EGS Electrical Group

SOLA/ HEVI-DUTY

S5K Modular UPS

208/240V
60Hz
12 to 20 kVA

TABLE OF CONTENTS

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be closely followed during installation and maintenance of this UPS unit and during the installation and replacement of Power and Battery Modules.

This product is designed for Commercial/Industrial use only. This product is not intended for use with life support and other U.S. FDA-designated "critical" devices. Maximum load must not exceed that shown on the UPS rating label. See **LIMITED WARRANTY on page 49**.

> **WARNING:** Lethal voltages may be present within this unit even when it is apparently not operating. Observe all cautions and warnings in this manual. Failure to do so MAY result in serious injury or death. Never work alone.

Observe the following precautions when working with batteries:

- **CAUTION:** DO NOT dispose of Battery Modules in a fire because the modules may explode.
- **CAUTION:** DO NOT open or mutilate batteries; released electrolyte is harmful to skin and eyes and 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 and other metal objects.
  - Use tools with insulated handles.
- **CAUTION:** Lead-acid batteries contain hazardous toxic materials. Handle, transport and recycle in accordance with local regulations.

This UPS is designed for use on a properly grounded (earthed), 208/240 VAC, 60 Hz supply and is to be installed by qualified personnel.

Electromagnetic Compatibility—The S5K Modular UPS complies with the limits for a Class A digital device, pursuant to Part 15 of FCC rules. These limits provide reasonable protection against harmful interference in a commercial environment. This device generates, uses and radiates radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operating this device in a residential area is likely to cause harmful interference which users must correct at their own expense.

Operate the UPS in an indoor environment only in an ambient temperature range of 0°C to +40°C (32°F to +104°F). Install it in a clean environment, free from conductive contaminates, moisture, flammable liquids, gases and corrosive substances.

Turn the UPS off and isolate the UPS before cleaning. Use only a soft cloth, never liquid or aerosol cleaners. Keep the front and rear vents free of dust accumulation that could restrict airflow.

Never block or insert any object into the ventilation holes or other openings.

This UPS contains user replaceable modules. No attempts should be made to access the interior of any module. See **Module Replacement on page 40**.

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GLOSSARY OF SYMBOLS

Symbol	Description
⚡	Risk of electrical shock
⚠	Indicates caution followed by important instructions
→	AC input
→	AC output
📖	Requests the user to consult the manual
🔋 PbH2SO4	Indicates the unit contains a valve-regulated lead acid battery
♻ Pb	Recycle
—	DC voltage
⏚	Equipment grounding conductor
⏚	Bonded to ground
∼	AC voltage
○	OFF
I	ON
⏻	Standby
☎	No telecommunication connection
🔒	Locked position
🔓	Unlocked position
⌒	Contact closure signals
IOIOI	Serial communications

Introduction

General Description
Modes of Operation
Major Components

GENERAL DESCRIPTION

Congratulations on your purchase of Sola/Hevi-Duty's S5K Modular Uninterruptible Power System. As with every other Sola/Hevi-Duty product, we stand behind our quality. If you have any questions concerning this UPS, please feel free to contact your local sales representative or call the appropriate Technical Support number listed on the back of this manual.

To ensure proper installation and operation of this unit, please read this manual thoroughly.

System Description

The Sola/Hevi-Duty S5K Modular Power System is a modular UPS intended for use with workstations, servers, network, telecom and other sensitive electronic equipment. It provides continuous, high-quality AC power to your equipment, protecting it from any power disturbance due to blackouts, brownouts, surges or noise interference.

The S5K Modular UPS was designed to provide maximum system availability to business-critical equipment. The S5K Modular UPS is also an easily adaptable UPS system. By simply installing additional Power or Battery Modules, you can expand your current system capacity or extend your backup runtime.

The S5K Modular UPS has a comprehensive user interface that enables configuration according to the user's preference. It also informs the user of details on the status of the UPS and keeps a log of events.

Features

- Up to 20 kVA of modular backup power
- Continuous power conditioning
- A user-friendly interface for custom configuration
- Continuous system monitoring
- Warning alarms and event logs
- Internal automatic & manual bypass

Standard Components

- Power Modules - for power conditioning
- Battery Modules - for backup power
- System Control Modules - for system monitoring and communications
- LCD Display - for comprehensive user indications and programmable controls
- Output Transformer - for isolation

Communications

- Dry contacts
- RS-232
- Optional communications via Intellislot™ communication ports

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User Interface

Control Enable Switch (SW2)

REPO Terminal

Intellislot™ Communications Ports

Power Module Bays

Battery Module Bays

DB-9 Communication Ports

Output Power Terminal

208/240 Jumper

Input Power Terminal

Input Earth Terminal

Manual Bypass Switch (SW1)

Intake Cooling Fans

External Battery Connection

COM1   COM2
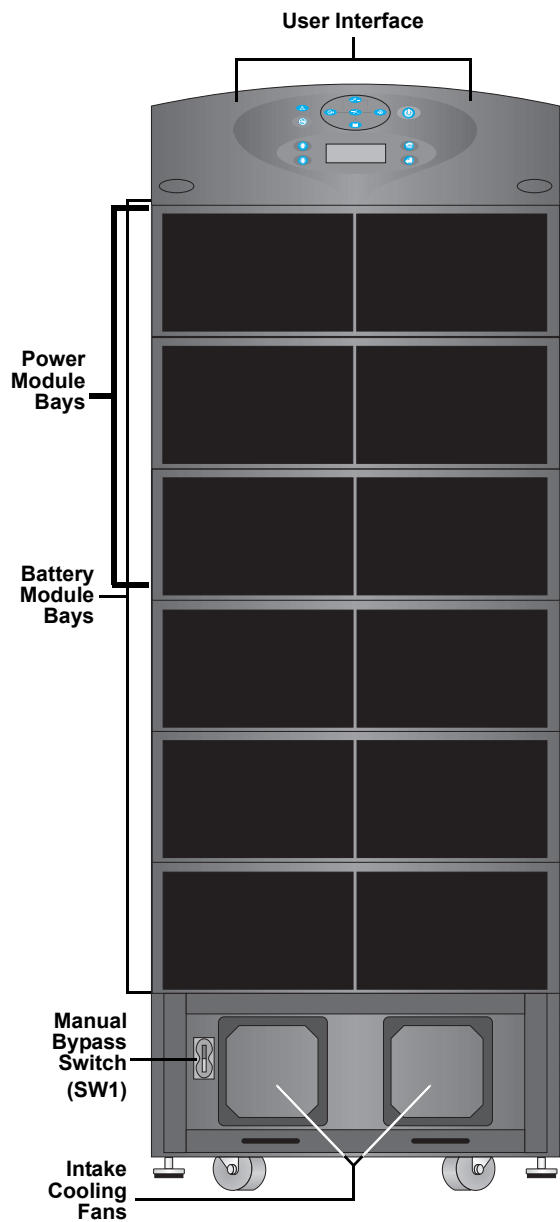
Front
with bezels removed
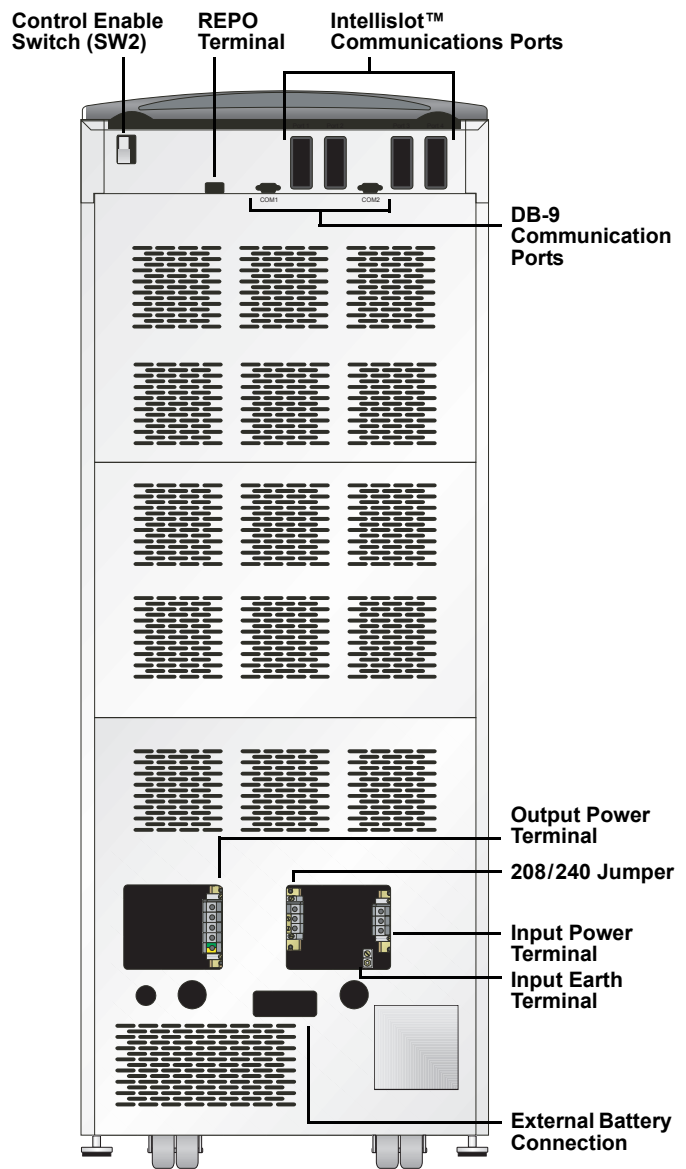
Back
with access plates removed

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MODES OF OPERATION

The S5K Modular UPS is designed to operate as a true on-line system in the following modes:

Normal Mode

The Power Module rectifiers derive power from a utility AC source and supply regulated DC power to the inverter. The module's inverter regenerates precise AC power to supply the connected equipment. The battery charger maintains a float-charge on the battery.

Backup Mode

When AC utility fails, the connected equipment is supplied power by the inverter, which obtains energy from the Battery Modules. The output power equipment will not be interrupted during the failure or restoration of the AC utility source.

Auto Restart Mode

After a power outage and complete battery discharge, once AC utility is restored, the UPS will automatically restart and resume supplying power to connected equipment. This feature is enabled at the factory, but can be disabled by the user. The user can also program two auto restart delay settings:

1. Battery capacity level (%)
2. Countdown timer

Recharge Mode

When AC utility is restored, the unit will automatically recharge the Battery Modules until they are fully charged.

Bypass Mode

The bypass provides an alternate path for power to the connected equipment and operates in the following manner:

- **Automatic**

  In the event of an internal fault or should the inverter overload capacity be exceeded, the UPS performs an automatic transfer of the connected equipment from the inverter to the bypass source.

- **Manual**

  Should the UPS need to be taken out of service for limited maintenance or repair, manual activation of the bypass will cause an immediate transfer of the equipment from the inverter to the bypass source.
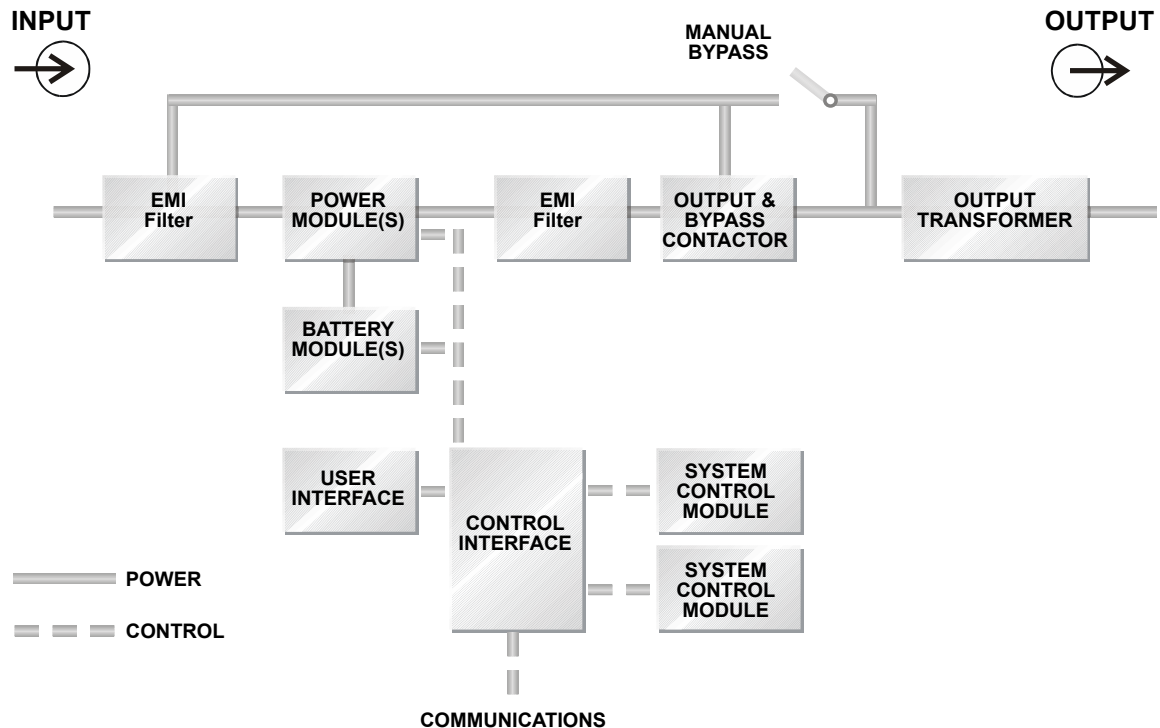
MAJOR COMPONENTS

The following is a general description of each component and its functions. Please review this section carefully, as it will give you a better understanding as to how The S5K Modular UPS operates.

Unit Frame

The S5K Modular's frame houses all of the other system components. Looking at the front of the S5K Modular UPS, one sees a series of plastic bezels. By grasping these bezels from the side and pulling out, you will remove the bezel to reveal the Battery / Power Module bays. the bottom bezel covers the cooling fans and the manual bypass switch.

The User Interface Module is located above the Power / Battery Module bays for easy access. From here the user may find out various information about the S5K Modular's condition. By moving the User Interface and setting it on top of the frame, you will see the system control module bays.
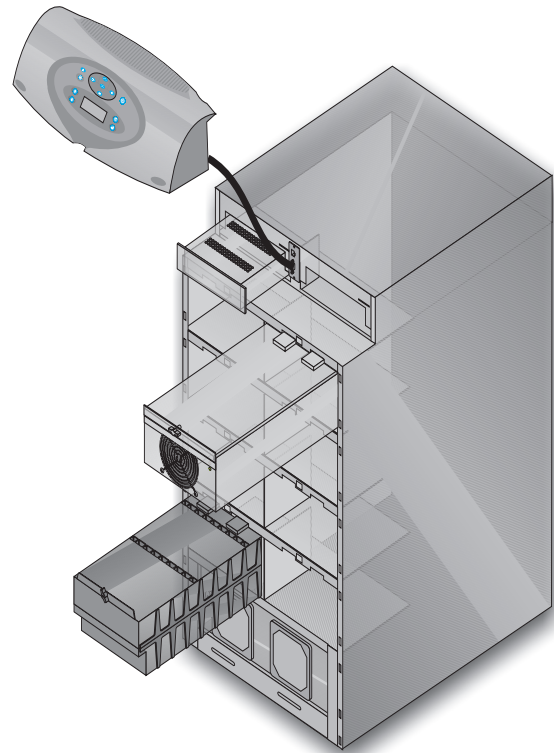
S5K Modular's frame with bezels removed

(Power Module and Battery Module extended for illustration only. Extending more than one module at a time could cause the unit to tip over.)

User Interface Module

The User Interface Module is the primary source of communication between the UPS and the user. From the interface, the user can:

- View the status of the UPS
- Custom configure the system
- Review the event log to assist with troubleshooting
- Enable/disable the output power
- Silence the audible alarm

For a more detailed explanation on how to operate the User Interface Module, see **Controls and Indicators on page 20**.

User Interface Module

System Control Module

The System Control Module is the communications backbone of the UPS. It gathers input from all modules and processes the data to control the operation of the system — including monitoring the condition of each module. An optional second System Control Module can be installed to provide full system functionality (operation and communication), in the unlikely event a System Control Module should fail.

Under normal operation, the Status LED (green) will blink and the Fault LED (amber) will be off. For any condition other than this, check the **Troubleshooting** section starting on page 35.
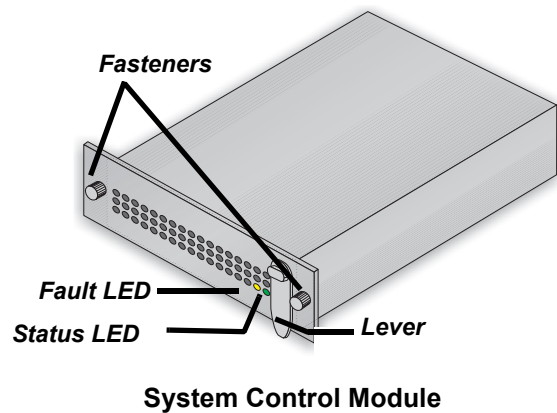
System Control Module

Power Module

The Power Module maintains the condition of power in the S5K Modular UPS. Each module is an independent 4 kVA unit, consisting of a power factor corrected rectifier, battery charger and inverter, with associated monitoring and control circuitry. The modules are paralleled to provide greater capacity and/or redundancy. Modules may be added or replaced on-line with no interruption or danger to the connected equipment.

Battery Module

The Battery Modules provide backup power in the event of input utility failure. Each module contains 10 individual 12-volt, valve-regulated (VRLA) battery blocks with associated monitoring and controls to isolate the Battery Module in the event of a battery failure. The modules are paralleled to provide greater capacity, backup time and/or redundancy. Modules may be added or replaced on-line with no interruption or danger to the connected equipment, provided that the UPS is not operating on battery.
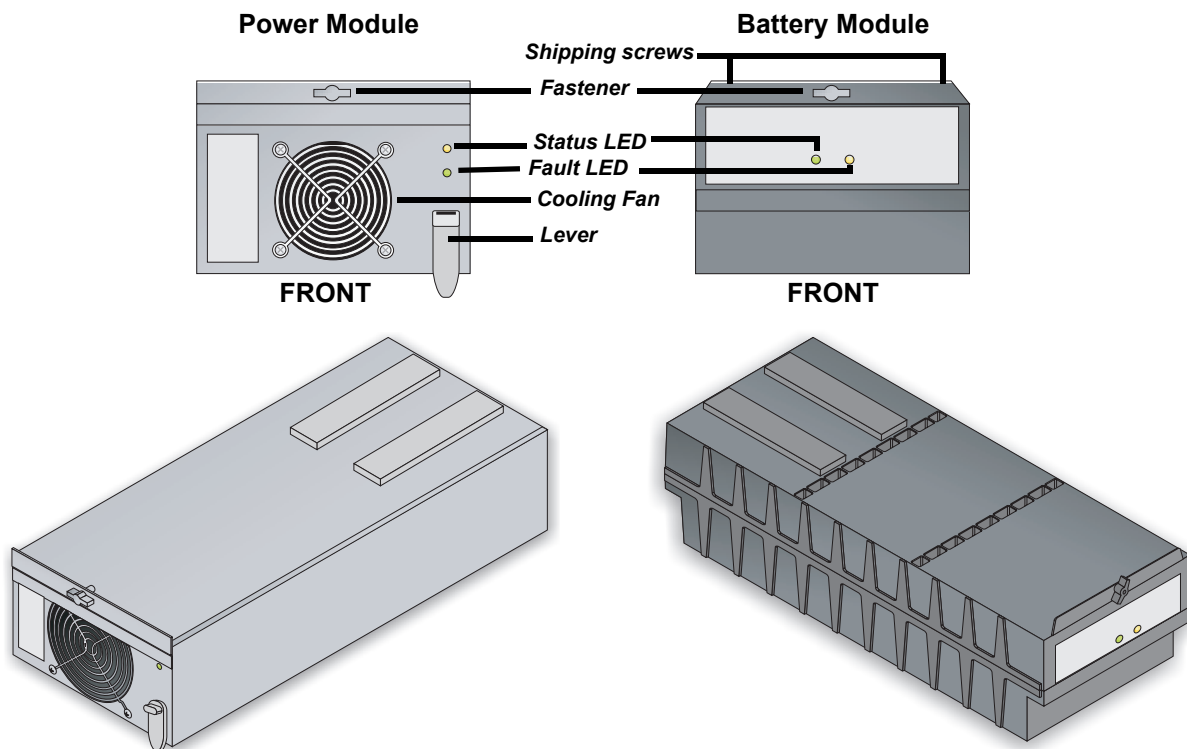
Power Module

Battery Module

Shipping screws

Fastener

Status LED

Fault LED

Cooling Fan

Lever

FRONT

FRONT

Under normal operation, the Status LED (green) will blink and the Fault LED (amber) will be off. For any condition other than this, check the **Troubleshooting** section starting on page 35.

Installation

Preparation
Unloading
Cable Installation
Communications

PREPARATION

These installation instructions provide all the information needed for positioning the UPS (including environmental requirements) and for connecting the input and output power cables.

Inspection

Upon receiving the UPS, examine the packaging for any signs of mishandling or damage. If any damage is noted, call your local Sola/Hevi-Duty representative and/or notify your carrier.

Environment

NOTE: Operating in temperatures above 25°C (77°F) will reduce battery life. The UPS environment must be free of conductive contaminants and excessive moisture (water and condensation), flammable vapors, chemical fumes or corrosive gases and liquids.

Required Setup Equipment

The tools below are required to properly set up your UPS:

- Pallet jack
- 13 mm (1/2") ratchet or wrench
- Torque wrench (in-lb)
- Flathead screwdriver
- #2 Phillips screwdriver

Site Preparation

When deciding where to locate your UPS, consider the weight and size of the unit. Make sure that the structural integrity of the floor can withstand the weight of a fully loaded unit. Refer to the table below for size and fully populated weight considerations.

Max Weight kg (lb)	H x W x D mm (in)
536 (1182)	1346 x 508 x 711 (53 x 20 x 28)

Check to make sure that your UPS will be located in a well-ventilated area with at least 305 mm (12 inches) behind it. The UPS is force-cooled with the aid of internal fans. Cooling air enters from the front of the UPS and is exhausted through ventilation grilles in the back. It should also have at least 915 mm (36 inches) in front in order to change modules when necessary.
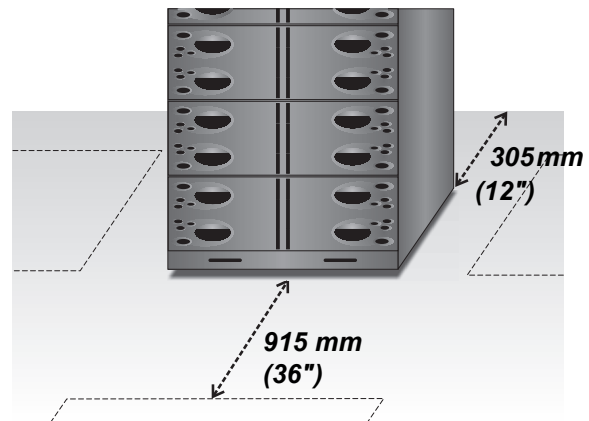
The unit frame is bolted to the shipping pallet to ensure safety. It is recommended that a pallet jack be used to transport the unit to its operating location (prior to unbolting the unit).

Unloading the UPS

CAUTION: This UPS is very heavy (see weight in **Site Preparation on page 12**). At least two people should be present to unload it from the pallet.

1. Once the UPS is near the desired operating location, remove the cardboard cover.

2. Use a ratchet or wrench, 13 mm (1/2"), to remove the four mounting bolts from the pallet brackets. Remove the mounting brackets from the pallet and UPS. Keep the brackets for future transportation of the UPS or for additional stability once in place.
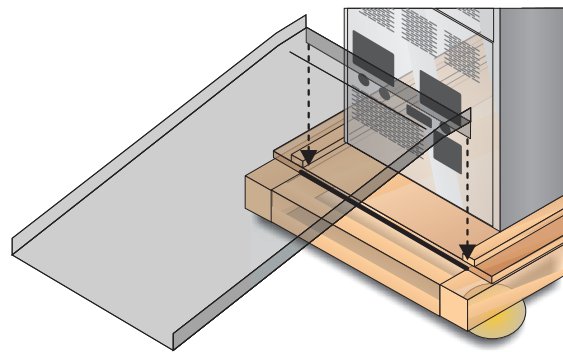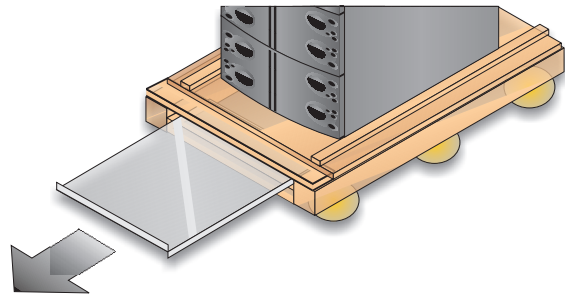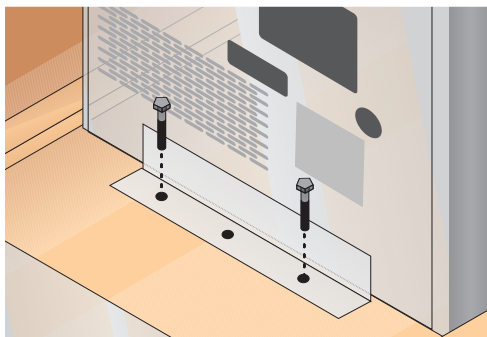
3. Remove the metal ramp from the bottom of the UPS, rotating it. Fit the ramp in the pallet slot as shown above.

4. Using two people, slowly move the UPS down the ramp until the UPS is on a level surface.
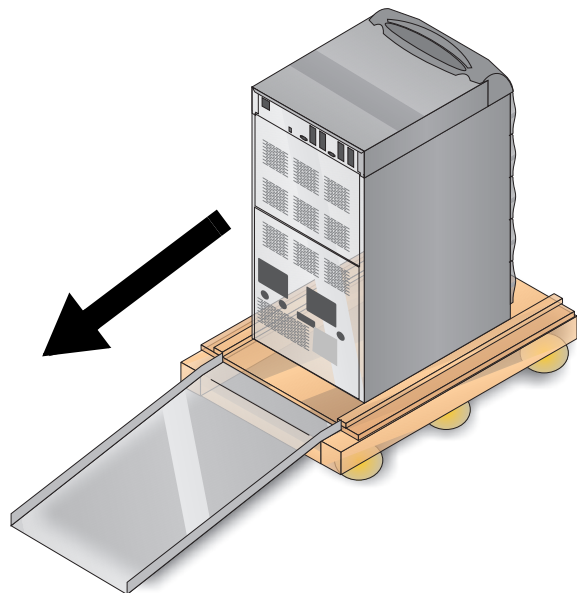
5. Once the UPS is in the desired location, adjust the leveling feet to secure its position.

13 mm (1/2")
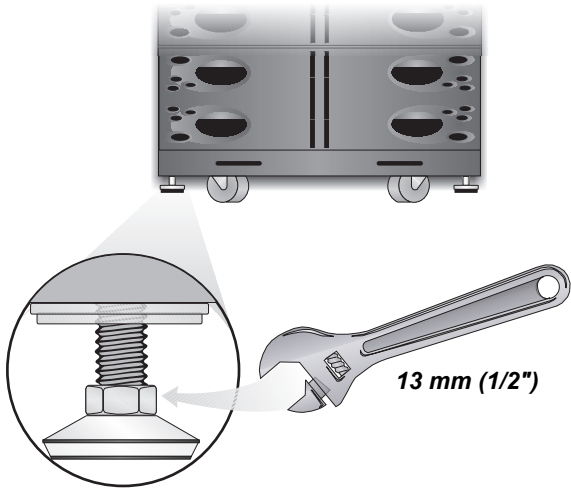
Stationary Mounting

Additional stability can be added by bolting the mounting brackets (used in shipping) to the floor.
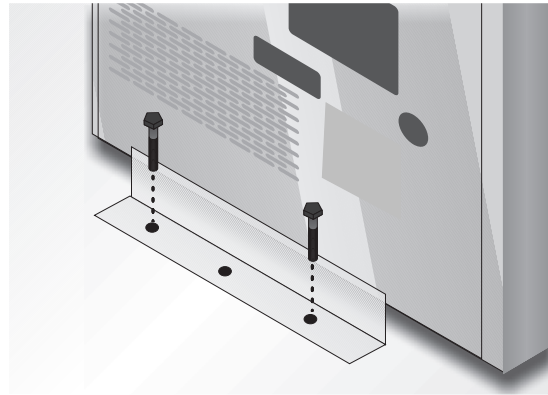
For greater stability, use a higher-grade bolt. Refer to the dimensions below when drilling holes for stationary mounting.

Optional Stationary Mounting

120 mm (4.75")   *120 mm (4.75")*

711 mm (28")

Center Line

7.94 mm (5/16") diameter 6 places
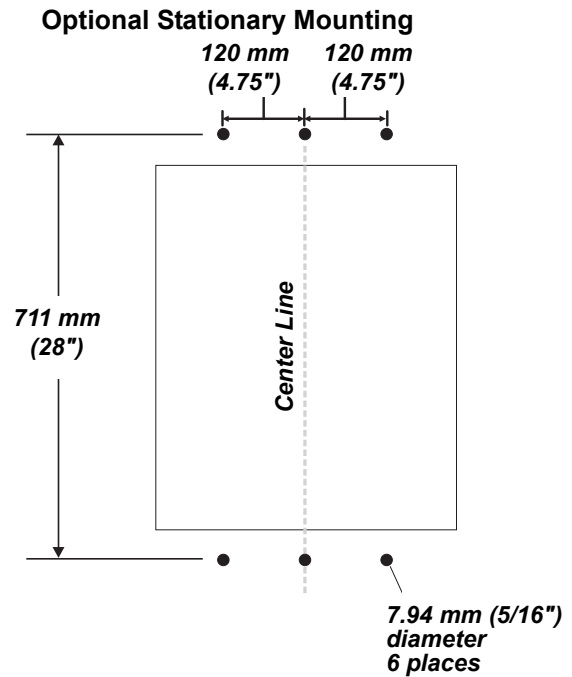
CABLE INSTALLATION

Wiring Preparation

WARNING:

Please read this section thoroughly before attempting to install wiring to this unit.

Be sure that the unit is not connected to any power source before installing any wiring to this unit. This UPS should be installed by a qualified / certified electrician.

Removing the Cover Plates

On the back of the UPS, cover plates are over the input and output terminals, as shown at right. Remove these using a Phillips screwdriver. Keep screws and plates to one side.

Remove Cover Plates
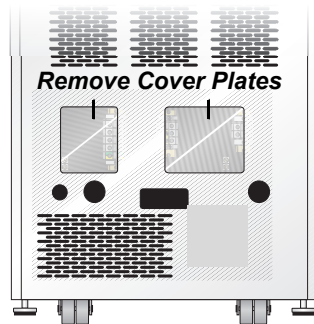
Configuring the Bypass Voltage (TB2)

The UPS voltage is factory-set to 208 V. Should the user have a utility supply of 240 V, the bypass voltage jumper will have to be changed to ensure correct output voltage.

Bypass Voltage Jumper

OR

208 V (default)   *240 V*
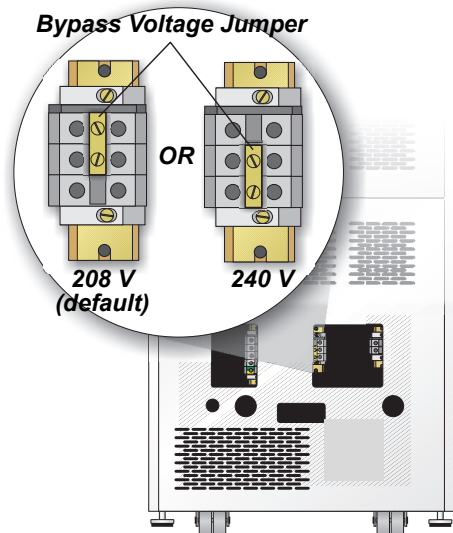
Power Cable Installation

Refer to the chart below when selecting cables

Power Cable and Protection Ratings			
	120 V	**208 V**	**240 V**
Max Input Current in UPS Mode and Nominal Voltage	N/A	102 A	88 A
Input Protection	N/A	125 A Branch Rated	125 A Branch Rated
Max Output Current	83 A/ phase	96 A	83 A
Input/Output Terminal Details	2 AWG Max: 35 mm² 6 AWG Min: 16 mm² Torque Rating: 2.5-3.0 Nm (22-26 in-lb)		

90°C rated copper wire is recommended

Customer-Provided Overcurrent Protection

A branch rated overcurrent protection device (circuit breaker or fused disconnect switch) must be installed for the AC input.

If the start-up is on bypass, the UPS has a six-cycle inrush current that is up to 20 times the rated output current. This must be taken into account when selecting the overload protection device at the AC input supply distribution point. To avoid random tripping on start up, it is recommended that the AC input supply be protected with a circuit breaker capable of withstanding this initial inrush.

This UPS is fitted with EMI suppression filters. Earth leakage current is less than 40mA. Transient and steady state earth leakage currents may occur when starting the equipment. This should be taken into account when selecting ground current detection devices, as the earth leakage currents of both the UPS and load will be carried.

Input and output cables must be run in separate conduits.

Input Wiring (TB1)

To connect the input wiring, follow these steps:

1. Locate the input wiring access, remove the knockout and pull the three input wires through it, allowing some slack for installation.
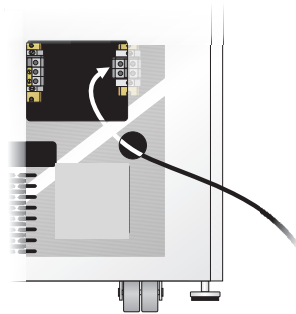
2. Secure the conduit to the rear panel of the UPS.

3. Input Power cables connect to screw terminals on the Input Terminal Block located to the right of the Bypass Voltage Terminal. Connect the wires to the block connections as shown below. Using a torque wrench, turn the screws clockwise until tightened to the proper torque value 2.5 - 3.0 Nm (22-26 in-lb). Insert the ground wire through the grounding lug and tighten it to the proper torque value.
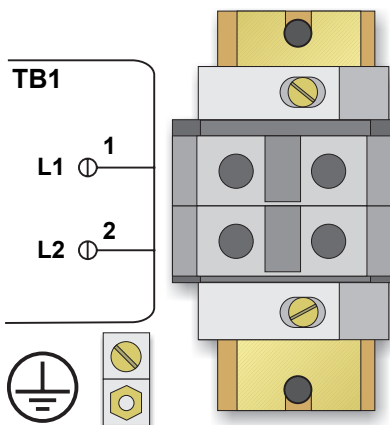
Grounding Conductor Installation

An insulated grounding conductor must be identical or larger in size, insulation material, and thickness as the grounded and ungrounded branch circuit supply conductors. This cable must be green with or without one or more yellow stripes and is to be installed as part of the branch circuit that supplies the unit or system.

The grounding conductor is to be grounded to earth at the service equipment or, if supplied by a separately derived system, at the supply transformer or motor generator set.

Output Wiring (TB3)

Output wiring may be configured one of two different ways (240/120 or 208/120). Refer to the chart and diagram below when configuring the output wiring.

Note the Neutral / Earth jumper on the terminal above
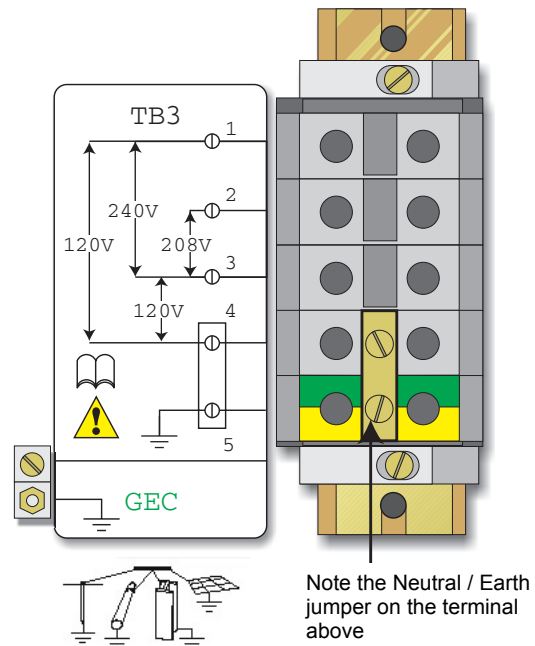
Voltage	120	208	240
Terminals	1,4 3,4	2, 3	1,3

Use only the connections listed above. Other connections will produce nonstandard voltages.

Note

The S5K Modular UPS contains an isolation transformer that generates a neutral conductor for the connected equipment. The UPS is a separately derived source and contains a neutral to ground bonding jumper. A grounding electrode conductor (GEC) must be installed in accordance with national and local wiring codes and regulations.

Connecting to External Panel Boards

If connected equipment operates at 240 VAC only or 120 VAC only or is a mixture of both, use a single-phase panel board connected to the UPS as follows:

Panel Board Input		UPS Output TB3
240 VAC	L	1
		2
120 VAC	L	3
120 VAC	N	4
	G	5
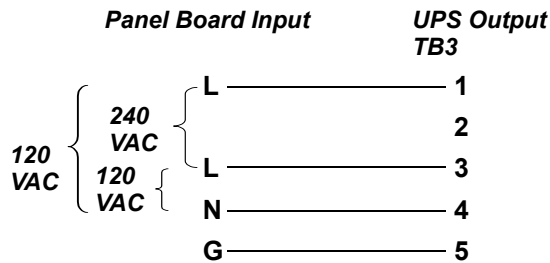
If connected equipment operates at 208 VAC only, use a single-phase panel board connected to the UPS as follows:

Panel Board Input		UPS Output TB3
		1
208 VAC	L	2
	L	3
		4
	G	5
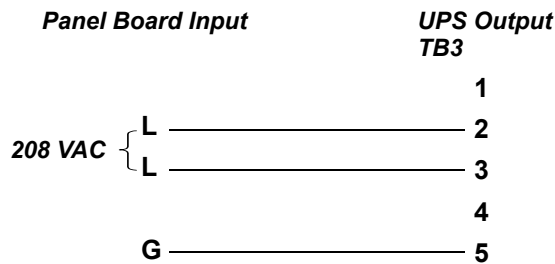
If connected equipment is a combination of 208 VAC and 120 VAC, use a three-phase panel board connected to the UPS as follows:

Panel Board Input			UPS Output TB3
		L3	1
120 VAC (N to L3 only)	208 VAC (L1 to L2)	L2	2
		L1	3
	120 VAC (N to L1)	N	4
		G	5
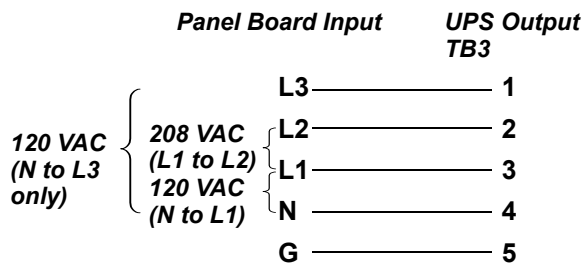
NOTE: L2 - N is 88 VAC.

CAUTION: It is necessary that the installing electrician clearly identifies the connections for future reference. Refer to NEC 215-8 and 210-4(d).

REPO Switch

The S5K Modular UPS is equipped with a Remote Emergency Power Off (REPO) switch.

The user must supply a means of interfacing with the REPO circuit to allow disconnecting the UPS input feeder breaker to remove all sources of power to the UPS and connected equipment to comply with national and local wiring codes and regulations.

REPO switch connection diagram

As shipped
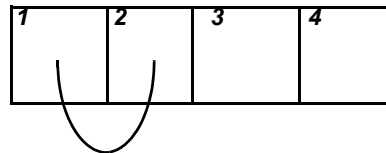
Normally open switch system
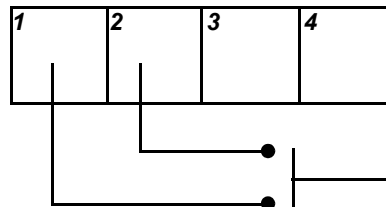
NOTE Remove jumper before wiring.

Normally closed switch system (fail-safe)
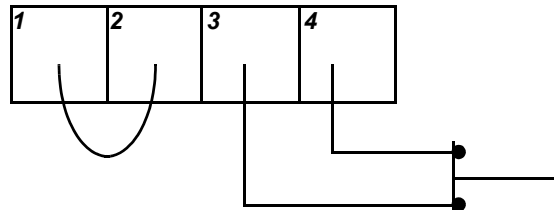
1. 24 V DC, 35 mA
2. = Sense
3. = Sense
4. = Ground

If the installation does not require connection to a REPO system, the jumper must be removed.

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

COMMUNICATIONS

COM Ports

The S5K Modular UPS is able to communicate through multiple communication ports simultaneously. Use only Sola/Hevi-Duty-provided communication cards. Connect only SELV/Class 2 circuits when connecting to any communication port.
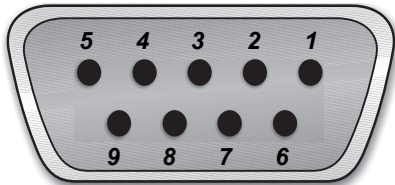
Pin Assignment

⌇⌇ COM 1 - Relay Contacts

Relay contacts are available through a DB-9F communications connector. Contact closure provides the following:

Pin	Assignment
1	Low Battery (normally open)
4	UPS shutdown in battery mode (5-12 V DC for 1.5 sec)
5	Common
7	Low Battery (common)
8	On Battery (common)
9	On Battery (normally open)

The contacts are rated 48 VDC, 1 amp maximum and are compatible with the MultiLink software.

IOIOI COM 2 - Serial

The S5K Modular UPS is able to communicate via Sola/Hevi-Duty proprietary protocol. The pin-out configuration of the DB-9 connector is:

Pin	Assignment
2	Transmit Data
3	Receive Data
5	Common
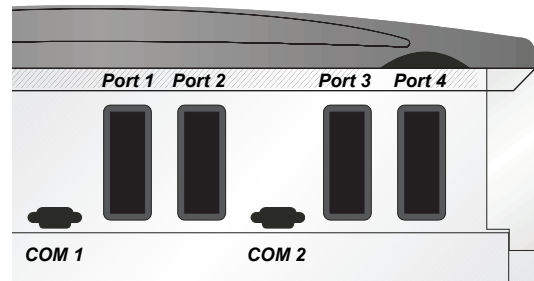
Intellislot™ Ports

The following communication cards may be used with the S5K Modular UPS:

- **Intellislot™ SNMP cards**—allows the S5K Modular to communicate intelligently with your Ethernet network. The SNMP card must be installed in port 1; any additional cards can be added in consecutive ports.

- **Intellislot™ MultiPort4 cards**—allows up to four client computer systems to monitor the status of the S5K Modular simultaneously.

- **Intellislot™ Relay Contacts cards**—provides contact closures for remote monitoring of alarm conditions; On Battery, On Bypass, Low Battery, Summary Alarm, UPS Fault and On UPS signals. It will integrate with AS400 computers (additional cable required) and other monitoring systems.

Operating Instructions

Controls and Indicators
Operating Procedures
Main Menu

CONTROLS AND INDICATORS

Display Controls

The User Interface Module informs you of the status of the UPS and lets you configure the UPS to your own needs or preferences.

The module consists of a series of Status LEDs, an LCD display window (four lines of 20 characters each), and buttons for navigation, as displayed below.
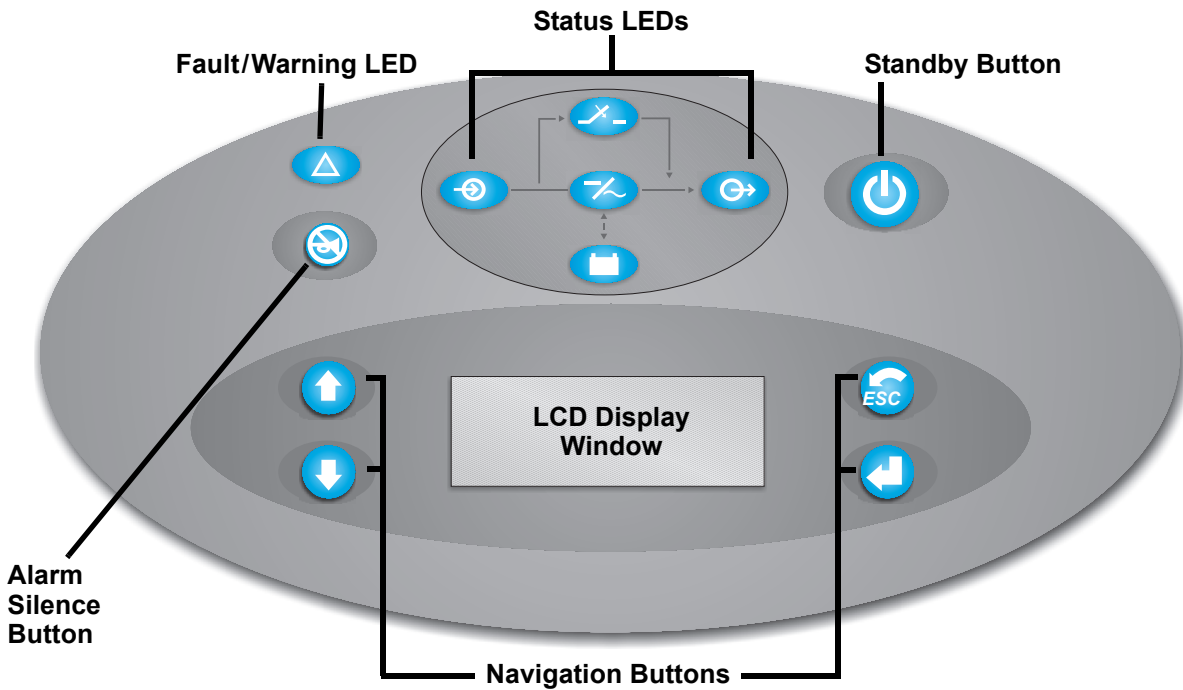
Buttons

Refer to the legend below to properly navigate the S5K Modular User Interface.

Up ⎱
Down ⎰ - Navigates cursor on display menus

Escape - Returns to previous display screen

Enter - Selects displayed information

Standby - Enables / disables output power

Alarm Silence - Mutes the audible alarm

Fault/Warning and Status LEDs

Refer to the legend below to indicate occurrence when an LED is lit.

Fault/Warning
  Solid - A UPS fault condition has occurred.
  Flashing - A Warning has occurred. Consult event log

AC Input - AC utility is available.

On Bypass - The Bypass is supplying the power.

Inverter On - The inverter is supplying the power.

On Battery - Battery is supplying power to the inverter.

AC Output - Power is available to supply the load.

Status LED Modes

LED Off
LED On
LED Flashing
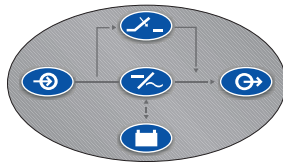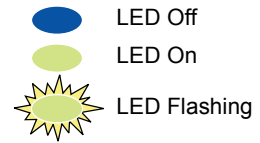
UPS is Off or Initializing
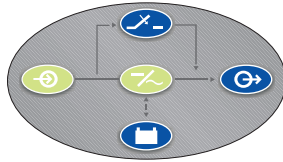
UPS is On, Utility is Good and Output is Off
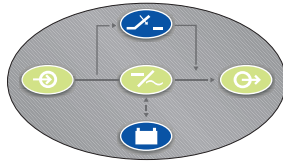
UPS is On, Utility is Good and Output is On
(Normal Operation)
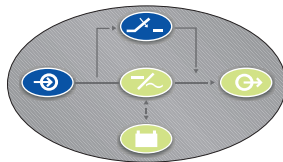
UPS is On, Utility is Bad and Output is On
(On Battery Operation)
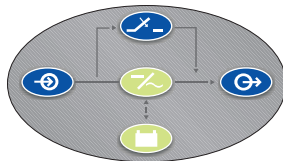
UPS is On, Utility is Bad and Output is Off
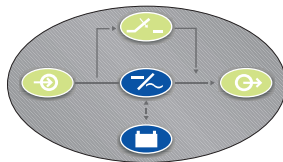
UPS is in Bypass Operation
(Manual or Automatic)
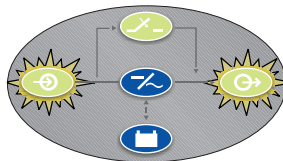
UPS is in Manual Bypass Operation with
Utility Out of Bypass Operation Range
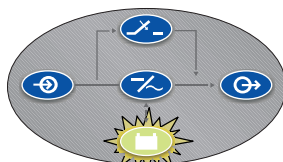
Shutdown Due to End of Discharge

Navigating the Menu

In order to review or change any settings on the UPS, it must be navigated using the buttons shown on the previous page. Because some menus contain more than four rows of information, you may see an arrow on the display pointing up or down (as shown below) — indicating to scroll using the ⬆ or ⬇ buttons.

If you are scrolling through any of the Main Menus, items will scroll one line at a time with the menu heading on the top line:

```
UPS Status
  Present Load
  Redundant Status
  Battery Status          ⌄
```

Pressing ⬇ reveals:

```
UPS Status               ⌃
  Redundant Status
  Battery Status
  Volts/Amps/kVA
                         ⌄
```
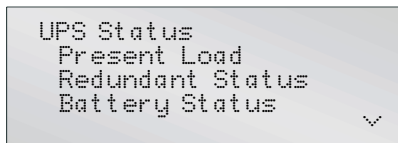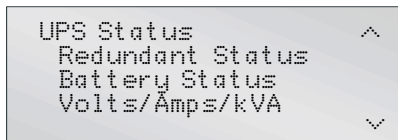
Note the arrows on the screen indicate that the user can scroll up or down to reveal more information.

Start-Up and Initialization

Follow these steps in order to start up the UPS.

1. Ensure the manual bypass switch is in UPS position. Close Input Supply Circuit Breaker and close the Control Enable Switch (SW2). You should see the following on the LCD display window:

```
UPS Initializing
 Please wait...
```

```
*Press ⏻ to Enable
UPS Output.
```

2. Press ⏻ or ESC button.

```
On Mains/Utility
Output kVA = xx.x
Battery Minutes yyy
Press ◀ for menu
```

3. Press ◀ to access the Main Menu.

Shutting Down the UPS

Use the following procedure to power down the UPS.

1. Press ⏻ to disable power from the connected equipment.
2. Verify request to disable the output by pressing ◀.
3. Turn off the Enable Switch (SW2). Open the Input Supply Circuit Breaker.

Manual Transfer to Bypass

In the event of a UPS overload or failure, the UPS will transfer to bypass via its automatic bypass switch. It is possible for the user to manually transfer the UPS to bypass by operating the manual bypass switch located behind the lowest front cover to the bypass position. To transfer the UPS from bypass to normal mode, follow the on-screen instructions.

Main Menu
```
>Transfer to Bypass
```

Transfer to Bypass
```
Press ◀ for bypass
Press ESC to cancel
```

```
Assert manual bypass
```

It should noted that once ◀ is pressed, the bypass alarm will annunciate and cannot be canceled until the manual bypass switch is operated.

Manual Bypass Switch

On Bypass

On UPS
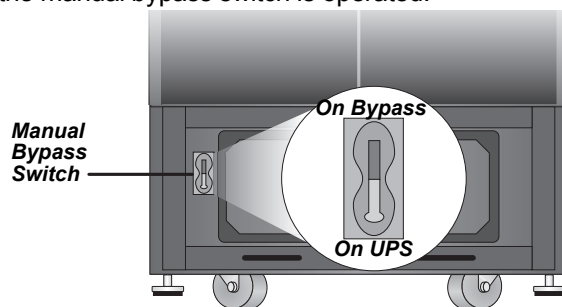
```
UPS on manual bypass
```

It should be noted that the load is not protected from utility interruptions when the UPS is in bypass mode.

To transfer the UPS from bypass to normal mode, simply operate the manual bypass switch back to the UPS position.

On return from bypass, the following screen will be displayed.

```
No active alarms
See Event Log
```

MAIN MENU

After initialization, the ◀ button will take you to the Main Menu. From here you may check on the status of the UPS, review the event and alarm log, configure your UPS and even receive instructions on replacing modules. The Main Menu is divided into eight sub-menus as shown below:

Main Menu

```
>UPS Status
 UPS Configuration
 Display Date/Time
 Event Log
 Alarm Log
 Transfer to Bypass
 Module Replacement
 Tools
```

UPS Status

```
UPS Status
 Present Load
 Redundant Status
 Battery Status
 Volts/Amps/kVA
 UPS Frequency
 UPS Information
 Module Information
```

Event Log

```
Event: xxx/xxx   xx
 event message
 event message
DD/MMM/YYYY  HH:MM:SS
```

Module Replacement

```
Module Replacement
 Ctrl w/ Redundant
 Ctrl w/o Redundant
 Pwr w/ Redundant
 Pwr w/o Redundant
 Battery Module
```

UPS Configuration

```
UPS Configuration
 Review Settings
 Change Settings
 Service Mode
```

Alarm Log

```
Alarm Log Message
```

Tools

```
Tools
 UPS test
 Clear failures
```

Display Date/Time

```
Date/Time
 xx/xx/xxxx  xx:xx:xx
 mm/dd/yyyy  hh:mm:ss
```

Transfer to Bypass

```
Press ◀ for bypass
Press ESC to cancel
```

Use the ⬆ and ⬇ buttons to select the desired menu item and press ◀ to access the appropriate submenu.

UPS Status Screen

From the Main Menu the user may select UPS Status and press ◄┘. Once at the UPS Status Screen, the user may access any information on the present condition of the UPS. Note the chart below when reviewing the UPS. Any underlined text indicates measured parameters.

Main Menu

```
>UPS Status
 UPS Configuration
 Display Date/Time
 Event Log
 Alarm Log
 Transfer to Bypass
 Module Replacement
 Tools
```

UPS Status

```
UPS Status
  Present Load
  Redundant Status
  Battery Status
  Volts/Amps/kVA
  UPS frequency
  UPS information
  Module information
```

Present Load

```
On Mains/Utility
Output: kVA xx.x
Output: kW xx.x
Output: pf xx.x
```

Redundant Status

```
Redundant Status
PMs Installed xx
PM: N+1 redundant/non-redundant
SC: Redundant/ (non-redundant)
```

Battery Status

```
Battery Status
Voltage (VDC) xxx
Capacity % xxx
Status: charging
BMs Installed xx
Ext batt present No.
Discharge count: xxxx
Batt Usage: Hr xxxx.x
```

Volts/Amps/kVA

```
Input      Output
xxx VAC    xxx VAC
xxx A      xxx A
xx.x kVA   xx.x kVA
```

UPS Frequency

```
UPS Frequency
Input:     xx.x Hz
Output:    xx.x Hz
```

UPS Information

```
     UPS Information
UPS ID: xxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxx
Module Information
```

Module Information

```
Main Control
S/N: xxxxxxxxxxxxxx
FW ver: xxxx

Redundant Control
S/N: xxxxxxxxxxxxxx
FW ver: xxxx

User Interface
S/N: xxxxxxxxxxxxxx
FW ver: xxxx

Power Module
S/N: xxxxxxxxxxxxxx
FW ver: xxxx

Battery Module
S/N: xxxxxxxxxxxxxx
FW ver: xxxx
```

UPS Configuration Screen

Review Settings

Follow this procedure to review your UPS configuration settings. Any underlined text indicates factory default values. Follow the menus below by pressing ⬆ or ⬇ to review the settings.

Main Menu

```
>UPS Status
 UPS Configuration
 Display Date/Time
 Event Log
 Alarm Log
 Transfer to Bypass
 Module Replacement
 Tools
```

UPS Configuration

```
UPS Configuration
>Review Settings
 Change Settings
 Service Mode
```

Review Settings

```
Voltage
Frequency
Battery
Alarm
Service Contact
Auto Restart
UPS Shutdown Delay
Remote Shutdown
External Battery
Bypass Alarm Mode
Intelli-Battery Ca.
Air Filter Reminder
```

Voltage Settings

```
Voltage Settings
  Input 208/120
```

Frequency Settings

```
Frequency Hz: 60
Sync Range Hz: +/- 5.0
Slew Range Hz/S: 3.0
```

Battery Settings

```
Battery Settings
Test intrvl 2 weeks
on Wed at 06:00
Low Batt Warn: 2 min
```

Alarm Settings

```
Alarm Settings
Redundant Alarm:
   Enabled/Disabled
Max Load: Enabled/
Disabled
```

Service Contact

```
Service Contact
Sola/Hevi-Duty

1-800-377-4384
```

Auto Restart

```
Mode:     Disable
Batt %    25%
Delay     10
```

UPS Shutdown Delay

```
UPS Shutdown Delay
120 seconds
```

Remote Shutdown

```
Remote comm shutdown
Mode: Enable
```

External Battery

```
External battery config
Amp.Hr    0000
Charge (A)00.0
```

Bypass Alarm Mode

```
Bypass Alarm Mode
Mode:       Enable
```

Intelli-Battery Ca.

```
Intelli-Batteries
        0
```

Air Filter Reminder

```
Air Filter Reminder
Mode:      26 weeks
```

Change Configuration Settings

Change Settings Menu

Starting from the Main Menu, locate and press UPS Configuration. From the UPS Configuration screen, select the Change Settings option. Here one may configure the S5K Modular UPS from a large variety of selections. Items indicated by an asterisk (*) or underlined are the selected settings.

Main Menu
```
>UPS Status
 UPS Configuration
 Display Date/Time
 Event Log
 Alarm Log
 Transfer to Bypass
 Module Replacement
 Tools
```

Change Settings
```
 Input Voltage
 Frequency Sync Range
 Frequency Slew Rate
 Set Password
 Auto Battery Test
 Low Battery Warning
 Auto Restart
 User Settings
 Set Date/Time
 Max Load Alarm Set
 UPS Shutdown Delay
 Redund Alarm Set
 Service Contact
 Remote Shutdown
 External Battery
 Bypass Alarm Mode
 Intelli-Batt Ca.
 Air Filter Reminder
 Factory Defaults
```

UPS Configuration
```
 UPS Configuration
  Review Settings
 >Change Settings
  Service Mode
```

Input Voltage: Select the required input voltage setting. This voltage must match the bypass voltage jumper setting.

```
 Input Voltage
*208/120
 240/120
```

Frequency Sync Range: Sets the window to which the system synchronizes to the input supply.

```
 Frequency Sync Range
 0.5 Hz
 1.0 Hz
 2.0 Hz
 3.0 Hz
 4.0 Hz
*5.0 Hz
```

Frequency Slew Rate: Sets the rate of change of frequency through the sync range window.

```
 Frequency Slew Rate
 0.5 Hz
 1.0 Hz
 2.0 Hz
 3.0 Hz
 4.0 Hz
*5.0 Hz
```

Set Password: Set a Password to prevent unauthorized users from changing the configuration of the S5K Modular UPS. It can be up to seven characters in length. Once set, the password will be required to change the configuration.

```
 Set Password
    xxxxxxx
```

NOTE: If the password is lost, call Sola/Hevi-Duty Technical Support.

Change Settings Menu, cont'd

Auto Battery Test: Configure when and how often the S5K Modular UPS's automatic battery test will run. This test is designed to ensure battery system integrity and provide early warning of problems.

```
Auto Battery Test
  Interval
  Start Day
  Start Time
```

Interval

```
Batt Test Interval
  1 week
 *2 weeks
  3 weeks
  4 weeks
  6 weeks
  Disabled
```

Start Day

```
Batt Test Start
SUN
MON
TUE
WED
THU
FRI
SAT
```

Start Time

```
Start Time
06:00
```
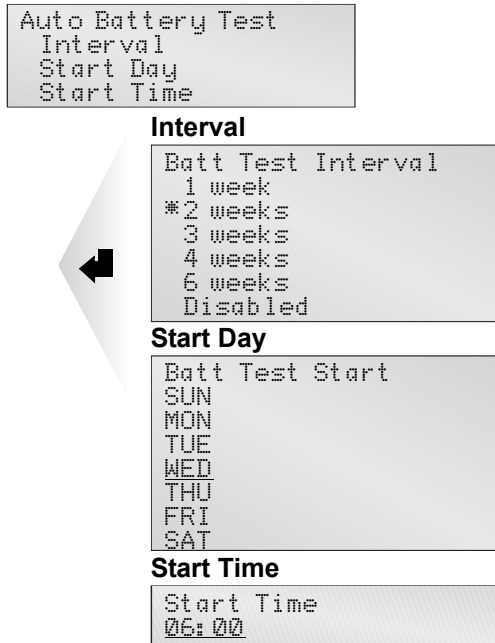
Low Battery Warning: Notifies user how much run time is available. Can be set from 1 to 30 minutes.

```
Low Battery Warning
02 Minutes
```
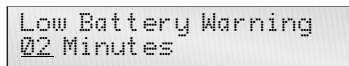
Auto Restart: Automatically restarts once both delay parameters (battery capacity percentage and countdown timer) are met.

```
Auto Restart
  Mode
  Auto restart batt %
  Auto restart delay
```

Auto Restart Mode

```
Auto Restart Mode
*Enable
 Disable
```

Auto Restart Batt %

```
Auto Restart Batt %
  0%
  10%
 *25%
  40%
  60%
  80%
```

Auto Restart Delay

```
Auto Restart Delay
in 10-second
increments,
        x0 sec
```
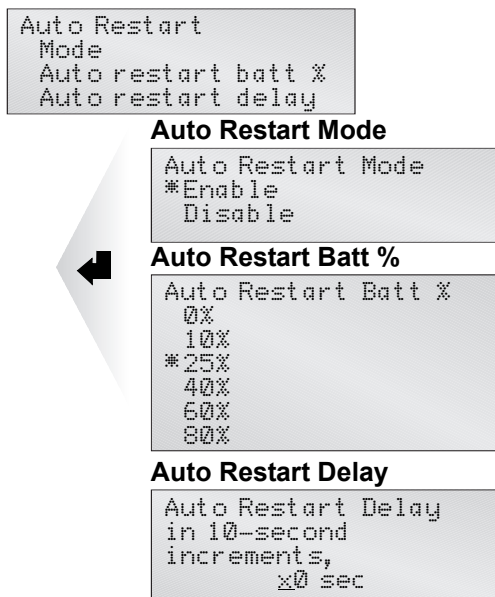
User Settings: From here one can enter the UPS ID, adjust the contrast of the user interface LCD or select the appropriate language.

```
User Settings
  Set UPS ID
  Screen Contrast
  Display Language
```

Set UPS ID

```
Set UPS ID
XXXXXXXXXXXXXXX
XXXXXXXXXXXXXXX
```

Screen Contrast

```
Screen Contrast

Press ↑ to increase
Press ↓ to decrease
```

Display Language

```
Display Language
  English
  Francais
  Italiano
  Deutsch
  Espanol
```
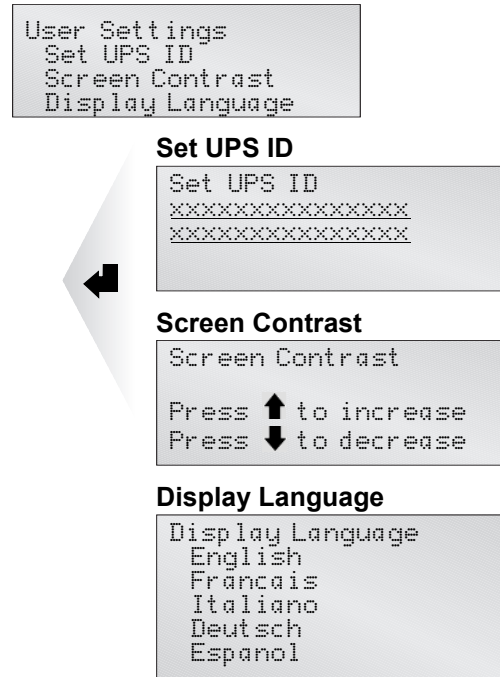
Set Date/Time: Allows user to enable/disable DST (Daylight Savings Time), change the Day, Date and Time setting on S5K Modular. When enabled, the time will automatically adjust to Daylight Saving Time.

```
Set Time/Date
  DST Mode
  Set Time/Date
```

DST Mode

```
DST Mode
  DST Enabled
 *DST Disabled
```

Set Date/Time

```
Date/Time

MM/DD/YYYY   HH:MM:SS
```
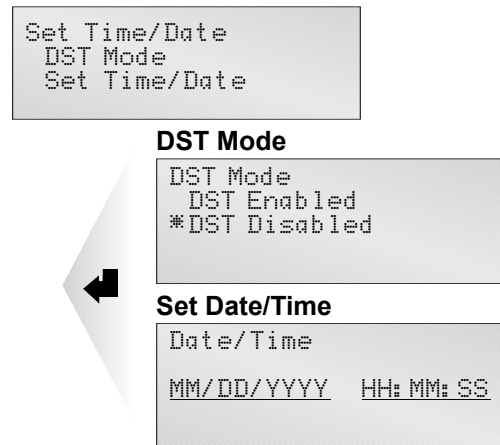
Change Settings Menu, cont'd

Max Load Alarm Set: Allows an alarm to set when the S5K Modular's load reaches a specific level.

```
Max Load Alarm Set
  Mode
  Threshold
```

Alarm Mode

```
Max Load Alarm Mode
*Enable
  Disable
```

Threshold

```
Max Load Alarm Set
Threshold = xx.x kVA
```
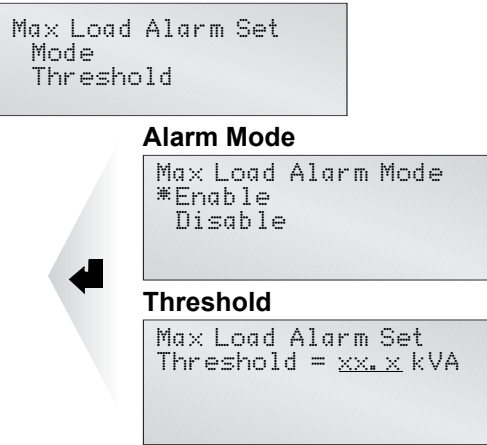
UPS Shutdown Delay: Delays UPS shutdown for specified amount of time after receiving shutdown command via relay contacts only.

```
UPS Shutdown Delay
xxx seconds
```

Redundant Alarm Set: Sets Alarm to notify user when redundancy is no longer available.

```
Redundant Power
Alarm Set
 N+1
*Disable
```
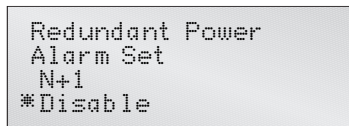
Service Contact: Set a contact for the user to reach if problems occur.

```
Service Contact
> Company Name
  Company Phone
```

Company

```
Company/name

SOLA/HEVI-DUTY
```

Phone Number

```
Phone Number

1-800-377-4384
```
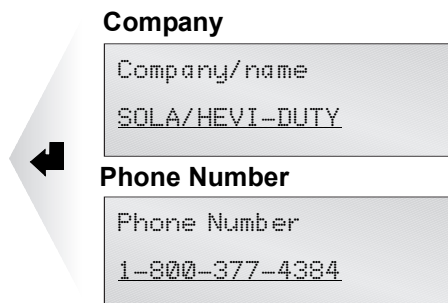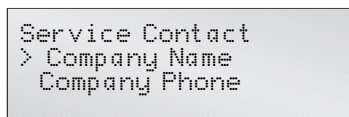
Remote Shutdown: Enables / Disables the Remote Communications Shutdown.

If you are using MultiLink™ software, this parameter should be enabled in order for the UPS output to be turned off once the operating system has been shutdown.

```
Remote COMMS
  Output Control
*Enable
  Disable
```

External Battery: Sets total amp-hour for external batteries to provide a more accurate runtime remaining value on the LCD display and through communications.

```
External Battery
  Amp-hour
> Charge Current
```

```
External Batt Config
Enter total amp-hour
        0000
```

```
External Batt Config
Enter charge current
        00.0
```
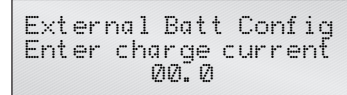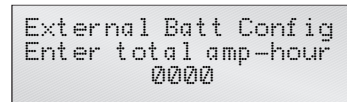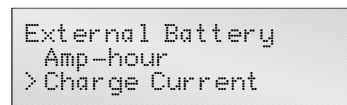
Enter the following when using the External Battery Cabinets with Chargers.

(P/N: PB10SLF105WC120)

# Cabinets	AH Value	Charge Current
1	0091	07.0
2	0182	14.0
3	0273	21.0
4	0364	28.0
5	0455	35.0
6	0546	42.0

Bypass Alarm Mode: Allows the user to enable/disable alarm, indicating that the bypass is not qualified.

```
Bypass Alarm Mode
*Enable
  Disable
```
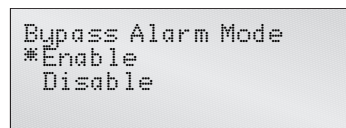
Intelli-Battery Ca.: Allows the user to enter the quantity of intelligent battery cabinets installed.

```
Enter Intelli-
Battery cabinet
count
        x
```
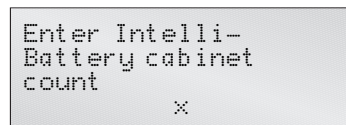
Change Settings Menu, cont'd

Air Filter Reminder: Allows the user to set a warning reminder to check the air filters.

```
Air Filter Reminder
  2 weeks
  4 weeks
  10 weeks
  26 weeks
  52 weeks
*Disable
```

Factory Defaults: Allows the user to reset all settings to the values in effect when the UPS was shipped from the factory.

```
Load Factory Default
Are you sure?
Press ◀ for yes
Press ESC for no
```

UPS Configuration Screen - Service Mode Menu

Service Mode contains site identification information about the UPS system. The data is entered by Sola/Hevi-Duty. To view the data, go to the Main Menu, select UPS Configuration and press ◀. Next, select Service Mode and press ◀.

Main Menu
```
  UPS Status
> UPS Configuration
  Display Date/Time
  Event Log
  Alarm Log
  Transfer to Bypass
  Module Replacement
  Tools
```

UPS Configuration
```
UPS Configuration
  Review Settings
  Change Settings
> Service Mode
```

Service Mode
```
Service Mode
> Set Site ID
  Set Tag Number
```

Set Site ID: Press ⎋ESC to return to the Service Mode menu. Scroll to Set Site ID and press ◀ to display the screen shown below.

Service Mode
```
Service Mode
> Set Site ID
  Set Tag Number
```

```
Set Site ID
_
```

Set Tag Number: Press ⎋ESC to return to the Service Mode menu. Scroll to Set Tag Number and press ◀ to display the screen shown below.

Service Mode
```
Service Mode
  Set Site ID
> Set Tag Number
```

```
Set Tag Number
_
```

Display Date/Time

This feature shows the current date and time. At the Main Menu, select UPS Configuration and press ◀. Next, select Display Date/Time and press ◀

Main Menu
```
  UPS Status
  UPS Configuration
> Display Date/Time
  Event Log
  Alarm Log
  Transfer to Bypass
  Module Replacement
  Tools
```

Display Date/Time
```
Date/Time
  xx/xx/xxxx  xx:xx:xx
  mm/dd/yyyy  hh:mm:ss
```

Event Log

Accessing the Event Log enables the user to scroll through the S5K Modular's past 255 occurrences. To open the Event Log, start at the Main Menu, select Event Log and press ◀┘.

Main Menu

```
 UPS Status
 UPS Configuration
 Display Date/Time
>Event Log
 Alarm Log
 Transfer to Bypass
 Module Replacement
 Tools
```

◀┘

Event Log

```
Event xxx/xxx    xx

  event message
  event message
DD/MMM/YYYY  HH:MM:SS
```

Press the ↑ and ↓ buttons to scroll through the S5K Modular's Event Log in chronological order. The Event Log contains the following information.

Event Number   *Reference Code*

Description

```
Event 031/255    04
Power module removed
S/N:00122000001002G1
19 MAY 2000  16:54:27
```

Event Detail or Serial Number

Date of Event   *Time of Event*

The typical event log screen will display the event number and reference code on the first line. The purpose of this code is to assist factory trained service personnel in troubleshooting. Please make a note of the code number when contacting technical support. The second line contains the event description. The third line will have either more detail about the event, a serial number indicating as to which module the event occurred, or be left blank. The last line will show the date and time the event occurred.

Press ⌐ESC to go back to the Main Menu.

When an event or alarm occurs, the User Interface LCD will display the last message regardless of the default screen. See **Alarm Messages on page 36** for a list of events and alarms and possible solutions. If you are unsure of the corrective action to take, contact a Sola/Hevi-Duty representative at the number listed on the back of this manual.

Alarm Log

Alarms affecting the S5K Modular UPS can be viewed at the Alarm Log screen. To access the screen, go to the Main Menu, select Event Log and press ◀┘.

Main Menu

```
 UPS Status
 UPS Configuration
 Display Date/Time
 Event Log
>Alarm Log
 Transfer to Bypass
 Module Replacement
 Tools
```

◀┘

Alarm Log

```
Alarm Log Message
```

When an alarm sounds, the User Interface LCD will display a general explanation as to what the alarm is indicating. To view these messages in chronological order, press the ↑ and ↓ buttons.

- The first line of a typical alarm log screen will display the reason for the alarm occurrence.
- The second line will give a more specific detail of the occurrence (i.e., module serial number).

Press ⌐ESC to go back to the Main Menu.

Transfer to Bypass

In the event of a UPS overload or failure, the UPS will transfer to bypass via its automatic bypass switch. The user can manually transfer the UPS to bypass if needed. For information, see **Manual Transfer to Bypass on page 23**.

Module Replacement

The user interface also supplies instructions for removing and replacing modules. From the Main Menu, access the module replacement screen and select the type of module. Refer to the screens below:

Main Menu

```
  UPS Status
  UPS Configuration
  Display Date/Time
  Event Log
  Alarm Log
  Transfer to Bypass
> Module Replacement
  Tools
```

Control Module w/ Redundant

```
Cntl Mod Replacement
1. Lift off display
   panel and place
   on top of UPS
2. Locate amber LED
3. Open lever
4. Loosen fastener
5. Replace module
6. Tighten fastener
7. Close lever
8. Replace display
```

Power Module w/ Redundant

```
Pwr Mod Replacement
1. Remove all
   front bezels
2. Locate amber LED
3. Open lever
4. Loosen fastener
5. Replace module
6. Tighten fastener
7. Close lever
8. Replace all bezels
```

Module Replacement

```
  Module Replacement
> SC w/ Redundant
  SC w/o Redundant
  PM w/ Redundant
  PM w/o Redundant
  Battery Module
```

Control Module w/o Redundant

```
Cntl Mod Replacement
1. Remove bottom
   bezel and place
   UPS in bypass
2. Lift off display
   panel and place
   on top of UPS
3. Locate amber LED
4. Open lever
5. Loosen fastener
6. Replace module
7. Tighten fastener
8. Close lever
9. Wait for amber LED
   to stop flashing.
10. Replace display
11. Switch bypass to
    return to UPS
    operation
12. Replace all bezels
```

Power Module w/o Redundant

```
Pwr Mod Replacement
1. Remove bottom
   bezel and place
   UPS in bypass
2. Remove remaining
   front bezels
3. Locate amber LED
4. Open lever
5. Loosen fastener
6. Replace module
7. Tighten fastener
8. Close lever
9. Wait for amber LED
   to stop flashing.
10. Switch bypass to
    return to UPS
    operation
11. Replace all bezels
```

Battery Module

```
Bat Mod
1. Remove all
   front bezels
2. Locate amber LED
3. Loosen fastener
4. Replace module
5. Tighten fastener
6. Replace all bezels
```

For more details on module replacement, consult **Troubleshooting**, beginning on page 35.

Tools

The Tools option allows the user to carry out certain tests and clear failures. From the Main Menu, select Tools and press ⏎.

Main Menu

```
 UPS Status
 UPS Configuration
 Display Date/Time
 Event Log
 Alarm Log
 Transfer to Bypass
 Module Replacement
>Tools
```

⏎

Tools

```
Tools
>UPS test
 Clear failures
```

UPS Test: Allows the user to test the Batteries, LEDs, LCD or Alarm.

Tools

```
Tools
>UPS test
 Clear failures
```

⏎

```
UPSTest
 LEDs
 LCD
 Battery
```

Clear Failures: Allows the user to reset the UPS after a Battery Module failure alarm.

Tools

```
Tools
 UPS test
>Clear failures
```

⏎

```
Clear Failures
 Clear batt failures
```

⏎

```
Clear batt failures
 Press ⏎ for yes
 Press ESC for no
```

Troubleshooting

Alarm Messages
Module LED Indication
Module Replacement

ALARM MESSAGES

In the event of an alarm, the User Interface LCD will display the last message regardless of the default screen. A list of possible alarm messages is displayed below. If you encounter one of these or other alarm messages and are unsure of the corrective action to take, please contact a qualified Sola/Hevi-Duty representative at the number listed on the back of this manual.

Alarm Message	Cause	Action
UPS Shutdown - End of Discharge	Shutdown because there is not enough battery power left to support the load.	Wait for return of utility
Battery Module Fail	A Battery Module has failed	Refer to Module LED indication section for corrective action
Number of Battery Modules changed	The number of Battery Modules in the system has changed	No action
Number of Power Modules changed	The number of Power Modules in the system has changed	No action
Power Module Fail	A Power Module has failed	Match module serial number to serial number in Alarm Log or Event Log, replace module
Active control fail	An ASC failure	Match module serial number to serial number in Alarm Log or Event Log, replace module
Passive control fail	A PSC failure	Match module serial number to serial number in Alarm Log or Event Log, replace module
Power Module N+1 Redundancy Alarm	The UPS is no longer redundant	Insert more Power Modules or replace faulty Power Module to regain redundancy
Output Off - Output Short Circuit	There was a short circuit on the output.	Investigate fault on load side of UPS
Low Battery Warning	Battery power is low	No action, Set point for low battery time remaining has been reached. Allow batteries time to recharge
UPS On Automatic Bypass	UPS switched to auto bypass for various reasons.	Determine reason from Alarm Log or Event History log why UPS is on Bypass
UPS Output Overload	The load exceeds the maximum load capacity of the active Power Modules.	Reduce the amount of connected load or add Power Modules
UPS On Battery	The unit is supporting the load from its batteries.	Wait for return of utility
Bypass source not qualified	The unit will not transfer to automatic bypass, instead the load will be dropped	Investigate utility supply
Transformer Fan Failure	There is a transformer in the unit, and at least one of the fans is not running	Investigate fans
Transformer temperature warning	The Transformer is slightly over temperature.	Investigate possible airflow problem
Transformer temperature alarm	The Transformer is greatly over temperature.	Investigate immediately
Input Voltage Setting Error	The input voltage configuration and bypass jumper settings do not match.	Ensure that the bypass voltage matches the input voltage and that the input voltage configuration matches the bypass jumper setting

Alarm Message	Cause	Action
Power Module Warning	Something abnormal occurring	Match module serial number to serial number in Alarm Log or Event Log, Contact qualified assistance
Battery Module Warn	Something abnormal occurring	Match module serial number to serial number in Alarm Log or Event Log, Contact qualified assistance
Main Control Warning	Something abnormal occurring	Match module serial number to serial number in Alarm Log or Event Log; contact qualified assistance
Main Control Failure	Main Control Module has failed	Refer to Module LED indication section for corrective action
Redund. Control Warn	Something abnormal occurring	Match module serial number to serial number in Alarm Log or Event Log, Contact qualified assistance
Redund. Control Fail	Redundant Control Module has failed	Refer to Module LED indication section for corrective action
Output exceeds max load setting	Max load alarm is enabled, and the load is greater then the value set	None, if additional load is not added
Switch To Manual Bypass	The switch on the only good SC has been lifted. Informs user that they should switch to bypass to avoid dropping the load when the pull the SC out.	Close manual bypass switch.
Battery Module Not Ready	A Battery Module is not ready and should be blinking it's yellow LED.	Ensure module is fully seated and locked into place. Refer to Module LED indication section for corrective action.
Power Module Not Ready	A Power Module is not ready and should be blinking it's yellow LED.	Ensure module is fully seated and locked into place and lock lever is down. Refer to Module LED indication section for corrective action.
Load Exceeds Battery Module Capacity	Occurs when there are no external, extended, or normal Battery Modules in the system, or when the load is too great for the active Battery Modules to support	Check the number of Battery Modules installed and the power required by the connected load.
Bypass source not qualified	The utility is out of range, unit will not go to automatic bypass.	Check utility supply.
UPS switched from bypass to inverter	The UPS switched from automatic bypass to normal operation.	None
UPS on manual bypass	The user has put the unit on manual bypass with the breaker on the bottom front of the unit.	None
CAN Communications Timeout	A module in the system has timed out	See Event log
Turn SW2 off before removing	Bypass source is not qualified or the output is off, and lever on the last good SC has been lifted. This warning is to shut down the unit with the rear rocker switch before pulling out the SC.	Switch SW2 off

Alarm Message	Cause	Action
Load exceeds frame limit	Load is greater then the rated frame limit.	Remove some of the connected load
Battery Card Warning	Something abnormal occurring	Contact qualified assistance
Battery Card Failure	An Intelli-Battery Card has failed	Replace faulty card
Configuration error! Re-enter settings	The configurations in the UI and ASC do not match.	To clear, review or change configuration settings
Assert manual bypass	If the user does a switch to manual bypass from the UI they will be prompted to physically switch to manual bypass with this alarm.	Close manual bypass switch
Output must be on	The UPS's output must be on prior to selecting bypass from the UI. This alarm will be generated if the customer requests bypass from the UI when the output is not on. [NM UPS General Warning]	Push UPS output button
External Battery Module Warning	Something abnormal occurring with the external battery system	Contact qualified assistance
External Battery Module Failure	There is a failed battery in the external battery system	Contact qualified assistance
System Is Not Ready Please Wait	The UPS's output could not be turned on because the system initialization is not yet complete.	Wait 30 seconds for alarm to clear
Power Module Is Not Ready - Please Wait	The UPS's output could not be turned on because the Power Module initialization is not yet complete.	Wait 30 seconds for alarm to clear
Please Review Or Set Configuration	The configurations in the UI and ASC do not match.	To clear either review or change configuration settings
Not Available Due To System Failure	The UPS's output could not be turned on because there is a system failure.	Wait 30 seconds for alarm to clear
Battery module communication failed	CAN communication between the SC and a Battery Module have failed.	Contact qualified assistance
Power module communication failed	CAN communication between the SC and a Power Module have failed.	Contact qualified assistance
UI is not compatible with this system	The User Interface is not compatible with the current System Control.	Contact qualified assistance
Reminder alarm - Check air filter	Fan Filter alarm is enabled and time interval has passed	Make sure transformer air filter is free of dust
Abnormal battery voltage	Abnormally low battery bus voltage	Contact qualified assistance
Comm failure, switch to manual bypass	The User Interface has detected a can bus off	Contact qualified assistance
Internal comms failure	The User Interface has detected a can bus off	Contact qualified assistance

MODULE LED INDICATION

Every Battery, Power and Control Module features two LEDs to help inform the user of the module status. Refer to the chart below for details.

Status LED (Green)	Fault LED (Amber)	Module Status
OFF	OFF	Module not inserted into frame. System is OFF.
OFF	ON	Module is initializing (max 30 seconds*).
FLASHING	OFF	Normal Operation
FLASHING	FLASHING	Module is in start-up qualification mode or module warning. **
FLASHING	ON	Module failed, is off-line and module control is functioning.
OFF	FLASHING	Abnormal operation, re-insert module. If this persists, contact Sola/Hevi-Duty at 1-800-377-4384.
ON	OFF	
ON	ON	
ON	FLASHING	

* If this persists for more than 30 seconds, check to verify the lever is in the down position, otherwise the module is faulty.

** If both green and amber LEDs are flashing for more than 30 seconds, then reinsert module.

Control Module

Status LED
Fault LED

Power Module

Status LED
Fault LED

Battery Module

Status LED
Fault LED
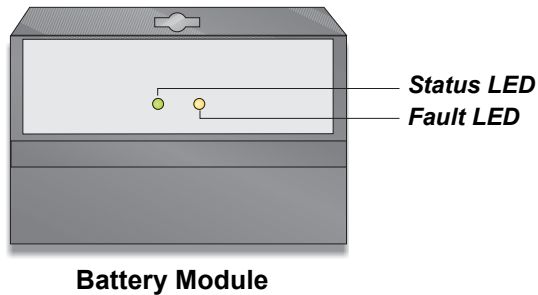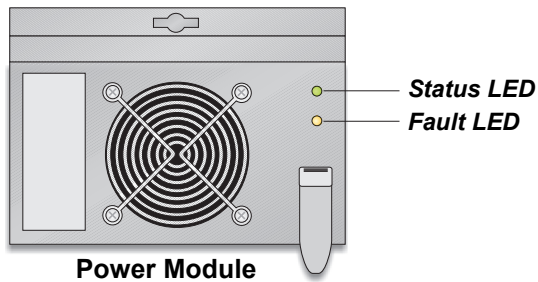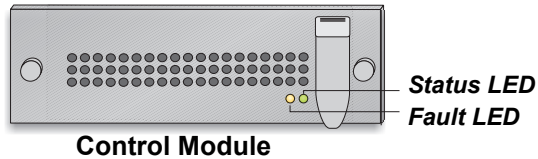
MODULE REPLACEMENT

Follow the instructions below when replacing a Control, Battery or Power Module and when adding modules to the system. To order additional modules, contact your Sola/Hevi-Duty representative or call 1-800-377-4384.

Removing Modules

1. Remove bezel cover of appropriate module. When replacing a Power or Battery Module, verify the faulty module by confirming the amber LED is lit.

2. If removing a Control or Power Module with no redundant modules, switch UPS to manual bypass.

3. Pull out and lift the lever if replacing a Control or Power Module, then turn fastener counterclockwise until it is loosened.
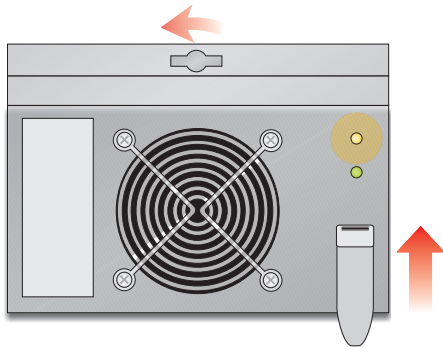
4. Start to pull out module. About 2/3 out it will stop. Slide module away from the center of the UPS. Continue to pull until module is removed (seen at right).

> **CAUTION**
>
> Battery Modules are heavy—30 kg (66 lb). Make sure to use two people when removing a Battery Module.

5. Dispose of module in an environmentally responsible way that complies with local codes / regulations or return to Sola/Hevi-Duty for proper disposal.

Note: Battery Modules may contain shipping screws. These screws may be removed and discarded.
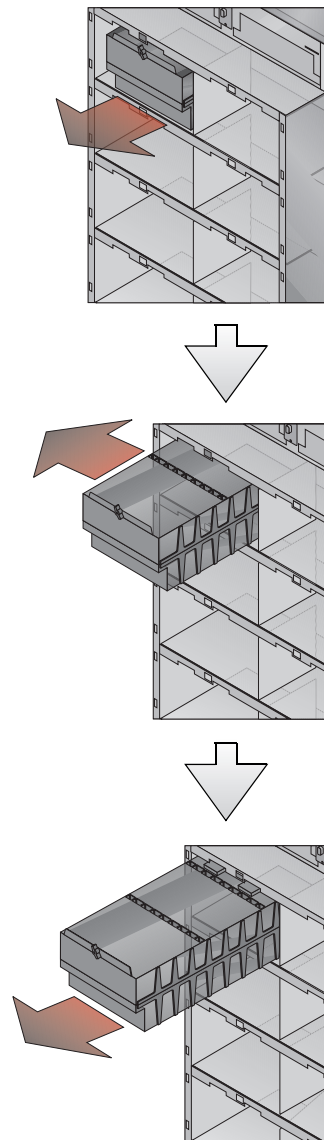
WARNING

POTENTIAL TIP HAZARD
Install all modules starting from bottom to top bays. For module removal start from top to bottom bays. Do not remove more than one module at a time. Failure to do so may cause unit to tip over and cause serious injury.
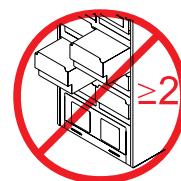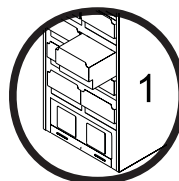
Adding or Replacing Modules

NOTE

Power Modules must be installed in a bay in the top half of the S5K Modular frame. Battery Modules can be installed in any bay of the UPS frame.

1. Lift module to appropriate bay, resting end of module on bay shelf. Use caution not to rest the module on the lower bezel cover.

2. Push module into bay. Once halfway in, slide module sideways toward the center of the UPS. Continue pushing module until fully inserted.
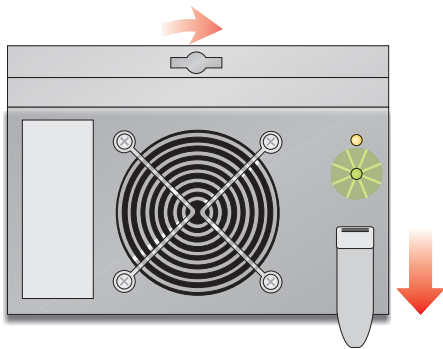
3. Press and turn fastener clockwise until locked. If replacing a Control or Power Module, press lever down.

4. Wait about 30 seconds as the module performs a start-up test and synchronizes with the other modules. Both the amber and green LEDs should be flashing. A green flashing LED will then confirm the module is properly installed.

5. If UPS was placed in bypass manually, transfer back to UPS operation.

6. Replace bezels.

NOTE

When replacing the Control Module, record user configuration data before removing. Re-verify the configuration settings after the new Control Module is installed.

Replacing the User Interface

1. Lift off user interface and set it on top of the UPS frame.

2. The attached cable will be connected to an Intellislot card, found in a port between the control modules.
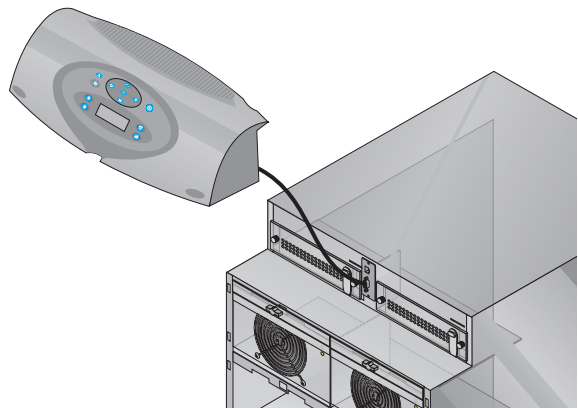
3. Remove the cable and the attached Intellislot card from the UPS.

4. Plug the new Intellislot card into the UPS.

5. Plug the new user interface cable into the Intellislot card.

6. Set replacement User Interface into proper position.

Maintenance

Proper Care
Scheduled Maintenance
Replacing Fan Filters

MAINTENANCE

Proper Care

Keeping your Sola/Hevi-Duty S5K Modular UPS operating properly is imperative to optimal performance and life of the unit. It is recommended that a certified technician perform preventive and corrective maintenance. Sola/Hevi-Duty is dedicated to ensuring the highest level of performance and unmatched support for your S5K Modular UPS. Contact a Sola/Hevi-Duty representative for service to guarantee maximum reliability and system availability.

Scheduled Maintenance

It is recommended the following maintenance is performed at least monthly:

- Clean unit
- Clean / replace filters
- Verify proper airflow

It is recommended the following maintenance is performed annually:

- Verify all Power Modules are operating properly.
- Verify all Battery Modules are operating properly.
- Verify redundancy (if applicable).

Replacing Fan Filters

The S5K Modular's intake fans contain filters that will need to be replaced or cleaned periodically, depending on the surrounding environment. Check by removing the bottom bezel and noting the condition of the two filters. If filters are dirty, replace them by removing the plastic cover over the filter frame and inserting a new filter in its place. Use caution when replacing filters when fans are running.
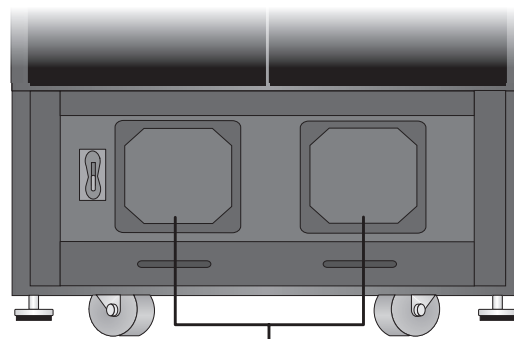
Fan Filters

The fan filters are washable and can be reused. To wash filters, place them under running water (with the dirt side down) to remove dirt and dust. Blot dry with a towel and allow air-drying before reusing.

Reference

Specifications
Battery Run Times
Warranty

SPECIFICATIONS

General & Environmental	Units	Configuration			
Unit Rating	kVA	12	16	20	20
	kW	8.4	11.2	14	16
Conducted and Radiated EMC Levels		FCC Part 15, Class A			
Compliant Safety Standards		UL 1778; c-UL			
Compliant Immunity Standards		IEEE C62.41, Category B			

Mechanical		Units				
Dimensions	Width	in (mm)	20 (508)			
	Depth		28 (711)			
	Height		54 (1372)			

Environmental	Units				
Operating Temperature (max)	C (F)	0° - 40° (32° - 104°)			
Relative Humidity	%	0-95% non-condensing			
Maximum operating altitude	M (Ft)	3,000 (10,000)			
Nominal heat dissipation	BTU/Hr	3,186	4,248	5,903	6,748
Acoustic noise level	dBA	<62 @ 1 meter			

Input Data	Units		
Nominal input voltage	VAC	208 or 240	
Voltage Range (Typical)		208VAC nominal: operating voltage range shall be variable based upon output loading percentages	
		% UPS Load	Input Voltage
		80 – 100%	170 VAC
		60 – 80%	144 VAC
		30 – 60%	127 VAC
		0 – 30%	110 VAC
Power factor	Cos Ø	>.98	
Input frequency (nominal)	Hz	60	
Input frequency range	Hz	40-70	

Battery Module	Units	
Number of lead acid batteries		10
Number of battery cells		60
Battery capacity	A/hr	9
Autonomy time (full load)	minutes	6 (With an equal number of Battery & Power Modules, in a non-redundant configuration)
Maximum charge current (full load)	A	3
Nominal Voltage	VDC	120
Recharge Time	Hrs	>6 (to 90% capacity)

Output Data	Units	
Output voltage	VAC	208/120 or 240/120
Voltage regulation	%	±3
Voltage stability (100% step load)	%	±7
Recovery time	msec	96
Voltage distortion	%	<3 THD, linear load
		<7 THD, non-linear load
Output frequency	Hz	60
Efficiency at 100% load	%	89
Output overload capability	%	110 - 125% for 10 min
		126-150% for 10 sec
		151 - 200% for 2 cycles

BATTERY RUN TIMES

Internal and External (minutes)

Load VA	Load Watts	Quantity of Battery Modules											Quantity of External Battery Cabinets with Charger					
		1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6
20,000	16,000	-	-	-	-	-	7	-	-	-	-	-	14	38	66	96	133	168
20,000	15,750	-	-	-	-	-	7	-	-	-	-	-	14	39	67	98	136	171
20,000	15,400	-	-	-	-	-	7	-	-	-	-	-	15	40	69	101	140	176
20,000	15,050	-	-	-	-	-	8	-	-	-	-	-	15	42	71	105	144	181
20,000	14,700	-	-	-	-	-	8	-	-	-	-	-	16	43	73	109	148	187
20,000	14,350	-	-	-	-	-	8	-	-	-	-	-	17	44	76	113	153	192
20,000	14,000	-	-	-	-	7	9	12	-	-	-	-	17	46	78	119	158	199
19,500	13,360	-	-	-	-	7	9	12	-	-	-	-	18	48	81	123	163	205
19,000	13,300	-	-	-	-	7	9	13	-	-	-	-	19	49	84	127	169	212
18,500	12,950	-	-	-	-	8	11	13	-	-	-	-	20	51	87	131	174	219
18,000	12,600	-	-	-	-	8	12	14	-	-	-	-	20	53	90	136	180	226
17,500	12,250	-	-	-	-	8	12	14	-	-	-	-	21	55	93	141	187	235
17,000	11,900	-	-	-	-	8	12	15	-	-	-	-	22	57	97	146	194	243
16,500	11,550	-	-	-	-	9	13	15	-	-	-	-	23	59	101	153	201	253
16,000	11,200	-	-	-	7	9	13	17	19	-	-	-	24	62	106	157	209	262
15,500	10,850	-	-	-	7	10	13	17	20	-	-	-	25	64	112	164	217	272
15,000	10,500	-	-	-	7	11	14	18	21	-	-	-	27	67	118	171	226	284
14,500	10,150	-	-	-	8	12	15	19	22	-	-	-	28	70	124	178	236	296
14,000	9800	-	-	-	8	13	16	20	23	-	-	-	29	73	129	186	246	309
13,500	9450	-	-	-	8	13	16	20	24	-	-	-	31	77	135	195	258	323
13,000	9100	-	-	-	9	13	17	21	25	-	-	-	32	81	142	205	270	338
12,500	8750	-	-	-	10	14	18	22	26	-	-	-	34	85	149	215	283	355
12,000	8400	-	-	7	12	16	20	24	28	32	-	-	36	90	157	226	298	373
11,500	8050	-	-	7	12	17	21	25	29	34	-	-	38	95	166	239	314	392
11,000	7700	-	-	7	12	17	21	26	30	35	-	-	40	101	176	252	332	413
10,500	7350	-	-	8	14	18	23	28	32	37	-	-	43	109	186	267	352	435
10,000	7000	-	-	9	15	19	24	29	34	38	-	-	46	118	198	283	396	459
9500	6650	-	-	10	15	21	26	30	36	41	-	-	49	126	211	302	396	486
9000	6300	-	-	11	16	22	28	33	38	44	-	-	53	135	226	323	422	517
8500	5950	-	-	12	17	23	29	35	40	46	-	-	57	146	243	347	449	551
8000	5600	-	7	13	19	25	31	37	43	49	55	-	62	157	262	373	480	589
7500	5250	-	8	14	21	28	34	40	47	53	59	-	67	171	283	402	517	630
7000	4900	-	8	16	23	30	36	43	50	57	64	-	73	186	309	435	558	678
6500	4550	-	9	17	24	32	40	47	55	62	69	-	81	205	339	473	605	734
6000	4200	-	11	19	24	36	43	51	60	68	76	-	90	226	373	517	659	798
5500	3850	-	12	21	23	39	47	56	66	74	82	-	101	252	413	569	722	875
5000	3500	-	14	23	28	42	52	61	72	80	90	-	118	283	459	630	798	970
4500	3150	-	15	25	37	47	57	67	78	88	98	-	135	323	516	704	891	1088
4000	2800	7	19	31	43	55	66	79	91	104	115	128	157	374	590	799	1016	1244
3500	2450	9	23	37	51	65	79	93	107	123	136	151	187	436	679	920	1177	1450
3000	2100	11	28	44	60	76	93	109	126	143	159	176	226	517	798	1090	1403	1731
2500	1750	14	33	52	71	89	109	128	147	167	185	205	283	630	970	1337	1729	2133
2000	1400	18	42	65	88	112	136	160	183	207	230	254	372	797	1240	1727	2233	2759

Internal and External (minutes) (Continued)

Load VA	Load Watts	Quantity of Battery Modules											Quantity of External Battery Cabinets with Charger					
		1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6
1500	1050	26	57	87	119	151	182	213	243	276	306	337	515	1085	1723	2400	3118	3939
1000	700	45	94	144	195	246	294	344	393	444	493	541	802	1739	2777	3800	4880	5965
900	630	50	105	160	216	273	327	382	436	492	547	600	893	1958	3135	4285	5485	6700
800	560	55	116	177	238	300	359	420	480	540	601	659	1013	2233	3550	4880	6240	7630
700	490	61	128	195	263	331	396	463	529	594	661	726	1168	2593	4120	5660	7250	8870
600	420	72	149	227	304	382	457	535	610	685	762	836	1416	3159	4880	6700	8590	10500
500	350	82	171	258	346	433	518	606	691	777	862	947	1739	3800	5965	8200	10500	12840

NOTES

Backup times are in minutes and based on resistive loading at an ambient temperature of 25°C for non-redundant (standard) configurations.

Backup times for External Battery Cabinets with Chargers do not include internal battery modules. To calculate total run time, add External Battery Cabinet run time to run time listed for your particular configuration of internal battery modules.

When using an External Battery Cabinet (s), one External Battery Cable or External Battery Adapter must be ordered to make the connection to the S5K Modular UPS. Connections between multiple External Battery Cabinets are made using contractor-supplied wiring and conduit.

WARRANTY

LIMITED WARRANTY

Sola/Hevi-Duty extends the following LIMITED WARRANTY to the purchaser and to its customer (collectively referred to as the "Purchaser"): the enclosed Uninterruptible Power System (UPS) and components are free from defects in materials and workmanship under normal use, service, and maintenance FOR A PERIOD OF TWO YEARS FROM THE DATE OF ORIGINAL PURCHASE from Sola/Hevi-Duty or the Sola/Hevi-Duty dealer or retailer. THE FOREGOING WARRANTY IS THE ONLY WARRANTY GIVEN AND NO OTHER WARRANTY IS PROVIDED, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Certain aspects of disclaimers are not applicable to consumer products acquired by individuals and used for personal, family, or household purposes (as distinguished from industrial or other purposes). Local laws may not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may have other rights, which vary according to local law.

Certain repairs or services are the responsibility of the Purchaser and the Purchaser is expected to pay for them. This warranty does not extend either to products with removed or altered serial numbers or to any losses or damages due to act of God or source external to the product, misuse, accident, abuse, neglect, negligence, unauthorized modification, alteration, or repair, use beyond rated capacity, or improper installation, maintenance, application or use, including, without limitation, use in a manner contrary to the accompanying instructions or applicable codes. WARNING: Warranty is void if the battery is allowed to discharge below the minimum battery cut-off point. The battery must be recharged every four (4) to six (6) months when not in use.

If the UPS fails to conform to the above warranty within the two-year warranty period, Sola/Hevi-Duty will repair or replace the UPS, at Sola/Hevi-Duty's option. Repairs or replacements are warranted for the remainder of the original warranty period. Purchaser should ccontact Sola/Hevi-Duty at 1-800-377-4384.

"LIFE SUPPORT" APPLICATIONS

Due to the diversity of applications and considerations to be applied in each case, Sola/Hevi-Duty does not recommend or knowingly sell its products for such use.

The responsibility for risk assessment and management in applications where the malfunction or failure of the UPS could be reasonably expected to give rise to a risk of human life shall be the sole responsibility of the purchaser. Sola/Hevi-Duty accepts no liability for consequential harm in such applications.

Technical Support

U.S.A.. . . . .(800) 377-4384

International . . . .(847) 679-7800

www.solaheviduty.com