



# USER MANUAL

PowerMust 1080 LCD (1KVA), Online, IEC  
PowerMust 2016 LCD (2KVA), Online, IEC  
PowerMust 3024 LCD (3KVA), Online, IEC

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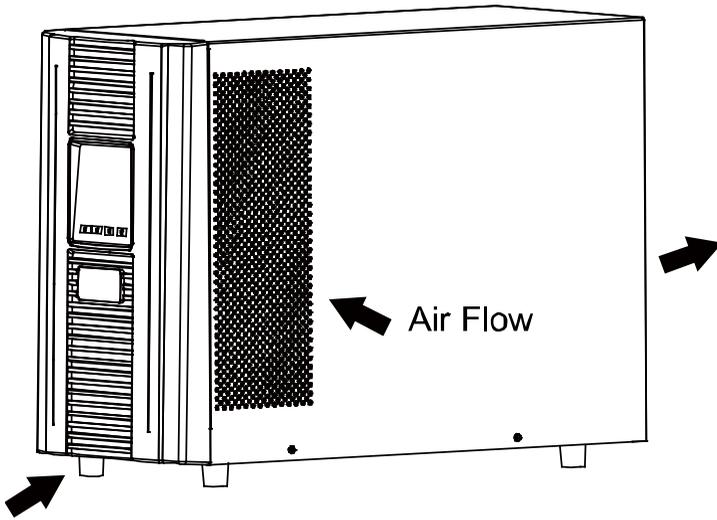
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# 1. Safety and EMC Instructions

**Please read carefully the following user manual and the safety instructions before installing the unit or using the unit!**

## 1.1 Installation

- ★ See installation instructions before connecting to the supply.
- ★ Condensation may occur if the UPS is moved directly from a cold to a warm environment. The UPS must be absolutely dry before being installed. Please allow an acclimatization time of at least two hours.
- ★ Do not install the UPS near water or in damp environment.
- ★ Do not install the UPS where it would be exposed to direct sunlight or near heat.
- ★ Do not connect appliances or items of equipment which would overload the UPS (e.g. laser printers, etc) to the UPS output.
- ★ Place cables in such a way that no one can step on or trip over them.
- ★ Assure to connect with the earth reliably.
- ★ Assure external battery source must be earthed.
- ★ Connect the UPS only to an earthed shockproof socket outlet.
- ★ The building wiring socket outlet (shockproof socket outlet) must be easily accessible to close to the UPS.
- ★ With the installation of the equipment, the sum of the leakage current of the UPS and the connected load does not exceed 3.5mA.
- ★ Do not block ventilation openings in the UPS's housing. Ensure the air vents on the front, side and rear of the UPS are not blocked. Allow at least 25cm of space on each side.



- ★ UPS has provided earthed terminal, in the final installed system configuration, equipotential earth bonding to the external UPS battery cabinets.
- ★ An appropriate disconnect device as short-circuit backup protection should be provided in the building wiring installation. Please see the disconnect device specification in chapter 5.2.
- ★ Equipment the powered more than one source.

## 1.2 Operation

- ★ Do not disconnect the mains cable on the UPS or the building wiring socket (grounded shockproof socket) during operation as this would remove the ground to the UPS and of all connected loads.
- ★ The UPS features its own, internal current source (batteries). You may be electric shock when you touch the UPS output sockets or output terminal block even if the UPS is not connected to the building wiring socket.
- ★ In order to fully disconnect the UPS, first press the OFF button to turn off the UPS, then disconnect the mains lead.

- ★ Ensure that no liquid or other foreign objects can enter the UPS.
- ★ Do not remove the enclosure. This system is to be serviced by qualified service personnel only.
- ★ Remove the protective panel only after disconnecting the terminal connections.
- ★ Use No. 12 AWG (for 3KS input wire) , 90°C copper wire and 4.4 lb-in Torque force when connecting to terminal block.
- ★ Use No. 10AWG (for 3KS output wire), 90°C copper wire and 12 lb-in Torque force when connecting to terminal block.

### **1.3 Maintenance, servicing and faults**

- ★ The UPS operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.
- ★ Caution - risk of electric shock. Even after the unit is disconnected from the mains power supply (building wiring socket), components inside the UPS are still connected to the battery which are potentially dangerous.
- ★ Before carrying out any kind of service and/or maintenance, disconnect the batteries. Verify that no current is present and no hazardous voltage exists in the capacitor or BUS capacitor terminals.
- ★ Batteries must be replaced only by qualified personnel.
- ★ Caution - risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Verify that no voltage is present before servicing!
- ★ Batteries have a high short-circuit current and pose a risk of shock. Take all precautionary measures specified below and any other measures necessary when working with batteries:
  - remove all jewellery, wristwatches, rings and other metal objects

- use only tools with insulated grips and handles.
- ★ When changing batteries, replace with the same quantity and the same type of batteries.
- ★ Do not attempt to dispose of batteries by burning them. It could cause explosion.
- ★ Do not open or destroy batteries. Effluent electrolyte can cause injury to the skin and eyes. It may be toxic.
- ★ Please replace the fuse only by a fuse of the same type and of the same amperage in order to avoid fire hazards.
- ★ Do not dismantle the UPS, except the qualified maintenance personnel.

## **1.4 Transport**

- ★ Please transport the UPS only in the original packaging (to protect against shock and impact).

## **1.5 Storage**

- ★ The UPS must be stockpiled in the room where it is ventilated and dry.

## 1.6 Standards

<b>* Safety</b>	
IEC/EN 62040-1	
<b>* EMI</b>	
Conducted Emission.....:IEC/EN 62040-2	Category C1
Radiated Emission.....:IEC/EN 62040-2	Category C1
Harmonic Current.....:IEC/EN 61000-3-2	
Voltage Fluctuation and Flicker.....:IEC/EN 61000-3-3	
<b>*EMS</b>	
ESD.....:IEC/EN 61000-4-2	Level 4
RS.....:IEC/EN 61000-4-3	Level 3
EFT.....:IEC/EN 61000-4-4	Level 4
SURGE.....:IEC/EN 61000-4-5	Level 4
CS.....:IEC/EN 61000-4-6	Level 3
MS.....: IEC/EN 61000-4-8	Level 3
Voltaje Dips.....: IEC/EN 61000-4-11	
Low Frequency Signals.....:IEC/EN 61000-2-2	

## 2. Description of Commonly Used Symbols

Some or all of the following symbols may be used in this manual. It is advisable to familiarize yourself with them and understand their meaning:

Symbol and Explanation			
Symbol	Explanation	Symbol	Explanation
	Alert you to pay special attention		Protective ground
	Caution of high voltage		Alarm silence
	Turn on the UPS		Overload indication
	Turn off the UPS		Battery
	Idle or shut down the UPS		Recycle
	Alternating current source (AC)		Do not dispose with ordinary trash
	Direct current source (DC)		

### 3. Introduction

This On-Line-Series is an uninterruptible power supply incorporating double-converter technology. It provides perfect protection specifically for Novell, Windows NT and UNIX servers.

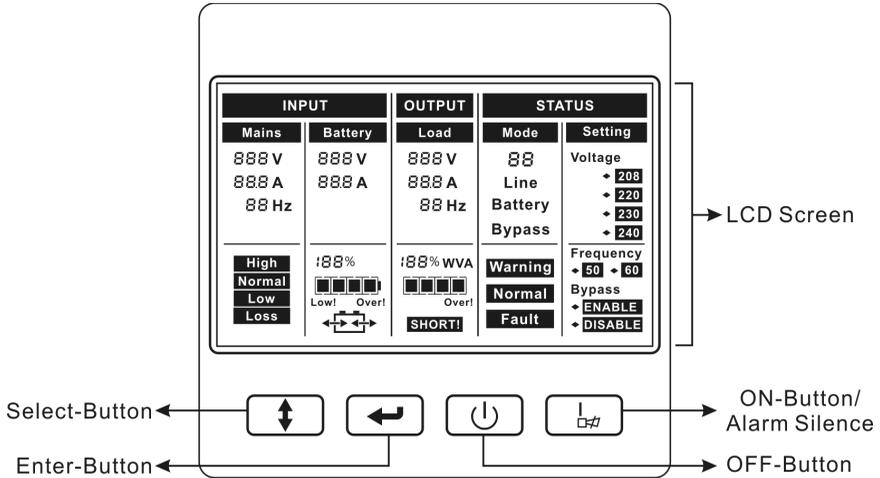
The double-converter principle eliminates all mains power disturbances. A rectifier converts the alternating current from the socket outlet to direct current. This direct current charges the batteries and powers the inverter. On the basis of this DC voltage, the inverter generates a sinusoidal AC voltage,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

Computers and periphery are thus powered entirely by the mains voltage. In the event of power failure, the maintenance-free batteries power the inverter.

This manual covers the UPS listed as follows. Please confirm whether it is the model you intend to purchase by performing a visual inspection of the Model No. on the rear panel of the UPS.

<b>Model No.</b>	<b>Type</b>
PowerMust 1080 LCD	Standard
PowerMust 2016 LCD	
PowerMust 3024 LCD	

# 4. Panel Description



**The Display Panel**

Switch	Function
<b>ON-Button</b>	<p>Turn on UPS system: By pressing the ON-Button “I” the UPS system is turned on.</p> <p>Deactivate acoustic alarm: By pressing this Button an acoustic alarm can be deactivated in the battery mode.</p> <p>Do the battery test: By pressing this Button the UPS can do the battery test in the Line mode or ECO mode or Converter mode.</p>
<b>OFF-Button</b>	<p>When mains power is normal, the UPS system switches to No output or Bypass mode by pressing OFF-Button “⏻”, and the inverter is off. At this moment, if Bypass is enabled, then the output sockets are supplied with voltage via the bypass if the mains power is available.</p> <p>Deactivate acoustic alarm: By pressing this Button an acoustic alarm can be deactivated in the bypass mode.</p>
<b>Select-Button</b>	<p>If the UPS system is No output or Bypass mode, the output voltage and frequency and Bypass disable/enable and operating mode could be selected by pressing Select-Button, and confirmed by pressing Enter-Button.</p>
<b>Enter-Button</b>	



<b>Loss</b>	Indicates the input Line voltage is lost and the UPS would be in the battery mode
<b>Output Information</b>	
<b>888 V</b>	Indicates the UPS output voltage value, which could be displayed from 0 to 999Vac
<b>88 Hz</b>	Indicates the frequency value of the UPS output voltage, which could be displayed from 0 to 99Hz
<b>88.8 A (1)</b>	Indicates the UPS output current value, which could be displayed from 0 to 99.9A
<b>Load Information</b>	
<b>SHORT!</b>	Indicates the load or the UPS output is short and the UPS would be fault
<b>Over!</b>	Indicates the load is over the SPEC range
	Indicates the load percent, and the left first grid represent not more than 25% load, the left two grids represent not more than 50% load, the three grids represent not more than 75% load, all the grids represent more than 75% load
<b>188% WVA</b>	Indicates the load percent, 'W' is displayed when the watt of load is maximum or 'VA' is displayed when the VA of load is maximum
<b>Battery Information</b>	
<b>888 V</b>	Indicates the battery voltage value, which could be displayed from 0 to 999Vdc
<b>88.8 A</b>	Indicates the battery current value, which could be displayed from 0 to 99.9A
<b>188%</b> 	Indicates the battery capacitance percent, and every grid represent 25% capacitance. All the grids represent 100% capacitance.
<b>Over!</b>	Indicates the battery is over charged, and the UPS would be switched to Battery mode
<b>Low!</b>	Indicates the battery is weak, and the UPS would shut down soon

	Indicates the battery is charging
	Indicates the battery is discharging
<b>UPS status Information</b>	
	Indicates UPS operating status including the operating mode, or some warnings or faults in the UPS, and the codes are illuminated in detail in the following chapter
<b>Bypass</b>	Indicates the UPS is working in bypass mode, the load is directly supplied by the input power through bypass
<b>Line</b>	Indicates the UPS is working in line mode
<b>Battery</b>	Indicates the UPS is working in battery mode
<b>Fault</b>	Indicates the UPS is working in fault mode
<b>Warning</b>	Indicates some warnings occur which need be attention
<b>Normal</b>	Indicates no any warnings or fault occur
<b>UPS setting Information</b>	
<ul style="list-style-type: none"> <li>◆ <b>208</b></li> <li>◆ <b>220</b></li> <li>◆ <b>230</b></li> <li>◆ <b>240</b></li> </ul>	The four value of the output voltage could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time. Derating 10% when the output voltage is adjusted to 208VAC
<b>Frequency</b> <ul style="list-style-type: none"> <li>◆ <b>50</b> ◆ <b>60</b></li> </ul>	The two frequency value of the output voltage could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time
<b>Bypass</b> <ul style="list-style-type: none"> <li>◆ <b>ENABLE</b></li> <li>◆ <b>DISABLE</b></li> </ul>	Bypass disable or enable could be selected when the UPS is in No output or Bypass mode, and only one of them could be active in the same time

(1) Here would become **UPS, ECO, CVF** instead when the user does operating mode of UPS setting.

“UPS” means the setting of normal inverter mode (Line mode).

“ECO” means the setting of economy mode.

“CVF” means the setting of converter mode.

The detail illustration of the three modes and the operation of the setting would be presented in the following section.

## 5. Connection and Operation

The system may be installed and wired only by qualified electricians in accordance with applicable safety regulations!

When installing the electrical wiring, please note the nominal amperage of your incoming feeder.

### 5.1 Inspection:

Inspect the packaging carton and its contents for damage. Please inform the transport agency immediately should you find signs of damage.

Please keep the packaging in a safe place for future use.

***Note: Please ensure that the incoming feeder is isolated and secured to prevent it from being switched back on again.***

### 5.2 Connection:

#### (1) UPS Input Connection

If the UPS is connected via the power cord, please use a proper socket with protection against electric current, and pay attention to the capacity of the socket: over 4.5 A for 1K, over 9.3 A for 2K, over 14.5A for 3K. If the UPS is connected via wires, it is recommended to select the 2.5mm<sup>2</sup> wire, and the “GND” terminal should be grounded first by using the green/yellow wire. The wiring is shown as the following.

The UPS System has an input breaker on the cabinet. But we still advise users to connect external breakers or protective components to the input. It is recommended to select the NFB (Non-Fuse Breaker) instead of the traditional combination kit including breaker and fuse.

When selecting the NFB, the user can refer to below table for detailed information when installation.

Model No.	UPS INPUT NFB	
	VOLTAGE	CURRENT
PowerMust 1080 LCD	300 VAC	10A
PowerMust 2016 LCD	300 VAC	20A
PowerMust 3024 LCD	300 VAC	32A

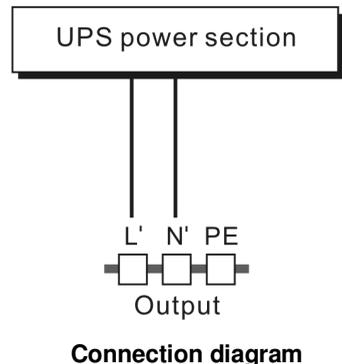
## (2) UPS Output Connection

The output of the UPS is German socket-types. Simply plug the load power cord to the output sockets to complete connection. Use one cord for every 5A load.

Model No.	Output Socket (pcs)
PowerMust 1080 LCD	2 German type
PowerMust 2016 LCD	3 German type + Terminal block
PowerMust 3024 LCD	3 German type + Terminal block

The wiring configuration is shown as the following procedure:

- Remove the small cover of the terminal block
- Use 2.5mm<sup>2</sup> wires for wiring configuration
- Upon completion of the wiring configuration, please check whether the wires are securely affixed
- Put the small cover back to the rear panel

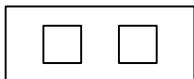


### Caution!

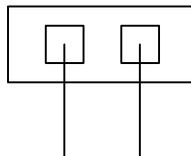
Do not connect equipment which would overload the UPS system (e.g. laser printers)

### (3) EPO Connection:

Normally the EPO connector is open on the rear panel. Once the connector is closed with a wire, the UPS would stop the output until the EPO status is disabled.



Disable the EPO status



Enable the EPO status

## 5.3 Battery charge:

Fully charge the batteries of the UPS system by leaving the UPS system connected to the mains for 1-2 hours. You may use the UPS system directly without charging it but the stored energy time may be shorter than the nominal value specified.

## 5.4 Turn on the UPS:

### (1) With utility power connecting:

Press “I” button continuously for more than 1 second to turn on the UPS, the UPS will get into the inverter mode, the LCD screen will indicate the state of the UPS.

### (2) Without utility power connecting:

If UPS is cold start without utility power connecting, user need to push “I” button twice, first pushing “I” button is for UPS to get power, and second pushing “I” button continuously for more than 1 second is for UPS to turns on, the UPS will get into the inverter mode. In fact, the two pushing “I” button is to make further sure user operation for turning on UPS, the LCD screen will indicate the state of the UPS.

***Note: The default setting for bypass mode is no output after UPS is connecting utility power and breaker is turned on. This can be configured by monitoring the LCD panel or firmware.***

## 5.5 Test function:

Test the function of the UPS system by pressing the On-Switch “I” for more than 1 second, the UPS would detect whether the battery is connected or the battery is low. And the UPS could also do the test automatically and periodically, the period time could be set by user.

## 5.6 Turn off the UPS:

### (1) In Inverter Mode:

Press ““ button continuously for more than 1 second to turn off the UPS, the UPS will get into no output or bypass mode. At this time, the UPS might has output if bypass is enabled. Disconnect the utility power to turn off the output.

### (2) In Battery Mode:

Press ““ button continuously for more than 1 second to turn off the UPS, the UPS will be turned off completely.

## 5.7 Audible alarm mute function:

If the alarm is too annoying in battery mode, you may press “I” button continuously for more than 1 second to clear it. Moreover, the alarm will be enabled when the battery is low to remind you to shutdown the load soon.

If the alarm is too annoying in bypass mode, you may press ““ button continuously for more than 1 second to clear it. The action doesn't affect the warning and fault alarm.

### **The Caution!**

A DC breaker must be connected between the UPS and external battery.

### **The Caution!**

The output sockets of the UPS system may still be electrically live even if the power supply system has been disconnected or the Bypass switch is on “OFF” position.

## 6. Operating Mode for All Models

The different codes could be displayed on the LCD screen corresponding to their own operating modes, and they are illustrated as the following table. At any time, only one normal operating mode or fault mode is presented. But the warning, even several warnings could appear in a certain normal operating mode at one time. And the normal operating mode code and the warning code would be shown circularly. Once one fault is come forth, then all previous warnings would not be shown again but only the fault code is presented.

<b>Normal operating mode</b>	<b>Code</b>
No output mode	0
Bypass mode	1
Line mode	2
Battery mode	3
Battery test mode	4
ECO mode	5
Converter mode	6

### 6.1 Line mode

The LCD display in Line mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed. The “Line” and “2” code indicate the UPS is working in Line mode.

INPUT		OUTPUT	STATUS	
<b>Mains</b>	<b>Battery</b>	<b>Load</b>	<b>Mode</b>	<b>Setting</b>
222 V 08.0 A 50 Hz	110 V	220 V 07.0 A 50 Hz	2 Line	Voltage 208 ← 220 230 240
<b>Normal</b>	90%  	73%w 	<b>Normal</b>	Frequency ← 50 60 Bypass ENABLE ← DISABLE

### ■ The Line mode

If output overloaded, the load percent is shown and alarm will keep twice every second. You should get rid of some unnecessary loads one by one to decrease the loads connected to the UPS less than 90% of its nominal power capacity.

Note: Please follow the following steps to connect the generator:

- Activate the generator and wait until the operation is stable before supplying power of the generator to the UPS (be sure that the UPS is in idle mode). Then turn on the UPS according to the start-up procedure. After the UPS is turned on, then the loads can be connected to the UPS one by one.
- The power capacity of the AC generator should be at least twice of the UPS capacity.

## 6.2 Battery mode

The LCD display in battery mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed. The “Battery” and “3” code indicate the UPS is working in the battery mode.

- 1) When the UPS is running in battery mode, the buzzer beeps once every 4 seconds. If the “ON” button on the front panel is pressed for more than 1 second again, the buzzer will stop beeping (in silence mode). Press the “ON” button once again for more than 1 second to resume the alarm function.
- 2) If the UPS is working in battery mode for the input line voltage is higher than the SPEC range, the alarm symbol - “High” will be shown; if the UPS is working in battery mode for the input line voltage is lower than the SPEC range, the alarm symbol - “Low” will be shown; if the input line voltage is lost, the alarm symbol - “Loss” would be shown.

INPUT		OUTPUT	STATUS	
Mains	Battery	Load	Mode	Setting
000V 000A 00 Hz	095V 08.4A	220V 050A 50 Hz	3  Battery	Voltage 208 ◀ 220 230 240
	70% █ █ █ █ █	37% VA █ █ █ █ █	<b>Normal</b>	Frequency ◀ 50 60 Bypass ENABLE ◀ DISABLE
<b>Loss</b>				

■ The Battery mode

### 6.3 Bypass mode

The LCD display in bypass mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed. The UPS will beep once every 2 minutes in bypass mode. The “Bypass” and “1” code indicate the UPS is working in the bypass mode.

INPUT		OUTPUT	STATUS	
Mains	Battery	Load	Mode	Setting
226 V 020 A 52 Hz	110 V	226 V 020 A 52 Hz	!	Voltage 208 220 ◀ 230 240
Normal	75% 	15% VA 	Bypass	Frequency ◀ 50 60 Bypass ◀ ENABLE DISABLE
			Normal	

### ■ The Bypass mode

The UPS does not have the backup function when it is in bypass mode. The power used by the load is supplied from the utility power via internal filter.

## 6.4 NO output mode

The LCD display in No output mode is shown in the following diagram. The information about the utility power, the battery, the UPS output and the load could be displayed. The “0” code indicates the UPS is working in the No output mode.

INPUT		OUTPUT	STATUS	
Mains	Battery	Load	Mode	Setting
226 V 000 A 53 Hz	110 V	000 V 000 A 00 Hz	0	Voltage 208 220 ◀ 230 240
Normal	100% 	00% W 	Normal	Frequency ◀ 50 60 Bypass ENABLE ◀ DISABLE
				

### ■ The No output mode

## 6.5 EPO (Emergency Power Off)

It is also called RPO (Remote Power Off). On LCD display, the mode code is “0”, the word of “EPO” are presented in the position of output voltage.

It is a special status in which the UPS would shut the output off and alarm. The UPS could not be turned off by pressing “OFF” button on the panel, only after releasing EPO status by turning off the EPO switch.

## 6.6 ECO mode (Economy mode)

It is also called high efficiency mode. In ECO mode, on LCD display, the mode code is “5”.

After the UPS is turned on, the power used by the load is supplied from the utility power via internal filter while the utility power is in normal range, so the high efficiency could be gained in the ECO mode. Once the mains is loss or abnormal, the UPS would transfer to battery mode and the load is supplied continuously by the battery.

- 1) It could be enabled through the LCD setting or the software (Winpower, etc.).
- 2) It is attention that the transfer time of UPS output from ECO mode to battery mode is less than 10ms. But it is still too long for some sensitive load.

## 6.7 Converter mode

In converter mode, on LCD display, the mode code is “6”.

The UPS would free run with fixed output frequency (50Hz or 60Hz) in converter mode. Once the mains is loss or abnormal, the UPS would transfer to battery mode and the load is supplied continuously by the battery.

- 1) It could be enabled through the LCD setting or the software (Winpower, etc.).
- 2) The load should be derating to 60% in converter mode.

## **6.8 Abnormal mode**

In abnormal mode such as Bus fault etc., the corresponding fault code would be shown to indicate the operating mode of the UPS. And some warning words could also be shown, for example “short!” would be shown when the load or the UPS output is short and the UPS is in inverter fault mode.

## 7. Setting by LCD Module

The output voltage and frequency, and bypass state, and ECO mode, and Converter mode could be set directly through LCD module. The output voltage could be set to 208V, 220V, 230V and 240V. The output frequency could be set to 50Hz and 60Hz. The operating mode of UPS could be set between the Line mode, ECO mode and Converter mode. The bypass state could be set to enable and disable. But all the settings could only be done when the UPS is in bypass or no output mode.

In bypass or no output mode, pressing the “Select” button on the LCD panel for more than one second, a flickering black dot would be shown before “208V” on the screen. And if pressing the “Select” button continuously again, the flickering black dot would move to “220V”, next to “230V”, “240V”, “50Hz”, “60Hz”, “Bypass Disable”, “Bypass Enable”, “UPS”, “ECO”, “CVF” in turn. (Here “UPS” means the normal inverter mode, and “UPS”, “ECO”, and “CVF” would be presented circularly at the position of output current) And if pressing the “Enter” button for more than one second at this time, the flickering black dot would turn to flickerless and the output voltage or frequency or bypass state or mode state setting would be modified to the selected value. And if no any pressing on the “Select” or “Enter” button lasting for more than 30 seconds, the flickering black dot would disappear.

The only one voltage value could be selected in “208V”, “220V”, “230V”, “240V” at any time. The only one frequency value could be selected in “50Hz”, “60Hz” at any time. And the output voltage and frequency would be changed to the corresponding value after the right values are selected on the LCD panel and the UPS is turn on by pressing the “ON” Button. The UPS would turn to bypass mode in several seconds after “Bypass Enable” is selected, and turn to no output mode in several seconds after “Bypass Disable” is selected. The mode change would be active only after the UPS is turned on.

- Here is an example for changing the output voltage from 220Vac to 230Vac through the LCD panel.

INPUT		OUTPUT	STATUS	
<b>Mains</b>	<b>Battery</b>	<b>Load</b>	<b>Mode</b>	<b>Setting</b>
226 V 020 A 52 Hz	110 V	226 V 020 A 52 Hz	;	Voltage ♦ 208 ♦ 220 230 240
<b>Normal</b>	75%  	15% VA 	<b>Bypass</b>	Frequency ♦ 50 60 <b>Bypass</b> ♦ <b>ENABLE</b> <b>DISABLE</b>
			<b>Normal</b>	

**Step 1:** One flickering black dot would appear before “208Vac” after pressing the “Select” button.

INPUT		OUTPUT	STATUS	
<b>Mains</b>	<b>Battery</b>	<b>Load</b>	<b>Mode</b>	<b>Setting</b>
226 V 020 A 52 Hz	110 V	226 V 020 A 52 Hz	;	Voltage 208 ♦ 220 ♦ 230 240
<b>Normal</b>	75%  	15% VA 	<b>Bypass</b>	Frequency ♦ 50 60 <b>Bypass</b> ♦ <b>ENABLE</b> <b>DISABLE</b>
			<b>Normal</b>	

**Step 2:** The flickering dot would move to “230Vac” after pressing the “Select” button two times again.

INPUT		OUTPUT	STATUS	
<b>Mains</b>	<b>Battery</b>	<b>Load</b>	<b>Mode</b>	<b>Setting</b>
226 V 020 A 52 Hz	110 V	226 V 020 A 52 Hz	;	Voltage 208 220 ◀ 230 240
Normal	75%  	15% VA 	Bypass	Frequency ◀ 50 60 Bypass ◀ ENABLE DISABLE
			Normal	

**Setup 3:** The dot before “230Vac” would turn to flickerless after pressing the “Enter” button.

INPUT		OUTPUT	STATUS	
<b>Mains</b>	<b>Battery</b>	<b>Load</b>	<b>Mode</b>	<b>Setting</b>
226 V 020 A 52 Hz	110 V	220 V 020 A 50 Hz	2 Line	Voltage 208 220 ◀ 230 240
Normal	75%  	14% VA 	Normal	Frequency ◀ 50 60 Bypass ◀ ENABLE DISABLE

**Setup 4:** The output voltage would be 230Vac after the UPS is turned on.

# 8. Trouble Shooting

If the UPS system does not operate correctly, check the operating status on the LCD display.

<b>Normal operating mode</b>	<b>Code</b>
No output mode	0
Bypass mode	1
Line mode	2
Battery mode	3
Battery test mode	4
ECO mode	5
Converter mode	6
<b>Warning</b>	<b>Code</b>
Site fail	09
Fan fail	10
Battery over voltage (over charged)	11
Battery low	12
Charge fail	13
DC-DC temperature high	21
Inverter temperature high	24
Ambient temperature high	25
Line voltage high (OVCD action)	26
Battery open	27
Overload	29

EPO	30
<b>Fault</b>	<b>Code</b>
Bus fault	05
Inverter fault	06
Overload fault	07
Over temperature fault	08
Inverter short	14
Bus short	28

If the UPS system does not operate correctly, please attempt to solve the problem using the table below.

<b><i>Problem</i></b>	<b><i>Possible cause</i></b>	<b><i>Remedy</i></b>
No indication, no warning tone even though system is connected to mains power supply	No input voltage	Check building wiring socket outlet and input cable.
BYPASS LED light up even though the power supply is available	Inverter not switched on	Press On-Switch "I".
BATTERY LED lights up, and audible alarm sounding every 1 beep in every 4 seconds	Mains power supply has failed, or Input power and/or frequency are out of tolerance	Switching to battery mode automatically. Check input power source and inform dealer if necessary.
Emergency supply period shorter than nominal value	Batteries not fully charged / batteries defect	Charge the batteries for at least 5 - 8 hours and then check capacity. If the problem still persists, consult your dealer.

Fan fail	Fan abnormal	Check if the fan is running
Battery over voltage	Battery is over charged	Switching to battery mode automatically, and after the battery voltage is normal and the mains is normal, the UPS would Switching to line mode automatically again.
Battery low	Battery voltage is low	When audible alarm sounding every second, battery is almost empty.
Charge fail	The charge is broken	Notify dealer.
DC-DC temperature high	Inside temperature of the UPS is too high	Check the ventilation of the UPS, check the ambient temperature.
Inverter temperature high	Inside temperature of the UPS is too high	Check the ventilation of the UPS, check the ambient temperature.
Ambient temperature high	The ambient temperature is too high	Check the environment ventilation.
Line voltage high (OVCD action)	Input power voltage is too high	Switching to battery mode automatically, and after the mains is normal, the UPS would Switching to line mode automatically again.
Battery open	Battery pack is not connected correctly	Do the battery test to confirm. Check the battery bank is connected to the UPS. Check the battery breaker is turn on.
Overload	Overload	Check the loads and remove some non-critical loads. Check whether some loads are failed.

Site fail	Phase and neutral conductor at input of UPS system are reversed	Rotate mains power socket by 180° or connect UPS system.
EPO active	EPO function is enabled	Turn off the EPO switch.
Bus fault	UPS internal fault	Notify dealer
Inverter fault	UPS internal fault	Notify dealer
Over temperature fault	Over temperature	Check the ventilation of the UPS, check the ambient temperature and ventilation.
Inverter short	Output short circuit	Remove all the loads. Turn off the UPS. Check whether the output of UPS and loads is short circuit. Make sure the short circuit is removed, and the UPS has no internal faults before turning on again.
Bus short	UPS internal fault	Notify dealer

Please have the following information at hand before calling the After-Sales Service Department:

1. Model number, serial number
2. Date on which the problem occurred
3. LCD/LED display status, Buzzer alarm status
4. Utility power condition, load type and capacity, environment temperature, ventilation condition
5. The information (battery capacity, quantity) of external battery pack if the UPS is “S” model
6. Other information for complete description of the problem

# 9. Maintenance

## 9.1 Operation

The UPS system contains no user-serviceable parts. If the battery service life (3~5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case please contact your dealer.

## 9.2 Storage

If the batteries are stored in temperate climatic zones, they should be charged every three months for 1~2 hours. You should shorten the charging intervals to two months at locations subject to high temperatures.

## 9.3 Battery Replace

If the battery service life has been exceeded, the batteries must be replaced.

Battery replacement should be performed only by qualified personnel. It recommends to shut off the UPS completely before the replacement. If there is a battery breaker then turn it off first. Disconnect the battery cable carefully and make sure no any exposed wires can be touched. Reconnect the new batteries to the UPS by following section 5.8. Then turn on the battery breaker and start the UPS.

Then turn on the battery breaker and press the ON switch to make the UPS do the battery test, check whether the battery information is normal.

# 10. Technical Data

## 10.1 Electrical specifications

INPUT			
Model No.	PowerMust 1080 LCD	PowerMust 2016 LCD	PowerMust 3024 LCD
Phase	Single		
Frequency	(45~55)/(54~66) Hz		
Current(A)	4.5A	9.3A	14.5A

OUTPUT			
Model No.	PowerMust 1080 LCD	PowerMust 2016 LCD	PowerMust 3024 LCD
Power rating	1kVA/0.8kW	2kVA/1.6kW	3kVA/2.4kW
Voltage	200/208/220/230/240× (1 ± 2%) VAC		
Frequency	50/60 (±0.2Hz) (Battery mode)		
Wave form	sinusoidal		

Derating to 90% when the output voltage is adjusted to 208VAC

Derating to 80% when the output voltage is adjusted to 200VAC

BATTERIES			
Model No.	PowerMust 1080 LCD	PowerMust 2016 LCD	PowerMust 3024 LCD
Number and type	3×12V 7Ah	8×12V 7Ah	8×12V 7Ah

## 10.2 Operating Environment

Ambient Temperature	0 °C to 45 °C
Operating humidity	< 95%
Altitude	< 1000m
Storage temperature	0 °C to 45 °C

### 10.3 Typical backup time (Typical values at 25°C in minutes:)

Model No.	100 % Load	50 % Load
PowerMust 1080 LCD	5	14
PowerMust 2016 LCD	9	21
PowerMust 3024 LCD	5	15

### 10.4 Dimensions and weights

Model No.	Dimensions W×D×H (mm)	Net Weight (kg)
PowerMust 1080 LCD	145×400×220	13
PowerMust 2016 LCD	192×460×347	31
PowerMust 3024 LCD	192×460×347	31

# 11. Communication Port

The communication port is for the monitoring software. A USB port and an intelligent slot are provided.

## 11.1 USB

The USB port is compliance with USB 1.1 protocol.

## 11.2 RS232 Interface(Option)

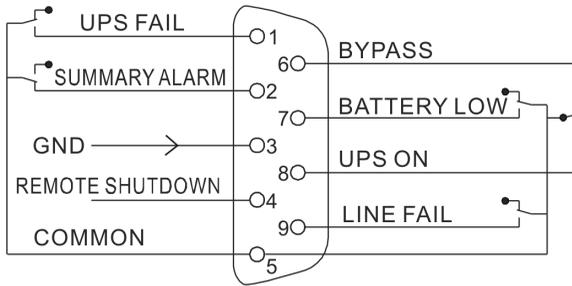
The following is the pin assignment and description of DB-9 connector.

Pin #	Description	I/O
2	TXD	Output
3	RXD	Input
5	GND	Input

## 11.3 AS400 Interface (Option)

Except for the communication protocol as mentioned above, this series UPS has AS400 card (an optional accessory) for AS400 communication protocol. Please contact your local distributor for details. The following is the pin assignment and description of DB-9 connector in AS400 card.

Pin #	Description	I/O	Pin #	Description	I/O
1	UPS Fail	Output	6	Bypass	Output
2	Summary Alarm	Output	7	Battery Low	Output
3	GND	Input	8	UPS ON	Output
4	Remote Shutdown	Input	9	Line Loss	Output
5	Common	Input			

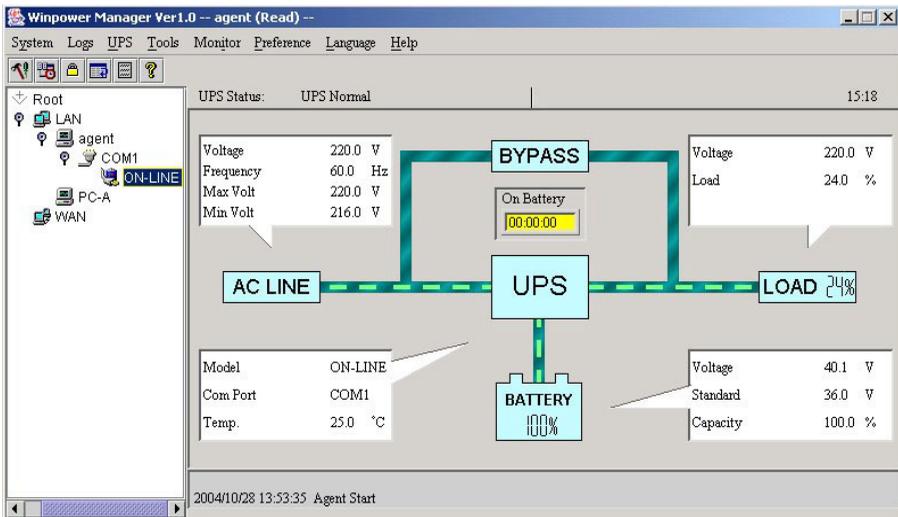


**DB-9 Interface of AS400 communication protocol**

## 12. Software

### Free Software Download – WinPower

WinPower is a brand new UPS monitoring software, which provides user-friendly interface to monitor and control your UPS. This unique software provides safely auto shutdown for multi-computer systems while power failure. With this software, users can monitor and control any UPS on the same LAN no matter how far from the UPSs.

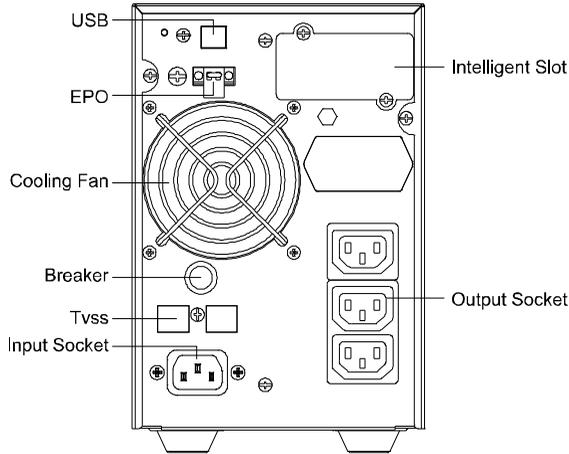


### Installation procedure:

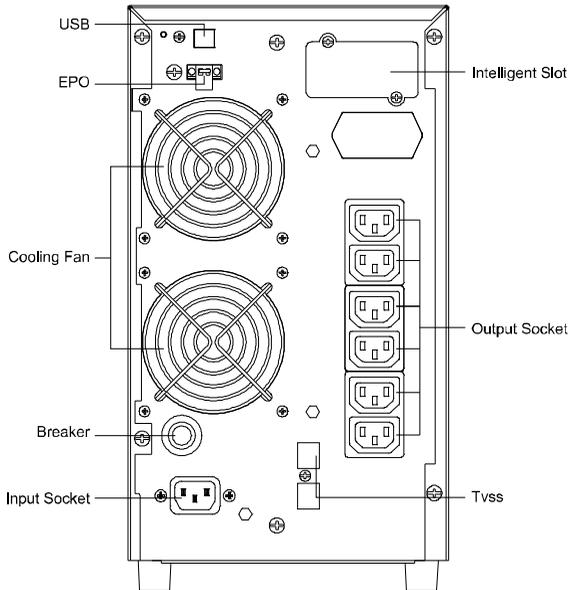
1. Go to the website:  
<http://www.ups-software-download.com/>
2. Choose the operation system you need and follow the instruction described on the website to download the software.
3. When downloading all required files from the internet, enter the serial No: **511C1-01220-0100-478DF2A** to install the software.

When your computer restarts, the WinPower software will appear as a green plug icon located in the system tray, near the clock.

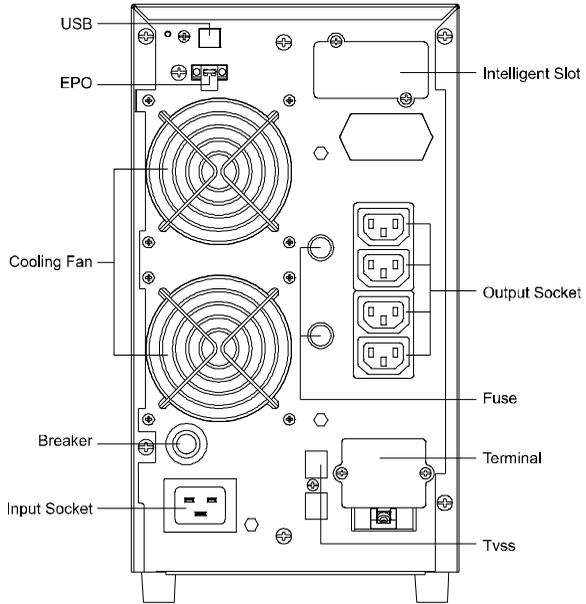
# Appendix: Rear panel



**Back View of PowerMust 1080 LCD**



**Back View of PowerMust 2016 LCD**



**Back View of PowerMust 3024 LCD**

