

# SOLAHD

**Industrial On-Line UPS - 120 V, 700 VA - 3000 VA**

## **S4KC Series**



**Instruction Manual**

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# IMPORTANT SAFETY PRECAUTIONS

## **WARNING**

Observe all cautions and warnings in this manual. Failure to do so may result in serious injury or death.

Refer all UPS and battery service to properly trained and qualified service personnel. Do not attempt to service this product yourself and never work alone.

Opening or removing the cover may expose you to lethal voltages within this unit, even when it is apparently not operating and the input wiring is disconnected from the electrical source.

## **SAVE THESE INSTRUCTIONS**

This manual contains important safety instructions that must be followed during the installation and maintenance of the UPS and batteries. Read this manual thoroughly before attempting to install or operate this UPS.

This UPS contains no user-serviceable parts. The Off/Bypass push button does not electrically isolate internal parts. Under no circumstances should you attempt to gain internal access other than to replace the batteries due to risk of electric shock or burn. Do not continue to use the UPS if the front panel indicators are not in accordance with these operating instructions or if the UPS performance alters in use. Refer all faults to your local distributor, SolaHD representative or SolaHD Technical Support.

This UPS has an internal battery, and the output receptacles of the UPS may carry live voltage even if the UPS is not connected to utility input power.

Before moving or rewiring this UPS, disconnect utility input power and the battery and make sure that the UPS is completely shut down. Otherwise, the output terminal may carry live voltage, presenting an electric shock hazard.

To ensure human safety and normal UPS operation, the UPS must be properly grounded before use.

When the UPS is connected to an IT power distribution system, a short-circuit protection device must be installed on the neutral line.

Install and use the S4K2UC in the following environments:

- Temperature: 0°C – 40°C (32°F – 104°F); Relative humidity: 0% – 95%, non-condensing
- Out of direct sunlight
- Away from heat sources
- Stable surface, not subject to vibrations or shocks
- Away from dust and other particulates
- Away from corrosive substances, salts and flammable gases

Keep the air inlet and outlet of this UPS unobstructed. Poor ventilation will increase the internal temperature of the UPS and can adversely affect the UPS and its batteries.

Keep liquid and foreign objects away from the UPS.

In case of fire, use a dry chemical fire extinguisher to put out the fire. Using a fluid fire extinguisher may cause electric shock.

This UPS is not intended for use with life support and other designated critical devices. Maximum load must not exceed that shown on the UPS rating label. This UPS is designed for data processing equipment. If uncertain, consult your local dealer or SolaHD representative.

This UPS is not for use in a computer room as defined in the standard for the Protection of Electronic Computer/Data Processing Equipment, ANSI/NFPA 75.

The S4K2U3000-C was investigated under 30 A branch circuit in accordance with the National Electrical Code, ANSI/NFPA 70, to reduce the risk of fire; connect only a circuit provided with 30 A maximum branch overcurrent protection.

## Battery Safety Notes

### CAUTION

Do not dispose of batteries in a fire; they may explode. Dispose of used batteries according to local regulations.

Do not open or mutilate the batteries. Released electrolyte is toxic and harmful to skin and eyes. If electrolyte comes into contact with the skin, wash the affected area immediately and get medical attention.

### CAUTION

A battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed when working with batteries:

- Remove watches, rings and other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves, boots, and safety glasses.
- Do not lay tools or metal parts on top of batteries.
- If the battery pack is damaged in any way or shows signs of leakage, please contact your SolaHD representative immediately.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- Determine if the battery is inadvertently grounded. If it is inadvertently grounded, remove the source of the ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if grounds are removed during installation and maintenance (applicable to a UPS and a remote battery supply not having a grounded supply circuit).
- When replacing batteries, replace with the same type and number of batteries or battery packs.

## Electromagnetic Compatibility

The S4K2UC complies with the limits for a CLASS A DIGITAL DEVICE, PURSUANT TO Part 15 of FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) This device must accept any interference received, including interference that may cause undesired operation. Operating this device in a residential area is likely to cause harmful interference that users must correct at their own expense.

The S4K2UC Series complies with the requirements of EMC Directive 2004/108/EC and the published technical standards. Continued compliance requires installation in accordance with these instructions and use of accessories approved by SolaHD.

**NOTICE:** This product is for restricted sales distribution to informed partners. Installation restrictions or additional measures may be needed to prevent radio interference.

## Information for the Protection of the Environment

**UPS Servicing:** The UPS makes use of components dangerous for the environment (e.g. batteries, electronic cards, and electronic components). The components removed must be taken to specialized collection and disposal centers.

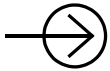
## Glossary of Symbols



Risk of electrical shock



Indicates caution followed by important instructions



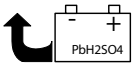
AC input



AC output



Requests the user to consult the manual



Indicates the unit contains a valve-regulated lead acid battery



Recycle



DC voltage



Equipment grounding conductor



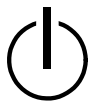
Bonded to ground



AC voltage



ON/Alarm Silence/Battery Test



OFF/Bypass



WEEE



# 1.0 Product Description

The SolaHD S4K2UC Series is a compact, on-line uninterruptible power system (UPS) that continuously conditions and regulates its output voltage. It is designed to supply microcomputers and other sensitive equipment with clean sine wave input power.

Upon generation, AC power is clean and stable. However, during transmission and distribution it is subject to voltage sags, spikes and complete failure that may interrupt computer operations, cause data loss and damage equipment. The S4K2UC protects equipment from these disturbances. The S4K2UC continuously charges its batteries from utility power, enabling it to supply power to connected loads even when utility power fails.

This section describes the UPS, its features, models, appearance, components, operating principles, and operating modes.

## 1.1 Features

- Intelligent battery management to extend the battery life
- Operation and display panel with LED for monitoring load percentage and battery capacity independently
- Flexible network management with MultiLink™ software
- Fan fault self-inspection and automated diagnostic function
- Intelligent fan operation, automatically changing rotation speed depending on system requirements to decrease power consumption and noise
- Input circuit breaker to ease recovery from overloads
- Safety approval from UL and cUL
- Communication options: USB port, IntelliSlot® port and terminal block communication
- Dry contacts for remote monitoring
- Input power factor greater than 0.99 at 100% load
- Output voltage selection function using the configuration software

## 1.2 Available Models

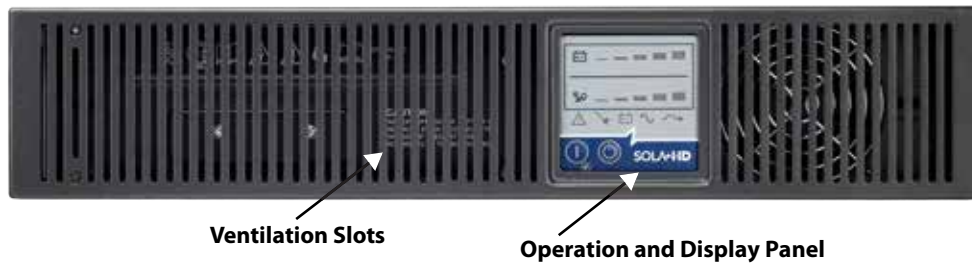
Available models of the UPS are shown in Table 1:

Model	Nominal Power Rating
S4K2U700C	700 VA/630 W
S4K2U1000C	1000 VA/900 W
S4K2U1500C	1500 VA/1350 W
S4K2U2000C	2000 VA/1800 W
S4K2U3000C	3000 VA/2700 W

## 1.3 Appearance & Components

### 1.3.1 Front Panel & Controls

The SolaHD S4K2UC rack/tower models, in various power ratings, have the same general appearance, controls and features (see Figure 1). The various rack/tower models differ largely in the receptacle type.



**Figure 1:** S4K2UC rack/tower models—front view

### 1.3.2 Rear Panel Features

The rear panel of the S4K2UC has these features (see Figure 2):

- USB port
- Cooling fan
- Power output receptacles
- Input circuit breaker
- IntelliSlot port
- Communication terminal block
- Input power cable

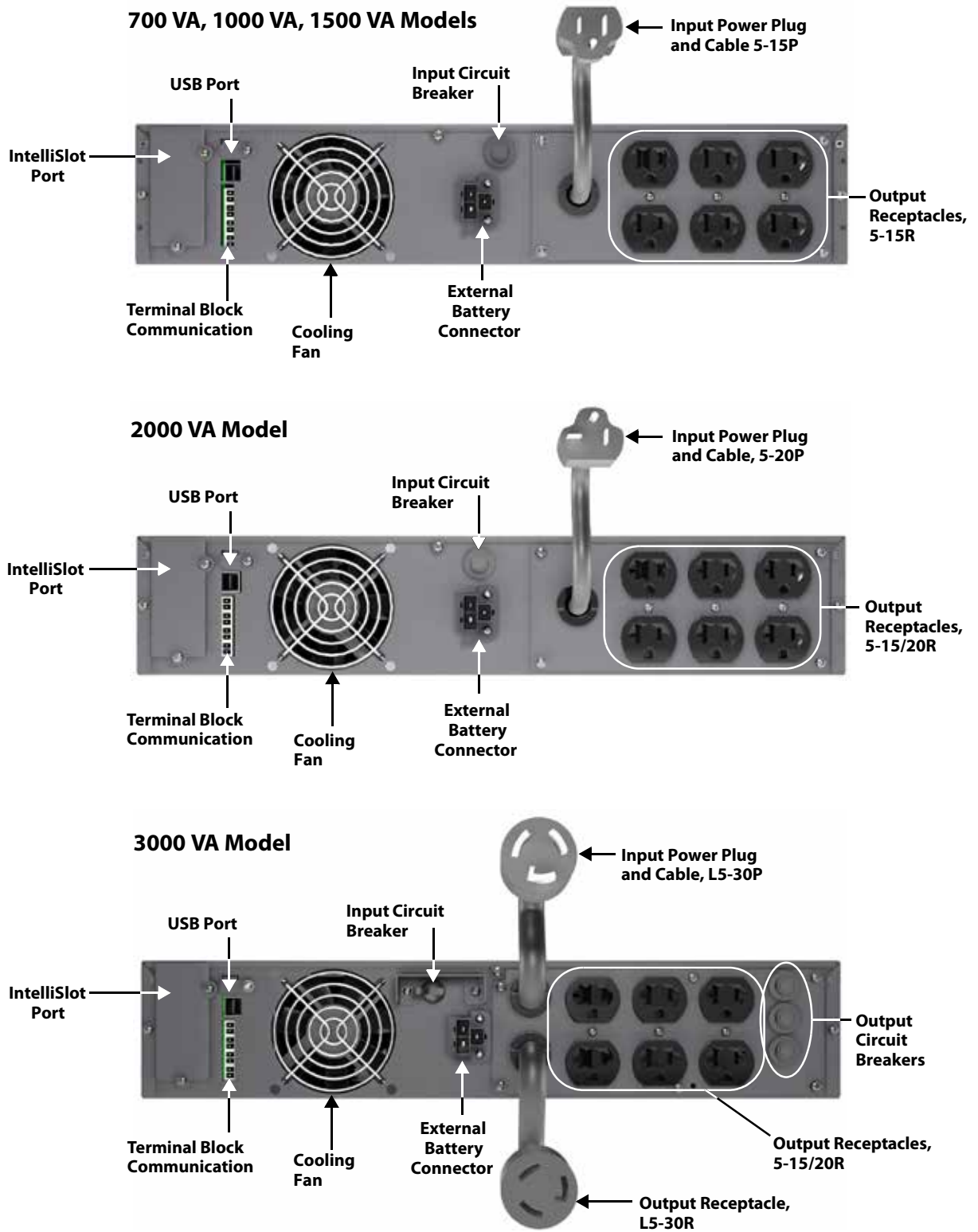
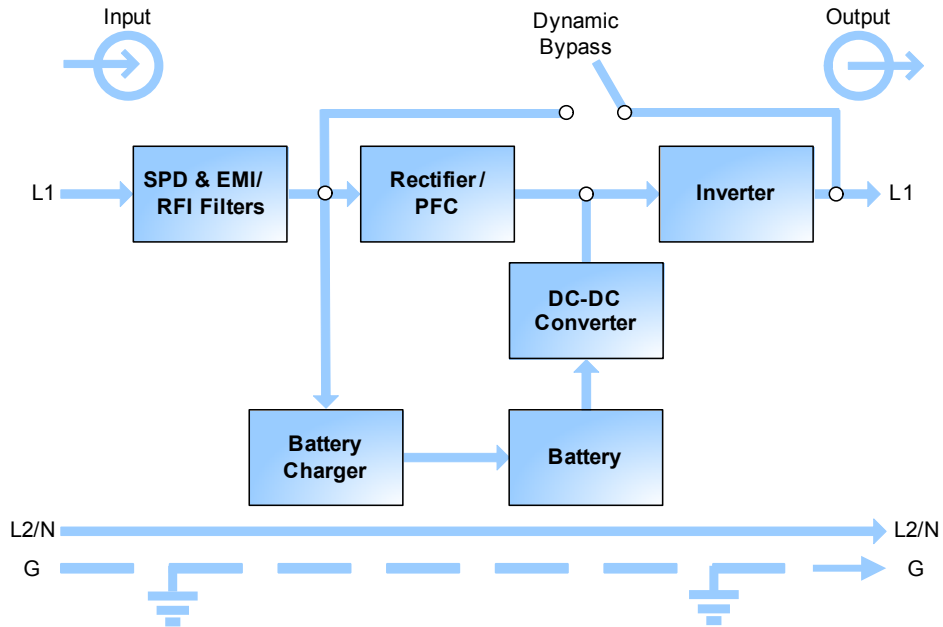


Figure 2: S4K2UC 120 V rack/tower models—rear panel components

## 1.4 Major Components

The operating principle of the UPS is illustrated in Figure 3.



**Figure 3: Operating principle diagram**

The UPS is composed of utility input, SPD and EMI/RFI filters, rectifier/PFC, inverter, battery charger, DC-DC converter, battery, dynamic bypass, and UPS output.

### 1.4.1 Surge Protection Device (SPD) & EMI/RFI Filters

The S4K2UC has surge protection and filters that protect the connected load from power surges, electromagnetic interference (EMI) and radio frequency interference (RFI). These features can minimize any surges or interference present in the utility power. The filters also prevent surges or interference generated by the UPS from adversely affecting devices connected on the same branch as the UPS.

### 1.4.2 Rectifier/Power Factor Correction (PFC) Circuit

In normal operation, the S4K2UC's rectifier/power factor correction (PFC) circuit converts utility power to regulated DC power for use by the inverter, while ensuring that the wave shape of the input current used by the UPS is near ideal. Extracting this sine wave input current achieves two objectives:

- Efficient power use by the UPS
- Reduced reflected harmonics

This results in cleaner power being available to other devices in the building not protected by the S4K2UC.

### 1.4.3 Inverter

In normal operation, the S4K2UC's inverter utilizes the DC output of the PFC rectifier to produce precise, regulated sine wave AC power. When utility power fails, the inverter receives DC power from the DC-DC converter. In either operation mode, the UPS inverter is online, continuously generating clean, precise, regulated AC output power.

### 1.4.4 Battery Charger

The battery charger utilizes energy from the utility power and precisely regulates it to continuously float charge the batteries. The batteries are being charged whenever the S4K2UC is plugged in, even when the UPS is not turned on.

### 1.4.5 DC-DC Converter

The DC-DC converter raises the DC voltage from the battery to the optimum operating voltage for the inverter. This allows the inverter to operate continuously at its optimum efficiency and voltage, thus increasing reliability.

### 1.4.6 Battery

The S4K2UC uses valve-regulated, non-spillable, lead acid batteries. To maintain battery design life, operate the S4K2UC in an ambient temperature of 0°C to 25°C (32°F to 77°F).

**NOTE:** Optional external battery cabinets are available to extend battery run times.

### 1.4.7 Dynamic Bypass

The S4K2UC provides an alternate path for utility power to the connected loads in the unlikely event of a UPS malfunction. Should the S4K2UC have an overload, overtemperature or UPS failure condition, the UPS automatically transfers the connected loads to bypass.

**NOTE:** The bypass power path does not protect the connected loads from disturbances on the utility.

## 1.5 Operating Modes

The UPS operating modes include: Utility (VAC) Mode, Bypass Mode, Battery Mode, Battery Recharge Mode, and Frequency Converter Mode. For descriptions of indicators and control buttons, refer to "3.0 Controls & Indicators".

### 1.5.1 Utility (VAC) Mode

During Utility (VAC) Mode, utility power provides energy to the S4K2UC. The filters, PFC rectifier and the inverter process this power to provide computer-grade power to connected loads. Meanwhile, the UPS maintains the batteries in a fully charged state.

### 1.5.2 Manual Bypass Mode

Manual Bypass Mode occurs when the Standby/Manual Bypass button is pressed and held for about 2 seconds while the S4K2UC is in Utility (VAC) Mode. Bypass operation is indicated by an audible alarm and illuminated amber bypass indicator. (If other indicators are illuminated, refer to "8.0 Troubleshooting"). During Manual Bypass Mode, utility power bypasses the inverter and provides energy to the connected load.

#### CAUTION

Turning off the UPS in Manual Bypass Mode will result in loss of output power and dropped loads.

### 1.5.3 Battery Mode

The S4K2UC enters Battery Mode when utility power fails or is outside acceptable values. The battery system supplies power through the DC-DC converter to the inverter to generate clean AC power for the connected loads.

When the S4K2UC enters Battery Mode, the UPS sounds a half-second beep at 10-second intervals.

When approximately 2 minutes of run time remains, the beeps sound every 5 seconds to warn that the battery is getting low (this low battery warning is user-configurable).

In Battery Mode, the AC Input indicator goes off and the Battery Level indicators illuminate. Each Battery Level indicator represents a 20% capacity level. As capacity decreases, fewer indicators remain illuminated. Refer to “8.0 Troubleshooting”.

For approximate battery run times, refer to “9.0 Specifications—Table 13”. The times in Table 13 are approximate. They are based on resistive loads and an ambient temperature of 25°C (77°F). To increase this time, turn off non-essential loads (such as idle computers and monitors) or add optional external battery cabinets.

#### CAUTION

Turning off the S4K2UC while in Battery Mode will result in loss of output power. If the UPS is turned off manually, it must be manually restarted after utility power returns. If the UPS is turned off by a communication signal or because the batteries are depleted, it will operate as selected in the configuration program for Auto-Restart (refer to “5.2.1 Configuration Program”).

### 1.5.4 Battery Recharge Mode

Once utility power is applied to the S4K2UC, the battery charger begins charging the batteries.

### 1.5.5 Frequency Converter Mode

All models of the S4K2UC are capable of frequency conversion. Frequency Conversion Mode can be selected using the configuration program. Allowable frequency operating modes include:

- Auto Sensing — 50 Hz or 60 Hz — Bypass Enabled
- Auto Sensing — 50 Hz or 60 Hz — Bypass Disabled
- Frequency Converter — 50 Hz — Bypass Disabled
- Frequency Converter — 60 Hz — Bypass Disabled

**NOTE:** The default for all models of the S4K2UC is “Auto Sensing — 50 Hz or 60 Hz — Bypass Enabled.”

#### CAUTION

Do not touch the AC input receptacle when the UPS is operating. AC input voltages may still be present, even when the AC input indicator is off.

## 2.0 Installation

### 2.1 Unpacking & Inspection

Unpack the UPS and conduct the following checks:

- Inspect the UPS for shipping damage. If any shipping damage is found, report it to the carrier and your local dealer or SolaHD representative immediately.
- Check the accessories against the delivery list. If there are any discrepancies, contact your local dealer or SolaHD representative immediately.

### 2.2 What's Included

- Compact disk containing: MultiLink, configuration program and user manual
- One, 6-1/2 ft. (2 m) long USB cable
- Mounting hardware, including screws and handles
- Two plastic tower stand sets (four pieces total)
- Terminal block communication terminals
- Warnings, Safety Instructions booklet and WEEE recycling sheet (ISO 14001 compliance)

**NOTE:** The S4K2UC external battery cabinet shipping package includes one battery cabinet, two spacers for tower configuration and one DC power cable.

### 2.3 Preparation for Installation

#### 2.3.1 Installation Environment

- Install the UPS indoors in a controlled environment, where it cannot be accidentally turned off. The installation environment should meet the specifications listed in "9.0 Specifications".
- Place the UPS in an area of unrestricted airflow around the unit, away from water, flammable liquids, gases, corrosives, and conductive contaminants. Avoid direct sunlight.

**NOTE:** Operating the UPS in temperatures above 25°C (77°F) reduces battery life.

#### 2.3.2 Installation Clearances

Maintain at least 4 inches (100 mm) clearance in the front and rear of the UPS. Do not obstruct the air inlets on the front panel and rear panel of the UPS; blocking the air inlets reduces ventilation and heat dissipation, shortening the service life of the unit.

## 2.4 Mechanical Installation

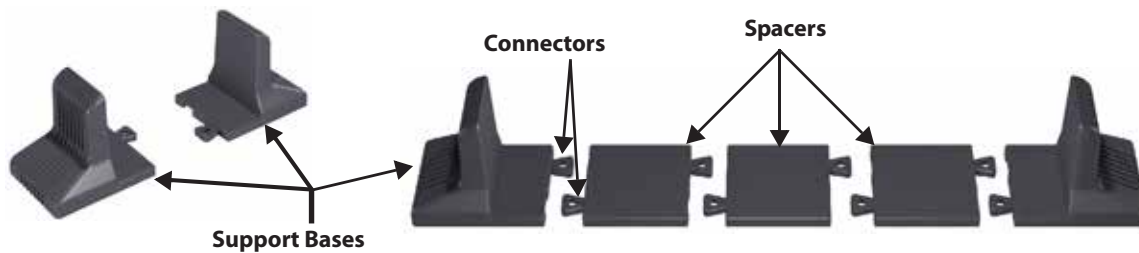
The S4K2UC may be installed as a tower or in a rack, depending on space and use considerations. The S4K2UC may be used alone, as a single UPS, or with up to four battery cabinets.

**NOTE:** When installing the UPS or making input/output connections, comply with all relevant safety codes and standards.

### 2.4.1 Tower Installation

To install the S4K2UC as a tower:

1. Take out support bases from the accessories (see Figure 4).



**Figure 4: Support bases**

2. If optional external battery cabinets will be connected to the UPS, take out the spacers shipped with the battery cabinet.
3. Connect the spacers and the support bases as shown in Figure 4. Each S4K2UC needs two assembled support bases, one in the front and one in the rear.
4. Adjust the direction of the operation and display panel on the S4K2UC.
  - a. Remove the front metal bezel cover as shown in Figure 5.



**Figure 5: Remove the front metal bezel cover**

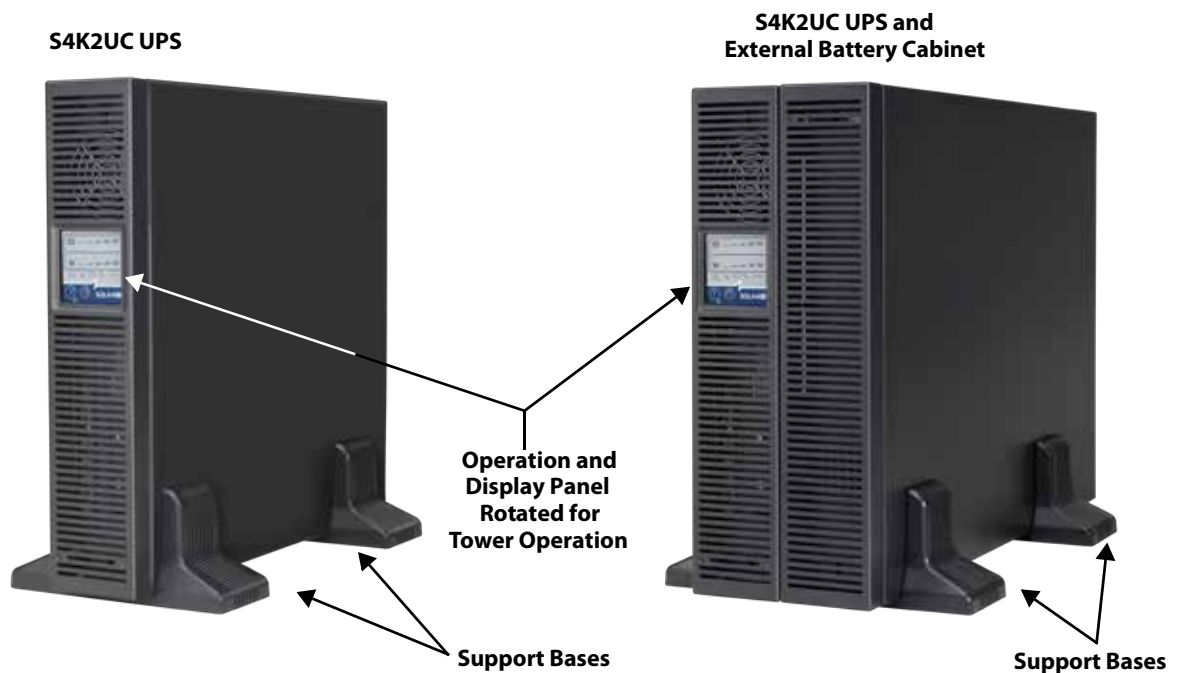


- b. Using the finger grips on the display panel, gently pull and rotate 90 degrees clockwise and snap it back into position as shown in Figure 6.



**Figure 6: Rotate the operation and display panel**

- c. Replace the front metal bezel cover on the S4K2UC. At this point, the UPS operation and display panel has been rotated 90 degrees clockwise, which provides upright viewing for users.
5. Place the S4K2UC and any battery cabinets on the support bases. Each S4K2UC needs two support assemblies as shown in Figure 7.



**Figure 7: Tower installation**

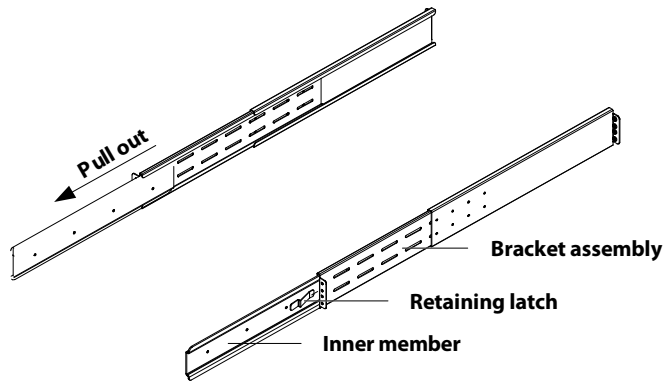
## 2.4.2 Rack Installation

### NOTES:

- When the S4K2UC is installed in a rack, it must be supported by a shelf, fixed rails or slide rails on each side. The factory-supplied rack mount handles cannot support the weight of the UPS. They are used to move the UPS into and out of the rack and to attach the UPS to the rack.
- Mounting hardware and slide rails are sold separately. Contact your local SolaHD representative for these options.

### To install a S4K2UC in a rack:

1. Unpack the two slide rail assemblies and mounting hardware from the rack mounting kit (P/N: SRS1832). Slide rail assembly includes inner member and front and rear members. They are interchangeable between left-hand or right-hand. Mounting hardware includes M4 screws and M5 screws.
2. Remove inner member of each slide rail assembly by extending it to its outermost position, depressing the retaining latch and then pulling inner member from bracket assembly (see Figure 8).



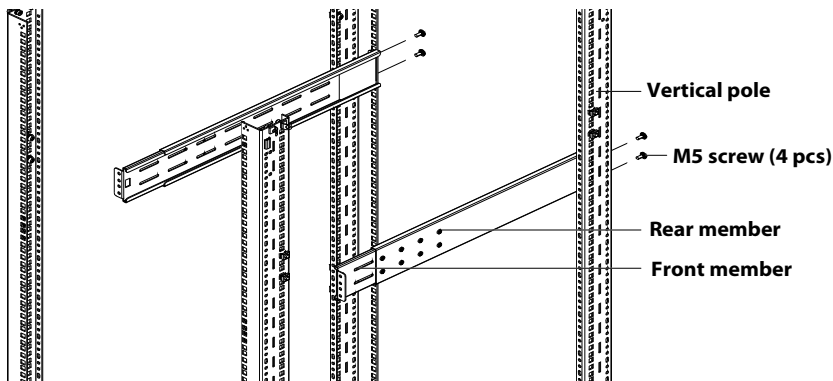
**Figure 8: Pulling inner member from each bracket assembly**

3. Determine the S4K2UC's mounting position inside the racks vertical rails.

### **⚠ CAUTION**

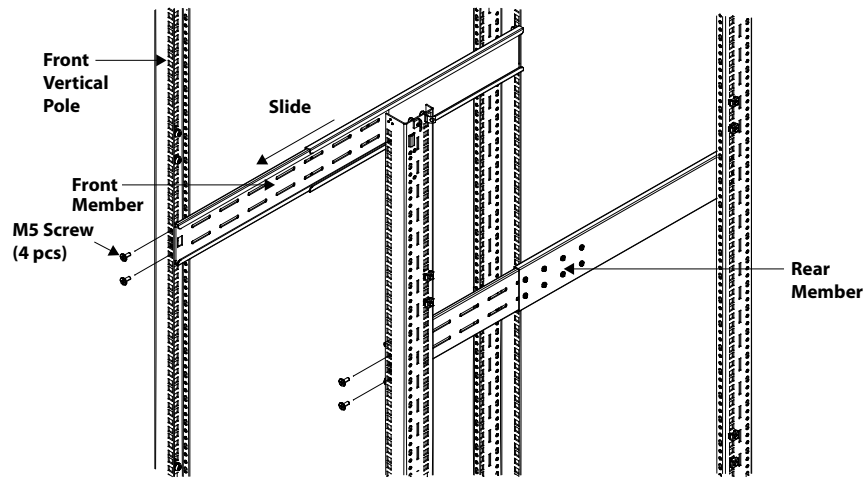
Install the S4K2UC as low as possible in the rack to reduce the risk of tipping.

4. Attach the rear member of each slide rail assembly to the rack's rails with two factory-supplied M5 screws (see Figure 9).



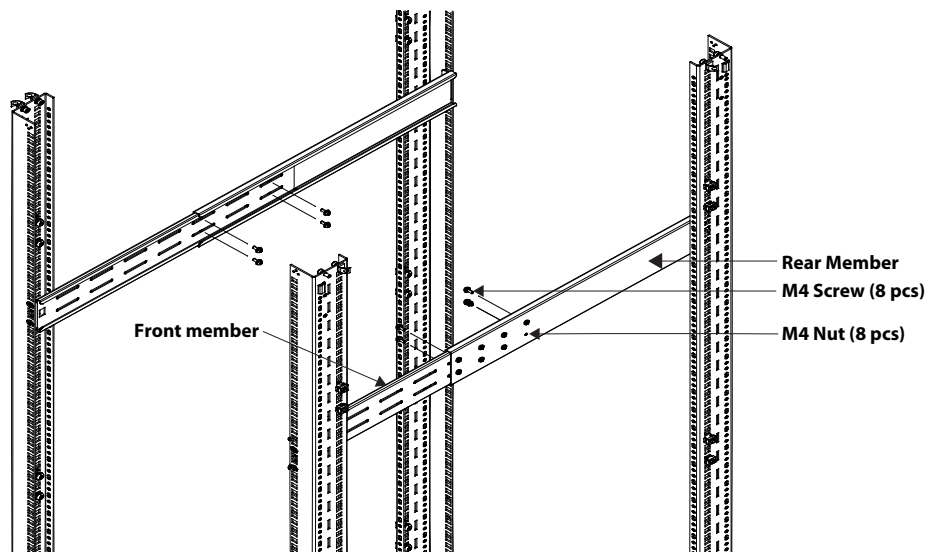
**Figure 9: Installing rear member of each slide rail assembly**

5. Extend the slide rail assembly by sliding the front member forward until it touches the rack's front vertical rails (adjustable length: 18–32 inches/457–813 mm). Use two M5 screws to fix each front member onto the front vertical rails through the installation holes. Make sure that slide rail assemblies are at the same mounting height on all four rack rails, as shown in Figure 10.



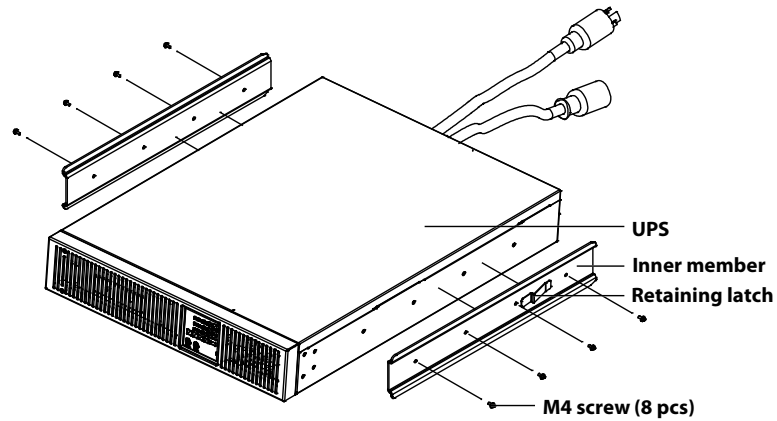
**Figure 10: Installing front member of each slide rail assembly**

6. Fasten rear member and front member together using four M4 screws and four M4 nuts (M4 nuts have been installed on the rear member before delivery) per slide rail assembly as shown in Figure 11.



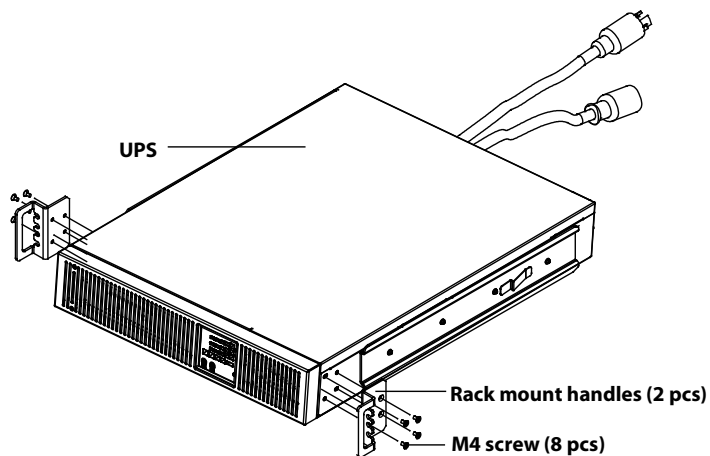
**Figure 11: Fastening rear member and front member together**

7. Fasten inner members (pulled from the slide rail assemblies in Step 2) to both sides of the UPS with eight M4 screws provided in this kit. Make sure that the retaining latch is near the rear of the UPS as shown in Figure 12.



**Figure 12: Installing inner members**

8. Use M4 screws to install ears on both sides of the UPS as shown in Figure 13.

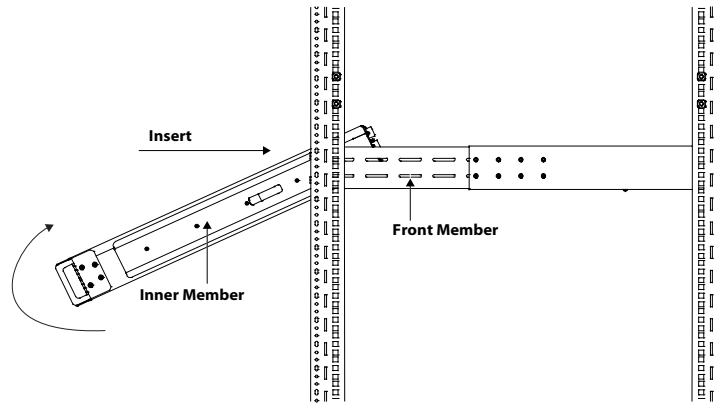


**Figure 13: Installing rack mount handles**

9. Insert the UPS, with inner members attached, into the slide rail assemblies by inserting the top and bottom edges of the inner members into the top and bottom curved tracks of the front members. Slide the UPS into the rack as shown in Figure 14.

**NOTE:** The ends of the inner members are tapered to allow the rear of the UPS to be angled upward before insertion, if space allows. Do not use the factory supplied rack handles to lift the UPS; their intended use is to slide the UPS in and out of the rack.

**NOTE:** The UPS should move smoothly into the slide rail assemblies. If not, recheck the alignment of the front and rear members from Steps 4 through 6.



**Figure 14: Insert the UPS**

10. Through the rack mount handles, use M5 screws provided in this kit to secure the front of the UPS to the rack vertical rails to prevent the UPS from sliding out of position.
11. If optional external battery cabinets are connected to the UPS, they can be placed all on one side of the UPS or stacked beneath the UPS. The installation procedures are the same as those of the UPS.

**NOTE:** Up to four external battery cabinets can be connected to the UPS. Each cabinet will increase the battery recharge time.

## 2.5 Cable Connection

The S4K2UC rear panel has an input cable and plug, output receptacles and output cables (S4K2U3000 models only). Refer to “1.3.2 Rear Panel Features” for details. The battery cables are supplied with the battery cabinet.

### 2.5.1 Connecting Input Plug & Loads

**NOTES:**

- Ensure that all the loads are turned off.
- Prepare an input power supply that is properly protected by a circuit breaker in accordance with national and local electrical codes. The wall receptacle must be grounded.
- The plug on the power supply cord is intended to serve as the disconnection device. The socket-outlet must be installed near the equipment and must be easily accessible.
- SolaHD recommends installing an upstream circuit breaker of the same series as the S4K2UC’s input circuit breaker. The upstream breaker should be the same or higher capacity than the UPS input circuit breaker. The specification of input circuit breaker on the rear panel of UPS is shown in Table 2.

Model	Rated Circuit Breaker	Model	Rated Circuit Breaker
S4K2U700C	10 A	S4K2U2000C	20 A
S4K2U1000C & S4K2U1500C	15 A	S4K2U3000C	30 A

1. Plug all loads into the output receptacles on the rear panel of the S4K2UC. Distribute loads evenly across all receptacles to prevent overloading individual receptacles.
2. Insert the input plug of the S4K2UC into the input power connection.

## 2.5.2 AC Input/Output Hardwire Installation

### CAUTION

This installation must be performed by electrical personnel and wired in accordance with local/national electrical codes.

#### Installation Considerations:

On start-up, the UPS will take a half cycle inrush current of up to three times the rated current. This must be taken into account when selecting the overload protection device at the input utility supply distribution point. To avoid random tripping on startup, we recommend that input utility supply be protected with a MCB (Mechanical Circuit Breaker) capable of withstanding this initial inrush.

The utility input supply cable must be connected to the UPS via a wall mounted double pole circuit breaker. The UPS output port must also be protected with a double pole circuit breaker connected to the load, rated to carry the input current, and be capable of breaking the maximum prospective short circuit current of this branch circuit. The breakers are to be mounted within six feet of the UPS and be readily accessible to the operator. Please refer to Table 3 for breaker specifications.

High-quality ground (earth) connections are required for the equipment ground conductors (protective earth) and grounding electrode conductor (power system earth connection) to reduce electrical noise and provide for safe operation of the UPS and connected loads. Conduit used alone without a grounding conductor wire is not an acceptable connection. Size ground (protective earth) conductors equal to circuit conductors. For wiring information, please refer to Table 3.

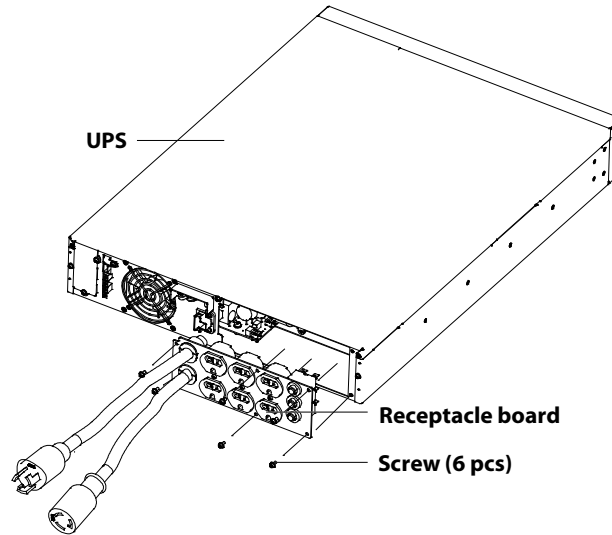
Table 3: Overcurrent Protection & Wiring Specifications					
Model VA	Input Current Rating	Recommended External Overcurrent Protection	Recommended Wire (105°C Copper Wire)	Maximum Wire Accepted by Terminal Block	Terminal Tightening Torque
700 VA	5.9 A	15 A	14 AWG	8 AWG	20 in.-lb.
1000 VA	8.3 A	15 A	14 AWG	8 AWG	20 in.-lb.
1500 VA	12.0 A	15 A	14 AWG	8 AWG	20 in.-lb.
2000 VA	16.0 A	20 A	12 AWG	8 AWG	20 in.-lb.
3000 VA	24.0 A	30 A	10 AWG	8 AWG	20 in.-lb.

#### NOTES:

- Make sure the UPS is turned off and unplugged before removing the original cord/receptacle board. To install the cable box, the original cord/receptacle board must be removed and disconnected from the terminal block.
- The cable sizes and distribution methods used during installation are subject to local/national electrical codes of practice, and therefore are not detailed here. Table 3 details the standard current ratings. The UPS rating plate gives details of the current ratings for alternative output voltages.
- When choosing the input and output cables, users should strictly adhere to Table 3 for cable dimensions. Failure to observe Table 3 could result in personnel injury and/or damage to the UPS.
- When installing the cable box, make sure that the input and output cables do not interfere with the position the UPS or external battery connectors.
- User needs to supply hardware for securing input and output cables.
- Section 2.5.3 describes the connection of optional external batteries. DC battery connections may not be hard-wired; Safety/EMC certification requires that the supplied battery cable be used.

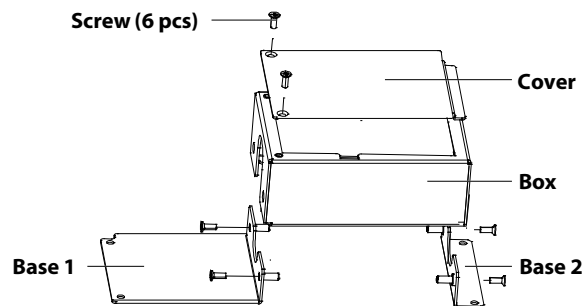
Installation procedures are as follows:

1. Remove the receptacle board on the UPS rear panel, as shown in Figure 15. Retain the six rear panel mounting screws for securing the box assembly to the UPS.



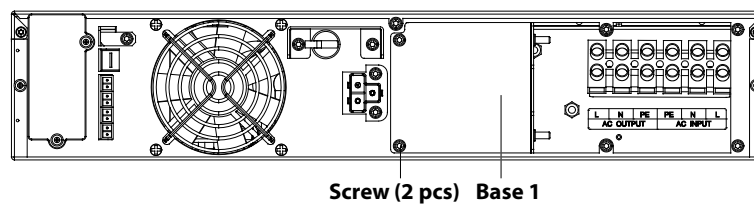
**Figure 15: Removing the receptacle board**

2. Take out the box assembly from the accessories and split it into cover, box, Base 1 and Base 2, as shown in Figure 16. Set the six screws aside for reassembly of the hardwire box.



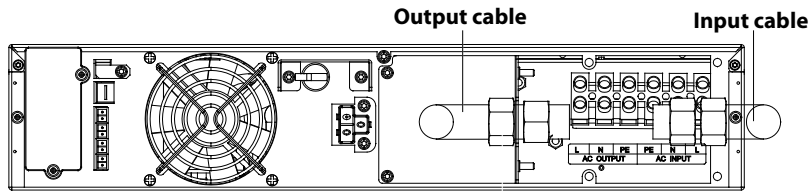
**Figure 16: Splitting the box assembly**

3. Use two rear panel mounting screws to install Base 1 to the UPS rear panel, as shown in Figure 17.

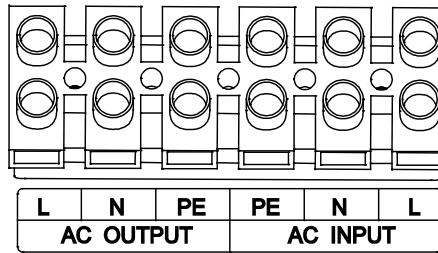


**Figure 17: Installing Base 1**

4. Connect the input power source line, neutral and ground cables to the input line (L), neutral (N) and ground (PE) terminals on the UPS I/O terminal block; tighten the fixing screws (see Figures 18 and 19).
5. Connect the UPS output line, neutral and ground cables to the output line (L), neutral (N) and ground (PE) terminals on the UPS I/O terminal block; tighten the fixing screws (see Figures 18 and 19).

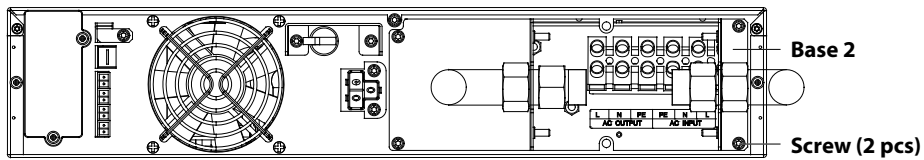


**Figure 18: I/O Cable placement**



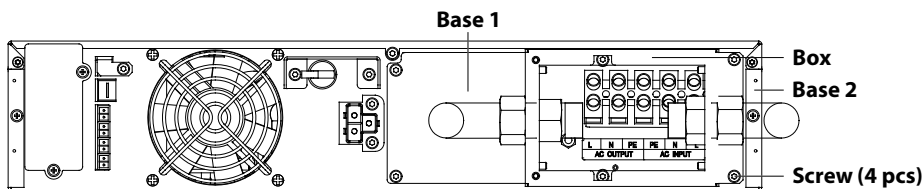
**Figure 19: UPS I/O terminal block**

6. Use two rear panel mounting screws to install Base 2 to the UPS rear panel, as shown in Figure 20.



**Figure 20: Installing Base 2**

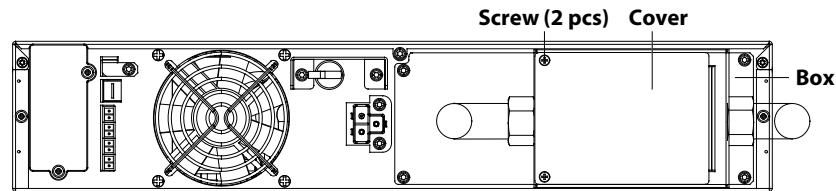
7. Insert the input and output cables/hardware into the slots on Base 2 and Base 1. Hand tighten the securing nuts to Base 2 and Base 1.
8. Set the box onto the Base 1 and Base 2 cable/hardware assemblies. Use the four box assembly screws to fasten the box to the bases (see Figure 21).
9. Using the hardware securing nuts, tighten the input and output cable assemblies to the box and bases (see Figure 21).



**Figure 21: Installing the box**



- Use two box assembly screws to install the cover onto the box, as shown in Figure 22.



**Figure 22: Installing the cover**

- Connect the other end of the UPS output line, neutral and ground cables to the load.

### 2.5.3 Connecting Battery Cables

- Switch off the input breaker of the battery cabinet.
- Take out the battery cable included with the battery cabinet.
- Connect one end of the battery cable to the external battery connector on the rear panel of the UPS and connect the other end to any battery port on the rear panel of the battery cabinet.
- Switch on the battery breaker on the rear of the external battery cabinet.
- Use the Configuration Program included with the UPS to specify the number of external battery cabinets connected to the S4K2UC. See Table 14 for approximate battery run times.

## 2.6 Connecting Communication Cables

Communication cable connection includes: USB and option card cables.

### 2.6.1 Connecting USB Communication Cables

- Take the USB communication cables out of the accessories box.
- Insert one end of the USB communication cable into the USB port on the rear panel of the S4K2UC (see Figure 2).
- Insert the other end of the USB communication cable into the USB port of the computer.

### 2.6.2 Installing the Optional IntelliSlot Card & Communication Cables

- Remove the protective cover of the IntelliSlot port on the S4K2UC and set it aside.
- Insert the IntelliSlot card into the IntelliSlot port and secure it with screws.
- To connect any cable associated with a IntelliSlot card, refer to the user manual provided with the card.

To configure and use the IntelliSlot communication card, refer to the card's user manual.

# 3.0 Control & Indicators

The operation and display panel, shown in Figure 23, is on the front panel of the S4K2UC.

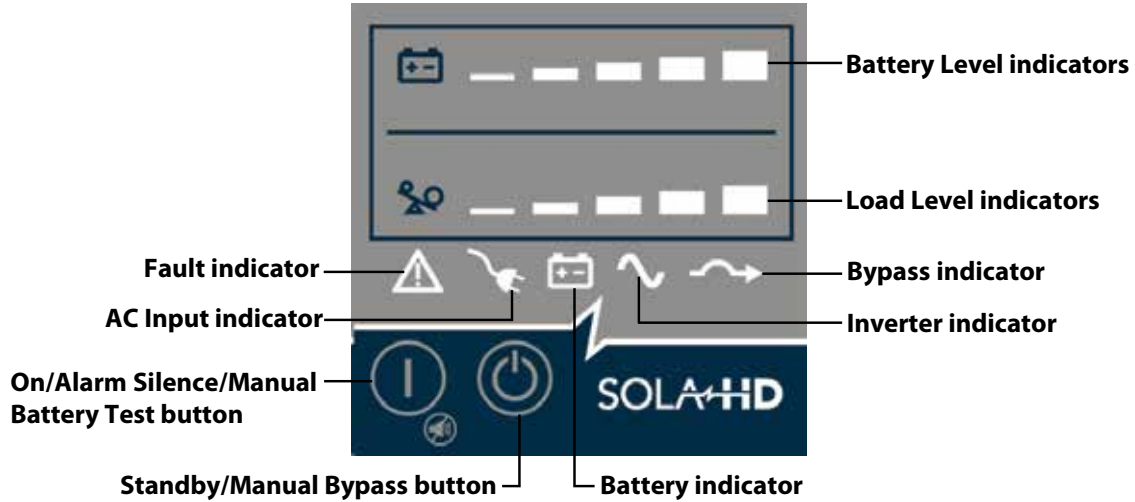


Figure 23: Operation and display panel

## 3.1 Control Buttons

The operation and display panel has two control buttons: On/Alarm Silence/Manual Battery Test and Standby/Manual Bypass.

### 3.1.1 On/Alarm Silence/Manual Battery Test Button

The On/Alarm Silence/Manual Battery Test button controls output power to connected load(s) and has three functions (see Table 4).

Table 4: Functions of the On/Alarm Silence/Manual Battery Test Button		
Function	Operation	Description
On	Press the button once for 3 seconds	To start the UPS
Alarm Silence <sup>1</sup>	Press the button for at least half a second	To silence the alarms <sup>2</sup>
Manual Battery Test	Press the button for at least half a second while operating in Utility (VAC) Mode with no alarms present	To initiate a manual battery test

<sup>1</sup>The low battery and bypass reminder alarms cannot be silenced  
<sup>2</sup>After the alarm is silenced, the UPS will reactivate the alarm system to alert of additional problems

### 3.1.2 Standby/Manual Bypass Button

The Standby/Manual Bypass button controls output power to connected load(s) and has two functions (see Table 5).

Table 5: Functions of Standby/Manual Bypass Button		
Function	Operation	Description
Manual Bypass	Press the button once and hold it for about 2 seconds <sup>3</sup>	To initiate a manual transfer of the connected loads to the internal bypass, if available
Standby	Press the button twice within 4 seconds (hold for at least a half a second each time) while the UPS is in Manual Bypass or Battery Mode <sup>4</sup>	To shutdown the UPS and shut off all power to the connected loads
<sup>3</sup> If the bypass is not available due to voltage or frequency, pressing this button once will be ignored <sup>4</sup> Perform all necessary shutdown procedures on connected loads before turning off the UPS		

## 3.2 Indicators

The operation and display panel has seven indicators (see Figure 23). The indicators can be divided into two groups according to the applications: level indicators and UPS status indicators.

### 3.2.1 Battery Level Indicators

The Battery Level indicator is composed of five sets of LED bars that illuminate and flash to indicate the battery capacity level. The S4K2UC battery capacity level is shown in 20% increments ( $\pm 5\%$ ). The Battery Level indicators will illuminate as shown in Figure 24.

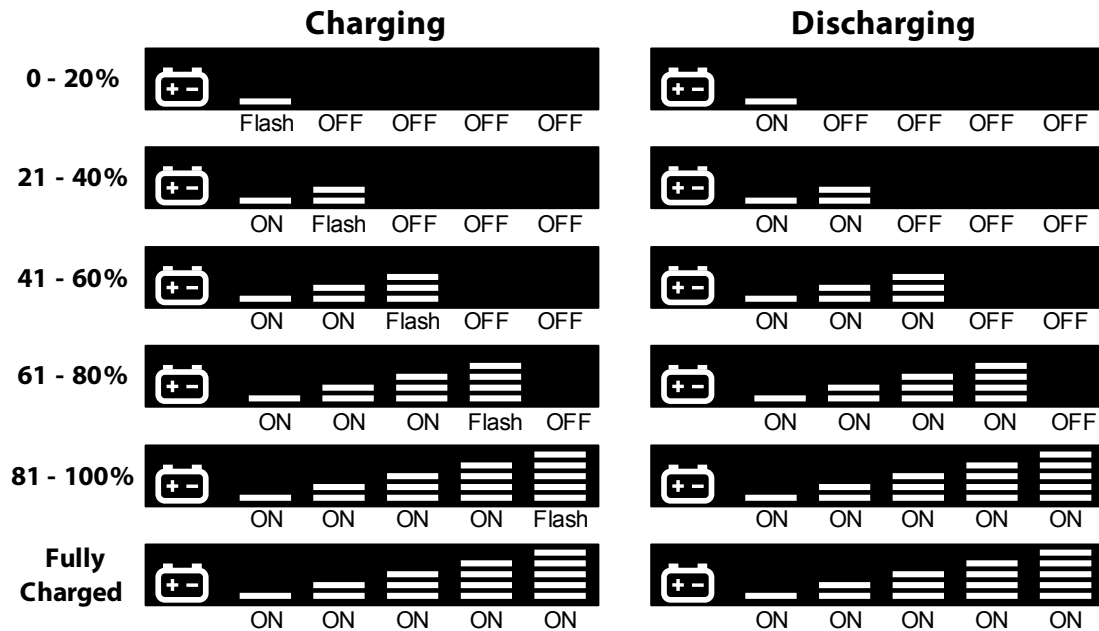


Figure 24: Battery Level indicators

### 3.2.2 Load Level Indicators

The Load Level indicator is composed of five LED bars that illuminate to indicate the relative load on the UPS output in 25% increments ( $\pm 5\%$ ). The Load Level indicator will illuminate as shown in Figure 25.

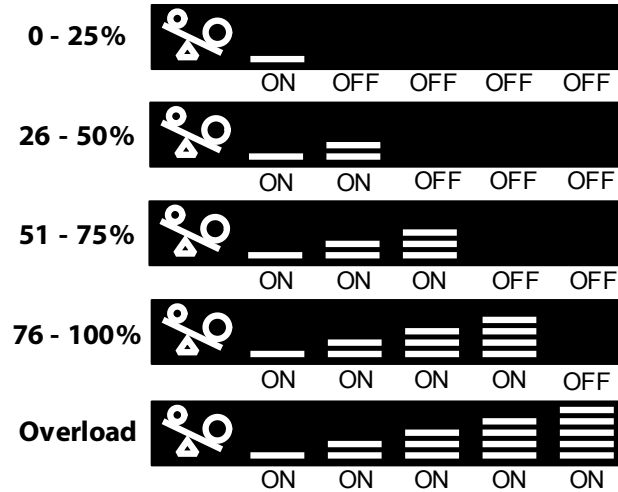


Figure 25: Load Level indicators

### 3.2.3 UPS Status Indicators

UPS status is indicated by five symbols: Fault indicator, AC Input indicator, Battery indicator, Inverter indicator and Bypass indicator. Table 6 shows the symbols and their meanings.

Table 6: UPS Status Indicators			
UPS Status Indicator	Icon	Color	Description
Fault indicator		Red	On if the UPS has detected a fault; off if there is no fault
AC Input indicator		Green	On when the utility input power is normal; off during utility failure; flashing when utility power is outside the specifications
Battery indicator		Amber	On when the battery is supplying power; off when the battery is not supplying power
Inverter indicator		Green	On when the inverter is supplying power; off when the inverter is not supplying power; and flashing when utility power is outside the specifications
Bypass indicator		Amber	On when the bypass is supplying power; off when the inverter is supplying power; and flashing when utility power is outside the specifications

## 4.0 Operation

This section describes checks to be made before starting the UPS, how to start the UPS, manual battery test, manual bypass, shutting down the UPS, and disconnecting the utility power from the UPS.

**NOTE:** The S4K2UC's battery is fully charged before delivery, but some charge will be lost during storage and shipping. To ensure that the battery has adequate reserve power to protect the connected load, charge the battery for 3 hours before putting the UPS into service.

### 4.1 Startup Checklist for the S4K2UC

Before starting the UPS, perform these checks:

1. Check that the input plugs and loads are connected properly and reliably.
2. Check that all of the battery cables are connected properly.
3. Check that the communication cables are connected properly.

### 4.2 Starting the UPS

1. Turn on the input circuit breaker (see Figure 2 for its location).
2. Turn on the UPS by pressing the On/Alarm Silence/Manual Battery Test button for 3 seconds.
3. Turn on the connected loads.
4. Check the status indicators to determine whether the S4K2UC is operating normally.
5. Check the load level indicators to verify that the connected load does not exceed the UPS's rated capacity.

The UPS is now providing conditioned power to the load.

### 4.3 Manual Battery Test

To initiate a manual battery test, press the On/Alarm Silence/Manual Battery Test button for at least half a second while operating from utility power with no alarm conditions present.

- If only the first two of the five LED segments illuminate, allow the UPS to recharge the batteries for 24 hours.
- Retest the batteries after 24 hours of charging the batteries.
- After the batteries have been retested, if only two of the five battery LEDs illuminate, contact your local SolaHD representative or SolaHD Technical Support.
- If none of the five battery LEDs illuminate during a manual battery test, check the battery connection and allow the UPS to recharge the batteries for 1 hour and initiate a manual battery test again.
- If none of the five battery LEDs illuminate during the manual battery test a second time, replace the batteries, and contact your local SolaHD representative or SolaHD Technical Support.

## 4.4 Manual Bypass

Press the Standby/Manual Bypass button once and hold it for about 2 seconds while the UPS is in Utility (VAC) Mode. The UPS will transfer the connected loads to the internal bypass. If the internal bypass is not available due to utility power problems, pressing this button once will be ignored. Bypass operation is indicated by an audible alarm and illuminated amber Bypass indicator. If other indicators are illuminated, refer to "8.0 Troubleshooting".

## 4.5 Shut Down the S4K2UC

1. Transfer the UPS to manual bypass by pressing the Standby/Manual Bypass button once (hold it for about 2 seconds). If manual bypass is not available, disregard the first step.
2. To shut down the UPS, press the Standby/Manual Bypass button twice within 4 seconds (hold the button for about a half a second each time).

Power to the connected loads is now off.

## 4.6 Disconnecting Input Power from the S4K2UC

1. Once the UPS has been shut down as detailed in "4.5 Shut Down the S4K2UC", disconnect the input cable plug.
2. Wait 30 seconds and verify that all indicators have turned off and the fan has stopped; this indicates that the power-off is complete.
3. If the UPS has an external battery cabinet, turn the external battery cabinet breaker switch to the off position.

After powering off the UPS, the UPS ceases output and the load is powered off.

## 5.0 Communication

This section describes UPS communication over the three types of communication connections on the rear of the S4K2UC:

- IntelliSlot port
- USB port (standard B-type)
- Terminal block communication

### CAUTION

To maintain safety (SELV) barriers and for electromagnetic compatibility, signal cables should be segregated and run separately from all other power cables.

## 5.1 IntelliSlot Communication Cards

The IntelliSlot port accepts two optional cards:

- **SNMPWEB Card.** The IntelliSlot SNMPWEB Card provides SNMP monitoring and control of the UPS across the network.
- **IS-RELAY.** The IntelliSlot IS-Relay Card provides dry contact relay outputs for custom-wired applications and delivers support for built-in shutdown for AS/400 systems.

Follow the instructions provided with the IntelliSlot card to configure MultiLink, the UPS, or any additional ancillary product for the S4K2UC. These instructions are also available at: [www.solahd.com](http://www.solahd.com).

### 5.1.1 MultiLink

MultiLink monitors the UPS continuously and can shut down your computer or server in the event of an extended power failure. MultiLink can be configured to shut down the UPS as well.

MultiLink can also be configured for use without the USB cable when the IntelliSlot SNMPWEB Card is installed in the UPS.

An optional MultiLink license kit allows you to shut down the UPS over a network. For more information about the MultiLink license kits, visit our Web site ([www.solahd.com](http://www.solahd.com)) or contact your SolaHD representative.

## 5.2 USB Port Communication

The standard B-type USB port is used to connect the UPS and network server or other computer system using MultiLink. The configuration program can be completed through the communication port.

### 5.2.1 Configuration Program

Accessing the configuration program via USB is a new feature of the S4K2UC. For most users, the factory default settings will be adequate. This section illustrates the features available for modification, as well as the factory default settings.

The USB configuration program allows these features of the S4K2UC to be changed:

- Enable/Disable Auto-Restart
- Select frequency converter operation with a fixed output frequency of 50 Hz or 60 Hz, bypass disabled
- Set the Low Battery Warning alarm time from 2 to 30 minutes
- Enable/Disable the Auto-Battery test
- Enable/Disable Auto-Restart after removing Remote Shutdown
- Set the wiring mode of Remote Shutdown
- Set the Auto-Enable output
- Set the Auto-Battery test to 7, 14, 21, or 28 days
- Select the number of external battery cabinets connected to the UPS to adjust the remaining run time calculated by software products
- Select one of multiple output voltages to match various voltages (see Table 7)

Table 7: Output Voltage Option, All Models	
Factory Default, VAC	Output Voltage Option, VAC
120	110, 115, 120

#### WARNING

The output voltage settings cannot be changed while the UPS is on and powering connected loads.

#### NOTES:

For all 120 V models, when the output voltage is programmed for 110 VAC, the UPS will be automatically derated as follows (refer to “9.0 Specifications” for VA and Watt ratings):

- 700 VA–1000 VA: Derated to 95% of both the VA and Watt ratings
- 1500 VA–3000 VA: Derated to 90% of both the VA and Watt ratings

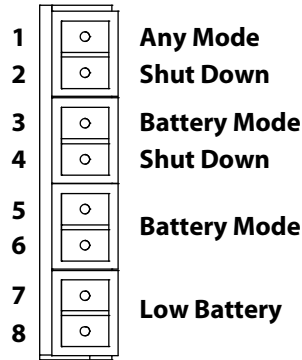
#### NOTES:

- The configuration program is compatible with UPS models S4K2UXXXXC, as in S4K2U3000C. It is not compatible with earlier versions of the S4K2U UPS.
- A computer running Windows 2000®, XP® or Vista® is required to set up and run the configuration program.



## 5.3 Terminal Block Communication

The terminal block includes eight pins, as shown in Figure 26.



**Figure 26: Terminal block layout**

### 5.3.1 Any Mode Shutdown

The purpose of Any Mode Shutdown is to shut down the UPS output by turning off the rectifier, inverter and static bypass switch so that there is no power to the loads.

Any Mode Shutdown can be operated locally and remotely, as described as follows:

- Local Any Mode Shutdown can be performed by shorting Pin 1 and Pin 2
- Remote Any Mode Shutdown can be performed by a switch connected to Pin 1 and Pin 2 and mounted at a remote location

#### NOTES:

- Remote Power off will be performed either by NO or NC contact of Any Mode Shutdown, depending on the settings in the configuration program.
- A current-limited source for the optocoupler (+12 VDC, 50 mA) will be available from the UPS.
- The connection to the UPS for remote connection will be via terminal block connector.
- Any Mode Shutdown wiring must conform to all national, regional and local wiring regulations.

#### **⚠ WARNING**

When the Auto-Enable output option is selected and the UPS output is disabled using Pin 1 and Pin 2, the S4K2UC's output can turn on automatically and without warning if the Pin 1 and Pin 2 connection is changed.

## 5.3.2 Battery Mode Shutdown

Battery Mode Shutdown permits shutting down the UPS by turning off the rectifier, inverter and static bypass switch so that there is no power to the load when the UPS is on battery.

Battery Mode Shutdown can be performed locally or remotely:

- Local Battery Shutdown can be performed by shorting Pin 3 and Pin 4
- Remote Any Mode Shutdown can be achieved by a switch connected to Pin 3 and Pin 4 and mounted at a remote location

### NOTES:

- A current-limited source for the optocoupler (+12 VDC, 50 mA) will be available from the UPS.
- The connection to the S4K2UC for remote connection will be via terminal block connector.
- Battery mode shutdown wiring will follow local wiring codes and laws.
- This signal must last for 1.5 seconds or longer.
- A battery shutdown signal will not cause an immediate shutdown. It will start a 2 minute shutdown timer. This timer cannot be stopped once triggered. If utility power returns during this countdown, the S4K2UC will still shut down and must remain shut down for 10 seconds. Whether the UPS turns back on when the power is restored depends on the auto-restart setting.

## 5.3.3 On Battery

On Battery signal is a Normally Open (NO) dry contact. When the UPS is supplying output power from the battery this dry contact will be closed.

## 5.3.4 Low Battery

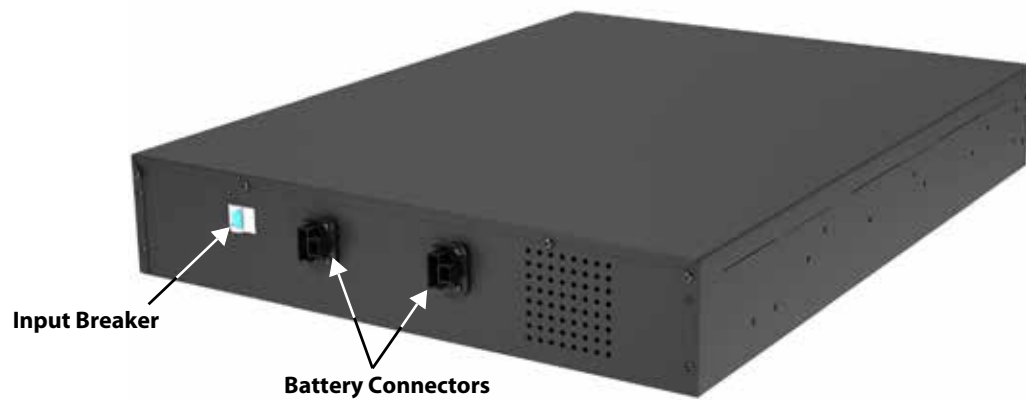
Low Battery signal is a Normally Open (NO) dry contact. When the UPS is supplying output power from the battery and has reached the Low Battery Warning time selected in the configuration program, this dry contact will be closed.

The dry contact rated values for the On Battery and Low Battery signals are:

- Rated Voltage: 5 VDC
- Working Voltage Range: 4.5–10 VDC
- Rated Current: 30 mA

## 6.0 Battery Cabinet

Optional battery cabinets are available for the S4K2UC. The battery connectors and input breaker are on the battery cabinet's rear panel, as shown in Figure 27. For battery cabinet specifications, refer to Table 12. For battery run times, refer to Table 14.



**Figure 27: Battery cabinet**

### **⚠ WARNING**

Do not contact the battery connectors and ground without wearing protective gloves and clothing and taking other precautions against electrical shock. The battery loop and AC input are not insulated, which may cause a dangerous voltage between the battery connectors and ground.

# 7.0 Maintenance

This section describes replacing the internal battery pack, precautions, and checking the UPS's status and functions.

## 7.1 Replacing the Internal Battery Pack

The S4K2UC is designed to allow service personnel to safely replace the internal battery pack. The battery pack may also be replaced by a properly trained user when the UPS is installed in a restricted access area such as a rack. Please read the "Battery Safety Notes" on page 7 before proceeding. Contact your SolaHD representative to obtain the part number and pricing of the appropriate replacement battery pack.

### **⚠ CAUTION**

Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to local regulations.

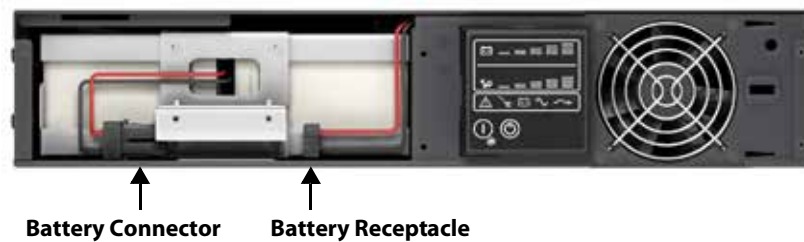
#### 7.1.1 Battery Replacement Procedures

1. Remove the front metal bezel cover from the UPS.
2. Loosen and remove the six screws on the battery door, as shown in Figure 28.
3. Lay the battery door and screws aside for reassembly.



**Figure 28: Removing the front metal bezel cover and battery door**

4. Gently pull the battery wire out and disconnect the polarized battery connector and receptacle, as shown in Figure 29.



**Figure 29: Disconnecting the battery connector and receptacle (front view)**

5. Grasp the battery handle and pull the internal battery pack out of the UPS, as shown in Figure 30.



**Figure 30: Pull out the internal battery pack**

6. Unpack the new internal battery pack. Take care not to destroy the packaging. Compare the new and old internal battery packs to make sure they are the same type and model. If they are the same, proceed with Step 7; if they are different, stop and contact your local SolaHD representative or SolaHD Technical Support immediately.
7. Line up and slide in the new internal battery pack.
8. Reconnect the polarized battery connector and receptacle.
9. Gently push the battery wire and internal battery pack back into the UPS.
10. Reattach the front battery door with the six screws.
11. Reattach the front metal bezel cover to the UPS.

**NOTE:** The internal battery pack is hot-swappable. However, caution should be exercised during this procedure because the load is unprotected from disturbances and power outages. Do not replace the battery while the UPS is operating in Battery Mode. This will result in a loss of output power and will drop the connected load.

## 7.2 Battery Charging

The batteries are valve-regulated, non-spillable, lead acid and should be kept charged to attain their design life. The S4K2UC charges the batteries continuously when it is connected to the utility input power.

If the S4K2UC will be stored for a long time period of time, SolaHD recommends connecting the UPS to input power for at least 24 hours every four to six months to ensure full recharge of the batteries.

## 7.3 Precautions

Although the S4K2UC has been designed and manufactured to ensure personal safety, improper use can result in electrical shock or fire. To ensure safety, observe the following precautions:

- Turn off and unplug the S4K2UC before cleaning it
- Clean the UPS with a dry cloth—do not use liquid or aerosol cleaners
- Never block or insert any objects into the ventilation holes or other openings of the S4K2UC
- Do not place the S4K2UC power cord where it might be damaged

## 7.4 Checking UPS Status

SolaHD recommends checking the UPS operation status every six months.

- Check if the UPS is faulty: Is the Fault Indicator on? Is the UPS sounding an alarm?
- Check if the UPS is operating in Bypass Mode. Normally, the UPS operates in Normal Mode; if it is operating in Bypass Mode, stop and contact your local SolaHD representative or SolaHD Technical Support.
- Check if the battery is discharging. When the utility input is normal, the battery should not discharge. If the UPS is operating in Battery Mode, stop and contact your local SolaHD representative or SolaHD Technical Support.

## 7.5 Checking UPS Functions

**NOTE:** UPS function check procedures may interrupt power supply to the connected load. Back up all critical load data before conducting the UPS functions check.

SolaHD recommends checking the UPS functions once every six months.

**Procedures are as follows:**

1. Press the Standby/Manual Bypass button to check whether the alarm and indicators are normal.
2. Press the On/Alarm Silence/Manual Battery Test button to check again whether the indicators are on and the UPS is operating normally.
3. Press the On/Alarm Silence/Manual Battery Test button for 3 seconds after Inverter Mode; the UPS should initiate battery self-test. Check to determine whether the battery is operating normally. If not, stop and contact your local SolaHD representative or SolaHD Technical Support.

## 8.0 Troubleshooting

This section indicates various UPS symptoms a user may encounter and troubleshooting steps in the event the UPS develops a problem. Use the following information to determine whether external factors caused the problem and how to remedy the situation.

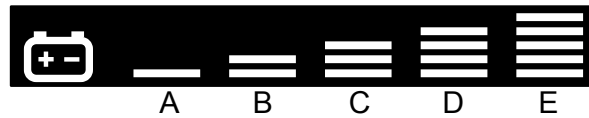
### 8.1 UPS Symptoms

The following symptoms indicate the S4K2UC is malfunctioning:

- The relative indicators will illuminate, indicating the UPS detected a problem
- An alarm will sound, indicating that the UPS requires attention

#### 8.1.1 Indicators

In addition to the Fault indicator being illuminated, one or more LED segments of the Battery Level indicator will also be illuminated, as shown in Figure 31. The descriptions are listed in Table 8.



**Figure 31: Battery Level indicator**

Table 8: Indicator Descriptions		
Indicator	Diagnosis	Audible Alarm
A–E	On bypass from output overload	Half-second beep every half second
A	On bypass due to overtemperature condition	1-second beep every 4 seconds
B	On bypass due to DC bus overvoltage	1-second beep every 4 seconds
C	On bypass due to DC/DC power supply failure	1-second beep every 4 seconds
D	PFC failure	1-second beep every 4 seconds
E	On bypass due to inverter failure	1-second beep every 4 seconds
A & B	UPS failure (includes dual-fan failure, single-fan failure under certain conditions, and battery charger failure)	Continuous alarm
A & C	UPS failed battery test	2-second beep every 60 seconds
A & E	Bypass Feedback	1-second beep every 4 seconds
B & E	Short circuit on output	n/a
C & E	UPS shutdown by command from communication (USB port or IntelliSlot port)	No audible alarm
A & B	UPS failure (includes dual-fan failure, single-fan failure under certain conditions, and battery charger failure)	Continuous alarm
<b>Battery indicator flashing</b>	Internal battery source not available. Check battery connection, power down and reboot the UPS.	Continuous alarm
<b>AC Input indicator flashing</b>	Line-to-neutral reversal in the AC input power supply or a loss of proper grounding for the UPS. UPS cannot start in standby status.	Continuous alarm
<b>Bypass indicator flashing</b>	Utility power voltage or frequency is out of tolerance; bypass is unavailable	n/a

**NOTE:** A–E indicators are shown in Figure 31

## 8.1.2 Audible Alarm

An audible alarm will sound in conjunction with the visual indicators to indicate a change in UPS operating status. The audible alarm will sound as described in Table 9.

Condition	Alarm
Battery discharge	Half-second beep every 10 seconds
Low battery	Two half-second beeps every 5 seconds
UPS fault, load on bypass	1-second beep every 4 seconds
UPS fault, no power to load	Continuous
Overload	Half-second beep every half second
Battery replacement	2-second beep every 60 seconds
Battery loss	Continuous
Wiring problem (including line-to-neutral reversal or a loss of proper grounding for UPS)	Continuous
Bypass reminder	1-second beep every 2 minutes

## 8.2 Troubleshooting

In the event of an issue with the UPS, refer to Table 10 to determine the cause and solution. If the issue persists, contact SolaHD Technical Support at (800) 377-4384/(847) 268-6000 or by e-mail at [solahd.technicalservices@emerson.com](mailto:solahd.technicalservices@emerson.com).

When reporting an issue to Technical Support, please include the UPS model number and serial number. This information is located on the top panel of the UPS.

Problem	Cause	Solution
UPS fails to start when the On/Alarm Silence/Manual Battery Test button is pressed	UPS is short-circuited or overloaded	Ensure the UPS is off. Disconnect all loads and ensure nothing is lodged in the output receptacles. Ensure loads are not defective or shorted internally.
Battery indicator is illuminated	UPS is not plugged in	UPS is operating from Battery Mode. Ensure UPS is securely plugged into the wall receptacle.
	UPS input protection breaker has opened	UPS is operating from Battery Mode. Save data and close applications. Reset input breaker, then restart the UPS.
	Utility power is out of tolerance	UPS is operating from Battery Mode. Save data and close applications. Ensure utility supply voltage is within acceptable limits for the UPS.
UPS has reduced battery backup time	Batteries are not fully charged	Keep the UPS plugged in continuously for at least 24 hours to recharge the batteries
	UPS is overloaded	Check Load Level indicator and reduce the load on the UPS
	Batteries may not be able to hold a full charge due to age	Replace the batteries. Contact your local dealer, SolaHD representative or SolaHD Technical Support for replacement battery packs.



<b>Table 10: Troubleshooting</b>		
<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Fault and Bypass indicators and all LED segments of the Battery Level indicator are illuminated	UPS is overloaded or the load is faulty	Check the Load Level indicator and remove non-essential loads. Recalculate the load and reduce the number of loads connected to the UPS. Check the load for faults.
Fault and Bypass indicators and Diagnostic A indicator are illuminated	UPS shutdown due to overtemperature condition Load is on bypass power	Ensure the UPS is not overloaded, ventilation holes are not blocked, or room ambient temperature is not excessive. Wait 30 minutes to allow the UPS to cool, then restart the UPS. If the UPS cannot restart, contact your local dealer, SolaHD representative or SolaHD Technical Support for assistance.
Fault and Bypass indicators and Diagnostic B indicator are illuminated	UPS internal DC bus overvoltage	UPS requires service. Contact your local dealer, SolaHD representative or SolaHD Technical Support for assistance.
Fault and Bypass indicators and Diagnostic C indicator are illuminated	UPS DC-DC fault	UPS requires service. Contact your local dealer, SolaHD representative or SolaHD Technical Support for assistance.
Fault indicator and Diagnostic D indicator are illuminated	UPS PFC (Power Factor Correction Circuit) fault	UPS requires service. Contact your local dealer, SolaHD representative or SolaHD Technical Support for assistance.
Fault and Bypass indicators and Diagnostic E indicator are illuminated	UPS inverter fault	UPS requires service. Contact your local dealer, SolaHD representative or SolaHD Technical Support for assistance.
Fault indicator and Diagnostic A and C indicators are illuminated	UPS failed the battery test	Replace the batteries. Contact your local dealer, SolaHD representative or SolaHD Technical Support for replacement battery packs.
Fault and Bypass indicators and Diagnostic C and E indicator are illuminated	UPS shut down by a command from the communication port(s)	UPS has received a signal or command from the attached computer. If this was inadvertent, ensure the communication cable is correct for your system. For assistance, contact SolaHD Technical Support.
Fault indicator and Diagnostic A and B indicators are illuminated; continuous alarm sounds	UPS failure (includes dual-fan failure, single-fan failure under certain conditions, and battery charger failure)	Ensure fan is not blocked up. If the fault is not resolved, contact SolaHD Technical Support for assistance.
AC Input indicator is flashing	UPS detected a line-to-neutral reversal or a loss of proper grounding for the UPS. A continuous alarm will sound; the UPS cannot start up in standby status. This is active only when power is first applied to the input. Once the UPS is running, the AC Input indicator will flash, unless the input wiring is correctly changed.	Contact a qualified electrician to verify site wiring.
Battery indicator is flashing; continuous alarm sounds	Battery source is not available	Check battery connections, completely power down and restart the UPS. <b>NOTE:</b> If the battery circuit opens while the UPS is running, it will be detected when the next battery test is performed.
Bypass indicator is flashing	The bypass is disabled because the voltage or frequency is outside the acceptable limits	The AC input powers the PFC input and serves as the bypass source. If the AC is present but the voltage or frequency exceeds the acceptable range for safe operation with a load, the bypass will be disabled and this indicator will flash, indicating that the bypass is unavailable.

# 9.0 Specifications

Table 11: UPS Specifications					
Parameters	Model				
	S4K2U700C	S4K2U1000C	S4K2U1500C	S4K2U2000C	S4K2U3000C
<b>DIMENSIONS, D x W x H, in. [mm]</b>					
Unit	19.7 x 16.9 x 3.4 [497 x 430 x 85]				23.7 x 16.9 x 3.4 [602 x 430 x 85]
Shipping	25.5 x 23.9 x 10.6 [647 x 607 x 270]				29.4 x 23.4 x 10.6 [747 x 607 x 270]
<b>WEIGHT, lb. [kg]</b>					
Unit	37.0 [16.8]	51.1 [23.2]	51.1 [23.2]	71.4 [32.4]	
Shipping	44.1 [20.0]	57.3 [26.0]	57.3 [26.0]	79.4 [36.0]	
<b>INPUT AC PARAMETERS</b>					
Voltage range (typical)	120 V ac nominal; variable based on output load				
90% to 100% Loading	90 VAC/140 VAC	102 VAC/140 VAC			
70% to 90% Loading	86 VAC/140 VAC	96 VAC/140 VAC			
30% to 70% Loading	77 VAC/140 VAC	84 VAC/140 VAC			
0% to 30% Loading	60 VAC/140 VAC	60 VAC/140 VAC			
Power factor	0.99				
Frequency	40 Hz to 70 Hz; auto sensing				
Input power cord	10 ft. attached with NEMA 5-15P plug		10 ft. attached with NEMA 5-20P plug	10 ft. attached with NEMA L5-30P plug	
<b>OUTPUT AC PARAMETERS</b>					
Output receptacles	5-15R x 6		5-20R x 6	L5-30R x 1 + 5-20R x 6	
Voltage	110/115/120 VAC (user-configurable) ±3%				
Waveform	Sine wave				
Utility (VAC) Mode overload	200% for 2 seconds; 150% for 50 seconds with transfer to bypass				
Power factor	0.90				
<b>BATTERY</b>					
Type	Valve-regulated, non-spillable, lead acid				
Qty x V x Rating	4 x 12 V x 5.0 Ah	4 x 12 V x 7.2 Ah	4 x 12 V x 9.0 Ah	6 x 12 V x 9.0 Ah	
Battery mfr./Part number	Panasonic/UP-RW1236; CSB/GP 1272		Panasonic/UP-RW1245; CSB/HR 1234W F2		
Backup time	See Table 14				
Recharge time	3 hours to 90% capacity after full discharge with 100% load until UPS auto shutdown (internal batteries only)				
<b>ENVIRONMENTAL REQUIREMENTS</b>					
Operating temperature	0°C to +40°C [+32°F to +104°F]; see Table 13 for operating temperature parameters				
Storage temperatures	-15°C to +50°C [+5°F to +122°F]				
Relative humidity	0% to 95%, non-condensing				
Operating elevation	Up to 10,000 ft. [3,000 m]				

Table 11: UPS Specifications					
Parameters	Model				
	S4K2U700C	S4K2U1000C	S4K2U1500C	S4K2U2000C	S4K2U3000C
Storage elevation	50,000 ft. [15,000 m] max.				
Audible noise	<43 dBA max. @ 3 ft. [1 m] front & sides; <46 dBA max. @ 3 ft. [1 m] rear	<43 dBA max. @ 3 ft. [1 m] front & sides; <46 dBA max. @ 3 ft. [1 m] rear	<45 dBA max. @ 3 ft. [1 m] front & sides; <46 dBA max. @ 3 ft. [1 m] rear	<48 dBA max. @ 3 ft. [1 m] front & sides; <48 dBA max. @ 3 ft. [1 m] rear	
<b>AGENCY</b>					
Safety	UL1778, cUL Listed				
RFI/EMI	FCC Part 15, Class A				
Surge immunity	IEC62040-2 2 <sup>nd</sup> Ed.				
Transportation	ISTA Procedure 1A				

Table 12: Battery Cabinet Specifications		
Parameters	Model Number	
	S4K2U48BATC	S4K2U96BATC
Used with UPS models	S4K2U700C, S4K2U1000C, S4K2U1500C, S4K2U2000C	S4K2U3000C
<b>DIMENSIONS, D x W x H, in. [mm]</b>		
Unit	19.7 x 16.9 x 3.4 [497 x 430 x 85]	23.7 x 16.9 x 3.4 [602 x 430 x 85]
Shipping	24.3 x 22.4 x 10.3 [617 x 570 x 262]	28.2 x 22.4 x 10.3 [717 x 570 x 262]
<b>WEIGHT, lb. [kg]</b>		
Unit	70.5 [32.0]	93.5 [42.4]
Shipping	77.2 [35.0]	101.4 [46.0]
<b>BATTERY PARAMETERS</b>		
Type	Valve-regulated, non-spillable, lead acid	
Qty x V x Rating	2 x 4 x 12 V x 9.0 Ah	2 x 6 x 12 V x 9.0 Ah
Battery mfr./Part number	Panasonic/UP-RW1245; CSB/HR 1234W F2	
Backup time	See Table 14	
<b>ENVIRONMENTAL REQUIREMENTS</b>		
Operating temperature	0°C to +40°C [+32°F to +104°F]; see Table 13 for operating temperature parameters	
Storage temperatures	-15°C to +50°C [+19°F to +122°F]; high ambient temperatures will reduce battery life	
Relative humidity	0% to 95%, non-condensing	
Operating elevation	Up to 10,000 ft. [3,000 m]	
Storage elevation	50,000 ft. [15,000 m] max.	
<b>AGENCY</b>		
Safety	UL1778, cUL Listed	
RFI/EMI	FCC Part 15, Class A	
Surge immunity	IEC62040-2 2 <sup>nd</sup> Ed.	
Transportation	ISTA Procedure 1A	

Ambient temperature	+25°C to +30°C [+77°F to +86°F]	+30°C to +35°C [+86°F to +95°F]	+35°C to +40°C [+95°F to +104°F]
Maximum output power factor derating at maximum load	100% to 93%	93% to 86%	86% to 79%

Number of Batteries/Cabinets	Load % of Capacity	Model Rating				
		700 VA	1000 VA	1500 VA	2000 VA	3000 VA
		Backup Time in Minutes				
Internal battery	10%	105	90	123	92	82
	20%	61	37	52	38	38
	30%	37	30	34	23	23
	40%	32	23	23	16	16
	50%	27	17	18	12	12
	60%	22	14	14	9	9
	70%	18	11	11	7	7
	80%	15	9	9	5	5
	90%	13	8	7	4	4
	100%	11	7	6	3	3
Internal battery + 1 external battery cabinet	10%	426	332	335	303	224
	20%	302	165	162	140	137
	30%	163	137	129	96	95
	40%	144	108	96	66	66
	50%	125	92	72	49	49
	60%	106	74	54	38	41
	70%	94	61	46	33	34
	80%	78	49	38	28	27
	90%	69	40	34	23	23
	100%	60	38	31	20	21
Internal battery + 2 external battery cabinets	10%	480	456	451	431	427
	20%	433	331	318	207	202
	30%	327	222	187	150	149
	40%	265	166	151	124	124
	50%	201	152	131	97	98
	60%	164	137	107	75	76
	70%	153	122	91	61	62
	80%	142	105	74	50	50
	90%	131	95	64	41	45
	100%	120	79	53	38	41
Internal battery + 3 external battery cabinets	10%	480	480	480	455	452
	20%	461	441	426	326	323
	30%	438	336	312	197	196
	40%	344	305	198	155	155
	50%	322	209	160	136	136
	60%	300	167	145	111	112
	70%	213	157	130	96	98
	80%	189	146	111	78	79
	90%	163	135	99	68	70
	100%	155	124	83	56	60
Internal battery + 4 external battery cabinets	10%	480	480	480	480	466
	20%	480	459	446	424	421
	30%	457	435	341	308	307
	40%	441	339	309	192	192
	50%	424	316	204	157	158
	60%	336	221	164	142	143
	70%	318	199	153	126	128
	80%	301	166	141	107	109
	90%	213	158	130	95	97
	100%	197	149	112	79	81
Internal battery + 5 external battery cabinets	10%	480	480	480	480	480
	20%	480	466	458	441	439
	30%	464	446	432	333	332
	40%	451	427	333	225	225
	50%	438	341	306	188	190
	60%	424	322	207	158	159
	70%	343	303	167	145	147
	80%	329	212	158	133	135
	90%	315	193	148	120	122
	100%	300	166	139	104	107
Internal battery + 6 external battery cabinets	10%	480	480	480	480	480
	20%	480	480	467	452	450
	30%	480	458	445	422	421
	40%	462	442	422	319	319
	50%	451	426	327	216	218
	60%	440	342	304	185	188
	70%	428	326	208	159	160
	80%	370	309	184	148	149
	90%	336	221	161	137	139
	100%	324	204	153	126	129

**NOTE:** Run times in this table are approximate. They are based upon new, fully charged standard battery modules at a temperature of 25°C (77°F) with 100% resistive UPS loading. Run times listed above can vary by +/-5% due to manufacturing variances of the individual batteries.

<b>Table 15: S4K2U-5C Battery Backup Times</b>				
Number of Batteries/Cabinets	Load % of Capacity	Model Rating		
		1000 VA	2000 VA	3000 VA
		Backup Time in Minutes		
Internal battery	10%	91	81	91
	20%	38	37	39
	30%	31	23	23
	40%	23	16	16
	50%	17	12	12
	60%	14	9	9
	70%	11	7	7
	80%	9	5	5
	90%	8	4	4
	100%	6	3	3
Internal battery + 1 external battery cabinet	10%	334	222	302
	20%	166	137	139
	30%	138	94	95
	40%	108	66	66
	50%	92	49	48
	60%	72	39	41
	70%	56	34	34
	80%	48	28	27
	90%	40	23	23
	100%	37	20	21
Internal battery + 2 external battery cabinets	10%	457	426	431
	20%	333	201	205
	30%	224	149	150
	40%	166	124	124
	50%	151	97	97
	60%	135	75	76
	70%	113	61	63
	80%	103	50	50
	90%	92	41	45
	100%	78	38	41
Internal battery + 3 external battery cabinets	10%	480	451	455
	20%	442	322	325
	30%	337	195	196
	40%	305	154	155
	50%	208	136	136
	60%	166	111	112
	70%	155	96	98
	80%	144	78	79
	90%	132	68	70
	100%	122	56	60
Internal battery + 4 external battery cabinets	10%	480	466	480
	20%	460	421	423
	30%	436	306	307
	40%	340	192	192
	50%	315	157	157
	60%	218	142	143
	70%	195	127	128
	80%	165	107	109
	90%	156	95	97
	100%	147	80	81
Internal battery + 5 external battery cabinets	10%	480	480	480
	20%	467	438	440
	30%	447	331	332
	40%	428	224	225
	50%	341	189	189
	60%	320	158	159
	70%	227	146	147
	80%	208	133	135
	90%	189	120	122
	100%	164	104	106
Internal battery + 6 external battery cabinets	10%	480	480	480
	20%	480	450	452
	30%	458	420	421
	40%	442	319	319
	50%	426	217	217
	60%	341	186	187
	70%	323	159	160
	80%	306	148	150
	90%	217	137	139
	100%	201	126	128

**NOTE:** S4K2U-5C models are not available in 700VA or 1500VA.

Run times in this table are approximate. They are based upon new, fully charged standard battery modules at a temperature of 25°C (77°F) with 100% resistive UPS loading. Run times listed above can vary by +/-5% due to manufacturing variances of the individual batteries.



## 10.0 Warranty & Support

### **10.1 Warranty Information**

Please see the "Terms & Conditions of Sale".

### **10.2 Technical Support**

**Phone:** (800) 377-4384 or (847) 268-6651

**E-mail:** [solahd.technicalservices@emerson.com](mailto:solahd.technicalservices@emerson.com)

**Web site:** [www.solahd.com](http://www.solahd.com)

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