User Manual

1kVA ~ 3kVA 220VAC

Contents

Important Safety Instructions

SAVE THESE INSTRUCTIONS. This UPS unit operates from utility power and contains a number of high current back-up batteries, the information is important to all personnel involved. **Please read this manual before installation and operation of the UPS**.

Safety of Persons

➔ Opening or removing the cover of the unit may expose you to lethal voltage within the unit, even if it is apparently not in operation and the input wiring is disconnected from the electrical source.

➔ Refer all UPS and battery servicing to authorized service personnel from the manufacturer or an agent authorized by the manufacturer.

➔ Do not dispose of the battery in a fire, as the battery may explode.

➔ Do not open or damage the battery. Battery acid is toxic and harmful to eyes and skin.

➔ The following precautions should be observed when working on batteries:

- Remove watches, rings, and other metal objects.
- Use tools with insulated handles.

Product Safety

➔ Install the UPS in a clean environment, free from moisture, flammable gases or fumes and corrective substances.

➔ Keep the UPS on a flat, stable surface with a **10cm** space around it for proper ventilation.

➔ Operate the UPS in an indoor environment only in an ambient temperature range of **32ºF to +104ºF (0ºC to +40ºC)**.

➔ The UPS is designed for data processing equipment. It is not intended for use with life support and other designated "critical" devices.

➔ The maximum load must not exceed that shown on the UPS rating label.

➔ Storing magnetic media on top of the UPS may result in data loss or corruption.

➔ Once batteries have reached the end of their life, ensure they are disposed of properly. REFER TO YOUR LOCAL LAWS AND REGULATIONS FOR BATTERY DISPOSAL REQUIREMENTS.

➔ The UPS must be handled with care and attention since there is high energy stored within the batteries. It must always be kept in the position marked on the external packaging and must not be dropped.

➔ Please keep the exhaust holes of UPS unobstructed.

➔ The battery should be maintained at regular intervals.

Special Precautions

➔ The UPS should be installed according to the instructions in this manual. Failure to do so could result in safety issues. It could also invalidate your warranty.

➔ DO NOT CONNECT equipment that could overload the UPS or demand half-wave rectification from the UPS, for example: **electric drills**, **vacuum cleaners**, **printers or hair dryers**.

➔ Adjust only those controls that are listed in the Adjustment Section. If the unit does not operate normally by following the operating instructions, contact the sales representatives.

Icon Usage

These icons may be found in the contents.

WARNING: Obvious danger to personnel or equipment.

CAUTION: Possible danger to personnel or equipment

Important information

1. Presentation

1.1 General Description

The continuity of electrical power is an essential requirement for critical load operations .The Uninterruptible Power System (UPS) is a compact and quiet solution for power protection of computer, server and office equipment.
To choose the UPS as your equipment protector is a wise investment as it supplies reliable, pure and stable power at an affordable price.

Feature & Benefits:
- ✓ True on-line double conversion
- ✓ PWM technologies w/ IGBTs
- ✓ Wide input voltage range
- ✓ DC Start
- ✓ Battery self-test
- ✓ Microprocessor based control
- ✓ User-friendly LCD or LED
- ✓ Communication ports: Standard RS232 and optional communication slot for either DB9, USB, AS-400 or SNMP/HTTP card.
- ✓ Light weight unit
- ✓ Optional external battery slot for long runtime requirement

Application:
- ✓ Computers
- ✓ Network Servers
- ✓ Workstations
- ✓ Wireless Communication
- ✓ Other Electronic Peripherals

1. Presentation

1.2 System Configuration

▸ **Tower**

1kVA: 160W x 220H x 400D mm / 15 kgs

2kVA: 200W x 352H x 450D mm / 34 kgs
3kVA: 200W x 352H x 450D mm / 35 kgs

1. Presentation

▶   **Rack-Mount**

<u>**1kVA**</u>: **440W x 88H x 465D mm / 15.5 kgs**

<u>**2kVA**</u>: **440W x 88H x 465D mm / 35 kgs**
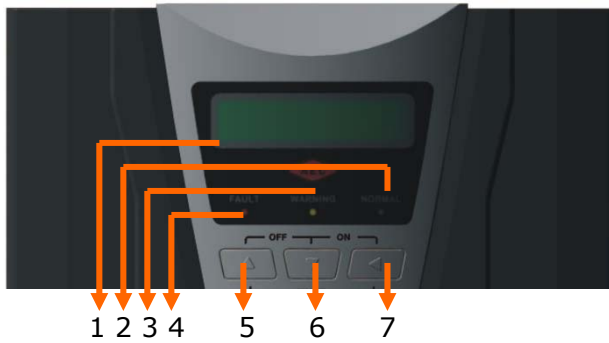<u>**3kVA**</u>: **440W x 88H x 465D mm / 36 kgs**

1. Presentation

1.3 Front Panel

1.3.1 Tower

▸ **LCD**

1. 2-line LCD Display
2. Normal LED (green)
3. Warning LED (yellow)
4. Fault LED (red)
5. Select-up button
6. Select-down button
7. Enter button
5-6. Off button
6-7. On button
5-7. Test/Silence button

▸ **LED**

1. Line LED (green)
2. Load & Battery Capacity LEDs
3. Battery LED (yellow)
4. Bypass LED (yellow)
5. Fault LED (red)
6. Inverter LED (green)
7. Select-up button
8. Select-down button
9. Enter button
7-8. Off button
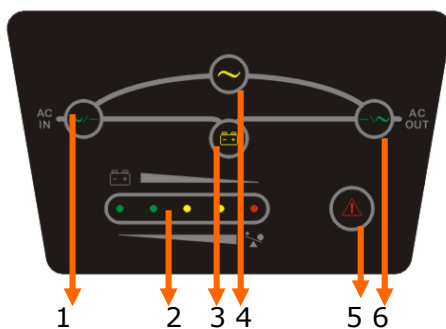8-9. On button & Test/Silence button

1. Presentation

1.3.2 Rack-Mount

1. 2-line LCD Display
2. Normal LED (green)
3. Warning LED (yellow)
4. Fault LED (red)
5. Select-up button
6. Select-down button
7. Enter button
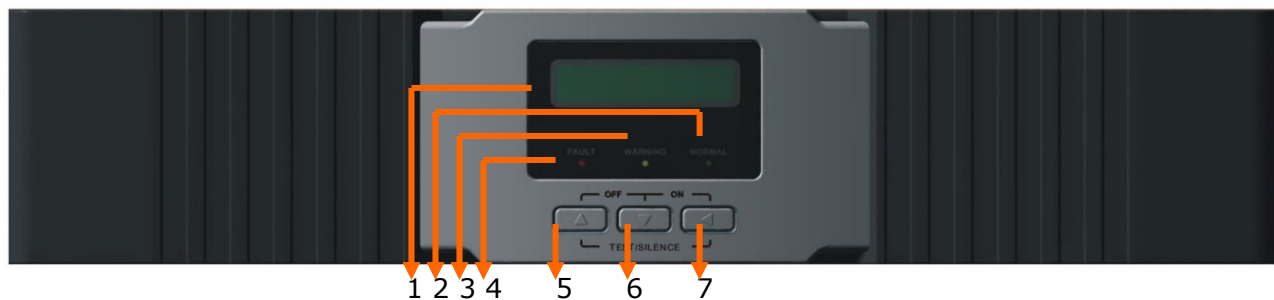5-6. Off button
6-7. On button
5-7. Test/Silence button

1. Presentation

1.4 Rear Panel

‣ **Tower**
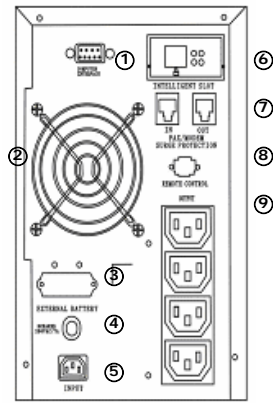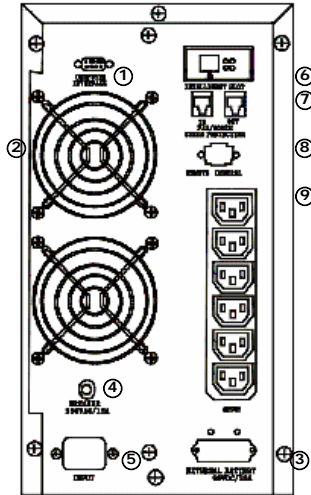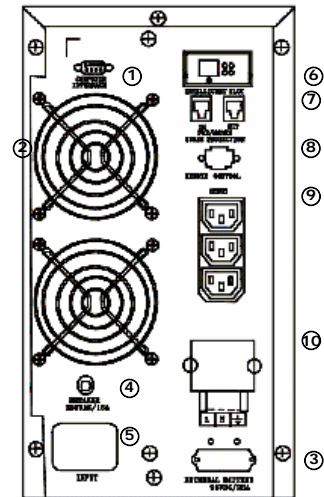
1kVA	2kVA	3kVA

1. Standard RS232 Port
2. Fan
3. External Battery Slot (Option)
4. Input Breaker
5. Inlet
6. Communication ports: DB9, USB, AS400, SNMP/HTTP (Option)
7. Surge Protection: RJ45
8. LCD Remote Control (Option)
9. Outlets (IEC, German)
10. Outlets (Terminal Block for 3kVA only)

1. Presentation

▸ **Rack-Mount**

1kVA
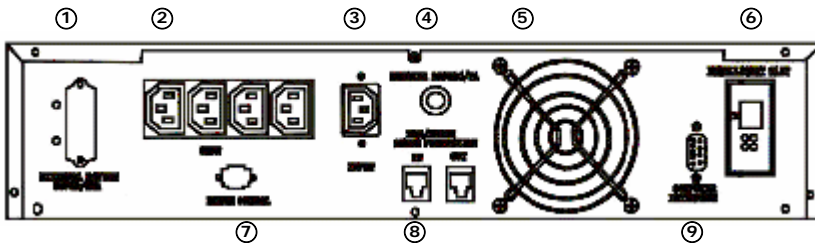
2kVA
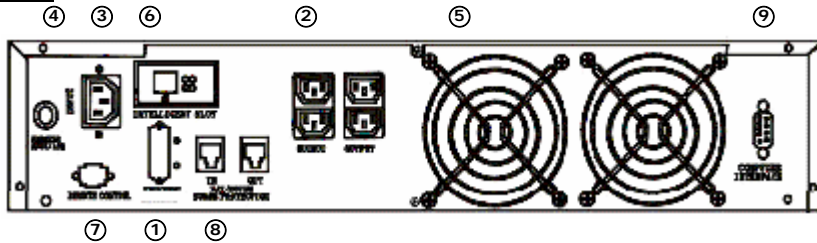
3/2(long run time)kVA
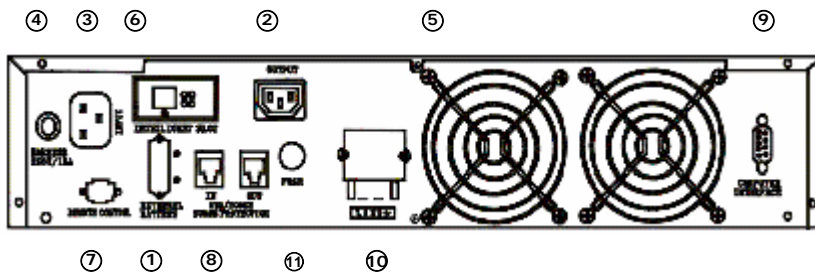
1. External Battery Slot (Option)
2. Outlets (IEC 10A,Germen)
3. Inlet
4. Input fuse
5. Fan
6. Communication Ports:DB9,USB,AS400,SNMP/HTTP (Option)
7. LCD Remote Control (Option)
8. Surge Protection: RJ 45
9. Standard RS232 Port
10. Output Terminal
11. Output fuse

1. Presentation

▸ **External Battery Bank or Module**

For Tower Product ranges:

For Rack-Mount product ranges:

2. Installation

2.1 Unpacking

> **You may find the "series number" labeled on both shipping box and UPS rear panel. If the UPS has a problem please send the number to your sales representative for tracking and troubleshooting.**

The ST Series UPS can be supplied in a varied number of boxes depending upon the model ordered.   The number of boxes provided should be as follows:

MODEL (Box 1)	BATTERY MODULE (Box 2)	TOTAL BOXES
ST 3200 Tower	N/A (internal batter	1 Box
ST 3200R Rack Mount	N/A (internal battery)	1 Box
ST 3200R Rack Mount	1 Battery Module	2 Boxes

ST Series 1kVA ~ 3kVA Tower

Box 1
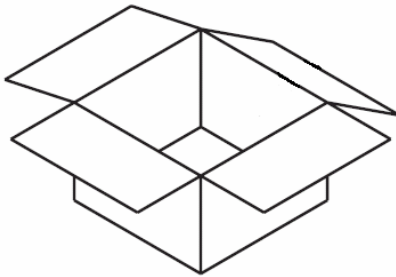
Shipping Box Includes:
1. **UPS**
2. **User Manual**
3. **Input Power Cord (German, British, Australian)**
4. **Extension Power Cord (IEC) to PC (for output receptacles "IEC" only)**

2. Installation

ST Series 1-3kVA Rack Mount

Box 1
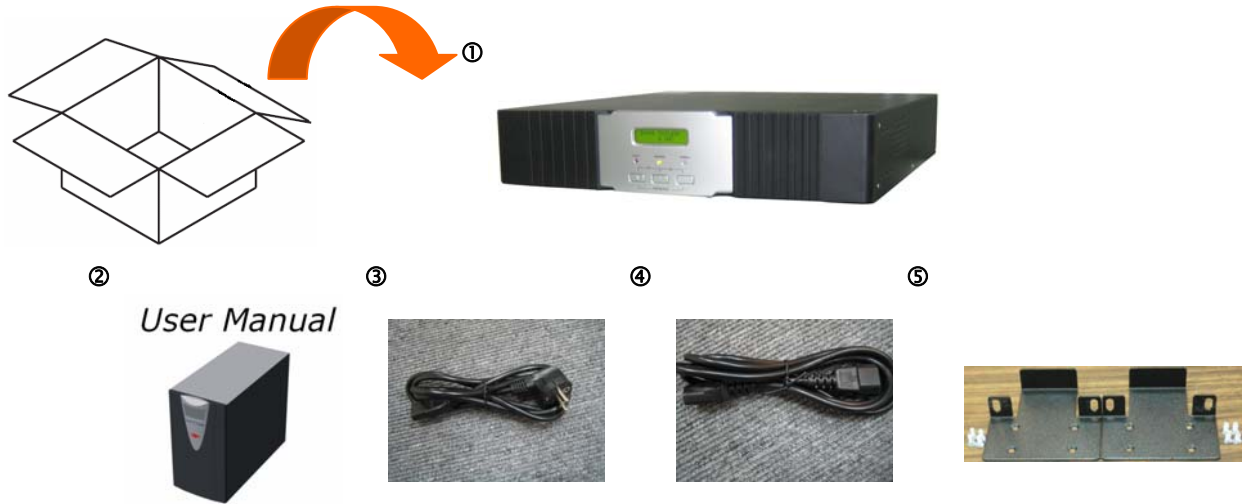
②   ③   ④   ⑤

Shipping Box Includes:
1. UPS
2. User Manual
3. Input Power Cord (German, British, Australian)
4. Extension Power Cord (IEC) to PC (for output receptacles "IEC" only)
5. 2pcs 19" rack ears (+screws)

Box 2 (for 2/3kVA Rack Mount and external battery module)

②   ③
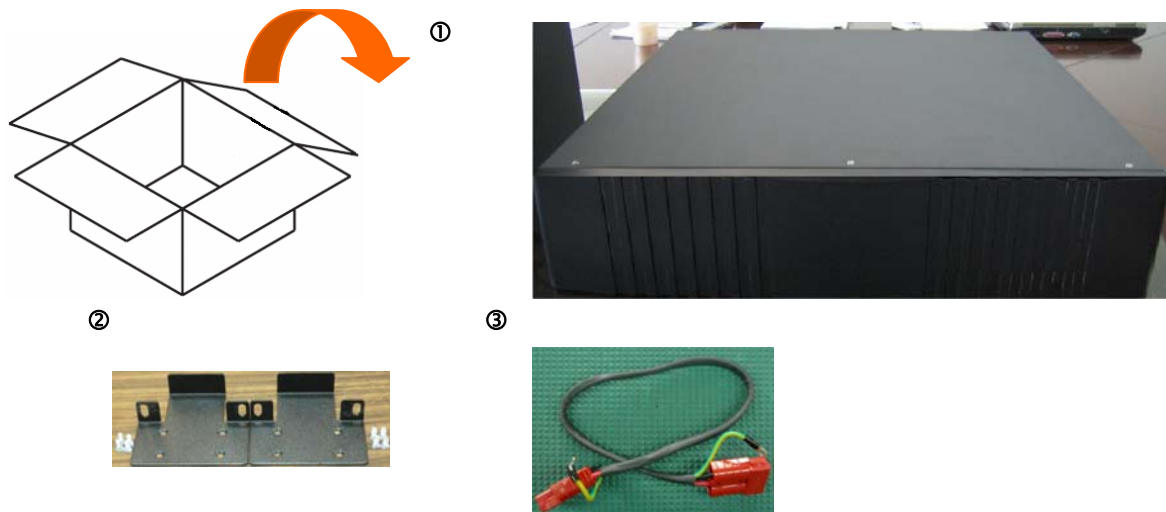
Box 2 Includes:
1. Battery Module
2. 2pcs 19" rack ears (+screws)
3. Battery cable

2. Installation

2.2 Installation

▸ **Tower**
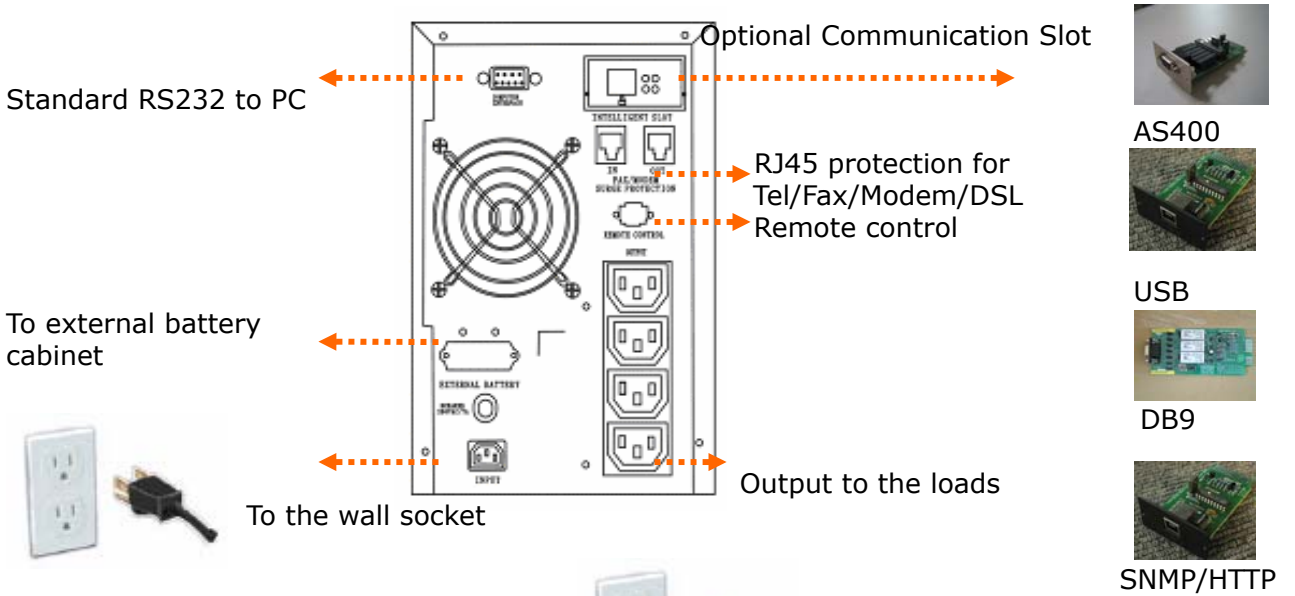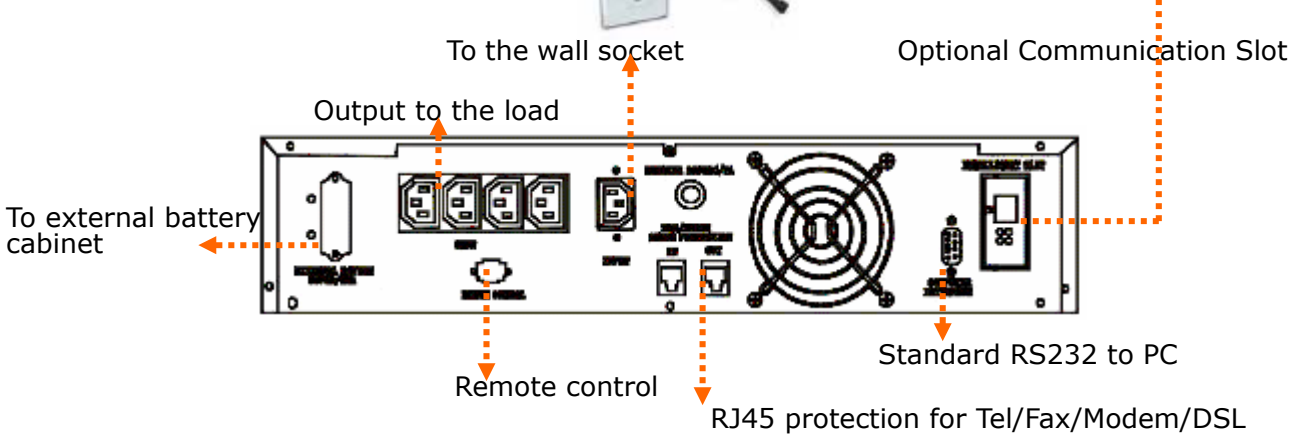
Optional Communication Slot

Standard RS232 to PC

AS400

RJ45 protection for
Tel/Fax/Modem/DSL
Remote control

USB

To external battery
cabinet

DB9

To the wall socket

Output to the loads

SNMP/HTTP

▸ **Rack-Mount**

To the wall socket

Optional Communication Slot

Output to the load

To external battery
cabinet

Standard RS232 to PC

Remote control

RJ45 protection for Tel/Fax/Modem/DSL

Keep the UPS on a flat, stable surface with a **10cm** space around it for proper ventilation.

UPS

10 cm

10 cm   10 cm
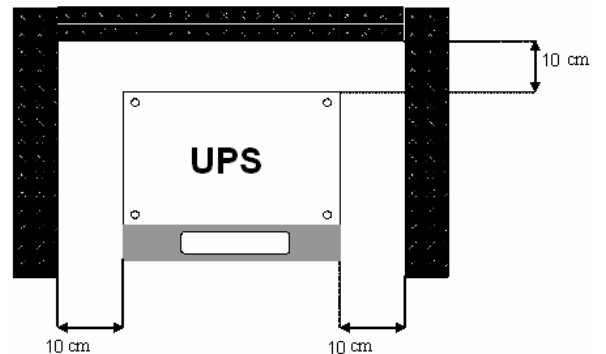
2. Installation

2.3 Connection to communication

2.3.1 Standard

▸ **RS-232**
The communication interface (DB9 port) on the back of the UPS may be connected to a host computer with specific monitoring software installed. (Please contact a sales representative for further information of monitor software)

The pins of the connector are as following:
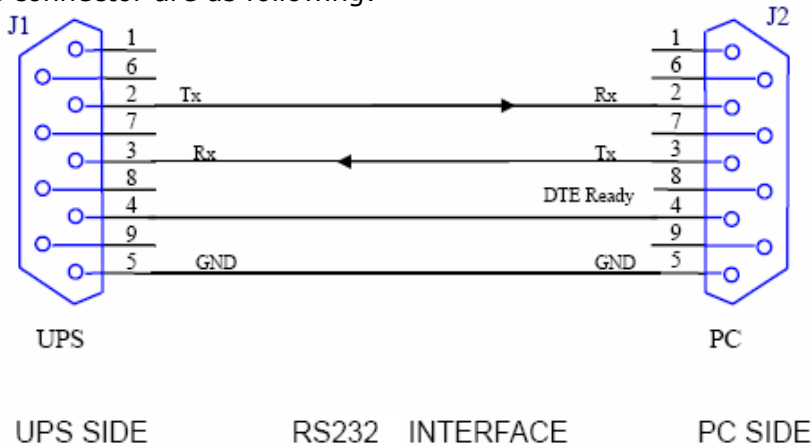
PIN #	PIN Definition (UPS)	PIN Definition (PC)
2	Transmitted data	Received data
3	Received data	Transmitted data
5	Signal Ground	Signal Ground

The RS-232 interface settings are as follows:

Baud Rate	2400 bps
Data Length	8 bits
Stop Bit	1 bit
Parity	None

2. Installation

2.3.2 Optional Interface Cards

A variety of interface cards can be installed into optional communication slot such as DB9 Dry Contact Card, USB Card, AS400 Card, and SNMP/HTTP Card.

▸ **USB Card**

▸ **DB9 Dry Contact Card**
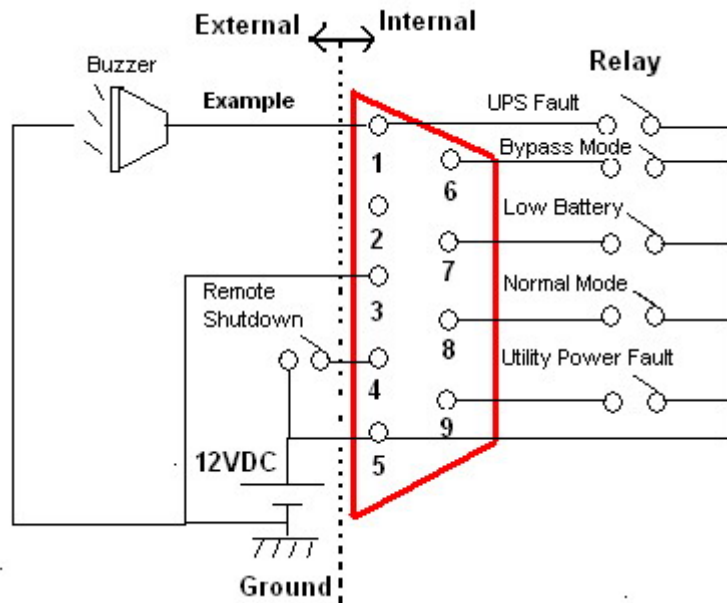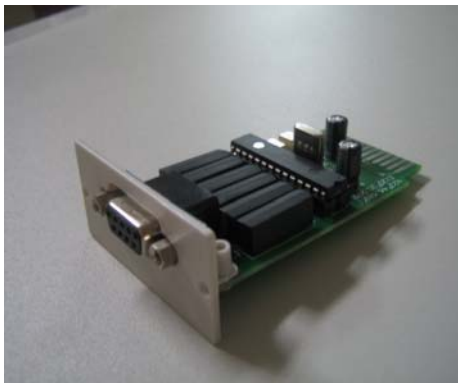
Pin Definition of DB9 for NOVELL Interface

PIN # of DB9	Function explanation	I/O
1	UPS Fault	Output
3	GND	Input
4	Remote Shutdown UPS(+12VDC)(work on Battery Mode)	Input
5	Input 12VDC	Input
6	Bypass Mode	Output
7	Low Battery	Output
8	Normal Mode, Battery Mode	Output
9	Utility Power Fault	Output

2. Installation

▸ **AS400 Card**

▸ **SNMP/HTTP Agent**

NetAgent Mini allows a user to obtain the status, and issue commands to the UPS. The communications protocol includes the MegaTec/ PPC/ SEC 2400 / 9600. Also it is possible to build in your own protocol. NetAgent Mini provides a simple and easy installation procedure. The user only needs to install the software from the NetAgent Mini CD on a Windows environment and configure the IP address.

All the other configurations could be accomplished in a Web browser. NetAgent Mini also provides shutdown programs for different operating systems. Shutdown commands can be sent for such events as power failure, low UPS battery condition, UPS overload, UPS overheating and scheduled shutdowns. All shutdown events are configurable by the user. The shutdown software provides an orderly shutdown to prevent the abnormal shut-off of clients or servers.

> **Please refer to the NetAgent Mini installation CD for more information.**

3. Operation

3.1 LCD and LED Display

▸ **LCD**

"Select-Down" Key: ▼ "Select-Up" Key: ▲

- **The welcome screen only shows for 10 seconds as UPS starts up, after that the "UPS Status" will show on the display.**
- **The screen should go back to "UPS Status" if you do not push any buttons for 2 minutes.**

Display 1 - Welcome screen

```
AEC Star T3 Series
   On-Line UPS
```

▼ ↓ ▲

Display 2 - Input/Output Voltage and Frequency Identification

```
 Input:220V 50Hz
Output:220V 50Hz
```

▼ ↓ ▲

Display 3 – UPS Status

```
AC:FAIL   BATT:LOW
    NO Output
```

▼ ↓ ▲

Display 4 – Real Input/Output Voltage and Frequency

```
Input Voltage
  220 VAC
```

▼ ↓ ▲

```
Output Voltage
   220VAC
```

▼ ↓ ▲

```
Input Frequency
    50 Hz
```

▼ ↓ ▲

```
Output Frequency
    50 Hz
```

▼ ↓ ▲

3. Operation

Display 5 – Battery Voltage/
　　　　　　Capacity

| Battery Voltage |
| 37 VDC |

▼　↓　▲

| Battery Capacity |
| 100 % |

▼　↓　▲

Display 6 – Output Power

| Output Power |
| 100 % |

▼　↓　▲

Display 7 – Inside Temperature

| Inside TEMP |
| 33 ℃　91　℉ |

▼　↓　▲

Display 8 – New Alarm

| NEW　AC Fail:　1 |
| ALM　Overload: 3 |

▼　↓　▲

Display 9 – Old Alarm

| OLD　AC Fail:　5 |
| ALM　Overload: 9 |

▼　↓　▲

Display 10 – Bypass Voltage Setting

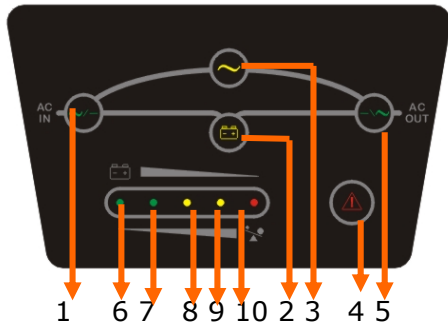| Bypass Volt Set |
| LO= 176V HI=253V |

▼　↓　▲

Display 11 – Output Voltage/
　　　　　　Frequency Setting

| Volt/Freq Set |
| 220 VAC 50 Hz |

3. Operation

▸ **LED**

1. Line LED (green): This indicates the AC power is applied to the UPS input. If the LED blinks, it means the AC power source is out of tolerance.
2. Battery LED (yellow): This indicates the UPS is in Battery Mode.
3. Bypass LED (yellow): This indicates the UPS is in Bypass Mode.
4. Fault LED (red): This indicates the UPS is in fault condition because of UPS shutdown or over-temperature
5. Inverter LED (green): This indicates the inverter is working normally.
6-10. Load & Battery Capacity LEDs:
> (a) No. 6 to 7 LED is green color, No. 8 to 9 is yellow and No.10 (used as warning LED for overload or battery low) is red.
> (b) These LEDs show the load (%) of the UPS if the AC input is available (in Normal Mode). LEDs light up to indicate the following information.

No. 6 LED: 0-25 %	No. 6 - 9 LEDs: 76-100 %
No. 6 - 7 LEDs: 26-50 %	No. 6 - 10 LEDs: Overload
No. 6 - 8 LEDs: 51-75 %	

> (c) In the Battery Mode, the LEDs indicate the capacity (%) of the batteries. LEDs light up to indicate the following information.

No. 10 LED: 0-25 % (battery low level)	
No. 9 - 10 LEDs: 26-50 %	No. 7 - 10 LEDs: 76-95 %
No. 8 - 10 LEDs: 51-75 %	No. 6 - 10 LEDs: 96-100 %

3. Operation

3.2 Starting up/ Shutting down the UPS

▸ **Starting up the UPS**

Step 1.   Plug the UPS into an AC wall socket and the UPS will enter Bypass mode.
Step 2.   Press the "Select-down" & "Enter" button simultaneously to switch on UPS.
The UPS will begin its start-up process. After entering the Normal Mode, the UPS is
ready for operation.

▸ **Shutting down the UPS**

Press the "Select-up" & "Select –down" button simultaneously for one second.   The UPS will
turn off.

	During shutdown, do not press any buttons. Pressing a button may cause the UPS to re-energize and deliver output power.

▸ **DC Start-up of the UPS**
Step 1: Without connecting the UPS into any AC input power.
Step 2: Press the "Select-down" & "Enter" button simultaneously to switch on UPS.   The UPS
will begin its start-up process. After entering the Battery Mode, the UPS is ready for
operation.

3. Operation

3.3 Operating Modes

▸ **Normal Mode**

There are two main circuits when AC utility is normal: the AC circuit and the battery charging circuit. The AC output power comes from AC utility input and passes through AC/DC rectifier, DC/AC inverter and static switch to support power to load. The battery charging voltage comes from AC utility input and is converted by AC/DC charger to support battery-charging power.
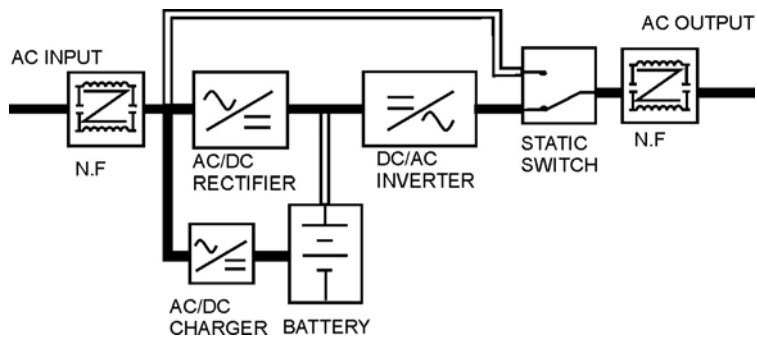
▸ **Battery Mode**
The AC output comes from battery, passing through DC/AC inverter and static switch within the battery backup time.
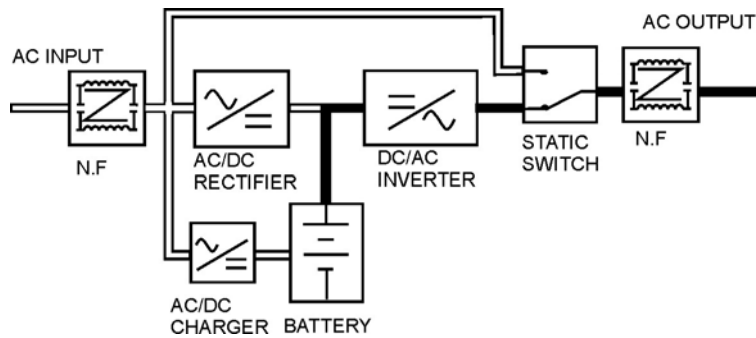
3. Operation

▸ **Bypass Mode**
Under the following conditions, the bypass will be enabled:
1. Overload.
2. Inverter failure.
3. Over-temperature

3. Operation

3.4 Configuration Settings

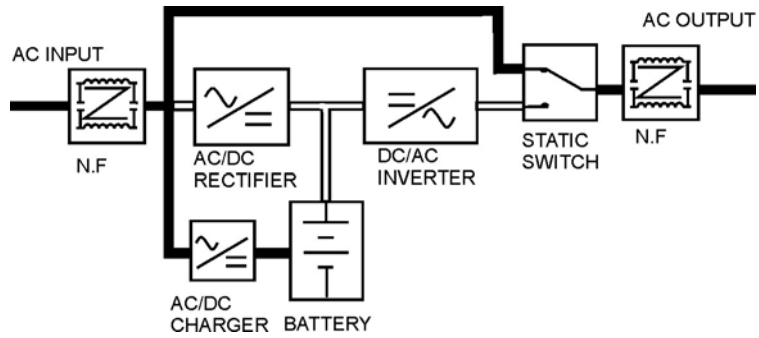⚠️ **UPS must be working on Bypass Mode in advance for any setting, because the setting function can not be available on Normal Mode and Battery Mode.**

▸ **Output Voltage / Frequency**

Step 1. In this screen, press the "Enter" key to proceed to the following steps for output voltage / frequency adjustment.

Display 11 – Output Voltage/
               Frequency Setting

```
Volt/Freq Set
220 VAC 50 Hz
```

Step 2. The cursor (→) will pop up to indicate the output voltage and frequency newly selected.

Display 11 – Output Voltage/
               Frequency Setting

```
Volt/Freq Set
→ 220 VAC    50 Hz
```

Display 11 – Output Voltage/
               Frequency Setting

```
Volt/Freq Set
220 VAC → 50 Hz
```

Step 3. Use "Select-Up" or "Select-Down" keys to adjust the output voltage (220V, 230V, and 240V). Press the "Enter" key to confirm voltage and then the cursor will move to frequency selection. The output frequency (50Hz, 50HzP, 60Hz, 60HzP) can be adjusted by the same key operation.

Step 4. Once the correct voltage is selected, press the "Enter" key again to save the selection.

📖 **There is no output on Bypass Mode if frequency is setting on 50Hz/60Hz, on the other hand, there is output on Bypass Mode if frequency is setting on 50HzP/60HzP.**

Display 11 – Output Voltage/
               Frequency Setting

```
Volt/Freq Set
Save?  → NO
```

3. Operation

▸   **Bypass Voltage**

⚠️ | **UPS must be working on Bypass Mode in advance for any setting, because the setting function can not be available on Normal Mode and Battery Mode.**

Step 1. To protect the load, the function of bypass auto-transfer is activated only when the AC main voltage is within the range of LO (low) and HI (high). In this screen, press the "Enter" key to enter the following steps for LO/HI voltage settings.

Display 10 – Bypass Voltage Setting

```
Bypass Volt Set
LO= 176V HI=253V
```

Step 2. The cursor (→) will pop up to indicate the item newly selected. Press the "Enter" key to select the item (either HI or LO range) you wish to adjust.

Display 10 – Bypass Voltage Setting

```
Bypass Volt Set
▸LO= 176V   HI=253V
```

Display 10 – Bypass Voltage Setting

```
Bypass Volt Set
LO= 176V▸ HI=253V
```

Step 3. Use the "Select-Up" or "Select-Down" keys to adjust the voltage (changing 1V by every press). LO (low rang):176V+/- 20V, HI (high range):253V+/- 20V).

Step 4. Once the value is confirmed, press the "Enter" key again to save the data.

Display 10 – Bypass Voltage Setting

```
Bypass Volt Set
   Save? ▸ NO
```

4. Maintenance

4.1 General Maintenance

The ST Series UPS requires only very simple maintenance.   The batteries are sealed, valve-regulated, maintenance-free and enclosed in a fire-retardant pack.   The batteries should be kept charged to maintain their designed lifetime.   When utility power is supplied to the UPS, it will continuously charge the batteries.

▸ **Environment**
   → For the best preventive maintenance, keep the area around the UPS clean and dust-free.
   → Please keep the exhaust holes of UPS unobstructed.
   → Operate the UPS in an indoor environment with an ambient temperature range of 32°F to +104°F (0°C to +40°C).
   → Keep the UPS on a flat, stable surface with a **10cm** space around it for proper ventilation.
   → Do not place the unit near a heat source also avoid placing the unit in direct sunlight.
   → Do not place the unit near water or excessive moisture.

▸ **Storing the UPS and Battery**
   When storing the UPS for any length of time, it is recommended to plug in the UPS for at least 24 hours every four to six months to ensure full battery recharge.

▸ **Replace the Battery**
   It is suggested that the battery pack be replaced every two years to ensure that the UPS provides full backup capacity during a blackout. Batteries should be checked every two to three months.   If the batteries need replacing, please contact your sales representative to order a new battery.

4. Maintenance

4.2 Replacing the New Battery

This UPS contains potentially hazardous voltages. Do not open the UPS. There are no user-serviceable parts inside.

➔ When replacing the battery, use the same number and voltage(V) /capacity(Ah).
➔ Avoid harm to the environment: proper disposal or recycling of the batteries is required. Refer to local regulations for disposal requirements.
➔ NEVER dispose of the battery in a fire. They may explode.
➔ Do not open or damage the battery. The contents (electrolyte) may be extremely toxic. If exposed to electrolyte, then wash immediately with plenty of water.
➔ Avoid charging in a sealed container.
➔ Never short circuit the battery. When working with batteries, remove watches, rings and other metal objects. Only use insulated tools.
➔ The following precautions should be observed when working on batteries:
  • Remove watches, rings, and other metal objects.
  • Use tools with insulated handles.
➔ Make sure that there is no voltage before touching the batteries.

4.3 Testing the New Battery
Start up the UPS with load added. Press the "Select-up" & "Enter" buttons for three seconds to activate the self-test. If the UPS switches back to Normal Mode after 10 seconds, then the batteries are good. If it does not, then please replace the battery or contact your sales representative for assistance.

4.4 Recycling the Used Battery
Do not discard the UPS and batteries with normal household/industrial waste. Contact your local recycling or hazardous waste center for information on proper disposal of used battery pack and batteries.

Consider all warnings, cautions, and notes before replacing batteries. Batteries can present a risk of electrical shock and high short circuit current. The following precautions should be observed when working on batteries:
➔ **Remove watches, rings, and other metal objects.**
➔ **Use tools with insulated handles.**
➔ **Do not lay tools or metal parts on top of batteries.**
➔ **Do not attempt to alter any battery wiring or connectors. Attempting to alter wiring can cause injury.**
➔ **Do not dispose of batteries in a fire. The batteries may explode. Refer to your local codes for disposal requirements.**
➔ **Do not open or damage the battery or batteries. Released electrolyte is harmful to the skin and eyes and it is toxic.**

5. Troubleshooting

▸ **LCD**

LCD & LED Status / Audible Alarms	Possible Cause	Action
AC: OK BATT: OK TEMP Fail Fault Warning Normal 🔴 ⚪ ⚪ • UPS in Bypass Mode. • The alarm beeps continuously.	1. Fan fail. 2. Temperature is higher than allowed operation temperature.	1. Replace the fan. 2. Reduce ambient temperature or O/P load.
AC: OK BATT: OK Inverter Fail Fault Warning Normal 🔴 ⚪ ⚪ • UPS in Bypass Mode. • Fault LED lights up and the alarm beeps continuously.	1. Inverter circuit failed 2. Output short.	1. Please contact with sale representative. 2. Remove short circuit condition, restart the UPS.
AC: OK BATT: OK DC_BUS Fail Fault Warning Normal 🔴 ⚪ ⚪ • UPS stop working. • The alarm beeps continuously.	1. Power Board failed.	1. Restart the UPS first. If the UPS can not work normally, please contact with sale representative.
AC: OK BATT: LOW Normal Mode Fault Warning Normal ⚪ 🟡 ⚪ • UPS in Normal Mode, but battery capacity is low. • The alarm beeps once every second for battery low.	1. Charger may break down.	1. Please replace charger board.
Output Power 105 % Fault Warning Normal ⚪ 🟡 ⚪ • AC utility power is normal but UPS is overloaded. • Warning LED lights up and the alarm beeps per 1 second.	1. Overload.	1. Please reduce the load less than 100%.

5. Troubleshooting

LCD & LED Status / Audible Alarms	Possible Cause	Action
Output Power **125 %** Fault Warning Normal ◯ 🟡 ◯ • AC utility power is normal but UPS is overloaded up to 125%. • Warning LED does not fade out and alarm beeps per 0.5 second.	1. Overload.	1. Please reduce the load less than 100%.
AC: OK BATT: OK **Bypass Mode** Fault Warning Normal ◯ 🟡 ◯ • UPS in Bypass Mode. Output power is more than 150%. • Warning LED lights up and alarm beeps continuously.	1. Overload.	1. Please reduce the load less than 100%.
AC: Fail BATT: OK **Battery Mode** Fault Warning Normal ◯ 🟡 ◯ • UPS in Battery Mode. • Alarm beeps every 4 seconds.	1. AC utility power fail 2. Input cable broken or disconnect with UPS.	1. If AC utility power fails, reduce the load in order to extend backup time. 2. If it is not power failure, please check the rated input or connected power line.
AC: Fail BATT: LOW **Battery Mode** Fault Warning Norma ◯ 🟡 ◯ • UPS in Battery Mode. • The alarm beeps per 1 second.	1. AC utility power fail. 2. Battery power is discharging deeply.	1. UPS will shut down automatically. Please save data soon.
Fault Warning Norma ◯ ◯ ◯ • UPS completely shut down.	1. AC utility power fail. 2. The UPS has already run out of battery.	1. UPS will restart up when AC utility power is restored. If AC utility power failure is more than 6 hours, please charge the battery for 24 hours to ensure the battery fully charged.

5. Troubleshooting

▸ **LED**

LED Status / Audible Alarms	Possible Cause	Action
• No indication and buzzer alarm even though system is connected to mains power supply.	1. No input voltage	1. Check building wiring socket outlet and input cable.
• Line LED flash.	1. Phase and neutral conductor at input of UPS system are reversed.	1. Rotate main power socket by 180 to connect UPS system.
• Line LED flash and Battery LED illuminate.	1. Input voltage/frequency are out of tolerance	1. Check input power source.
• Line and Bypass LED illuminated even though the power supply is available.	1. UPS not turn on.	1. Please turn on the UPS
• Inverter LED illuminated. • Alarm sounds every 4 second.	1. AC utility power fail.	1. UPS go to battery mode automatically. 2. As the audible alarms per every 1 second, battery is almost empty.
• Fault LED illuminated. • Buzzer alarm sounds per every 1 second.	1. Overload.	1. Please reduce the load less than 100%.
• Fault LED illuminated. • Buzzer alarm sounds continuously.	1. UPS Fault	1. Please contact with sale representative.
• UPS completely shut down.	1. AC utility power fail. 2. The UPS has already run out of battery.	1. UPS will restart up when AC utility power is restored. If AC utility power failure is more than 6 hours, please charge the battery for 24 hours to ensure the battery fully charged.
• Fault and Battery LED illuminated. • The alarm sounds per every 1 second	1. Charger or Battery may break down.	1. Please contact with sale representative.

6. Appendix
6.1 Specifications
▸ **General Specification**

Specifications			
Model No.	**ST3200 (tower)** **ST3200R (rack-mount)**	**ST3200 (tower)** **ST3200R (rack-mount)**	**ST3200 (tower)** **ST3200R (rack-mount)**
Topology	True On - Line , Double Conversion		
On- battery Output Waveform	Pure Sine Wave		
Number of Phase	Single (1 Φ 2W + G)		
Input			
Maximum Capacity (VA / W)	1000 VA / 700 W	2000 VA / 1400 W	3000 VA / 2100 W
Nominal Input Voltage	230 VAC		
Input Voltage Regulation	160~300 VAC Single Phase w/ Ground		
Nominal Input Frequency	50/60 ± 4 Hz		
Input PFC	≧ 0.95		
Input Short Protection	Circuit Breaker		
Output			
Nominal Output Voltage	220 / 230 / 240 VAC nominal		
Output Voltage Regulation	+ / - 2 %		
Output T.H.D	≦3% (Linear Load) ≦6% (Non-Linear Load)	≦4% THD (Linear Load) ≦7% THD (Non-Linear Load)	
High Efficiency Mode (AC to AC)	85%	85%	88%
High Efficiency Mode (DC to AC)	83%	83%	83%
Crest Factor	3 : 1		
Start on Battery	Yes		
Output Frequency	50 Hz + / - 0.2 Hz		
Overload	Sustaining 30 sec @ 125%~150% load; 200ms @ >150% load		
Battery			
Typical Backup Time (Full load)	5 minutes	9 minutes	5 minutes
Battery Type	Sealed Lead-Acid maintenance-free 12VDC/7AH per cell		
Numbers of Batteries	3 cells	8 cells	
Recharge Time to 90%	5 hours		
Advance Warning Diagnostics			
Front Panel Indication - LCD	UPS Status, I/P Voltage & Frequency, O/P Voltage & Frequency, Battery Voltage, Battery Capacity, Loading %, Temperature, History Alarm.		
Front Panel Indication - LED	Normal (Green), Warning (Yellow), Fault (Red)		
Audible Alarms	Battery Mode, Low Battery, Overload, Fault		
Communication Interface			
Communication port	RS232 (Standard); DB9 or USB or AS400 or SNMP / HTTP(Optional)		
SNMP Manageable	Yes		
Environmental			
Operation Temperature	0-40℃		
Storage Temperature	- 15 to 50 ℃		
Relative Humidity	20% to 90 % Non-Condensing		
Audible Noise (at 1 meter from surface of unit)	< 45 dBA @ 1 meter	< 50 dBA @ 1 meter	
Mechanical			
Tower Dimensions (W x H x D mm)	160 x 220 x 400	200 x 352 x 450	200 x 352 x 450
Rack-mount Dimensions (W x H x D mm)	440 x 88 x 465 (w/ internal battery)	440 x 88 x 465 (UPS only) 440 x 88 x 465 (External Battery Module)	
Tower Weight (Net weight with Battery) (kgs)	15	34	35
Rack Mount Weight (Net weight with Battery) (kgs)	15.5	35	36

6. Appendix

▶ **Battery Run Time**

Tower

RUN TIME CHART in Minutes									
Output load UPS Model	200 VA (140 W)	400 VA (280 W)	600 VA (420W)	800 VA (560W)	1000 VA (700 W)	1500 VA (1050 W)	2000 VA (1400 W)	2500 VA (1750 W)	3000 VA (2100 W)
ST3010	60	24	13	8	5				
+ 1 EB (6pcs)	243	102	61	42	30				
+ 2 EB (12pcs)	451	194	117	81	61				
+ 3 EB (18pcs)	675	293	178	124	94				
ST3020	210	88	52	36	26	15	9		
+ 1 EB (8pcs)	488	210	127	88	66	39	26		
+ 2 EB (16pcs)	791	345	210	147	111	66	45		
+ 3 EB (24pcs)	1110	488	299	210	159	96	66		
ST3030	210	88	52	36	26	15	9	7	5
+ 1 EB (8pcs)	488	210	127	88	66	39	26	19	15
+ 2 EB (16pcs)	791	345	210	147	111	66	45	34	26
+ 3 EB (24pcs)	1110	488	299	210	159	96	66	49	39

Rack Mount

RUN TIME CHART in Minutes									
Output load UPS Model	200 VA (140 W)	400 VA (280 W)	600 VA (420W)	800 VA (560W)	1000 VA (700 W)	1500 VA (1050 W)	2000 VA (1400 W)	2500 VA (1750 W)	3000 VA (2100 W)
ST3R10	60	24	13	8	5				
+ 1 BM (9pcs)	345	147	88	61	45				
+ 2 BM (18pcs)	675	293	178	124	94				
+ 3 BM (27pcs)	1029	451	276	194	147				
ST3R20	210	88	52	36	26	15	9		
+ 1 BM (8pcs)	488	210	127	88	66	39	26		
+ 2 BM (16pcs)	791	345	210	147	111	66	45		
+ 3 BM (24pcs)	1110	488	299	210	159	96	66		
ST3R30	210	88	52	36	26	15	9	7	5
+ 1 BM (8pcs)	488	210	127	88	66	39	26	19	15
+ 2 BM (16pcs)	791	345	210	147	111	66	45	34	26
+ 3 BM (24pcs)	1110	488	299	210	159	96	66	49	39

EB: External Battery Bank (for Tower type)
BM: External Battery Module (for Rack Mount type)
Indicates time not calculated, contact sales representative for details.