on the setting of the Backup Stop Signal, refer to "10-1 Function that can be set/change from the UPS" on page 41.

6. Contact Signal circuit inside the UPS

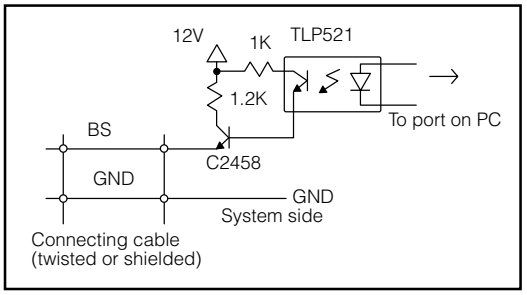


7. Example of the use of the Contact Signal circuit

● **Example of BU signal output circuit and the connected circuit**



● **Example of BS signal input circuit and the connected circuit**



8-3 Expanding the signal card

You can expand the signal card into the signal card expansion slot at the rear of the UPS.

● Contact Signal card (model: SC06)

8-4 Precautions and notes on the use of the Contact Signal

Notes

When connecting a device that generates counter electromotive force such as a relay to the signal output circuit, connect a diode to prevent counter electromotive force across the relay.

Explanation

● After shutdown processing and recovery from a power failure, the UPS automatically restarts and supplies power. If you do not want to start the connected devices, turn off their switch in advance.

● The UPS monitoring software allows you to disable automatic restart.

9. Extending the backup time

9-1 Expanding the battery unit (BU100XS only)

You can extend the backup time by expanding the optional battery unit (model: MB100XSU) to the BU100XS.

You can expand only one battery unit.

The Battery Connecting Cable accompanied with MB100XSU is provided with the attached Cable Clamps. Connect the Battery Connecting Cable according to the following instructions.

(1) Loosen the screws and remove the cover of the Battery Expansion Connector of the BU100XS at the rear side and the cover of the Battery Expansion Connector of the CMB100XSU at the rear side. The removed screws are to be used for fixing the Cable Clamps.

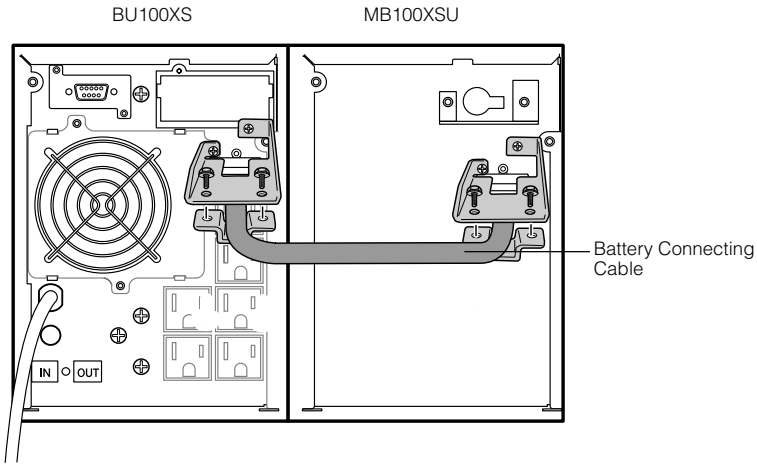
(2) Connect the Connectors of the Battery Connecting Cable to the Battery Expansion Connector of the BU100XS at the rear side and to the Battery Expansion Connector of the MB100XSU located at the rear sides. Do not tighten the screws at the Cable Clamps that hold the Battery Connecting Cable at this stage, for easier operation.

(3) Fix the Cable Clamps at the rear side of the BU100XS and at the rear side of the MB100XSU using screws (each 2 screws).

(4) Tighten the screws at the Cable Clamps that hold the Battery Connecting Cable.

(5) Put the Overcurrent Protection Switch at the rear of the battery unit into the ON position.

(6) Connect the AC Input Plug of the BU100XS to a wall outlet. The Battery Expansion Lamp in BU100XS's operation part goes on.



The backup time is 20 minutes when a device of 1KVA/700W is connected. (Initial value of battery at ambient temperature of 20°C) The charging time from completely discharged status is 24 hours.

10. Changing the setting of the functions

This product provides the following functions that you can set. The settings are held even when you turn off the power.

10-1 Function that can be set/change from the UPS

● Changing the acceptance condition for the Backup Stop Signal (BS)
You can select the acceptance condition for the Backup Stop Signal from the following 2 modes.
• Accept both during Line mode and during Battery mode.
• Accept only during Battery mode.

Notes

Setting the acceptance condition for the UPS Stop Signal (BS)

● The factory-shipped setting is "Accept only during Battery mode."
Do not change the factory-shipped setting except under the following conditions.
Do not change it also when using the attached UPS monitoring software, “PA”.
- If you change the setting to "Accept both during Line mode and during Battery mode," the UPS stops suddenly at the startup of the PC, which may break files and so on.
It is known that this phenomenon occurs when expanding a SCSI board to Sony VAIO R series and so on.
- Do not start up the PC during Battery mode. The UPS stops at the startup.

● Changing the factory-shipped setting
When you want to always perform restart (for example, unmanned system when you use the auto closing processing by Windows NT's UPS service or you make the shutdown system by the contact signal by yourself), change the setting to "Accept both during Line mode and during Battery mode."
- If the factory-shipped setting is used along with Windows NT's UPS service, after the start of shutdown due to a power failure and before the stop of the UPS, if a power supply is restored, resetting power supply to the PC may not be performed and therefore the auto restart of Windows NT may not be performed.
- If you change the setting, the UPS may stop at the startup of the PC, depending the type of the PC in use.
Before operating the system, check that the UPS does not stop at the startup of your PC according to the following procedure.
- Check procedure
  1. Disconnect the AC plugs of the devices connected to the UPS such as PC and peripherals from the Power Supply Output Receptacles.
  2. Connect the PC and peripherals to a wall outlet (commercial power).
  3. Connect the serial port on the PC and the UPS.
  4. Start up the PC.

  Check that the UPS does not stop.
  * If the UPS does not stop, you can use the "Accept both during Line mode and during Battery mode" setting.
  If it stops, change the setting to "Accept only during Battery mode" before use.
  * After the operation check, restore the connection of the AC plugs of the PC and peripherals.
  For information on the connection procedure, refer to "2. Installation and connection" on page 12.

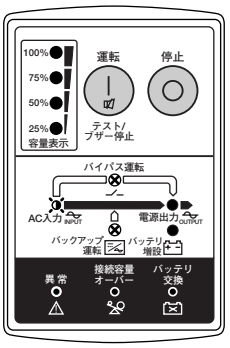
● Setting procedure

1. When the UPS is stopped with AC input supplied, while pressing the Stop Switch, press and hold the Start Switch for at least 0.5 second.
2. The AC Input Lamp blinks and the Bypass mode Lamp or the Battery mode Lamp goes on.
3. Under this condition, press and hold the Start Switch once for at least 0.5 second. The Bypass mode or the Battery mode Lamp goes on alternately, which indicates the change of the setting.
   - When the Bypass mode Lamp goes on: Accepts both during Line mode and during Battery mode.
     In this case, the UPS stops when a continuous voltage signal of 10 seconds or more is applied.
   - When the Battery mode Lamp goes on: Accepts only during Battery mode.
     In this case, the UPS stops when a continuous voltage signal of 0.01 second (10 ms) or more is applied.

   * Factory-shipped setting: Accepts only during Battery mode.
   (The Battery mode Lamp goes on.)
4. When the desired setting is displayed, press and hold the Stop Switch for at least 2 seconds to complete the setting.

Blinks ● Goes out

⊗ Goes on, blinks, or goes out depending on the status



10-2 Functions that can be set/change from the UPS monitoring software

1. Beeper ON/OFF setting

   ON : The beeper sounds when an alarm is necessary.

   OFF : The beeper is disabled.

   * Factory-shipped setting: ON
2. Auto battery test ON/OFF

   ON : The battery test is automatically executed at intervals of 4 weeks.
   If the test result shows that battery replacement is required, a replacement alarm occurs.

   OFF : The battery test executed at intervals of 4 weeks is automatically disabled.
   Set to OFF, for example, when you want to disable a series of operation of the auto battery check and Battery mode.

   * Factory-shipped setting: ON
3. Auto restart ON/OFF

   ON : When the UPS is shut down and stopped by the UPS monitoring software or the contact signal at the occurrence of a power failure and then the commercial power is restored, the UPS automatically starts up and starts output.

   OFF : Even if the UPS is shut down and stopped by the UPS monitoring software or the contact signal and then the commercial power is restored, the UPS does not start up. You can start it up only manually by pressing the Start Switch.

   * Factory-shipped setting: ON

11. Troubleshooting

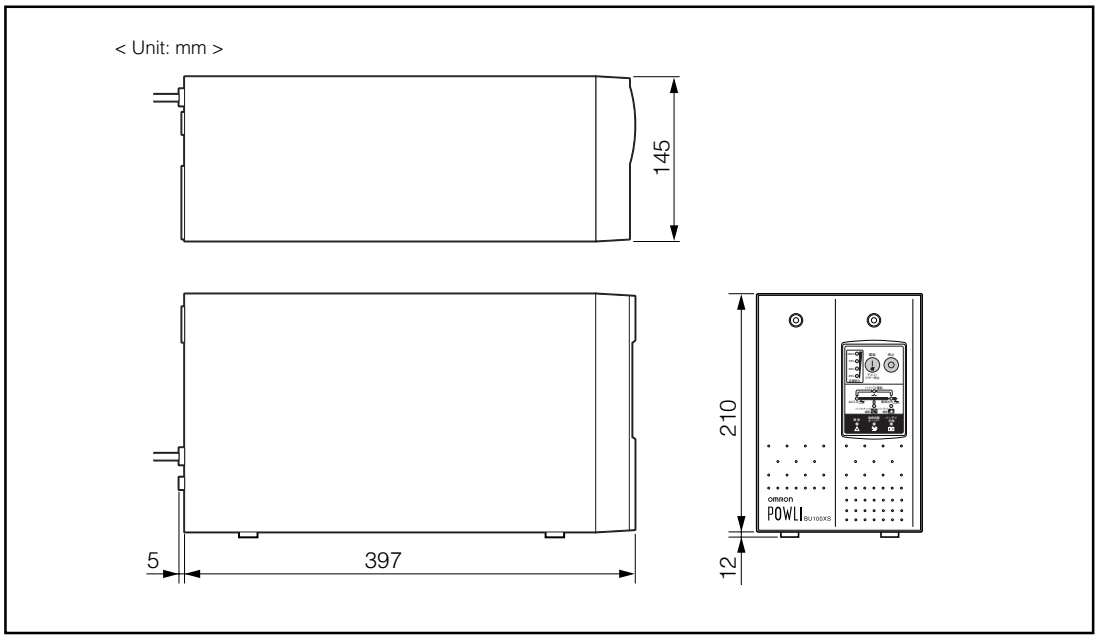
Problem	Check and remedy
The UPS does not operate. Or, the AC Input Lamp does not go on.	The AC Input Plug is not connected to the commercial power. ● Check that the AC Input Plug is connected to the commercial power securely. The button is popped up from the AC Input Overcurrent Protection. ● It is suspected that there are too many connected devices or there is a short in connected devices. Reduce connected devices or check the fuses of connected devices. If the connected devices are normal, disconnect all of them and push the Black button into the AC Input Overcurrent Protection, or set it to ON and connect the AC Input Plug to a wall outlet (commercial power). Even after this, if the AC Input Overcurrent Protection goes OFF, the product may be at fault.
Battery mode is not performed. The connected devices stop when a power failure occurs.	It is suspected that the battery is not charged sufficiently or dead. ● Connect the AC Input Plug of the UPS to a wall outlet (commercial power) and charge it for at least 8 hours. (Charging is performed regardless of in operation or in pause. You can choose either of the charging methods for your convenience.) After 8 hours, bring the UPS into operation and bring the connected devices into operation. Disconnect the AC Input Plug of the UPS from a wall outlet (commercial power) to perform Battery mode. If the Battery mode is performed, the battery was not charged sufficiently. If Battery mode cannot be performed at all or the backup time is less that the time you need, replace the battery pack because the battery is exhausted.
Battery mode is performed too frequently.	Variations (decrease) in the input power occur frequently. Or, noise is included that significantly distorts the voltage waveform of the input power. ● Change a wall outlet (commercial power) to which you connect the UPS. Attempt a wall outlet (commercial power) away from equipment that consumes large 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.
The display of connected devices is abnormal. • The display is unstable. • White lines occur.	A probable cause is noise that occurs inside the UPS. ● Ground all devices connected to the UPS. Connect them to a wall outlet (commercial power) for 3-pin plugs or connect their Grounding Terminal to the Grounding Terminal of a wall outlet. ● This problem may occur when power cords are long or placed closely or when the UPS and devices to be backed up are placed closely. Change the placement of them. ● If the UPS or devices connected to the UPS are contained in a metal rack, attempt to ground the rack itself.
The Connection Capacity Exceeded Lamp goes on.	The total capacity of the devices connected to the Power Supply Output Receptacles exceeds the rated capacity. ● Reduce connected devices.
The Battery Replacement Lamp goes on.	The battery is judged to be dead in the auto battery test. ● Battery mode cannot be performed and therefore replace the battery pack.
The Error Lamp goes on.	An error or faulty has occurred in the UPS. ● Stop the UPS and the connected devices. Disconnect all the connected devices and turn on the Start Switch of the UPS only. If the normal operation is restored, a short has occurred in one or more connected devices. Check the connected devices. If the problem persists, check whether the fan on the rear side is stopped. If the fan is stopped, replace it. If the fan is not stopped, stop the UPS for 1 hour and then start operation again. If normal operation is restored, temperature rise is suspected and therefore improve ventilation around the UPS. If the problem persists after 1 hour, the product may be at fault and need repair. Contact us;

References

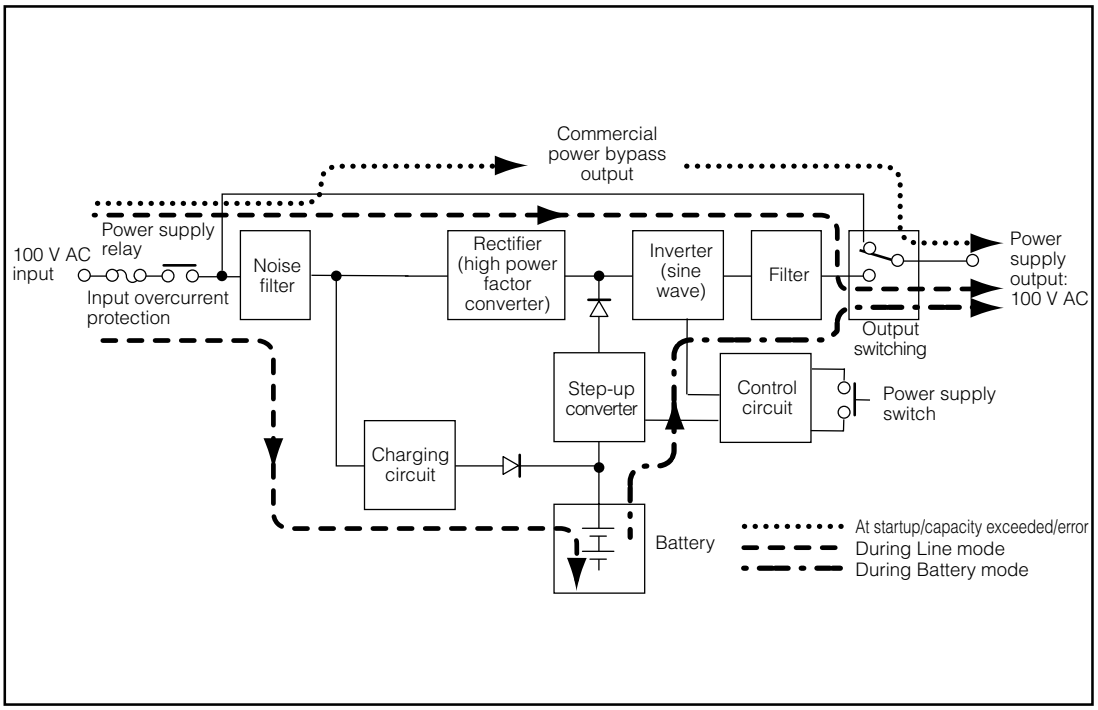
A. Specifications

Operation method	Operation method Cooling method	Full-time inverter power supply method Forced air cooling	
Input	Rated voltage range Frequency Maximum current	79 VAC to 121 VAC 50/60Hz ± 7% 8A 10A 14A	 BU50XS BU70XS BU100XS
Output	Number of phases Rated capacity Voltage/accuracy Output waveform Frequency/accuracy Number of phases Overload protection Switching time (at power failure) Bypass switching time	Single phase 2 lines 500VA / 350W 700VA / 490W 1KVA / 700W (Both VA and Watt should not over the Rated Capacity) 100 VAC ± 3% Sine wave In synch with input frequency Single phase 2 lines Warning by beeper and display at rated capacity or greater Bypass switching at 105% of rating for 10 seconds Immediate bypass switching at 120% or more Non intermittent 4 msec or less	 BU50XS BU70XS BU100XS Auto retransfer method At startup/error/capacity exceeded
Battery	Type Voltage Capacity/quantity Backup time Charging method Charging time	Sealed lead-acid battery 24V 36V 7.2Ah/12V x 2 7.2Ah/12V x 3 8 minutes (at 20°C, initial characteristics and rated load) 5 minutes (at 20°C, initial characteristics and rated load) 5 minutes (at 20°C, initial characteristics and rated load) Constant voltage constant current charging 8 hours (20°C)	 BU50XS, BU70XS BU100XS BU50XS, BU70XS BU100XS BU50XS BU70XS BU100XS 80% for 4 hours
Environment	Operating ambient temperature Operating ambient humidity Storage temperature Storage humidity Withstand voltage Insulation resistance Leak current Thunder surge resistance VCCI Input harmonic	0 to 40°C 25 to 85%RH (No condensation) -15 to 40°C 20 to 90%RH (No condensation) 1500 VAC, 1 minute 10 M ohm or more 1 mA or less To ground 4KV / between lines 2KV Type A compliance Within suppression reference value	 500 VDC
Others	Internal power consumption Noise Outside dimension (mm) Weight	60 W or less 70 W or less 50 dB or less W145 x H210 x D397 13Kg 15.5Kg	BU50XS, BU70XS BU100XS BU50XS, BU70XS

B. Dimensional outline drawing



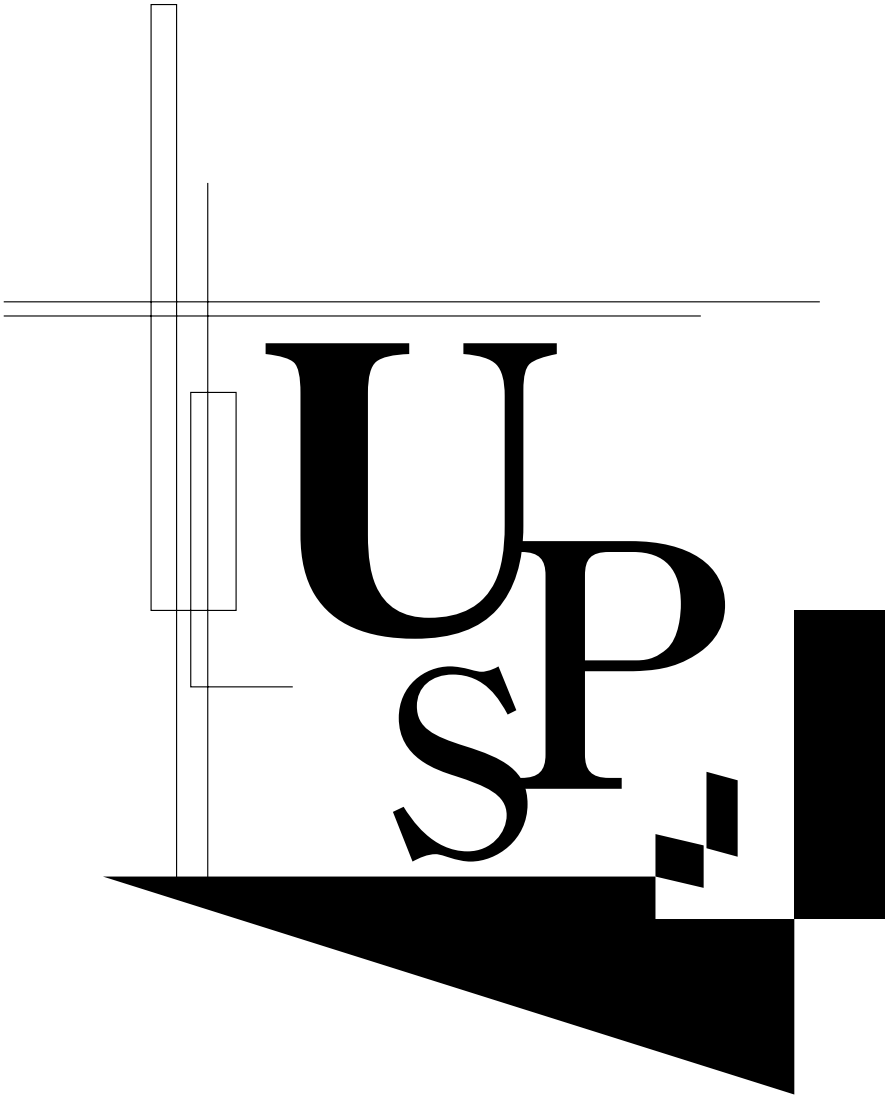
C. Circuit block diagram



D. Related products

The following optional devices and parts are available.

● Replacement battery pack for BU50XS/BU70XS	(Product model: BP70XS)
● Replacement battery pack for BU100XS	(Product model: BP100XS)
● Expansion battery unit for BU100XS	(Product model: MB100XSU)
● Cable for Windows NT UPS service (For DOS/V)	(Product model: BUC16)
● Cable for Windows NT UPS service (For NEC PC9800/9821 series)	(Product model: BUC19)



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K1L-D-04037A