



SSG SERIES®

Industrial-Grade UPS® Tower

U.L. Listed for -20°C to +55°C Operation

USER'S OPERATIONS MANUAL





FALCON'S UNINTERRUPTIBLE POWER SYSTEM MODELS COVERED IN THIS USER'S OPERATING MANUAL

- ✓ SSG1.5K-1T - 1.5kVA, 1050W, 120Vac
- ✓ SSG1.5K-2T - 1.5KVA, 1050W, 230Vac
- ✓ SSG2.2K-1T - 2.2kVA, 1540W, 120Vac
- ✓ SSG2.2K-2T - 2.2kVA, 1540W, 230Vac
- ✓ SSG3K-1T - 3kVA, 2100W, 120Vac
- ✓ SSG3K-2T - 3kVA, 2100W, 230Vac



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Important Safety Instructions

SAVE THESE INSTRUCTIONS

Retain This User Manual

This manual contains important instructions which must be followed during the installation, operation, and maintenance of the SSG Series UPS, battery banks, options, and battery replacement.

Please read all instructions before operating this equipment and save this manual for future reference.

All of the models presented herein are designed for installation and use in a temperature controlled environment, free of contamination.

This UPS operates from utility power and contains a number of high current back-up batteries; this information is important to all personnel involved. Please read this manual first before continuing to unpack, install or operate this UPS.

Transportation

This UPS must be handled with care and given special attention due to the high amount of energy stored within its internal sealed, lead-acid batteries. Please retain the shipping container in the unlikely event the UPS needs to be returned for service. The container has been specifically designed to ship the UPS safely without shipping damage.

Operating Conditions

This UPS must be installed in a clean environment, free from moisture, flammable gases or fumes and corrosive substances. Operate the UPS in an indoor environment with an ambient temperature range of -20°C to +55°C (-4°F to +131°F).

This UPS is designed for use with industrial, scientific or data processing class equipment.

DO NOT USE TO POWER LIFE SUPPORT EQUIPMENT OR OTHER DESIGNATED "LIFE CRITICAL" APPLICATIONS.



The maximum UPS output load (in watts) must never exceed that shown on the UPS rating label. NEVER CONNECT equipment that could overload the UPS or demand half-wave rectification from the UPS, for example: electric drill motors, vacuum cleaners or hair dryers.

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

WARNING

This UPS should be installed according to the instructions in this manual. Failure to do so could result in unsafe operation and could invalidate your warranty.

WARNING

Once batteries have reached the end of their life, ensure they are disposed of properly.

PLEASE REFER TO YOUR LOCAL LAWS AND REGULATIONS FOR BATTERY RECYCLING REQUIREMENTS. NEVER DISPOSE OF BATTERIES IN A LANDFILL.

Do not dispose of batteries in a fire. The battery may explode. Do not open or mutilate the batteries. Released electrolyte can be toxic and is harmful to skin and eyes.

CAUTION

A battery 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

1.0

INSTALLATION

Inspecting the Equipment

Visually inspect the UPS for shipping damage. If the equipment has been damaged during shipment, and is signed for as received, make sure the receiver slip is noted with the detail of the damage exception. Keep the shipping cartons and packing materials for the carrier, and immediately file a claim for "shipping damage" with the carrier. If you discover damage after acceptance, file a claim for "concealed damage."

To file a claim for shipping damage or concealed damage:

1. **YOU MUST** file with the carrier within **24 hours of receipt** of the equipment;
2. **YOU MUST** send a copy of the **damage claim within 15 days** to Falcon Electric, Inc.

Contents

This UPS is shipped complete with all the cables required for operation, as well as UPSILON software, unless ordered with the SNMP option. A full list of the box contents is provided as follows:

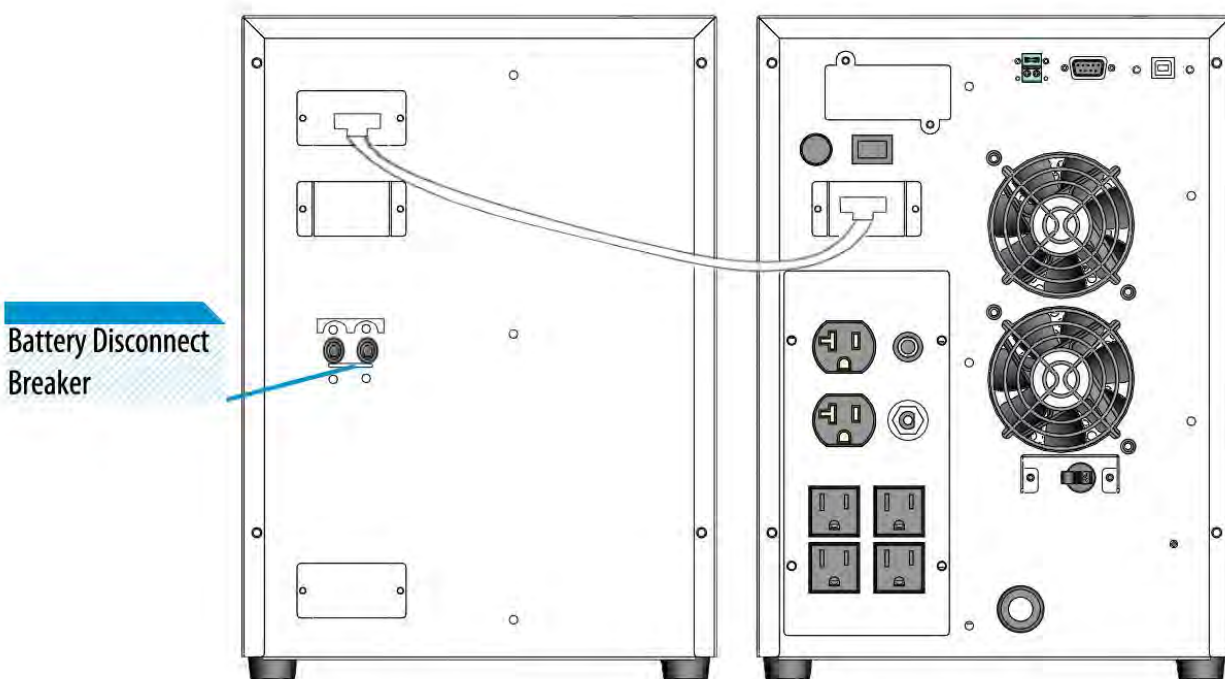
- ✓ UPS module with battery
- ✓ RS-232 cable
- ✓ Software CD
- ✓ User's manual
- ✓ Power cord (if not rear panel connected)

Installation

CAUTION

The UPS and auxiliary battery box is heavy. Take proper precautions when lifting or moving it.

1. Install the UPS indoors in a controlled environment.
2. Place the UPS in an area with unrestricted airflow around the unit, away from water, flammable liquids, gases, corrosives, and conductive contaminants.
3. Attach the input line cord, if not already connected, to the input inlet at the rear of the unit.
4. Maintain a minimum clearance of 4 inches in the front and rear of the UPS.
5. Maintain an ambient temperature range of 0°C to 40°C (32°F to 104°F), to maximize the lifetime of the batteries. An ambient temperature of 20°C to 25°C (68°F to 77°F) is recommended.
6. The internal battery disconnect fuse is shipped in a separate bag, attached to the cooling fan grill on the rear panel.
 - a) Remove the bag from this location.
 - b) Remove the fuse from the bag.
 - c) Press and hold the pre-charge button on the rear panel (see rear panel diagrams and overview in the following section) for 3 seconds.
 - d) Insert the fuse into open fuse holder on rear panel.
 - e) The internal battery is now connected within the UPS.
7. If full rated battery backup time is mandatory for immediate operation, allow the system to operate a minimum of 8 hours prior to connecting a critical load. Otherwise, the unit is now ready for normal operation.



If connecting an external auxiliary battery box (SSGB):


- ✓ Remove battery connector cover plates on UPS and SSGB.
- ✓ Connect cable (supplied with SSGB) to the UPS and to one connector port (top) of SSGB.
- ✓ Activate the system by closing the battery disconnect breaker on the SSGB rear panel.


2.0


SSG COMPONENT OVERVIEW


Display and Controls


The diagram below shows the basic functions of the front panel LCD for the SSG Series 1.5kVA-3kVA UPS models. Refer to the LCD symbols in the left hand column, below for their functional interpretation:


 **Utility Power Status:** The *Line Cord* icon will be displayed when rated utility power is present.


 **PFC Status:** The *Sinewave* icon will be displayed when Input Power Factor Correction (PFC) is functioning.


 **Inverter Status:** The *Generator* icon will be displayed when the UPS is operating in the Inverter mode.

 **Charger Status:** When the battery charger is operating, the *Gas Pump* icon will be displayed.

 **Output Load %:** The greater the load, up to three vertical bars, will be illuminated at the top of the *Weight Lifter* icon. Each bar represents approximately 25% of the UPS output rating.

 **Battery Mode:** When the UPS is operating from the battery, the *Scissor Lift* icon will be displayed.

 **Battery Level:** The *Battery Cell* icon indicates the battery capacity. The more battery capacity available, the more internal bars will be illuminated. Each bar represents approximately 25% capacity.

 **Fan in high speed mode:** The *HS Fan* icon is displayed when the UPS cooling fan is in high speed mode, typically during battery mode operation.



Front Panel LCD



Fan in medium speed mode: The *MS Fan* icon is displayed when the UPS cooling fan is in medium speed mode, typically when utility is present and the inverter is supporting some of the load.



Fan in low speed mode: The *LS Fan* icon is displayed when the UPS cooling fan is in low speed mode, typically when the UPS is in bypass, or not supporting a load.



Audible Alarm: The *Speaker* icon will be displayed during an alarm condition. It will flash when the audible alarm has been silenced by the *Alarm Silence* button.



Test: The *Test* icon will be displayed and will flash whenever the UPS is conducting a Self/Battery Test, prompted by pushing the *Test (F)* button.



UPS Fault Condition: The *Exclamation* icon will be displayed when an alarm condition exists. Refer to the trouble shooting section of this manual to interpret and correct any alarm condition.



Green Mode: The *Bulb* icon is displayed continuously when the Green Mode function is enabled. It will flash when the UPS has switched to Green Mode due to the UPS output load decreasing to less than 3% of the total UPS output rating. The UPS is shipped with the Green Mode disabled. See Green Mode setting instructions in the setup, configuration & programming section.



Function/Test Button: This is a multifunction key that:

- ✓ Performs a self-test of the system
- ✓ Moves through each BIT in the programming mode



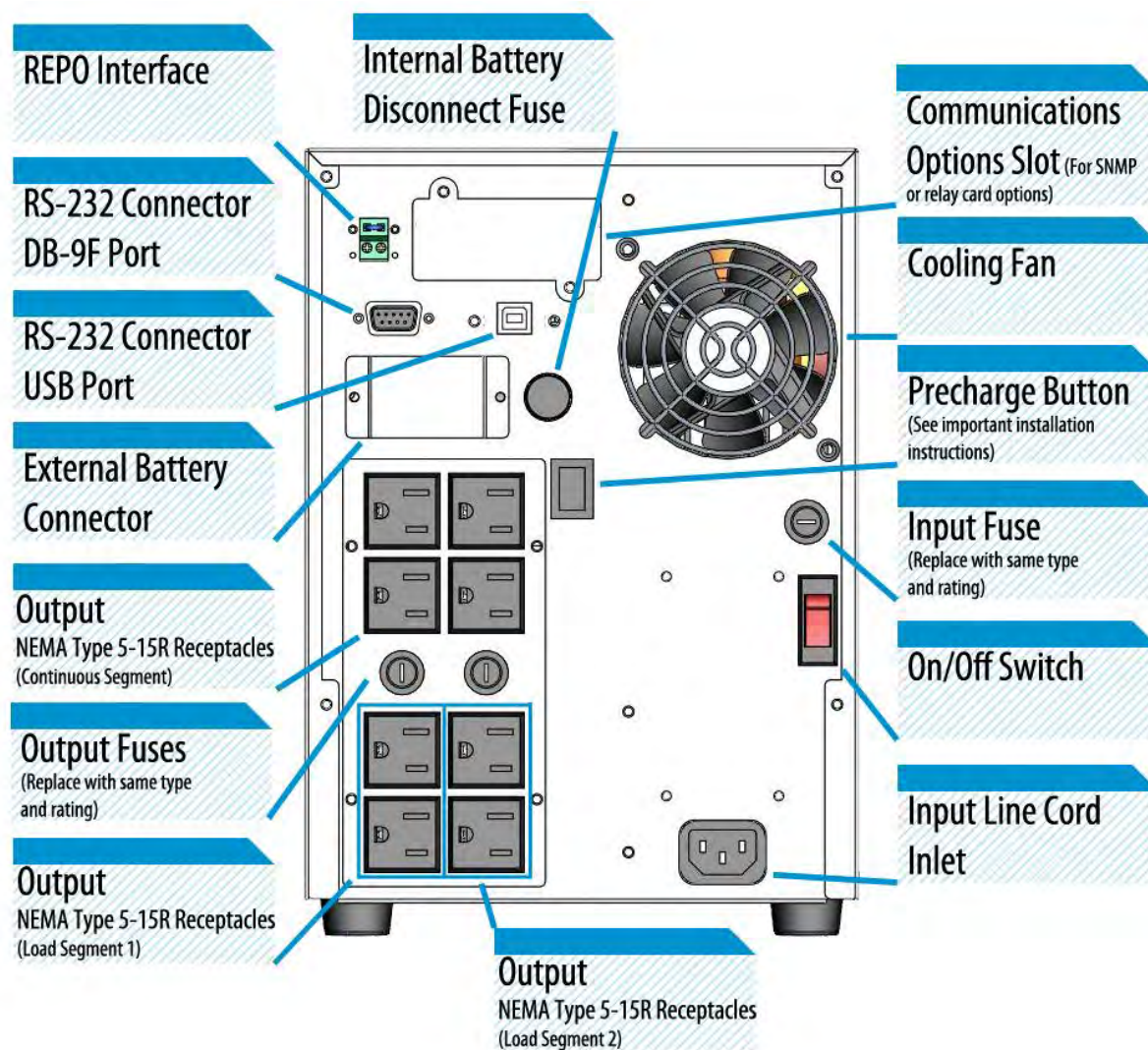
Set/Alarm Silence Button: This is a multifunction key that:

- ✓ Scrolls through UPS input and output operating parameters
- ✓ Silences the audible alarm
- ✓ Acknowledges (sets) program settings

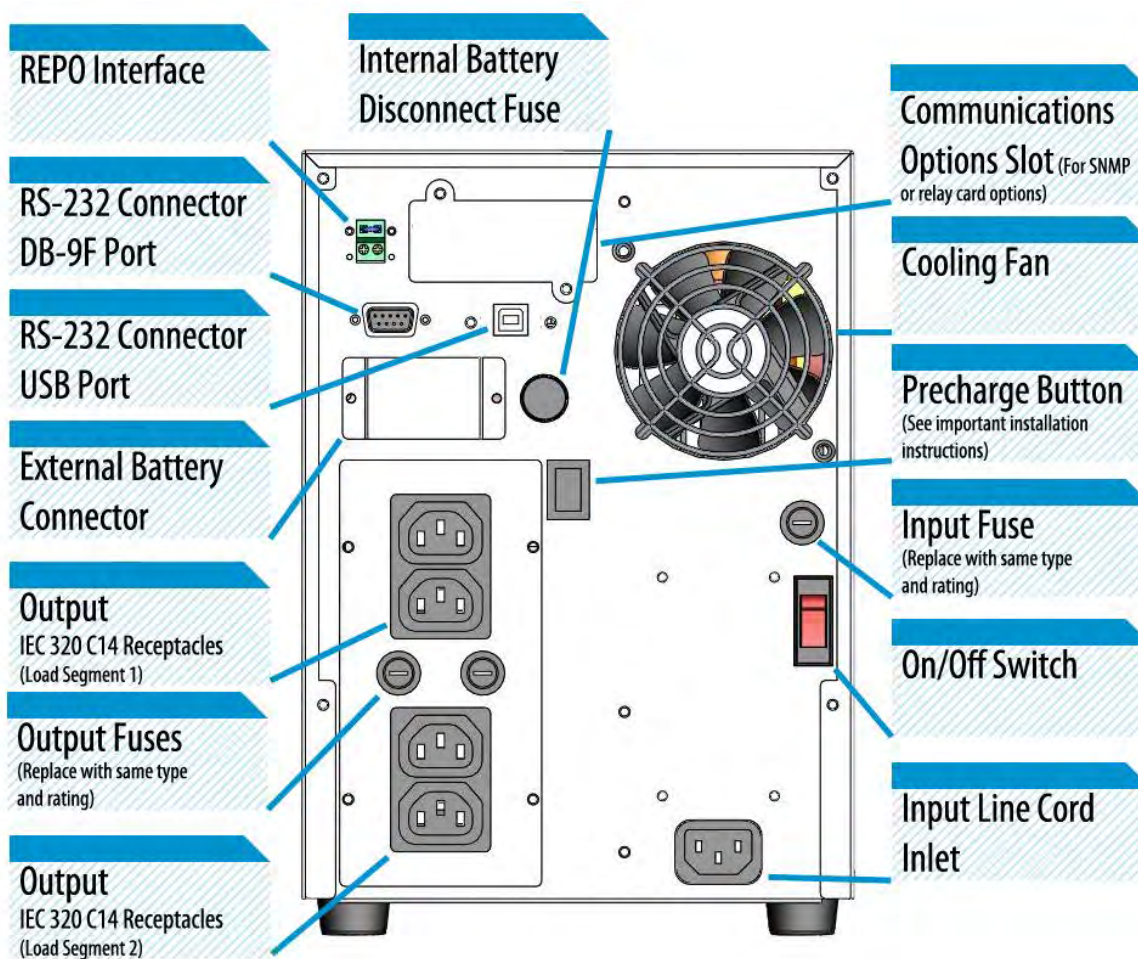


Bypass/DC Start & Off Button: This is a multifunction key that will start the unit up if pushed when the unit is off and the internal battery is connected. During normal operation, if this button is pressed, the unit will transfer to the bypass mode. (This is necessary in order to discontinue system operation by then flipping the rear panel switch OFF.) Once the unit is in bypass mode operation, pressing this button again will force the system back to inverter mode operation.

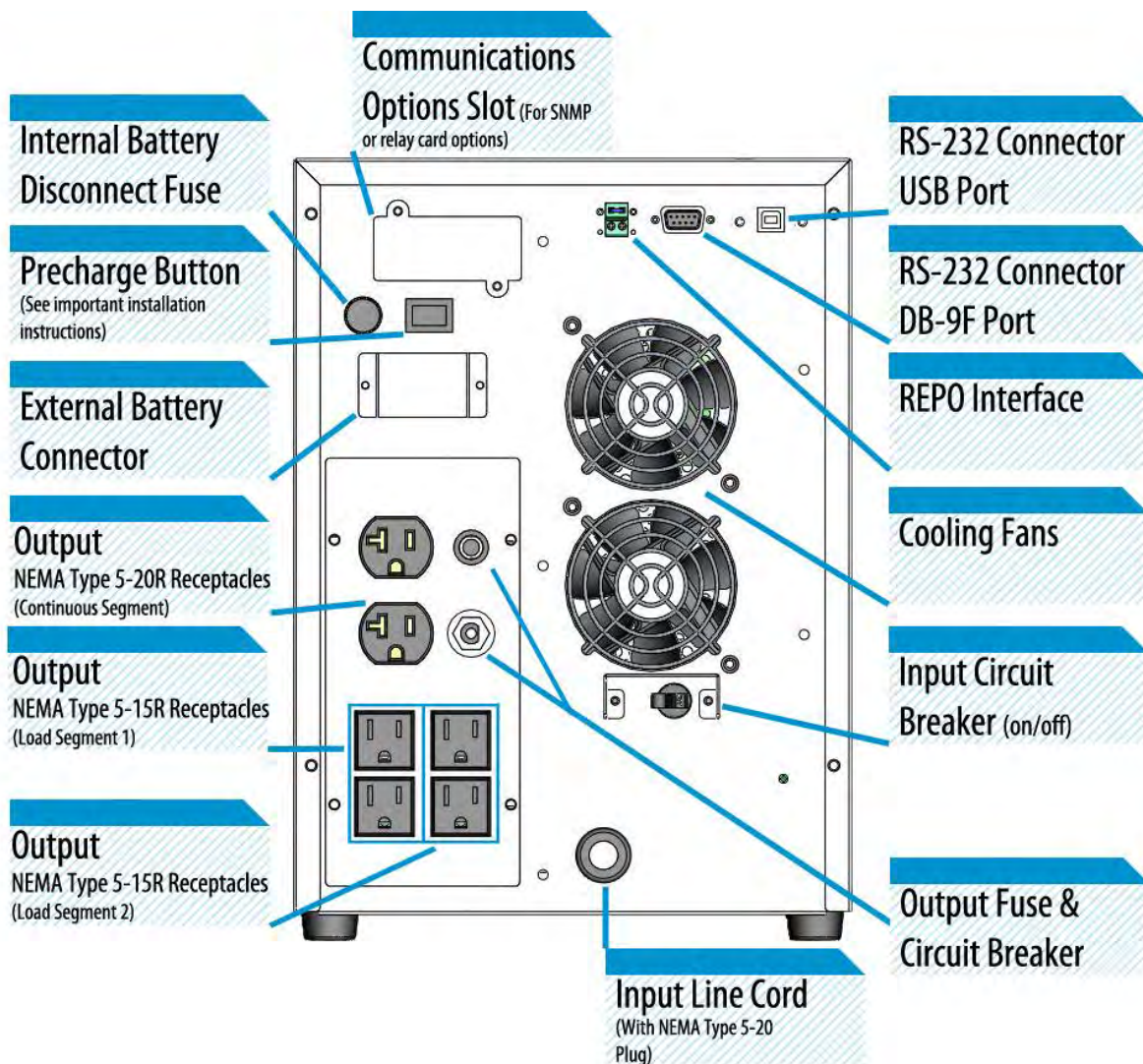
SSG1.5K-1T Rear Panel Layout



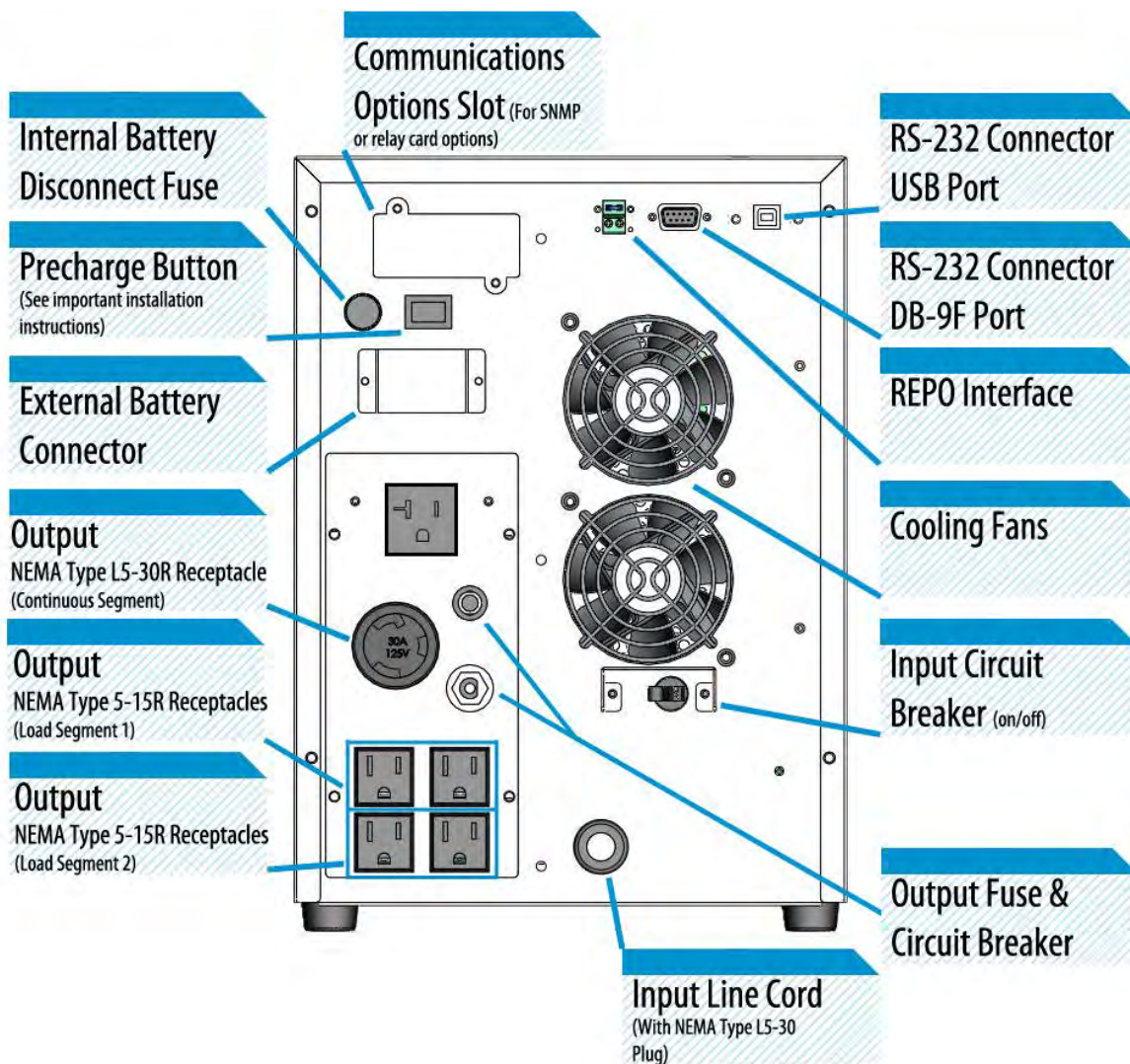
SSG1.5K-2T Rear Panel Layout



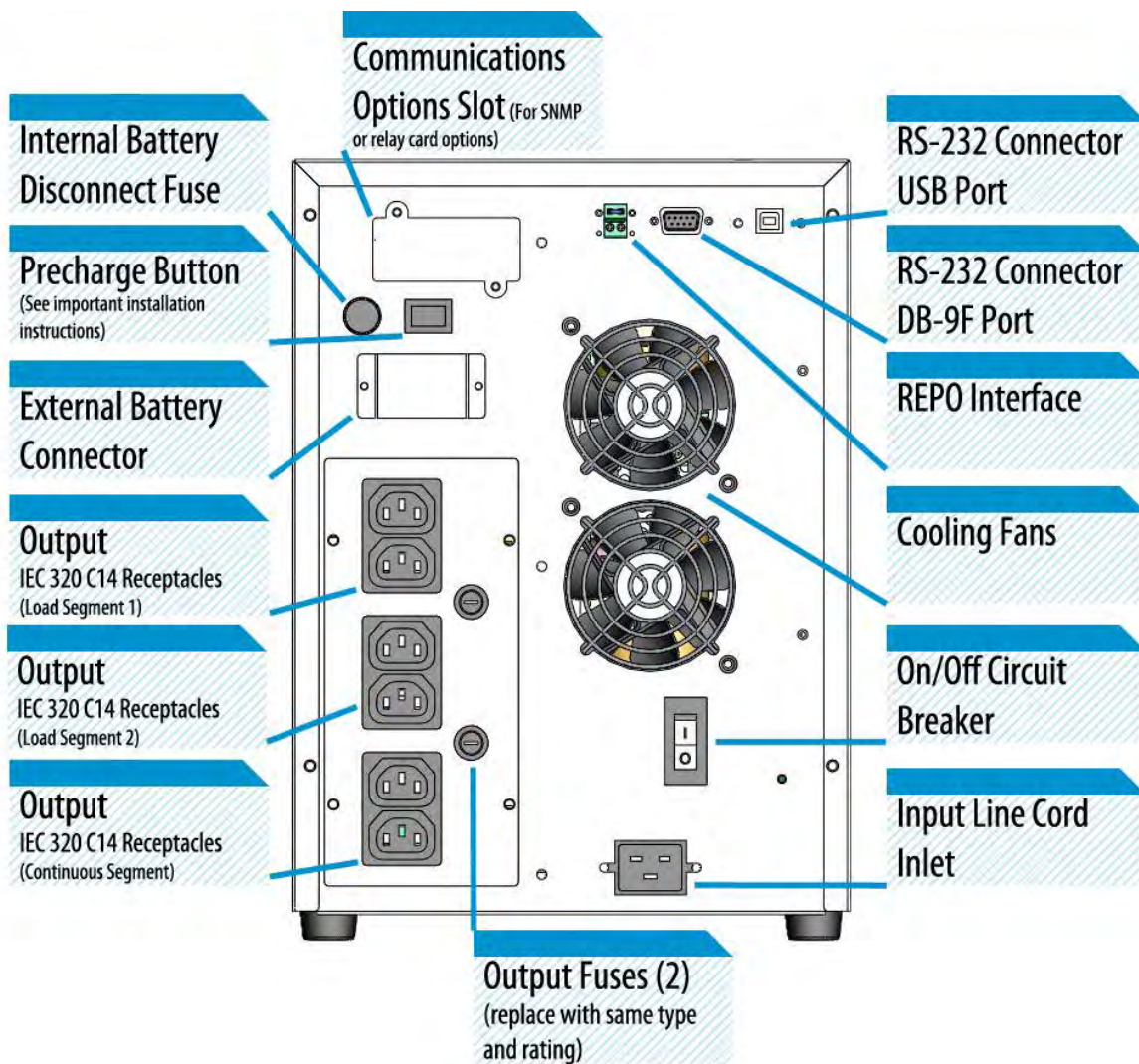
SSG2.2K-1T Rear Panel Layout



SSG3K-1T Rear Panel Layout



SSG2.2K-2T & SSG3K-2T Rear Panel Layout



Panel Component Overview

- ✓ Input Fuse: Input current protection device provided if the system is not provided with an input circuit breaker.
- ✓ Input Line Cord Inlet: Connector for line cord or attached line cord that allows system connection to mains.
- ✓ On/Off Switch or Input Circuit Breaker: The power system switch to activate the system. The circuit breaker provides input current protection.
- ✓ Precharge Button: A momentary push button switch that must be pushed and held in for at least 3 seconds prior to installing the battery disconnect fuse.
- ✓ Internal Battery Disconnect Fuse: This protection device has been removed to separate the internal battery from the electronics for safe shipping purposes.
- ✓ Output Fuse & Circuit Breaker: One or more protection devices provided to protect the output devices from an over current situation.
- ✓ Output (Load Segment 1, Load Segment 2, Continuous Segment): Connector receptacles provided for adequately and conveniently obtaining the output power from the system. Load segments can be programmed to switch on or off whereas the continuous segment will always provide output power as long as the system is operating.
- ✓ Cooling Fan: One or two devices provided to maintain the proper temperature of the internal electronics.
- ✓ External Battery Connector: When the cover plate is removed, this special port is exposed to allow connection of a Falcon Electric auxiliary battery.
- ✓ REPO Interface: Remote emergency power off closed loop that, once opened, will cause the output to switch off.
- ✓ Communications Options Slot: When the cover plate is removed, a card slot is made for options, i.e. SNMP, relay card, etc.
- ✓ RS-232 Connector DB-9F Port or USB Port: Two connectors provided to access the system's RS-232 protocol.

3.0

INTRODUCTION

Manual Overview

This user manual provides basic information about the Falcon SSG Tower Series Industrial-Grade Uninterruptible Power Supply (UPS). SSG models are available in nominal power ratings of 1500, 2200 and 3000 volt-amperes (VA). The SSG Series is a compact, rugged, double conversion, "on-line" UPS. It provides continuous power conditioning and accepts a wide range input voltage while providing a regulated voltage, true sinewave output. The wide temperature SSG Series UPS protects sensitive electronic equipment against the widest range of power problems, including power failures, power sags, power surges, brownouts, line noise, high voltage spikes, frequency variations, switching transients and harmonic distortion.

This manual also provides complete unit installation, safety considerations, important features, as well as detailed operation, configuration and troubleshooting of this device.

The specifications page at the end of this manual states the detailed operational parameters for the SSG Series, and provides general information on approvals and certifications.

4.0

UPS OPERATION

OPERATING MODES

The following outlines the UPS status for each mode of operation as displayed by the Liquid Crystal Display (LCD). To initiate the system, once it is properly installed, connect the input line cord to an appropriately rated outlet. Position the rear panel switch to the "on" position. The UPS will enter an Auto-Test state and all of the LCD indicators will be illuminated – flashing for ten seconds – and then return to a normal state. The UPS will start up in bypass mode and after several seconds, transfer to the normal on-line mode.

Normal On-Line Mode Operation



The LCD icon configuration on the left indicates on-line mode operation, indicating the percent of load, inverter, PFC, line, charger and battery operation and status. The fan is shown at medium speed.

The dark, solid green line on the MIMIC portion of the display indicates the normal mode power flow from input, through the inverter, to load and from the input, to the charger and into the battery.

Battery Mode Operation



The LCD icon configuration on the left indicates the UPS is in Battery Mode. The dark solid green line indicates battery power flow to the DC/DC converter and on to the inverter. The fan is shown in high speed mode. The bars inside the battery icon indicate the amount of battery capacity remaining; each bar represents approximately a 25% capacity increment. As capacity decreases, fewer bars will remain illuminated. The charger icon is turned off.

The battery mode icon configuration is displayed during a loss of utility power or during excessively high or low line voltage conditions. When in battery mode, the UPS battery

supplies energy to the DC/DC converter, and then on to the inverter, which powers the connected load. While the battery is discharging, the audible alarm will beep. The rate of the beeping will increase as the battery runs low (low battery), prior to system shut down. Once the low battery warning is sounded, there will be about one minute of battery runtime remaining.

After the UPS has shutdown and utility power has been restored, the UPS will automatically restart.

Bypass Mode Operation



The LCD display icon configuration on the left indicates the UPS is in Bypass Mode. The dark solid green line shows the input connected directly to the load. Another dark solid line shows the input power to the battery charger icon, then to the battery. The fan is shown in low speed mode.

The UPS will automatically transfer to Bypass Mode and will sound an audible alarm upon the following conditions:

- ✓ The UPS has experienced an over temperature condition.
- ✓ The UPS has experienced an overload condition of 101% to 110% for over 120 seconds.
- ✓ The UPS has experienced an overload condition of 111% to 150% for over 20 seconds.
- ✓ The UPS has experienced an overload condition of over 150%.
- ✓ The UPS detects a fault in the battery or UPS electronics.


When in Bypass mode, the UPS will transfer the connected load directly to the incoming utility power. When in Bypass mode, Battery Mode is not available. The utility power, however, will continue to be passively filtered through the UPS.

Green Mode Operation



When Green Mode is activated using the UPS programming interface, the SSG unit will automatically transfer to Bypass Mode (Green Mode) once the connected load drops to less than 3% of the UPS's rated output. The load will operate directly from utility power, similar to Bypass Mode. The LCD will indicate the UPS is in Bypass Mode and the Green Mode bulb icon will be flashing. If the load is increased to over 3% of the UPS output rating, the system will automatically transfer back to normal, on-line operation.

All SSG models are shipped from the factory with Green Mode disabled. To enable Green Mode, refer to the section on UPS Setup, Configuration & Programming. See the Green Mode configuration section for further details and cautions. Falcon Electric recommends that this feature remain disabled.

How to DC Start the UPS (without utility power)

In the event utility power is not available, the UPS may be initiated using the internal battery. Make sure that the rear panel switch is in the "on" position. To start the UPS without utility power available, momentarily press the front panel Bypass/DC Start & Off Button.  The UPS will start and supply power to the connected loads until the batteries are depleted. After any battery discharge, always recharge the batteries immediately by connecting the UPS to utility power when available after any battery discharge. For DC only operation, the load segment control **must not be used or be set to "Continuous Mode" operation.**

How to Turn Off the UPS

1. While in normal on-line mode, press the Bypass/DC Start & Off Button  for one second. The UPS will transfer to bypass.
2. Next, turn off the input circuit breaker at the rear panel. The unit will shut down after about 30 seconds.
3. While in Battery Mode, press the Bypass/DC Start & Off Button  for one second. The unit will shut down after about 30 seconds.

NOTE! DURING THE SHUT DOWN PROCESS, DO NOT PRESS ANY OTHER BUTTONS AS THE UPS MAY BE RE-ENERGIZED AND DELIVER POWER TO ITS OUTPUT UNEXPECTEDLY.

5.0

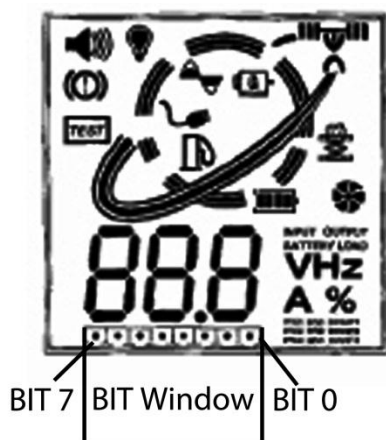
UPS SETUP, CONFIGURATION & PROGRAMMING

The following section describes how to reconfigure the internal UPS setup options using the Setup, Configuration & Programming Mode. The setup options include:

- ✓ The UPS output voltage
- ✓ Enabling or disabling segment control
- ✓ Enabling or disabling *Green Mode* function

How to Place the UPS Into Setup/Configuration Mode

To place the UPS into configuration mode, press the front panel "Function/Test" (F) and "Set/Alarm Silence" (S) buttons at same time and hold them for one second. The unit will emit one audible beep and will display a status BIT window at the bottom of the LCD.



The right most BIT is function *BIT 0*, with the remaining six BITS to the left; function *BIT 1* through *BIT 6*. The last *BIT 7* is the Status BIT and will indicate the setting status of the other Function BITS. Repeated pressing of the "Function/Test" button will move the dot from function *BIT 0* (far right) to function *BIT 6* (far left). When selecting function *BIT 0* through *BIT 6*, observe whether status *BIT 7* has a set (Dot) or a clear (No Dot) displayed for the function BIT selected. To select a (Dot) or (No Dot) for the function you are presently in, press the "Set/Alarm Silence" button to enable or set (Dot) or disable or clear (No Dot) in status *BIT 7*.

Next, press the "Set/Alarm Silence" and "Function/Test" buttons at the same time, and hold for one second. The audible alarm will sound one short beep to acknowledge the UPS has stored the selected settings and exit the setup/configuration mode. Multiple BITS can be set prior to saving and exiting this mode. **The system will have to be completely shut down and then restarted for any changes to take effect.**

Output Voltage Setup

Status BIT 7	Function BIT 6	Function BIT 5	Function BIT 4	Function BIT 3	Function BIT 2	Function BIT 1	Function BIT 0
Set Or Clear	LSC#2 Low Batt	LSC#2 Uty. Loss	LSC#1 Low Batt	LSC#1 Uty. Loss	Green Mode	120V-On 115V-On 110V-Off 100V-Off	120V-On 115V-Off 110V-On 100V-Off

How to Set the UPS Output Voltage (Function BIT 0 & BIT 1)

The SSG Series UPS is shipped configured from the factory with its output voltage set to 120Vac for “-1” units and 230Vac for “-2” units. For most North American applications, the UPS output voltage will not have to be changed.

Make output voltage configuration changes and then restart the UPS to verify the desired output voltage is present at the output using the front panel LCD output voltage display function. Next, verify that all of the equipment to be connected to the UPS will operate satisfactorily on the newly selected output voltage.

CAUTION

When the UPS output voltage is set to 100Vac, the maximum amount of load that can be connected to the UPS must be derated (reduced) by 15%.

-2	-1	BIT 7	
240 VAC	120 VAC (Default)	<input checked="" type="checkbox"/>	BIT 0
		<input checked="" type="checkbox"/>	BIT 1
230 VAC (Default)	115 VAC	<input type="checkbox"/>	BIT 0
		<input checked="" type="checkbox"/>	BIT 1
220 VAC	110 VAC	<input checked="" type="checkbox"/>	BIT 0
		<input type="checkbox"/>	BIT 1
208 VAC	100 VAC	<input type="checkbox"/>	BIT 0
		<input type="checkbox"/>	BIT 1

Voltage Configuration BIT Settings

Example - How to Set the UPS Output Voltage to 115Vac

1. Place system into the Configuration Mode.
2. The configuration mode starts in *BIT 0*.
3. Press the "Set/Alarm Silence" (**S**) button to clear (No Dot) on Status *BIT 7*.
4. Press the "Function/Test" (**F**) button one time and move the dot to function *BIT 1*.
5. Press the "Set/Alarm Silence" (**S**) button to set (Dot) (if not already set) on Status *BIT 7*.
6. Press the "Set/Alarm Silence" (**S**) and "Function/Test" (**F**) buttons at the same time again and hold for one second. The alarm buzzer will sound one short beep to acknowledge the UPS has stored the settings and has exited the Configuration Mode.
7. You must now restart the UPS before the new voltage setting will be in effect.

Setting the Green Mode Function (set to disabled from factory)

Green Mode is a power saving feature that should only be used:

- ✓ In non-critical applications
- ✓ With a single connected piece of equipment
- ✓ If battery backup is not required when equipment is drawing low current

When the Green Mode function is enabled and the connected load decreases to less than 3% of the full rated UPS output capacity, the UPS will automatically switch from On-Line to Bypass Mode, 30 seconds after the drop in load has been detected. After the UPS has switched to Bypass Mode, the Green Mode* bulb icon will flash to indicate the UPS is in the energy saving Green Mode. While in Green Mode, should the load increase to greater than 3% of the UPS's full output rating, the UPS will automatically return to normal On-Line Mode protected operation.

***CAUTION**

While in Green Mode, **the UPS output is not protected against power loss or fluctuation.**

Green Mode Setup

Status BIT 7	Function BIT 6	Function BIT 5	Function BIT 4	Function BIT 3	Function BIT 2	Function BIT 1	Function BIT 0
Set Or Clear	LSC#2 Low Batt	LSC#2 Uty. Loss	LSC#1 Low Batt	LSC#1 Uty. Loss	Green Mode	120V-On 115V-On 110V-Off 100V-Off	120V-On 115V-Off 110V-On 100V-Off

How to Enable or Disable Green Mode (Function *BIT 2*)

To Enable:

1. Place the unit into Configuration Mode.
2. Press the "Function/Test" (**F**) button two times to move the dot from function *BIT 0* to function *BIT 2* (Green Mode function).
3. Press the "Set/Alarm Silence" (**S**) button to clear (Dot) on *BIT 7* (The reverse of other feature disable settings).
4. Press the "Set/Alarm Silence" (**S**) and "Function/Test" (**F**) buttons at same time again and hold for one second. The alarm buzzer will sound one short beep to acknowledge the UPS has stored the setting and has exited the Configuration Mode.

To Disable: (Factory Default)

1. Enter the Configuration Mode.
2. Press the "Function/Test" (**F**) button two times to move the dot from function *BIT 0* to function *BIT 2* (Green Mode function).
3. Press the "Set/Alarm Silence" (**S**) button to set (Dot) *BIT 7*. (The reverse of other feature enable settings).
4. Press the "Set/Alarm Silence" (**S**) and "Function/Test" (**F**) buttons at the same time again and hold for one second. The alarm buzzer will sound one short beep to acknowledge the UPS has stored the setting.

Load Segment Control Setup

Status BIT 7	Function BIT 6	Function BIT 5	Function BIT 4	Function BIT 3	Function BIT 2	Function BIT 1	Function BIT 0
Set Or Clear	LSC#2 Low Batt	LSC#2 Uty. Loss	LSC#1 Low Batt	LSC#1 Uty. Loss	Green Mode	120V-On 115V-On 110V-Off 100V-Off	120V-On 115V-Off 110V-On 100V-Off

How to Set the UPS Load Segment Control Options (Function *BITs* 3, 4, 5 & 6)

Three conditions of automatic load segment control may be programmed for two separate output load segments. There are the two programmable and one continuous load segments that are assigned to specific output receptacles, located on the UPS rear panel. (See rear panel diagrams in section 2 for your specific model layout.)

For each programmable load segment, the following conditional states may be selected:

1. Turn off the assigned load segment when utility power is lost (*BITs* 3 & 5).
2. Turn off the assigned load segment whenever low battery is reached (*BITs* 4 & 6).
3. Load segment *BITs* are turned off making the load segment continuous.

Programming Load Segment Settings

- a. Setting load segments to automatically turn off the load when utility power is lost:
 - 1. Press the "Function/Test" (**F**) and "Set/Alarm Silence" (**S**) buttons at the same time and hold them for one second. The unit will emit one alarm beep and then enter the Configuration Mode.
 - 2. Press the "Function/Test" (**F**) button repeatedly to move the dot to function *BIT 3* (for load segment 1), or *BIT 5* (for load segment 2).
 - 3. Press the "Set/Alarm Silence" (**S**) button once to set (Dot) Status *BIT 7*.
 - 4. When finished with Load Segment Control settings, press the "Set/Alarm Silence" (**S**) and "Function/Test" (**F**) buttons at the same time again and hold for one second. The alarm buzzer will sound one short beep to acknowledge the UPS has stored the settings and exit the configuration mode.
- b. Setting load segments to automatically turn off the load at low battery:
 - 1. Enter the Configuration Mode.
 - 2. Press the "Function/Test" (**F**) button repeatedly to move the dot to function *BIT 4* (for load segment 1), or *BIT 6* (for load segment 2).
 - 3. Press the "Set/Alarm Silence" (**S**) button once to set (Dot) Status *BIT 7*.
 - 4. Press the "Set/Alarm Silence" (**S**) and "Function/Test" (**F**) buttons at the same time again and hold for one second. The alarm buzzer will sound one short beep to acknowledge the UPS has stored the settings.
- c. Setting load segments for continuous mode operation:
 - 1. Enter the Configuration Mode.
 - 2. Press the "Function/Test" (**F**) button repeatedly to move the dot to function *BIT 3* (for load segment 1), or *BIT 5* (for load segment 2).
 - 3. Press the "Set/Alarm Silence" (**S**) button once to clear (No Dot) Status *BIT 7*.
 - 4. Press the "Function/Test" (**F**) button repeatedly to move the dot to function *BIT 4* (for load segment 1), or *BIT 6* (for load segment 2).
 - 5. Press the "Set/Alarm Silence" (**S**) button once to clear (No Dot) Status *BIT 7*.
 - 6. Press the "Set/Alarm Silence" (**S**) and "Function/Test" (**F**) buttons at the same time again and hold for one second. The alarm buzzer will sound one short beep to acknowledge the UPS has stored the settings.

NOTE

In all the above cases, the final step may be deferred until all programming functions have been set.

6.0

COMMUNICATIONS

All SSG Series UPSs are provided with the following communications ports:

- ✓ RS-232 port with standard DB-9F serial port connector.
- ✓ USB port supporting the connection of a standard USB interface cable.
- ✓ One advanced communications option slot is provided on the rear panel of the UPS. Unless an advanced communications option board has been previously purchased and installed, the port will be covered with a small cover plate. This plate will be secured with screws.

CAUTION

NEVER INSTALL OPTION CARDS THAT HAVE NOT BEEN SUPPLIED BY FALCON ELECTRIC OR ARE FOR ANOTHER FALCON MODEL WITHOUT CONSULTING WITH FALCON SERVICE.

CAUTION

When an internal SNMP/HTTP AGENT device is installed into the Advanced Communications Option Slot, the RS-232 port and UPSilon® software should not be used. The USB port may be used in conjunction with UPSilon® software concurrently with the SNMP/HTTP agent.

RS-232 & USB Ports

This UPS is equipped with (1) RS-232 and (1) USB port located on the UPS rear panel. A standard RS-232C interface cable is provided to allow for the connection of the UPS to another RS-232 port found on most computers. The USB port interfaces with a standard USB cable to be supplied by the end-user. The USB cable required is a - 4 Pin USB Type A (M) connector - 4 PIN USB Type B (M) connector. The USB and RS-232 ports cannot be used concurrently. When an RS-232 or USB cable has been connected, and the supplied UPSilon® Computer Shutdown and Management software has been properly installed on the connected computer, a high level of UPS management and protection against lost or corrupted files is in effect. Please follow the installation and setup instructions supplied on the UPSilon® software CD.

The UPSilon® user's manual is also located on the UPSilon® CD supplied with this unit. UPSilon® supports most popular operating systems. Should you have special UNIX requirements, please contact Falcon Sales for information and pricing of UPSilon® for UNIX.

Remote Emergency Power Off (REPO)

A two-pin REPO connector is located on the rear panel of the UPS. The connector is shipped with a jumper wire installed, to facilitate the normal operation of the UPS in the event a REPO connection is not used.

The REPO function provides an interface for a NFPA 70, NEC 645-11 compliant Remote Emergency Power Off (REPO) switch. The switch must have a normally-closed contact state that opens when the REPO button is depressed (REPO ACTIVE).

When the REPO switch contacts are opened, which also turns the equipment room power and UPS power off, the UPS output will immediately turn off all connected loads and then will shut down within one minute. When the REPO switch contacts are closed, the equipment room's power will be restored and the UPS will restart.

7.0

BATTERIES

Recycling the Used Battery Packs

NEVER discard the UPS, the UPS battery pack, or batteries in the trash. Contact your local recycling or hazardous waste center for information on proper disposal of the used battery pack and batteries. The entire spent battery packs may be returned to the Falcon Service Center at the end user's expense for recycling. Prior to returning the spent battery pack(s), please call the Falcon Service Center and obtain a Return Materials Authorization (RMA) number or email service@falconups.com

NEVER dispose of batteries in a fire, as batteries will explode.

NEVER dispose of used batteries or the UPS in the trash or a landfill as it is a violation of federal and state laws. The UPS and batteries must be recycled. For UPS and battery recycling information, please contact Falcon Service for the name and address of the nearest battery recycling facility.

NEVER open or mutilate the battery or batteries. Released electrolyte can be toxic and is harmful to the skin and eyes. A battery can present a risk of electrical shock and burns due to high short circuit current.

CAUTION

Observe all warnings, cautions, and notes before replacing batteries. Batteries can present a risk of electrical shock and burns due to 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 mutilate the battery packs or batteries. Released electrolyte can be toxic and is harmful to the skin and eyes.

Battery Storage

If the SSG system is to be stored for a long period of time, the following precautions need to be observed in order to maintain maximum battery life:

- ✓ Operate unit by connecting to a properly rated outlet for at least eight hours to ensure batteries are in a fully charged state prior to long-term storage.
- ✓ Keep the storage ambient temperature between -15°C to 40°C.
- ✓ Remove the external rear panel battery fuse and store in a safe place. This will slow down the internal self-discharge process.
- ✓ Do not allow the unit to stay in storage for more than 90 days without a proper recharge of 8 or more hours of operation.

How to Replace the SSG1.5K-XT Batteries

Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.

When replacing batteries, replace with the same type and number of batteries or battery packs. Before replacing the batteries, remove conductive jewelry such as chains, wrist watches, and rings. High energy through conductive materials could cause severe burns.

CAUTION

This UPS receives power from more than one source. Disconnect all power sources prior to cleaning, replacing batteries or servicing. Disconnect the charging source prior to connecting or disconnecting battery terminals. Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance.

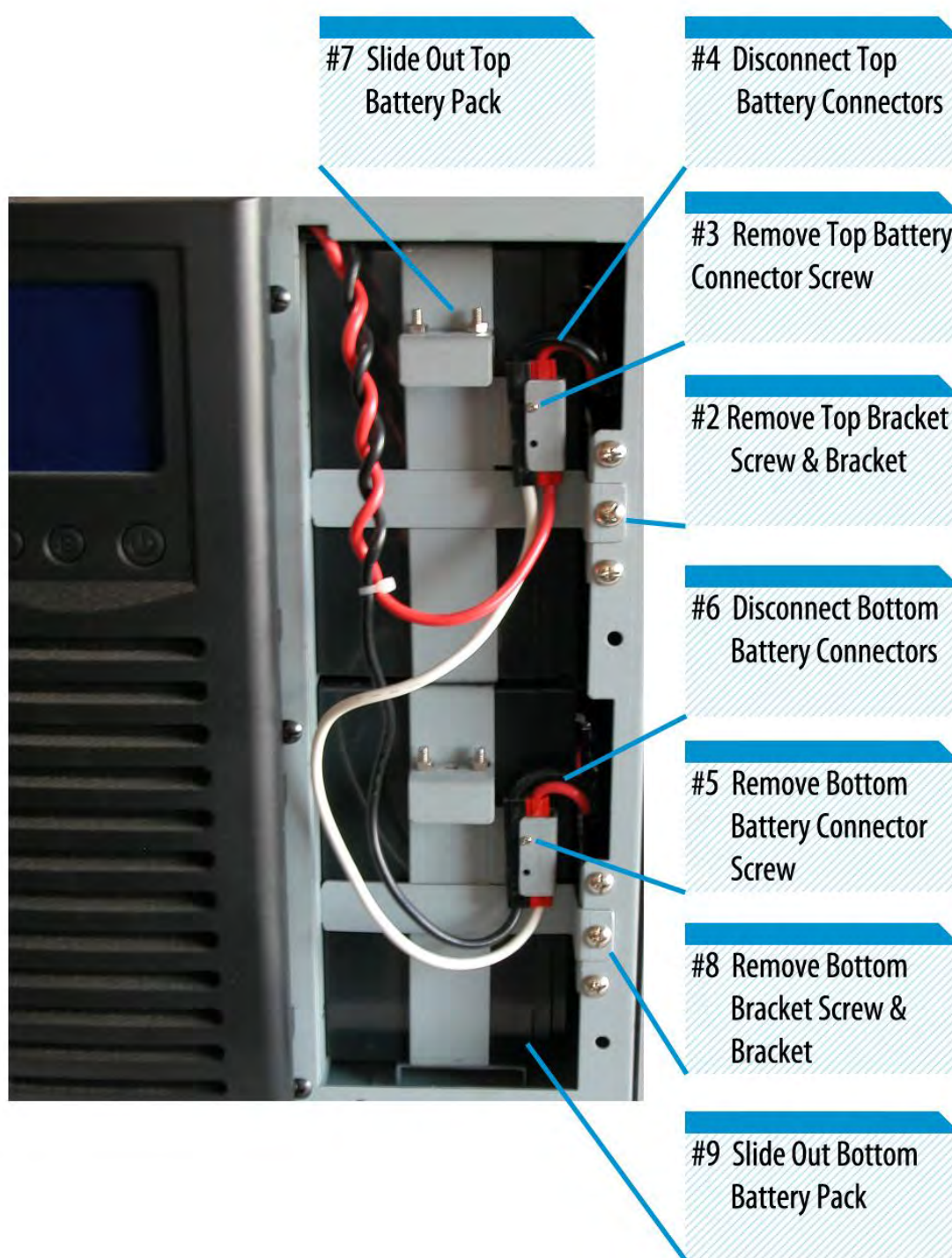
1. Using a Phillips screwdriver remove the (2) screws located on the bottom of the UPS front panel.
2. Remove the lower front panel.
3. Remove the screw securing the battery holding bracket and remove the bracket.
4. Remove the screw securing the black and red battery connectors and disconnect both connectors.
5. Remove the (4) batteries by sliding forward.

6. Disconnect the individual battery wires one battery at a time and reconnect to the new battery. Red to the positive (+) battery terminal and black to the negative (-) battery terminal. Repeat until all four batteries are replaced.
7. Reinstall the four batteries by sliding them rearward into the UPS chassis in the reverse order as removed.
8. Reconnect the red and black battery pack connectors and secure with the screw removed.
9. Reinstall the battery holding bracket and secure with the screw removed.
10. Reinstall the lower UPS front panel and secure with the (2) screws removed. Be careful not to over tighten.

How to Replace the SSG2.2K-XT & SSG3K-XT UPS Batteries

See following photo for steps 2-9

1. Remove the (2) screws securing the right side UPS front panel.
2. Remove the top bracket screw and bracket.
3. Remove the top battery connector screw.
4. Disconnect the top battery pack connectors.
5. Remove the bottom battery connector screw.
6. Disconnect the bottom battery pack connectors.
7. Slide out the top battery pack.
8. Remove the bottom bracket and screw.
9. Slide out the bottom battery pack.
10. Remove the screws securing the top and bottom battery packs together.
11. One battery at a time, disconnect the battery pack cables, replace the battery with a new one and reconnect the cables. Red cable terminals to the positive battery terminals and black cable terminals to the negative battery terminals. Perform on each (4) battery packs.
12. Reinstall both battery packs as they came out of the system.
13. Reinstall both securing brackets removed in steps 2 and 8.
14. Reconnect both battery connectors from steps 4 and 6.
15. Secure the two connector screws removed in steps 3 and 5.
16. Reinstall the right UPS front panel using the (2) screws removed.



8.0

TROUBLESHOOTING

Audible Alarms

The SSG Series UPS features audible alarm codes to alert the user of potential problems. Please refer to the following table to identify and resolve alarms and the conditions causing the alarms.

Alarm	Possible Cause	Solution
Three short beeps, continuously	<ul style="list-style-type: none"> Utility voltage out of range 	<ul style="list-style-type: none"> The UPS is in Battery Mode, check the input voltage
Four short beeps, continuously	<ul style="list-style-type: none"> Utility frequency out of range 	<ul style="list-style-type: none"> The UPS is in Battery Mode, remove the input power and check the input frequency
Five short beeps, continuously	<ul style="list-style-type: none"> UPS internal over temperature The fan is not turning 	<ul style="list-style-type: none"> Check the ventilation and remove any blockage Call Falcon Service for fan replacement
Six short beeps, continuously	<ul style="list-style-type: none"> PFC over current protection in action 	<ul style="list-style-type: none"> Verify the input AC voltage is not too low, remove some load from UPS output
Seven short beeps, followed by three long beeps, every five seconds	<ul style="list-style-type: none"> Battery low after utility loss 	<ul style="list-style-type: none"> Save the data, turn off the equipment and wait for utility power to return
One long beep every few seconds	<ul style="list-style-type: none"> Output overload Charger fail UPS alarm, continuous 	<ul style="list-style-type: none"> Check the LCD display Remove some load Call Falcon Service

Troubleshooting Guide

Prior to attempting any troubleshooting, always verify the UPS battery fuse is installed and the input voltage, input plug and wiring are correct. Please refer to the table below and attempt to solve the problem prior to contacting Falcon Service.

Problem	Possible Cause	Solution
UPS will not turn on	<ul style="list-style-type: none"> • Input breaker not switched ON • Input/battery cables not correctly fitted 	<ul style="list-style-type: none"> • Verify the UPS Input breaker on rear panel is turned ON • Verify connected load is less than the rating of the UPS • Verify the input cable and battery are connected to the UPS and battery module. Verify the battery circuit is turned ON
UPS will not provide power to the load	<ul style="list-style-type: none"> • Power only present on one output receptacle • No output from any output receptacle • Output fails as soon as load is connected 	<ul style="list-style-type: none"> • Check the output fuse • Check the connected cable • Ensure the load does not exceed the maximum rating of the UPS
UPS operates from battery despite utility power presents	<ul style="list-style-type: none"> • Open fuse or circuit breaker • Generator does not power UPS 	<ul style="list-style-type: none"> • Input fuse may need replacing • Check generator is properly governed for both frequency and voltage. Some low grade generators will not provide a stable enough supply to run an UPS
UPS drops the load and is in bypass mode with alarm	Excessive load	Check the load status; the UPS may be overloaded

Problem	Possible Cause	Solution
<p>UPS battery time is not long enough or the unit does not run on battery at all</p> <p>UPS beeping</p> <p>Button on front panel does not work</p>	Weak Battery	Test the battery by pressing the "Function/Test" button. If the battery fails the test, replace the battery pack
		Refer to the audible alarms table
	<ul style="list-style-type: none"> • UPS in green mode • Button damaged 	<ul style="list-style-type: none"> • Wait for a while to operate • Call Falcon Service for a Returned Material Authorization (RMA)

9.0

TECHNICAL SUPPORT

In the event your SSG Series UPS requires service or should any other technical support be required, write, call, fax or email Falcon Service.

Falcon Electric Inc.
5116 Azusa Canyon Road
Irwindale, CA 91706
Service: 800.842.6940
Voice: 626.962.7770
Fax: 626.962.6850
Email: service@falconups.com
www.FalconUPS.com

Please have your UPS model, serial number and date of purchase on hand prior to your call. This information is located on the identification label on the rear panel of the UPS. This information is essential in retrieving your unit's historical records. Should our service department determine service is required, you will be given a Return Material Authorization (RMA) number along with return shipping instructions. (See enclosed RMA Request Form at the end of this document)

The RMA number issued must appear on the outside of the shipping carton. The original shipping container must be used when returning any SSG Series product. Failure to use the original shipping container and packing materials will likely result in the unit being received by Falcon with shipping damage.

Falcon® Electric will not assume any responsibility for shipping damage. In the event shipping damage is found, you will be notified of the damage and be instructed to file a claim with the freight carrier. You will be billed for all required repairs due to the shipping damage. You must submit a copy of our repair invoice to the carrier for reimbursement.

All units must be returned prepaid. The address and shipping instructions will be given to you at the time the RMA is issued.



Requesting Technical Information or Support

You may request technical information or support by email or telephone.

Please send your technical or support questions by email to:

Support@FalconUPS.com

You may contact a Falcon support engineer directly by calling the Falcon support line between 9:00 am and 4:00 pm PST.

800.842.6940

Falcon Web Support

Product data sheets, specifications and User's manuals are available in Adobe® Acrobat .PDF format on our corporate website at:

www.FalconUPS.com



10.0

FALCON ELECTRIC, INC. NEW PRODUCT LIMITED WARRANTY

Two-Year Limited Warranty: Falcon warrants that this product will be free from defects in materials and workmanship for a period of two years from the date of shipment within the 50 states and Canada (Domestic). The warranty is limited to one year for all other destinations (International).

Procedures: Any defective product must be returned to Falcon. No product can be returned without first obtaining a Return Material Authorization (RMA) number from Falcon. Falcon will repair, replace or refund the purchaser price, at Falcon's sole discretion, for any defective product that is returned to Falcon with an RMA number. For defective product sold domestically, as defined above, returned within 30 days of shipment, Falcon will pay for the shipping costs to and from its service center. For a defective product returned after 30 days but within 90 days of shipment, Falcon will only pay for shipping costs in sending the new or repaired product back to the end-user. For a defective product returned more than 90 days after shipment, all shipping costs will be borne by the end-user. Falcon will not pay any shipping costs sold internationally, as described above.

Exclusions: This limited warranty does not cover damage caused by: (i) improper installation, misuse or neglect; (ii) unauthorized repairs or modifications or use of unauthorized parts; (iii) acts or events outside of Falcon's control, such as fire, accidents, impacts; (iv) normal wear and tear, such as cleaning and replacement of batteries.

The warranty is null and void if: (i) the product is used in conjunction with life support equipment; (ii) The factory seal is broken or shows signs of tampering; or (iii) the battery is allowed to discharge below the minimum battery cutoff point. To prevent this discharge, remove the battery fuse, or switch the battery disconnect to the "off" position when the unit is to be stored without the AC power being supplied to the UPS for more than two days. The battery must be recharged every four to six months when not in use. This limited warranty is not transferable.

Limitations: In no event is Falcon responsible for any special, indirect, secondary or consequential damages, such as personal injury, damage to property, loss of data, lost profits, etc. In no event will Falcon's liability under this limited warranty exceed the purchase price paid for the product in question.

Disclaimers: The limited warranties set forth in this document are the only warranties that apply to Falcon's products. All other warranties are expressly disclaimed, including any implied warranties of merchantability or fitness for a particular purpose. This warranty gives you specific legal rights, and you may have other legal rights that vary from state to state.



11.0

TECHNICAL SPECIFICATIONS

SSG Series® Industrial Grade UPS 1.5kVA – 3kVA

Tower Model Number		SSG1.5K-1T SSG1.5K-2T	SSG2.2K-1T SSG2.2K-2T	SSG3K-1T SSG3K-2T
Nominal VA		1500	2200	3000
Electrical Input				
Nominal AC Voltage		-1 Models 120Vac -2 Models 208-240Vac		
AC Voltage Range		-1 Models 80-138Vac -2 Models 160-276Vac		
Frequency		50/60 Hz ± 5% (Auto Tracking)		
Power Factor Correction		> 0.97 (at full load)		
Surge Suppression		IEEE/ANSI C62.41		
Efficiency (Typ.)		> 87%		
Electrical Output				
Watts		1050	1540	2100
AC Voltage (User Programmable)		-1 Models = 100, 110, 115 or 120Vac (sinewave) -2 Models = 208, 220, 230 or 240Vac (sinewave)		
Frequency		50/60 Hz (Auto Tracking or user programmable fixed 50 or 60Hz modes)		
Frequency Stability		± 0.3% (Battery Mode), ±5% Synchronized to the input frequency in utility mode		
Voltage Regulation		± 2%		
Step Load Change		± 7% for 100% load variation, recovery in 5ms		
Harmonic Distortion		< 3% Linear Load, < 5% Non-Linear Load		
Overload		150% for 10 seconds, 110% for 20 seconds, 105% for 50 seconds		
Crest Ratio		3:1		
Battery				
DC Bus Voltage		48Vdc	96Vdc	
Battery Pack Type		User-Replaceable		
Battery Type		Long-life, 8 to 10 Year, Maintenance-Free, Sealed VRLA Batteries, 12Vdc, 7AH		
Back Up Time		@Full Load 5 minutes	8 minutes 20 minutes	6 minutes 18 minutes
Recharge Time		@1/2 Load 16 minutes	8 Hours to 90%	
Transfer Time				
Line Fails/Recovers		Zero		
UPS to Bypass or Reverse		< 4ms		
After Overload		Auto Transfer to UPS		
With Frequency Converter Options		Bypass Disabled		
Electrical Connections				
Input		-1 Models = 6' Cord with 5-15P Plug -2 Models = 6' Cord with Schuko Plug	-1 Models = 6' Cord with 5-20P Plug -2 Models = 6' Cord with Schuko Plug	-1 Models = 6' Cord with L5-30P Plug -2 Models = 6' Cord with Schuko Plug
Output		(8) 5-15R (8) IEC320	(4) 5-15R & (1) Duplex 5-20R (8) IEC320	(4) 5-15R & (1) 5-20R & (1) L5-30R (8) IEC320
Environmental				
Temperature		Operational Storage	-20°C - 55°C (-4°F to 131°F) -15°C - 50°C (5°F to 122°F) (Extended operation in temperatures above 25°C will shorten the battery life)	
Humidity		10% to 95% Non – Condensing		
Altitude		10,000 Feet (3000 meters) without derating		
Cooling		Low Velocity Forced Air Fans		
Heat Dissipation (BTU/Hour)		535	784	1071
Audible Noise (@ 1 Meter)		<50dBA		
Controls & Indicators				
LCD Display		MIMIC Graphical Display, Input/Output Voltage, Frequency & Load, Alarm, Programmable settings & UPS state icons		
Audible Alarms		DC Mode, Low Battery, Over/Under Voltage, Over/Under Frequency, High Temp., Over Load, Fault Alarm		
Load Segment Control		Two programmable load segments, one continuous load segment		
Remote Emergency Power Off (or)		(Standard) Meets NFPA 70, NEC 645-11 (REPO connections located on the UPS rear panel)		
Remote Output Receptacle Control		(Optional) UPS Load Segment Controlled Output Receptacles can be turned off and on using a remote isolated switch contact.		
Communications		USB Port, RS-232C Serial Port, Optional SNMP/HTTP Agent Board (UPS Bundled UPSilon Software)		
Mechanical				
Dimensions inches (mm)		11.1 x 7.6 x 18 (280x 197 x 457)	14 x 10 x 19.2 (354 x 253 x 487)	
Weight lbs. (kg)		55.2 (25)	92.6 (42)	92.6 (42)
Agency Approvals		-1 Models = UL 1778, CUL, FCC Class B, -2 Models = CE		

RMA REQUEST FORM

(TO ACCELERATE PROCESSING, PLEASE COMPLETE ALL APPLICABLE FIELDS)

Company Name:

Ship to Address:

Contact:

Phone:

Ext.:

Email:

ITEM DESCRIPTION

Model Number:

Serial #:

Problem or Symptom:

Model Number:

Serial #:

Problem or Symptom:

Model Number:

Serial #:

Problem or Symptom:

Model Number:

Serial #:

Problem or Symptom:

PAYMENT METHOD (REQUIRED FOR ALL RETURNING ITEMS)

Credit Card #:

Purchase Order #:

Card Type (Circle One) Amex

MC

Visa

Expiration:

Code:

Billing Contact Information: (If Different)

Bill To Address: (If Different)

RETURN SHIPMENT METHOD

IF INFORMATION BELOW IS NOT PROVIDED, FALCON ELECTRIC WILL PREPAY & ADD (PP & A) RETURNED MATERIALS. SHIPMENTS OVER **60LBS** MUST BE SHIPPED USING FREIGHT LTL SERVICES.

Carrier Account #:

Return Shipment Service:

THE SECTIONS BELOW ARE FOR INTERNAL USE ONLY

RMA Info:

Original Order Details:

RMA Type

RMA Assigned:

Ship Date:

Warranty

Non Warranty

Assigned By:

Sales Order:

Return to Stock / Credit

Return for Exchange

Approved By:

Invoice:

Extended Warranty

1yr

2yr

3yr