UNINTERRUPTIBLE POWER SUPPLY

The SPH series on line double conversion UPS with full time Digital Signal Processor control technology is the perfect solution for mission critical users who demand high reliability, availability and performance from a UPS. Input power factor correction, high efficiency and parallel redundant capability (N+X) provide a superior level of power quality for seSPHitive electronic equipment and computers loads.

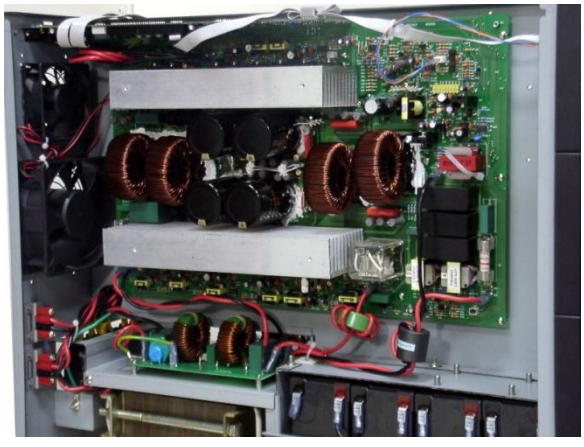
PRINCIPLES OF WORKING

The backup series is composed by: Rectifier, Inverter, Static Switch, manual by-pass and Battery.
The Rectifier-Inverter line normally feeds the users, and the Battery is kept charged by the Rectifier.
If a black out occurs, the Battery supplies power energy to users always through the Inverter. When the blackout is over, the Rectifier provides for Battery charge.

If a short circuit or an overload occurs to the users, the Static By-pass switches the load over the emergency line. When the fault is over, the Inverter feeds users.

FEATURES

- Simple Parallel installation N+X
- Full time Digital Signal Processor Control
- Filtered, stabilized and regulated sine wave supply
- High input power factor and low current THD
- Wide input voltage and frequency range, minimizing the battery usage
- Zero transfer time
- Add matching battery cabinets and extend the backup time up to several hours. With its isolation conversion technology plus precision control, the optional charger can be installed in parallel up to 4 units
- Superior overload capability
- High battery reliability (battery test, manual and automatic)
- LCD display provides real time status and parameter readings
- Advanced Battery Discharge Management to prevent the deep discharge of the batteries during a power failure
- ON LINE – OFF LINE mode settable
- Optional galvanic isolation transformer
- RS232 standard, dry contact, USB, RS485 & SNMP as option
- Optional dual input loops
- Personalizing 60Hz output converter
- Emergency Power Off

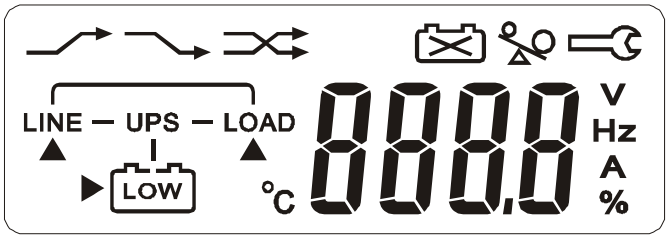


CONTROL PANEL

The front display panel provides all major systems parameters and operational status of the UPS that include full diagnostics for simple, easy servicing. The SPH series UPS with DSP control, systematically checks each component and displays the result using on LCD display. This feature allows service technicians the ability to pinpoint and repair the UPS very quickly.

- LED indicators:
1 Mains_1 LED
2 Mains_2 LED
3 Redundancy LED
4 ECO Mode LED
5 Common Alarm LED

- Control Keypads:
6 ON & Alarm Sil. Key
7 OFF Key
8 Function Key
9 Scroll Keys
10 Enter Key

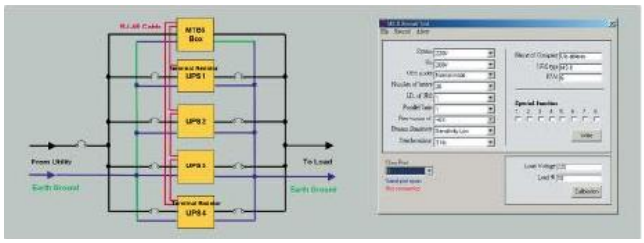


- LCD Display Explanations:
✓ Status
Line Mode, Back up Mode, ECO Mode, Bypass Supply, Battery Low Voltage, Battery Bad/Disconnect, Overload, Transferring with Interruption & UPS fault.
✓ Parameters
AC Voltage, Frequency, Load Percentage, Battery Voltage & Temperature

N+X POWER SCALABLE PARALLEL REDUNDANCY

The SPH UPS may be paralleled for power capacity or for redundancy up to 4 units to increase the power capacity or configuring a parallel redundant UPS system.
The standard apparatus can be simply interconnected up to 4 units using the CAN-bus RJ45 cables on the rear of the SPH series UPS. The SPH series UPS used an inverter control technology that allows to achieve N+1 scalable redundant power without the use of additional components.

The standard version is provided with this feature without any factory operation. The system is fully modular and allows to increase the overall power output, battery runtime, and redundancy as your needs and requirements grow. Parallel Distribution Box are available till 200 A (40kVA).



INTERFACES

In additional to the standard RS232 with software, the SPH Series UPS also provides two additional customer options communication slots.

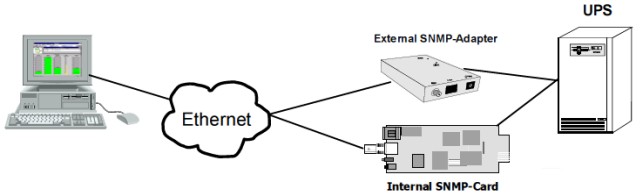
Standard serial RS 232
The smart port is an intelligent RS232 serial port that allows the UPS to a computer. The connector is a standard D-Type, 9 pin, female. The software optionally allows the computer to monitor the mains voltage and the UPS status continuously.

The SPH series UPS is provided with the following accessory cards:

Dry contact card provides isolated contacts for industrial and remote alarm application.

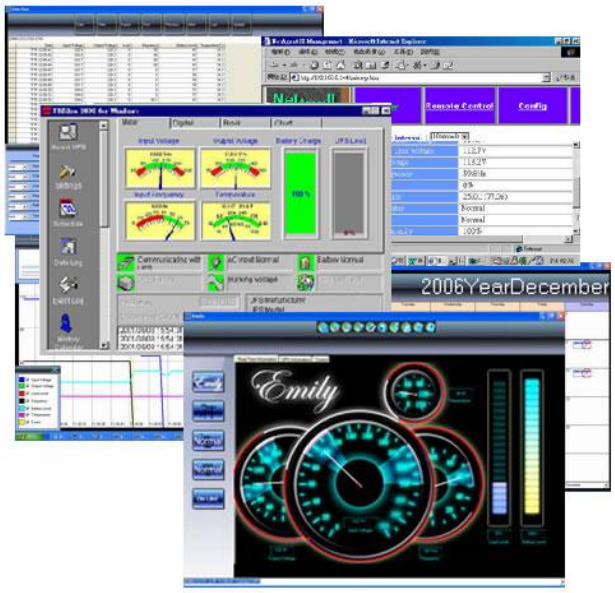
2nd RS232, RS485 and USB port for remote signaling and automatic computer shutdown.

SNMP card for monitoring and integration in network management. The Simple Network Management Protocol (SNMP) is a worldwide-standardized communication-protocol. It is used to monitor any device in the network via simple control language.



The **Emergency Power Off** facility must use a normally NO contact, which closes to operate the emergency stop procedure. The emergency stop port is located at the rear of the UPS SPH module. Through the dry contact interface it is available also a NC contact.

The SPH series UPS is provided on request with monitoring and shutdown software. The monitoring software provides real-time UPS status display via easy-to-read Meter and Gauges, Digital Table, Block Diagram and Graph Chart as well as remote monitoring of the UPS through Intranet or Internet.
The software is compatible with many operating systems such as Windows 98, 2000, XP, Vista and Windows 7 For other applications like Novell, NetWare, Unix, Linux, please contact your local distributor for a proper solution.

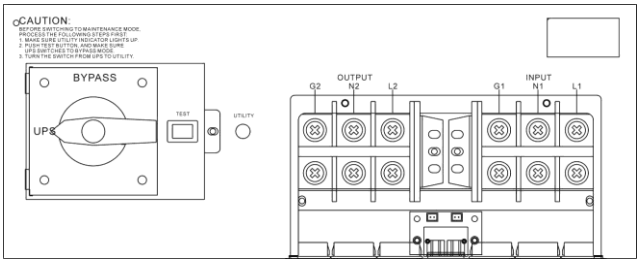


ACCESSORIES

- Additional battery cabinets to upgrade the backup time till several hours even after the first installation. On request the add battery cabinet can be provided with an external independent battery charger to guarantee a fast recharge.

- Optional External 1000W Charger. Its independent electronic control allows to the device to work in parallel up to 4 units. The external battery charger is foreseen to be placed on back of the cabinet.

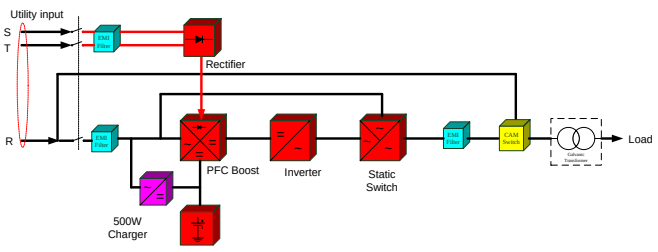
- External Bypass Switch Box Series. Beyond to the standard manual by-pass fitted in each UPS, the external maintenance bypass and power output distribution switch allows you to manually transfer the connected equipment to utility power via a maintenance bypass switch and vice versa. It is available till 400 A and it is suitable for single UPS and for a system composed till no. 4 UPS in parallel.



REAR PANEL EXPLANATION

RS232 port
Terminal Resistor for Parallel Function
CAN Bus Connection Port for Parallel System
Customer Options Slot 1
Customer Options Slot 2
Cooling Fan
External Battery Connector
External Charger Connector
Utility Input Breaker CB1
Bypass Input Breaker CB2 (for Dual Input Model Only)
CAM Switch (Maintenance Bypass Switch)
Input/Output Terminal Block
Fixing Holes for External Charger Cabinet
EPO, Short to enable the Function
Thermal Breaker for the Protection of Load in Abnormal Condition: CB3
Air Ventilation Hole

BLOCK DIAGRAM



Model	SPH10000	SPH15000	SPH20000	SPH KING15	SPH KING20
Rated power kVA/kW	10/9	15/13.5	20/18	15/12	20/16
INPUT					
Nominal Voltage	380/400/415Vac 4w				
Voltage tolerance	277 ÷ 485Vac			308 ÷ 460Vac	
Power factor	Up to 0.99	0.95 at full load		0.98 at full load	
Frequency	50/60Hz				
Frequency tolerance	45 ÷ 65Hz			35 ÷ 70Hz	
Distortione (THiD)	< 30%			< 25%	
OUPUT					
Voltage	220/230/240Vac 2w				
Frequency	50/60Hz auto sensing				
Frequency tolerance	± 0.2% free running; reg. ±1Hz or ±3Hz			Static <1%, dynamic ±4%	
Waveform	Sinusoidal				
Distortion (THD)	< 3%				
Transfer time	0 ms.				
Crest factor	3 : 1				
DC start	Yes			No	
Overload	150% for 3''			150% for 1'	
BATTERY					
Type	Maintenance free VRLA				
Recharge time	4h at 90%		6h at 90%	5h at 90%	
Nominal voltage	240Vdc			± 288Vdc	
Battery Test	Automatic and periodically (adjustable)				
EFFICIENCY					
ON LINE mode	Up to 90%	> 91%		Up to 94.5%	
OFF LINE mode	Up to 95%			98%	
MISCELLANEOUS					
Relative humidity	< 90% without condensing				
Operating temperature	from 0°C to + 40°C				
Noise at 1 meter	< 50dBA	< 52dBA		< 53dBA	
Interfaces	RS232 & EPO, as option: contacts, 2nd RS232, RS485, USB, SNMP			RS232, contacts & EPO, as option: RS485, USB and SNMP	
Parallel capability	yes			no	
Heat dissipation	< 600W	850W	1150W	750W	960W
Input/output connection	Terminals				
Ext. battery connection	Plug-in & Play			Terminals	
Dimensions (mm)	290x645x881	2x 290x645x881		340x800x820	450x860x1250
Weight w/o battery(kgs)	45	75	80	85	154
STANDARDS					
Safety	IEC/EN 62040-1-1, IEC/EN 60950-1				
EMC	IEC/EN 62040-2, IEC/EN61000-3-2, IEC/EN61000-6-2,				
Performance	EN 62040-3				