



NEOLINE SERIES

1000 – 2000 – 3000

1000XL – 2000XL – 3000XL

1 Phase In - 1 Phase Out

USER MANUAL

Thank you for purchasing product. Observe the warnings on the machine and manual strictly and properly keep the manual. Do not operate the UPS before read safety notes and operation instructions.








TABLE CONTENT

1. Introduction	2
1.1 Description of Commonly Used Symbols.....	2
1.2 Safety Instructions.....	2
2 Product Description	4
2.1 System Type and Configuration.....	4
2.2 The Appearance of the UPS	5
2.3 Operating Principle.....	6
3 Installation	8
3.1 Unpacking Inspection	8
3.2 Installation Notes.....	8
3.3 Cable Connection.....	9
3.3.1 Connecting Input and Output Cables.....	9
3.3.2 Operation Procedure of External Battery for Long backup Time UPS.....	11
3.3.3 Connecting Communication Interface	13
4 Operation	15
4.1 Introduction of Display Panel	15
4.2 Operation Mode	17
4.2.1 Normal mode.....	17
4.2.2 Bypass mode.....	18
4.2.3 Battery mode.....	19
4.3 Operating Instructions.....	19
4.3.1 Turning On and Completely Powering Down the UPS.....	19
4.3.2 Conducting Battery self-diagnosis.....	20
4.3.3 Error Code and Warning Code	21
5 Maintenance	22
5.1 Battery Maintenance	22
5.2 Checking UPS function	23
6 Troubleshooting	24
7 Specifications	25
7.1 Electrical.....	25
7.2 Mechanical	26
7.3 Environmental.....	26
7.4 EMC.....	26
7.5 Safety	26
8 Warranty	27

1. Introduction

1.1. Description of Commonly Used Symbols

Some or all of the following symbols may be used in this manual and may appear in your application process. Therefore, all users should read the form carefully and thoroughly.

Symbol & Description	
Symbol	Description
	Caution, danger
	Danger electric shock
	Alternating current (AC)
	Direct current (DC)
	Protective ground
	Recycle
	Do not dispose with ordinary trash

1.2. Safety Instructions

1. Read this manual carefully and thoroughly before operation the UPS and save this manual properly for future reference.
2. Do not tear up or shatter the alarm table on the UPS and pay attention to it.
3. Please do not overload the UPS beyond its designed capacity.
4. The UPS contains large capacity batteries. The case of the UPS must not be opened by untrained personnel; otherwise it may cause electric shock.
5. Do not let battery or batteries get close to any heating source and do not incinerate battery or batteries, they may explode.

6. Do not open or mutilate the battery or batteries, released electrolyte is highly poisonous and harmful to the skin and eyes.
7. Do not short the positive and negative of battery electrode. Otherwise, it may cause electric shock or fire.
8. Do not plunge or insert any objects into the air vents and other inlets.
9. Do not store or use the device in the following environment:
 - Where there is inflammable gas, corrosive agents or heavy dust
 - Where the temperature is very high or low (above 40°C or below 0°C) or the humidity is very high (more than 90%)
 - Under direct sunlight or close to heating facilities
 - Place of strong vibrations
 - Outdoor
10. In the event of fire occurring in the vicinity, please use dry powder fire extinguishers. The use of liquid fire extinguishing agents may cause electric shock.

2. Product Description

The On-Line-Series is an uninterruptible power supply incorporating double-converter technology. It provides perfect protection specifically for strict load.

The double-converter principle eliminates all mains power disturbances. A rectifier converts the alternating current from the socket outlet to direct current. This direct current charges the batteries and powers the inverter. On the basis of this DC voltage, the inverter generates a sine wave AC power, which permanently supplies the loads.

Designed with the proven on-line, double conversion architecture, this series of UPS offers the greatest degree of availability in power protection and provides continuous, high-quality AC power to connect strict load, especially for the basic equipments in some areas as: finance, communication, government, traffic, manufacture, education and so on.

2.1 System Type and Configuration

There are two types of UPS according to the battery configuration: standard type and long backup time type, each available in the following ratings: 1kVA, 2kVA and 3kVA UPS.

Table 2-1 UPS types and configurations

Type		Model	Remark
Standard	1kVA UPS	NEOLINE 1000	With a 1A internal charger and 3 batteries
	2kVA UPS	NEOLINE 2000	With a 1A internal charger and 6 batteries
	3kVA UPS	NEOLINE 3000	With 1A internal a charger and 8 batteries
Long Backup Time	1kVAS UPS	NEOLINE 1000XL	With a 7A internal charger and external batteries
	2kVAS UPS	NEOLINE 2000XL	With a 8A internal charger and external batteries
	3kVAS UPS	NEOLINE 3000XL	With a 8A internal charger and external batteries

Note: "XL" model: Long Backup Time

2.2 The Appearance of the UPS

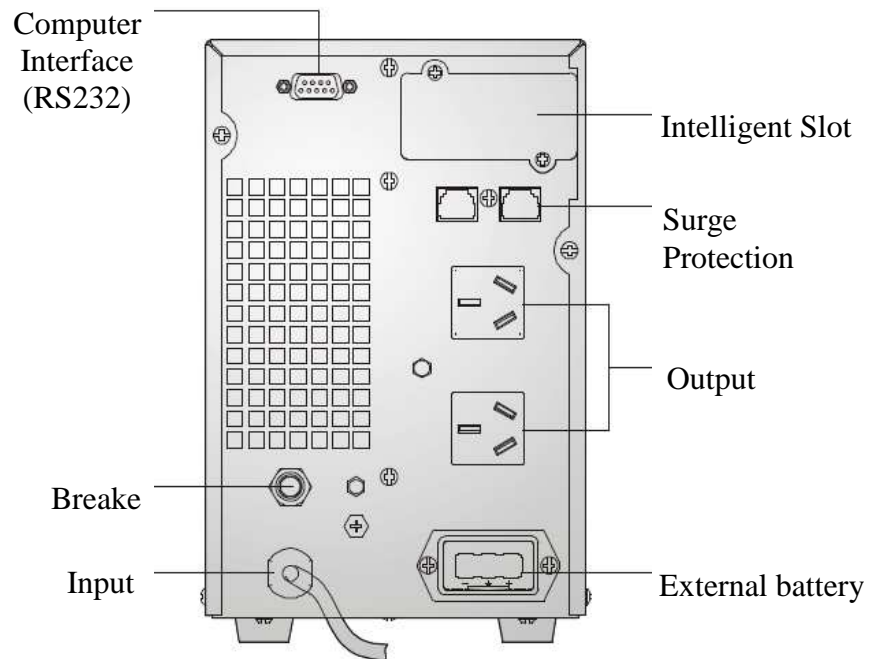


Figure 2-1 The Appearance of NEOLINE 1000XL UPS

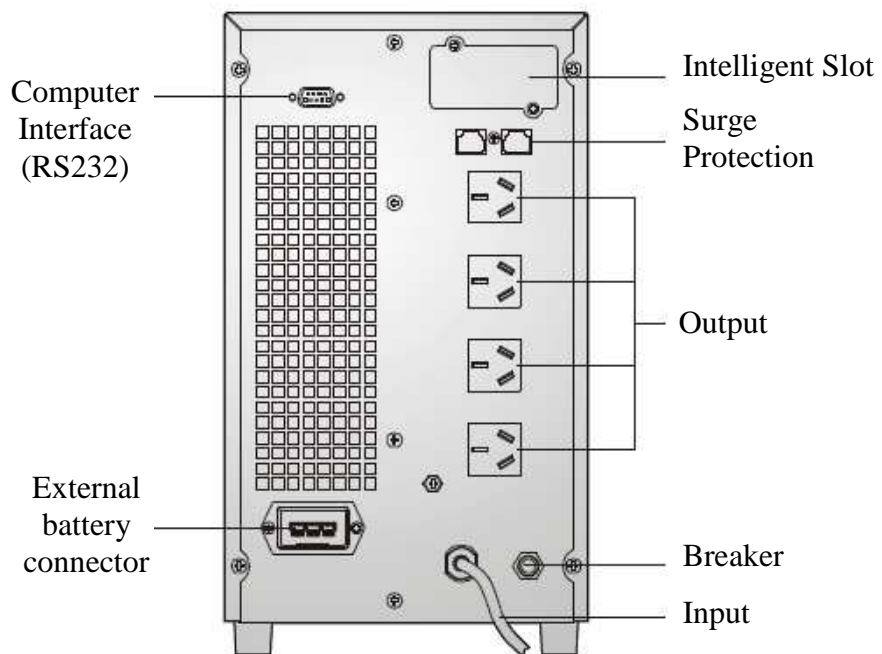


Figure 2-2 The Appearance of NEOLINE 2000XL UPS

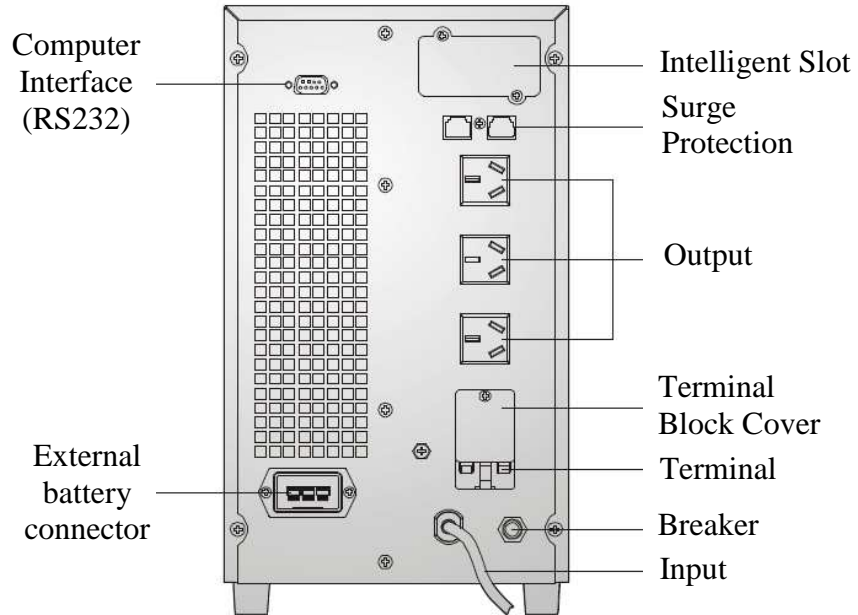


Figure 2-3 The Appearance of NEOLINE 3000XL UPS

2.3. Operating Principle

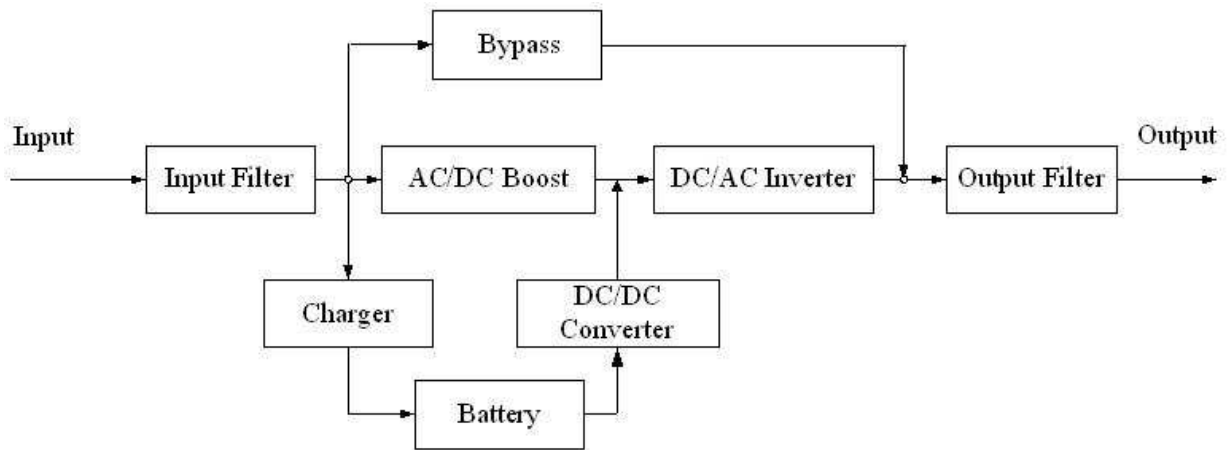


Figure 2-4 The UPS operating principle

1. Input filter: Perform a filter for input .It provides clean AC power to the UPS.
2. AC/DC Boost: In Normal mode, it converts the AC input power to regulated DC power.
3. DC/DC converter: Raises the DC Voltage from the battery system to the optimum operating voltage for the inverter when the UPS operates in Battery mode.
4. DC/AC inverter: In Normal mode, it utilizes the DC output of the AC/DC inverter and inverts it into precise, regulated sine wave AC power. In Battery mode, it receives energy from the battery through the DC/DC converter.
5. Bypass: It is very important in the UPS system. In the event of an UPS fault that will not lead to UPS shutdown, the load will be automatically transferred to the bypass. Meanwhile, the LED or LCD indicators will indicate the fault type, and the fault information will be reported through the communication ports.
6. Charger: The charger of standard UPS provides 1A charging current; that of 1kVA long backup time provide 7A charging current: and that of 2kVA and 3kVA long backup time provided 8A charging current.
7. Battery: sealed maintenance-free lead –acid battery can be used as the DC source of the UPS.
8. Output filter: Perform a filter for output .It provides clean AC power to the load.

3. Installation

3.1 Unpacking Inspection

1. Open the packing box of UPS and take them out, visually examine the units for transit damage.
2. Check against the accessory lists that the accessories of the UPS are present.
(Refer to Table 3-1)
3. If the UPS arrives damaged, or there is any missing accessory, please contact the distributor immediately.

Table 3-1 Accessory list of UPS

Model	Accessory	Quantity	Unit
standard	RS232 Communication Line	1	Pcs
	User manual	1	Pcs
	A Winpower software CD	1	Pcs
long backup time	RS232 Communication Line	1	Pcs
	User manual	1	Pcs
	A Winpower software CD	1	Pcs
	External Battery Cable	1	Pcs

3.2 Installation Notes

1. When locating the UPS, make sure there is no hazardous objects around the UPS, and that the installation environment meets the specifications.
2. The UPS should not be tilted. The air inlet port at the front panel and the fan outlet port on the rear panel should not be blocked so as to ensure good ventilation.
3. In case if the UPS is unpacked, installed and used at very low temperatures, condensations of water drops may appear. It is necessary to wait until the UPS fully dried inside out before proceeding to installation and use. Otherwise, they may be a risk of electric shock.
4. Place the UPS near the utility power source outlet which supplies power to the UPS. In any emergency, switch off the main input socket, cut off the battery voltage input. All power sockets must be connected with ground protection.

3.3 Cable Connections

3.3.1 Connecting Input and Output Cables

1. Input cable connection

If the UPS is connected via the power cable, please use a proper socket with protection against electric current, and pay attention to the capacity of the socket: over 10A for NEOLINE 1000(XL) and NEOLINE 2000(XL), over 16A for NEOLINE 3000(XL). The wiring configuration is shown in the following diagram.

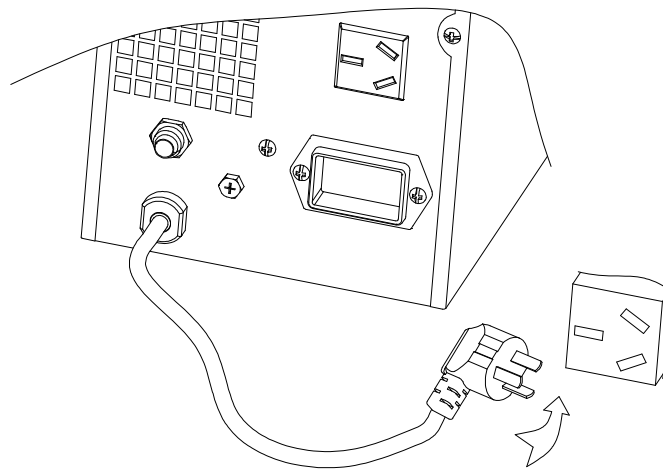


Figure 3-1 Connection Method of Input for NEOLINE 1000(XL)~3000(XL)

1. Output cable connection

Table 3-2 Output way of UPS

Rating	Model	Quantity of output socket	Output Terminal Block
1kVA	NEOLINE 1000(XL)	2	Nil
2kVA	NEOLINE 2000(XL)	4	Nil
3kVA	NEOLINE 3000(XL)	3	Available

The output of NEOLINE 1000(XL)/ NEOLINE 2000(XL)/ NEOLINE 3000(XL) all available to uses sockets.the total output power shall not exceed 1kVA/0.8kW,2kVA/1.6kW , 3kVA/2.4kW. Simply plug the load power cable to the output sockets of UPS to complete connection as shown in the following diagram

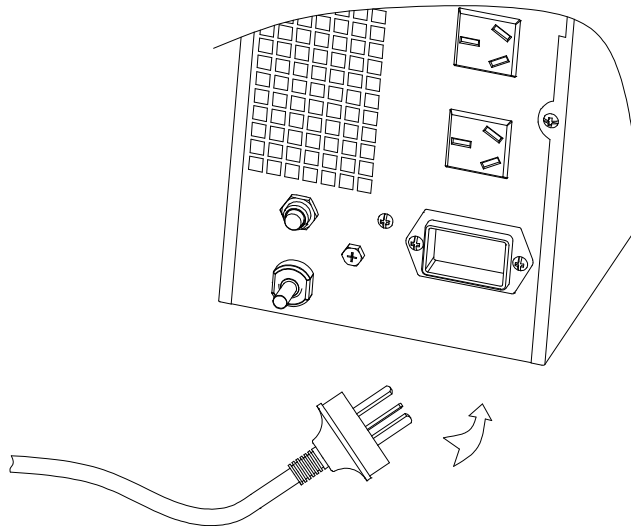


Figure 3-2 Connection method of output for NEOLINE 1000(XL) ~ NEOLINE 3000(XL)

Apart from using the socket for output, NEOLINE 3000(XL) has the terminal block available for output as well. The wiring configuration is shown in the following diagram.

- 1) Remove the small cover of the terminal block;
- 2) Use AWG14 (2.1mm^2) wires for wiring configuration;
- 3) Upon completion of the wiring configuration, please check whether the wires are securely affixed;
- 4) Put back the small cover to the rear panel.

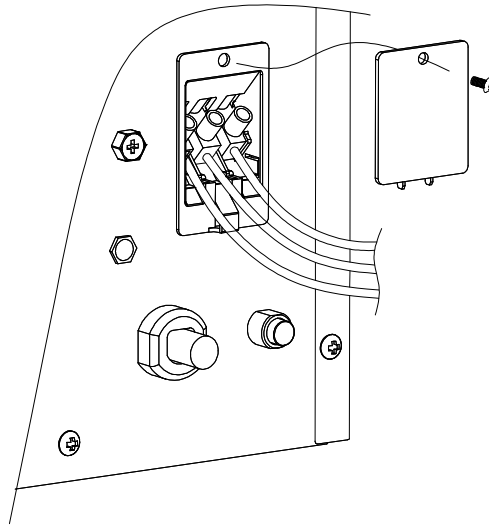


Figure 3-3 Connection method of terminal block for NEOLINE 3000(XL)

Caution: Do not connect the loads with terminal block by the personal without qualified training.

3.3.2 Operation Procedure of External Battery for Long Backup Time UPS

The battery connection procedure is very important. Any incompliance may result in the risk of electric shock. Therefore, the following steps must be strictly complied with.

1. First connect in series the batteries of the pack to ensure proper battery voltage.
(Refer to Table 3-3)
2. Take out the battery cable delivered with the UPS, one end of the external battery cable is a plug for connecting the UPS, the other end has 3 open wires for connecting the battery pack.
3. Connect the external battery cable to the battery terminal (DO NOT connect the battery socket of the UPS first. Otherwise, it may cause electric shock). Connect the red wire to the: “+” terminal of the battery. The black wire is connected to the “-” terminal of the battery. The green/yellow wire is grounded for protection purpose.

4. Connect the plug of the external battery cable to the external battery socket on the rear panel of the UPS to complete the connection procedure and the UPS starts to charge the battery pack.

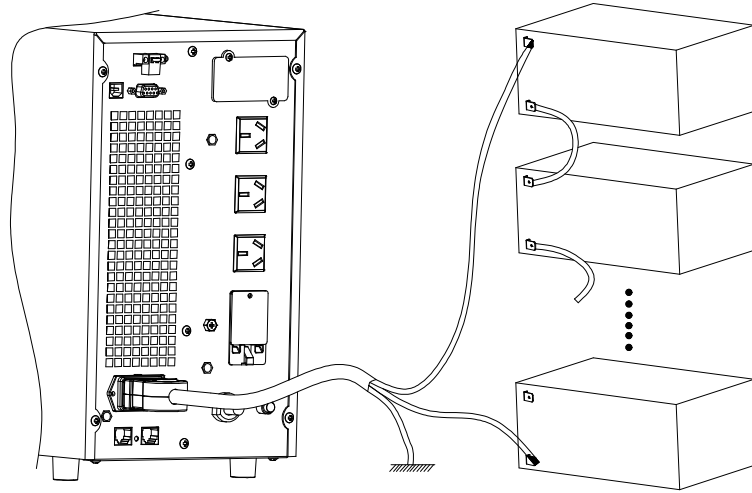
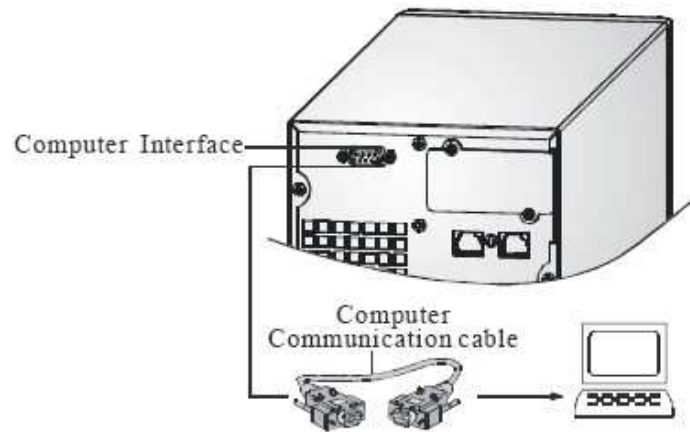


Figure 3-4 Battery connection diagram for Long Backup time models

Note: The length of the external battery cable is 2m, If users need a longer one, please consult the distributor. There is a limit to the length of the external battery cable to ensure normal operation of the UPS.

3.3.3 Connecting Communication interface

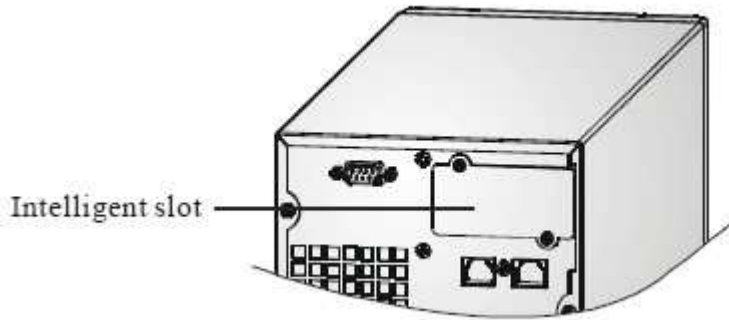
1. Computer interface



Computer interface:

The type of signals, serial command (RS232), is provided by the UPS to communicate with a host computer. User can use WinPower software to monitor the UPS through the RS232 communication port.

2. Alternative connection of communication



Intelligent Slot—

The intelligent slot is designed for installing the AS400 card, SNMP card and CMS card. You can choose for one of them to install.

a—AS400: You can utilize AS400's monitor function to manage the power supply directly.

b—SNMP: It enables you monitor the UPS remotely through Internet

c—CMS:Central monitor card

Note: 1. Remove the cover board of the intelligent slot before any card is installed

2. Refer to some other relative documents for the use of the Winpower software and the AS400 and SNMP and CMC cards, If you have any question about the above communication ports, please contact customer service center.

3. There are two type of card for intelligent slot: short card and long card, theUPS this manual described match for the short card.

3. Surge-protection connection

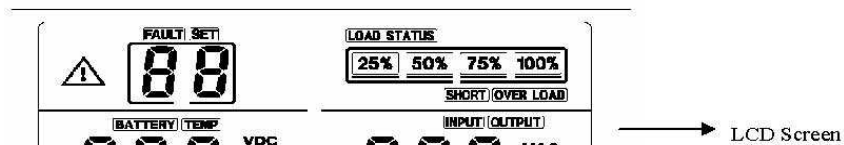


a—Output: Connects the equipment to be protected.

b—Input: Connects the telephone line or network

4. Operation

4.1 Introduction of Display Panel



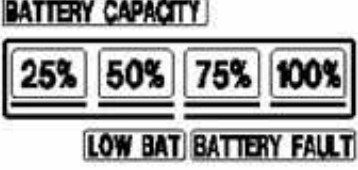
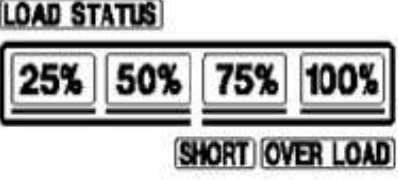

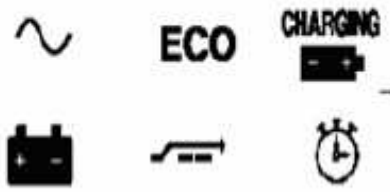


Display	Function
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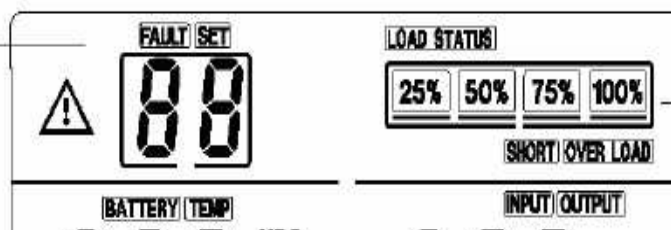
Display Panel

The following table describes the function of the button switches of the front panel.

Button	Function
ON/OFF-Button	This button has two functions: -Turning on the UPS system: By pressing this button the UPS system turns on. -Shut off the UPS system: When mains power is normal, the UPS System switches to Bypass mode by pressing OFF button , and the inverter is off.
Select Button	if the ups system is in bypass mode or self-test mode, the output , frequency could be selected by pressing Select button, and confirmed by pressing Enter button.
Enter Button	if the ups system is in bypass mode or self-test mode, the output , frequency could be selected by pressing Select button, and confirmed by pressing Enter button.

	<p>FAULT lighting indicates mode code, fault code and warning code, which could be displayed from 0 to99 ,SET lighting indicates the set code, type V (set voltage), F (set frequency)</p>
	<p>BATTERY lighting indicates the battery voltage value, which could be displayed from 0 to 999Vdc; TEMP lighting indicates the ups inside temperature, which could be displayed from 0 to 999°C(The two items alternate displayed once every three seconds.)</p>
	<p>indicates the battery capacity. For example: 25% and 50% lighting synchronous, it means current battery capacity is 50%. LOW BAT lighting indicates the battery is weak, and the UPS should shut down soon,BATTERY FAULT lighting indicates</p>
	<p>indicates the present load value. For example: 25% and 50% lighting synchronous, it means current load is 50%. When load 100% lighting and the OVER LOAD lighting with warning, it means ups in overload</p>
	<p>Indicates ups input voltage value, output voltage value, output frequency value, which could be displayed from 0 to 999VAC (The four items alternate displayed once every three seconds.) 208, 220 ,230,240VAC The four value of the output voltage could be selected, 50/60HZ the two frequency value of the output voltage could be selected.</p>
	<p>indicates have mains power and when mode code display 02 that mean the ups working in Line mode. ECO lighting indicates ups working in ECO Mode. lighting indicates ups charging, lighting and mode code display 03 that mean the ups working in battery mode. and lighting coinstantaneous and mode code display 03 that means UPS working in Bypass mode. and LOW BAT lighting coinstantaneous and UPS with warning that means Battery low voltage, the ups will would shut down soon. .</p>

Mode/Fault/Warni-
ng code Set type



Load Information

Input/output

LCD display

4.2 Operation Mode

4.2.1 Line mode

The LCD display in line mode is shown in the following diagram. The information about the utility power, the battery, the temperature and load could be displayed, The operating mode code of the UPS is "03"

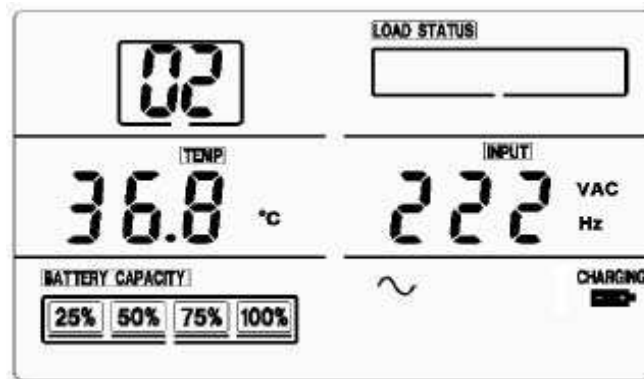
If the UPS becomes overloaded, the percentage of the load will be shown and the audible alarm will beep twice per second. In this case, the UPS load has to be decreased to less than 90% of its rated power capacity.



Line mode

4.2.2 Bypass mode

The LCD display in bypass mode is shown in the following diagram. The information about the utility power, the battery, the UPS temperature and could be displayed. The operating mode code of the UPS is "02". The UPS will beep once every 2 minutes in bypass mode.

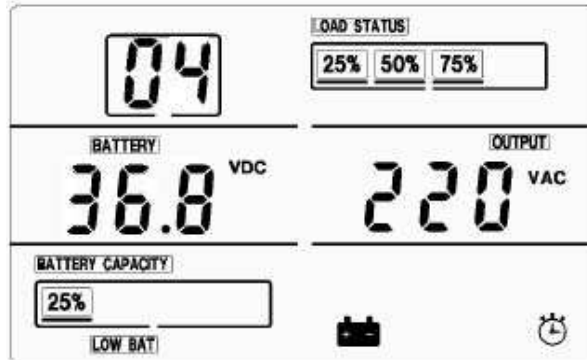


Bypass mode

4.2.3 Battery mode

The LCD display in battery mode is shown in the following diagram. The information about the utility power, the battery, the temperature and load could be displayed. The operating mode code of the UPS is "04".

When the UPS is running in battery mode, the buzzer beeps once every 4 seconds.



Battery mode

4.3. Operating Instructions

4.3.1 Turning On and Completely Powering Down the UPS

Note: The battery is fully charged before delivery. However, storage and transportation will inevitably cause some charge loss. Therefore, it is advisable to charge the battery for 10 hours before using it, so as to ensure adequate battery autonomy.

1. Turning on the UPS

The operation of turning on the UPS contains: turning on with utility power and turning on without utility power.

- 1) Turning on with utility power:

Connect the mains input to the UPS, press and hold the ON/OFF button for 1 second until the buzzer beeps. At this point, the UPS begins to conduct self-diagnosis, with the load/battery capacity indicators on the front panel turned on and then off one after another. Seconds later, the UPS will begin to operate in Normal mode; meanwhile, the utility power indicator, inverter indicators will turn on. If the utility power is abnormal, the UPS will work in battery mode.

2) Turning on without utility power:

With no mains input fed to the UPS, hold and press the ON/OFF button for 1 second until the buzzer beeps. In the power on process, the UPS has the same operation as if it is connected to utility power except that the utility power indicator is not turned on and the battery indicator is turn instead.

2. Powering down the UPS

The operation of powering down the UPS is shown as follow:

1) Completely power down the UPS from Normal mode

Hold and press the ON/OFF button persistently for more than 1 second to power off the UPS. If it is set up to work in bypass mode by WinPower software and the bypass indicator will be turn on to indicate that the UPS is working in bypass mode. In order to cut off the output from the UPS, simply cut off the utility power supply. Finally, not any display is shown on the front panel and no output is available from the UPS outlets.

2) Completely power down the UPS from Battery mode

Press the "ON/OFF" button persistently for more than 1 second to power off the UPS. When being powered off, the UPS will start self-diagnosis and all the load/battery capacity indicators will be turn on and off one after another. Finally, not any display is shown on the front panel and no voltage output is available from the UPS outlets.

4.3.2 Conducting Battery self-diagnosis

In UPS operation, users can manually initiate battery self-diagnosis to check the battery conditions. There are two methods to initiate the battery self-diagnosis:

1. Through the function button

In normal mode, press and hold the function for more than 2 seconds until the buzzer beeps. At this point the indicators will blink cyclically, indicating the UPS has worked in battery mode and the battery self-diagnosis has started. The battery self-diagnosis will last for 10 seconds default (Users can set up it through WinPower software). In the event of a battery fault during battery self-diagnosis, the UPS will transfer to normal mode automatically.

2. Through the background monitoring software

Users can also initiate battery self-diagnosis through the background monitoring software.

4.3.3 Error code and warning code

Error code	Description	Warning code	Description
1	Communication error	11	EPO state
2	short circuit	12	Battery overvoltage
3	Overload	13	Fan alarm

5. Maintenance

5.1 Battery Maintenance

The battery is key component of the UPS. The battery life depends on the ambient temperature, charge and discharge times. High ambient temperature and deep discharge will shorten the battery life.

1. Sealed maintenance-free lead –acid battery be used in the standard. When being connected to the utility whether the UPS has been turned on or not, the UPS keeps charging the battery and also offers the protective function of charging and discharging.
2. Keep the ambient temperature between 15°C and 25°C
3. If the UPS has not been used for a long period, charging is recommended at the intervals 3 months.
4. Normally, the battery should be charged and discharged every 4 to 6 months. Charging should be begin after the UPS shut down automatically in the course of discharging. In the regions of hot climates, the battery should be charged and discharged every 2 months. Moreover, the standard charging time should be not less than 12 hours.
5. Batteries should not be replaced individually. All batteries should be replaced at the same time following the instruction of the battery supplier.
6. Under normal conditions, the battery life lasts 2 to 3 years. In case if the battery is found not in good condition, earlier replacement should be made. The battery should only be replaced by qualified service personnel.

Note:

1. *Prior to battery replacement, the UPS must be turned off and disconnected from utility power.*
2. *Metal objects such as rings and watches should be removed.*
3. *Use the screwdriver with insulated handle. Tools and other metal objects should not be placed on the battery.*
4. *Short circuit or reverse connection between the positive and negative terminal of the battery is strictly forbidden.*

5.2 Checking UPS function

Every time when conducting field maintenance, please check the regular function of the UPS, including:

1. **Check the operation status of the UPS**

If the main voltage is within the specifications, the UPS should operate in normal mode; if the main voltage is abnormal, the UPS should operate in battery mode. In both cases, there should be no fault indication.

2. Check the transfer between the UPS operation modes

Disconnect the main input to simulate a mains failure, the UPS should transfer to battery mode and operate normally; then recover the mains input, the UPS should transfer to normal mode and operate normally.

6. Troubleshooting

In the event of an UPS fault, shoot the trouble according to Table... If the fault still persists, please contact the customer service center.

Table 6-1 UPS troubleshooting table

Problem	Possible cause	solution
Display Fault 4 Buzzer long	Internal overheat	Ensure that the UPS is not overloaded and the ventilation opening is not blocked and ambient temperature is not too high. Wait for 10 minutes for the UPS to cool down before turning it again. If it does not work. please contact the distributor or service center
Display Fault 2 Buzzer long	UPS short circuit	Turn off the UPS, Remove all loads. Ensure that loads are not failed or has no internal short before turn on it again. If failed ,Please contact the distributor or service center
Display Fault 3 Buzzer long	The UPS is overloaded	Check the load status and remove the non-critical device
Display Fault 14 Buzzer long	Over-charging Protection	The charger of the UPS is defective. Please contact the distributor or Service center
Display Fault 8 Buzzer long	Internal fault	Please contact the distributor or Service center
Display Fault 13 Buzzer long	Fan of UPS is not connected or fault	Please contact the distributor or Service center
Display Fault 1 Buzzer long	Internal fault	Please contact the distributor or Service center
The UPS cannot power on after pressing the power on key	The "ON/OFF" button is pressed to briefly	Press the "ON/OFF" button persistently for more than 1 second
	The UPS is not connect to battery or the battery voltage is too low	Check the connection of the battery. Turn on the UPS without load if the battery voltage is low
	Internal fault	Please contact the distributor or Service center
The battery discharge time diminishes	The battery has not been fully charged	Keep the UPS connected to utility power persistently for more than 10 hours to charge the battery again
	The UPS overloaded	Check the load status and remove the non-critical device
	Battery aged	Replace the batteries. Please contact the distributor to obtain the replacement components for battery

7. Specifications

7.1 Electrical

Model		NEOLINE 1000	NEOLINE 1000XL	NEOLINE 2000	NEOLINE 2000XL	NEOLINE 3000	NEOLINE 3000XL	
Rating		1kVA/800W		2kVA/1600W		3kVA/2400W		
Input	Input system	Single phase & earth ground						
	Rated voltage	220VAC						
	Voltage range	115VAC~300VAC						
	Frequency	50Hz						
	Power factor	0.99						
	Voltage range of bypass	80VAC* (1±5%) ~ 285VAC* (1±5%)						
Output	Output system	Single phase & earth ground						
	Rated voltage	220VAC						
	Power factor	0.8						
	Voltage precision	±2%						
	Output frequency	Normal mode	1.The output frequency synchronizes with the input frequency when the input frequency is in the range of 46 Hz~54 Hz 2.The output frequency is 50Hz when the input frequency is not in the range of 46 Hz~54 Hz					
		Battery mode	50 ± 0.2 Hz					
	Inverter overload capacity (Utility power, 25°C)	108%±5%<Load≤150%±5% 47s~25s 150%±5%< Load <200%±5% 25s~300ms Load ≥200%±5% 300ms						
	Transfer time	0ms (Normal mode⇒Battery mode)						
<4ms (Normal mode⇒Bypass mode)								
Crest factor	3:1 (max)							
Battery	Batteries voltage	36VDC		72VDC		96VDC		
	Battery capacity*Quantity	12VDC*3		12VDC*6		12VDC*8		
	Backup Time (25°C)	Full load ≥4min (Standard)						
	Battery charge time	Charger to 90% battery capacity in 5 hours (Standard) Dependent on the capacity of external batteries (Long backup time)						

7.2 Mechanical

Model	W*H*D(mm)	Weight(kg)
NEOLINE 1000	145×220×355	12 kg
NEOLINE 1000XL	145×220×355	6.5 kg
NEOLINE 2000	190×318×383	23 kg

NEOLINE 2000XL	190×318×383	10.5 kg
NEOLINE 3000	190×318×433	28 kg
NEOLINE 3000XL	190×318×433	11.5 kg

7.3 Environmental

Item	Normal range
Ambient temperature	0°C~40°C
Environment humidity	<95%
Altitude	Lower than 1000m
Storage temperature	-15°C~45 °C

7.4 EMC

Item	Standard	Level
ESD	IEC61000-4-2 LEVEL4	LEVEL4
RS	IEC61000-4-3 LEVEL3	LEVEL3
EFT	IEC61000-4-4 LEVEL4	LEVEL4
Surge	IEC61000-4-5 LEVEL4	LEVEL4

7.5 Safety

Comply with GB4943-2001, IEC62040-1 and CE requirements.

8. Warranty

- To obtain service under warranty via an valid guarantee offered by dealers;
- To obtain service under warranty via serial number.

This limited warranty does not apply to conditions as follows:

- Man-made fault; Out of warranty;
- The finished product of which the serial number is changed or lost;
- Damage or loss resulted from force majeure or external causes;
- Disassembly or modifications to the unit with no authorization;
- Disobeying provisions of operating/using the unit;
- Battery over discharged or man-made damage.

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