

USER'S GUIDE

LEONICS®

NB-series

NBP-series

Authorized Distributor :



• www.leonics.com • e-mail : global_business@leonics.com • LEN.MAN.UPS.068 Rev.3.00/2008



TRUE ON-LINE DOUBLE CONVERSION UPS

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SAFETY INSTRUCTIONS

Please read carefully and follow this LEONICS NB-series/NBP-series UPS guide.

Important : Please keep this manual for reference in order to use the LEONICS UPS properly and safely. This user's guide contains instructions for installation, maintenance, operation and unit specifications.

If there are any symptoms of problems which are not mentioned in this guide or any queries, please contact your LEONICS local distributors, LEONICS Service Center, send e-mail to global_business@leonics.com or visit www.leonics.com.

For your convenience and quick reference for LEONICS UPS service, please fill the requested information in the blanks below.

UPS Model : _____
Serial Number : _____
Purchase date : _____
Purchased from : _____

CAUTION

DO NOT remove LEONICS NB-series/NBP-series UPS cover for repairing by yourself. Complicated electronic devices inside the UPS may be damaged or caused hazard to life. Repairing is only referred to technician.

1.1 Electrical Safety

- 1.1.1 Do not work alone where there is danger of shock.
- 1.1.2 Contact with live conductors will cause burns and dangerous electric shock.
- 1.1.3 Please allow ONLY a certified electrician to wire your system permanently.
- 1.1.4 Periodically check your cable, outlets and power source to make sure that they are in good condition.
- 1.1.5 To reduce risk from electric shock if you can not find the electrical ground of the building, unplug the UPS from the AC source before plug in your load at the rear side of the UPS. Then, plug in the UPS to AC source.
- 1.1.6 Do not touch any metal parts of the loads when they are plugged into the UPS.

- 1.1.7 Use ONLY one hand when plugging and unplugging the load in order to avoid electric shock from touching two surfaces with different potential.
- 1.1.8 It is recommended to connect the UPS to a three wire AC source (two poles plus ground) which connects to a protected circuit such as employs a fuse or automatic circuit breaker.

1.2 CAUTION ! Safety guide for installation and operation

- 1.2.1 Install the UPS in dry location with good ventilation, low humidity, no chemical particles, no inflammable substances. Avoid to install the UPS near radio transmission station, heat dissipation equipments, or directly to sunlight.
- 1.2.2 DO NOT block the ventilation grills.
- 1.2.3 Connect the UPS to utility line and turn it on at all time.
- 1.2.4 When you want to connect the computer to the UPS, turn off UPS and disconnect it from the utility line before connect the computer.
- 1.2.5 Turn on the UPS before turn on the load to prevent surge from the loads.
- 1.2.6 DO NOT connect utility power to the UPS OUTPUT. This may cause the UPS damaged.
- 1.2.7 When heavy rain, avoid using electronic instruments including UPS to prevent it from lightning.
- 1.2.8 Use soft cloth to clean the UPS when it is OFF. DO NOT clean it with solvent.
- 1.2.9 DO NOT use the UPS with life recovery instruments. The failure of UPS may cause life recovery instruments failure or effect to their performance or effect to the safety system of those instruments.

1.3 Warning ! Battery Safety

- 1.3.1 The UPS has hazardous voltages inside, do not disassemble any parts of UPS except for the battery. Users are not allowed to repair, recondition or disassemble the UPS. This must be done by LEONICS qualified technicians only.
The battery that is inside your UPS can be recycled. It contains LEAD, which is harmful to health and the environment. If it can not be disposed of properly, please return it to a LEONICS local distributor or Leonics Service Center.
- 1.3.2 Do not dispose of batteries in a fire. They may be exploded.

Battery can be recycled and needs proper elimination. It consists of lead which harms to our environment and health. Please return the battery to us or our service center.

- 1.3.3 Do not disassemble batteries. They contain poisonous electrolyte which is harmful to your skin and eyes.
- 1.3.4 When replacing a battery, use tools with insulated handles and remove any watch, rings or other metal objects that you wear in order to avoid electric shock.
- 1.3.5 Replace batteries with the same type and rating and follow the proper battery replacement procedure.

Vocabulary

- Load : Any equipment which is plugged into the UPS and gets power from the UPS such as a computer, printer, fax machine or modem.
- UPS : NB-Series and NBP-series UPS
- VA : The unit of UPS power rating showing its capacity.

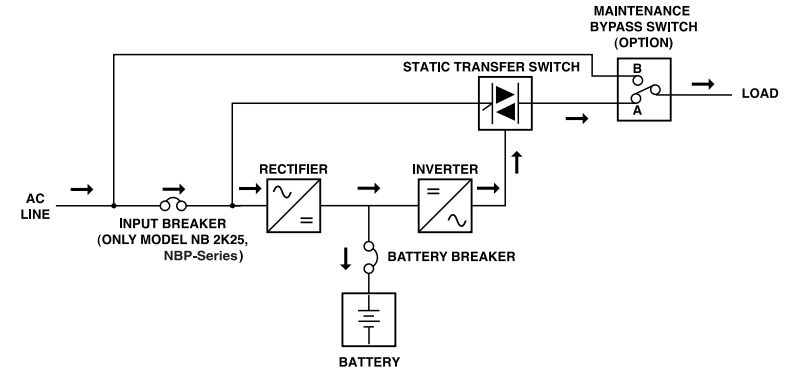
INTRODUCTION

2.1 General

LEONICS NB-series/NBP-series UPS is a True On-Line Double conversion uninterruptible power supply which is the highest quality power protection system to protect against all utility power problems. It is designed for power sensitive equipments or critical applications such as computers, communication equipments, medical instruments, electronic measurement equipments, scientific equipments, and etc.

2.2 LEONICS NB-series and NBP-series UPS operation

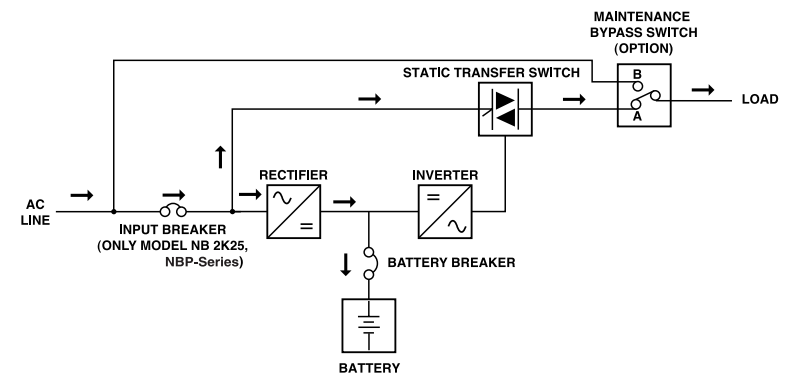
2.2.1 When utility power and loads are normal



Above diagram shows how UPS works when utility power (AC line) is normal and UPS has less than 100% load. UPS converts utility power from alternative current (AC) to direct current (DC) at RECTIFIER. Some of the DC power flow to charge battery to be backup power and the rest flow directly to INVERTER to invert power to high quality and stable AC power. Then, supply to load.

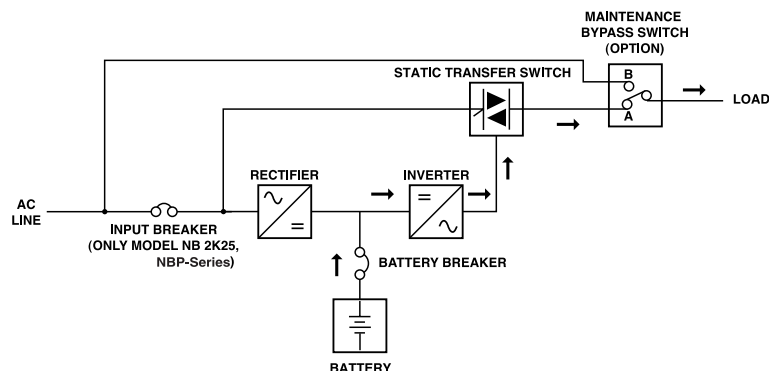
Note: The input circuit breaker is available in NB 2K25, NBP Series only.

2.2.2 When utility power is normal but overload



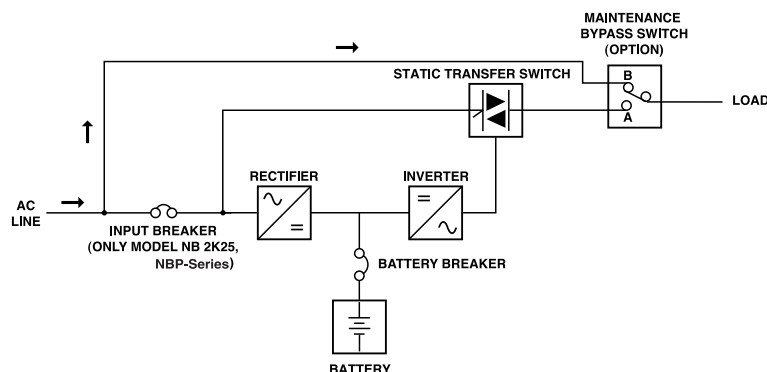
Above diagram shows how UPS works when utility power is normal and UPS has more than 100% load. UPS converts utility power at RECTIFIER to charge battery only. The power supplied to load is from utility line.

2.2.3 When utility power fail but loads are normal



Above diagram shows how UPS works when utility power fails such as blackout, brownout, under voltage, over voltage or frequency fault and UPS has less than 100% load. UPS draws backup power from battery to invert to AC power and continuously supplies to load.

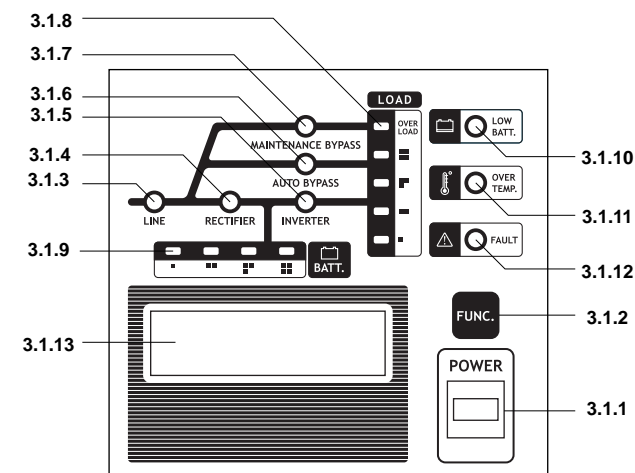
2.2.4 Use maintenance bypass switch when UPS is malfunction (option)



Above diagram shows how system works when UPS is malfunction. User is allow to temporary run the system by turning the manual bypass switch from position A to B. All loads will get power supplied directly from utility line. Then, contact us or our nearest service center.

FRONT AND REAR PANEL

3.1 Front panel

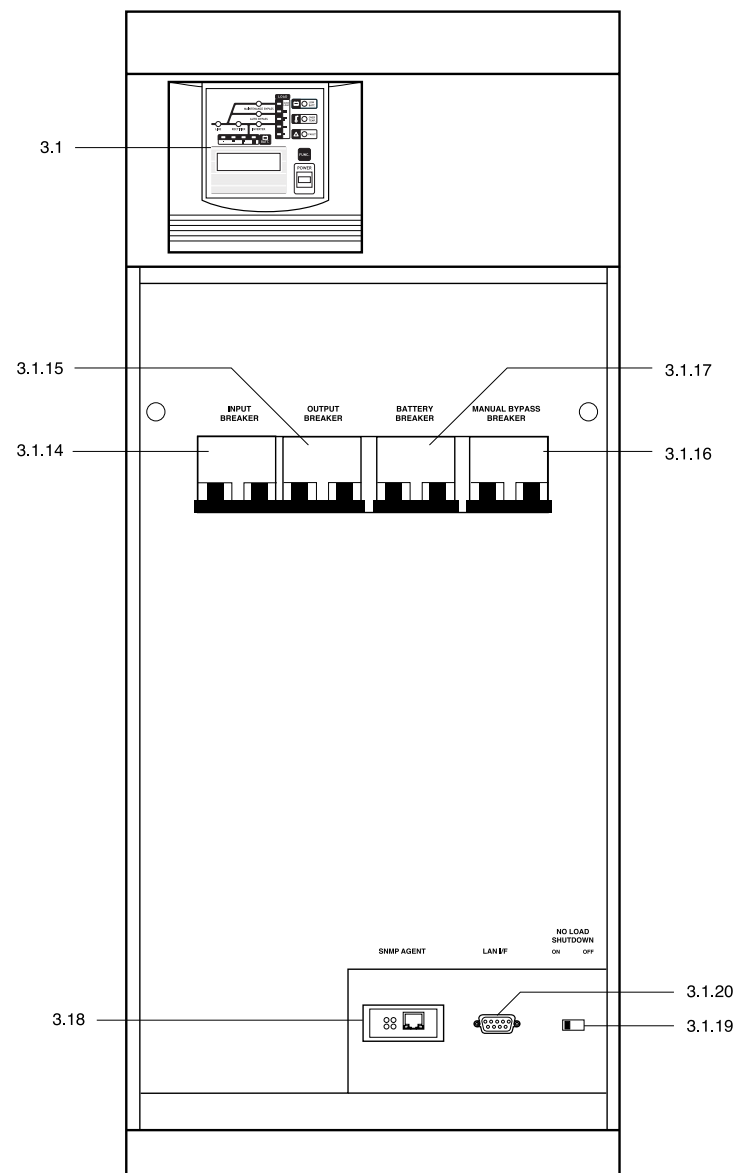


- 3.1.1 **POWER button:** The button to turn on and turn off the UPS.
- 3.1.2 **FUNC. button:** The button to mute alarm sound or turn on the LCD's back light; The back light will turn off automatically in 10 seconds after release this button.
- 3.1.3 **LINE indicator:** The Indicates when utility line normally.
- 3.1.4 **RECTIFIER indicator:** The indicator is displayed when utility line normally, It supplies power to the UPS in rectifier section and supplies power to charge battery and loads normally.
- 3.1.5 **INVERTER indicator:** The indicator is display when the load is consuming high quality power from inverter section.
- 3.1.6 **AUTO BYPASS indicator:** The indicator is displayed when load is consuming power from utility line. It is possible that you connected more than 100% load to UPS or INVERTER section is malfunction.
- 3.1.7 **MAINTENANCE BYPASS indicator:** The indicator is displayed when MAINTENANCE BYPASS SWITCH is at position B or maintenance bypass circuit breaker is at position ON (for NBP-0811-1011 only). At this moment, power that supplies to load is from utility line.
- 3.1.10 **LOW BATT. indicator:** The indicator is displayed when the battery is low.
- 3.1.11 **OVER TEMP. indicator:** The indicator is displayed when the temperature is high.
- 3.1.12 **FAULT indicator:** The indicator is displayed when there is a fault in the system.

- 3.1.8 **LOAD indicator:** The indicator displays how much power UPS is supplying compare with its full capacity.
- 3.1.9 **BATTERY indicator:** The indicator displays how much backup power stored in battery compare with its full capacity of battery.
- 3.1.10 **LOW BATT. indicator:** The indicator display when battery energy is almost gone. After the indicator is on for 2 minutes, UPS will shut down to protect battery life.
- 3.1.11 **OVER TEMP. indicator:** Indicates when temperature inside the UPS is too high for the UPS to operate.
- 3.1.12 **FAULT indicator:** Indicates when UPS is malfunction.
- 3.2.13 **SNMP AGENT (option):** The additional port to connect the LAN cable to computer network to monitor electrical and UPS status via SNMP/HTTP. Read more details in Net Agent manual.
- 3.2.14 **BATTERY TERMINAL (for NBP0811 and NBP1011) :** The teminal for connecting to extension battery unit.
- 3.1.13 **LCD DISPLAY:** The screen to displays Input voltage (Vin), Output voltage (Vout), Battery Level (%B) and Load level (%LD) as shown in the picture below

$V_i = 220$ $V_o = 220$ $\%B = 90$ $\%LD = 97$

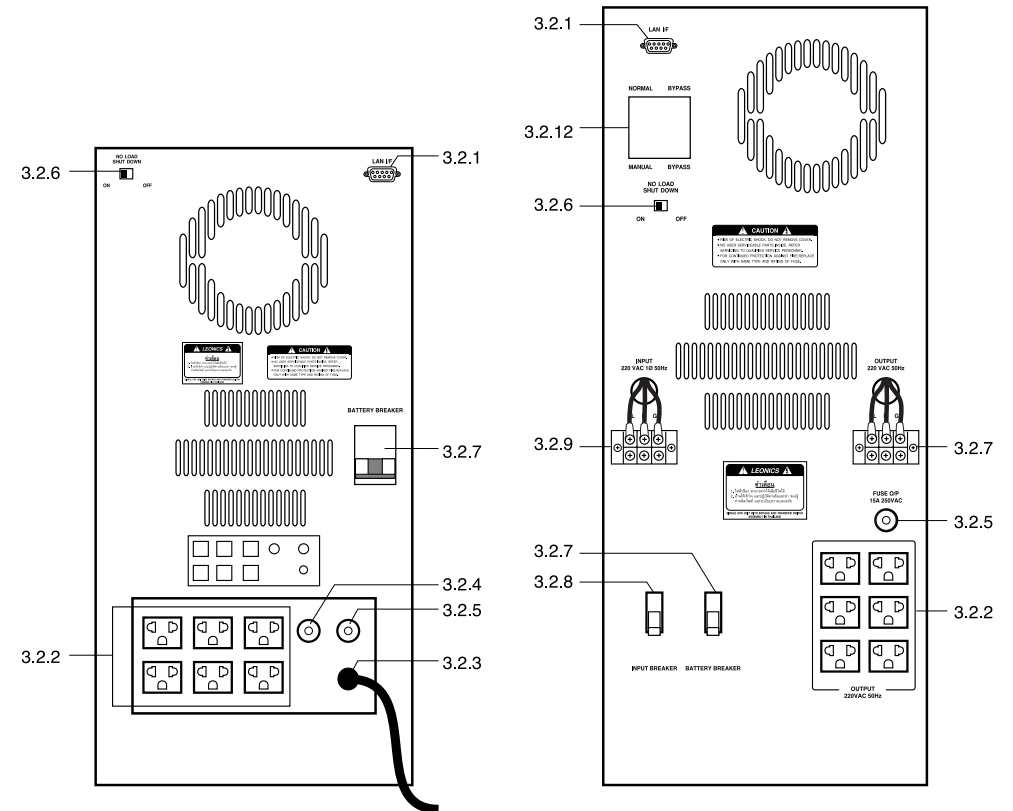
Note : The values of input (Vin) and output (Vout) voltages read from the LCD of UPSs or Easy-Mon X from the UPSs in the same network may be different, even though connected to the same power source. Possible causes of these happenings are the voltage over each branch circuit is not equal, or $\pm 1\%$ accuracy of input and output voltage measuring circuit, or the UPSs are connected to different power phases of the same source.



NBP 0811, NBP 1011

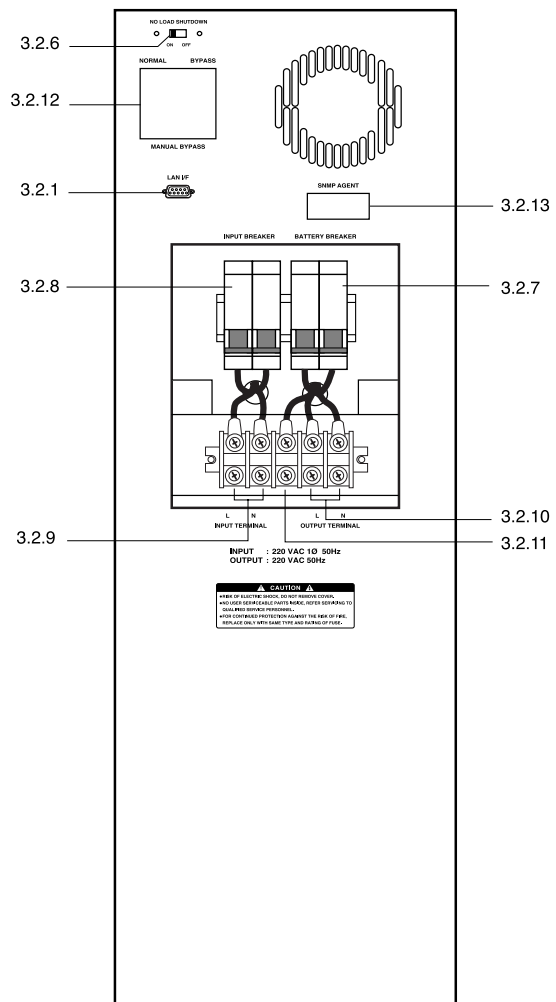
- 3.1.14 **INPUT circuit breaker:** The circuit breaker for protecting the UPS from over load or short circuit current.
- 3.1.15 **OUTPUT circuit breaker:** The circuit breaker for protecting the loads from over load or short circuit current .
- 3.1.16 **BATTERY circuit breaker:** The circuit breaker for protecting battery from over load or short circuit current.
- 3.1.17 **MANUAL BYPASS circuit breaker (OPTION):**The component to switch the power source of loads to utility power when maintenance.
- 3.1.18 **SNMP AGENT (OPTION):** The additional port to connect the LAN cable to computer network to monitor electrical and UPS status via SNMP/HTTP. Read more details in Net Agent manual.
- 3.1.19 **NO LOAD SHUT DOWN SWITCH:**The switch to enable automatic shutdown when there is no load and power fails. (No load means the total power consumption of all loads are lower than 10% of full load).
- 3.1.20 **LAN I/F:**The communication port for connecting RS-232 cable from UPS to computer.

3.2 Rear Panel

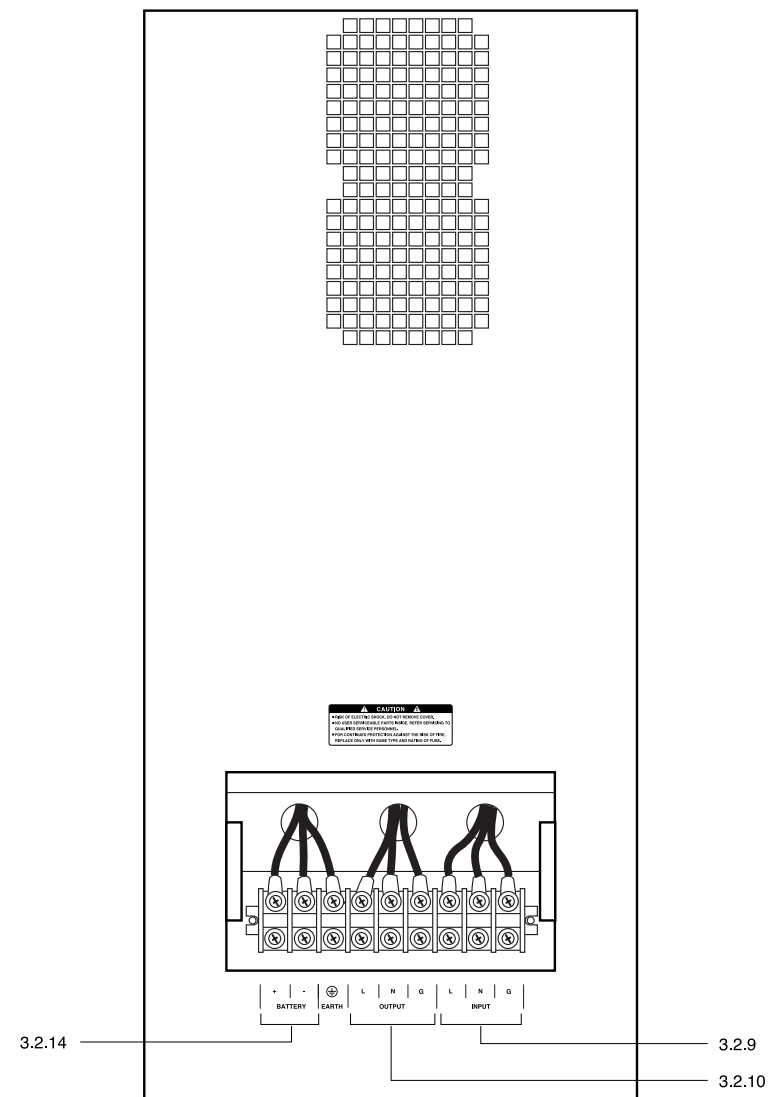


NB 7525 / NB 1K25

NB 2K25



NBP 3K25, NBP 5K25, NBP 6K25



NBP 0811, NBP 1011

- 3.2.1 **LAN I/F:** The communication port for connecting RS-232 cable from UPS to computer.
- 3.2.2 **UPS OUTPUT:** The output outlets for connecting loads to the UPS backup power system (available in NB-series UPS only).
- 3.2.3 **INPUT CABLE:** The cable to connect to utility power line.
- 3.2.4 **INPUT FUSE:** The overload or short circuit protection at UPS input side.
- 3.2.5 **OUTPUT FUSE:** The overload or short circuit protection at UPS output side.
- 3.2.6 **NO LOAD SHUT DOWN SWITCH:** The switch to enable automatic shutdown when there is no load and power fails. (No load means the total power consumption of all loads are lower than 10% of full load).
- 3.2.7 **BATTERY circuit breaker:** The circuit breaker for protecting battery from over load or short circuit current.
- 3.2.8 **INPUT circuit breaker:** The circuit breaker for protecting the UPS from over load or short circuit current.
- 3.2.9 **INPUT TERMINAL:** The terminal for connecting power from utility line to the UPS.
- 3.2.10 **OUTPUT TERMINAL:** The terminal for connecting to loads.
- 3.2.11 **GROUND:** The terminal for connecting to ground system.
- 3.2.12 **MAINTENANCE BYPASS SWITCH (option):** Turn this switch to position B when UPS is under maintenance.

INSTALLATION

- 4.1 Connect the RS-232 signal cable from the computer (if any) to the UPS at LAN I/F or RS232-PC port.
- 4.2 Enable NO LOAD SHUTDOWN feature. Slide NO LOAD SHUTDOWN switch to position ON. When power fails, the UPS will check whether the load is equal to 9% or lower. If it is, the UPS will shut down to save battery power.

Note: The factory default setting is OFF or disabled.

- 4.3 For NB7525 and NB 1K25; plug INPUT CABLE to utility power source. Then, plug loads' cables to the UPS OUTPUT sockets.
- 4.4 Cable size for installing NB 2K25, and NBP-series.

Model	NB2K25	NBP-3K25	NBP-5K25	NBP-6K25	NBP-0811	NBP-1011
Input cable (mm ²)	2.5-4	4	6	6	10	16
Output cable (mm ²)	1.5-2.5	2.5	4	6	6-10	16
Earth cable (mm ²)	2.5-4	2.5-4	4	6	6	10
Battery cable (mm ²)	-	-	-	-	6	6-10

Note: If the cable is longer than 5 meters, the cable size must be increased.

- 4.5 For NB 2K25; connect the cable from INPUT TERMINAL to utility power source. Then, connect the cable from OUTPUT TERMINAL to loads as shown in Figure 1. Please refer to the cable sizing in 4.4.

SUB DISTRIBUTION BOARD

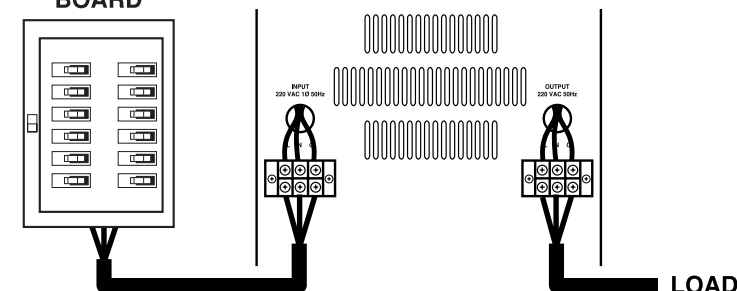


Figure 1

- 4.6 For NBP 3K25, NBP 5K25 and NBP 6K25; connect the cable from INPUT TERMINAL to utility power source. Then, connect the cable from OUTPUT TERMINAL to loads as

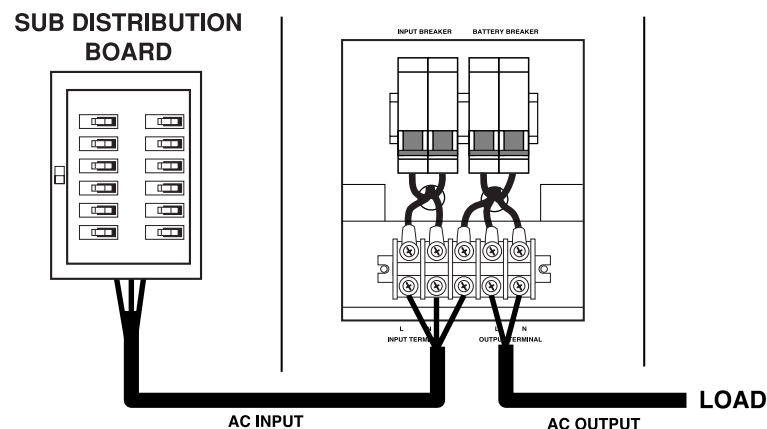


Figure 2

- 4.7 For NBP 0811 and NBP 1011; connect the cable from INPUT TERMINAL to utility power source. Then, connect the cable from OUTPUT TERMINAL to loads as shown in Figure 3. Please refer to the cable sizing in 4.4
- 4.8 For NBP 0811 and NBP 1011; connect the cable from BATTERY TERMINAL to BATTERY unit. The wire from positive pole connects to positive (+) battery terminal of BATTERY unit. The wire from negative (-) pole connects to negative battery terminal of BATTERY unit as shown in Figure 3. Please refer to the cable sizing in 4.4 .

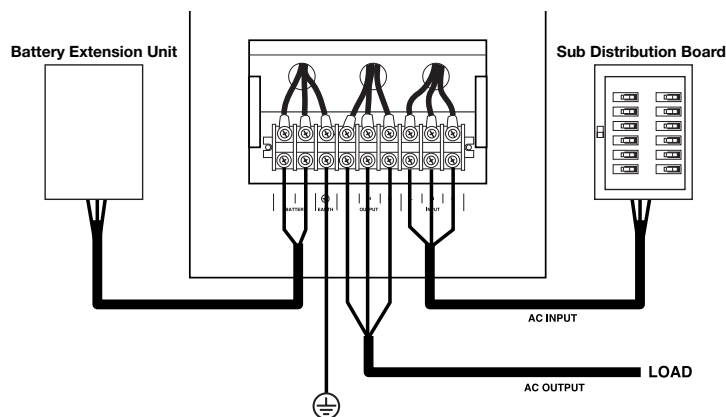


Figure 3

OPERATION

5.1 Start up procedure

To start the UPS, please follow the steps

- 5.1.1 Model NB7525 and NB1K25
- 5.1.1.1 Plug the INPUT CABLE to wall outlet (utility line).
- 5.1.1.2 Turn on POWER button and wait until the ventilation fan blows.
- 5.1.1.3 Turn on BATTERY circuit breaker.
- 5.1.2 Model NB 2K25, NBP 3K25, NBP 5K25 and NBP 6K25
- 5.1.2.1 Turn on INPUT circuit breaker.
- 5.1.2.2 Turn on POWER button and wait until INVERTER indicator is lit.
- 5.1.2.3 Turn on BATTERY circuit breaker.
- 5.1.3 Model NBP 0811 and NBP 1011
- 5.1.3.1 Turn on INPUT circuit breaker.
- 5.1.3.2 Turn on POWER button and wait until INVERTER indicator is lit.
- 5.1.3.3 Turn on BATTERY circuit breaker.
- 5.1.3.4 Turn on OUTPUT circuit breaker.

Note: When the UPS is out of order, turn on MANUAL BYPASS circuit breaker (OPTION). The power source of loads will be transferred from UPS output power to utility power directly in order to supply power to the loads temporarily . Then, turn off INPUT circuit breaker and contact us.

5.2 Turn on and turn off the UPS for the next time

From now on, you are allowed to turn on and turn off the POWER button to ON and OFF the UPS.

5.3 Using UPS under normal power condition

- 5.3.1 After start, the LINE, RECTIFIER, INVERTER, and AUTO BYPASS indicators are lit. About 10 seconds later, AUTO BYPASS indicator is OFF. That means high quality power is supplying to loads . (To prevent overload when start UPS, LEONICS design to start loads with utility power).
- 5.3.2 When UPS operates normally, batteries are always charging to maintain the full level. In case that battery is fully discharge, it takes about 8 hours to charge to full level.

5.3.3 When loads connected to UPS consume power more than 125% of the UPS capacity, OVERLOAD indicator will be lit. To protect the UPS from damages, LEONICS designed Automatic Transfer Switch system to bypass the system. At that time, the power supplies to loads is direct from utility line. This situation may happen when loads draw very high current such as when user turns on computers. When the loads consume power less than 125% for 10 seconds, UPS switches back to normal operation mode.

5.3.4 If you connect loads to UPS more than 100% (OVERLOAD indicator is lit), we recommend you to unplug some of them until %load is less than 100% to let loads get high quality power from UPS and backup power from battery

Note: LEONICS suggests that for highest reliability and safety that you should connect loads at no more than 75 % of rated UPS power. This allow for loads that change power level during use and provides for some reserve backup power for some loads.

5.4 Using UPS when power fails

5.4.1 When power line fails, UPS still supplies power which comes from backup batteries to load for 15-90 minutes. The duration that it can supply depends on %load and battery level. When battery power is weak (about 2 minutes before UPS fully shuts down), LOW BATT. indicator is blinking and alarm sounds. To mute the alarm, press FUNC. button. When utility power returns to normal status and UPS still has backup power left, UPS automatically switches back to normal operation and charges battery at the same time.

5.4.2 When UPS is supplying backup power and does not have any loads connected, UPS will shut down in 10 seconds to save battery backup power. (Set Noload shutdown switch is on position).

5.5 Using UPS when UPS is malfunction

For NB 2K25, NBP 3K25, NBP 5K25 and NBP 6K25 which have manual bypass switch (option), when UPS is malfunction, please turn the manual bypass switch at the back of the UPS from position AUTO (A) to position BYPASS (B). The UPS changes to operate in bypass mode. INVERTER LED is off while MAINTENANCE BYPASS LED and alarm sound is on. All loads which connected to UPS OUTPUT are switched to connect to utility power for temporary use. Then press POWER switch at the front to shutdown the UPS, turn off INPUT circuit breaker and contact us or nearest service center.

After the UPS is repaired, start the UPS following the startup procedure, then turn manual bypass switch to position AUTO (A). The UPS will switch back to normal operation mode within 20 seconds.

For NBP-0811, NBP-1011 which have manual bypass circuit breaker (option), when UPS is malfunction, please turn on manual bypass circuit breaker. The UPS changes to operate in bypass mode. INVERTER LED is off while MAINTENANCE BYPASS LED and alarm sound is on. All loads which connected to UPS OUTPUT are switched to connect to utility power for temporary use. Then press POWER switch at the front to shutdown the UPS, turn off INPUT circuit breaker and contact us or nearest service center.

After the UPS is repaired, start the UPS following the startup procedure, then turn off manual bypass circuit breaker. The UPS will switch back to normal operation mode within 20 seconds.

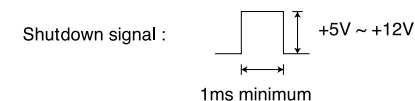
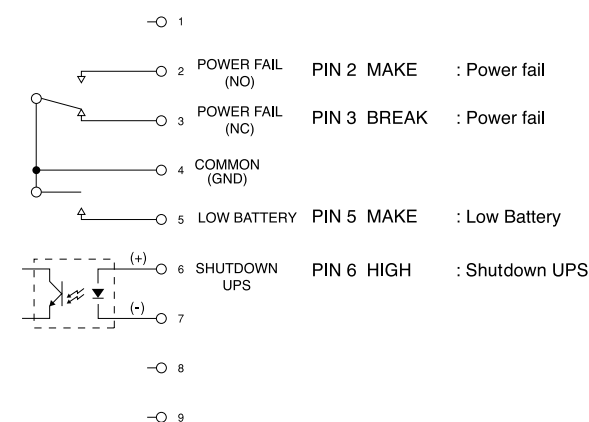
5.6 LAN Interface (I/F) or RS232-PC

To communicate with computer or network, user is allowed to connect the signal from DB9 connector to your computer to get the status as below,

5.6.1 POWER FAILURE shows utility power fails.

5.6.2 LOW BATTERY shows batteries are going to run out of power.

5.6.3 SHUTDOWN UPS When utility power fails and UPS is going to run out of battery, computers and network are automatically save files or data. Then send signal to UPS to shutdown the whole system.



TROUBLE SHOOTING

If the UPS does not operate properly and you cannot solve the problems using this troubleshooting information in this user's guide, please contact your LEONICS local distributor, LEONICS Service Center, send e-mail to support@leonics.com or visit www.leonics.com.

MODEL	PROBLEM	SOLUTION
NBP 7525	No indicator displays at the panel when the UPS is turned on.	Replace input fuse (10 A) following section 6.1
	UPS does not supply backup power when power fails.	Turn on BATTERY circuit breaker following section 6.3
NB 1K25	No indicator displays at the panel when the UPS is turned on.	Replace input fuse (15 A) following section 6.1
	UPS does not supply backup power when power fails.	Turn on BATTERY circuit breaker following section 6.3
NB 2K25	No indicator display at the panel when the UPS is turned on.	Turn on INPUT circuit breaker following section 6.2
	UPS does not supply backup power when power fails.	Turn on BATTERY circuit breaker following section 6.3
NBP 3K25	No indicator displays at the panel when the UPS is turned on.	Turn on INPUT circuit breaker following section 6.2
NBP 5K25	UPS does not supply backup power when power fails.	Turn on BATTERY circuit breaker following section 6.3
NBP 6K25	UPS does not supply backup power when power fails.	Turn on BATTERY circuit breaker following section 6.3
NBP 0811		
NBP 1011		Check BREAKER FUSE inside the fuse holder of BATTERY unit whether it is blown (Only NBP0811 and NBP1011). If it is blown, replace the new fuse with same size and same rating as the original one.

6.1 How to replace INPUT fuse for NB7525 and NB1K25

- 6.1.1 Turn off the UPS.
- 6.1.2 Use screwdriver to release input fuse.
- 6.1.3 Replace blown fuse with the new one. (Replace with the same type and same rating fuse only.)
- 6.1.4 Assemble the fuse holder to the same position. Then, turn on the UPS.

6.2 How to turn on INPUT circuit breaker for NB2K25, NBP 3K25, NBP 5K25 NBP 6K25, NBP 0811 and NBP 1011

- 6.2.1 Turn off the UPS by pressing the POWER button at the front panel.
- 6.2.2 Turn on the INPUT circuit breaker
- 6.2.3 Turn on the UPS by pressing the POWER button at the front panel.

6.3 How to turn on BATTERY circuit breaker

- 6.3.1 Turn off the UPS by pressing the POWER button at the front panel.
- 6.3.2 Turn on the INPUT circuit breaker.
- 6.3.3 Turn on the UPS by pressing the POWER button at the front panel and wait until INVERTER indicator is lit.
- 6.3.4 Turn on the BATTERY circuit breaker.

Caution: Turn on the UPS by pressing the POWER button first every time. Do not turn on the BATTERY BREAKER when the UPS is still operating because it may damage.

MAINTENANCE

- 7.1 LEONICS UPS does not need any special maintenance. Just only keep it away from dust and humidity. Anyway, if any of following items occurred, please contact us or our nearest service center.
 - 7.1.1 Part of the cable is cut, broken or damaged.
 - 7.1.2 The inside is wet with any kind of liquids.
 - 7.1.3 The metal cabinet is broken.
 - 7.1.4 The UPS is dropped, fallen, crashed or hit.
 - 7.1.5 User notices abnormal conditions under normal use.
- 7.2 Under normal operation and continuous use, expected life time of ventilation fan is approximately 20,000 hours.
- 7.3 Even though the backup batteries are maintenance free type, user still need to check them every year to make sure that they are at good condition by following the procedure on the next page,

- 7.3.1 Turn on the UPS and then turn on loads..
 - 7.3.2 Turn off INPUT circuit breaker or unplug input cable for model NB 7525 and NB 1K25 from utility power. Check whether the loads are still working normally because right now the loads are taking power from backup battery.
 - 7.3.3 If the loads are not working normally, that means backup batteries are deteriorated. To replace with the new batteries, contact us or our nearest service center.
- 7.4 If you have to store UPS for a long period of time, before storing, be sure the battery is fully charged and it need to be recharged every three months to preserve the condition of the internal battery by following the procedures below;
- 7.4.1 Model NB7525 and NB1K25
 - 7.4.1.1 Turn off the UPS by pressing the POWER button at the front panel.
 - 7.4.1.2 Turn off the BATTERY circuit breaker .
 - 7.4.1.3 When user wants to use the UPS, plug the INPUT CABLE to wall outlet (utility line). Turn on POWER button and wait until the ventilation fan blows. Then, turn on BATTERY circuit breaker.
 - 7.4.2 Model NB 2K25, NBP 3K25, NBP 5K25 and NBP 6K25
 - 7.4.2.1 Turn off the UPS by pressing the POWER button at the front panel.
 - 7.4.2.2 Turn off the BATTERY circuit breaker.
 - 7.4.2.3 Turn off the INPUT circuit breaker.
 - 7.4.2.4 When user wants to use the UPS, turn on INPUT circuit breaker. Turn on POWER button and wait until INVERTER indicator is lit. Then, turn on BATTERY circuit breaker.
 - 7.4.3 Model Model NBP 0811 and NBP 1011
 - 7.4.3.1 Turn off OUTPUT circuit breaker.
 - 7.4.3.2 Turn off the UPS by pressing the POWER button at the front panel.
 - 7.4.3.3 Turn off the BATTERY circuit breaker.
 - 7.4.3.4 When user wants to use the UPS, follow start up procedure in section 5.1.3.
- 7.5 For your safety, unplug the input cable and turn off input switch or disconnect from utility power before maintenance.
- 7.6 When you need to replace input fuse, use the same type and same rating only.