

# USER MANUAL



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SQUARE WAVE INVERTER

## **Dear Valued Customer,**

We congratulate you for your excellent choice of our SF POWERSMART. SF POWERSMART will provide you complete comfort during the absence of utility power and provide your appliances the exact replication of mains supply because of the latest Technology.

### **The salient features of SF POWERSMART**

- Controlled Output Voltage
- Automatic Battery Charge Management
- Dual Mode of Charging i.e. Normal & High Charging Rates through soft Touch Switches
- LED Indications for better user interface
- Automatic Overload, Battery Low, Over Temperature & Short Circuit protection sense
- Wide Mains Voltage Charging Range i.e. 100V – 290V
- Mains Low Voltage Charging Facility
- Great Power Saving
- Easy to Service
- No Humming Noise

This manual provides you thorough understanding of your SF POWERSMART and its optimum use.

Please read installation and operating instructions in the manual carefully. Before installing and using your SF POWERSMART. Pay special attention to the **CAUTION** and **WARNING** statements in this manual.

## About the SF POWERSMART

SF POWERSMART transforms Direct Current (DC) to Alternating Current (AC). The battery acts as a reservoir ensuring continuous supply when utility power is not available.

## Controls

### Front Panel

Graphic Description	Indication	Meaning
MAINS ON	Continuous Glow	Mains Present
	Blinking with beep sound	Mains fuse blown
BACK-UP ON	Continuous Glow	Back-up ON
BATTERY LOW	Continuous glow with beep sound	Battery Voltage Low
	Continuous glow without beep sound	Battery Voltage Low Cut
CHARGING/ CHARGED	Blinking	Battery Charging
	Continuous Glow	Battery Charged
OVERLOAD/ SHORT CIRCUIT	Blinking with beep sound	Overload Alarm
	Blinking without beep sound	Shutdown
	Continuous glow with beep sound	Short Circuit
ON/ OFF – ON	ON/ OFF Switch LED Glow	HOME UPS ON
ON/ OFF – OFF	ON/ OFF Switch LED Not Glow	HOME UPS OFF
HIGH CHARGING	High Charging Switch LED Glow	High Charging Mode
NORMAL CHARGING	High Charging Switch LED Not Glow	Normal Charging Mode
UPS MODE	UPS Mode Switch ON LED Glow	UPS Mode Operation
NORMAL MODE	Normal Mode Switch ON LED Glow	Normal Mode Operation

### Rear Panel

SF POWERSMART has two battery wires coming out from the rear side, a Thermal Circuit Breaker 7 / 10Amp (7Amp for PRO 700, PRO 900 & PRO 1200 and 10Amp for 1500), output socket and a three pin top power cord to connect with mains supply. Red coloured battery wire is to be connected to positive terminal of battery and black coloured wire to be connected to negative terminal of the battery.

**Caution: Do not reverse the battery connections, it will blow the DC fuse connected in series with battery connection inside the Power Card**



### **Personal Precautions**

- Someone should be your audible range to come to your aid when you work near batteries.
- Have plenty of fresh water and so nearby in case battery acid contacts skin, clothing or eyes
- Wear complete eye protection and clothing protection. Avoid touching eyes while working near batteries. Wash hands when done.
- If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eyes, immediately flood eyes with running cool water for at least 15minutes and get medical attention immediately.
- Never attempt to charge a frozen battery.
- Before touching battery terminal makes sure that the system front system is OFF and AC mains to the SF POWERSMART are also OFF.
- NEVER smoke or allow spark or flame in vicinity of the batteries.
- Remove personal metal items such as rings, bracelets, necklaces and watches when working electrical circuit. These items can cause a short circuit current high enough to weld a ring and may cause severe burns
- If it is necessary to remove any battery, always remove the grounded terminal from the battery first. Make sure all the accessories are off, so as not to cause arcing. Be sure that the area around the battery is well ventilated.
- Clean battery terminals. Be careful not to allow corrosion to come in contact with eyes.
- Study all battery manufacturers' specific precautions and recommended rate of charge.
- Add only distilled water in each cell until battery acid reaches level specified by the battery manufacturer. This helps purge excess gas from cells. Do not over fill. For a battery without caps, carefully follow manufacturer's charging instructions.
- CATUION: The SF POWERSMART should be connected to grounded, permanent wire system.

### **SPECIAL NOTICES:**

1. The SF POWERSMART charge is for use with a nominal supply voltage of 12V/ 24V DC.
2. No AC or DC disconnects are provided as an integral part of this system.
3. No over current protection for the battery supply is proved as an integral part of this system. Both AC & DC disconnects must be provide as part of the system installation.
4. No over current protection for the AC output wiring is provided as an integral part of the system. Over current protection of the AC output wiring is prided as part of the system installation.

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## Charging and Load Chart

### CHARGING MODE

PARAMETERS	SPECIFICATIONS			
	PRO 700	PRO 900	PRO 1200	PRO 1500
Charging Current (HC) $\pm 1.5\text{Amp}$	13Amp	14Amp	17Amp	
Charging Current (NC) $\pm 1.5\text{Amp}$	9.5Amp	10Amp	12.5Amp	
Battery Boost Voltage	14.4V $\pm 0.2\text{V}$			28.8V $\pm 0.4\text{V}$
Battery Float Voltage	13.7V $\pm 0.2\text{V}$			27.4V $\pm 0.4\text{V}$

### LOAD CHART SF POWERSMART PRO\*

Model	PRO 700				PRO 900				PRO 1200				PRO 1500			
	A	B	C	D		B	C	D	A	B	C	D	A	B	C	D
Options																
Computers (TFT)	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	3
Printer (Laser)	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1
TV (LCD 26")	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Tube light (40W)	3	0	2	1	4	0	3	1	6	0	4	3	8	0	6	2
Fan (80W)	3	0	3	2	4	0	3	3	6	0	5	3	8	0	6	4
CFL (15W)	4	28	5	3	4	37	5	5	4	52	8	8	4	62	9	5

\* Depending on the actual VA rating/technical specifications of the appliance. Specifications are subject to change without prior notice due to constant R&D effort. Accessories show in the picture is not the standard part of the product.

### APPLICATION CHART SF POWERSMART PRO\*

Back-up Power of electrical loads:

- Computer & Printer
- Fan, Tubelight CFL, LED Light
- T.V. Sets, DVD & Music System

\*Ideal for Computer & Printer.

## Installation

### Where to install

The system should be installed in a location that meets the following requirements :

- a) **Dry** – Do not allow water to drip or splash on the SF POWERSMART
- b) **Cool** – The ambient air temperature around the system should be between 0°C to 45°C (32°F to 113°F). Cooler environment is better for the system.
- c) **Ventilation:** Allow at least two inches (5cm) of clearance around the system for air flow.
- d) **Safe:** DO not install the SF POWERSMART in the same compartment as batteries or in any compartment which are storing flammable liquids such as gasoline.
- e) **Close to battery** - Install the system as close to the battery as possible in order to minimise the length of cable required to connect the system to the battery. It is better and cheaper to run longer AC wires than longer DC cables.

**CAUTIONS!** To prevent fire, do not cover or obstruct ventilation openings. Do not install the system in a zero - clearance compartment. Overheating may result.

**WARNING!** This equipment contains components which tend to produce arcs or sparks. To prevent fire or explosion do not install in compartment containing batteries or flammable materials or in locations which require ignition protected equipment.

### How To Install

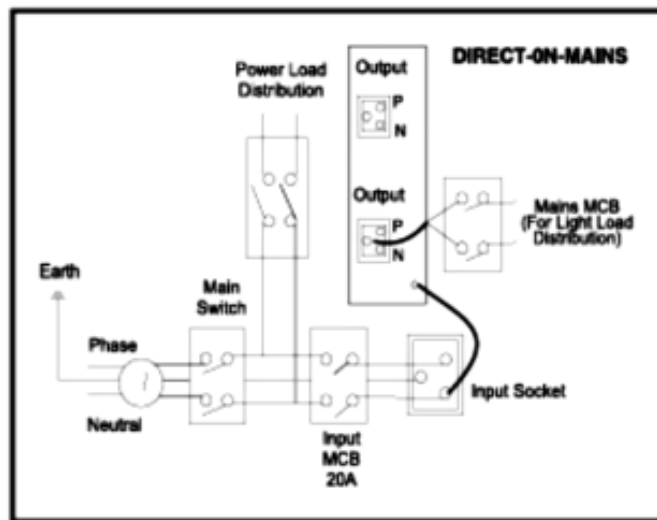
#### DC Cabling:

1. Ensure that the ON/OFF switch on the front panel of the UPS is in OFF position before you begin the installation.
2. Connect the negative terminal of the battery to the thick black wire of system
3. Connect the positive terminal of the battery to the thick red wire of system

#### AC Cabling:

Plug in the power cord to the mains socket on the wall. The cabling should have proper earthing.

Connect AC input supply to the 3 way terminal of the system such that the line is connected to 'L', neutral is connected to 'N' and earth is connected to 'E'. Input supply should remain ON once The system is installed. Take out from output socket.



### Start Operation

Once the AC and DC wiring have been installed and connected, take a moment to go re-examine all the connections and make sure they are secured and in the proper terminals.

1. Check to see that the SF POWERSMART is turned off and then apply battery (DC) power to it. Ensure that all wiring has been installed properly. Next turn on the battery bank DC disconnects or connect the proper fuse in line to the battery to complete the battery circuit.
2. Put ON/OFF switch to the ON position. This system should run a load without AC input (battery only). Place a load on the system and make sure it works.
3. To charge your batteries connect AC power to the system by lugging in the AC power and turning on the mains line. This shows that charger is working properly. Any AC load powered by the system should also work at this point since a portion of the AC power is passed through this SF POWERSMART to power the loads.
4. Disconnect the AC power the system should transfer to battery mode immediately. This will be indicated by clicking sound as the internal transfer relay changes position.
5. The system will begin to take power from the batteries and use it to power the load. And the load continues to operate uninterrupted.

The above steps will complete the functional test of the SF POWERSMART. If all areas pass, the system is ready for use. If something fail figure out the reason before proceeding or contact the service centre

### Maintenance

Very little maintenance is required to keep your SF POWERSMART operating properly. You should clean the exterior of the unit periodically with a damp cloth to prevent accumulation of dust and dirt.



## Troubleshooting Guide

Problems and Symptoms	Possible Cause	Solution
No Output voltage No Indication	Poor battery condition or battery connection loose	Use new battery or make proper connections
No output voltage Overload indication	Excess Load Applied	Reduce the excessive load from the SF POWERSMART & reset by ON/OFF Switch
No output voltage All LED Blinking	Thermal shut down	Call the service support. There is overheat problem in the system
Mains LED Blinking with Buzzer	Thermal Circuit Breaker Trip	Reset Thermal Circuit Breaker
Mains ON but Not Charging	UPS/ Normal Selection switch may be in UPS mode	Check Mains voltage & Selection of Normal / UPS mode as per specified voltage range

## Specifications

### Technical Specifications

Parameters	Model with Rating			
	PRO 700	PRO 900	PRO 1200	PRO 1500
Rating	700VA	825VA	1050VA	1500VA
No Load Output Voltage	235V ± 5V			
Output Frequency	50Hz ± 1Hz			
Output Wave Form	Modified Square Wave			
Nominal Battery Voltage	12V			24V
Battery Low Cut Off	10.5V ± 0.2V			21.0V ± 0.4V
Mains Input Voltage Range (at Normal Mode)	100V - 290V ± 10V			
Mains Input Voltage Range (at UPS Mode)	180V - 260V ± 10V			
Changeover Time - Mains to Back-up (UPS Mode)	≤ 10 msec			
Changeover Time - Back-up to Mains (UPS Mode)	≤ 10 msec			
Changeover Time - Mains to Back-up (Normal Mode)	≤ 40 msec			
Changeover Time - Back-up to Mains (Normal Mode)	≤ 10 msec			

## Marketing Division

6A, Hatibagan Road, Kolkata - 700 014

**Head Office** : 59-E, Chowringhee Road, Kolkata - 700 020



| [www.sfbatteries.in](http://www.sfbatteries.in)

Send 'HI' to  **6289011111** | Customer Care Number **1800 102 6060**  
For terms & conditions, please visit [www.sfbatteries.in](http://www.sfbatteries.in) | [customercare@sfbatteries.in](mailto:customercare@sfbatteries.in)