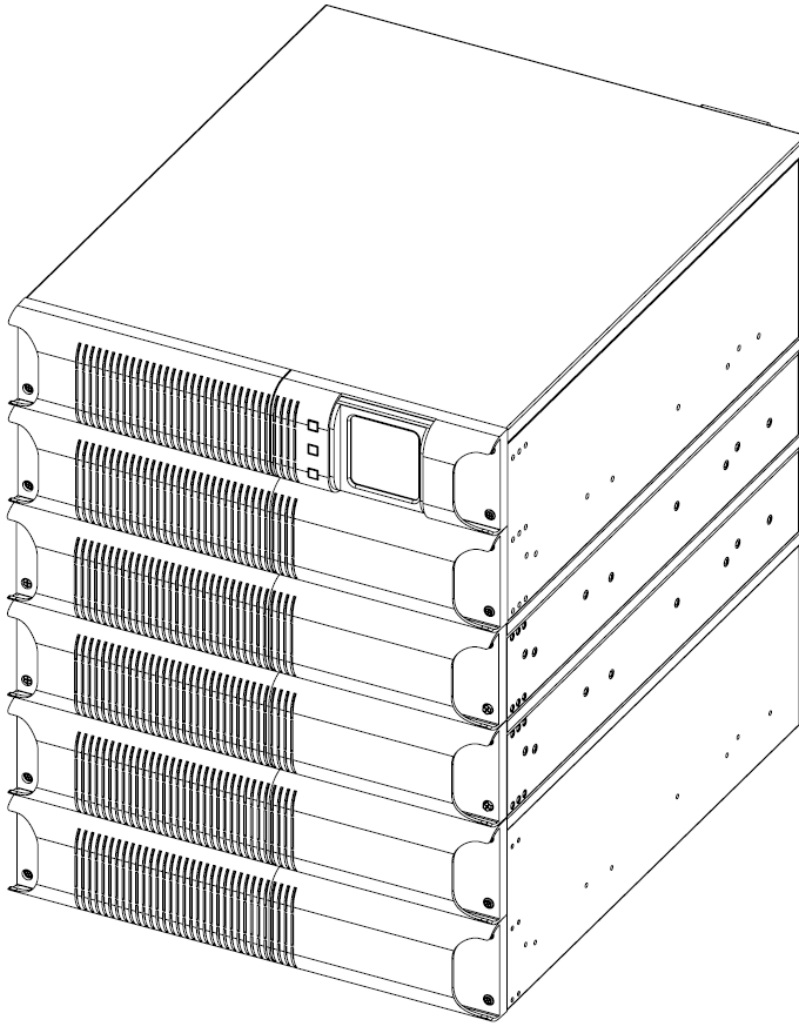




SSG Industrial UPS (Wide-temperature) Installation & User Manual



6kVA

SSG6KRM-2

XM6KRM-2/2

SSGR

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INTRODUCTION

Manual Overview

This user manual provides basic information about the Falcon SSG Industrial Wide-temperature Uninterruptible Power Supply (UPS). This SSG model is available in nominal power rating of 6000 volt-amperes (VA).

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

UPS Features

- **-20°C to 55°C temperature range**

The SSG UPS is agency-certified (UL, cUL, CE) to operate reliably in demanding environments.

- **Long-life UPS: true on-line, industrial**

Tested and designed with robust components and materials, the SSG assures reliable operation and a long service life in stressful environments. It is a true on-line industrial UPS.

- **12-year rated batteries cut service costs**

The long-life batteries cut frequent battery replacements and maintenance costs. They have a 12-year life at 25°C and 4 years at 50°C.

- **Extended battery banks**

The battery banks are easily expandable to provide minutes to hours of extra battery runtime.

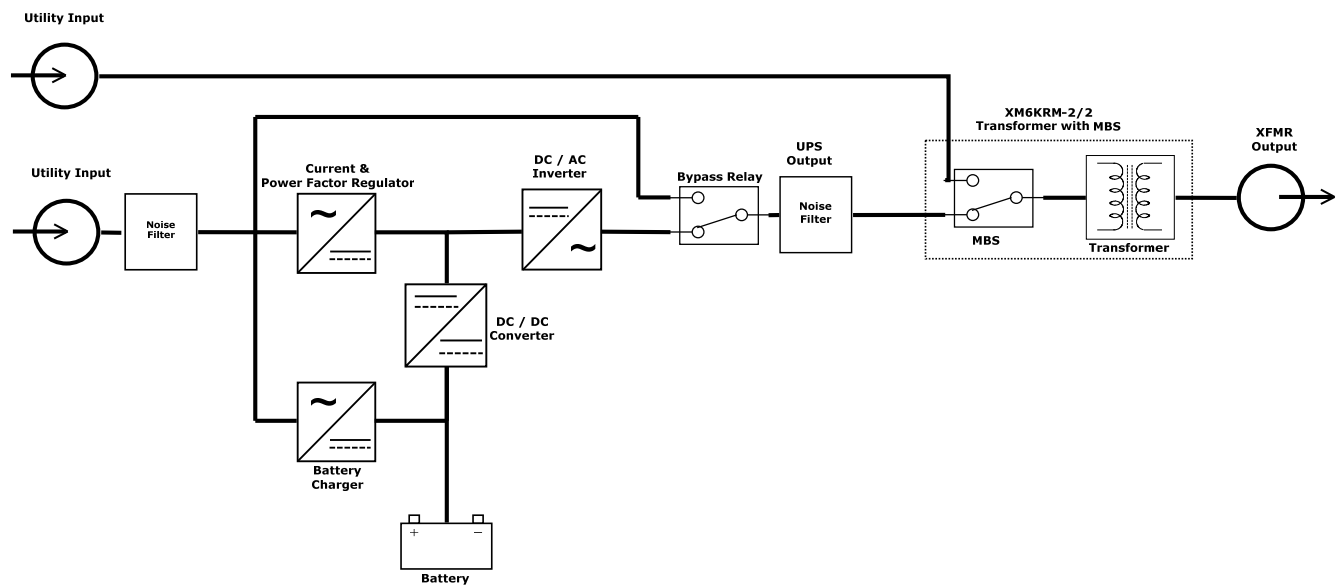
- **Available options / Advanced communications**

NEMA 3R-rated enclosures, environmental protection, remote UPS management, environment sensors, relay cards – and much more.

- **Falcon – recognized for quality and reliability**

Falcon Electric is a recognized authority in industrial UPS solutions. Our technical expertise assures you find the right solution – the first time.

Double Conversion On-line UPS Block Diagram



SAFETY

Retain This User Manual

SAVE THESE INSTRUCTIONS - This manual contains important instructions that should be followed during installation and maintenance of the UPS and batteries.

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

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

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

Warnings

CAUTION: Risk of electric shock. Do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

CAUTION - Risk of Electric Shock - Battery circuit is not isolated from AC input; hazardous voltage may exist between battery terminals and ground. Test before touching.

WARNING: To reduce the risk of fire or electrical shock, replace only with the same type and rating of fuse.

CAUTION - To reduce the risk of fire, connect only to a circuit provided with 30 amperes maximum branch circuit overcurrent protection in accordance with the National Electric Code, ANSI/NFPA 70. (U.S. Installations only.)

Adhere to all local and national electrical codes.

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.

This device is not intended for life support applications.

The maximum UPS output load (in watts) must never exceed that shown on the UPS rating label.

Do not connect inductive load type equipment that could severely overload the UPS including but not limited to motors, pumps, vacuums, or high voltage contactor coils.

The UPS, battery packs and battery banks are heavy. Take proper precautions when lifting or moving them.

If using an external maintenance bypass switch, assure the UPS is manually placed in bypass mode before operating the maintenance bypass switch. Failure to follow this procedure will result in damage to this device.

Symbols



Important Instruction



Special Note



Recycle



Do not dispose with ordinary trash

PRODUCT OVERVIEW

Transportation

The 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 containers in the unlikely event the UPS need to be returned for service. The containers have been specifically designed to ship the UPS system safely.

Operating Conditions

This UPS must be installed in a protected environment, free from moisture, flammable gases or fumes and corrosive substances.

Operate the UPS in a protected environment within the temperature range of -20°C to 55°C (-4°F to 131°F). A temperature of 0°C to 40°C (32°F to 104°F) will maximize the battery life which is rated at 12 years at 25°C (77°F). This UPS is designed for use with industrial, scientific or data processing class equipment.

The SSG Industrial UPS requires minimal maintenance or monitoring if the documented installation, environmental and operational specifications have been met. The items provided below are basic preventative maintenance measures to maintain UPS service life:

- Cooling Fans:
 - Assure the cooling fan guards / vents are free of dirt / dust build up every 6 to 12 months depending on environment. The UPS vents are located on the rear and / or front panel of the UPS.
- Ambient Temperature:
 - Monitor ambient temperature to ensure it is within the UPS specification. This is critical to maintain maximum battery life.
- Batteries:
 - To maintain optimum battery life, the user should operate the UPS in an ambient temperature of 25°C to 30°C (77°F to 86°F). At higher temperatures, battery life will be significantly reduced.
 - As the ambient temperature rises, monitor the battery capacity by performing a battery self-test every 6 to 12 months.

Input Filter

This circuit filters out both electro-magnetic interference (EMI) and radio frequency interference (RFI) and prevents excessive levels from being conducted back to the utility source. All SSG models have been tested and comply with FCC Class A requirements.

Input Rectifier & Power Factor Correction

While the UPS is operating from the utility source, this circuit converts utility AC power to regulated DC power for inverter use. It corrects the input current to maintain a sinusoidal waveform to minimize the amount of current distortion that will be reflected to the utility.

DC/DC Converter

The DC/DC converter utilizes energy from batteries and boosts up the DC bus voltage to a level required by the inverter. This allows the inverter to operate continuously at optimum efficiency and voltage. The converter incorporates a circuit which reduces the amount of ripple current and EMI interference to the battery, increasing the overall battery life.

DC/AC Inverter

In utility mode operation, the inverter utilizes the regulated DC output to invert DC back into clean, regulated AC power. When utility power fails, the inverter will receive its energy from the battery through the DC/DC converter. In both modes of operation, the UPS inverter is online and continuously generating clean, regulated AC power to the load. The Isolated Gate Bipolar Transistor (IGBT), Pulse Width Modulation (PWM) inverter design produces a pure sine wave output with a +/-2% voltage regulation.

Hot-swappable Battery Packs

The SSG UPS utilizes a flame-retardant battery pack comprised of four 12V, 7AH, valve-regulated, sealed lead acid (VRLA) batteries in each pack. The battery packs are interchangeable between all SSG 1.5kVA to 6kVA rackmount models. They are easily replaced through the UPS or battery bank front panel. Optional extended battery banks are available from Falcon.

Battery Charger

The battery charger utilizes energy from the utility power source to continuously charge the UPS batteries. The UPS batteries are being charged whenever the UPS is plugged in, turned on and operating from utility power. The internal UPS battery charger output is rated at 1 amp.

Manual Bypass Function

A manual bypass button is located on the SSG front panel. When the UPS is operating from utility power in online mode, depressing this button will cause the UPS to transfer to bypass. The bypass condition transfers the connected equipment to the utility power source via an internal relay. During bypass condition, the UPS inverter and battery backup operation is disabled. Depressing the bypass button again will return the UPS to online mode.

Automatic Bypass Function

The SSG UPS will automatically switch to bypass to energize the connected load when the UPS is first turned on, encounters an overload, over temperature condition, or failure condition. Should any of these events occur, the UPS will transfer to bypass mode, sound an audible alarm, and provide a bypass indication on the LCD display. The output filter and the input filter stage maintain the conducted EMI and RFI levels below FCC Class A limits.

Maintenance Bypass Switch (MBS)

A maintenance bypass switch is located on the optional XM6KRM-2/2 transformer box. This switch serves to provide power to the connected equipment in case of UPS failure or maintenance is required.

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.”

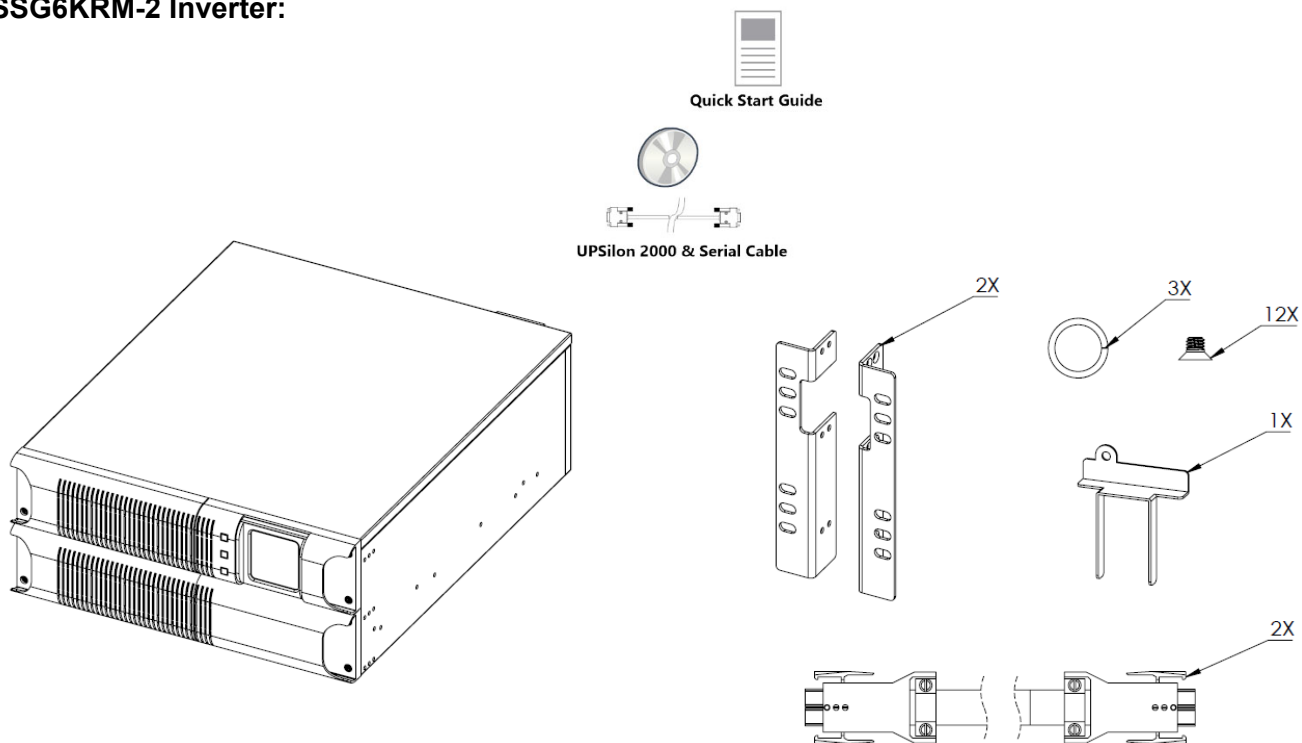
To file a claim for shipping damage or concealed damage:

- You must file with the carrier within 24 hours of receipt of the equipment.
- You must send a copy of the damage claim within 3 days to Falcon Electric, Inc.

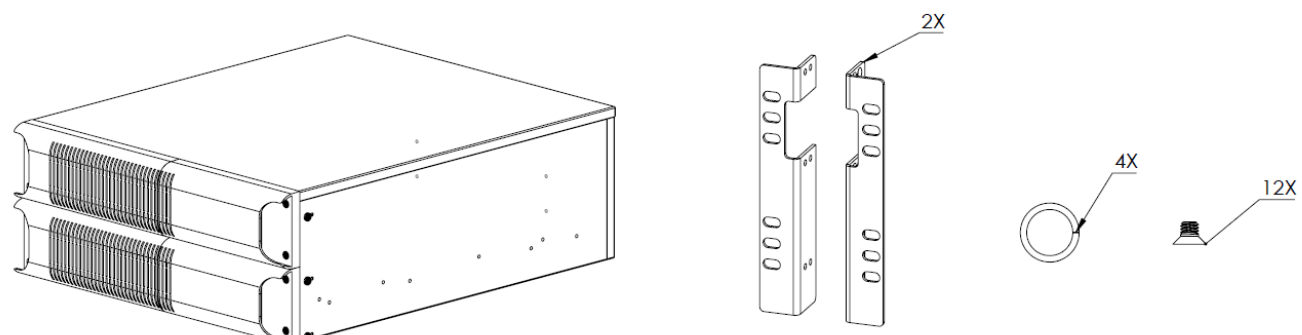
Box Contents

The UPS is shipped complete with all cables and accessories required for operation. A full listing of the box contents is provided below:

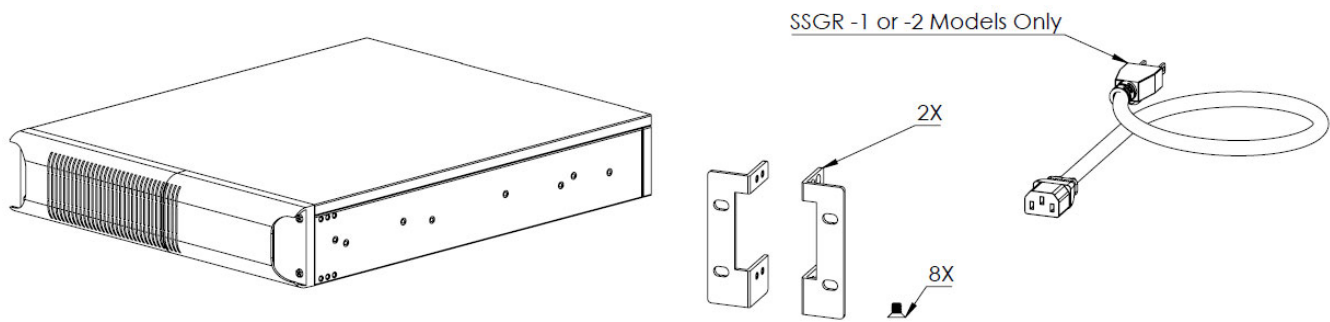
SSG6KRM-2 Inverter:



XM6KRM-2/2 Transformer:

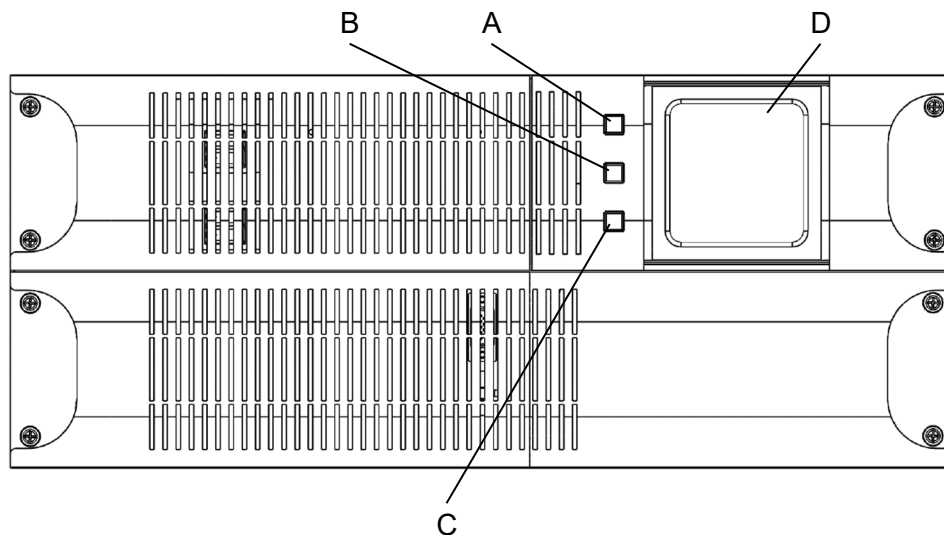


SSGR / SSGR-1, -2 Models:



UPS Inverter: SSG6KRM-2

Front View



A: Function / Test Button

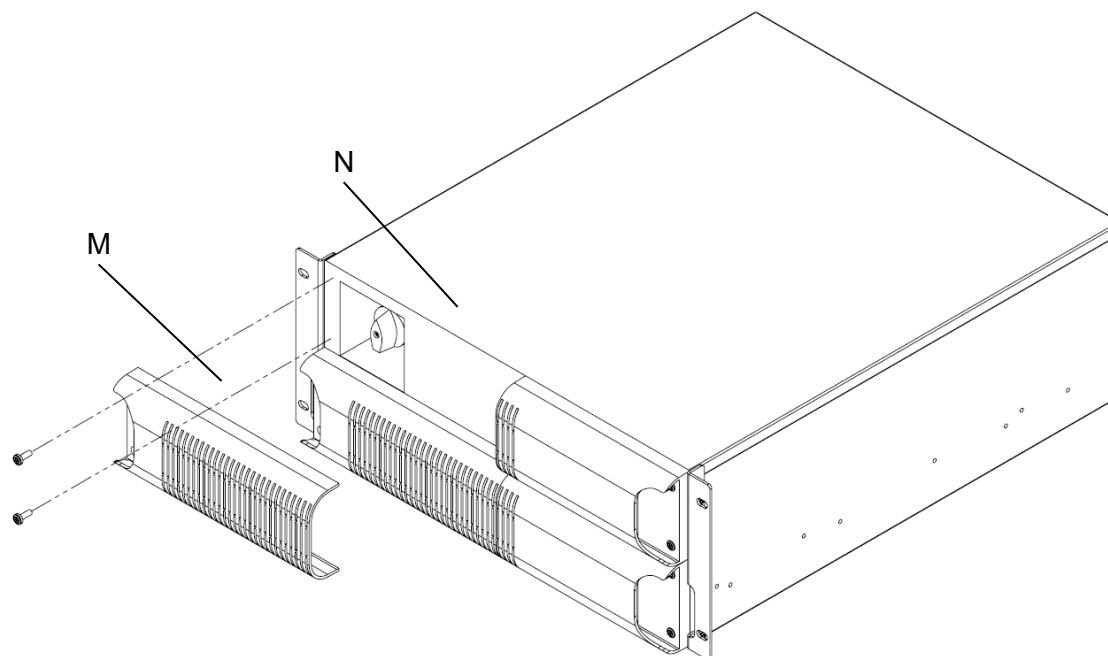
B: Set / Alarm Silence Button

C: Power / Bypass Button

D: LCD Display

UPS Transformer: XM6KRM-2/2

Front / MBS View

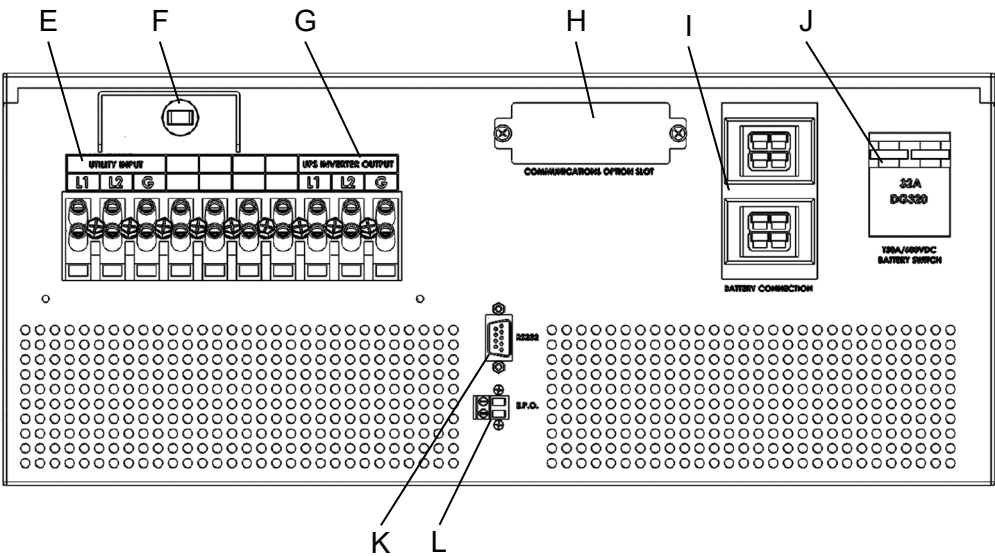


M: Removeable front panel

N: Maintenance Bypass Switch

SSG6KRM-2

Rear View



E: Input Terminal Block

F: Input Circuit Breaker

G: Output Terminal Block

H: Communication Option Slot

I: Battery Connectors

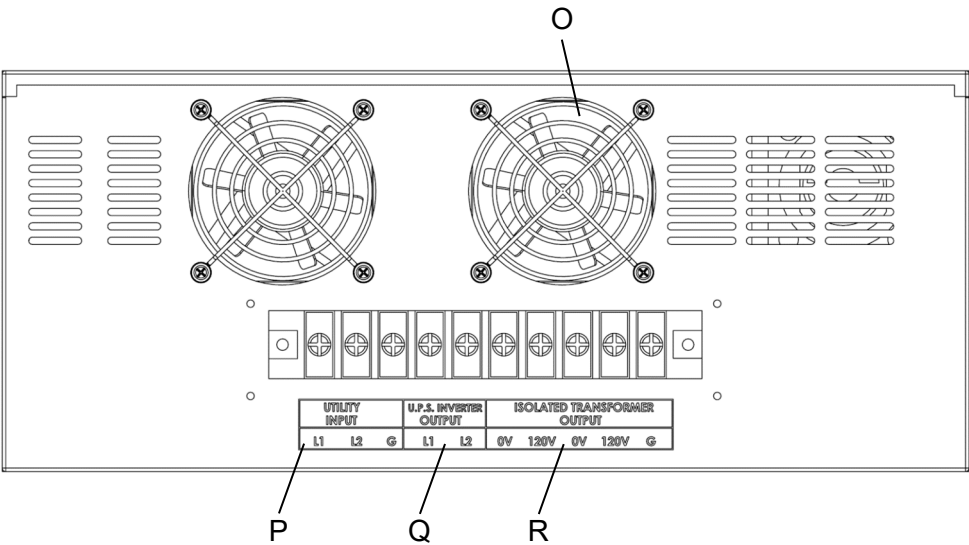
J: Battery Fuses

K: DB-9, RS232

L: Remote Emergency Power Off (R.E.P.O) Terminal

XM6KRM-2/2

Rear View



O: Cooling Fans

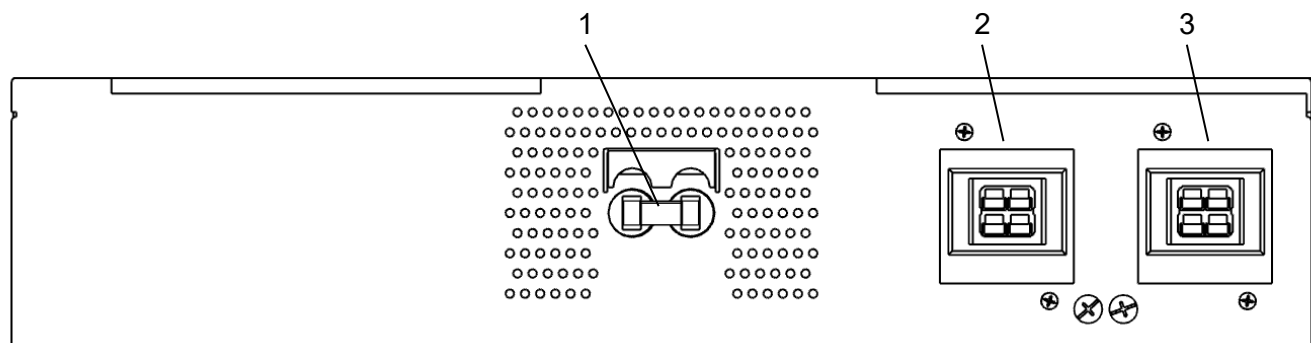
P: Utility Input

Q: UPS Inverter Output

R: System Output (User Configurable)

SSGR

Rear View



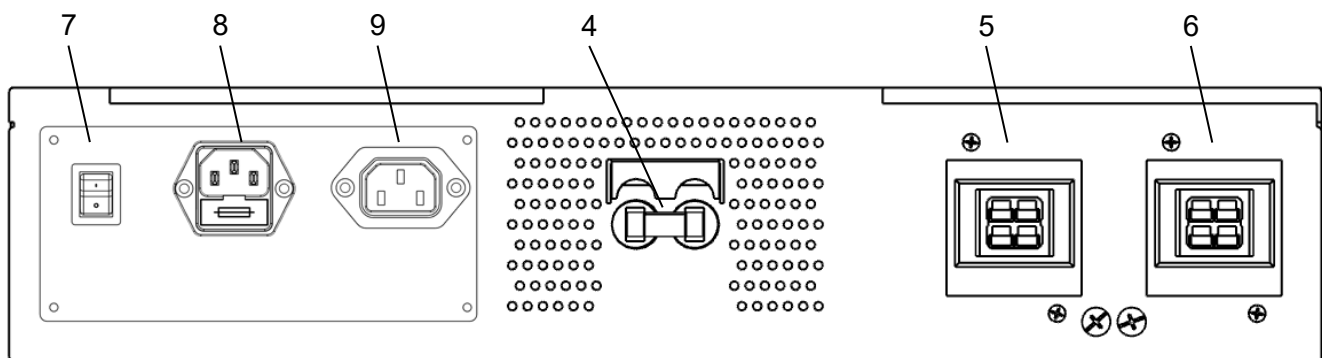
1: Battery Circuit Breaker

2: Additional Battery Connection

3: Battery Connection

SSGR-1 / SSGR-2

Rear View



4: Battery Circuit Breaker

7: AC Power Switch

5: Additional Battery Connection

8: AC Power Cord Inlet with Fuse (3A / 250V)

6: Battery Connection

9: Daisy Chain Inlet (3A Max)

AC Terminal Block: Hardwired terminal block for input, output and transformer interconnections to UPS Inverter.

Battery Pack Compartment: Compartment housing the 48V battery pack for the SSGR models. The front panel and support bracket must be removed to expose compartment.

Battery Fuse: These protection devices are required for proper UPS operation and protection against over-current condition.

Battery Circuit Breaker: This protection device is used to disconnect the battery voltage from the UPS inverter module.

Input Circuit Breaker: One or more protection devices provided to protect the UPS input from an over-current condition.

Cooling Fan: One or more devices provided to maintain the proper temperature of the internal electronics.

Battery Connection: When the cover plate is removed, this universal port is exposed to allow connection of an SSGR battery bank.

REPO Interface: Remote Emergency Power Off provides an interface for a NFPA 70, NEC 645-11 compliant shut off closed loop switch.

Communication Option Slot: When the cover plate is removed, a card slot is available for options, i.e., SNMP / HTTP Web Interface & Dry Contact Relay Cards.

















RS-232 Connector DB-9F Port or USB Port: Two connectors provided to access the system's RS-232 protocol.

Display & Controls

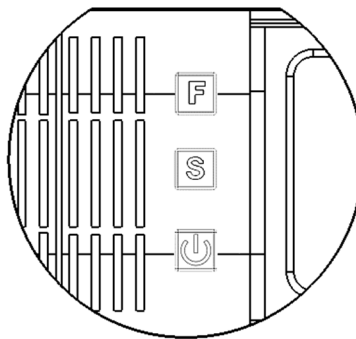
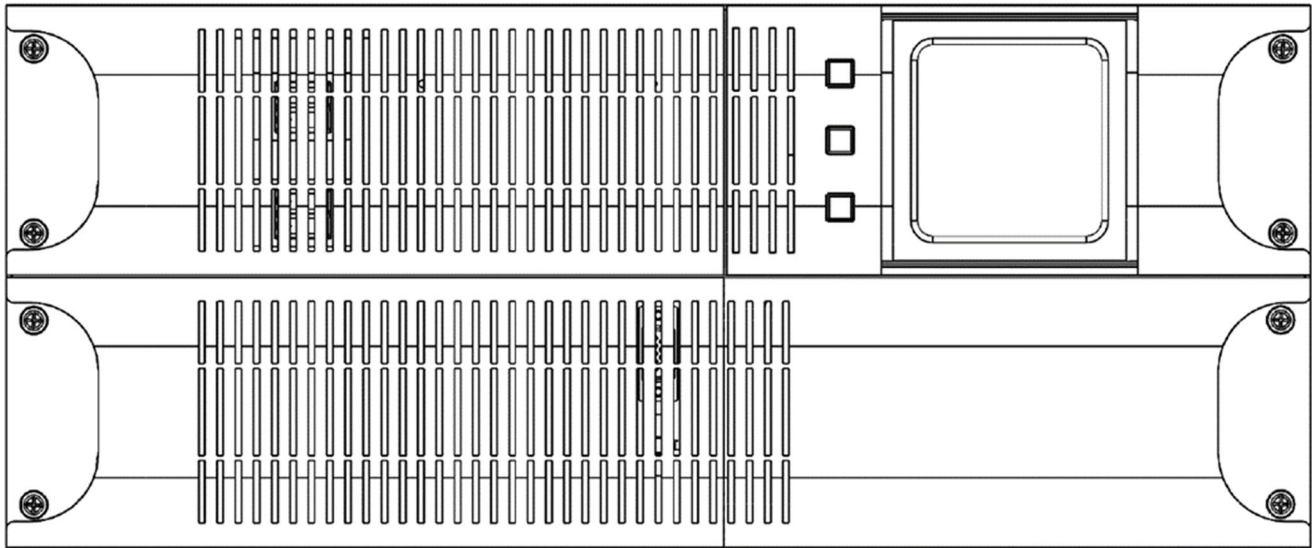
LCD Display

The diagram to the right shows all available icons of the front panel LCD for all SSG models. Refer to the LCD symbols in the left-hand column, below for their functional definition:



-  **Utility Power Status:** Line cord icon indicates utility power is within specification.
 -  **PFC Status:** Sine wave icon indicates the input power factor correction (PFC) is functioning properly.
 -  **Inverter Status:** Generator icon indicates the inverter is functioning properly.
 -  **Charger Status:** Gas pump icon indicates the charger is functioning properly.
 -  **Output Load %:** The greater the load, up to three vertical bars will be illuminated at the top of the weightlifter icon. Each bar represents approximately 25% of the UPS output rating.
 -  **Battery Mode:** Scissor lift icon indicates the UPS is in battery mode.
 -  **Battery Level:** Battery cell icon indicates the battery capacity. The greater the battery capacity available, the more internal bars will be illuminated. Each bar represents 25% capacity.
 -  **Fan in high-speed mode:** HS fan icon indicates fans are in high-speed mode.
 -  **Fan in medium speed mode:** MS fan icon indicates fans are in medium speed mode.
 -  **Fan in low-speed mode:** LS fan icon indicates fans are in low speed mode.
 -  **BIT Window:** The bit window displays programmable settings and fault condition error codes.
 -  **Audible Alarm:** Speaker icon indicates the audible alarm is on.
 -  **Test:** Test icon flashes indicating a battery self-test is being performed.
 -  **UPS Fault Condition:** Exclamation point icon indicates an alarm condition exists.
 -  **Green Mode:** Bulb icon indicates 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.
-  **Metering:** Seven segment display provides readings for voltage, current, temperature, applied load and frequency reported from the UPS.

Front Panel Controls



Function / Test Button: Multifunctional key performs the battery self-test and is used to scroll through bit options during UPS function setting.



Set / Alarm Silence Button: Multifunctional key disables audible alarm, used to scroll through metered parameters and sets the desired programmed setting.

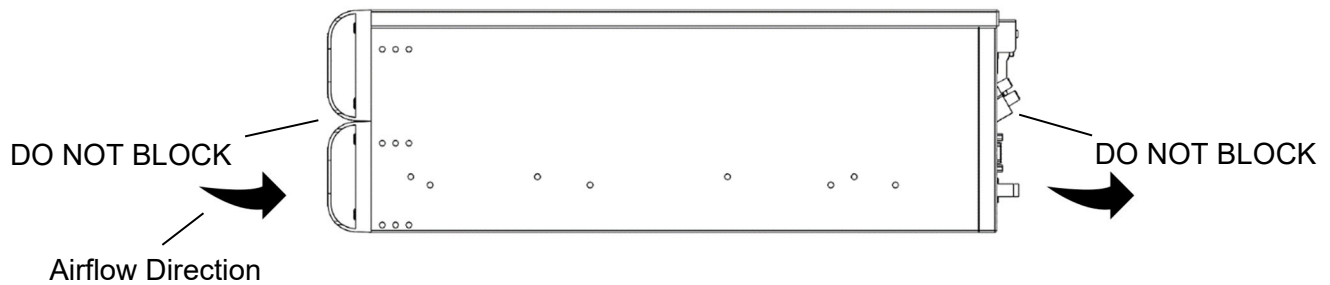


Power / Bypass Button: Multifunctional key performs DC cold start to power UPS without utility power present, places UPS into bypass mode and is used to turn off UPS when utility power is lost.

Getting Started

Installation Environment

The UPS can be installed as a standalone tower or rack mounted in a typical 19" equipment rack. Each UPS inverter and transformer module requires 4U (7" / 178mm) of vertical rack space.



- Do not block air flow.
- Allow a minimum of 3 inches / 76.2mm clearance from the front and rear panel air vents.
- Environment:
 - Intended for use in a protected environment, free from moisture, flammable gases or fumes and corrosive substances.
 - Ambient Temperature:
 - Ideal: 25°C to 30°C (77°F to 86°F)
 - Maximum: -20°C to 55°C (-4°F to 131°F)
 - Humidity:
 - 10-95% (non-condensing)



Securing hardware, slide rails (SGRMKIT) and rail extensions (DP70357) are sold separately.



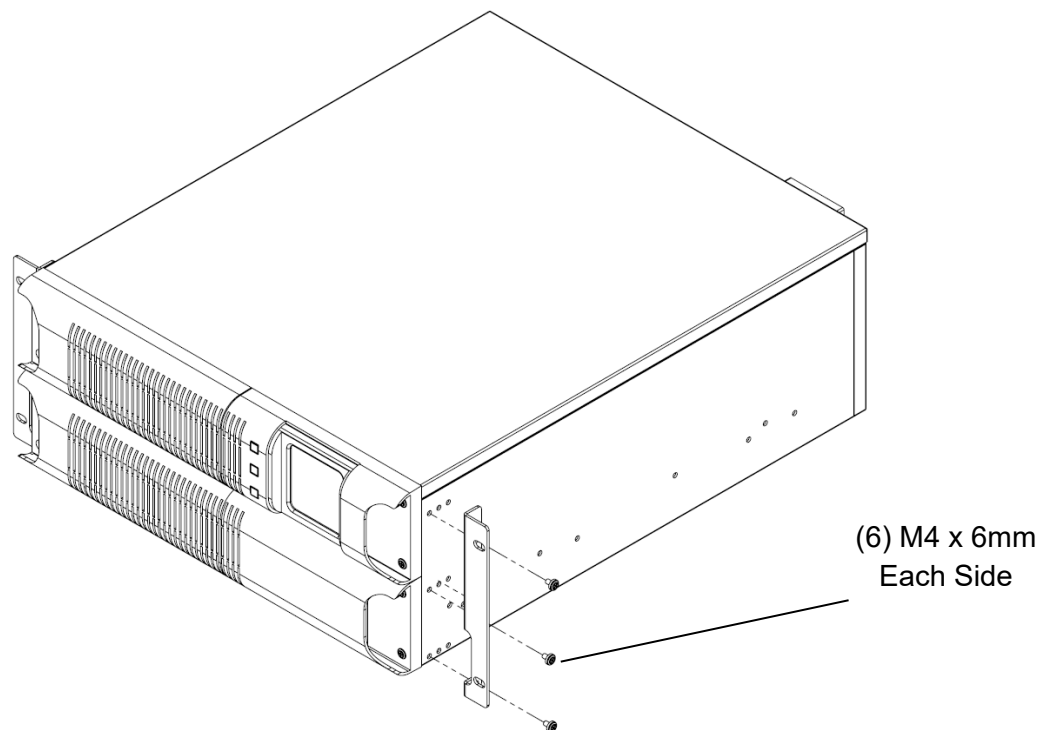
The UPS is designed to fit in a 19" equipment rack. Each UPS inverter and transformer module requires 4U (7 inches / 178mm) of vertical rack space.



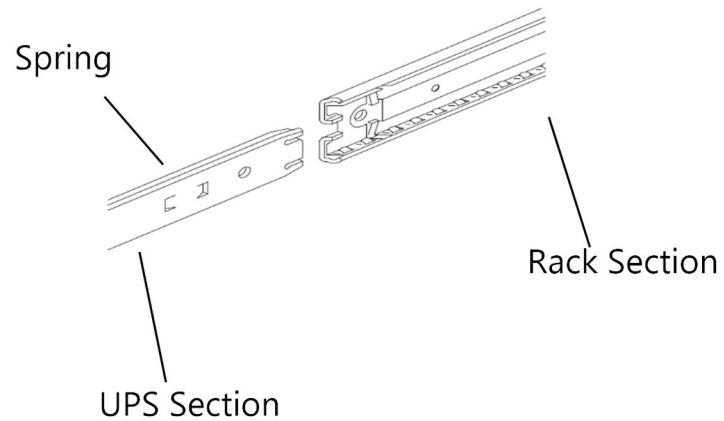
The supplied rack mounting ears are intended to secure the units to the rack rails. They do not support the weight of the UPS, transformer or battery bank. Rack slides or shelves are required.

Reference the following procedure to install the UPS in a standard 19" equipment rack:

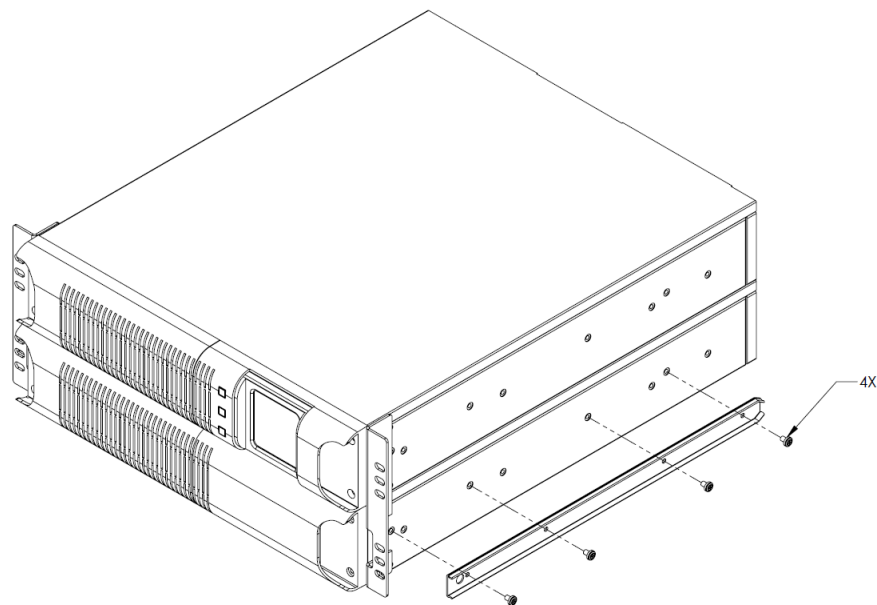
1. Place the UPS on a flat, stable surface with either side of the UPS facing you.
2. Align mounting ears with screw holes on each side of the UPS and secure with the supplied screws. (12) M4 x 6mm.
 - a. Repeat the procedure for the transformer module or battery banks to be used.



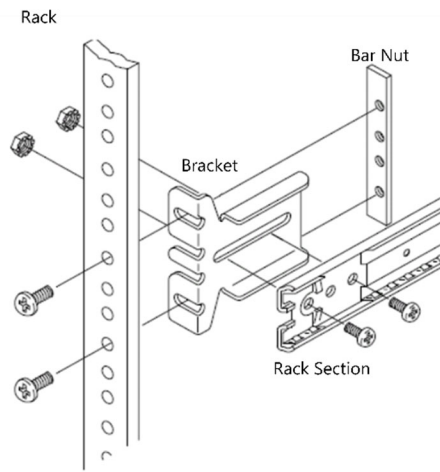
3. Extend the slide fully until it locks out. Depress the spring on the inner member (UPS Section) and disconnect the inner from the outer member. (Rack Section)



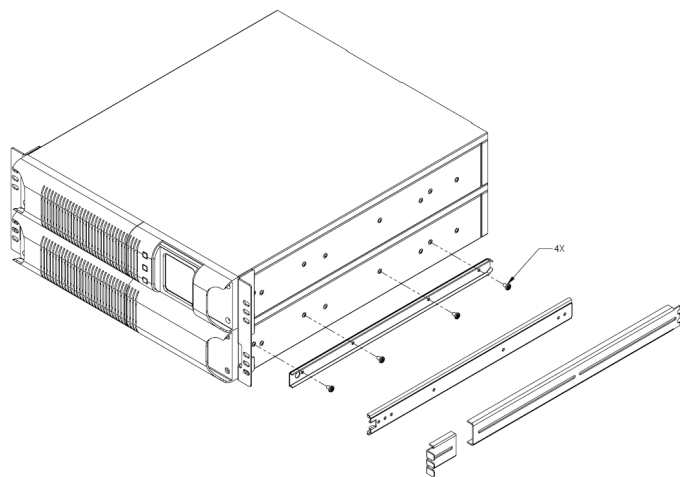
4. For slide rail installation, fasten the inner portion of the slide rail to the UPS on both sides with the screws provided. (4) (8-32 x 3/16") Follow any additional instructions that are included with the optional slide rail kit (SGRMKIT).



5. Attach the two mounting brackets to the rack's mounting rails.



6. After checking alignment, tighten all screws.
7. Insert the UPS, with inner parts attached, into the slide assemblies. You may need to depress the locking mechanisms on the inner and outer parts of the slide assemblies to allow the slides to retract. The UPS should move smoothly forward and backward on the slide assemblies. If not, recheck alignment. (SGRMKIT shown with optional DP70357 brackets)



SSG6KRM Models

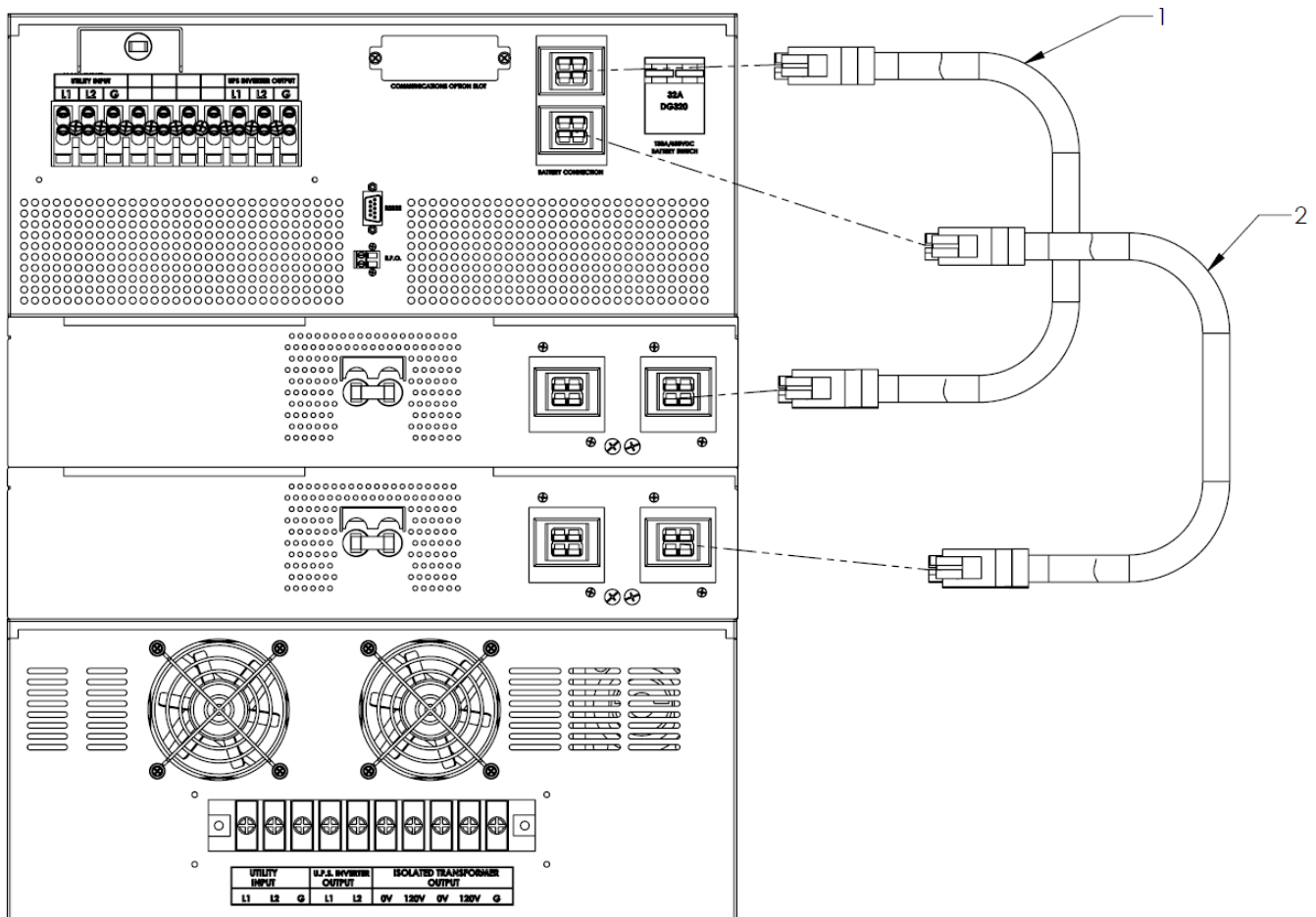


Warning: Verify the battery circuit breakers on the SSGR battery banks are in the off position prior to installing battery cables.



Note: The SSGR Battery Banks are shipped with the internal battery packs preinstalled.

1. Remove the Battery Connector cover plates to expose the battery connectors as shown below.
2. Assure the battery circuit breakers are in the off (down) position before connecting the cables as shown below.
3. If extended banks are used, continue the connections sequence as shown. (The cover plates can be left on if no additional banks are used.)



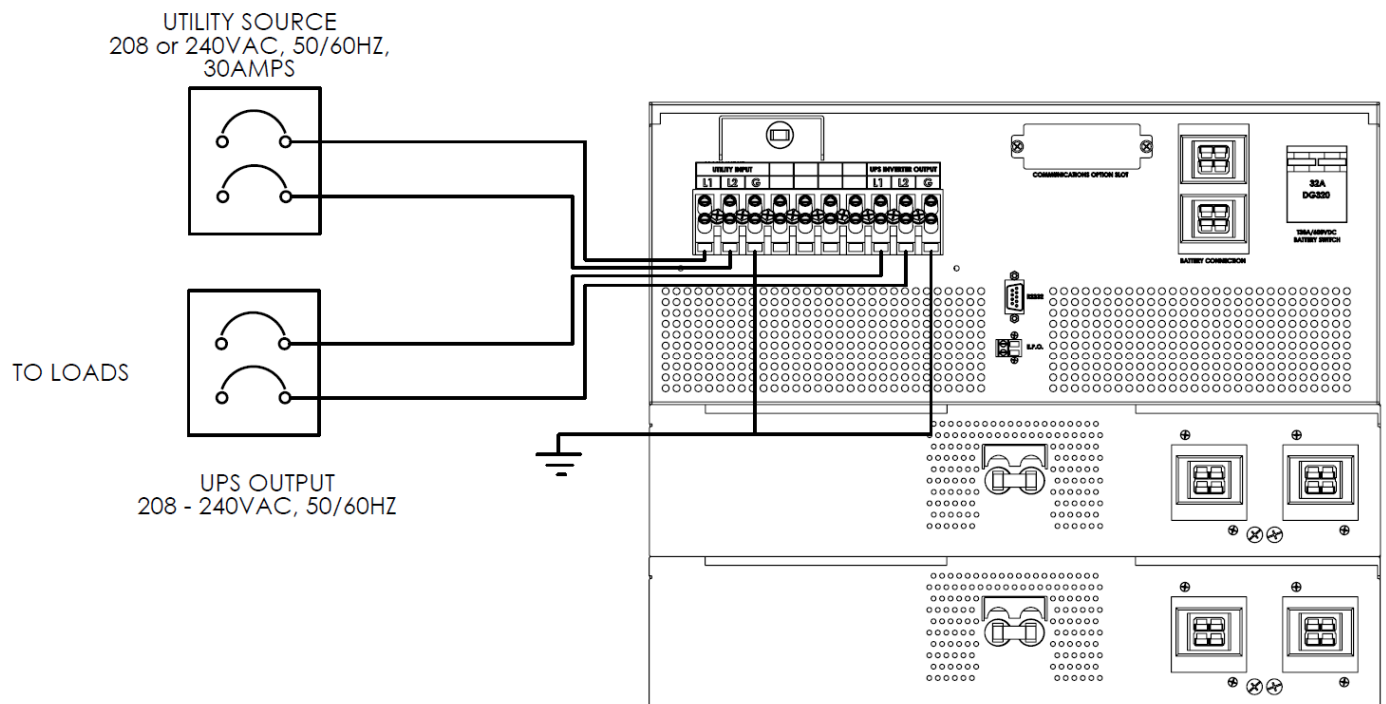


Warning: Local and national electrical codes supersede all recommendations. Please adhere to local and national electrical codes.

Model	Maximum Current	Conductor Selection
6kVA	30 Amps	Input: Use #10 AWG, 75°C copper wire, TRQ: 4.4 IN LB
	30 Amps	Output: Use #10 AWG, 75°C copper wire, TRQ: 4.4 IN LB

Input Connections

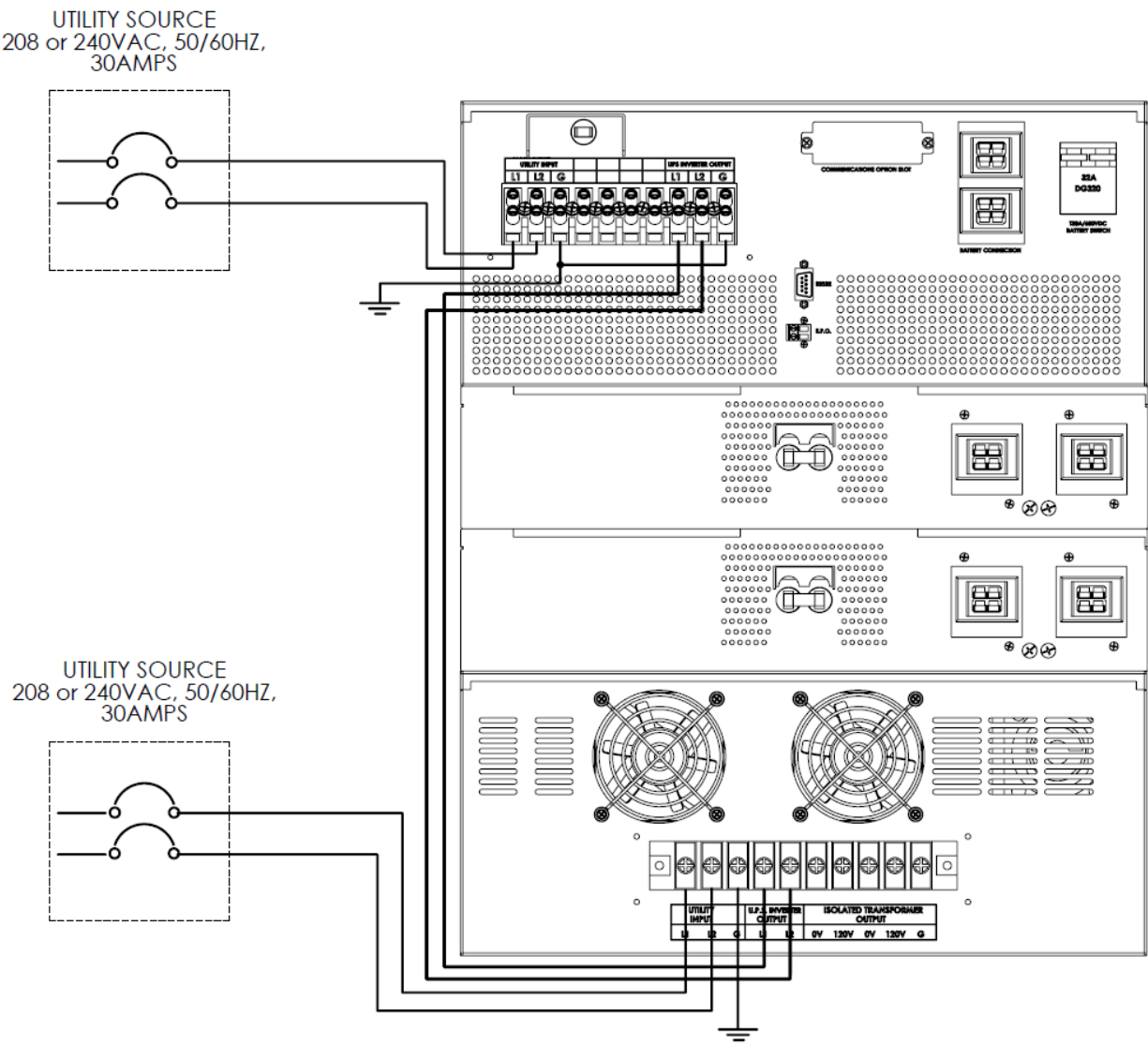
SSG6KRM-2 (Without Transformer Module)



SSG6KRM-2TXI (With Transformer Module)

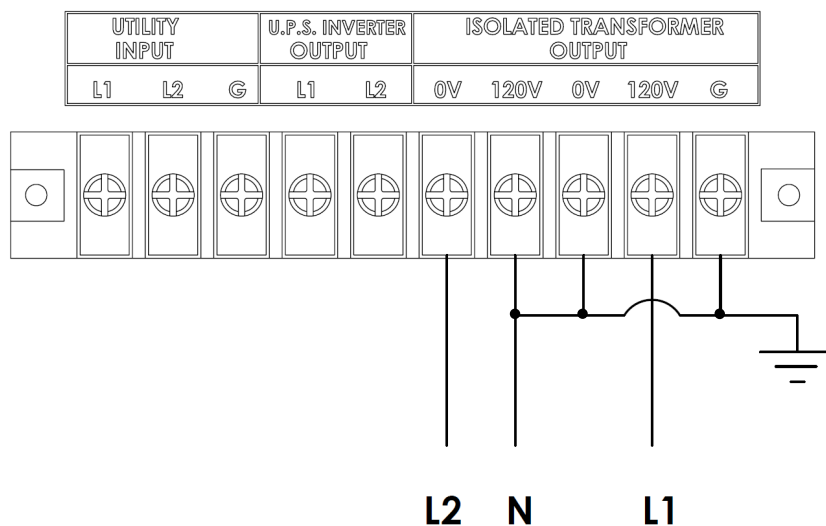


Warning: Utility sources must be of the same phase.



Output Configurations

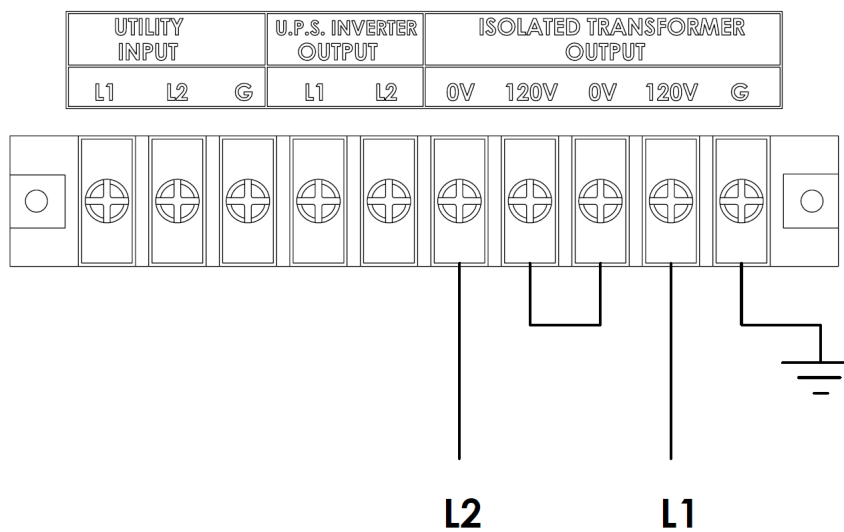
240V / 120V Split Phase



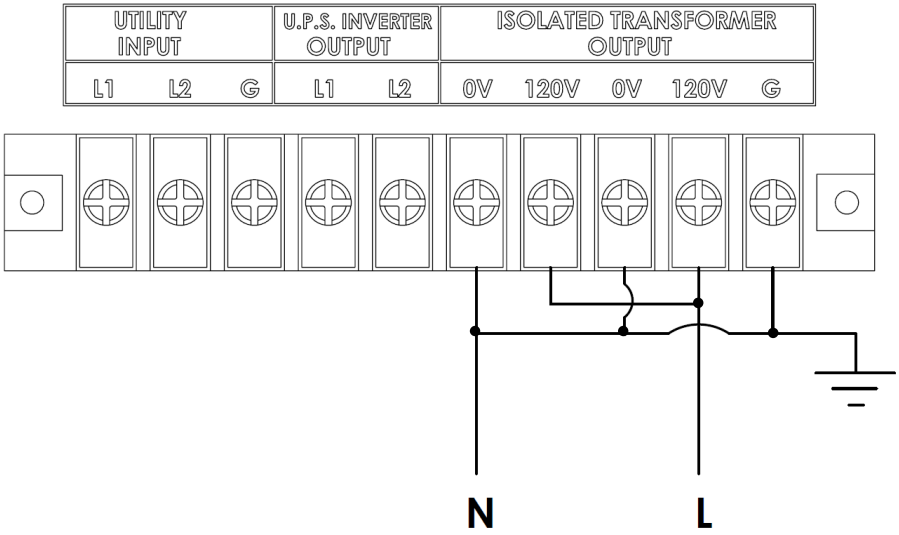
L1 to L2: 240VAC

L1 or L2 to N: 120VAC (Each 120VAC winding is limited to 50% maximum of total UPS output capacity.)

Single Output Configuration: 208 ~ 240VAC

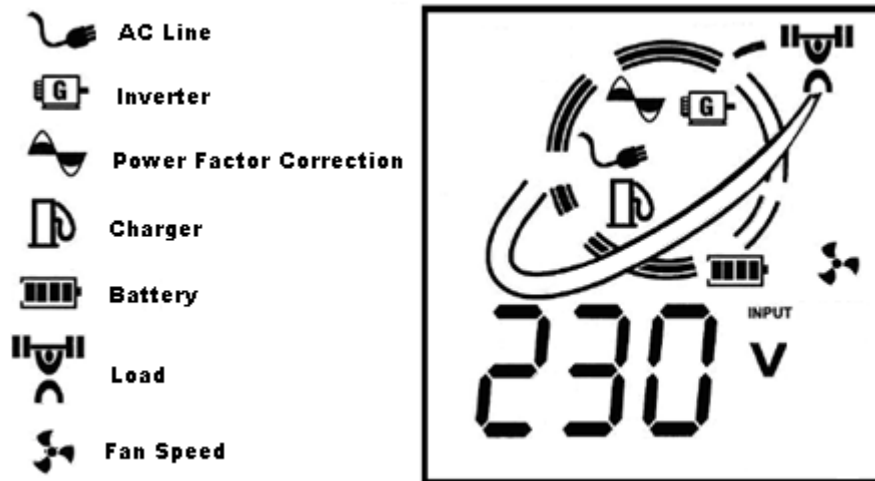


Single Output Configuration: 120VAC



SSG6KRM Models:

1. Place the battery circuit breakers on both SSGR battery banks in the ON (up) position.
2. Turn on the input circuit breaker located on the rear panel of the UPS inverter module.
3. Allow 30 to 45 seconds for the UPS to complete power on self-test.
4. Confirm the UPS display icons for online mode operation. See below.
5. The external output circuit breakers can now be turned on.



DC Start-up Procedure – Utility Power Unavailable



Warning: Verify the connected equipment is turned off prior to starting procedure. Turn on the equipment after the UPS output has been turned on.



Note: In the event utility power is not available, the UPS may be started up in battery mode. The UPS will operate on battery and supply power to the connected equipment until the batteries are depleted. Always charge the batteries immediately by connecting the UPS to utility power and turning on the AC power switch.

1. Press and release the power / bypass button.
2. After about 25 seconds, the UPS will operate in battery mode.
3. Connect the load to the output receptacles then power on the load.

Turn off UPS – Utility Power Available



Warning: Do not press any other buttons after the shutdown command has been initiated to prevent interruption, fault alarm or unexpected output activation.

1. Turn off any equipment connected to the UPS output.
2. While in online mode, press the power / bypass button for one second.
 - a. The UPS will transfer to bypass mode after about 5 seconds.
3. Turn off the input circuit breaker on the rear panel.
 - a. The UPS will shut down after about 30 seconds.

Turn off UPS – Utility Power Unavailable

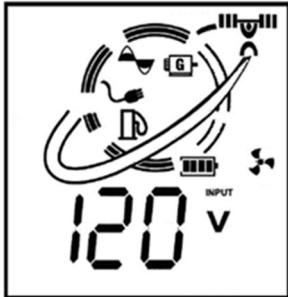


Warning: Do not press any other buttons after the shutdown command has been initiated to prevent interruption, fault alarm or unexpected output activation.

1. Turn off any equipment connected to the UPS output.
2. While in battery mode, press the power / bypass button for one second.
 - a. The UPS will shut down after about 30 seconds.

Operating Modes

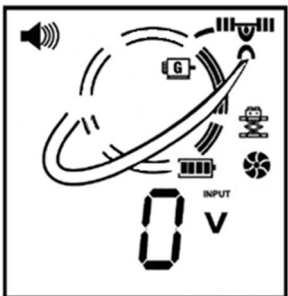
Online Mode



Online mode operation indicates the load, inverter, PFC, line, charger and battery status. The fan is shown at medium speed.

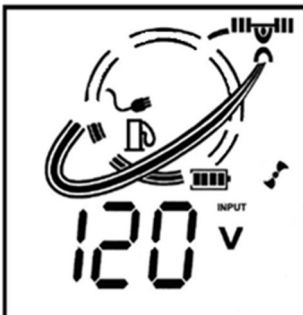
The dark, solid line inside the circle indicates the power flow from input, through the inverter, to load and from the input to the charger and into the battery.

Battery Mode



Battery mode operation indicates battery power flow to the DC/DC converter and on to the inverter. The fan is shown in high-speed mode. Each bar inside the battery icon indicates approximately 25% battery capacity. As capacity decreases, fewer bars will remain illuminated. The charger icon is turned off and the UPS will emit a continuous audible beep sequence during battery mode operation.

Bypass Mode



Bypass mode indicates the input is connected directly to the load. The 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:

- Over-temperature
- Overload
- UPS Fault
- Manual Activation

When in bypass mode, the UPS will transfer the load directly to the utility power and battery backup is not available. The utility power, however, will continue to be passively filtered.

Green Mode



When green mode is activated, the UPS will automatically transfer to bypass mode once the connected load drops to less than 3% of the UPS's rated output. The load will operate directly from utility power. 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.

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

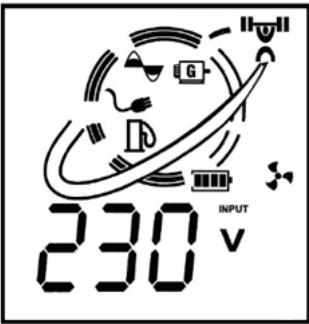
REPO Mode (Remote Emergency Power Off)

A two-pin, normally closed 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 auxiliary contact that opens when the switch is opened. (REPO ACTIVE)

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

LCD Meter



Use the set / alarm silence button to scroll through the available meter readings. (Actual readings will vary depending on UPS model. Shown for illustration purposes only.)

INPUT

120 V

Input Voltage

OUTPUT

120 V

Output Voltage

OUTPUT

600 Hz

Output Frequency

BATTERY

54.0 V

Battery Voltage

OUTPUT

50 %

LOAD

Load Percentage

INPUT

5 A %

Input Current Percentage

25.0

Internal Temperature (Celsius)

OUTPUT

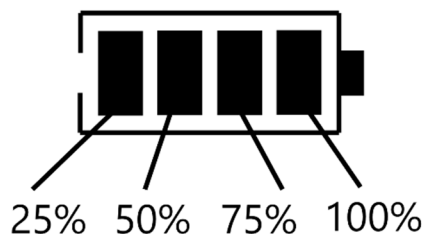
5 A

Output Current

Battery Capacity Indicator

During battery mode operation, the battery capacity indicator will show approximate percentage of battery capacity remaining. The low battery alarm will begin to sound when 25% capacity is remaining.

The battery voltage meter can be used in conjunction with the capacity indicator to verify the remaining capacity. Use the set / alarm silence button on the front panel to access battery voltage.



Battery Percentage	Battery Voltage
100%	>211.2VDC
75%	198.4VDC ~ 211.2VDC
50%	176VDC ~ 198.4VDC
25%	168VDC ~ 176VDC

Battery Self-test



Note: When performing battery self-test, a minimum of 500W load should be applied to the UPS to provide accurate battery capacity.

1. While the UPS is operating in online mode, press the set / alarm silence button three times until the battery voltage metering is displayed.
2. While the UPS is operating in online mode, press and hold the function / test button for about one second, then release.
3. If the batteries are in good condition, the UPS will beep 6 times while the test is being performed. During this time the battery voltage meter and capacity icon will display the current condition.
4. If a single, long audible tone sounds and the unit does not switch to battery mode, this indicates the following possible situations: the batteries are dead / defective or installed incorrectly, the battery pack is not installed, the battery bank interconnect cable is not installed, or the battery fuse is missing / defective. If the problem cannot be resolved, contact Falcon Service.

Programming Mode

The following section describes how to configure the UPS setup options using the setup, configuration & programming mode. The setup options include:

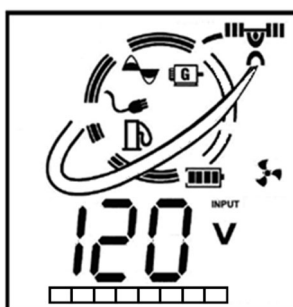
- Programming the UPS output voltage.
- Enabling or disabling green mode function.



Warning: Do not change the output voltage setting while powering the connected load. Disconnect all equipment from the UPS output receptacles.



The green mode bit setting is opposite to all the other settings. Status Bit 2 On (•) indicates the green mode is disabled. Status Bit 2 Off () indicates the green mode is enabled.



Status Bit	Function Bit						
7	6	5	4	3	2	1	0
On = (•) Off = ()	N/A	N/A	N/A	N/A	Green Mode	240V – On 230V – On 220V – Off 208V – Off	240V – On 230V – Off 220V – On 208V – Off

1. While the UPS is online, simultaneously press the function / test and set / alarm silence buttons until an audible beep emits to enter the configuration mode.
2. Use the function / test button to scroll through the available function bits. (Scrolling from right to left, a dot (•) will indicate the current function bit.)
3. Use the set / alarm silence button to turn the desired function bit on or off. The status bit on the far left of the bit window (Bit 7) shows the current on or off setting. (See green mode note above.)
 - a. Status Bit (•) = Function Enabled
 - b. Status Bit () = Function Disabled
4. To store desired configuration and exit configuration mode, simultaneously press the function / test and set / alarm silence buttons until an audible beep emits. The desired configuration is now stored, and you must now restart the UPS for the new configuration to take effect.

Default Programmed Settings

230V Models

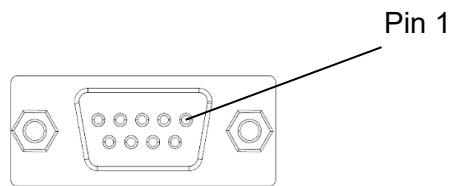
Function Bit						
6	5	4	3	2	1	0
N/A	N/A	N/A	N/A	●	●	
N/A	N/A	N/A	N/A	Green Mode Disabled	230V Output	

Communication Features

RS-232 & USB

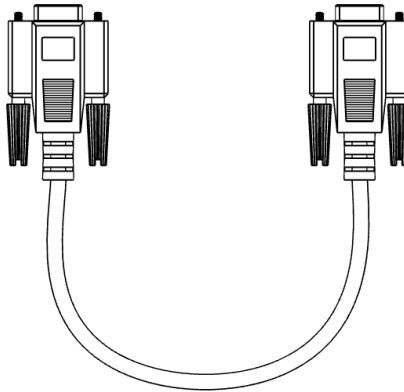
The SSG UPS is equipped with (1) RS-232 and (1) USB port located on the UPS rear panel. A proprietary RS-232 interface cable is provided to allow the UPS to be connected to a workstation. The USB port interfaces with a standard USB cable to be supplied by the end-user. The USB cable required is a – 4 Pin USB Type A (M) connector – 4 PIN USB Type B (M) connector. The USB and RS-232 ports cannot be used concurrently. Please follow the installation and setup instructions supplied on the software CD.

DB-9 Serial Port (RS232)



RS-232, DB-9 Pin Designation	
Pin #	Pin Definition (UPS)
6	Transmit Data
7	Signal Ground
9	Receive Data

Serial Cable



Serial Cable Pin Designation			
UPS Serial Port	Designation	PC Serial Port	Designation
6	Transmit Data	3	Transmit Data
7	Signal Ground	5	Signal Ground
9	Receive Data	2	Receive Data

UA88376-SSG, DB-9 Version

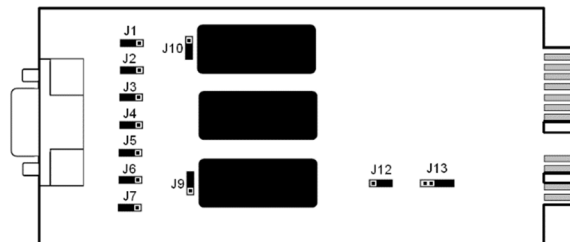


Warning: Do not change the default jumper settings of jumpers J1 to J7. The jumpers must all remain in the 1 – 2, default setting otherwise the relay card will not function properly.



The pin designations table provides relay contact positions while the UPS is turned on and in online mode operation.

- Relay Contact Ratings
 - 48Vdc / 1 Amp Max




Default Jumper Configuration			
Jumper #	Designation	Default Setting	Definition
J9	Summary Alarm	1 – 2	Contact Closed
J10	Low Battery	1 – 2	Contact Open
J12	UPS Model Selection	1 – 2	SSG Series
J13	On-bypass / Alarm	2 – 3	Enabled


DB-9 Pin Designations	
Pin #	Designation
1	Not Used
2	Utility Loss, Normally Open
3	Utility Loss, Normally Closed
4	Common
5	Low Battery
6	Remote Shutdown (+)
7	Common
8	Alarm / Bypass
9	Not Used

Remote Shutdown Operation

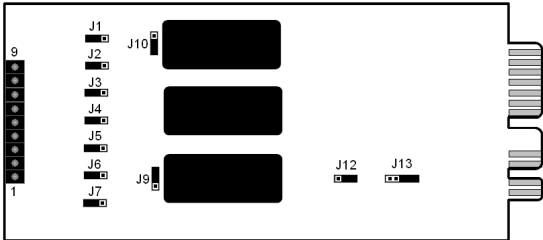
- To operate remote shutdown, momentarily apply a voltage (5 to 12Vdc) between pin 6 (+) and pins 4 or 7 (–) while the UPS is operating in battery mode. The UPS will execute shutdown command and turn off within 30 to 45 seconds.

UA88376-SSG-HW, Hardwire Terminal Version

 Warning: Do not change the default jumper settings of jumpers J1 to J7. The jumpers must all remain in the 1 – 2, default setting otherwise the relay card will not function properly.

 The pin designations table provides relay contact positions while the UPS is turned on and in online mode operation.

- Relay Contact Ratings
 - 48Vdc / 1 Amp Max



Default Jumper Configuration			
Jumper #	Designation	Default Setting	Definition
J9	Summary Alarm	1 – 2	Contact Closed
J10	Low Battery	1 – 2	Contact Open
J12	UPS Model Selection	1 – 2	SSG Series
J13	On-bypass / Alarm	2 – 3	Enabled

Terminal Designations	
Terminal #	Designation
1	Not Used
2	Utility Loss, Normally Open
3	Utility Loss, Normally Closed
4	Common
5	Low Battery
6	Remote Shutdown (+)
7	Common
8	Alarm / Bypass
9	Not Used

Remote Shutdown Operation

- To operate remote shutdown, momentarily apply a voltage (5 to 12Vdc) between pin 6 (+) and pins 4 or 7 (–) while the UPS is operating in battery mode. The UPS will execute shutdown command and turn off within 30 to 45 seconds.



IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

CAUTION: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.

When replacing batteries, replace with the same number of the following battery: Hitachi Chemical / CSB, XTV1272 F2

CAUTION: Risk of Energy Hazard, 12V, 7 Ampere-hour battery. Before replacing batteries remove conductive jewelry such as chains, wrist watches, and rings. High energy through conductive materials could cause severe burns.

CAUTION: Do not dispose of batteries in a fire. The batteries may explode.

CAUTION: Do not open or mutilate batteries. Released material is harmful to the skin and eyes. It may be toxic.

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 or other metal objects

- Use tools with insulated handles
- Wear rubber gloves and boots
- Do not lay tools or metal parts on top of batteries
- Disconnect 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.



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



Never discard the UPS, battery pack, or individual batteries in the trash. Contact your local recycling or hazardous waste center for information on proper disposal of the used batteries. The depleted batteries or packs may be returned to the Falcon Service Center at the end user's expense for recycling. Prior to returning the depleted batteries or packs, please contact the Falcon Service Center and obtain a Return Material Authorization (RMA) number.



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 your local recycling or hazardous waste center.

Battery Storage

If the UPS system is to be stored for an extended period, the following precautions should be observed to maximize battery life:

- Connect UPS to a properly rated outlet for at least 24 hours to ensure batteries are in a fully charged state prior to long-term storage.
- The ideal ambient temperature for storage should be between -15°C to 40°C. (5°F to 104°F) When operated in temperatures above 25°C, the battery service life will be reduced.
- Remove the battery fuse or turn off the battery circuit breaker prior to storage.



Battery specifications subject to change without notice. Visit battery manufacturers website for latest information

Battery Capacity Retention

The table below provides the maximum allowable storage period based on ambient temperature. The recommendations below yield about 60% battery capacity at maximum storage period. The batteries require recharge after storage.

Temperature	Maximum Storage Period (Months)	Recommendation
5°C / 41°F	19	Good condition. Charge prior to use. (Minimum 8 hours to 90% capacity using UPS charger.)
25°C / 77°F	10	
30°C / 86°F	6	
40°C / 104°F	3.5	

Battery Service Life (Float / Trickle Charge)

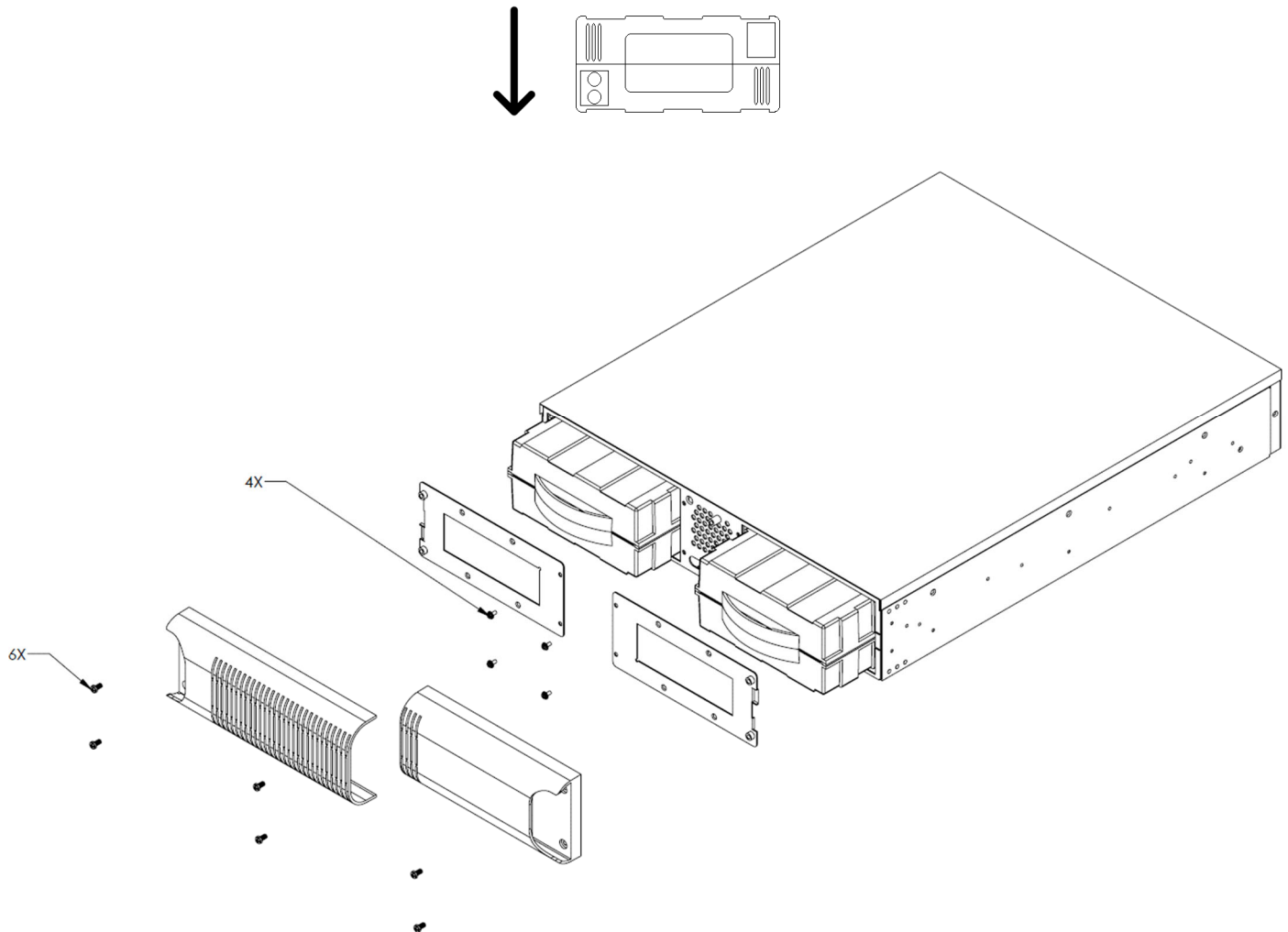
The table below provides the typical battery service life during float / trickle charge. Ambient temperature greatly affects the overall battery life.

Temperature	Period (Years)	Float Charge
25°C / 77°F	12	2.275Vdc per cell
40°C / 104°F	7	
50°C / 122°F	4	

SSG6KRM Models



Warning: Do not touch battery terminals located on the rear of the battery pack.



1. Remove the plastic front panel on the left side first and battery support plate as shown. Then remove the right side.
2. Remove the battery packs. (Grasp each battery pack from the sides. Do not place hands on rear.)
3. Install the replacement battery packs with terminal side facing down to allow alignment with the mating battery terminals inside the UPS battery compartment. Secure panels and support plates.

Alarms

Audible Alarms

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

Alarm	Possible Cause	Solution
Three short beeps, continuously • • • — • • •	Utility voltage out of range.	The UPS is in battery mode, check the utility power.
Four short beeps, continuously • • • • — • • • •	Utility frequency out of range.	The UPS is in battery mode, check the utility power frequency.
Five short beeps, continuously • • • • • — • • • • •	UPS internal over temperature. Cooling fan failure.	Check air vents for blockage. Check fan operation. Check ambient room temperature.
Six short beeps, continuously • • • • • • — • • • • • •	PFC over current protection activated.	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 • • • • • • • — • • • • •	Battery low after utility loss.	Save the data, turn off the equipment and wait for utility power to return.
One long beep every few seconds • — •	Output overload. Charger failure. UPS alarm.	Check the LCD display. Remove some load.

Troubleshooting Tips



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.

Problem	Possible Cause	Solution
UPS will not turn on.	Input breaker is not switched on. Input plug is not connected properly.	Verify the UPS input switch on front panel is turned on. Verify the input cable and battery is connected to the UPS and battery bank. Verify the battery disconnects are in place / turned on.
UPS will not provide power to the load.	Output only present on one receptacle. No output from any output receptacle. Output fails as soon as load is connected.	Check the output fuses. Check the connected cable. Ensure the load does not exceed the maximum rating of the UPS.
UPS operates from battery despite utility power being present.	Open fuse or circuit breaker.	Check utility power protection devices.
UPS drops the load and is in bypass mode with alarm.	Excessive load.	Check the load status; the UPS may be overloaded.
Short battery backup time.	Weak battery.	Perform battery self-test. If the self-test fails, replace the battery pack.

Bit Error Codes

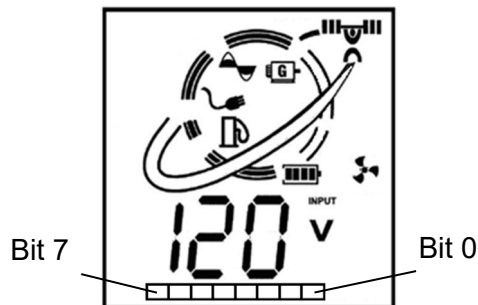
In the event of a severe failure, the UPS features audible alarm and bit codes to alert the user of potential faults. Please refer to the following table to identify and resolve alarms.



Warning: Bit error alarm faults are considered severe. Do not attempt to troubleshoot the UPS with the load connected to the UPS. Shutdown all connected equipment prior to attempting to troubleshoot the UPS.



Warning: If a bit error fault occurs, the UPS will switch the load to bypass mode and emit continuous audible alarm with the alarm icon on the LCD.



Bit Error Code	Error Code Description	Possible Cause	Solution
0	DC BUS VOLTAGE OUT OF TOLERANCE – HIGH RANGE	CPU detects error due to excessive load variation or severe utility power surge.	Disconnect load from UPS output. Restart UPS. If error persists, contact Falcon Electric Service Department.
1	SOFT START FAULT	CPU detects error due to excessive overload at start up affecting the DC to DC Boost Circuitry.	
2	INVERTER VOLTAGE OUT OF TOLERANCE – HIGH RANGE	CPU detects error due to excessive load variation.	
3	INVERTER VOLTAGE OUT OF TOLERANCE – LOW RANGE	CPU detects error due to excessive load variation.	
4	INVERTER OVERCURRENT	CPU detects error due to excessive overload or direct short on the UPS output.	
5	CHARGER VOLTAGE OUT OF TOLERANCE – HIGH RANGE	CPU detects error due to charger output voltage being out of tolerance.	
6	DC BUS VOLTAGE OUT OF TOLERANCE – LOW RANGE	CPU detects error due to severe power surge or load variation affecting the PFC circuitry.	
7	INVERTER VOLTAGE FEEDBACK ERROR	CPU detects error due to severe power surge or load variation affecting the inverter circuitry.	

Contact Us

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

Falcon Electric, Inc.
5116 Azusa Canyon Road
Irwindale, Ca 91706

Service: 800-842-6940

Voice: 626-962-7770

Email: service@falconups.com

www.falconups.com

Please have your UPS model, serial number and date of purchase on hand prior to your call. Serial number information is located on the identification label on the rear section 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 number (RMA) along with return shipping instructions.

The RMA number issued must appear on the outside of the shipping carton. The original shipping container must be used when returning any product. Failure to use the original shipping container and packing materials will likely result in irreparable 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 may 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 unless otherwise specified. The address and shipping instructions will be given to you at the time the RMA is issued.

Warranty

LIMITED WARRANTY

Four-Year Limited Warranty: Falcon Electric warrants that this product will be free from defects in materials and workmanship for a period of four 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.