

SMART POWER SYSTEMS USER MANUAL

SPS-600 / SPS-1000



Branson Holdings (Pty) Ltd

Importer and distributor for Smart Power Systems,
Euro Fireplaces and Jeep ® E-bikes

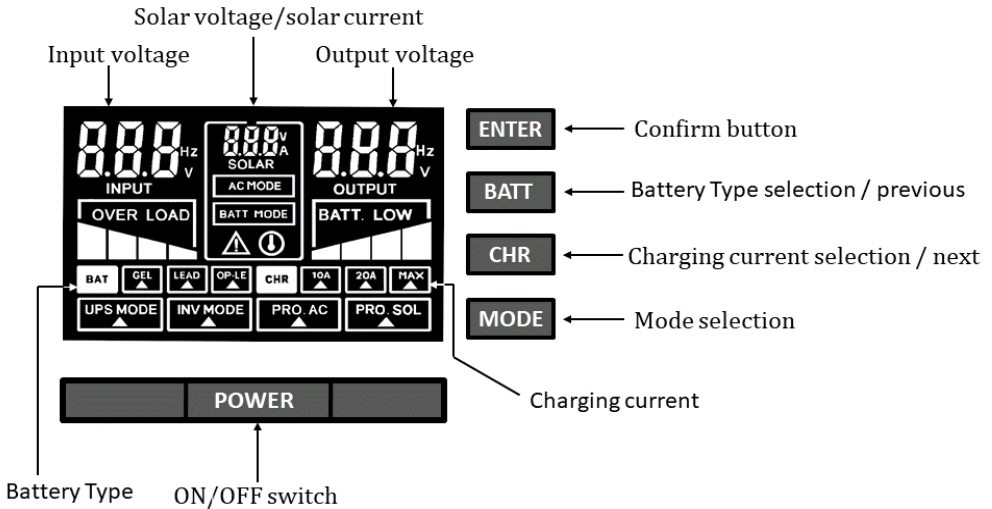
SAFETY

- Keep the battery door locked at all times.
- Do not touch the battery connectors. The battery loop and input voltage loop are unsegregated. There is a risk of high voltage at the battery connectors.
- Even if the system is disconnected from mains power it may still be live (220v).
- Do not overload the system with high power appliances such as kettles, electric heaters, etc. Some inductive load equipment- (motors, laser printers, etc.) have start-up power requirements two to five times their normal capacity.
- Use the power system in a dry, well ventilated area. Make sure it is upright and that all the vent holes are unobstructed.
- Do not use the unit in temperatures outside the range of 0 - 40 degrees centigrade.
- Always be aware of the potential risk of high voltage inside the unit.

OPERATION

- Ensure batteries are installed (refer to battery wiring section).
- Connect the power system to 220v mains power using the supplied cord.
- Move the DC breaker on the side of the machine up to the "ON" position.
- Press and hold the power button for 3 seconds. The machine will turn on.
- A multi plug and/or extension cable can be used to connect several devices to the outlet at the front of the machine. **Ensure the total power requirement does not exceed the SPS rating.** Excessively high powered items like hair dryers, kettles, irons, microwaves, vacuum cleaners, etc. will overload and severely damage the CPU. **Damage caused by excessive overloading is not covered under the warranty.**
- Once plugged in, turn on the equipment in sequence, starting with the biggest load first.
- The system will charge the battery automatically and power your appliances using solar or mains electricity. When fully charged, the battery capacity display shows four bars and maintains a float charge. (NB. the use of solar panels is optional.)
- If a power cut happens the SPS will immediately switch to battery power.
- An audible beeping warns when the battery is low. The machine will automatically shut down after a few minutes. When AC power is restored the SPS will automatically start up and recharge the batteries.
- The SPS is not designed for connection to a DB board.

DISPLAY PANEL



STANDARD SETTINGS

- Press 'POWER' for 3 seconds to turn the inverter on or off.
- **Battery Type** - Press 'BATT' and ▲ flashes. Press again for the required battery type. Press 'ENTER' to set.
Battery types: Gel (GEL), sealed Lead-Acid/drop in lead acid replacements (LEAD) and open Lead-Acid (OP-LE).
- **Charging Current** - Press 'CHR' and ▲ flashes. Press again to scroll between 10A and 20A. Press 'ENTER' to set. 'MAX' is only available on “special design” models.
- **Mode** - Press 'MODE' and ▲ flashes. Press again to scroll between 'UPS MODE' and 'INV MODE'. Press 'ENTER' to set.

ADVANCED SETTINGS

Press 'ENTER' for about 4 seconds to go to the Advanced Menu.

- The first page shows the voltage at which the battery turns off. Options are 10.0V, 10.5V, 10.8V and 11.1V. Press 'BATT' to show previous voltage option, press 'CHR' to show next voltage option. Press 'ENTER' to select the option temporarily and turn to next page.

- The second page shows the battery voltage at which the machine switches to AC charging. Options are 11.4V, 11.6V, 11.8V and 12.0V.
- The third pages shows the maximum solar charger current. Options are 10A, 20A, 30A, 40A and 50A.
- The fourth page shows the SOLAR or AC preference settings. Options are 'PRO AC' (AC preferred) or 'PRO SOL' (solar preferred).
- The fifth page is a confirmation page. Select 'YES' to confirm the selection of previous 4 pages or select 'NO' to cancel.

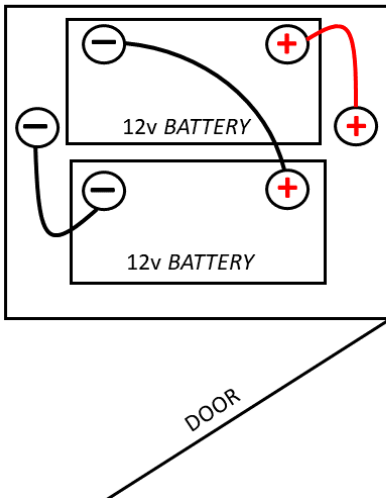
BATTERY WIRING

The SPS will **NOT** function without deep cycle batteries installed.

- **SPS-600** is a 12V system and requires **ONE** 12V battery.
- **SPS-1000** is a 24V system and requires **TWO** 12v batteries **in series**. A cable is supplied with the unit for series connection. Connecting in series means wiring the positive of one battery to the negative of the other to double the voltage.
- Any battery **Ah** value can be used. Ensure that the physical dimensions of the battery will fit inside the cabinet.

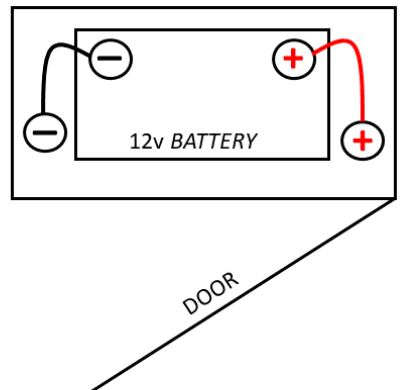
SPS-1000 WIRING DIAGRAM

VIEWED FROM ABOVE



SPS-600 WIRING DIAGRAM

VIEWED FROM ABOVE



BATTERY INSTALLATION



- Solar power and mains power must be disconnected. The DC breaker must be turned OFF. Remove conductive metals such as wristwatches and rings. Use tools with insulated handles. Be aware that the battery loop and input voltage loop are unsegregated. There is a risk of high voltage at the battery connectors. Do not touch or short the positive and negative electrodes.

- Deep cycle batteries need regular charging to prolong their life. Once connected to mains power, whether the system is ON or OFF, it keeps charging, maintaining the batteries at an optimum level while offering both overcharging and over discharging protection.
- Repeated **deep** discharging will shorten battery life. To increase run time and reduce battery drain try to run only essential, low wattage appliances during power failures.
- Lithium iron phosphate (LiFePO₄) batteries can be used as a drop in lead acid replacement.

UPS / INV MODE

- “UPS MODE” gives uninterrupted pure sine wave power to your appliances as well as voltage protection. This is the default setting.
- “INV MODE” is only used when running non-sensitive equipment that will not be affected by power lag on switchover.

AUTOMATIC VOLTAGE CONTROL (AVC)

- The SPS has a built in Automatic Voltage Control that monitors AC input voltage. If this exceeds a safe threshold the SPS will reduce output voltage to protect your electronics.
- “Output” voltage will show as much lower than “input” voltage on the screen. In this case the SPS is protecting your equipment from the potentially damaging higher voltage. All electronics will operate safely at this lower voltage.

TURNING OFF

- If the power button is pressed for 3 seconds the LED screen will dim and the UPS function will turn off. The SPS, however, will continue to charge the batteries.
- If the DC breaker is turned off but the machine is plugged in to mains power, it will still provide AC current but the UPS function will be off.
- To shut down the SPS **completely**, mains AC power must be disconnected **and** the DC breaker switch turned off.

SPECIFICATIONS

MODEL		SPS-600	SPS-1000
Rated Power		600w	1000w
Battery Requirement		12v	24v
CHARGING			
Charging Mode		PV or Mains 10A or 20A Selectable	
PWM Solar Controller	Input voltage	12v	24v
	Charging current	30A Max.	50A Max.
AC MODE			
Input voltage		145 – 275v AC	
Input Frequency		46 – 65Hz	
Short Circuit		Breaker	
INVERTER MODE			
Output wave form		PURE SINE WAVE	
Transfer time		Typical 2-6ms, 10ms max	
Overload response		110% shut down within 60 sec	
		120% shut down within 5 sec	
Short circuit		System shuts down automatically	

NB. If appliances are plugged in that exceed the SPS rating, an audible warn beep will sound and overload will appear on the LED Display. Unplug the appliance immediately to avoid damage.. Excessively high powered items like hair dryers, kettles, irons, microwaves, vacuum cleaners, etc. will severely damage the CPU. **Damage caused by excessive overloading is not covered under the warranty.**

WARRANTY / MAINTENANCE

- The SPS has a 12 month comprehensive warranty from date of purchase.
- Battery warranty is pro-rata from date of purchase. A warranty of 6 months on gel or 12 months on lithium's is used to take into account the battery service time already used by individual customers.
- There are no serviceable parts inside the SPS. For any repairs please consult your distributor.
- If the system is disconnected for a long period of time, please recharge the batteries once every 3 to 4 months. It is important that they are not allowed to completely discharge as this will shorten their life expectancy.
- Lithium batteries will be required to be "woken up" if the BMS shuts down with a 12v charger over each battery.
- Use the power system in a dry, well ventilated area. Make sure it is upright and that all the vent holes are unobstructed.
- Do not use the unit in temperatures outside the range of 0 - 40 degrees centigrade.
- Always be aware of the potential risk of high voltage inside the power system.

SOLAR

- The SPS 600 and SPS 1000 both have a built-in solar controller.
- Solar panels can greatly increase the run time of the SPS during a power failure but the unit is cannot be used as an off-grid system.
- If solar panels are connected, they will automatically charge the batteries and run appliances during a power outage as long as there is sufficient sun. (See Solar Panels info below).
- All wiring must be performed by qualified personnel.
- A DC circuit breaker must be installed between the SPS inverter and PV panels.
- The appropriate cable type and size must be used.

PRO AC / PRO SOL

- The default and preferred setting is "PRO AC". In this mode mains AC power is used as long as it is there.
- If solar panels are installed and the AC power cuts, then solar will automatically be used in conjunction with the batteries to keep appliances powered.

PRO AC / PRO SOL (Continued)

- To use solar power only, even when AC is available, select “PRO SOL” (solar preferred) by double pressing the “power” button fast. This will drain your batteries if there is not sufficient power from solar available, especially at night time.
- To revert to “PRO AC” double press the “power” button again.

SOLAR PANELS

- The wattage of the solar panel (or combined panels) is up to the user but total charging current must not exceed 50A.
- **SPS 1000: Optimum charging** is achieved using a 32v-36v panel (or panels with a total combined voltage of 32v-36v). Do not go lower than 30Vdc or exceed 50Vdc.
- **SPS 600: Optimum charging** is achieved using 15v-18v panel (or panels with a total combined voltage of 15v-18v). Do not go lower than 15Vdc or exceed 30Vdc.
- Charging efficiency is maximized when PV voltage is close to OPTIMUM values below.

	SPS-600	SPS-1000
PWM Solar Charger Current	30A Max	50A Max
Optimum Vmp	15 Vdc	30 Vdc
Optimum Range	15v - 18v	32v – 36v
Max PV Voltage	30 Vdc	50 Vdc

Collections and deliveries are by appointment only.
All repairs & servicing must be booked in beforehand
Please contact us to make an appointment.



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