



PROFESSIONAL SOUND CORPORATION



## PSC PowerStar LiFE Zeus™

Portable Power Without Compromise



### Operational Manual for PCB Version 2.0

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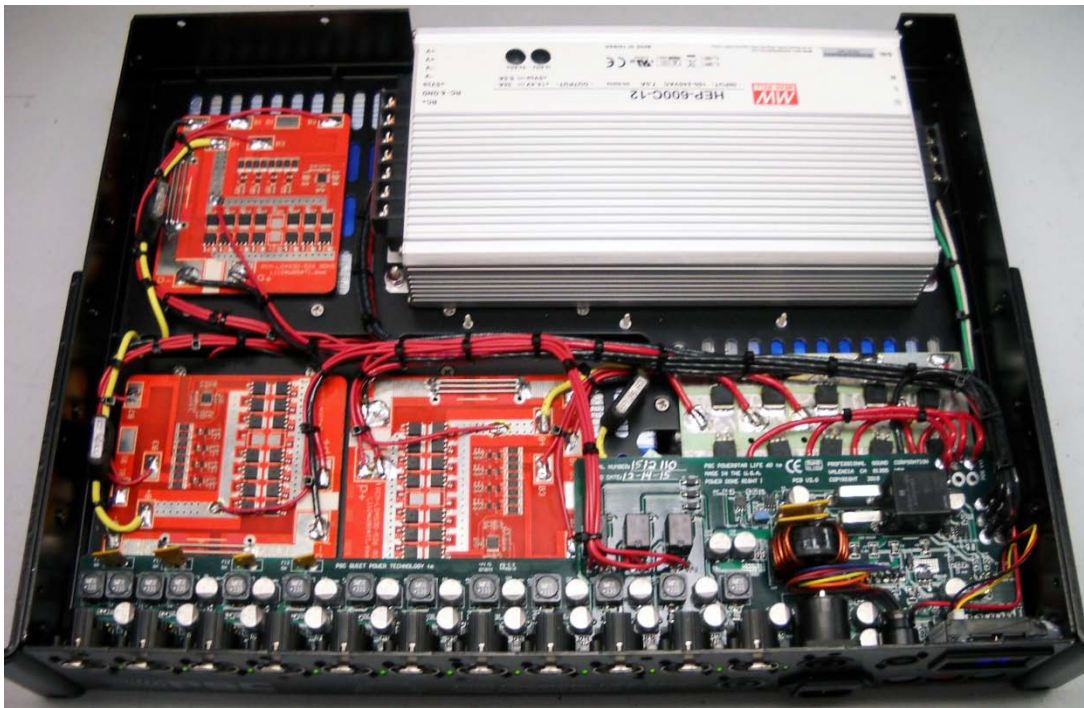
28085 Smyth Drive, Valencia, CA 91355 USA

CE RoHS Printed in the U.S.A.

Thank you for purchasing your new PSC PowerStar LiFE Zeus re-chargeable power distribution system. This new power system combines an AC Power Supply, Charger, LiFE Rechargeable Battery, Power Distribution, Power Filtering, Monitoring and Protection Circuitry all in a two rack mount space. We believe this design provides the ultimate rechargeable field power system.

The PSC PowerStar LiFE Zeus is the most powerful, well designed, reliable portable power system we have ever offered in our 30 years in business.

## Zeus.....Power Done Right!



Internal view of the PowerStar LiFE Zeus. Big, Powerful and Reliable

## **WARNINGS:**

- **PLEASE BE SURE THAT YOU HAVE READ AND UNDERSTOOD THIS ENTIRE OPERATIONAL MANUAL BEFORE OPERATING THE PSC POWERSTAR LIFE ZEUS!**
- **CAUTION! THE CASE OF THE POWERSTAR LIFE ZEUS MAY GET HOT DURING USE. DO NOT ALLOW ANYTHING TO BLOCK THE SILVER COLORED AC POWER SUPPLY AND OTHER VENT OPENINGS. ALWAYS ALLOW AT LEAST A ONE RACK SPACE AIR GAP ABOVE THE UNIT FOR PROPER AIR CIRCULATION AND COOLING. ALL AUXILIARY EQUIPMENT SHOULD BE REVERSE POLARITY PROTECTED AND PROPERLY FUSED AT ALL TIMES.**
- **THE POWERSTAR LIFE ZEUS IS DESIGNED FOR USE BY ITSELF OR WITH AN EXTERNAL PSC PELICAN LIFE BATTERY AND IS FACTORY ADJUSTED FOR PROPER CHARGING OF THIS BATTERY TYPE ONLY!**
- **THERE ARE NO USER ADJUSTABLE OR USER SERVICABLE PARTS INSIDE THE POWERSTAR LIFE ZEUS. PLEASE REFER ALL SERVICE AND MAINTANCE WORK TO A QUALIFIED TECHNICIAN. DANGER! THERE ARE HIGH VOLTAGES AND CURRENTS INSIDE THE UNIT THAT CAN BE DANGEROUS AND/OR LETHAL. DO NOT OPEN OR DISASSEMBLE THIS DEVICE.**
- **DO NOT REPLACE ANY OF THE CASE SCREWS WITH SCREWS THAT ARE LONGER THAN THOSE USED BY PSC. THE USE OF LONGER SCREWS CAN CAUSE DAMAGE TO THE DEVICE AND WILL VOID YOUR WARRANTY. PLEASE CALL PSC IF YOU NEED ANY REPLACEMENT SCREWS AND WE WILL BE HAPPY TO SUPPLY THEM TO YOU.**

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**LiFE BATTERY SAFETY:** This new product design is based on Lithium Iron Phosphate battery chemistry.....also known as “LiFE” or “LiFePO4”. LiFE cells offer high capacity in a lightweight package similar to Lithium Polymer or Lithium Ion cells, but with one big improvement. LiFE chemistry is much more inherently safe as it does not suffer from temperature runaway conditions like older lithium chemistries do. The older lithium batteries were prone to fire if physically damaged or short circuited. These new LiFE batteries have proven to be a much safer alternative. While this battery chemistry is considered to be very safe, the TSA (Transportation Safety Administration) has not yet made the distinction between these LiFE lithium cells and the older less safe lithium technologies. Please read and understand all transportation regulations before shipping any batteries. Your new PSC PowerStar LiFE Zeus contains 12.8@60 AH (768 watt hours) of LiFE batteries. Because of this high capacity lithium system, this device cannot be shipped via air transport. **This device should only be shipped via ground transportation. Because of this, this device cannot be shipped and sold in Europe. Never ship your PSC PowerStar LiFE Zeus if it has been physically or electrically damaged.**

All AC powered devices should be treated with proper caution and respect. AC power on film sets and on locations may not always be properly grounded and/or distributed. PSC highly recommends that you purchase and use an AC power tester prior to plugging in your PSC PowerStar LiFE Zeus or any other AC powered device while on location. You can purchase simple to use, inexpensive AC testers for less than \$15. They are a simple plug that has 3 or 4 lights on the rear of the plug. These lights indicate good AC, proper grounding, etc. They can also indicate dangerous AC conditions such as Hot and Neutral reversed or missing grounds. These AC testers can be purchased at most electronics and home improvement stores. Here is an example of a typical AC Tester. PSC does not recommend any specific brand or take responsibility for its use or performance.



**Typical AC Tester of the type you should use before plugging into AC on a film set or location.**

**FRONT PANEL:** The front panel of the PSC PowerStar LiFE Zeus contains:

- Eleven (11) DC power output connections on 4 pin female XLRs. Two (2) of these XLR outputs are rated for 8 Amps, Two (2) are rated for 5 Amps and the remaining seven (7) are rated for 3 amps each.
- A 4 pole SpeakOn output connector used to connect the unit to an external DC to AC Inverter used for powering a Yamaha or similar mixer.
- A 2 pole SpeakOn connector used to connect to an external PSC Pelican LiFE Battery.
- An 8 pin Neutricon female connector is used to connect the Power Star LiFE Zeus Remote Control.
- An AC indicating BLUE LED.
- A Multi Colored LED “Fuel Gauge” to indicate battery charge level.
- Power “ON” and “OFF” push button switches (delayed action for “OFF” switch)
- A LiFE battery protection circuit “RESET” switch.
- Dual, digital LED Volt and Current Meter to display battery and output voltage and current.
- AC power connection. This connection accepts a standard IEC power cord. You will also notice that just below the AC cord socket is a built in fuse holder that holds the AC protection fuse. This unit uses a 250v, 15 Amp, slow blow, 5 x 20mm fuse. A spare fuse is included inside the fuse holder drawer.



**REAR PANEL:** On the rear panel of the PowerStar LiFE Zeus you will find all of the various operating specifications, warnings, safety information, etc. **Please read and understand all of this information before operating your new PowerStar LiFE Zeus.**



**Rear Panel showing Specifications, Warnings, Safety Information, etc.**

**Please read and understand all of the rear panel information before operating the unit.**

**RACK MOUNTING:** Your new PowerStar LiFE Zeus is designed to be rack mounted. It comes with a pair of heavy duty rack mount brackets. These brackets can be used from the front of the unit or the rear of the unit. Screws for installing these brackets are included. Please only use 6-32 x 0.375" screws with this Power Star LiFE. The use of longer screws may cause internal damage to the unit. These rack mounting brackets can be installed in many positions to allow front or rear mounting as well as offset mounting to allow room for the cable mounted XLRs to not protrude beyond the face of your rack system.



**Standard Rack Ear Position**



**Recessed Rack Ear Position**

**HEAT SINK:** The PSC PowerStar LiFE Zeus uses a large, heavy duty AC supply/charger that is housed in a custom made extruded aluminum heat sink to provide proper system cooling. This properly engineered cooling system uses convection cooling to pull heat away from the unit's power supply. This silver colored heat sink should be kept clean and dust-free during use. The PSC PowerStar LiFE Zeus does not use a fan for cooling. If the heat sink becomes covered with dust, it will not properly function and you may cause damage to your device. **PSC recommends that you blow off the heat sink area with compressed air monthly to keep the heat sink clean.** You must leave open space above and to the sides of the PSC PowerStar LiFE Zeus for proper cooling to take place. A minimum of 1 rack space (1.75") should be left open above the unit for cooling purposes. Likewise, this product should not be used in fully enclosed rack case or other enclosures that limit air flow. Failure to provide proper ventilation can and will damage the unit and will void your warranty.



**Close up view of the silver colored heat sink extrusion that must be kept clean.**

**Always keep one (1) rack space above this unit open for proper air circulation and cooling.**

**DC OUTPUT CONNECTIONS:** There are eleven (11) XLR female DC output connectors located on the front panel of the PSC PowerStar LiFE Zeus. The first two (2) XLRs located to left hand side of the unit are rated for 8 Amps of output current. The next two (2) XLRs are rated for 5 Amps of output current. The remaining seven (7) output connectors are all rated for 3 Amps of output current. Each connector is individually Polyfuse protected and monitored via the

adjacent LEDs. If the connector is working properly, the GREEN LED will be lit. If the Poly Fuse has been tripped (short circuit in your cable or equipment) the GREEN LED will turn off and the YELLOW LED will turn on indicating a fault condition. Under normal conditions, you should never see any YELLOW LEDs. If you see a YELLOW LED, there is a problem and you should investigate the cable and device connected to that particular output connector immediately. If you ever have any questions about this, please do not hesitate to call PSC and ask to speak with our service technician. We are always available to help you in any way needed.



**Typical output XLRs (8 Amp and 5 Amp Shown, 3 Amp also available)**

**POWER SWITCHES:** There are two round, momentary push button switches used to turn the unit on and off. The GREEN “ON” push button switch is used to turn the unit on. The RED “OFF” push button is used to turn the unit off. **Please note that the RED “OFF” push button switch is equipped with a time delay circuit. You must press and hold this push button switch for 4-5 seconds before the unit will shut off.** This time delay function serves to keep you from accidentally shutting down the PSC PowerStar Life Zeus unexpectedly while working.



**RED and GREEN Power On and OFF switches**



**RESET SWITCH:** The PowerStar LiFE Zeus is equipped with a “reset” switch. This switch is used to manually “reset” the LiFE battery protection circuitry should the need ever arise. The Protection Circuitry protects the LiFE battery in four different ways:

1. It protects the battery from deep discharge conditions.
2. It protects the battery from over charge conditions.
3. It protects the battery from overly high discharge rates (short circuits).
4. It protects the battery from excessive charge currents.

In addition, this protection circuitry actively balances the individual LiFE cells during charging to increase their useful life.

If you were to somehow short out multiple outputs of the PSC PowerStar LiFE, the battery protection will disconnect the batteries from the load. If this happens, there are two ways to reset the protection circuitry: One way is to simply plug the unit into AC power and the protection circuitry will reset itself. The second way to reset the protection circuitry is to press the reset button momentarily. This will reset the LiFE protection circuits even if you have no AC power available. This manual reset button is a PSC exclusive feature.



**“RESET” switch located under the AC LED**

**FUEL GAUGE:** The PSC PowerStar LiFE Zeus is equipped with an easy to read and easy to understand multi-colored battery “Fuel Gauge”. Just a quick glance and you will immediately know the charge condition of your battery. A full row of Green LEDs indicated a fully charged battery. As the battery is discharged, the LEDs slowly go out. It is similar to reading the fuel gauge in your car. When the last (left most) Red LED goes out, the unit will shut down to protect the LiFE batteries from deep discharge. The unit must then be plugged into AC power

to re-charge the batteries and/or power up your equipment. Both functions can be done simultaneously.



**Battery “Fuel Gauge” indicating a fully charged battery**

**AC INDICATOR:** Whenever the unit is plugged into AC power, the BLUE “AC” LED will light indicating AC power is connected. Whenever the AC indicator is lit, the batteries will be charged (if needed). In addition, you can power your equipment anytime the unit is connected to AC power whether or not the battery is fully charged. Please note that the blue AC indicating LED may stay lit for a few moments after the unit is unplugged for AC. This is a normal function.



**Unit Not Plugged Into AC Power**



**Unit Plugged Into AC Power**

**REMOTE CONTROL:** The remote control box that is included with your PSC PowerStar LiFE Zeus serves several functions. It can be used to remotely turn the unit on and off. This will allow you to mount the main PowerStar LiFE Zeus housing in a convenient place on your sound cart. The remote control also has a battery charge level indicating “Fuel Gauge” that duplicates the fuel gauge on the main unit. It also contains the same dual digital LED volt and current meters found on the main unit. Additionally, the remote control features four USB charging ports for your convenience. These four USB charging ports output 5Vdc up to a total of 4 Amps of output current. Lastly, the remote control box features a bright BLUE LED indicating AC power is connected to the PowerStar LiFE. **Please note that the Power toggle switch is momentary in action. Simply flip the powers switch upward momentarily to turn the unit “ON”. You must press and hold the power toggle switch downward for about 5 seconds to turn the unit “OFF”. This delayed “OFF” action is designed to make sure you do not inadvertently turn off your PowerStar LiFE Zeus by accident while working.**



### Power Star LiFE Remote Control Box

**EXTERNAL BATTERY, 2 POLE SPEAKON CONNECTOR:** The PSC PowerStar LiFE is equipped with one 2 pole SpeakOn connector. This connector is used for the connection of an optional external battery. Using this connector, you can add a PSC Pelican LiFE Battery for extra battery capacity. The polarity of this connector is conventional SpeakOn. The center most contact is Positive (+) and the outer ring connection is Negative (-)



2 Pole SpeakON Connector



Optional PSC Pelican LiFE Battery – 12.8V, 20AH

## INVERTER, 4 POLE SPEAKON CONNECTOR:

Your new PSC PowerStar LiFE Zeus is equipped with a 4 pole SpeakOn connector used for powering of external DC to AC Inverters. These inverters are typically used to power AC powered mixers such as those made by Yamaha and others. The output power of this connector is limited to about 18 Amps. This connector will power up most commonly used inverters in the sound industry. PSC does not make specific recommendations for inverter brands and models. Most of our customers use 400 to 1000 watt inverters in order to keep the operating temperatures of the inverters low and the fan operation of the inverter minimized. Keep in mind that just because you have a 1000 watt inverter, that does not mean the PSC PowerStar LiFE Zeus will provide enough output current to allow the inverter to provide 1000 Watts. **We recommend that you only load your inverter with a maximum of about 150 watts.** The 4 pole SpeakOn connector is wired as follows: SpeakON Pins marked "1+" and "2+" are wired for positive voltage to the inverter. SpeakON Pins marked "1-" and "2-" are wired to the negative or ground connection of the inverter. Please use 12AWG wires for your inverter wiring and keep the length of the wires to a minimum. We recommend that you keep the length of the 12AWG wires to the inverter to less than 3 feet.



**4 Pole SpeakON**



**Optional PSC Zeus Inverter Cable**

**CHARGING:** PowerStar LiFE Zeus contains a built in charger designed to charge the internal LiFE battery and also charge any external LiFE battery such as the PSC Pelican Life Battery. This allows you to connect an external battery to increase the battery capacity of the PowerStar LiFE Zeus. The PSC PowerStar LiFE Zeus will operate from a wide range of AC power so you can plug it in anywhere in the world without having to worry about making adjustments. The charger circuit used in the PowerStar Life Zeus has been specifically designed for charging the batteries while the batteries are in use powering low noise audio equipment. Unlike most battery

chargers, ours have a very low noise floor. Typical recharge time ranges from 1.5 to 2 hours. The charging function is automatic and thus, it does not require your assistance in any way. Simply plug the PSC PowerStar LiFE Zeus into an AC outlet and the charging begins (when needed). Be aware that the PowerStar LiFE Zeus may get warm during use. Be careful when touching the surface of the PowerStar LiFE Zeus heat sink as this part may be HOT! Be sure to allow ventilation air gaps around the top panel and sides of the PowerStar LiFE Zeus for proper heat dissipation. When using an additional external battery such as the PSC Pelican LiFE Battery, be sure to use a heavy-duty interconnect cable. This cable should be made with 12AWG wire and must use SpeakOn connectors. Please keep this and all battery cables as short as possible for best performance. We recommend a maximum external battery cable length of 3' (1M).

**EQUIPMENT POWER CABLES:** PSC recommends that you use only two conductor, unshielded 16AWG power cable for power distribution. Shielded cable is not recommended as the shield may cause short circuits between adjacent pins on the connectors. Please keep all cables as short as possible as this will minimize DC voltage drop across the cable.

**WARNING:** It is highly recommended that you have your cables built by qualified personnel and tested prior to use with your Power Star LiFE. All power cables should be clearly labeled on both ends as to what they are to be connected to. For example, label one end "PowerStar LiFE Zeus" and the other end "Solice Mixer". This will help prevent inadvertently connecting the cables to the wrong piece of equipment. We cannot stress enough the importance of good quality power cables and careful connections. Poorly constructed and/or labeled cables can result in equipment damage!

**PSC QUIET POWER TECHNOLOGY™:** All PSC power products contain PSC Quiet Power Technology™. This power filter technology allows the PSC PowerStar LiFE Zeus to deliver clean, quiet DC power for all of your sound equipment powering needs. These filters include both audio and RF frequency filters to ensure trouble free DC power distribution in the field. Nearly all of today's audio equipment contain DC to DC converters within their power supplies. These converters can and will cause inter-modulation noise when connected to common DC power sources such as a battery. Here at PSC we firmly believe that proper DC filtering can and will eliminate most noise issues in the field. Our competitors do not understand inter-modulation noise and thus do not take the additional steps to prevent it like we do at PSC. Though not every piece of equipment will suffer from inter-modulation noise issues, we at PSC believe that the extra parts cost and design time are worth it if it solves even one issue in the field. Why do we spend the extra \$200.00 to include these parts? Because we think you deserve the best quality DC power available.



**PSC Quiet Power Technology™ Filters partially shown behind output XLRs.**

**LIFE BATTERY FUSING:** Internally, the LiFE cells are protected against many typical faults via electronic monitoring and automatic fault protection circuitry. This design utilizes 3 separate 20 amp hour LiFE battery packs wired in parallel for highly reliable, redundant operation. Each of these three battery packs is monitored via its own LIFE protection circuitry. In addition, there is a 30Amp Slow Blow automotive blade style fuse in series with each of these three battery packs for ultimate safety. These fuses should never blow in normal use. If you ever experience a blown internal fuse, something is wrong with your setup. Please call PSC for technical assistance.

**POWER OUTPUT FUSING:** Each of the 4 pin XLR power outputs are individually Polyfuse protected. We use Polyfuses due to their reliability and the fact that they reset automatically upon power down. This saves you the user from having to keep replacement fuses on hand. If an output Polyfuse trips, the green LED next to that particular output connector will go out and the Yellow LED will light indicating a blown Polyfuse. If this happens, please check the power cable and device plugged into that particular power output. Powering down the system for about one minute will reset the Polyfuse and allow normal operation.

**STORAGE:** Please note that all rechargeable batteries slowly self discharge while in storage. If you store this battery, it must be fully recharged prior to storing it. It should also be charged every month while in storage. Failure to follow these instructions will cause damage to the battery and will not be covered under the PSC warranty.

**TERMS OF USE:**

THE IMPROPER CONNECTION OF THIS POWER SUPPLY TO AUXILIARY EQUIPMENT MAY RESULT IN DAMAGE TO SAID EQUIPMENT AND/OR PERSONAL INJURY. THIS PRODUCT IS DESIGNED TO BE OPERATED BY PROFESSIONALS IN THE FILM AND TELEVISION INDUSTRIES ONLY. THE PSC POWER STAR LiFE ZEUS SHOULD ONLY BE OPERATED AFTER READING AND UNDERSTANDING THIS ENTIRE INSTRUCTION MANUAL. THE OPERATOR OF THIS POWER SUPPLY ASSUMES ALL RESPONSIBILITY AND LIABILITY FOR PROPER USE AND OPERATION OF THIS EQUIPMENT! PROFESSIONAL SOUND CORPORATION AND/OR ITS EMPLOYEES AND OFFICERS ASSUME NO RESPONSIBILITY OR LIABILITY FOR PERSONAL AND PROPERTY DAMAGE INCURRED DUE TO ACCIDENT, CARELESS HANDLING, ABUSE OR MISUSE, IMPROPER CONNECTION, AND/OR INSTALLATION, IMPROPER ELECTRICAL CONTACT OR GROUNDING. THIS DEVICE MUST BE USED IN A CLEAN, DRY ENVIRONMENT TO INSURE PROPER USER AND EQUIPMENT SAFETY. OWNERSHIP AND/OR USE OF THE PSC POWER STAR LiFE CONSTITUTES AGREEMENT WITH THESE TERMS.

## **Limited Warranty Certificate**

Professional Sound Corporation warrants the Power Star LiFE Zeus individual cells to be free of defective material and workmanship for a period of 6 months (LiFE Cells only). Furthermore, Professional Sound Corporation warrants the remaining electronics, housing and other parts to be free from defective material and workmanship for a period of one year from the original date of purchase and agrees to repair or replace such defective parts or the whole product at its option, provided that the equipment is returned to Professional Sound Corporation. Shipping and insurance costs to and from Professional Sound Corporation must be prepaid by the owner. This warranty does not cover damage due to accident, careless handling, abuse or misuse, improper connection and/or installation, improper electrical contact, wet or overly dusty location or other improper operating environment, improper electrical connection, charging or grounding. This warranty will be null and void in the event of removal, alteration or tampering with the serial number, or by service or repair work not performed by Professional Sound Corporation. Proof of purchase date (copy of invoice or Warranty Certificate) must be furnished before warranty service will be performed. This warranty is in lieu of any other warranty, expressed or implied, including warranties without limitation, products being merchantable at the time of purchase or suitable for a particular purpose. This warranty does not extend to, or include consequential damage.

**SPECIFICATIONS:**

**SIZE:** 17.50" wide, 13.50" deep, 3.5" high (44.5cm x 34cm x 7.6cm)

**WEIGHT:** 31 lbs (14Kg)

**TEMPERATURE RANGE:** Use: -4F to +124F (-20C to +50C)

**AC INPUT:** 100 – 240Vac, 47Hz -63Hz

**AC INPUT FUSE:** 15Amp, slow blow, 5 x 20 mm Glass

**OUTPUTS:** 4P XLRs: 2 x 8Amp, 2 x 5Amp, 7 x 3Amp

4P SpeakOn for Inverter: 18 Amps

**OUTPUT VOLTAGE:** 12.8Vdc Nominal

**OUTPUT CURRENT:** On LiFE Battery, 60 Amps. AC only, 35 Amps

**CHARGING TIME:** Typical Cart 3 hours, No Load (all equipment off) 1.5 to 2 hours

**USB CHARGING PORT:** 4 Ports, Total Output 5Vdc at 4 Amps

**LIFE BATTERY CAPACITY:** 12.8 Volts @ 60 Amp Hours (768 watts)

**BATTERY CONNECTOR:** SpeakOn 2 Pole (Mating connector Neutrik NL2FC)

**INVERTER CONNECTOR:** SpeakON 4 Pole (mating connector Neutrik NL4FC)

**Warranty:** Electronics and Case, 1 year, Limited

Life cells, 6 Months, Limited



# CE

## DECLARATION OF CONFORMITY

**EMC:** This product is in compliance with the Electromagnetic Compatibility Directive, 89/336/EEC as defined in EN 50081-1, EN55022 and EN 50082-1. IEC801-2, IEC801-3 and IEC801-4.

**LVD:** This product is in compliance with the requirements of the Low Voltage Directive, 73/23/EEC. 93/68/EEC as defined in EN60065, 1993 and/or EN60950/A1/A2/A3: 1995

**TRADE NAME:** PSC

**MODEL:** PowerStar LiFE Zeus Power Distribution System

**RESPONSIBLE PARTY:** Professional Sound Corp.  
28085 Smyth Drive  
Valencia, CA 91355 USA

**CONTACT PERSON:** Ronald Meyer  
(661) 295-9395

**TYPE OF PRODUCT:** Rechargeable Battery, Power Distribution

**MANUFACTURER:** Professional Sound Corp.  
28085 Smyth Drive  
Valencia, CA 91355 USA

We hereby declare that the equipment bearing the trade name and model number listed above has been tested in accordance with the requirements contained in the above listed directives. All necessary steps have been taken and are in force to assure that production units manufactured will conform to Directive guidelines.

November 2015

Professional Sound Corporation.