# USER MANUAL EP Series UPS



GE imagination at work

## CONTENTS

1.Safety Instructions 1
1.1 Transport
1.2 Set-up 1
1.3 Installation ····································
1.4 Operation
1.5 Maintenance, servicing and faults
2.Description of commonly used notations
3. Introduction -EP700/1000/2000/3000/6000 5
4.System Description - EP700/1000/2000/3000
5.Connection and Operation - EP700/1000/2000/3000 8
6.Trouble Shooting - EP700/1000/2000/300011
7.Maintenance - EP700/1000/2000/300012
7.1 Operation ·······12
7.2 Storage
8.Technical Data - EP700/1000/2000/300013
8.1 Electrical specifications13
8.2 Operating Environment······13
8.3 Typical stored energy time13
8.4 Dimensions and weights
9. Technical Data - EP6000 ······15
9.1 General Specification
9.2 Electrical Performance ······15
9.3 Operating Environment·······16
10.Installation - EP600017
10.1 Unpacking and Inspection17
10.2 Input and output power cords and protective earth ground
Installation17
10.3 Operating procedure for connecting the long backup time
Model UPS with the external battery
11.Operation and Operating Mode - EP600020

12.Trouble Shooting - EP6000······ 22
13.Notes for Battery Disposal and Battery Replacement
14.Battery Maintenance
15.Operating mode for all models25
15.1 Utility power mode25
15.2 Battery mode
15.3 Bypass mode ·······26
15.4 Abnormality mode······· 26
16.Communication Port
16.1 RS232 Interface······27
16.2 USB Interface ·······27
16.3 SNMP communication (Option)27
17.Software for all models
Appendix1:Corresponding Form of the LED Display
- EP700/1000/2000/3000
Appendix2: Corresponding Form of the LED Display
- Ep6000
Appendix3:Safety & EMC Standards
Appendix4:Back Panel for all models

## **1. SAFETY INSTRUCTIONS**

Please read the FOLLOWING user manual and the safety instructions before installing the unit and starting it up!

## 1.1 Transport

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

## 1.2 Set-up

- ★ Condensation may occur if the UPS system is moved directly from a cold to a warm environment. The UPS system must be absolutely dry before being installed. Please allow an acclimatization time of at least two hours.
- ★ Do not install the UPS system near water or in damp environments.
- ★ Do not install the UPS system where it would be exposed to direct sunlight or near heat.
- ★ Do not block off ventilation openings in the UPS system's housing.

## **1.3 Installation**

- ★ Do not connect appliances or items of equipment which would overload the UPS system (e.g. laser printers) to the UPS outlet socket
- $\star$  Place cables in such a way that no one can step on or trip over them.
- ★ Do not connect domestic appliances such as hair dryers to UPS output sockets.
- ★ It is easy to operate the equipment. Please read through this manual and operate according to the instructions in it. The meaning of the LED indicators, please refer to the appendix 1.
- ♦ Installation for EP 700/1000/2000/3000
- ★ Connect the UPS system only to an earthed shockproof socket outlet.
- ★ The building wiring socket outlet (shockproof socket outlet) must be easily accessible and close to the UPS system.
- ★ Please use only VDE-tested, CE-marked mains cable (e.g. the mains cable of your computer) to connect the UPS system to the building wiring socket outlet (shockproof socket outlet).
- ★ Please use only VDE-tested, CE-marked power cables to connect the loads to the UPS system.
- $\star$  This is operator installable.

#### ♦ Installation for EP6000

- ★ A readily accessible disconnect device should be incorporated in the building installation wiring and must be close to the UPS system.
- ★ This is permanently connected equipment and only qualified maintenance personnel may carry out installations.

## 1.4 Operation

- ★ Do not disconnect the mains cable on the UPS system or the building wiring socket outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- ★ The UPS system own internal power supplying (batteries). The UPS output sockets or output terminals block may be electrically active even if the UPS system is not connected to the building wiring socket outlet.
- ★ In order to fully disconnect the UPS system, first press the OFF switch then disconnect the mains lead
- ★ Ensure that no fluids or other foreign objects like animal can enter the UPS system.
- ★ The UPS operates with hazardous voltages. Only qualified maintenance personnel may carry out repairs

## 1.5 Maintenance, servicing and faults

- ★ The UPS system operates with hazardous voltages. Repairs can only be carried out by qualified maintenance person.
- ★ Caution risk of electric shock. Even after the unit is disconnected from the mains power supply (building wiring socket outlet), components inside the UPS system are still connected to the battery and are still electrically active and dangerous.
- ★ Before carrying out any kind of servicing and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exist in the terminals of high capability capacitor such as BUS-capacitors.
- ★ Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorised persons must be kept well away from the batteries.
- ★ 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. Before touching, please verify that no voltage is present!
- ★ Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:

- remove wristwatches, rings and other metal objects
- use only tools with insulated grips and handles.
- ★ When changing batteries, install the same number and same type of batteries.
- ★ Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- ★ Do not open or destroy batteries. Escaping 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.
- $\star$  Do not dismantle the UPS system.

## 2. DESCRIPTION OF COMMONLY USED NOTATIONS

Some or all of the following Notations may be used in this manual and may appear in your application process. Therefore, all users should be familiar with them and understand their explanations.

Notation and Explanation				
Notation	otation Explanation Notation		Explanation	
	Alert you to pay special attention	$\oplus$	Protective ground	
A	Caution of high voltage	田	Alarm silence	
	Turn on the UPS	24	Overload indication	
0	Turn off the UPS	┸	Battery check	
Ŀ	Idle or shut down the UPS	¢	Recycle	
$\sim$	Alternating current source (AC)	Ŕ	Keep UPS in a clear area	
	Direct current source		Refer to manual	

## 3. INTRODUCTION -EP700/1000/2000/3000/6000

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.

Load like 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.

Model No.	Туре
EP 700T	
EP 1000T	
EP 2000T	Tower Model
EP 3000T	
EP 6000T	
EP 700LRT	
EP 1000LRT	
EP 2000LRT	Tower Model with Long backup time
EP 3000LRT	
EP 6000LRT	
EP 700R	
EP 1000R	
EP 2000R	Rack Model
EP 3000R	
EP 6000R	

4. SYSTEM DESCRIPTION - EP700/1000/2000/3000/6000





#### EP700R/1000R/2000R/3000R/6000R

Switch	Function
	Turn on UPS system:
ON Switch	By pressing the ON-Switch <b>ON</b> the UPS system is turned on.
ON - Switch	Deactivate acoustic alarm:
	By pressing this switch an acoustic alarm can be deactivated.
OFF-Switch	When mains power is normal and Bypass is enable, the UPS system switches to Standby mode by pressing OFF-Switch <b>OFF</b> . It is then switched to Bypass and the inverter is off. At this moment, maybe the output sockets are supplied with voltage via the bypass if the mains power is available and bypass is enable. When UPS is on battery mode, pressing OFF-Switch <b>OFF</b> will shutdown UPS.

Display	Function
AC INPUT LED	The green AC INPUT LED lights up if mains voltage is applied to the UPS input. AC INPUT LED blinks when the phase and neutral conductor have been reversed at the input of the UPS system. If AC INPUT LED and BATTERY LED light up, the mains power supply is out of tolerance.
BATTERY LED	The orange-coloured BATTERY-LED lights up when the mains power has failed and the inverter is being powered by the batteries.
BYPASS LED	The orange-coloured BYPASS LED lights up when the UPS system is supplying voltage provided by the mains power via the bypass.
UPS ON LED	The green-coloured INVERTER LED lights up if the UPS system is supplying voltage provided by the mains power via the inverter.
ALARM LED	The red FAULT LED lights up and an acoustic warning signal is issued continuously when the UPS system is in fault condition. Press the OFF switch in order to turn off the warning tone.

Display	Function			
LOAD and BATTERY CAPACITY LEDs(#2~#6) (For EP700/1000/2000 /3000)	These LEDs show the load of the UPS system if the mains power is available (normal operation):2nd LED: 96%-105 %3rd LED: 76%-95%4th LED: 56%-75 %5th LED: 36%-55 %6th LED: 0-35 %In the battery operation, the LEDs indicate the capacity of the batteries:2nd LED: 0-25 %3rd LED: 26%-50 %4th LED: 51%-75 %5th LED: 76%-100 %6th LED: 100 %			
LOAD and BATTERY CAPACITY LEDs(#2~#6) (For EP6000)	These LEDs show the load of the UPS system if the mains power is available (normal operation):2nd LED: 96%-105 %3rd LED: 76%-95%4th LED: 56%-75 %5th LED: 36%-55 %6th LED: 0-35 %In the battery operation, the LEDs indicate the capacity of the batteries:2nd LED: 0-20 %3rd LED: 21%-40 %4th LED: 41%-60 %5th LED: 61%-80 %6th LED: 81%-100 %			

## 5. CONNECTION AND OPERATION - EP700/1000/2000/3000

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 rated current 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 7A for EP 700/1000, over 12A for EP 2000 and over 16A for EP 3000.

#### 2) UPS Output Connection

The output of EP 700/1000/2000/3000 are socket-types only. Simply plug the load power cord to the output sockets to complete connection.

Model No.	Output Socket (pcs)
EP 700	4
EP 1000	4
EP 2000	6 for Tower & 4 for Rack
EP 3000	6 for Tower & 2 for Rack

#### **3)** Computer Connection:

Connect your load to the outlet sockets of the UPS system directly.

#### Caution!

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

**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 **ON** button continuously for more than 1 second to turn on the UPS. Then the UPS will get into self-test status first. After having finishing the self-test, the UPS will get into the inverter mode, at this time, the AC INPUT LED, Inverter LED, and Load and Battery Capacity LEDs will light up.

#### 2) Without utility power connecting:

Even though utility power is not connected to the UPS, the UPS still can be turned on by just simply pressing **ON** button continuously for more than 1 second. Then the UPS will get into self-test status first. After having finishing the self-test, the UPS will get into the inverter mode, at this time, Battery LED, Inverter LED, Load and Battery Capacity LEDs will light up.

**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 software.

#### 5.5 Test Function:

Test the function of the UPS system by either pressing the On button or disconnecting the input of the UPS system from the power supply.

#### 5.6 Turn Off the UPS:

#### 1) In Inverter Mode:

Press **OFF** button continuously for more than 1 second to turn off the UPS. Then the UPS will get into LED self-test status first. After having finished the self-test, the UPS will get into Standby mode (or Bypass mode if Bypass enable) and the AC INPUT LED (and Bypass LED if Bypass enable) will light up. At this time, the UPS might has output (if Bypass enable). Disconnect the utility power to turn off the output.

#### 2) In Battery Mode:

Press **OFF** button continuously for more than 1 second to turn off the UPS. Then the UPS will get into self-test status first. After having finished the self-test, 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 **ON** 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.

#### 5.8 Operation Procedure of External Battery

- Use the battery pack with voltage: 36VDC for EP 700/1000 (3 pcs of 12V batteries), 96VDC for EP 2000/3000 (8 pcs of 12V batteries). Connection of batteries more than or less than required will cause abnormality
- 2) One end of the external battery cord is a plug for connecting the UPS and the other end has a plug for connecting the user battery cabinet
- 3) (*Do not connect the UPS to any load at this time*). Then, connect the power cord of the UPS to supply utility power to the UPS to make the UPS operate in utility power mode.
- 4) Connect the plug of the external battery cord to the external battery socket on the rear panel of the UPS to complete the connection procedure and the UPS will start to charge the battery pack.

#### Caution!

The output sockets of the UPS system may still be electrically live even if the power supply system has been disconnected.

## 6. TROUBLE SHOOTING - EP700/1000/2000/3000

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

Problem	Possible cause	Remedy
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.
AC INPUT LED blinks	Phase and neutral conductor at input of UPS system are reversed	Rotate mains power socket by 180° or connect UPS system.
AC INPUT LED blinks and BATTERY-LED lights up	Input power and/or frequency are out of tolerance	Check input power source and inform seller if necessary
AC INPUT and BYPASS LED light up even though the power supply is available	Inverter not switched on	Press On-Switch <b>ON</b>
INVERTER LED lights up, and audible alarm sounding every 1 beep in every 4 seconds	Mains power supply has failed	Switching to battery mode automatically. When audible alarm sounding every second, battery capacity is low.
FAULT LED lights, warning tone once a second	Overload	Remove loads from UPS output.
FAULT-LED lights up, permanent warning tone	UPS fault	Notify seller!
Emergency supply period shorter than nominal value	Batteries not fully charged / batteries defect	Charge the batteries for at least 3 hours and then check capacity. If the problem still persists, consult seller.
FAULT LED lights, BATTERY-LED blinks, warning tone once a second	Charger or Batteries damaged	Notify seller !

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

- Model number, serial number
- Date on which the problem occurred
- Detailed description of the problem

## 7. MAINTENANCE - EP700/1000/2000/3000

## 7.1 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 seller.

## 7.2 Storage

If the batteries are stored in temperate 20°C~25°C, 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.

## 8.TECHNICAL DATA - EP700/1000/2000/3000

## 8.1 Electrical specifications

INPUT				
Model No.	EP700	EP1000	EP2000	EP3000
Phase	Single			
Frequency	(46~54)Hz for 50Hz system & (56~64)Hz for 60Hz system			
Current(A)	7A	7A	12A	16A

OUTPUT				
Model No.	EP700	EP1000	EP2000	EP3000
Power rating(VA/W)	700/490	1000/700	2000/1400	3000/2100
Voltage	220/230/240VAC $\pm$ 2%			
Frequency	50/60Hz $\pm$ 0.2% (Battery mode)			
Wave form	Sine Wave			

BATTERIES				
Model No.	EP700	EP1000	EP2000	EP3000
Number and type	3×12V 7.2Ah	3×12V 7.2Ah	8×12V 7.2Ah	8×12V 7.2Ah

## 8.2 Operating Environment

Operating Temperature	0 °C to 40 °C(20°C~25°C recommended)
Operating humidity	< 95%
Altitude	< 1000m
Storage temperature	-15 °C ~ 40 °C

Note: if 1000m < Altitude < 3500m (output derating: 1% derating per 100m )

## 8.3 Typical stored energy time (Typical values at 25°C in minutes:)

Model No.	100 % Load	50 % Load
EP700	5	10
EP1000	5	10
EP2000	5	10
EP3000	5	10

## 8.4 Dimensions and weights

Model No.	Dimensions W x D x H (mm)	Net Weight (kg)
EP700T	145X400X220	14
EP700LRT	145X400X220	7
EP700R	482X420X87	15
EP1000T	145X400X220	14
EP1000LRT	145X400X220	7
EP1000R	482X420X87	15
EP2000T	192 X460X340	34.5
EP2000LRT	192 X460X340	15
EP2000R	482X420X87	9.6
EP3000T	192 X460X340	35.5
EP3000LRT	192 X460X340	16
EP3000R	482X420X87	10
Battery pack 96V Rack	482X420X87	26

## 9. TECHNICAL DATA – EP6000

## 9.1 General Specification

M	odel	EP6000	Battery pack (240V)							
Powe (V/	r Rating A/W)									
Freque	ency (Hz)		50/60							
loout	Voltage		(176-276)VAC							
input	Current		31A max.							
Battony	Voltage		240VDC							
Dallery	Current		24A max							
Output	Voltage		220/230/240VAC	;						
Output	Current		27A							
Dimensio	n (WxDxH) mm	260x570x717	482.6X600X130 (3U)							
Net We	Net Weight (kg) 90 35 18.3									

## 9.2 Electrical Performance

Input										
Model	Voltage	Frequency	Power Factor							
EP6000	Single-phase	(46~54)Hz for 50Hz system (56~64)Hz for 60Hz system	>0.98 (Full load)							

			Output		
Voltage Regulation	Power Factor	Frequency tolerance.	Distortion	Overload capacity	Current crest ratio
±2%	0.7 lag	Synchronized 46-54Hz in Line mode (AC mode) ±0.1% of normal frequency in Battery mode	THD<3% Full load (Linear Load)	105%-130% load transfers to bypass mode after 10 seconds >130% load transfers to bypass mode after 1 second and shutdown the output after 1 minute	3:1 maximum

## 9.3 Operating Environment

Temperature	Humidity	Altitude	Storage temperature
0°C~40°C	<95%	<1000m	-15°C~40°C

## Note: Output power is derated when UPS is above 1000m as following:

Altitude (M)	1000	1500	2000	2500	3000	3500	4000	4500	5000
Derating Power	100%	95%	91%	86%	82%	78%	74%	70%	67%

## 10. INSTALLATION - EP6000

## 10.1 Unpacking and Inspection

- 1) Unpack the packaging and check the package contents. The shipping package contains:
  - An UPS
  - An user manual
  - A communication cable (RS232)
  - A Software CD
  - SNMP card (optional)
  - Battery cable (long backup time model battery pack only)
- 2) Inspect the appearance of the UPS to see if there is any damage during transportation. Do not turn on the unit and notify the carrier and seller immediately if there is any damage or lacking of some parts.

## 10.2 Input and output power cords and protective earth ground installation

#### 1. Notes for installation

- 1) The UPS must be installed in a location with good ventilation, far away from water, inflammable gas and corrosive agents.
- 2) Ensure the air vents on the front and rear of the UPS are not blocked. Allow at least 0.5m of space on each side.
- 3) Condensation may occur if the UPS is unpacked in a very low temperature environment. In this case it is necessary to wait until the UPS is fully dried inside before proceeding installation and use. Otherwise there are hazards of electric shock.

#### 2. Installation

Installation and wiring must be performed in accordance with the local electric code and the following instructions by professional person.

For safety, please cut off the mains power switch before installation. The battery breaker also needs to be cut off if it is a long backup time model ("LRT" model) or Rack model ("R" model).

- 1) Open the terminal block cover located on the rear panel of the UPS, please refer to the appearance diagram.
- 2) It is recommended to select the UL1015 10AWG(6mm<sup>2</sup>) wire or other insulated wire which complies with AWG Standard for the UPS input and output wirings.

- Note: Do not use the wall receptacle as the input power source for the UPS, as its rated current is less than the UPS's maximum input current. Otherwise the receptacle may be burned and destroyed.
- 3) Connect the input and output wires to the corresponding input and output terminals according to the following diagram.



Input and output Terminal Block wiring diagram of EP6000

## Note: you must make sure that the input and output wires and the input and output terminals are connected tightly.

- 4) It is recommended to select the UL1015 10AWG(6mm<sup>2</sup>) green wire with yellow ribbon for protective earth ground wire.
- 5) After having completed the installation, make sure the wiring is correct.
- 6) Please install the leak current protective breaker at the output power distribution panel of the UPS if necessary.
- 7) To connect the load with the UPS, please turn off all the loads first, then perform the connection and finally turn on the loads one by one.
- 8) No matter the UPS is connected to the utility power or not, the output of the UPS may have electricity. The parts inside the unit may still have hazardous voltage after turning off the UPS. To make the UPS have no output, power off the UPS, and then disconnect the utility power supply.
- 9) Suggest charging the batteries for 8 hours before use. After connection, turn the input breaker in the "ON" position, the UPS will charge the batteries automatically. You can also use the UPS immediately without charging the batteries first, but the backup time may be less than the standard value.
- 10) If it is necessary to connect the inductance load such as a monitor or a laser printer to the UPS, the start-up power should be used for calculating the capacity of the UPS, as its start-up power consumption is too big when it is started.

# 10.3 Operating procedure for connecting the long backup time model UPS with the external battery

- The nominal DC voltage of external battery pack is 240VDC. Each battery pack consists of 20 pieces of 12V maintenance free batteries in series. To achieve longer backup time, it is possible to connect multi-battery packs, but the principle of "same voltage, same type" should be strictly followed.
- 2) The connector of the external battery cable is used to plug into the external battery socket of the UPS, the other end of the external battery cable is used to connect with the external battery pack(s). The procedure of installing battery pack should be complied with strictly. Otherwise you may encounter the hazardous of electric shock.
  - a) Set the battery pack breaker in "OFF" position.
  - b) You must connect the external battery cable to the battery first, if you connect the cable to the UPS first, you may encounter the hazardous of electric shock. Then connect the other end to UPS.
- 3) To complete the connection by plugging the connector of the external battery cable into the external battery socket of the UPS. Do not attempt to connect any loads to the UPS now. You should connect the input power wire to the right position first. And then set the breaker of the battery pack in the ON position. After that set the input breaker in the ON position. The UPS begins to charge the battery packs at the time.

## 11. OPERATION AND OPERATING MODE – EP6000

It is easy to operate the equipment. Please read through this manual and operate according to the instructions in it.

Please refer to the appendix 2 for the meaning of the LED indicators.

#### 11.1 Turn on the UPS with utility power supplied (in Line mode/AC mode)

- 1).After you make sure that the power supply connection is correct, set the bypass breaker in the "UPS" position and input breaker in the "ON" position first. At this time the fan rotates, and the UPS operates in Bypass mode or in Standby mode.
- 2) To power on the UPS by simply pressing the "ON" button continuously for more than 1 second.
- 3) When being powered on, the UPS will perform self-diagnosis, with the load/battery level LEDs turned on and then off one after another in ascending order. A few seconds later, the UPS ON LED is turned on, the UPS is already running in Utility Power mode. If the utility power is abnormal, the UPS will operate in battery mode without output interruption of the UPS.

#### 11.2. Turn on the UPS with no utility power supplied (in Battery mode)

- 1).For long back up time model ("LRT" model), please make sure that the battery breaker is in "ON" position.
- 2) Press the "ON" button continuously for more than 1 second to power on the UPS.
- 3) During the course of starting up, the UPS has the same action as if it is connected to utility power except that the utility power LED is not turned on and the battery LED is turned on instead.

#### 11.3 Turn off the UPS with utility power supplied (in Line mode/AC mode)

- 1) Press the "OFF" button continuously for more than 1 second to turn off the inverter of the UPS immediately.
- 2) When being powered off, the UPS will perform self-diagnosis, the Load/Battery level LEDs will be turned on and then off one after another in ascending order, then the UPS ON LED will be turned off. The UPS will be working in Standby mode. But if Bypass is enable, bypass LED will be turned on and the UPS will be working in Bypass mode.
- 3) Upon completion of the above to turn UPS off, output of electric current of the UPS may be still present (Bypass mode). In order to cut off the output from the UPS, simply cut off the utility power supply and the UPS will perform self-diagnosis, finally no any display is shown on the display panel and no voltage

output is available from the UPS output.

#### 11.4 Turn off the UPS with no utility power supplied (in Battery mode)

- 1) Press the "OFF" button continuously for more than 1 second to power off the UPS.
- 2) When being powered off, the UPS will perform self-diagnosis, the Load/Battery level LEDs will be turned on and then off one after another in ascending order. Finally no any display is shown on the display panel and no voltage is available from the UPS output.

Suggestions: Please turn off the connected loads before turning on the UPS and turn on the loads one by one after the UPS is working in INV mode. Turn off all of the connected loads before turning off the UPS.

#### **11.5.** Backup time for the standard model

The backup time of the long backup time model is dependent on the external battery pack capacity and the load level as well as other factors.

The backup time of standard model may vary from different load level. Please refer to the following:



Backup time of EP6000

## **12. TROUBLE SHOOTING - EP6000**

Problem	Possible cause	Solution				
The #1 ALARM LED and the #6 LED are turned on, the buzzer beeps continuously.	The UPS transfers to fault mode due to internal overheat.	Make sure the UPS is not overloaded; the air vents are not blocked and the ambient temperature is not too high. Wait for 10 minutes for the UPS to cool down before turning on again. If failed, please contact the distributor or service center.				
The #1 ALARM LED and the #2 and #5 LED are turned on, and the buzzer beeps continuously.	The UPS output is short circuited.	Remove all the loads. Turn off the UPS. Ensure that the load is not failed or the UPS has no internal faults before turning it on again. If failed, please contact the distributor or service center.				
The #1 ALARM LED and the #4 LED are turned on, the UPS beeps continuously.	The UPS transfers to fault mode due to its internal fault.	Please contact the distributor or service center.				
The #1 ALARM LED and the #5 LED are turned on, the UPS beeps continuously.	The UPS transfers to fault mode due to its internal fault.	Please contact the distributor or service center.				
The AC INPUT LED flashes.	The voltage or frequency of the utility power is out of the input range of the UPS.	The UPS is running in battery mode. To save your data and close the application program. Make sure the utility power is within the input voltage or frequency range permitted by the UPS.				
The #1 ALARM LED and the #2 LED are turned on, the UPS beeps continuously.	The UPS is overloaded or the load equipment is faulty.	Check the loads and remove all no-critical equipment. Recalculate the load power and reduce the number of loads connected to the UPS. Check that the loads are not failed.				
The #1 ALARM LED is turned on, and the BATTERY LED is flashed, the buzzer beeps every second.	The charger of the UPS is defective.	Please contact the distributor or service center.				
BATTERY LED flashes	Battery low or battery not connected.	Check the battery. If the battery is damaged, please contact the distributor or service center.				
The utility power is normal, but the UPS can not turn in line mode	Maintain switch loose	Please contact the distributor or service center.				
	Battery not yet been fully charged.	Keep UPS connected to utility power persistently for more than 10 hours to recharge the batteries again.				
Battery discharging time diminishes	UPS overloaded.	Check the loads and remove the non-critical equipment.				
	Battery aged.	Replace the batteries. Please contact the distributor to obtain the parts and replacement service.				
	The "ON" button is pressed too briefly.	Press the "ON" button for more than 1 second.				
The UPS cannot power on after pressing the ON button	The UPS is not connected to the battery or the battery pack voltage is too low.	Check the battery or recharge the battery.				
	UPS fault.	Please contact the distributor or service center.				

When you contact the service center, please provide the following information:

- Model No. and the serial No. of the UPS
- The date when the problem arose
- Complete description of the problem, including the LED display, alarm warning, and power condition and load capacity. If your UPS is a long backup time model, you may also provide the battery information.

## 13.NOTES FOR BATTERY DISPOSAL AND BATTERY REPLACEMENT

- 1) Before disposing of batteries, remove conductive object such as necklace, wrist watches and rings.
- 2) If it is necessary to replace any connection cables, please purchase the original materials from the authorized distributors or service centers, so as to avoid overheat or spark resulting in fire due to insufficient capacity.
- 3) Do not dispose of batteries or battery packs in a fire, they may explode.
- 4) Do not open or mutilate batteries, released electrolyte is highly poisonous and harmful to the skin and eyes.
- 5) Do not short the positive and negative of the battery electrode, otherwise, it may result in electric shock or fire.
- 6) Make sure that there is no voltage before touching the batteries. If the battery circuit is not isolated from the input potential circuit, there may be hazardous voltage between the battery terminals and the ground.
- 7) Even though the input breaker is disconnected, the components inside the UPS are still connected with the batteries, and there are potential hazardous voltages. Therefore, before any maintenance and repairs work is carried out, switch off the breaker of the battery pack or disconnect the jumper wire of connection between the batteries.
- 8) Batteries contain hazardous voltage and current. Battery maintenance such as the battery replacement must be carried out by qualified personnel. No other persons should handle the batteries.

## **14. BATTERY MAINTENANCE**

- This series UPS doesn't requires much maintenance. The battery used for standard models are value regulated sealed lead-acid maintenance free battery. The only requirement is to charge the UPS regularly so as to maximize the expected life of the battery. When being connected to the utility power, whether the UPS is turned on or not, the UPS keeps charging the batteries and also offers the protective function of overcharging and over-discharging.
- The UPS should be charged once every 4 to 6 months if it has not been used for a long time.
- In hot regions, the battery should be charged and discharged every 2 months. The standard charging time should be at least 12 hours.
- Under normal conditions, the battery life lasts 3 to 5 years. In case if the battery is found not in good condition, earlier replacement should be made. Battery replacement should be performed by qualified personnel.
- Replace batteries with the same number and same type of batteries.
- Do not replace the battery individually. All the batteries should be replaced at the same time following the instructions of the battery supplier.
- Normally, the batteries should be charged and discharged once every 4 to 6 months. Charging should begin after the UPS shuts down automatically in the course of discharging, the standard charging time for the standard UPS should be at least 12 hours.

## **15. OPERATING MODE FOR ALL MODELS**

### 15.1 Utility power mode

The display panel in utility power mode is shown in the following diagram. The AC input LED and the UPS ON LED are turned on. The load level LEDs will be turned on in accordance with the load capacity connected.

- The battery LED is turned on and the AC INPUT LED flashes, it indicates the voltage or frequency of the utility power has exceeded the normal range, the UPS operates in battery mode.
- If output overloaded, the load level LEDs will be turned on and alarm will keep twice every second. You should get rid of some



The utility power mode

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, no load). 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.

## 15.2 Battery mode

The display panel in battery mode is shown in the following diagram Fig.15.2. The battery LED and the UPS ON LED are turned on. The displayed number of the battery level LEDs will be turned on in accordance with the battery capacity. Note that the load level LEDs in utility power mode will indicate the level of the battery capacity in battery mode instead.

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) When the battery capacity decreases, the number of the battery capacity LEDs turned on will be reduced. If the battery voltage descends to the alarm level, the buzzer will beep once every second to remind the users of insufficient battery capacity and the UPS is soon going to shut down automatically. Then the load operations should be carried out promptly and the loads should be eliminated one by one.



Battery mode diagram

## 15.3 Bypass mode

The display panel in bypass mode is shown in the following diagram Fig 15.3. The AC INPUT LED and the bypass LED are turned on. The displayed number of the load LEDs will be turned on in accordance with the load capacity connected. The UPS will beep once every 2 minutes in bypass mode.

The AC INPUT LED flashes, it shows that the voltage or frequency of the utility power has exceeded the normal range of the UPS.

- 1) Other indications on the display panel are the same in utility mode.
- 2) The UPS does not have the backup function when it is in bypass mode. The



UPS bypass mode diagram

power used by the load is supplied from the utility power via internal filter.

## 15.4 Abnormality mode

In case the fault LED is turned on when the UPS is in use, it shows that the UPS is operating in abnormal mode.

## **16. COMMUNICATION PORT**

## 16.1 RS232 Interface

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

## 16.2 USB Interface

Except for the communication protocol as mentioned above, this series UPS has USB card for USB1.1 communication protocol.

## 16.3 SNMP communication (Option)

Except for the communication protocol as mentioned above, this series UPS has SNMP communication card (an optional accessory) for SNMP communication protocol. Please contact your local distributor for details. The following is the card panel description.



## **17. SOFTWARE FOR ALL MODELS**

#### **EP Series OS Shutdown Software**

EP Series OS Shutdown Software is a multifunctional 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 or even Internet no matter how far it is.



Please refer to enclosed software user manual for installation and using.

## Appendix 1: Corresponding Form of the LED Display - EP700/1000/2000/3000

						L							
No.	Op	perating state	#	#	#	#	#	#	#	#	#	#	Alarm warning
		0.05%	1	2	3	4	5	6	7	8	9	10	
1		0~35% Load capacity						•		•	•		none
2	l Itility	36%~55% Load capacity					•	●		•	•		none
3	Power	56%~75% Load capacity				•	•	•		•	•		none
4	Mode	76%~95% Load capacity			•	•	•	•		•	•		none
5		96%~105% Load capacity		•	•	•	•	•		•	•		none
6		0~25% Battery capacity		•							•	•	Beep once every sec
7		26%~50% Battery capacity		•	•						•	•	Beep once every 4 sec
8	Battery Mode	51%~75% Battery capacity		•	•	•					•	•	Beep once every 4 sec
9		76%~100% Battery capacity		•	•	•	•				•	•	Beep once every 4 sec
10		100% Battery capacity		•	•	●	•	●			•	•	Beep once every 4 sec
11	Bypass m	ode		1	1	↑	1	•	•	•			Beep once every 2 min.
12	overloade UPS still i	d in utility mode and n INV mode		•	•	•	•	•		•	•		Beep twice every sec.
13	overloade UPS in by	d in utility mode and pass mode	•	•	•	•	•	•	•	•			Continuously beep
14	Utility pow	ver abnormal		1	1	$\uparrow$	1	●	1	$\star$	1	$\uparrow$	$\uparrow$
15	Overloade Early-warr	ed in battery mode, ning	•	•	$\uparrow$	$\uparrow$	1	$\uparrow$		$\uparrow$	•	•	Beep twice every sec.
16	Overloade Cut off the	ed in battery mode, e output	•	•									Continuously beep
17	Over temp	perature	•					٠	1	1			Continuously beep
18	Inv abnormal		•				•		1	$\uparrow$			Continuously beep
19	Output short circuited		•	•			•			$\uparrow$			Continuously beep
20	BUS voltage abnormal		•			٠			$\uparrow$	$\uparrow$			Continuously beep
21	Charger voltage too high		•		•				$\uparrow$	$\uparrow$			Continuously beep
22	2 Fan abnormal		•	•				•	1	1	$\uparrow$		Beep once every sec
23	Charge or	battery failed	•									$\star$	Beep once every sec
24	Battery vo	Itage abnormal	$\uparrow$	$\uparrow$	$\uparrow$	$\uparrow$	$\uparrow$	•				$\star$	1
25	Site Fault			$\uparrow$	$\uparrow$	$\uparrow$	$\uparrow$	•	$\uparrow$	$\star$	$\uparrow$	$\uparrow$	Beep once every 2 min.

•: Solid ON ★: Flash ↑:LED display and alarm warning are dependent on other conditions.

## Appendix 2: Corresponding Form of the LED Display - EP6000

		LED display											
No	Operating state		# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	Alarm warning
1		0~35% Load capacity				-		•	-	•	•		none
2	1.1019	36%~55% Load capacity					•	•		•	•		none
3	Otility Power Mode	56%~75% Load capacity				•	•	•		•	•		none
4	mode	76%~95% Load capacity			•	•	•	•		•	•		none
5		96%~105% Load capacity		•	•	•	•	•		•	•		none
6		0~20% Battery capacity		•							•	•	Beep once every sec
7		21%~40% Battery capacity		•	•						•	•	Beep once every 4 sec
8	Battery Mode	41%~60% Battery capacity		•	•	•					•	•	Beep once every 4 sec
9		61%~80% Battery capacity		•	•	•	•				•	•	Beep once every 4 sec
10		81%~100% Battery capacity		•	•	•	•	•			•	•	Beep once every 4 sec
11	11 Bypass mode			î	ſ	ſ	1	•	•	•			Beep once every 2 min.
12	overloade UPS still ir	d in utility mode and n INV mode	•	•	•	•	•	•		•	•		Beep twice every sec.
13	overloadeo UPS in by	d in utility mode and pass mode	٠	•	•	•	•	•	•	•			Beep twice every sec.
14	Utility pow	er abnormal		↑	↑	↑	↑	•	↑	*	1	1	1
15	Overloade Early-warr	d in battery mode, ning		•	ſ	ſ	1	1		î	•	•	Beep twice every sec.
16	Overloade Cut off the	d in battery mode, output	•	•						î			Continuously beep
17	Over temperature		•					٠	1	Î			Continuously beep
18	Inv abnormal		٠				٠		1	1			Continuously beep
19	Output short circuited		•	•			•			1			Continuously beep
20	BUS voltage abnormal		•			•			1	1			Continuously beep
21	1 Charger and battery failed		•						1	1	1	★	Beep once every sec
22	22 BAT SCR failed				•			•	1	1			Continuously beep
23	Fan abnor	mal	٠	•				•	1	1	1	1	Beep once every sec
24	INV RLY fa	ailed	•			•		•	1	1			Continuously beep
25	Communio	cation abnormal	•		•	•			1	1			Continuously beep

•: Solid ON ★: Flash ↑:LED display and alarm warning are dependent on other conditions.

## Appendix 3: Safety & EMC Standards

The units comply with the following standards:

EP700/1000/2000/3000
*Safety
EN62040-1-1
*EMC
EN62040-2 C1

EP 6000	
*Safety	
EN62040-1-1	
*EMC	
EN62040-2 Output Current>16A	-

## Appendix 4: Back Panel for all models



Back View of EP700T/EP1000T



Back View of EP700LRT/EP1000LRT







Back View of EP2000T



Back View of EP2000LRT







Back View of EP3000LRT



Back View of EP6000T



TERMINAL EXTERNAL BATTERY NETWORK/FAX/MODEM BLOCK COVER CONNECTOR SURGE PROTECTION

