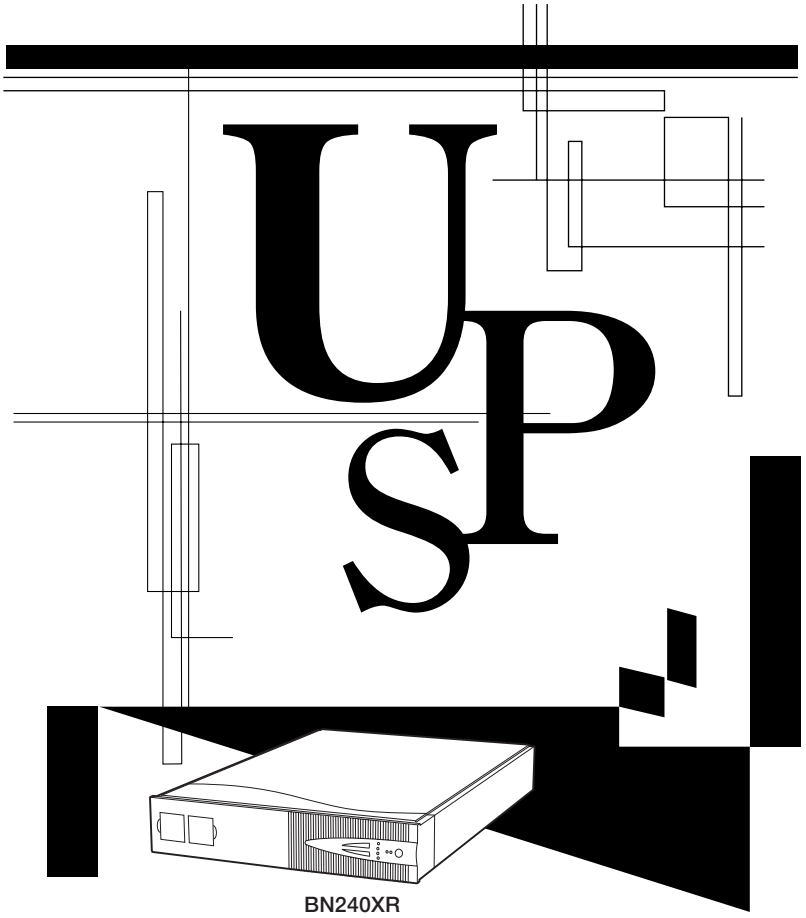
OMRON

Uninterruptible Power Supply (UPS)

POWLI BN100XR/BN150XR/BN240XR

Instruction Manual



BN240XR

* Read this instruction manual before the installation and use of BN100XR/BN150XR/BN240XR to ensure that you fully understand the critical do's and don'ts of the devices.
* Keep this instruction manual within easy reach of where you install BN100XR/BN150XR/BN240XR so that you can refer to it when necessary.

Introduction

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

- The UPS protects computers and other devices from surge voltage (a phenomenon in which extraordinary high voltage occurs instantaneously) caused by power failures, voltage variations, instantaneous voltage drops and power failures, and lightning.
- The BN100XR, BN150XR and BN240XR are line interactive UPS with simple output voltage adjustment functions. Under normal service conditions, commercial power input passes through the transformer and is output, and when the input voltage is low, the transformer raises the voltage, and when the input voltage becomes high, the transformer lowers the voltage. In addition, when abnormalities in commercial power are detected, such as in a power failure or when there are large changes in voltage, power supply is shifted to the battery within 10ms, and sine wave output is continued.
- Under normal setting conditions, output capacities are 1000VA/700W for BN100XR, 1500VA/1000W for BN150XR and 2310VA/2000W for BN240XR.

Notes on the use of the UPS

- The UPS is designed and manufactured for OA equipment such as personal computers.
  Do not use the UPS with the devices that require very high reliability and safety as listed below.
  ◊ Medical devices that support life directly
  ◊ Particular applications of devices that may cause injury (applications that directly affect the operation and control of planes, ships, railroads, elevators, and others)
  ◊ Applications that are subjected to constant vibration, such as cars and ships
  ◊ Applications in which a failure of the UPS may cause critical damage or effect on public safety (major computer systems, main communications equipment, public transportation systems, and others)
  ◊ Devices with the similar level of importance
- For the devices that adversely affect the safety of people and maintenance of utilities in the event of failure, special considerations related to operation, maintenance, and management of the system must be taken such as a standby system for emergency use and an auxiliary power generator.
- Observe the do's and don'ts of this instruction manual related to the operating and environmental conditions.
- When you want to add the UPS to the critical system that requires very high reliability, contact us; _____.
- Do not modify/alter your UPS.
- The UPS is designated for domestic use only. Do not use the product abroad (outside Japan).
  ◊ Voltages and frequencies may differ abroad and may result in failure and/or fire.

IMPORTANT SAFETY INSTRUCTIONS

1. SAVE THESE INSTRUCTIONS

This manual contains important instructions for Model BN100XR/BN150XR/BN240XR/MB240XR that should be followed during installation of the UPS and batteries.

2. SYMBOL


This symbol indicates the ground.


This symbol indicates that the on UPS is ON.


This symbol indicates that the UPS is OFF.


This symbol indicates AC voltage.


This symbol indicates DC voltage.


This symbol indicates phase.

3. INTERNAL BATTERY

Internal battery voltage is 36V DC for BN100XR/BN150XR, 72V DC for BN240XR and MB240XR.

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.

Table of Contents

Directions for safe use

Read this instruction manual before installation and use to ensure that you fully understand the critical do's and don'ts of your UPS.

● The safety symbols used in this manual and their meanings 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 prohibited action (don'ts). For example, indicates that disassembly is prohibited.

: Indicates necessary action (do's). For example, indicates that grounding is necessary.

Notice that do's and don'ts of "Caution" may bring about a serious accident according to the circumstances. These do's and don'ts are critical and must be observed strictly.

Warnings

Do not disassemble, repair, and/or modify your UPS.

● Doing so may cause an electric shock or fire.

If battery liquid leaks from the UPS, do not touch it.

● Doing so can lead to blindness and/or or burns.
● If the liquid gets in eyes or spills on your skin, wash with clean water and consult a doctor.

When replacing the battery, do not insert anything metal into the battery.

● An electric shock or short may occur.

Warnings (uses of the UPS)

Do not add the UPS where very high reliability and safety are required as listed below. (The UPS is designed and manufactured for uses with OA equipment, such as personal computers.)

● Medical devices and/or systems that support life directly
● Applications that may adversely affect the safety of people (for example, the operation and control of automobiles and elevators)
● Applications that adversely affect the maintenance of utilities in the event of failure (for example, critical computer systems and trunk lines)
● Applications with the similar level of importance

Cautions (installation)

Unpacking and carrying the UPS requires the following number of people:
BN100XR/BN150XR: 2 or more people
BN240XR/MB240XR: 3 or more people

● The UPS is heavy, so be careful when unpacking and carrying it.

Keep the weight in mind when unpacking and carrying the UPS.
Place and run the UPS on a structurally sound and level base.

● If the UPS falls over, or if you drop it, it may cause injury.
● The weight of the UPS
BN100XR: 20kg BN150XR: 20kg BN240XR: 38kg MB240XR: 29kg (add-on battery unit)
● If the UPS falls, immediately stop using it, inspect it, and repair it if necessary.

⚠ Cautions (installation)

Keep packing materials, including plastic bags and film, out of the reach of children

- Should children swallow or put their head into the packing materials, there is danger of suffocation.

Provide secure grounding

- Earth the ground terminals of the UPS and devices connected to the UPS. (See "2. Installation and connection" on page 17)
  You may receive an electric shock in the event of trouble or power failure. When both the UPS and devices are not grounded and you touch both, you may receive an electric shock.
- For BN100XR/BN150XR, when you use a 3-pin to 2-pin plug for the AC Input Plug, be sure to perform grounding before putting the AC Input Plug in a wall outlet (commercial power). On the other hand, be sure to disconnect the grounding terminal after removing the AC Input Plug from a wall outlet (commercial power).
- Connect the UPS grounding terminal to a grounded-type wall outlet (commercial power) to ensure that the Power Line Surge Protection works as intended.

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

- Battery deterioration will occur rapidly.
- Doing so may result in a failure or malfunction of the UPS.

Do not exceed the specified ranges in the operating and storage environments.
Do not install or store the UPS in the following types of places.

- Places with high temperatures, low temperatures, or high humidity
- Places that receive direct sunlight
- Places that are directly heated by a stove or other heat source
- Places where the UPS may experience vibration or physical shock
- Places where there is dust, corrosive gas, salt, or flammable gas
- Outdoors

Placing the UPS in these types of areas may result in malfunction, deterioration, and/or fire.

Do not obstruct the air inlets and outlets on the sides and rear of the UPS.
Do not place the UPS in an enclosed space or cover the UPS.

- Doing so may lead to abnormal overheating or fire.
- Temperature will increase inside the UPS and may cause a failure of the UPS and battery deterioration.
- Install the UPS 5cm or further away from the wall.

Do not install the UPS in other orientations.
Do not install the UPS on a structurally unsound base.

- See "2-2 Installation" on page 20.
- If the UPS falls over, or if you drop it, injury may result.

Do not clip the cables, and do not use when the cables are bundled.

- If the cables become damaged or overheated, there is a danger of electric shock or fire.
- If the cables become damaged, immediately stop using the UPS, and make the necessary repairs.

Do not connect a device such as a voltage transformer or isolated transformer to the output side.

- Overcurrent may damage the UPS.
- Even when connected to the input side, the UPS may fail or malfunction. Make sure to check the operation before use.

⚠ Cautions (installation)

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

When connecting a battery unit and/or adding another battery unit, be sure to place the battery unit in a position lower than the main unit.

- 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 the UPS: BN100XR: 20 kg BN150XR: 20 kg
  BN240XR: 38 kg MB240XR: 29 kg (add-on battery unit)

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

- Dropping it may result in injury.

Be sure to use the supplied mounting screws.

- Screws other than those supplied may not be strong enough to support the UPS, causing it to fall.

Do not place things on the units.

- Doing so may make battery change difficult due to the load.

⚠ Cautions (connection)

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

- Electrical wiring may become hot.
- When connected to a rated capacity device, the maximum current that can flow is as follows:
  BN100XR: 13.5A, BN150XR: 18A, and BN240XR: 27A.

Be sure to put the input plug of the UPS in a 100V AC (50/60 Hz) wall outlet (commercial power).

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

When using the 15A plug (NEMA 5-15P) with the BN150XR
The maximum capacity that can be connected to the output is about 1100VA1000W.

- Power consumption over 1100VA/1000W results in an input current of more than 15A, which can lead to overheating or fire.
- When the "Input over 15A" display appears, replace it with a 20A plug.

When replacing the input plug for the BN150XR, make sure to follow the connection directions correctly, and make sure not to mistake the colors of the plug receptacle and wire.

See "2-4. Connection of AC input cable" on page 24.

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

Do not connect devices that exceed the output capacity of the UPS.
You can add extra devices with a plug strip. Note that the plug strip does not permit the connection of devices that exceed the current capacity of the plug strip.

- The UPS may detect overload and stop the output.
- The plug strip cord may heat up and could lead to a fire.

Do not connect to a device (such as a dryer) that uses half-wave rectification in which AC power supply current flows in half-cycles only.

- The UPS may fail.

⚠ Cautions (use)

In a case where the Battery Replacement Lamp comes on or the backup time becomes shorter than the required backup time, replace the battery pack with a new one while the UPS is running, or stop the UPS and discard the old battery pack.

- The continuous operation of the UPS may result in fire.
- For further information on how to inspect the battery, see "5. Maintenance and inspection" on page 37.

Ambient temperature	Estimated life expectancy
20°C	2 to 3 years
30°C	1 to 1.5 years

* The table on the left shows the estimated life expectancy of a battery pack in normal usage conditions. This is not the warranty period.

When you notice abnormal sound or smell, smoke, or liquid coming from the inside of the UPS, immediately turn OFF the power switch (⏻) and remove the AC Input Plug from the wall outlet (commercial power).

- Continuous operation under the abnormal conditions may cause a leakage of current or fire.
- If you notice the abnormal conditions, never operate the UPS, and contact us or the distributor from which you purchased your UPS for inspection and repair.
- Your UPS must permit instant removal of the AC Input Plug from a wall outlet (commercial power) at the onset of a failure.

Do not place objects on the UPS and do not drop metal objects into the UPS.

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

Do not place the UPS in an enclosed space or put a cover over the UPS.

- Doing so may lead to abnormal overheating and/or fire.

Do not spill water on the UPS or get it wet.

- Doing so may cause an electric shock or fire.
- If the UPS gets wet, immediately stop using it, inspect it, and make repairs if necessary.

Do not insert metal objects into the output receptacles of the UPS.

- Doing so may cause an electric shock.

Do not insert metal objects into the battery connector or add-on battery connector. Do not short-circuit the connector terminals.

- Doing so may cause an electric shock.
- There is a risk of combustion, battery explosion, and burn injury.

⚠ Cautions (maintenance)

Before maintaining devices connected to the UPS, turn off the UPS and remove the AC Input Plug from the wall outlet (commercial power).

- Even if you remove the AC Input Plug during the operation of the UPS, the backup function of the UPS keeps feeding power through the power supply output receptacle of the UPS.
- In a case where the scheduled operation is ON and the AC Input Plug of the UPS is put in a wall outlet (commercial power), the UPS starts feeding power at the starting time of the scheduled operation.

⚠ Cautions (battery replacement)

Do not short-circuit the battery with a metal object.

- Doing so may result in burn injury or fire.
- Even in a dead battery, there is some current remaining.

Do not toss a battery into a fire. Do not try to break a battery.

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

Do not use any batteries other than those specified.

- Doing so may lead to a fire.
- Battery pack product models: BP150XR (for BN100XR, BN150XR), BP240XR (for BN240XR, MB240XR)

Do not use a new battery and an old battery at the same time (when adding BN240XR battery).

- Rapid deterioration of battery may occur, and dilute sulfuric acid may leak.

Do not drop the battery, and make sure that it does not receive any strong impact.

- Dilute sulfuric acid may leak.

Do not replace the battery in a place near flammable gas.

- A spark may occur when connecting the battery, and lead to a fire.

Replace a battery on a structurally sound base.

- Hold the battery securely with both hands to avoid dropping.
- Failure to do so may result in injury due to the battery falling, burns, or injury.

If there is liquid coming from the replaced battery pack, do not touch it.

- If touched, the liquid (dilute sulfuric acid) may cause burn injury or blindness.

Do not disassemble or modify the battery.

- Doing so may cause a leakage of dilute sulfuric acid, which may cause blindness and burns.

Notes

After purchasing the UPS, charge the battery until the battery charge indication shows that the battery is fully charged.

- If you do not use your UPS for a long time after purchase, the battery may deteriorate and become unusable.
- After inserting the AC Input Plug of the UPS into a wall outlet (commercial power), the battery automatically begins to charge.

Before storing the UPS, charge the battery until the battery charge indication shows that the battery is fully charged.

- In a case where you do not use the battery, it discharges naturally and goes into over discharge status after it is left for a long time. The backup time may become shorter or the battery may become unusable.
- The maximum possible storage period for the battery installed in the UPS is 6 months (after being fully charged).
- If the storage period is to exceed 6 months, recharge the battery before 6 months have passed by connecting the AC Input Plug to a wall outlet (commercial power).
- When storing the UPS, make sure that power switch (⏻) is turned OFF.

Do not create a short between the output lines of the UPS, or a ground fault between the output lines and the ground.

- The UPS may fail.

When the UPS is in operation, do not insert the AC Input Plug into the Power Supply Output Receptacle of the same UPS.

- The UPS may fail.

Shut down the UPS before cutting commercial power supply.
If the power switch cannot be turned OFF, perform an auto shutdown of the UPS using the UPS monitoring software with the minimum required backup time.

- The UPS goes into Battery mode whenever commercial power is cut. By continuing to run the devices on the battery and recharging the battery, the life expectancy of the battery is significantly shortened.
  The less you repeat charges and discharges, the longer the life expectancy of the battery will become.

Do not connect a page printer to the UPS.

- The peak current of the page printer is large, so it may be detected as an overcurrent, or the resulting instantaneous voltage drop may be detected as a power failure.
- Operation may switch between Line mode and Battery mode, reducing battery life.

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

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

Do not perform a withstand voltage test.

- The power input circuit has a built-in surge absorber element. A withstand voltage test may break it.
- When performing an insulation resistance test, conduct it in the 250V DC range.

Recycling and discarding the battery

- The UPS has a lead acid battery. The battery is a recyclable and valuable resource. We need your cooperation in recycling old batteries, batteries that you replace with a new batteries, and the batteries you used to discard.

Installation and storage places

- Do not install or store the UPS in a place exposed to direct sunlight.
  High temperatures may cause the battery to deteriorate and become unusable.

Explanations

Usual operating method

- You may keep the UPS running without shutting down, or you may turn off the UPS each time the devices connected the UPS are turned off.
  You can choose either way, depending on which is convenient.
- When connected to commercial power, the battery starts charging.

Terminating backup operation

- In the case of an extended power failure, the battery keeps discharging until power supply from the UPS stops. Before that happens, turn off your computer in the usual manner (including data backup).

Rebooting

- If the battery discharges completely during a power failure, the UPS stops. After the recovery from a failure of the power supply (for example, a power failure), the UPS automatically restarts and starts to feed power. If you do not want to run the devices connected to the UPS, keep the devices turned off.
- Using UPS monitoring software, automatic restart can be disabled.

The USB and RS-232C ports cannot be used simultaneously.

- The UPS monitoring software and can be used with either the USB or RS-232C ports of the UPS, but they both cannot be used at the same time.

Scheduled operation using UPS monitoring software

- When scheduled operation is being used, if commercial power is stopped during the scheduled shutdown period, set the period of time until the start of next operation at about one month.
  The timer is activated by the built-in battery for the period of time that the commercial power supply input is stopped.
  If the timer stops, operation start cannot be performed according to schedule.

Using UPS service of Windows NT

- If you are using Windows NT Server, make the settings using the server menu as shown below. An incorrect setting of the remote UPS shutdown the UPS will be unable to perform backup in the event of a power failure. For more detailed information, refer to the Windows NT 4.0 manual or the Windows NT 4.0 help file.

  The signal settings are as follows:

Power supply shutdown signal:	Negative (for initial value, Windows NT server is set as negative, and OS2Lan server is set as positive)
Battery weak/dead signal:	Negative (for initial value, Windows NT server is set as negative, and OS2Lan server is set as negative)
Remote UPS shutdown:	Positive (for initial value, Windows NT server is set as negative, and OS2Lan server is set as negative)

- For Netware users, call up the command input screen, and enter the following to load a UPS module into the file server.

  ```
  LOAD  UPS  TYPE=6 PORT=__  REV=2
  ```

  After this is input, press the Enter key.
  In the command line, after "PORT=", enter the number of the serial port that is connected to the UPS. (1 or 2)

Explanations

Auto restart after shutdown processing by UPS monitoring software

- In the event of a power failure, some PC models (see *1 below) automatically restart immediately after the completion of the OS shutdown processing by the UPS monitoring software.
  In this case, the UPS stops during restart or after startup, possibly damaging files and/or the hard disk.
  This problem can be avoided by disabling POWER MANAGEMENT in the BIOS settings.
  *1) PC models: This problem has been reported with MICRON's Millennia Mme.
- When the PC does not start up automatically, select the "System startup at power restoration" setting (example: "Restore On AC/Power Loss") in the BIOS settings of your PC, and change to a "System startup after power restoration" setting (example: "Power On"). Individual BIOS setting methods and/or displays may differ depending on the PC. For more information, consult your PC instruction manual or contact the technical support center for your PC.
- When considering a system with automatic startup at power restoration, choose a PC that satisfies the condition below. For more information on PC operation when input power is supplied, consult your PC instruction manual or contact the PC technical support center.

  <Condition>
  Without having the power switch pressed, the PC starts up when input power is supplied.
- After shutdown processing, the UPS restarts automatically and supplies power once power is restored. If you do not want the devices connected to the UPS to start up, turn off their switches in advance.
- The automatic restart setting can be disabled in the included UPS monitoring software.

1. Preparation

1-1 Unpacking the UPS

⚠ Cautions

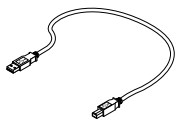
Keep the weight in mind when unpacking and carrying the UPS.
Place and run the UPS on a structurally sound and level base.

- If the UPS falls over, or if you drop it, it may cause injury.
- The weight of the UPS
  BN100XR/BN150XR: 20kg BN240XR: 38kg MB240XR: 29kg (add-on battery unit)
- If the UPS falls, immediately stop using it, inspect it, and repair it if necessary.

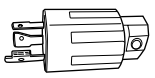
1-2 Checking the accessories

If you should notice defects or anything wrong, please contact your distributor at once.

Accessories	Quantity	BN100XR	BN150XR	BN240XR	MB240XR
1. Main unit	1	○	○	○	○
2. UPS monitoring software (CD-ROM, RS232C cable, etc.)	1 set	○	○	○	–
3. USB cable for UPS monitoring software	1	○	○	○	–
4. 3P-2P adapter plug	1	○	○	–	–
5. 20A AC plug	1	–	○	–	–
6. Upright stand	1	–	–	○	–
7. Battery unit connection cable set	1	–	–	–	○
8. Signal cable (modular cable for battery unit)	1	–	–	–	○
9. Upright coupling plate	1	—	–	–	○
10. EIA19-inch rackmount fittings and supports	1 set	○	○	○	○
11. Instruction manual (Japanese)	1	○	○	○	○
12. Instruction manual (English)	1	○	○	○	○
13. Warranty	1	○	○	○	○
14. User registration card	1	○	○	○	–
15. Label (Identification of operating condition)	1	○	○	○	–

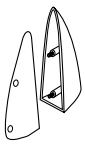


USB cable for UPS monitoring software

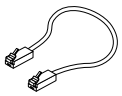


20A AC plug

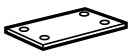
Battery unit connection cable



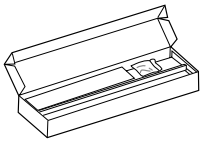
Upright stand



Signal cable (modular cable for battery unit)
Connect to the battery unit connecting cable



Upright coupling plate

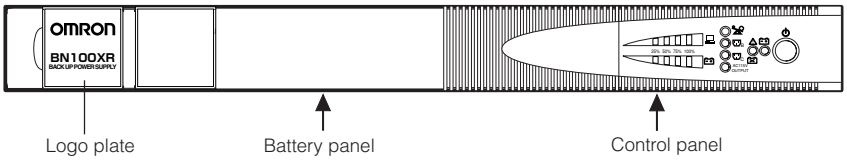


EIA 19-inch rackmount fittings and supports

1-3 Part names

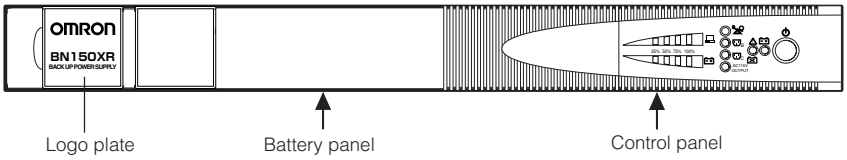
1. Front panel

● BN100XR



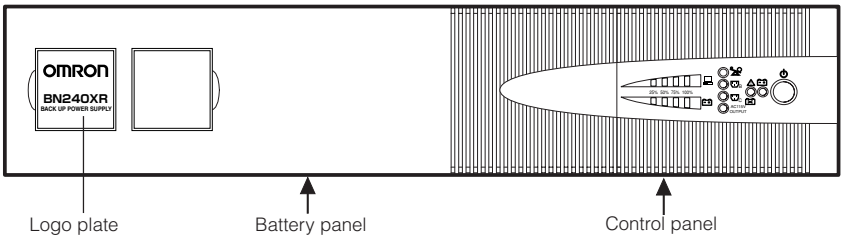
Note: There is a fixing screw for the battery panel beneath the logo plate.

● BN150XR

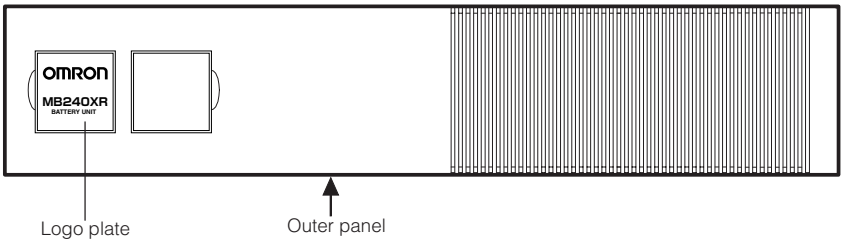


Note: There is a fixing screw for the battery panel beneath the logo plate.

● BN240XR

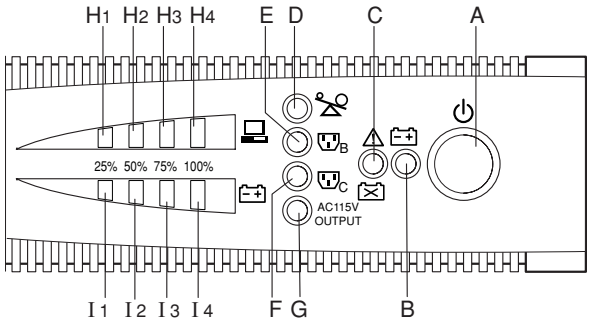


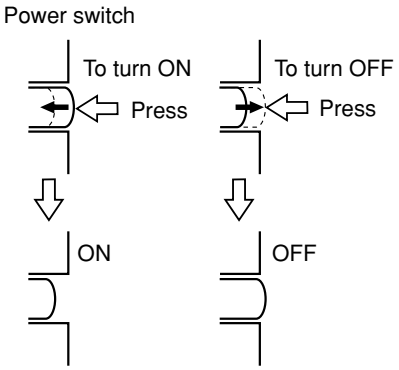
● MB240XR (Add-on battery)



Note: There is a fixing screw for the battery panel beneath the logo plate.

● Control panel (BN150XR/BN240XR)



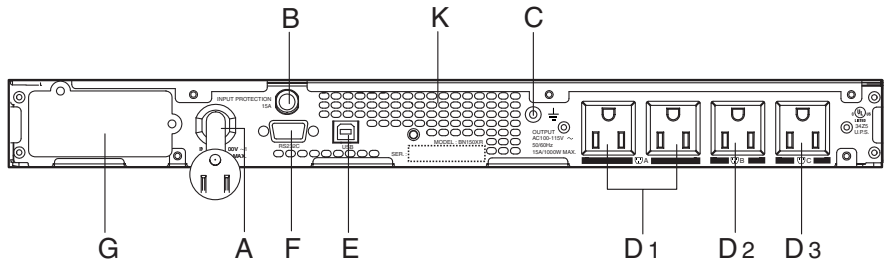


Switch	FUNCTION
A	Power switch

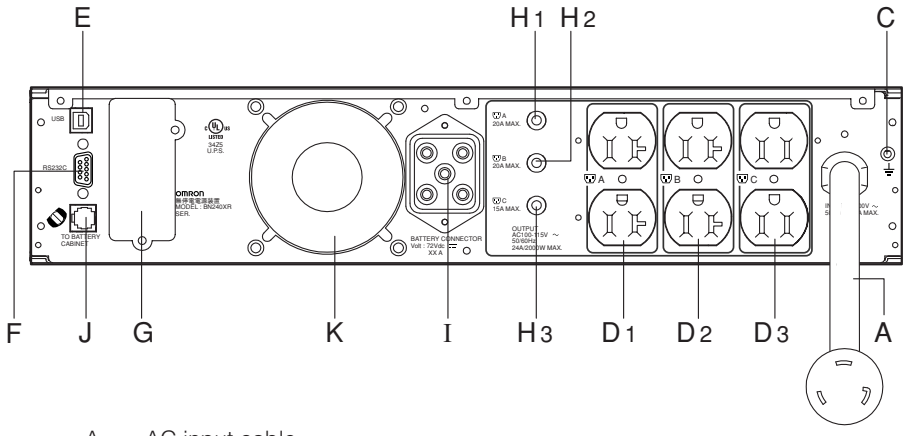
Indication lamp	Lit	
	Continuous illumination	Blinking display
A (green)	Power supply output/receptacle A output indication	Charging (blinks once every 10 seconds)
B (yellow)	Battery mode indication	Testing the battery (blinks once per second)
C (red)	Warning indication (failure)	Battery deterioration indication (blinks once every two seconds)
D (yellow)	Input over 15A indication (BN150XR only)	Overload indication (once every 0.5 second)
E (green)	Output indication for output receptacle B	
F (green)	Output indication for output receptacle C	
G (yellow)	115V AC output mode indication	
H1 to H4 (green)	Connection capacity indication	
H1	0 to 25%	
H2	25 to 50%	
H3	50 to 75%	
H4	75 to 100%	
I1 to I4 (green)	Battery charge/remaining capacity indicator (approximate value)	
I1	0 to 25%	
I2	25 to 50%	
I3	50 to 75%	
I4	75 to 100%	

2. Rear panel

●BN100XR/BN150XR



●BN240XR



A AC input cable
BN100XR: NEMA 5-15 (15A) plug
BN150XR: NEMA 5-15 (15A) plug
BN240XR: NEMA L5-30 (30A) plug

B Input overcurrent protection
BN100XR: 15A BN150XR: 20A BN240XR has built-in fuse (30A)

C Grounding screw terminal (FG)

D1 Output receptacle A
BN100XR (10A max.) BN150XR (15A max.) BN240XR (20A max.)

D2 Output receptacle B (Delayed output at startup/ON-OFF control possible)
BN100XR (10A max.) BN150XR (15A max.) BN240XR (20A max.)

D3 Output receptacle C (Delayed output at startup/ON-OFF control possible)
BN100XR (10A max.) BN150XR (15A max.) BN240XR (20A max.)

E USB interface

F RS232C interface

G Option card slot

H1 Output receptacle A overcurrent breaker (20A)

H2 Output receptacle B overcurrent breaker (20A)

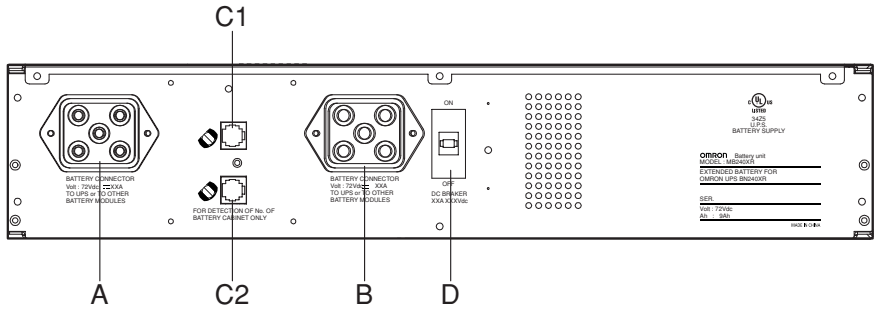
H3 Output receptacle C overcurrent breaker (15A)

I Add-on battery (MB240XR) connector

J Add-on battery (MB240XR) signal connector

K Air vent

●MB240XR



A	Add-on battery connector (to BN240XR/previously connected MB240XR)
B	Add-on battery (MB240XR) connector (to additionally connected MB240XR)
C1, C2	Add-on battery signal connector
D	Battery overcurrent breaker (63A) (Switch “ON” the breaker when operating.)

1-4 Explanation of symbols used on unit

Symbol	Description
	UPS is ON.
	UPS is OFF.
	Add-on battery unit is connected to the UPS.
	An error occurred with the UPS.
	Connection overload. Output capacity exceeded by connected devices.
	Batteries at end of useful life. Necessary to replace the batteries.
	Output receptacle B is ON.
	Output receptacle C is ON.
	AC input / output power supplied.
	DC power supplied.
	Phase of AC power, 1ϕ : Single phase.
	Indicates earth ground.

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.

⚠ Cautions (Compulsory (do's))

Keep the weight in mind when unpacking and carrying the UPS.
Place and run the UPS on a structurally sound and level base.

- If the UPS falls over, or if you drop it, it may cause injury.
- The weight of the UPS
  BN100XR: 20kg BN150XR: 20kg BN240XR: 38kg MB240XR: 29kg (add-on battery unit)
- If the UPS falls, immediately stop using it, inspect it, and repair it if necessary.

Keep packing materials, including plastic bags and film, out of the reach of children

- Should children swallow or put their head into the packing materials, there is danger of suffocation.

Provide secure grounding

- Earth the ground terminals of the UPS and devices connected to the UPS.
  You may receive an electric shock in the event of trouble or power failure. When both the UPS and devices are not grounded and you touch both, you may receive an electric shock.
- For BN100XR/BN150XR, when you use a 3-pin to 2-pin plug for the AC Input Plug, be sure to perform grounding before putting the AC Input Plug in a wall outlet (commercial power). On the other hand, be sure to disconnect grounding terminal after removing the AC Input Plug from a wall outlet (commercial power).
- Connect the UPS grounding terminal to a grounded-type wall outlet (commercial power) to ensure that the Power Line Surge Protection works as intended.

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

- Electrical wiring may become hot.
- When connected to a rated capacity device, the maximum current that can flow is as follows:
  BN100XR: 13.5A, BN150XR: 18A, and BN240XR: 27A.

Be sure to put the input plug of the UPS in a 100V AC (50/60 Hz) wall outlet (commercial power).

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

⚠ Cautions (Prohibition (don'ts))

Do not obstruct the air inlets and outlets on the sides and rear of the UPS.
Do not place the UPS in an enclosed space or cover the UPS.

- Doing so may lead to abnormal overheating or fire.
- Temperature will increase inside the UPS and may cause a failure of the UPS and battery deterioration.
- Install the UPS 5cm or further away from the wall.

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

- Battery deterioration will occur rapidly.
- Doing so may result in a failure or malfunction of the UPS.

Do not exceed the specified ranges in the operating and storage environments.
Do not install or store the UPS in the following types of places.

- Places with high temperatures, low temperatures, or high humidity
- Places exposed to direct sunlight
- Places that are directly heated by a stove or other heat source
- Places where the UPS may be exposed to vibration or physical shock
- Places where there is dust, corrosive gas, salt, or flammable gas
- Outdoors
- Placing the UPS in these types of areas may result in malfunction, deterioration, and/or fire.

Do not install the UPS in other orientations.
Do not install the UPS on a structurally unsound base.

- See "2-2 Installation" on page 20.
- IP the UPS falls over, or if you drop it, injury may result.

Do not connect devices that exceed the output capacity of the UPS.
You can add extra devices with a plug strip. Note that the plug strip does not permit the connection of devices that exceed the current capacity of the plug strip.

- The UPS may detect overload and stop the output.
- The plug strip cord may heat up and could lead to a fire.

Do not connect to a device (such as a dryer) that uses half-wave rectification in which AC power supply current flows in half-cycles only.

- The UPS may fail.

Do not clip the cables, and do not use when the cables are bundled.

- If the cables become damaged or overheated, there is a danger of electric shock or fire.
- If the cables become damaged, immediately stop using the UPS, and make the necessary repairs.In a case where the UPS is to be mounted on a rack, place it on the lowest part of the rack.

Do not connect a device such as a voltage transformer or isolated transformer to the output side.

- Overcurrent may damage the UPS.
- Even when connected to the input side, the UPS may fail or malfunction. Make sure to check the operation before use.

Notes

Do not create a short between the output lines of the UPS, or a ground fault between the output lines and the ground.

- The UPS may fail.

When the UPS is in operation, do not insert the AC Input Plug into the Power Supply Output Receptacle of the same UPS.

- The UPS may fail.

Shut down the UPS before cutting commercial power supply.
If the power switch cannot be turned OFF, perform an auto shutdown of the UPS using the UPS monitoring software with the minimum required backup time.

- The UPS goes into Battery mode whenever commercial power is cut. By continuing to run the devices on the battery and recharging the battery, the life expectancy of the battery is significantly shortened.
  The less you repeat charges and discharges, the longer the life expectancy of the battery will become.

Do not connect a page printer to the UPS.

- The peak current of the page printer is large, so it may be detected as an overcurrent, or the resulting instantaneous voltage drop may be detected as a power failure.
- Operation may switch between Line mode and Battery mode, reducing battery life.

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

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

Do not perform a withstand voltage test.

- The power input circuit has a built-in surge absorber element. A withstand voltage test may break it.
- When performing an insulation resistance test, conduct it in the 250V DC range.

Installation and storage places

- Do not install or store the UPS in a place exposed to direct sunlight.
  High temperatures may cause the battery to deteriorate and become unusable.

2-2 Installation

The UPS permits the following installing methods. Choose the one best suited for the environment.
1. Rackmount installation
2. Stationary installation
   - Horizontal
   - Upright intatllation for BN240XR/MB240XR

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

⚠ Cautions

When performing rack installation, ensure that the UPS is supported and stabilized by using both the support angles and the table clamps that were included.
When connecting a battery unit and/or adding another battery unit, be sure to place the battery unit in a position lower than the main unit.

- 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 the UPS: BN100XR: 20 kg BN150XR: 20 kg
  BN240XR: 38 kg MB240XR: 29 kg (add-on battery unit)

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

- Dropping it may result in injury.

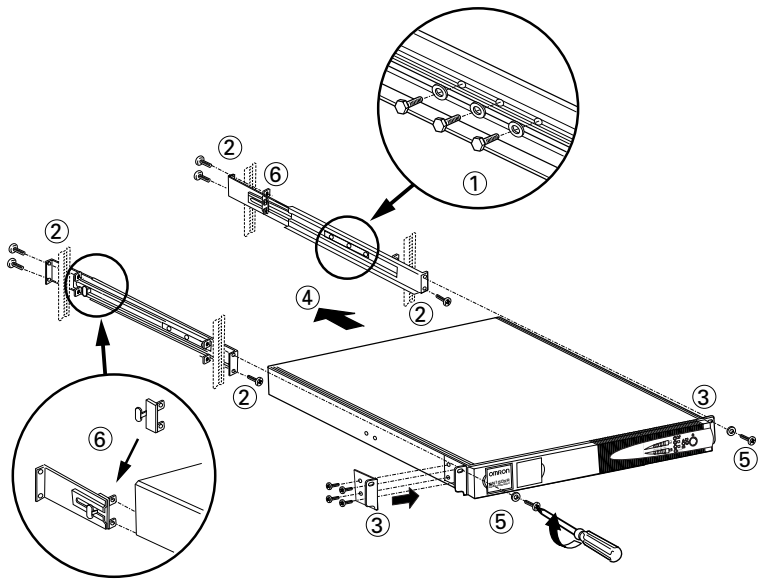
Be sure to use the supplied mounting screws.

- Screws other than those supplied may not be strong enough to support the UPS, causing it to fall.

● Rack installation for BN100XR/BN150XR

Follow steps ① through ⑥ for installation.

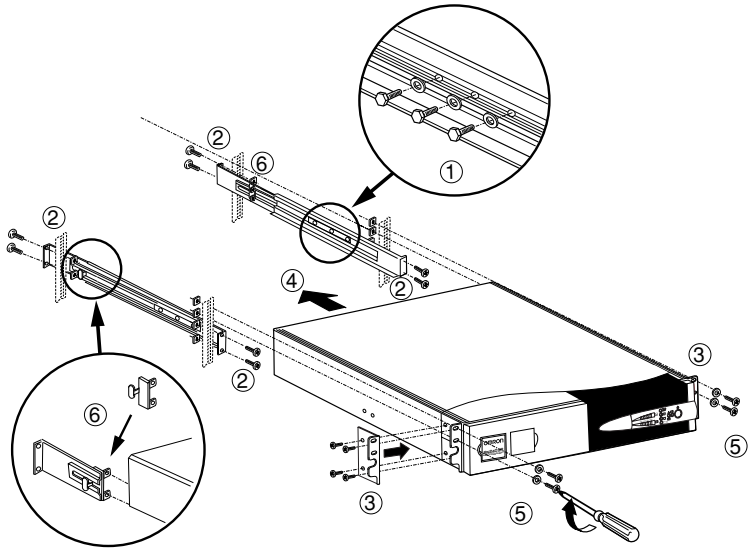
⚠ **Make sure to use the support clamps (support angles, front support clamp ③, rear support clamp ⑥).**



● Rack installation for BN240XR (MB240XR)

Follow steps ① through ⑥ for installation.

⚠ **Make sure to use the support clamps (support angles, front support clamp ③, rear support clamp ⑥).**



Two types of nuts have been included for ② and ⑤. Use the type that suits the rack.

2. Stationary installation

Perform installation only as shown in the diagrams below.

● Horizontal installation

This product does not have rubber feet, and there are no screw threads on the bottom side. For stationary horizontal installation, make sure that this product does not slide or fall.

Do not place things on the units.
● Doing so may make battery change difficult due to the load.

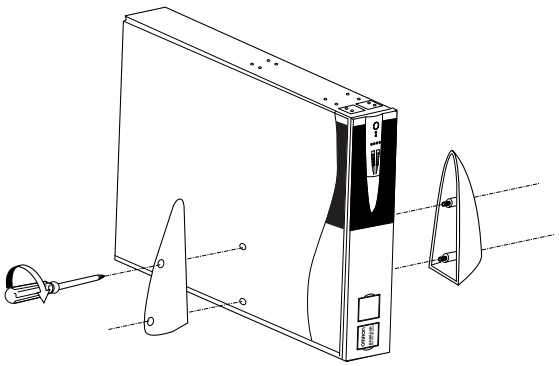
BN100XR/BN150XR

BN240XR

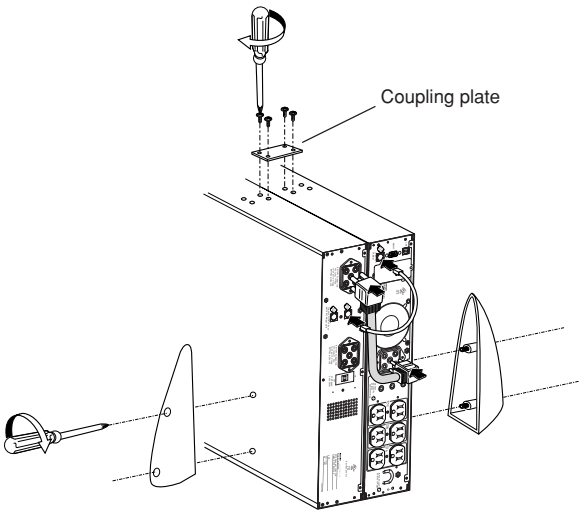
● Upright installation (BN240XR/MB240XR)

BN100XR/BN150XR can not be installed upright.

(1) Upright installation for BN240XR
Use the stand that was included with this product.



(2) Upright installation for BN240XR + MB240XR
Use the included coupling plate to join the BN240XR and the MB240XR, and then attach the stand to both sides.



2-3 Adding a battery unit (MB240XR)

- It is possible to connect up to two add-on battery units (MB240XR) to the BN240XR.
- It is possible to perform connection while the main unit (BN240XR) is plugged in.

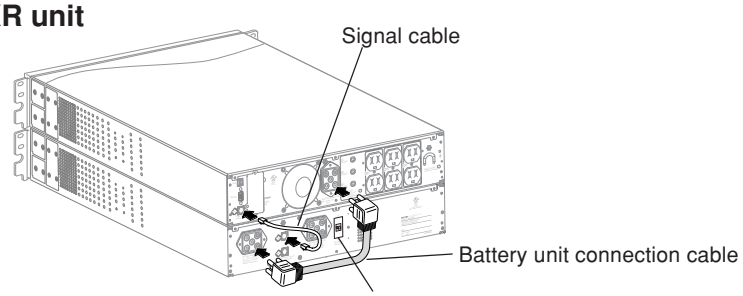
When connected to a 2.4KVA/2000W device, the backup time for one add-on battery is 10 minutes, and the backup time for two add-on batteries is 20 minutes (for new battery at ambient temperature of 20°C). The time required for recharging completely discharged batteries is 24 hours for one battery, and 36 hours for two batteries.

- Connect the MB240XR2 using the included battery connection cable.
- Connect the MB240XR2R using the included signal cable (modular cable) as shown below.
- Switch ON the breaker on the rear side.

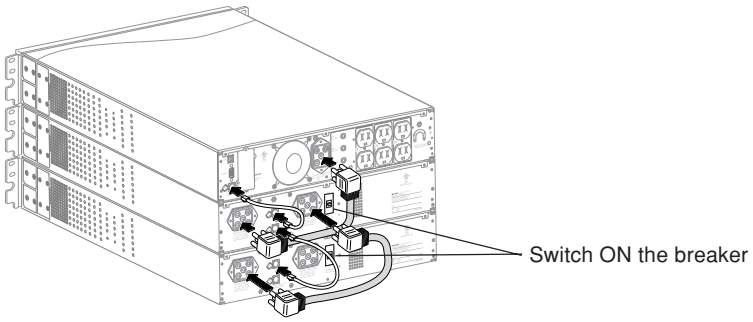
⚠ Do not connect a telephone line to the modular jack. 

After connecting, switch ON the breakers on the back of each MB240XR.

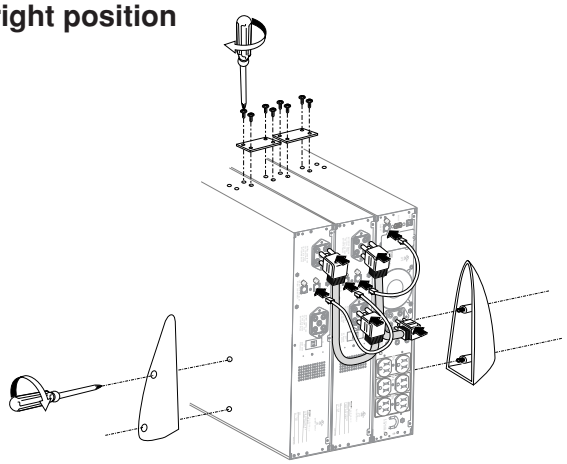
●Connecting one MB240XR unit



●Connecting two MB240XR units



●Connecting in the upright position



2-4 Connection of AC input cable

1. BN100XR

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

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

2. BN150XR

● A 15A plug (NEMA 5-15) is included with the BN150XR at shipment. If this plug is used, make sure that the capacity of the connected devices stays below the maximum capacities shown in the table below.

● If the "Input over 15A" indication (symbol blinks every 0.5 second) appears, do not continue to use a 15A plug.
Replace it with the 20A plug that was included.

⚠ Caution

When using the 15A plug (NEMA 5-15P)
The maximum capacity that can be connected to the output is about 1100VA/1000W.

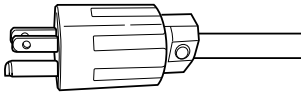
- Power consumption over that exceeds the values indicated in the table below results in an input current of more than 15A, which can lead to overheating or fire.
- When the "Input over 15A" display appears, replace it with a 20A plug.
- When the AC input is connected directly from a power switchboard, make sure that the wiring work is performed by a qualified electrical engineer (with Type II certification or higher).
  Wiring capacity of 20A or more is required. (Recommended cable: nominal cross-section of 3.5mm^2 (AWG12) or more)

Maximum capacity that can be connected when using 15A plug	
Voltage setting mode	**Maximum output capacity**
100V AC output/normal voltage sensitivity	1110VA/1000W
100V AC output/low voltage sensitivity	1035VA/1000W
115V AC output/normal voltage sensitivity	1140VA/1000W
115V AC output/low voltage sensitivity	1080VA/1000W

● **Use of 15A plug**

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

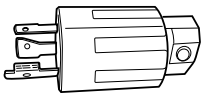
⚠ **In this case, make sure that the grounding is connected separately.**



● **Use of 20A plug**

Maximum usable capacity is the rated output capacity of the BN150XR (1500VA/1000W).

- Provide a wall outlet (commercial power) suitable for the shape of the 20A plug (NEMA L5-20).
- Replace the AC Input Plug of the BN150XR with the included NEMA L5-20 plug.

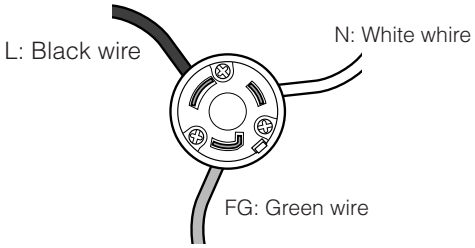


● **To replace the plug**

(1) Detach the 15A plug (NEMA 5-15P).

(2) Connect the NEMA L5-20 plug as shown in the diagram below.

⚠ **Do not mistake the color of the wire, and affix with a screw as shown in the diagram.**



3. BN240XR

● The input plug for the BN240XR is 30A (NEMA L5-30P).

⚠ Caution

When the AC input is connected directly from a power switchboard, make sure that the wiring work is performed by a qualified electrical engineer (with Type II certfication or higher).
Wiring capacity of 30A or higher is required. (Recommended cable: nominal cross-section of 5.5mm^2 (AWG10) or more)

● It is possible to use a wall outlet (commercial power) with as much rated output capacity as the unpluggable type 30A (NEMA L5-30) plug.

2-5 Connecting the devices

● Control by group of output receptacles

The output receptacles of the BN100XR/BN150XR/BN240XR are divided into three groups: A, B, and C.

1. Output receptacle A
   Begins output at the same time as startup.
2. Output receptacles B and C
   - It is possible to delay the start of output with respect to output receptacle A at startup.
     The period of delay can be set using the included UPS monitoring software.
   - While the BN100XR/BN150XR/BN240XR is in operation, the output can be switched ON/OFF by using the included UPS monitoring software.
   - The delay settings and ON/OFF control of output receptacles B and C can be set separately.

When using this function, it is possible to set the startup order of the server, peripheral devices, etc.
The connected devices can be switched ON/OFF by remote control.

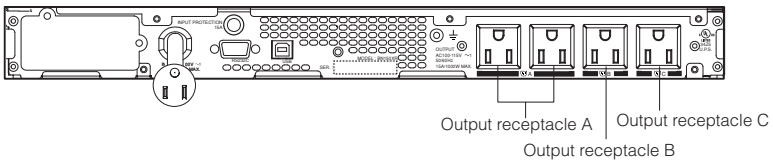
● Connecting devices to the output receptacles

It is not possible to connect a device that surpasses the rated capacity of the output receptacle, even if it is within the output rated capacity of the BN240XR. Distribute the connections so that each outlet is within its rated capacity.

Make sure that the total capacity of the devices connected to the output receptacle does not exceed the output rated capacity of the BN100XR/BN150XR/BN240XR. If the overload indication ( ) is displayed, reduce the number of connected devices.

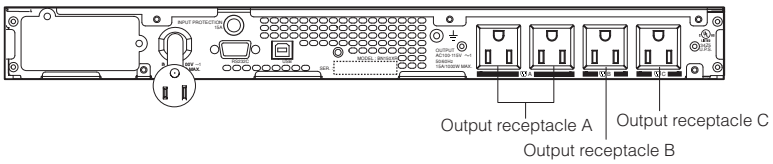
BN100XR

Output receptacle group	Outlet rated capacity	Quantity
Output receptacle A	10A	2
Output receptacle B	10A	1
Output receptacle C	10A	1



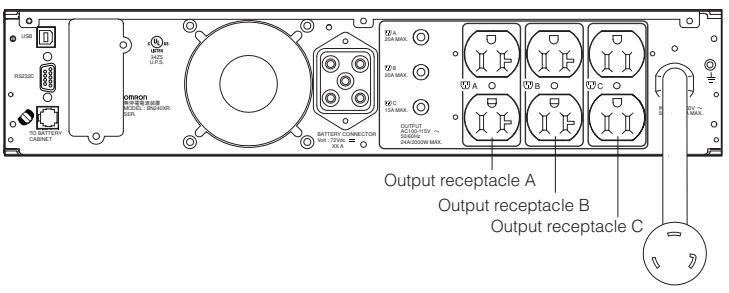
BN150XR

Output receptacle group	Outlet rated capacity	Quantity
Output receptacle A	15A	2
Output receptacle B	15A	1
Output receptacle C	15A	1



BN240XR

Output receptacle group	Outlet rated capacity	Quantity
Output receptacle A	20A	2
Output receptacle B	20A	2
Output receptacle C	15A	2



● When the overload indication appears, output stops

The time it takes until output stoppage occurs differs depending on the degree of overload.

Operation status	Overload amount	Time until output stops
Line mode	Around 110% and up Around 120% and up	5 minutes 10 seconds
Battery mode	Around 115% and up Around 125% and up	30 seconds Immediately

● The rated output capacity differs according to the voltage setting mode.

Output capacity of BN100XR	
AC100V output / normal voltage sensitivity	1000VA/700W
AC100V output / low voltage sensitivity	1000VA/700W
AC115V output / normal voltage sensitivity	1000VA/700W
AC115V output / low voltage sensitivity	1000VA/700W
When using input plug 15A	1000VA/900W

Output capacity of BN150XR	
AC100V output / normal voltage sensitivity	1500VA/1000W
AC100V output / low voltage sensitivity	1420VA/1000W
AC115V output / normal voltage sensitivity	1500VA/1000W
AC115V output / low voltage sensitivity	1480VA/1000W
When using input plug 15A	1000VA/900W

⚠ Note that even when using a 15A plug, the maximum output at which the overload indication appears does not change.
If the "Input over 15A" indication (blinking) appears, replace with a 20A plug.

Output capacity of BN240XR	
AC100V output / normal voltage sensitivity	2310VA/2000W
AC100V output / low voltage sensitivity	2160VA/2000W
AC100V output / normal voltage sensitivity	2370VA/2000W
AC100V output / low voltage sensitivity	2250VA/2000W

For information on "Voltage selection mode", see "9-3 UPS functions whose settings can be changed from the UPS monitoring software" on pages 52 - 53.

2-6 Checking the operation

Before using the UPS, follow the steps below to check whether the Battery mode functions properly.
(This operational check of removing the “AC Input Plug” from the wall outlet is carried out on the assumption that power failure would occur.)

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

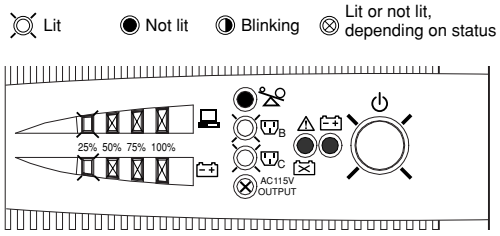
(2) Press the power switch (⏻) to get the UPS running. Operation status becomes normal in 20 seconds. When operation has started, make all devices linked to the UPS operational.
(This includes devices connected to the AC outlet of your PC.)

Operate devices in a way that allows their power supply to be cut off at any time.

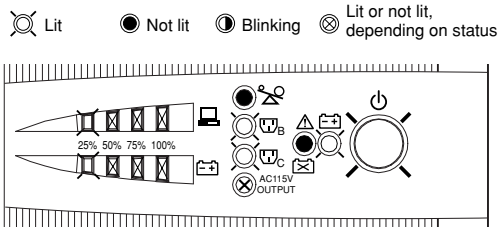
(3) Under this condition, check the indicator lamps of the UPS.
Does the display of your UPS look exactly like the figure on the right?

Yes → Operation is normal.
Proceed to (4).

No → Operation is abnormal.
The panel looks like either of those shown in "C. Failure (display and beep when a failure occurs in the UPS)" of "3-3 Beeps and displays" on page 33. Take necessary troubleshooting measures and then proceed to (4).



(4) Remove the AC Input Plug of the UPS from the wall outlet (commercial power) to put it into Battery mode.
Under this condition, check the indication lamp and the beeping of the UPS.
Does the display of your USP look like the one below?



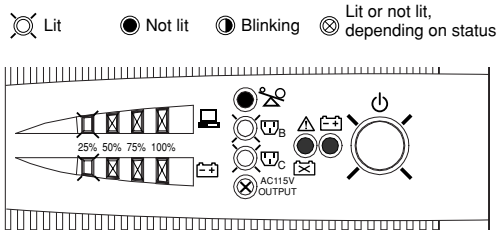
Beep	A beep every 4 seconds, or one per second

Yes → The beeping sound varies depending on the state of the battery.
The operation is normal.
Proceed to (5).

No → The operation is abnormal.
- If the display looks like either of those shown in "C. Failure (displays and beeps when a failure occurs in a device) of "3-3 Beeps and displays" on page 33, take the measures necessary for troubleshooting and then go back to (4).
- In a case where there is no backup and both the UPS and devices linked to the UPS stop, a weak battery charge may be the cause.
  Insert the AC Input Plug of the UPS into a wall outlet (commercial power), charge the battery for at least 12 hours, and then go back to (4).

♦ If the problem still remains after performing the two checks above, contact our Customer Support Center.

(5) Insert the AC Input Plug into a wall outlet (commercial power) again.
The Battery Mode Lamp ( ) goes out, the AC Input Lamp goes on, and the beeping stops.
(It should appear as in the figure on the right.)



The operating checks are complete.

2-7 Charging the battery

When you connect the AC Input Plug of the UPS to a wall outlet (commercial power), battery-charging will begin automatically, and it will be fully charged within 12 hours. (When no MB240XR add-on battery is connected.) (The batteries will charge regardless of whether the UPS is being used or not, and regardless of whether the power switch (⏻) is ON or OFF.)

● The UPS has been charged prior to shipment, but the backup time may be shorter when using the UPS for the first time due to natural discharge.
We recommend charging the UPS before use.

2-8 Measuring the backup time

After "2-6 Checking the operation" is complete, you can start the actual operation. However, we recommend measuring the actual backup time of the UPS in your operating evironment before starting the initial operation. That gives you a guideline for the battery check.

See also "4-1 Measuring method of the backup time" on page 36.

3. Operating the UPS

3-1 Precautions and notes on operation

During the operation, follow the do's and don'ts below.

⚠ Cautions (use)

In a case where the Battery Replacement Lamp comes on or the backup time becomes shorter than the required backup time, replace the battery pack with a new one while the UPS is running, or stop the UPS and discard the old battery pack.

- The continuous operation of the UPS may result in fire.
- For further information on how to inspect the battery, see "5. Maintenance and inspection" on page 37.

Ambient temperature	Estimated life expectancy
20°C	2 to 3 years
30°C	1 to 1.5 years

* The table on the left shows the estimated life expectancy of a battery pack in normal usage conditions. This is not the warranty period.

When you notice abnormal sound or smell, smoke, or liquid coming from the inside of the UPS, immediately turn OFF the power switch (⏻) and remove the AC Input Plug from the wall outlet (commercial power).

- Continuous operation under the abnormal conditions may cause a leakage of current or fire.
- If you notice the abnormal conditions, never operate the UPS, and contact us or the distributor from which you purchased your UPS for inspection and repair.
- Your UPS must permit instant removal of the AC Input Plug from a wall outlet (commercial power) at the onset of a failure.

Do not place objects on the UPS or do not drop metal objects into the UPS.

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

Do not place the UPS in an enclosed space or put a cover over the UPS.

- Doing so may lead to abnormal overheating and/or fire.

Do not spill water on the UPS or get it wet.

- Doing so may cause an electric shock or fire.
- If the UPS gets wet, immediately stop using it, inspect it, and make repairs if necessary.

Do not insert a metal object into the Power Supply Output receptacle of the UPS.

- Doing so may cause an electric shock.

Do not insert metal objects into the battery connector or add-on battery connector. Do not short-circuit the connector terminals.

- Doing so may cause an electric shock.
- There is a risk of combustion, battery explosion, and burn injury. Do not insert metal objects into the battery connector or add-on battery connector.

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

- Battery deterioration will occur rapidly.
- Doing so may result in a failure or malfunction of the UPS.

Notes

Turn off the UPS before opening a circuit breaker or removing the AC Input Plug from a wall outlet (commercial power).
If you cannot stop the UPS for some reason, bring the UPS to automatic stop through the UPS monitoring software, which requires the least backup time.

- The UPS goes into Battery mode whenever commercial power is cut. By continuing to run the devices on the battery and recharging the battery, the life expectancy of the battery is significantly shortened. The less you repeat charges and discharges, the longer the life expectancy of the battery will become.

3-2 Operating and stopping procedures

● Operating procedure

1. Connecting the AC Input Plug of the UPS to a wall outlet (commercial power)

The power lamp (⏻) should blink once every 10 seconds. In this state, the battery is being charged.

2. Startup

- **Press the power switch (⏻).**
  After the switch is turned on, all of the indicators blink three times, and there is a simultaneous beeping sound.

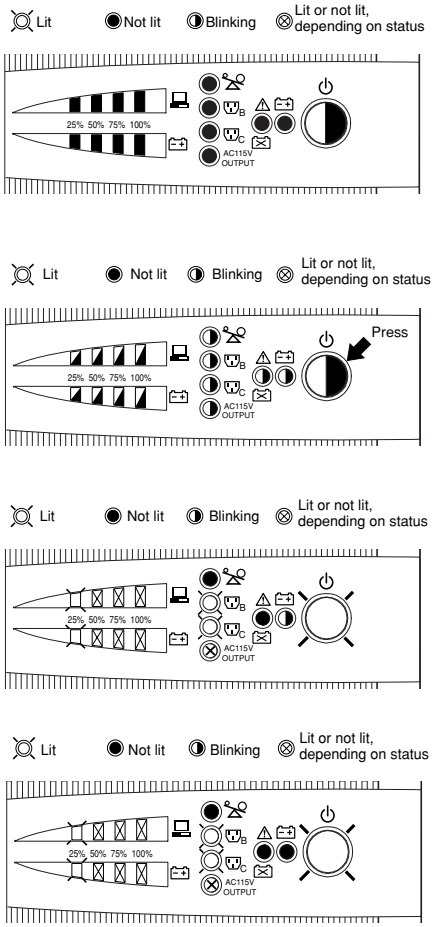
● Function check

The ⏻ , B , and C indicators light up, and after five seconds the 🔋 indicator blinks for about 10 seconds (once per second).

- When the battery charge is insufficient, the function check cannot be performed.
- Depending on the settings, there is a delay before B and C light up. (Factory setting: no delay)

The blinking of the 🔋 indicator stops, and appears as in the figure on the right.

- The frequency of the level meter's blinking depends on the load capacity and the charge state of the battery.
- **Connection capacity indicator (💻)**
  When the rated load capacity is 100%, the four lights are illuminated.
  Even at 0% (no load), the lamp on the left is illuminated.
- **Battery capacity indicator (🔋)**
  When charging : Charging status is displayed
  During backup : Remaining battery capacity is displayed
  (The capacity indicator shows a rough estimate of capacity.)



<Displays during normal output>

*** Before starting operation for the first time, you should measure the initial value for the backup time of the UPS in your operating environment. This initial value becomes the standard to consider when checking the battery.**
See section "4-1 Measuring method of the backup time" on page 36.

● Stopping procedure

1. Press the power switch (⏻) of the UPS.

- The switch on the front side returns to its original position, the beep sounds for 3 seconds, and output stops immediately.
- All of the indication lamps go out.
  After that, the ⏻ indicator blinks once every 10 seconds. (Charging status)
  In the event that commercial power supply is cut off, the ⏻ indicator stops blinking and goes out, and charging stops.

2. Power switch functions during stoppage

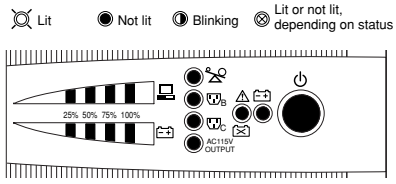
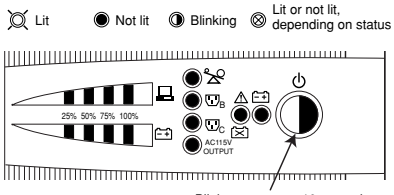
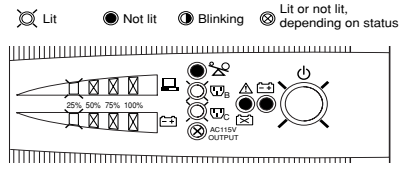
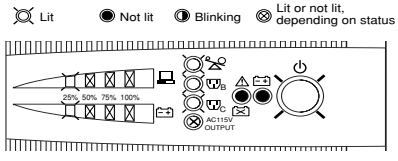
- Turn the power switch (⏻) OFF. If the switch is turned ON (pressed) again while the beeper is sounding, the output stoppage ends and operation (output) continues.
- When the battery deterioration indicator (blinking once every 2 seconds and beeping) appears, the alarm can be turned off by turning the power switch ⏻ OFF and then ON again.

When the battery deterioration indicator appears, replace the battery.

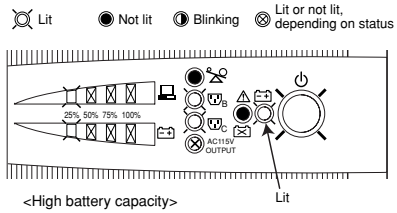
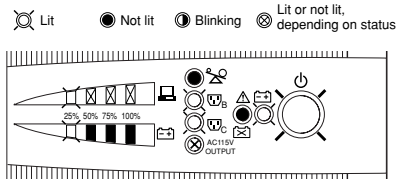
When using the included UPS monitoring software, the battery deterioration indicator can be turned off by performing a self-diagnosis test on the battery after replacing it.

3-3 Beeps and displays

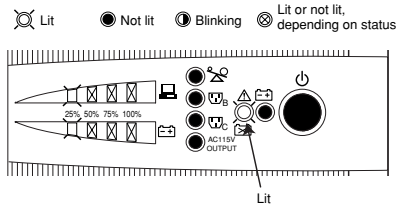
A. Normal (Normal operation status)

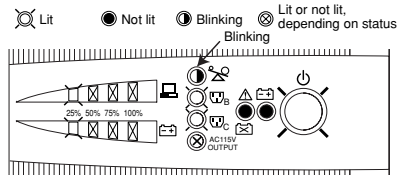
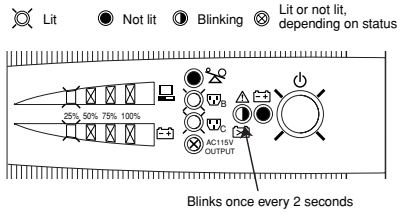
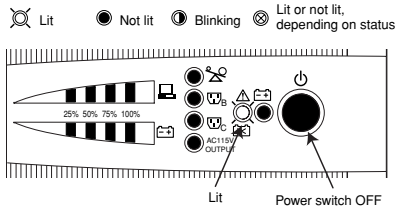
No.	Display	Beep	Output	Charge	Description
1		None	Stop	Stop	Status: Operation is interrupted due to removal of the AC Input Plug or abnormal input power supply.
2		None	Stop	ON	The AC Input Plug is inserted, and the input power supply is normal. Operation is stopped. Power switch : OFF Charging
3	 <Input current over 15A>	None	ON	ON	Status: The AC Input Plug is inserted, and the input power supply is normal, and in operation. The remaining capacity and charging status is indicated on the level meter. Power switch : ON Charging status and load capacity is displayed.
4	 <Input current over 15A> BN150XR only	None	ON	ON	Status: Input current is over 15A. Remedy: Replace with a 20A type plug. OR Reduce the connected capacity until the "Input over 15A" indication disappears.

B. Failure (displays and beeps when a power failure and/or irregularities in the input power supply occur)

No.	Display	Beep	Output	Charge	Description
1	 <High battery capacity>	Continuous Every 4 seconds	ON	Stop (discharging)	Status: Due to power failure or input voltage irregularities, power is being supplied to devices connected to the UPS in the battery mode. The amount of charge remaining is displayed on the level meter. Remedy: To prevent battery depletion, turn off the devices linked to the UPS after shutting them down.
2	 <Low battery capacity>	Continuous Every 1 second	ON	Stop (discharging)	Status: Power is being supplied to devices connected to the UPS in battery mode. The remaining charge is nearly exhausted, so the output will stop soon. The remaining charge is displayed on the level meter. Remedy: To prevent battery depletion, turn off the devices linked to the UPS after shutting them down.

C. Failure (displays and beeps when a failure occurs in a device)

No.	Display	Beep	Output	Charge	Description
1		Continuous	Stop	Stop	Status: The UPS stops due to a failure of the internal circuit of the UPS, an output short, or abnormal internal temperature. Remedy: ● Turn off the UPS and devices connected to the UPS. Disconnect all devices connected to the UPS and press the Power switch again. In a case where the status of A-3 on page 33 occurs, there may be a malfunction in a device connected to the UPS. Check the devices. ● If the same display appears after taking the above countermeasures, stop the UPS for approximately 1 hour and then press the Power switch again. In the case when the status of A-3 on page 33 occurs, the temperature inside the UPS must have increased. Check whether ambient temperature is below 40°C and make sure that a vent has not become obstructed. ◆ If the trouble still remains despite performing the above checks, there has likely been a failure of the internal circuit. Contact the dealer or our Repair Center.

No.	Display	Beep	Output	Charge	Description
2		Every 0.5 second	ON	ON	Status: The rated output capacity is exceeded because too many devices are linked to the UPS. When this status continues for the periods of time shown below, it will become the C-1 status above. Amount of the current capacity 110% or more: 5 minutes Amount of the current capacity 120% or more: 30 seconds Amount of the current capacity 115% or more: 10 seconds (Backup) Amount of the current capacity 125% or more: fraction of a second (Backup) Remedy: Reduce the number of devices linked to the UPS until the above display turns off and shows the display as in A-3 on page 33.
3		Every 2 seconds	ON	ON	Status: Battery replacement is necessary. Remedy: ● Charge the battery for at least 12 hours. (For information on how to charge the battery, refer to "2-7 Charging the battery" on page 29.) After charging is complete, check whether Battery mode performs according to "2-6 Checking the operation" on page 28. In a case where the UPS performs no backup or the backup time became less than half of the initial value, the battery, which is in a deteriorated condition, needs replacing. (For information on the procedure to replace the battery, refer to "5-2 Replacing the battery" on page 37.) ● The display will be turned off either by turning OFF the power switch, or by performing a self-diagnosis test on the battery after replacing it. ● The battery deterioration indicator can be turned off without stopping the output if the power switch is turned back ON within 3 seconds of being turned OFF. ● If you continue to use a weak battery, and there is a power failure, the Battery mode will not work and output will stop.
4		Con-tinuous	None	Stopped	Status: Circuit failure Power switch : OFF Remedy: ● There is trouble with the circuit. The alarm stops when commercial power is cut, or when the AC plug is unplugged. Contact the dealer or our Electronic Systems & Equipments repair center.

4. Measuring the backup time

4-1 Measuring method of the backup time

(1) Insert the AC Input Plug of the UPS into a wall outlet (commercial power) and charge the battery for at least 12 hours.
(The power switch may be turned ON, and the status of devices linked to the UPS does not matter.)
- When adding one MB240XR battery, charge it for more than 24 hours.
- When adding two MB240XR batteries, charge them for more than 36 hours.

(2) Turn on all devices connected the UPS.
(This includes devices connected to the AC receptacles of connected devices such as your computer.)
Conduct operation so that even if power supply to connected devices stops, there will be no hindrance.

(3) Remove the AC Input Plug of the UPS and check the backup time.

*** 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

4-2 Estimated backup time

The backup time varies depending on the power consumption of devices connected to the UPS.
After calculating the total power consumption of devices connected to the UPS, refer to the graph of the backup time to obtain an estimate for the initial value of backup time.

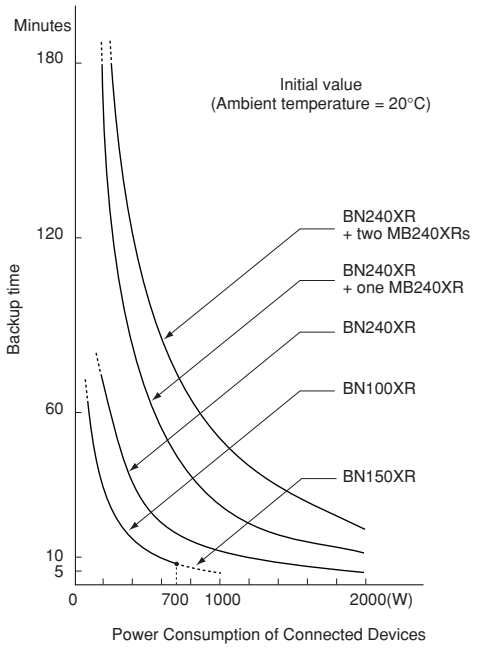
(1) Convert the total power consumption (power consumption) of devices linked to the UPS to watts.
Check the units of these devices connected to the UPS.
There are 3 units: VA, A, and W
Example 1) AC100V, 50/60Hz, 145W
Example 2) AC100V, 50/60Hz, 1.8A
Example 3) AC100V, 50/60Hz, 150VA
For the devices with the units of VA and A, convert VA and A to W.
See the table on the right for the conversion.

Unit	Value
VA	x power factor = W
A	x power factor x 100 = W

- When the power factor is unknown, use "1". Normally, the value for the power factor is between 0.6 and 1.0.

(2) Add up the values converted in W and obtain the total power consumption of the devices connected to the UPS.

(3) Obtain the initial value of the backup time for the total power consumption of the devices connected to the UPS from the graph on the right.



5. Maintenance and inspection

5-1 Checking the battery

The sealed lead-acid battery mounted in the UPS has its own life. (The life of the battery varies depending on storage conditions, the operating environment, and backup frequency.) As the end of the battery life draws near, deterioration takes place much faster. Check the battery regularly.

1. Battery life (standard replacement period)

Ambient temperature	Battery life	Replacing cycles
20°C	2 to 3 years	2 years after the date of the first use
30°C	1 to 1.5 years	1 years after the date of the first use

*** The battery deteriorates even in storage. The higher the temperature is, the shorter the life becomes. Include storage time in the life expectancy period above.**

2. How to check the battery

Obtain the back-up time according to "4-1 Measuring method of the backup time" on page 36.
If the measured value is half of the "initial value of the backup time," the battery needs replacing.

3. Guideline and frequency for checking the battery (measuring the backup time)

Ambient temperature	Checking every 6 months	Checking every month
20°C	Up to 3 years after the date of purchase	Over 3 years after the date of purchase
30°C	Up to 1.5 years after the date of purchase	Over 1.5 years after the date of purchase

5-2 Replacing the battery

You can replace the battery of the UPS by yourself.

Battery replacement for the UPS can be done under usual operating conditions (when power is being output). The battery can also be replaced while the UPS is off (no power is being output). You can choose either of the methods, whichever is more convenient.
*** When replacing the battery during operation, if a power failure or other failures occur while the battery is not connected, the UPS will shut down without going into Battery mode.**

⚠ Warnings

If there is liquid coming from the replaced battery pack, do not touch it.
● If touched, the liquid (dilute sulfuric acid) may cause burn injury or blindness.

When replacing the battery, do not insert anything metal into the battery.
● An electric shock or short may occur.

⚠ Cautions

Do not short-circuit the battery with a metal object.
- Doing so may result in burn injury or fire.
- Even in a dead battery, there is some current remaining.

Do not toss a battery into a fire. Do not try to break a battery.
- The battery may explode or dilute sulfuric acid may leak.

Do not use any batteries unless otherwise specified.
- Doing so may lead to a fire.
- Battery pack product models: BP150XR (for BN100XR, BN150XR), BP240XR (for BN240XR, MB240XR)

Do not use a new battery and an old battery at the same time (when adding BN240XR battery).
- Rapid deterioration of battery may occur, and dilute sulfuric acid may leak.

Do not drop the battery and make sure that it does not receive any strong impact.
- Dilute sulfuric acid may leak.

Do not replace the battery in a place near flammable gas.
- A spark may occur when connecting the battery, and lead to a fire.

Replace a battery on a structurally sound base.
- Hold the battery securely with both hands to avoid dropping.
- Failure to do so may result in injury due to the battery falling, burns, or injury.

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

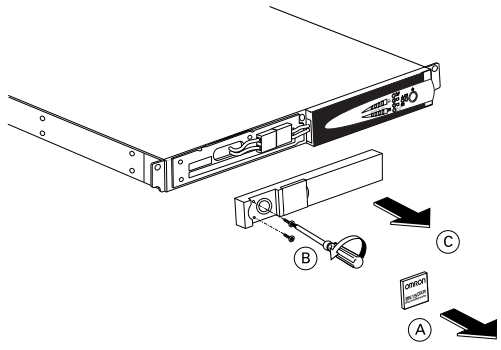
Notes

The UPS uses a lead acid battery.
The lead acid battery is recyclable.
- For information about recycling and disposing of unneeded batteries, contact the Electronic Systems & Equipments repair center.

Pb

1. Changing the battery for BN100XR/BN150XR

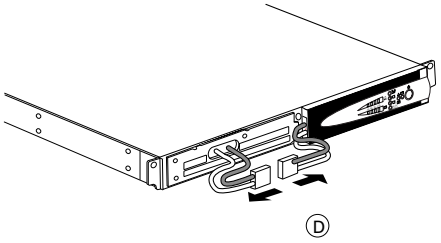
- **Replaceable battery pack** **Model name: BP150XR**



Ⓐ Use a screwdriver to pry off the square plate on the left with the OMRON logo printed on it.

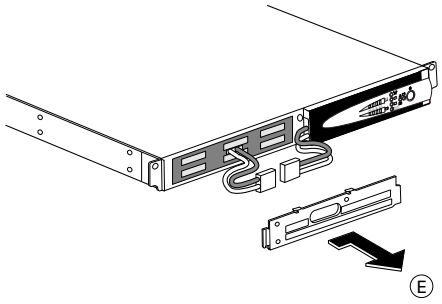
Ⓑ Remove the two screws.

Ⓒ Pull the left side of the plastic panel toward you.



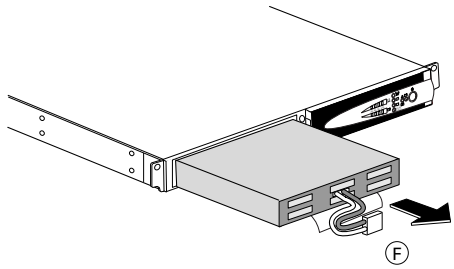
Ⓓ Pull the battery pack connector as shown in the diagram on the left.
(Be careful not to pull the wiring.)

Ⓔ Slide the metal cover to the right and remove it.



Ⓕ Grab the white label attached to the bottom side of the battery pack, and pull it toward you.

⚠ During removal, when the red line on the top side of the battery becomes visible, this indicates that after 10 cm, it will be completely pulled out. Carefully hold both the left and right sides of the battery when removing it so that you do not drop it.

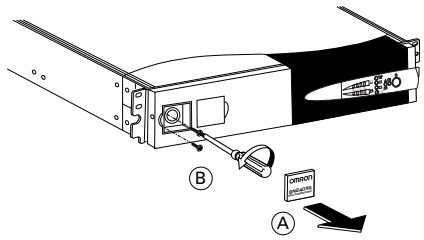


- Install the new battery pack by following the above steps in reverse order.
- Press firmly on the battery pack connector until the lock stops.

Caution: Sparks and/or sound may be emitted when connecting the connector.

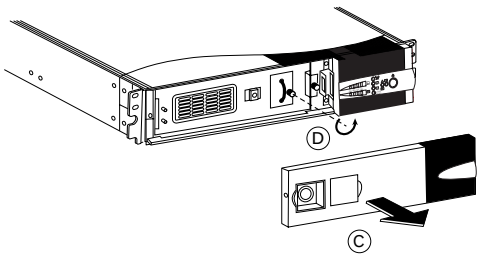
2. Changing the battery pack for BN240XR

● **Replaceable battery pack** **Model name: BP240XR**



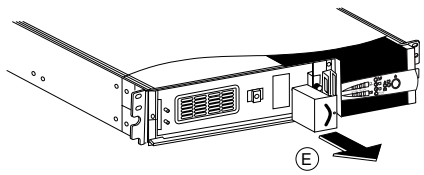
Ⓐ Use a screwdriver to pry off the square plate on the left with the OMRON logo printed on it.

Ⓑ Remove the two screws.

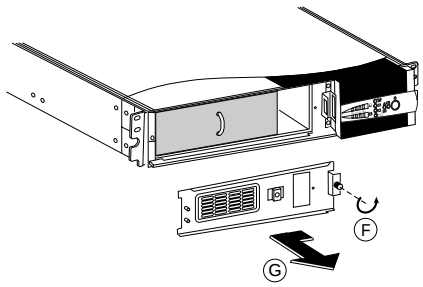


Ⓒ Firmly pull the left side of the plastic panel toward you.

Ⓓ Remove the screw of the safety connector.

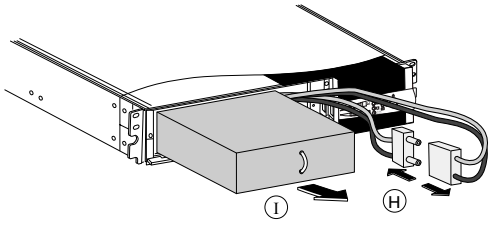


Ⓔ Pull out the safety connector.
(The connection inside the battery is cut.)



Ⓕ Remove the screw that holds the metal cover in place.

Ⓖ Slide the metal cover to the left and remove it.



Ⓗ Pull out the battery pack as far as 10 cm.
Firmly pull forward on the connector located on the right side to detach it.

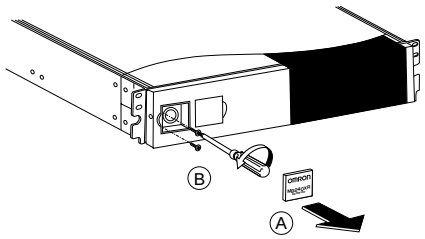
Ⓘ Slowly pull out the battery pack.

⚠ During removal, when the red line on the top side of the battery becomes visible, this indicates that after 10 cm, it will be completely pulled out. Carefully hold both the left and right sides of the battery when removing it so that you do not drop it.

- Install the new battery pack by following the above steps in reverse order.
- Press firmly on the battery pack connector until the lock stops.

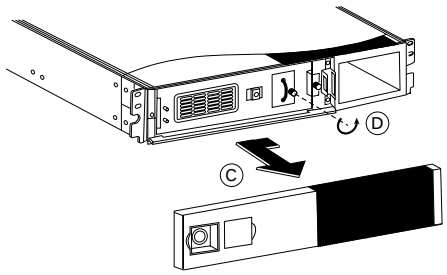
3. Battery pack changing procedure for MB240XR

● Replaceable battery pack Model name: BP240XR



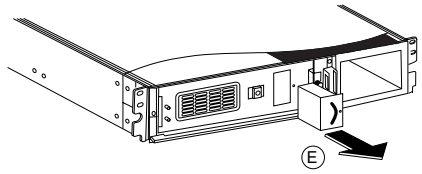
Ⓐ Use a screwdriver to pry off the square plate on the left with the OMRON logo printed on it.

Ⓑ Remove the two screws.

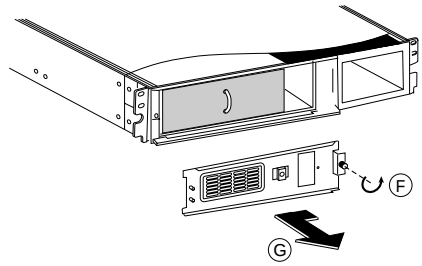


Ⓒ Firmly pull the left side of the plastic panel toward you.

Ⓓ Remove the screw of the safety plug.

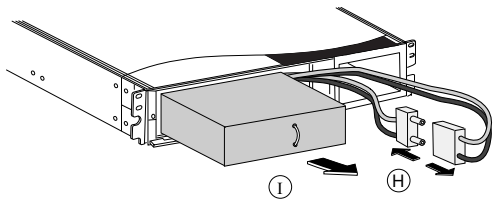


Ⓔ Pull out the safety plug.
(The connection inside the battery is cut.)



Ⓕ Remove the screw that holds the metal cover in place.

Ⓖ Slide the metal cover to the left and remove it.



Ⓗ Pull out the battery pack as far as 10 cm.
Firmly pull forward on the connector located on the right side to detach it.

Ⓘ Slowly pull out the battery pack.

⚠ During removal, when the red line on the top side of the battery becomes visible, this indicates that after 10 cm, it will be completely pulled out. Carefully hold both the left and right sides of the battery when removing it so that you do not drop it.

- Install the new battery pack by following the above steps in reverse order.
- Press firmly on the battery pack connector until the lock stops.

4. Checking and processing after battery replacement

- **When using the included UPS monitoring software**
  - After replacing the battery, perform a "self-diagnosis" to check operation.
  - If the battery deterioration alarm sounds, perform a "self-diagnosis". When it finishes normally, the battery deterioration alarm stops and normal operation is restored.
  - Input the new battery replacement date.

- **When the included UPS monitoring software is not being used**
  - Remove the AC plug to check whether the UPS is going into Battery mode when commercial power is cut.
  - When the battery deterioration alarm sounds:
    Turn OFF the power switch to shut down the UPS, and then restart it. The battery deterioration alarm stops.
    If you do not want to shut down the UPS, turn OFF the power switch of the UPS and turn it back ON within 3 seconds. This stops the battery deterioration alarm without stopping the output.
    (When the power switch is turned OFF, a beep sounds for 3 seconds. Turn the power switch back ON while the beep is sounding.)

NOTE:
After replacing the battery, immediately dispose of the old battery.
- Dilute sulfuric acid may leak from batteries stored for long periods of time.
- Contact our Electronic Systems & Equipments repair center for information on battery disposal.

5-3 Maintenance of the main unit

1. Cleaning the UPS main unit

Soak a soft cloth in water with/without soap, then wring tightly. Softly wipe the main unit.
Do not use products such as thinner or benzene. (Deformation and/or discoloration may occur.)

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

Shut down the UPS and all connected devices, and remove the AC Input Plug from the wall outlet (commercial power).
Use a dry cloth to remove the dust, and then reconnect the plug.
(See "2. Installation and connection" on page 17 for information about connection.

5-4 Caution when maintaining connected devices

⚠ Caution

When performing maintenance on connected devices, shut down the UPS and remove the AC Input Plug from the wall outlet (commercial power).

- When the UPS is in operation status, power continues to be supplied from the power supply output receptacles even if the AC Input Plug is removed, because of the backup function.
- In the case when scheduled operation is set, if the AC Input Plug is connected to a wall outlet (commercial power), power output will be supplied at the operation start time.

6. Using the UPS monitoring software

*** If you do not use the UPS monitoring software and contact signal I/O, this step is not required.**

6-1 Performing auto shutdown

Auto shutdown can be performed in the following two ways.

1. Using the included UPS monitoring software

To use the software, your computer must be connected to the UPS in one of the following ways.

- USB connection ..... Connect using the included USB cable.
- RS-232C connection ..... Connect using the included RS-232C cable.
- LAN connection ..... Connect using a separately sold SNMP/Web card and a commercially available LAN cable

2. Using UPS service of Windows Server 2003/XP/2000

Use the UPS Service Driver installed on the CD-ROM that was included with the UPS, and connect to the UPS using the method below.

- RS-232C connection ..... Connect using the included RS-232C cable.

When a power failure occurs, files can be saved, applications can be quit, Windows can be shut down, and the UPS can be shut down.

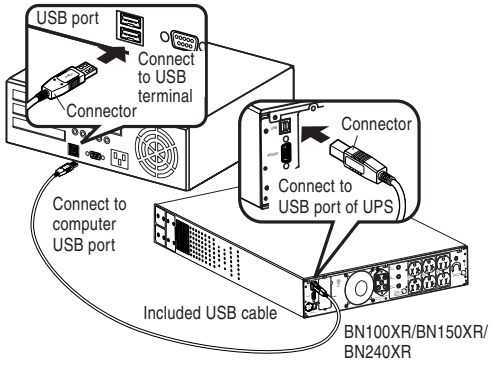
3. Using UPS service of Windows NT

The following method must be used to connect the UPS.

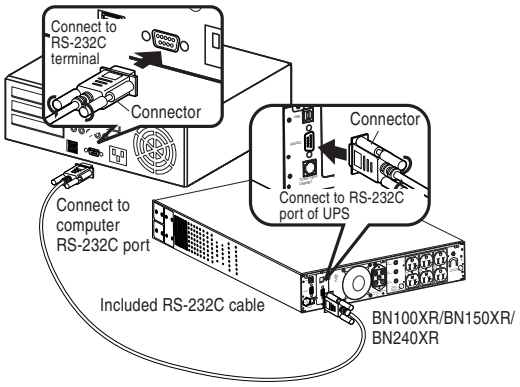
- Contact connection ..... Connect using a separately sold signal I/O card (SC05) and signal cable (BUC10: for DOS/V).

6-2 Connection methods

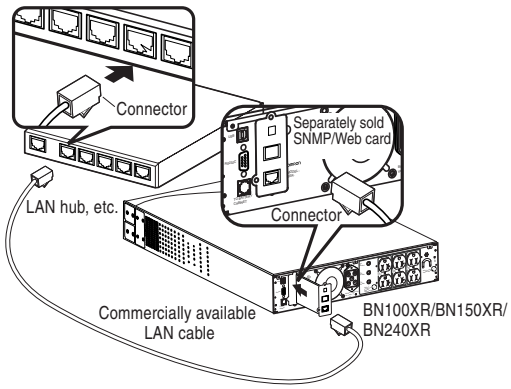
1. USB connection



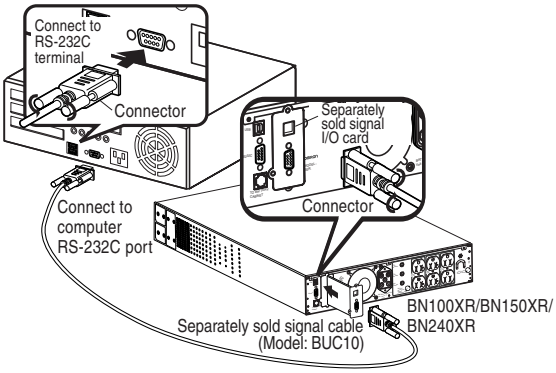
2. RS-232C connection



3. LAN connection



4. Contact connection



6-3 About the included UPS monitoring software

The included UPS monitoring software enables you to save files automatically and perform shutdown processing of the computer when there is a power failure. However, the time between the occurrence of a power failure and the completion of the shutdown of your PC must be within the backup time measured in "4-1 Measuring method of the backup time" on page 36. For more detailed explanations and operations, refer to either the UPS monitoring software instruction manual or the online help for the UPS monitoring software.
When using the included UPS monitoring software, it is possible to change the UPS operation mode settings, use additional functions, perform scheduled operation, and conduct redundant operation by connecting multiple UPS to servers with redundant power supply, etc.

Explanations

The USB and RS-232C ports cannot be used simultaneously.

- The UPS monitoring software and can be used with either the USB or RS-232C ports of the UPS, but they both cannot be used at the same time.

Starting operation during scheduled shutdown with UPS monitoring software

- If the UPS operation is started during the scheduled shutdown period, turn OFF the power switch, and then turn it ON again.
  The UPS can be restarted manually.
  In this case, the next set scheduled ON operation is cancelled.

Using UPS service of Windows NT

- If you are using Windows NT Server, make the settings using the server menu as shown below. An incorrect setting of the remote UPS shutdown the UPS will be unable to perform backup in the event of a power failure.
  For more detailed information, refer to the Windows NT 4.0 manual or the Windows NT 4.0 help file.
  The signal settings are as follows:

  Power supply shutdown signal: Negative (for initial value, Windows NT server is set as negative, and OS2Lan server is set as positive)
  Battery weak/dead signal: Negative (for initial value, Windows NT server is set as negative, and OS2Lan server is set as negative)
  Remote UPS shutdown: Positive (for initial value, Windows NT server is set as negative, and OS2Lan server is set as negative)

- For Netware users, call up the command input screen, and enter the following to load a UPS module into the file server.

  ```
  LOAD  UPS  TYPE=6 PORT=__  REV=2
  ```

  After this is input, press the Enter key.
  In the command line, after "PORT=", enter the number of the serial port that is connected to the UPS. (1 or 2)

Explanations

Auto restart after shutdown processing by UPS monitoring software

- In the event of a power failure, some PC models (see *1 below) automatically restart immediately after the completion of the OS shutdown processing by the UPS monitoring software.
  In this case, the UPS stops during restart or after startup, possibly damaging files and/or the hard disk.
  This problem can be avoided by disabling POWER MANAGEMENT in the BIOS settings.
  *1) PC models: This problem has been reported with MICRON's Millennia Mme.
- When the PC does not start up automatically, select the "System startup at power restoration" setting (example: "Restore On AC/Power Loss") in the BIOS settings of your PC, and change to a "System startup after power restoration" setting (example: "Power On"). Individual BIOS setting methods and/or displays may differ depending on the PC. For more information, consult your PC instruction manual or contact the technical support center for your PC.
- When considering a system with automatic startup at power restoration, choose a PC that satisfies the condition below. For more information on PC operation when input power is supplied, consult your PC instruction manual or contact the PC technical support center.

  <Condition>
  Without having the power switch pressed, the PC starts up when input power is supplied.

- After shutdown processing, the UPS restarts automatically and supplies power once power is restored. If you do not want the devices connected to the UPS to start up, turn off their switches in advance.
- The automatic restart setting can be disabled in the included UPS monitoring software.

7. Using the contact signal I/O card

7-1 Adding a signal I/O card

A Contact Signal I/O card can be added in the option card slot on the backside of the UPS.

● Signal I/O cards (Model: SC05) are sold separately.

7-2 Details on contact signal I/O (SC05 card)

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 a battery capacity sufficient to prepare for the next occurrence of a power failure.

1. Signal output

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

- Backup signal output: BU
  BU stays ON during a power failure.
- Reverse signal of BU: $\overline{BU}$
  BU stays OFF during a power failure.
- Battery low signal output: BL
  BL goes ON (LOW) when the remaining battery capacity is getting low in Battery mode.

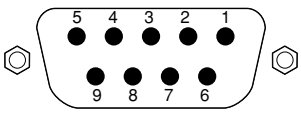
2. Input of the UPS Backup Stop Signal (BS)

- The minimum acceptance time of the input signal necessary for shutdown operation is 10 msec or more.
- Accept backup stop signal only during Battery mode
  You can stop the UPS by transmitting a continuous voltage signal (high) from outside the UPS.
  The signal is acceptable only during backup operation.

3. Connection to the system

It is the user's responsibility to take care of the cable connection to the system.
(For sample circuits, see "7. Example of the use of the Contact Signal I/O circuit" on page 49.)

4. Signal I/O connector (DSUB9P female)

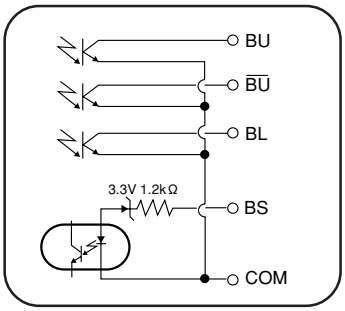
Pin No.	Signal Name	Pin Configuration
1	FG	 Front view Screw type: inch screw #4-40 UNC
2	BU	
3	$\overline{BU}$	
4	COM	
5	BL	
6	BS	
7	COM	
8	NC	
9	NC	

5. Contact Signal I/O ratings

- Signal output (BU and BL)
  Photo coupler ratings
  Applied voltage: 24V DC or less
  Maximum current: 20mA

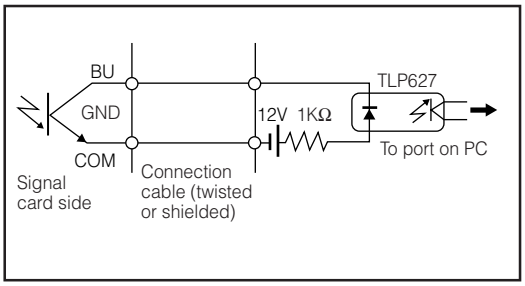
- Signal input (BS)
  Input voltage: HIGH 5 to 12V DC, LOW 2.5V DC or less

6. Contact Signal I/O circuit of the SC05 card

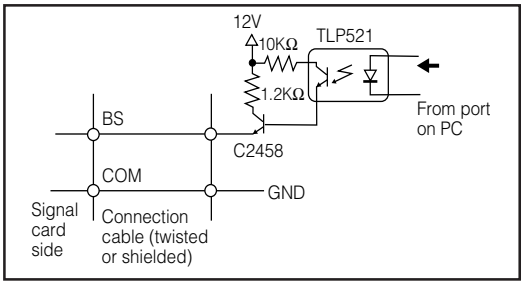


7. Example of the use of the Contact Signal I/O circuit

● **Example of the use of the BU signal**



● **Example of the use of the BS signal**



7-3 Notes and explanations for the use of contact signal I/O

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.

8. Using SNMP/Web card

8-1 Addition of SNMP/Web card

An SNMP/Web card can be loaded in the option card slot on the backside of the UPS.
• SNMP/Web cards (Model: SC20) are sold separately.

8-2 SNMP/Web card outline

● Description (features)

- SNMP management of the UPS through the network is possible. Supports UPS MIB.
- Has a function that links one UPS to another. Even in cases such as when a separate UPS is used for each the server and storage, it is possible for the two UPSs to work together to carry out shutdown operation.
- No serial connector; use of blade server is possible.
- Setting functions: Possible to make settings by using browser, telnet, or serial connection.
- Log functions: Data log, event log, syslog, and mail notification are possible.
- Security functions: Access is controlled by ID, password, and IP address at time of HTTP and SNMP access.
- UPS monitor function: Monitoring of UPS status, such as input/output voltage, battery status, and connection load, is possible.
- UPS control function: With the included UPS monitoring software, shutdown is possible when there is a power supply failure.
  Possible to perform scheduled shutdown or startup immediately via the network.
- Network function: Possible to change port numbers for SNMP, HTTP, and telnet.

● Specifications

LAN port	10/100 Mb
Network protocol	SNMP, HTTP, ARPR, TFTP, ICMP
Other communication route	Serial connection asynchronous system (setting only)
Number of controllable computers	Maximum of 32 (this includes slave UPS when coordinated shutdown is in effect)
Support MIB	UPSMIB (RFC1628), OMRON MIB
Other	Equipped with real-time lock
UPS monitoring software-compatible OS	Windows NT 4.0, Windows 2000, Windows XP, Widows Server 2003 Red Hat Linux 7.27/7.3/8.0 Red Hat Enterprise Linux AS/ES/WS (Red Hat Linux Advanced Server 2.1) *Note: Limited to IA32 environment.*

9. Additional functions and function setting changes for the UPS

9-1 Auto battery test

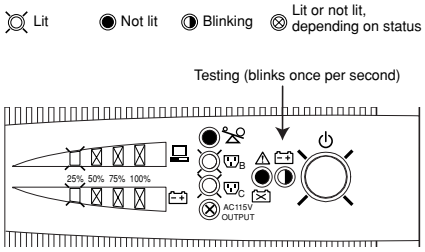
This UPS has a function that automatically checks for battery deterioration, and an alarm will sound whenever the battery needs replacement.
(Special operation is not required of the customer.)

The auto battery test function is built in to the UPS.

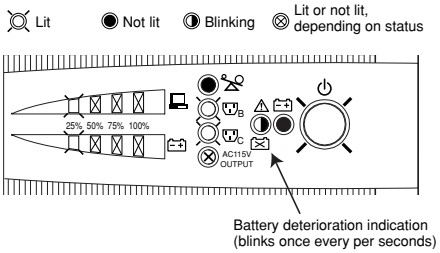
- It will run automatically, even if UPS monitoring software is not used.
- If the UPS monitoring software is used, it is possible to prohibit the auto battery test.

In the case of "Do not run auto battery test", the setting can be changed from the included UPS monitoring software.
For a detailed explanation, see the online help for the UPS monitoring software.
(Factory setting is "Run auto battery test".)

- If the UPS is being used continuously, it will automatically conduct a battery test every four weeks. If there is a period of time in which commercial power is not supplied to the UPS, the test will be conducted each time the actual total time of power supply reaches four weeks.
  The four weeks of time that commercial power is supplied to the UPS is counted, even when the power switch is OFF. The auto battery test cannot be run unless the power switch is ON, and the battery is in a more or less fully charged state.
- The battery indicator blinks once per second when the auto battery test is being conducted. There is no beep.



- When the test finishes, the UPS returns to normal operation.
  If there is nothing abnormal with the battery, the indicator will also return to normal status. If battery deterioration is detected, the battery deterioration indication comes on, and there is a beep every two seconds.
  This alarm indicates that significant deterioration of the battery has occurred, and the battery requires immediate replacement.



- For information on battery replacement and how to reset the battery deterioration display, see "5. Maintenance and inspection" on page 37.

9-2 Estimated backup time and backup time test in Battery mode

1. Estimated backup time

The estimated time of backup in the current operating conditions is displayed on the UPS monitoring software monitor screen.

- In Line mode: Estimated backup time under the current charge status and load conditions is displayed.
- In Battery mode: Estimated backup time is displayed. An accurate estimate of backup time cannot be performed. Use this as a rough estimate.

2. Backup time adjustment

As the battery deteriorates, backup time becomes shorter. To estimate backup time, the decrease of battery capacity needs to be measured.

- Periodically and voluntarily perform backup operation, and measure and adjust for the battery capacity.
- During backup time adjustment, the battery indicator blinks once per second. There is no beeping sound.
- Scheduled backup time adjustment can be performed by setting the schedule in the UPS monitoring software.
  For example, set the schedule for once every six months as a guide.
- Voluntary backup time adjustment can also be performed by using the UPS monitoring software.

9-3 UPS functions whose settings can be changed from the UPS monitoring software

These setting details can be selected and input from the included UPS monitoring software, and the settings are maintained in the event that power supply is cut.

- They cannot be used with UPS services included in the OS.

1. Beep ON/OFF setting

(Factory setting) Beep ON

ON : When the alarm is necessary, a beep will sound.

OFF : This setting disables the beep sound.
When an input power supply abnormality (power failure, input overvoltage) activates Battery mode, there is no beep sound. It is not possible to disable the beeps that accompany other alarms.

2. Auto battery test ON/OFF

(Factory setting) Auto battery test ON

ON : Battery tests are performed automatically.
If the result of the battery test indicates that the battery needs to be replaced, the battery deterioration alarm will sound.

OFF : The auto battery test is disabled.
Turn this setting OFF when you do not want to check the battery automatically and run Battery mode.

3. Auto restart ON/OFF

(Factory setting) Auto restart ON

ON : The UPS restarts automatically and begins output when commercial power is restored after a power failure that shut down the UPS.

OFF : After the UPS is shut down, it does not automatically restart when commercial power is restored.
The UPS can be restarted only by pressing the power switch.

4. Output voltage selection/Input power supply sensitivity selection settings

(Factory settings) 100V output/normal voltage sensitivity

Settings can be made by selecting from the following four modes:

● 100V AC output/normal voltage sensitivity
With input of 100V AC, output is 100V AC.
Power failure detection voltage is at normal setting.
- At this setting, output voltage (output voltage varies depending on input voltage) ranges from around 90V AC to 110V AC.
- The maximum output capacity at this setting is:
  1000VA/700W (BN100XR)
  1500VA/1000W (BN150XR)
  2400VA/2000W (BN240XR)

● 100V AC output/low voltage sensitivity
With input of 100V AC, output is 100V AC.
Power failure detection voltage is 5V lower than normal setting.
- At this setting, output voltage (output voltage varies depending on input voltage) ranges from around 90V AC to 110V AC.
- The maximum output capacity at this setting is:
  1000VA/700W (BN100XR)
  1450VA/1000W (BN150XR)
  2250VA/2000W (BN240XR)

● 115V AC output/normal voltage sensitivity
With input of 100V AC, output is 115V AC.
Power failure detection voltage is at normal setting.
- At this setting, output voltage (output voltage varies depending on input voltage) ranges from around 100V AC to 125V AC.
- The maximum output capacity at this setting is:
  1000VA/700W (BN100XR)
  1500VA/1000W (BN150XR)
  2450VA/2000W (BN240XR)

● 115V AC output/low voltage sensitivity
With input of 100V AC, output is 115V AC.
Power failure detection voltage is 4V lower than normal setting.
- At this setting, output voltage (output voltage varies depending on input voltage) ranges from around 95V AC to 125V AC.
- The maximum output capacity at this setting is:
  1000VA/700W (BN100XR)
  1500VA/1000W (BN150XR)
  2350VA/2000W (BN240XR)

5. Output receptacle delay time at UPS startup

(Factory setting) Output receptacle B has no delay. Output receptacle C has no delay.

The output start time for output receptacles B and C at UPS startup can be set independently, and delayed with respect to output receptacle A.

● Output delay time setting
Values ranging from 0 (minimum value) to 10 minutes (maximum value) can be set.

6. Battery start date (replacement date) registration

(Factory setting) No data.

It is possible to register and/or update the battery start/replacement date.
Register the battery start date for the purpose of battery replacement maintenance.

10. Troubleshooting

Problems	Solution
The battery indicator does not blink every 10 seconds (when the power switch is OFF).	• The AC Input Plug is not connected to a wall outlet. • Voltage and/or frequency are out of the operating range. • Check that the AC Input Plug is properly plugged into a wall outlet. **In the case of BN240XR:** If the battery indicator does not blink even when the AC input is correct, either the AC input fuse (built-in/not replaceable) is blown, or there is a possible malfunction. The cause may be either too many connected devices, or a device malfunction. • **In the case of BN100XR/BN150XR:** The Black button of the AC Input Overcurrent Protector pops up. There are too many devices connected, or a short circuit occurred within one or more of the connected device. Reduce the number of connected devices, or check the fuses of the connected devices. If the connected devices are normal, disconnect them all, press the Black button of the AC Input Overcurrent Protector, or turn it ON, and try connecting the AC Input Plug to a wall outlet (commercial power). If the AC Input Overcurrent Protector still remains OFF, it is likely that a malfunction has occurred.
The UPS does not start up when the power is switched ON.	• Voltage and/or frequency are out of the operating range. • There are too many devices connected, or a short circuit occurred within one or more of the connected devices. If the connected devices are normal, disconnect them all, and try connecting the AC Input Plug to a wall outlet (commercial power). If it still does not start up, it is likely that a malfunction has occurred.
Battery mode does not function. The connected devices shut down when there is a power failure.	The battery may not be sufficiently charged. • Turn off all of the connected devices and charge the battery until the battery charge indication is fully illuminated. After that, shut down the UPS and all of the connected devices, then try turning ON only the Power switch of the UPS. Remove the AC Input Plug from the wall outlet (commercial power). If Battery mode does not function at all, the battery is dead and needs to be replaced.
The UPS frequently enters into Battery mode.	Changes (drops) in the input power supply, and/or instantaneous voltage drops are frequently occurring. Or, there may be noise that is causing extreme distortion of the voltage waveform of the input power supply. • Try connecting the UPS to a different wall outlet. Change to a wall outlet some distance away from devices that consume large amounts of power. • This may occur if many devices are connected to a power strip, extension cord, or to a long or thin cable.
In Battery mode, the screens of the connected devices do not look normal. **The screen flickers.**	The likely cause is noise occurring inside the UPS. • Ground all of the devices connected to the UPS. Connect them to 3-pin (3P) wall outlets, or to wall outlets with a grounding terminal. • If a UPS and backup device are too close to one another, problems may occur. Rearrange the placement of the UPS and devices. • If the UPS and/or the devices connected to the UPS are placed on a metal rack, try to ground the rack.
Overload indication ( ) is blinking (every 0.5 second).	The total capacity of the devices connected to the Power Supply Output Receptacles of the UPS exceeds the rated capacity. • Reduce the number of connected devices.
The Battery Replacement Lamp comes on.	The auto battery test determined that the battery life has expired. • The battery has deteriorated to the point that backup time is about 1/3 of the initial value, or that backup cannot be performed. Replace the battery.

Problems	Solution
The Error Lamp comes on.	An error or malfunction has occurred in the UPS. Shut down the UPS and the connected devices. • After disconnecting all of the connected devices, turn ON the power switch of the UPS. If it returns to normal operation, then there was probably excessive inrush current or a short circuit in one or more of the connected devices. Check the connected devices. If the problem remains, shut down the UPS for one hour, and then restart it. If it returns to normal operation, the problem was probably caused by high temperature, indicating that the ventilation around the UPS needs to be improved. If the problem still occurs after one hour, the UPS has probably malfunctioned and is in need of repair.
There is no output, even though the operation mode indicator is normal (only BN240XR).	The Output Overcurrent Protector may have been tripped. • Make sure that the white button of the overcurrent breaker of the output receptacle is not sticking out. Output receptacles A, B and C each have their own separate breaker. After reducing the number of connected devices, press the button.
Input 15A Exceeded Lamp comes on. **No beep sound (only BN150XR).**	• The input current has exceeded 15A, so stop operating with the 15A plug. Replace with the included 20A plug. To continue operating with the 15A plug, reduce the number of connected devices.

Reference

A. Specifications

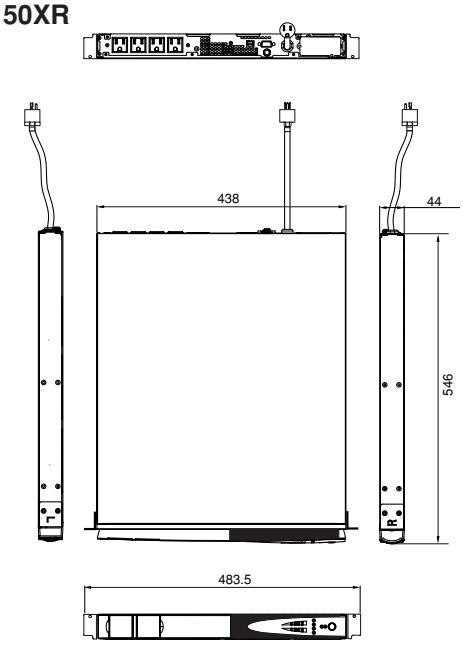
Operation method		Line interactive method
Cooling method		Forced air cooling
AC input	Rated input voltage	100 VAC
	Voltage range	90 VAC+3% ~ 118 VAC+3% (100 VAC output/normal voltage sensitivity) 85 VAC+3% ~ 118 VAC+3% (100 VAC output/low voltage sensitivity) 92 VAC+3% ~ 118 VAC+3% (115 VAC output/normal voltage sensitivity) 88 VAC+3% ~ 118 VAC+3% (115 VAC output/low voltage sensitivity)
	Rated frequency	50 / 60Hz+4Hz
	Maximum current	13A (BN100XR) 18A (BN150XR) 24A (BN240XR)
	Number of phases	Single phase two lines
	Input plug type	3-pin (with ground) NEMA 5-15P (BN100XR) NEMA 5-15P (replaceable with L5-20P) (BN150XR) NEMA L5-30P (BN240XR)
	Input protection	Reset-type overcurrent protection device (BN100XR/BN150XR) Fuse (built-in) (BN240XR)
	Input protection capacity	15A (BN100XR) 20A (BN150XR) 30A (BN240XR)
AC output	Output capacity [*The total load capacity to connect the UPS should be less than rated value for both the VA value and the Watt value.]	**(BN100XR)** 1000VA/700W
		(BN150XR) 1500VA (1110VA)/1000W (100 VAC output/normal voltage sensitivity) 1420VA (1035VA)/1000W (100 VAC output/low voltage sensitivity) 1500VA (1140VA)/1000W (115 VAC output/normal voltage sensitivity) 1480VA (1080VA)/1000W (115 VAC output/low voltage sensitivity) Data in parentheses ( ) are for when 15A input plug is used
		(BN240XR) 2310VA/2000W (100 VAC output/normal voltage sensitivity) 2160VA/2000W (100 VAC output/low voltage sensitivity) 2370VA/2000W (115 VAC output/normal voltage sensitivity) 2250VA/2000W (115 VAC output/low voltage sensitivity)
	Output waveform (In Commercial Power Mode/ Batttery Mode)	Sine wave / Shine wave
	Rated voltage	100 VAC /115 VAC
	Output voltage (reference value) (In Commercial Power Mode)	90 VAC ~ 110V (100 VAC output/normal voltage sensitivity) 90 VAC ~ 110V (100 VAC output/low voltage sensitivity)
		100 VAC ~ 125V (115 VAC output/normal voltage sensitivity) 95 VAC ~ 125V (115 VAC output/low voltage sensitivity)
	Output voltage (In Battery mode)	100 VAC+ 10%/115 VAC+ 10%
	Frequency	Same as input frequency
		50 / 60Hz+0.1Hz (in Battery mode)
	Number of phases	Single phase two lines
	Switching time	10 ms or less
	Waveform distortion rate	22% or less (in Battery mode, under rectifying load, at rated output)

AC output	Overload protection	• When rated capacity is exceeded, there is a warning, and output stops with passage of time • Output drops (in Battery mode)
	Number of output receptacles	Backup output (grounded 3-pin) x 4 (BN100XR) • 10A (NEMA 5-15) x 2 • 10A (NEMA 5-15) output delay, ON/OFF controllable x 1 • 10A (NEMA 5-15) output delay, ON/OFF controllable x 1
		Backup output (grounded 3-pin) x 4 (BN150XR) • 15A (NEMA 5-15) x 2 • 15A (NEMA 5-15) output delay, ON/OFF controllable x 1 • 15A (NEMA 5-15) output delay, ON/OFF controllable x 1
Battery	Type	Backup output (grounded 3-pin) x 6 (BN240XR) • 20A (NEMA 5-20) x 2 • 20A (NEMA 5-20) output delay, ON/OFF controllable x 2 • 15A (NEMA 5-15) output delay, ON/OFF controllable x 2
	Backup time	Sealed lead-acid battery Expected battery life 2 to 3 years (in ambient temperature of 20°C)
		7 minutes or more (at 20°C, in new condition, at rated load) ... (BN100XR)
	Charging time	4 minutes or more (at 20°C, in new condition, at rated load) ... (BN150XR)
	User replaceable	5 minutes or more (at 20°C, in new condition, at rated load) ... (BN240XR)
Communication I/F		12 hours (20°C)
		Possible (corresponding to Hot-swap)
		Yes (automatic check every 4 weeks)
Environ-ment	Auto battery check function	RS-232C, USB
	Operating ambient temperature	Contact signal input/output card SC05 (optional)
	Operating ambient humidity	SNMP/Web card SC20 (optional)
	Storage temperature	0 to 40°C
	Storage humidity	25 to 85%
	Withstand voltage	-15 to 50°C
	Insulation resistance	10 to 90% RH
Standards	Lightning surge resistance	1500 VAC, one minute
	Safety standards	10 megaohms or more
		4kV to ground/2kV or more between lines
VCCI Input harmonics		UL 1778 Class A compliance
Internal power consumption (Normal, Max.)		Meets limitation standards 25W / 65W max (BN100XR/BN150XR) 50W / 140W max (BN240XR)
Noise		45dB or less (BN100XR/BN150XR) 55dB or less (BN240XR)
External dimensions (W x D x H)		438 x 546 x 44 mm (BN100XR/BN150XR) 438 x 640 x 88 mm (BN240XR)
Mass		438 x 636 x 88 mm (MB240XR) 20 kg (BN100XR/BN150XR) 38 kg (BN240XR) 29 kg (MB240XR)

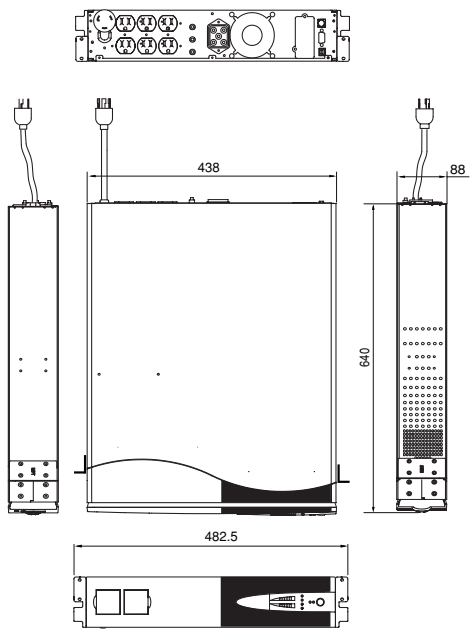
B. Dimensional outline drawings

(unit:mm / Tolerance ±1mm)

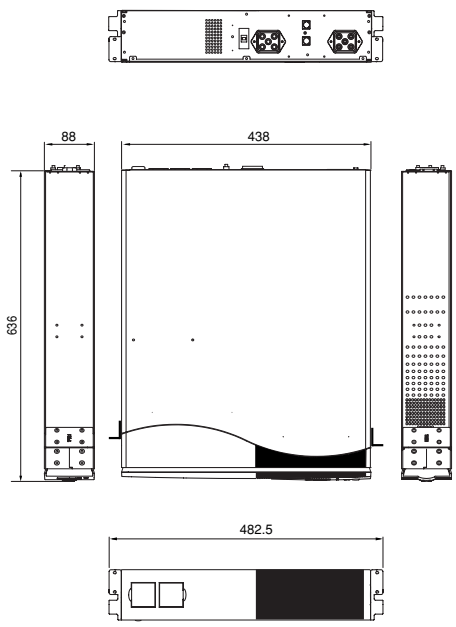
BN100XR
BN150XR



BN240XR

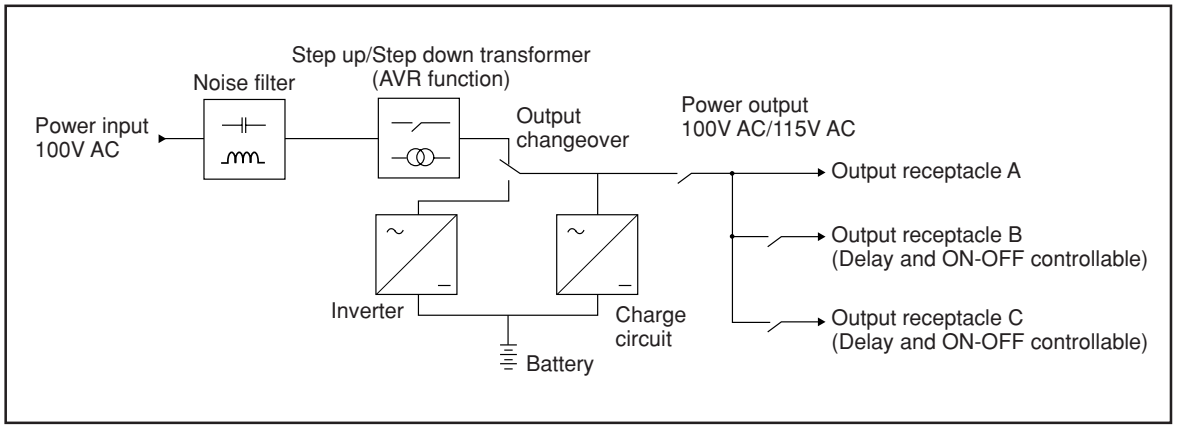


MB240XR
Battery Unit



The figure indicates the condition with rack support clamps attached.

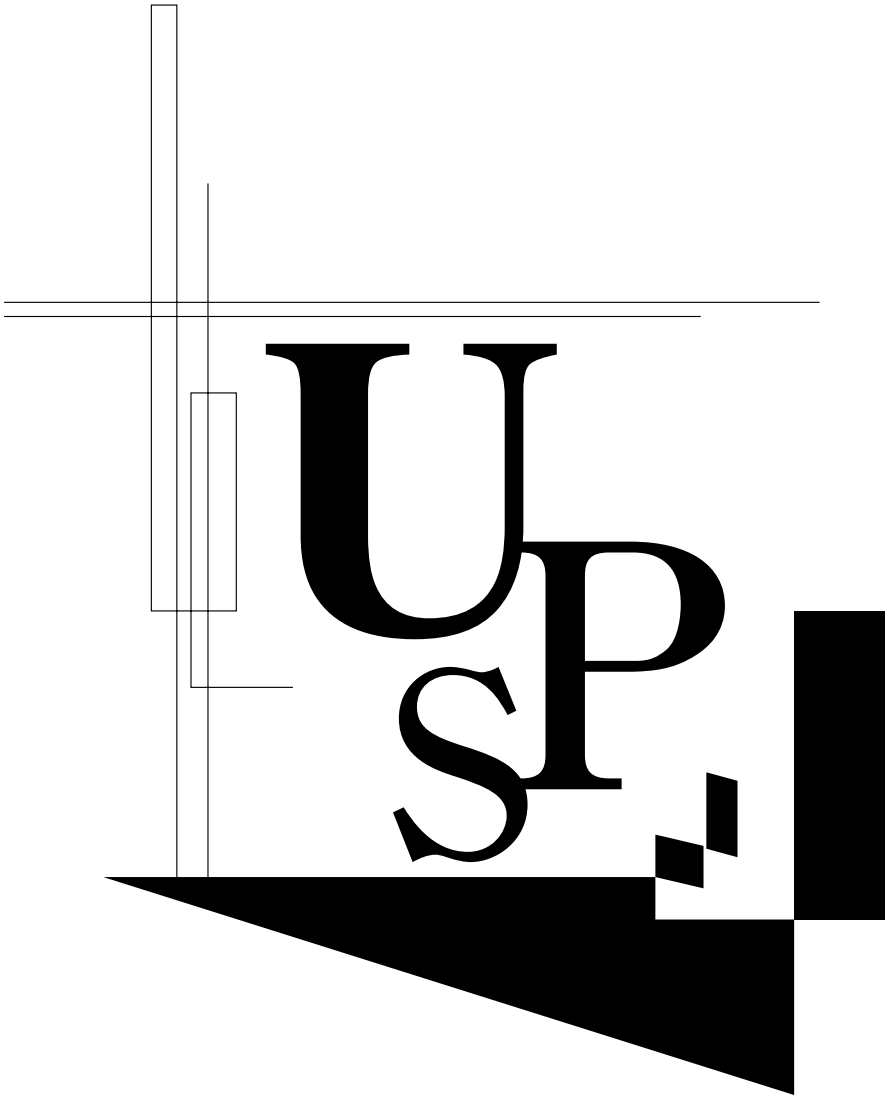
C. Circuit block diagram



D. Optional products

The following optional devices and parts are available. For further information, refer to OMRON's general catalogs for peripheral devices.

Add-on battery unit	Model: MB240XR	For BN240XR
Replaceable battery pack	Model: BP150XR	For BN100XR/BN150XR only
	Model: BP240XR	For BN240XR/MB240XR only
SNMP/Web card	Model: SC20	For both BN100XR/BN150XR/BN240XR
Contact signal input/output card	Model: SC05	For both BN100XR/BN150XR/BN240XR



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