

Staco SEL
120/208/240/277VAC 60Hz
0.675 – 1.35kW
USER MANUAL

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Thank you for choosing this product.

Staco Energy is highly specialized in the development and production of Emergency Lighting Inverter System (ELI). The ELI of this series are high quality products, carefully designed and manufactured to ensure optimum performance.

Safety Warnings



IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS

This manual contains important instructions for Staco UL924 series Emergency Lighting Inverter System (ELI) that should be followed during installation and maintenance of the ELI. Please read all instructions before operating the ELI and save this manual for future reference.

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

- a. Do not install outdoors.
- b. Do not route wires across or near hot surfaces.
- c. Do not install near gas or electric heaters.
- d. Use caution when servicing batteries. Battery acid can cause burns to skin and eyes. If acid is spilled on skin or in eyes, flush acid with fresh water and contact a physician immediately.
- e. Unit should be installed where it will not readily be subjected to tampering by unauthorized personnel.
- f. The use of accessory equipment not recommended by the manufacturer may present an unsafe condition.
- g. Do not use this ELI for anything other than intended use.
- h. WARRANTY IS VOID if system is energized without approved startup/commissioning by a factory Authorized Service Provider. (U.S. & Canada only)

This ELI is designed and manufactured according to the relevant product standards for normal use.

DANGER



This ELI contains LETHAL VOLTAGES. All repairs and service should be performed by AUTHORIZED SERVICE PERSONNEL ONLY. There are NO USER SERVICEABLE PARTS inside ELI.

WARNING



To reduce the risk of fire or electric shock, install this ELI in a temperature and humidity controlled, indoor environment, free of conductive contaminants. Do not operate near water or excessive humidity (95% maximum).

WARNING



Batteries present a risk of electrical shock or burn from high short circuit current. Observe proper precautions. Servicing should be performed by qualified service personnel knowledgeable of batteries and required precautions. Keep unauthorized personnel away from batteries.

There is a risk of explosion if batteries are replaced with an incorrect type. Replace with same type and rating only.

Proper disposal of batteries is required. Refer to your local codes for disposal requirements. Never dispose of batteries in a fire.

Emergency Intervention

First aid intervention

Local and company procedures should be followed for any first aid intervention that may be required.

Firefighting measures

1. Do not use water to put out a fire. Use fire extinguishers that are suitable for use with electrical and electronic equipment.
2. If exposed to heat or fire, some products may release toxic fumes into the atmosphere. Always use a respirator when extinguishing a fire.

Symbols used in the Manual

Some elements are highlighted with graphic symbols to alert the user to dangerous operations.

	Danger / Risk of Electric Shock <i>This symbol indicates the possibility of serious injury or substantial damage to the unit, unless adequate precautions are taken.</i>
	Warning <i>This symbol indicates important information which must be understood. Stated precautions must be taken</i>
	Note

Protective Equipment

No maintenance operation should be carried out on the unit without wearing the Personal Protective Equipment (PPE) described below. Personnel involved in the installation and/or maintenance of the unit must be properly clothed.

The following signs show the protective equipment that should be worn. The various items of PPE must be selected and sized according to the nature of the hazard (particularly electrical) posed by the unit.

	Accident prevention footwear		Protective eyewear
	Protective clothing		Helmet
	Work gloves		

GENERAL PRECAUTIONS

This manual contains detailed instructions for the use, installation and start-up of the ELI. Read the manual carefully before installation. For information on using the ELI, the manual should be kept close at hand and consulted before carrying out any operation on the ELI.

Table of Contents

Safety Warnings	ii
Emergency Intervention	iii
First aid intervention	iii
Firefighting measures	iii
Symbols used in the Manual	iv
Protective Equipment	iv
GENERAL PRECAUTIONS	iv
1. Safety Warnings and EMC instructions	1
1.1 ELI Location	1
1.2 Connections	1
1.3 Maintenance	1
1.4 Battery	2
2. Installation	3
2.1 Unpacking and Inspection	4
2.1.1 ELI Layout	4
2.1.2 ELI Main Components	5
2.2 System Single Line Diagram	5
2.3 Installation	6
2.3.1 Battery Installations	6
2.3.2 ELI Input / Output Wiring	8
2.3.3 Dual Output Voltage	9
2.3.4 Optional Output Circuit Breakers (OCB)	10
3. Operation	11
3.1 CONTROL PANEL	11
3.2 LCD Flowchart	12
3.3 LCD Layout	13
3.3.1 Status Page:	13
3.3.2 Configuration Page:	13
3.3.3 Event Log Page:	14
3.3.4 About Page:	14
3.3.5 Reset to Default	14
3.4 ON / OFF / TEST BUTTON	15
3.5 SELF-TEST	15
3.6 ALARM SILENCER BUTTON	15
3.7 SERVICE MODE	15
3.7.3 PASSWORD SETUP	15
3.7.4 INPUT VOLTAGE SENSITIVITY ADJUSTMENT	15
3.8 ALARMS	16
3.8.1 ON BATTERY	16
3.8.2 LOW BATTERY WARNING	16
3.8.3 WEAK/BAD/DISCONNECTED BATTERY	16
3.8.4 OVERLOAD	16
3.8.5 UPS FAULT	16
3.9 Configurable Parameters and Settings	17
5. Specifications	18
5.1 General Specification	18
5.2 Nominal ELI Current	19
5.3 Recommended Wiring	19
6. Storage	19
7. Recommended Replacement Intervals	20

8 Troubleshooting 21

Figures

Figure 1: ELI Layout..... 4

Figure 2: ELI Main Components..... 5

Figure 3: Battery Installation 7

Figure 4: Terminal block array of 0.675 -1.35kW ELI 8

Figure 5: Output Circuit Breaker Terminals on ELI 10

1. Safety Warnings and EMC instructions

Strictly comply with all warnings and operating instructions in this manual. Save this manual and carefully read the following instructions before installing the unit. Do not operate this unit before reading through all the safety information and operating instructions carefully.

1.1 ELI Location

- Install the ELI indoors, away from excess moisture or heat, direct sunlight, dust and conductive contaminants.
- Install the ELI in a structurally sound area. The ELI is extremely heavy; take care when moving and lifting the unit.
- Only operate the ELI at indoor temperatures between 32°F and 104°F (between 0°C and 40°C).
- Leave adequate space around all sides of the ELI for proper ventilation.
- Do not install the ELI near magnetic storage media, as this may result in data corruption.

1.2 Connections

- There is back feed protection inside.
- The ELI should be connected to a properly grounded utility system (**TN** grounding system).
- The input source for the unit must be single-phase rated in accordance with the equipment nameplate and must be suitably grounded.
- Use of this equipment in life support applications where failure of this equipment can reasonably be expected to cause the failure of the life support equipment or to significantly affect its safety or effectiveness is not recommended.
- Do not use this equipment in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.
- The ELI is connected to a DC energy source (battery). The output terminals may be live when the ELI is not connected to an AC supply.
- An external branch circuit breaker at the ELI output side is strongly recommended to provide overcurrent protection or easy disconnection of the load device.

1.3 Maintenance

- Service and repair should be performed only by trained personnel. During any service work to the ELI, it should be turned off or manually bypassed. Note that potentially lethal voltages exist within this unit as long as the battery supply is connected.
- The ELI power module does not require routine maintenance. Do not open for any reason. There are no user-serviceable parts inside.
- Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present, and no hazardous voltage exists at the terminals of high-capacity capacitors such as BUS-capacitors.
- Fuses should be replaced only with fuses of the same number and type and should be replaced only by factory authorized personnel.
- The battery circuit is not isolated from the input voltage. Verify that no voltage between the battery terminals and ground is present before maintenance or repair. Hazardous voltages may occur between the battery terminals and the ground.

1.4 Battery

WARRANTY IS VOID if system is energized without approved startup/commissioning by a factory Authorized Service Provider. (U.S. & Canada only)

- Installation and servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and required precautions.
- Batteries present a risk of electrical shock and burn from high short-circuit current. Observe proper precautions.
 - Remove watches, rings, or other metal objects.
 - Use tools with insulated handles.
 - Wear rubber gloves and boots.
 - Do not lay tools or metal parts on top of batteries.
 - Disconnect charging source prior to connecting or disconnecting battery terminals.
 - Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground.
- Contact with any part of a grounded battery can result in electrical shock.
- The batteries are recyclable. The batteries must be disposed of properly according to local regulations.
- Do not dispose of the batteries in a fire.
- Do not short or bridge the battery terminals.
- Unplug and turn off the ELI before performing battery installation or replacement.
- Battery replacement should be performed only by authorized service personnel using the same number and type of batteries (Sealed Lead-Acid). Use tools with insulated handles.
- Do not open or mutilate the batteries. Released electrolyte is harmful to the skin and eyes and may be toxic.
- Do not connect or disconnect battery(s) while the ELI is operating from the battery supply.

2. Installation

S E L 0 0 9 1 1 0 - E

MINI

OUTPUT VOLTAGE 2

0	Single Output
1	120
2	208
3	240
5	277

OUTPUT VOLTAGE 1

1	120
2	208
3	240
5	277

INPUT VOLTAGE

1	120
2	208
3	240
5	277

KW RATING

6	0.675
9	0.9
13	1.35

FAMILY

SEL Staco SEL

2.1 Unpacking and Inspection

Shipment consists of ELI enclosure and separate battery pallet. Unpack and check the contents of each package. The shipping package contains:

- (1) User manual
- (1) USB cable
- (1) Software CD
- (1) Battery pallet

NOTE: Before installation, inspect the unit and each battery. Ensure that nothing inside the package is damaged during transportation. If there is any damage or lack of parts, do not turn on the unit and notify the carrier and factory immediately. Keep the original package in a safe place for future use.

2.1.1 ELI Layout

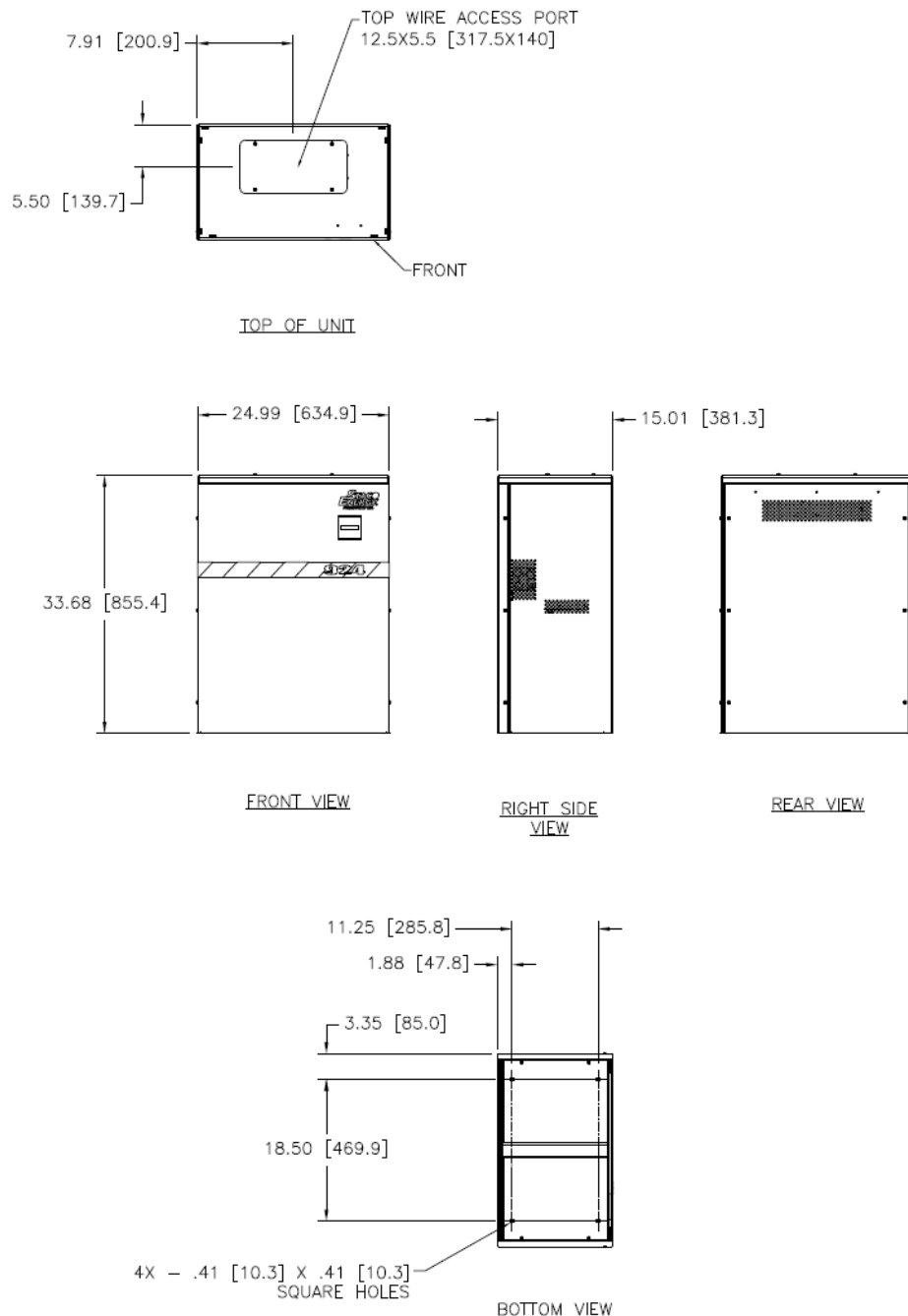


Figure 1: ELI Layout

2.1.2 ELI Main Components

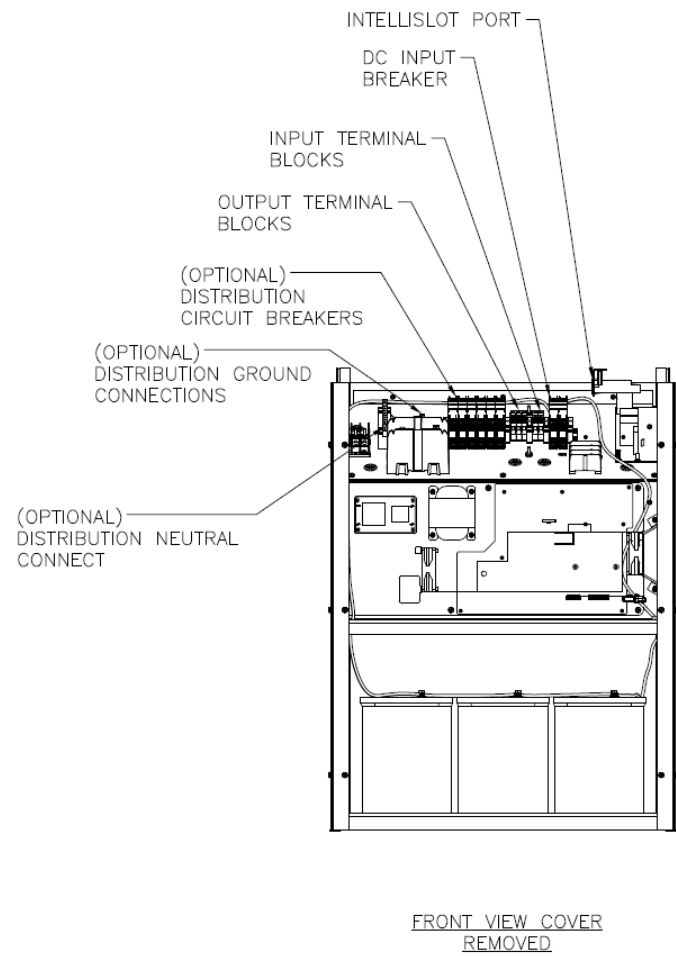
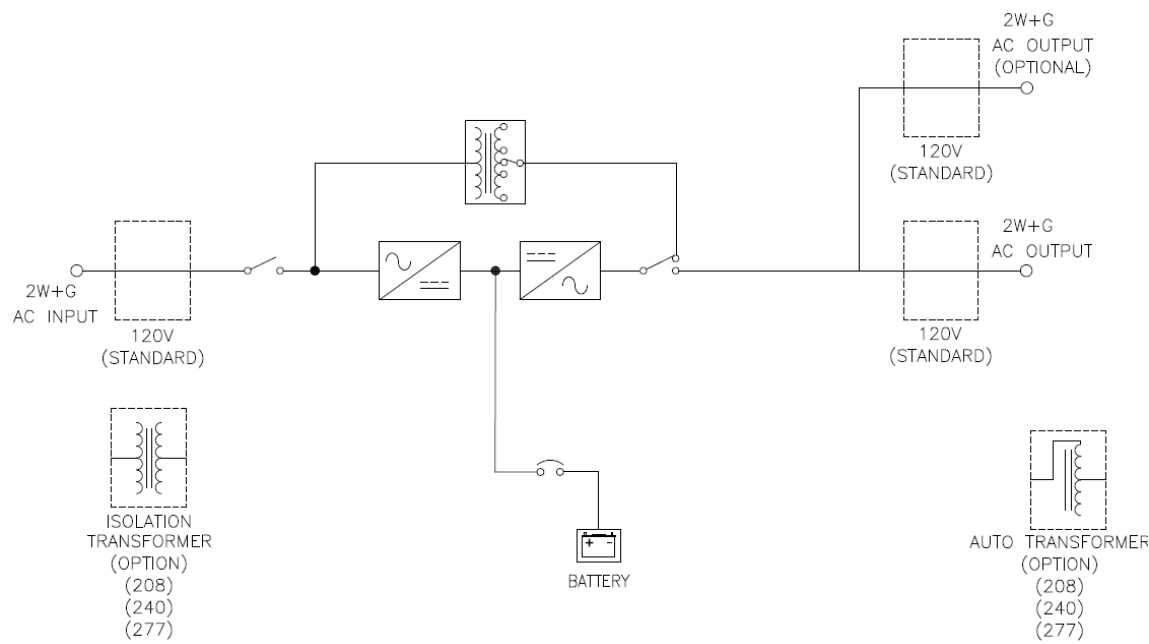


Figure 2: ELI Main Components

2.2 System Single Line Diagram

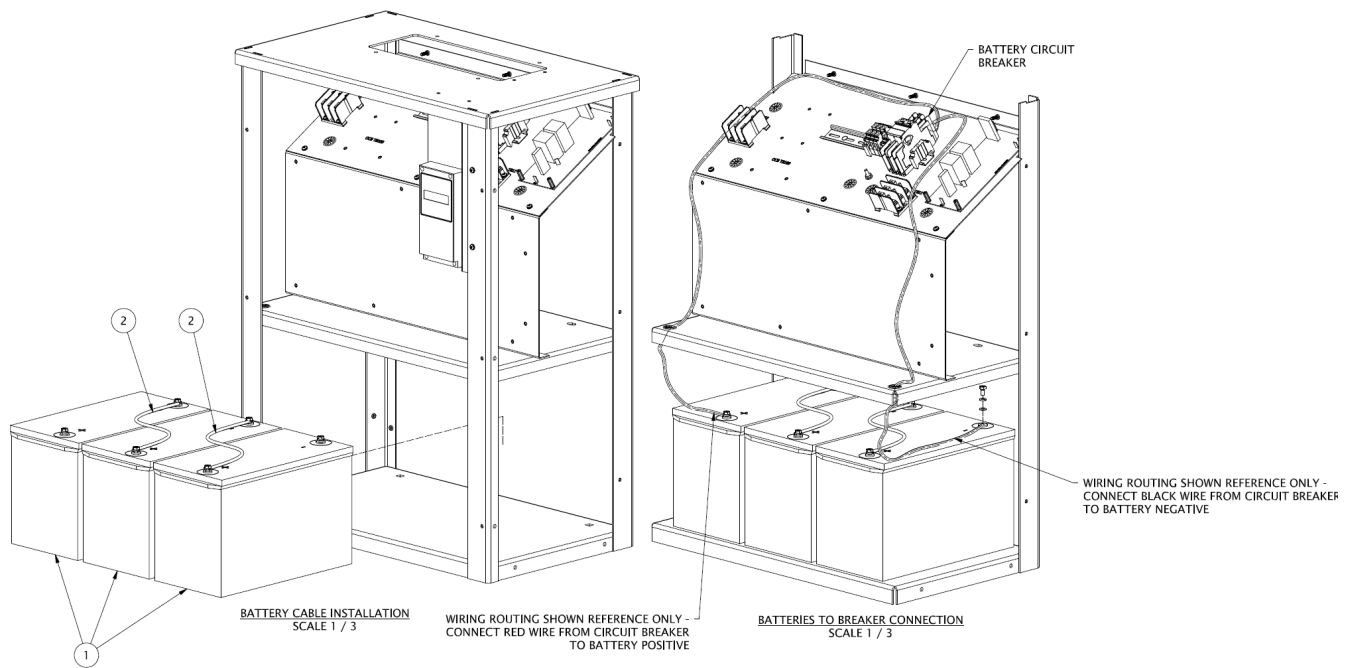


2.3 Installation

Installation and wiring must be set in accordance with the national and local codes.

2.3.1 Battery Installations

- Installation and servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and required precautions.
- DC input breaker polarity is marked on the load side (battery side) of the breaker. Ensure positive is connected to the 'RED' wire and negative is connected to the 'BLACK' wire.
- Batteries present a risk of electrical shock and burn from high short-circuit current. Observe proper precautions.
 - Remove watches, rings, or other metal objects.
 - Use tools with insulated handles.
 - Wear rubber gloves and boots.
 - Do not lay tools or metal parts on top of batteries.
 - Disconnect charging source prior to connecting or disconnecting battery terminals.
 - Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground.
- Contact with any part of a grounded battery can result in electrical shock.
- Do not short or bridge the battery terminals.
- Unplug and turn off the ELI before performing battery installation or replacement.
- Use tools with insulated handles.



NOTES:

1. BATTERIES, BOLTS, AND WASHERS COME AS PART OF STACO BATTERY KIT AND PALLET
2. BATTERY TERMINAL TORQUE: 120.3 LBF-IN (13.58 N-m)
3. CAUTION: BATTERIES WEIGH IN EXCESS OF 90LBS (40.8)KG. HANDLE CAREFULLY.

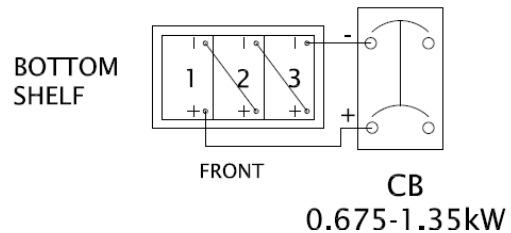
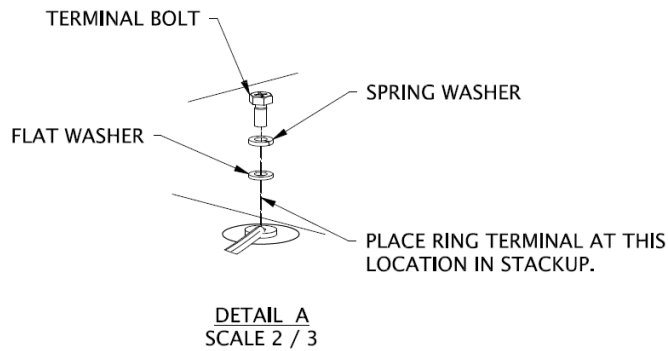


Figure 3: Battery Installation

2.3.2 ELI Input / Output Wiring

The input and output wiring are located behind enclosure panels. See **Figure 2** for component layout.

NOTE: Connect the earth ground wire first when making wire connection. Disconnect the earth ground wire last when making wire disconnection.



Wire size should be in accordance with NEC and local code referencing the currents shown in section **5.2 Nominal ELI Current**

1. Connect input wires to appropriate input terminals according to **Figure 4**
2. Connect output wires to appropriate output terminals according to **Figure 4**

NOTE: Make sure that the wires are connected tightly with the terminals in accordance with section **5.3 Recommended Wiring**.

NOTE: Install the output breaker between the output terminal and the load. The breaker should be qualified with leakage current protection if necessary.

CUSTOMER WIRING CONNECTION
TERMINAL TORQUE: 14 in-lb (1.6Nm)
WIRE STRIPPING LENGTH: 0.43 INCHES (11 mm)

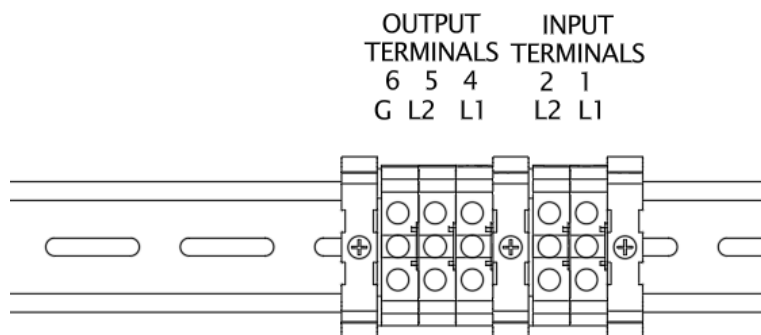


Figure 4: Terminal block array of 0.675 -1.35kW ELI

2.3.3 Dual Output Voltage

NOTE: Dual rated output voltages are available. The combined outputs power may not exceed the maximum ELI kW rating.

NOTE: Connect the earth ground wire first when making wire connection. Disconnect the earth ground wire last when disconnecting.



Wire size should be in accordance with NEC and local code referencing the currents shown in **5.2 Nominal ELI Current**

1. Connect input wires to appropriate input terminals according to **Figure 4**.
2. Connect Output wires to appropriate Output terminals to **Figure 4**.

NOTE: Ensure that the wires are connected tightly with the terminals in accordance with section **5.3 Recommended Wiring**.

NOTE: Install the output breaker between the output terminal and the load. The breaker should be qualified with leakage current protection if necessary.

2.3.4 Optional Output Circuit Breakers (OCB)

Output circuit breaker(s) for separating and controlling the load connected to the ELI are available. The breakers are located in an accessible compartment separated from the customer connection section. See **Figure 5: Output Circuit Breaker Terminals on ELI**. The OCB wire connections replace the standard and dual output terminals. A grounding bar & neutral bar are provided with this option.



Wire size should be in accordance with NEC and local code referencing the currents shown in **5.2 Nominal ELI Current**

NOTE: Ensure that the wires are connected tightly with the terminals in accordance with section **5.3 Recommended Wiring**.

Connect Output wires to appropriate line, neutral, and ground terminals according to **Figure 5**.

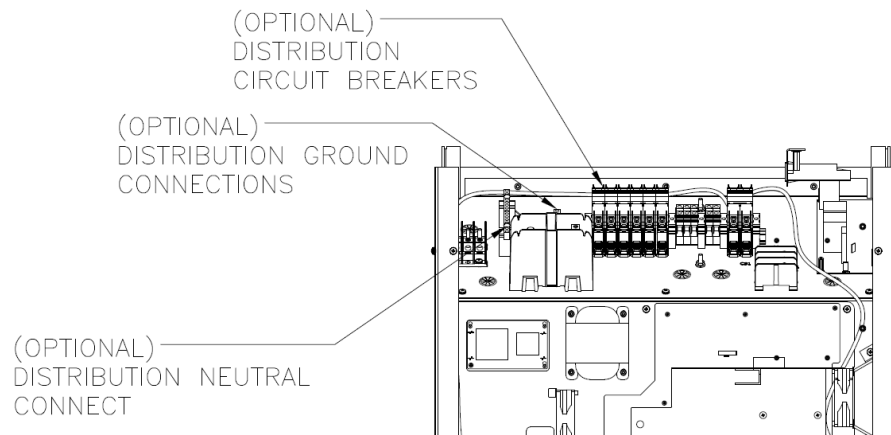
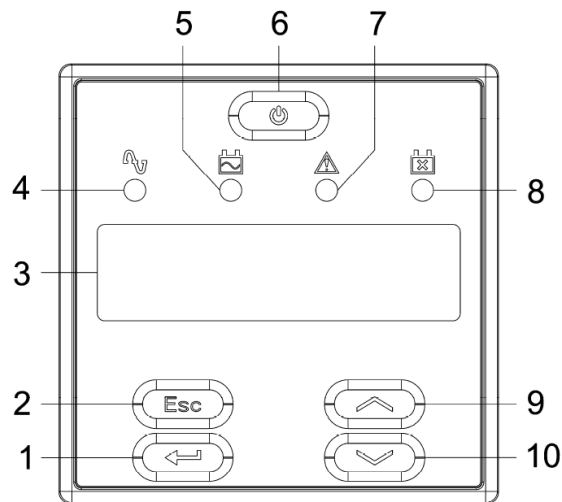


Figure 5: Output Circuit Breaker Terminals on ELI

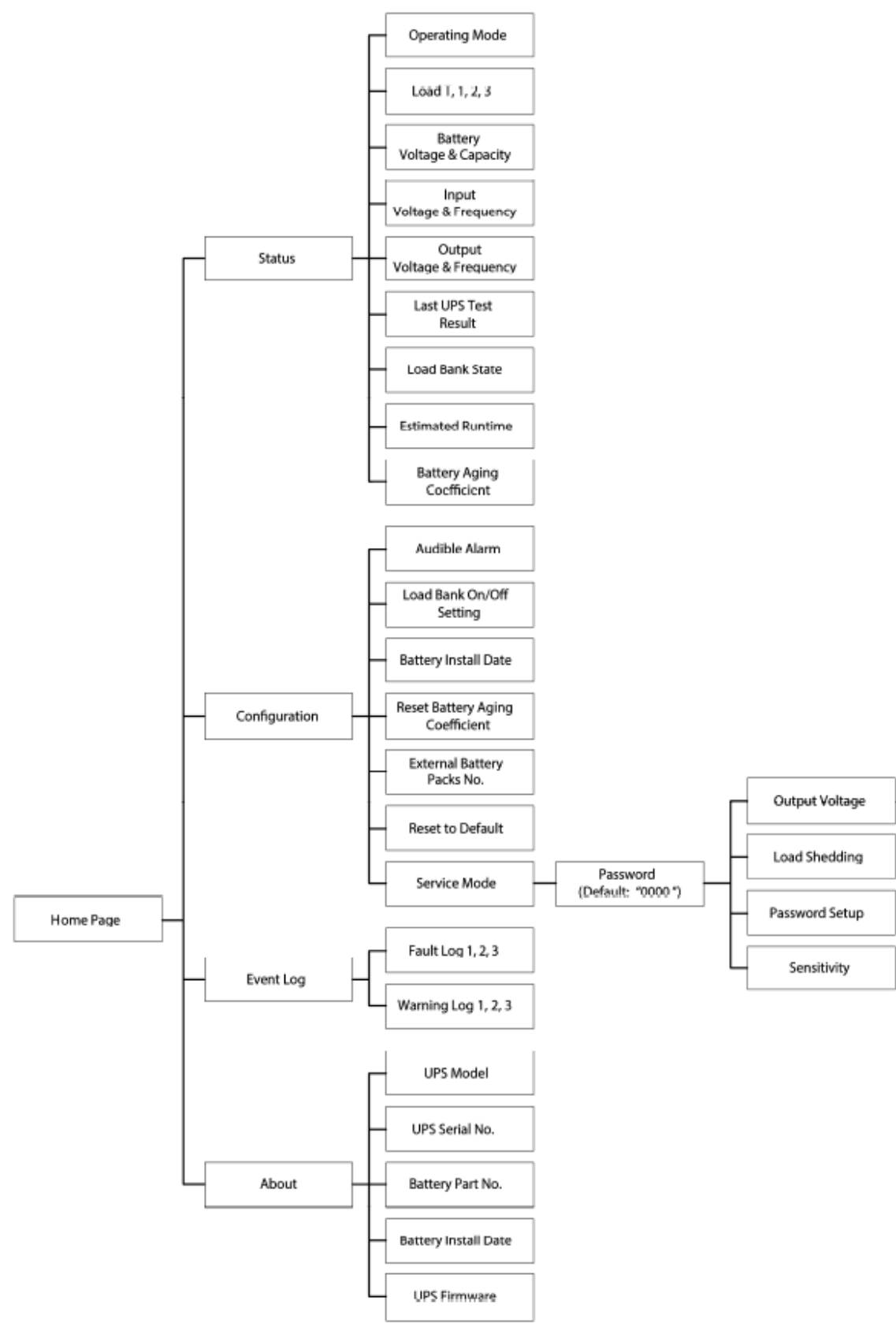
3. Operation

3.1 CONTROL PANEL



1. Pressing the Enter button saves the changes made to the UPS settings.
2. The Escape button will exit the current screen.
3. The LCD screen provides useful information about the UPS.
4. The AC normal icon illuminates when the UPS is on and operating in the AC normal mode. The AC normal icon will extinguish when operating in the Battery mode. The AC normal icon will blink when the UPS is operating in the Boost and/or the Buck mode.
5. The On-Battery icon illuminates when the UPS is operating in the Battery mode. The On-Battery icon will extinguish when operating in the AC normal, Boost and Buck modes.
6. The Multi-function On/Off/Test button is used to turn the UPS on or off or to perform a self-test.
7. The Fault icon illuminates when the UPS detects an internal fault. The Fault icon is extinguished when the UPS is operating properly.
8. The Weak/Bad/Disconnected Battery icon illuminates when the UPS detects a weak battery, bad battery or if the battery is disconnected. The Weak/Bad/Disconnected Battery icon is extinguished when the battery's condition is good.
9. The Scroll up button allows the user to scroll through the UPS parameters that are available on the LCD screen.
10. The Scroll down button allows the user to scroll through the UPS parameters that are available on the LCD screen.

3.2 LCD Flowchart



3.3 LCD Layout

The LCD screen's Home Page has four sections:

Status
Configuration
Event Log
About

3.3.1 Status Page:

1. Operating Mode:
 - Standby mode (the UPS is connected to utility power, but is not turned on)
 - AC Normal mode
 - AVR mode Boost 1
 - AVR mode Boost 2
 - AVR mode Buck 1
 - AVR mode
 - Buck 2
 - Battery mode
 - Fault mode
2. Load T (Combined total of the load on all three output banks),
 - 1 (Load on output bank 1),
 - 2 (Not Used),
 - 3 (Not Used).
3. Battery: Voltage and Capacity.
4. Input: Voltage and Frequency.
5. Output: Voltage and Frequency.
6. Last UPS Test Results.
7. Load Bank Status: ON / OFF.
8. Estimated Runtime: The amount of estimated time the UPS will operate in the Battery mode.
9. Battery Aging Coefficient: Using the battery install date and periodic monitoring of the batteries to get early warning alarms for battery replacement.

3.3.2 Configuration Page:

1. Audible Alarm: Turn On/Off the audible alarm (for the Battery mode Only).
NOTE: With the exception of the On-Battery alarm all the other Warning/Fault alarms cannot be silenced. Once the Warning/Fault condition has been corrected the alarm will reset to default.
2. Load Bank On/Off Setting: Not Available.
3. Battery Install Date: Set the date the batteries were replaced.
4. Reset Battery Aging Coefficient: Reset the Battery Aging Coefficient once the batteries have been replaced.
5. External Battery Pack Number: Not Available
6. Reset to Default: Resets the changes to the Configuration back to the factory default settings (Must be in the Standby mode).
7. Service Mode

3.3.3 Event Log Page:

1. Fault Log 1,2,3: View the current or previous faults.
2. Warning Log 1,2,3: View the current or previous warnings.

3.3.4 About Page:

1. UPS Model: Displays the model name of the UPS.
2. UPS Serial No.: Displays the serial number of the UPS.
3. Battery Part No.: Displays the battery module part number.
4. Battery Install Date: Displays the date the battery module was installed.
5. UPS Firmware: Displays the UPS's firmware version.

3.3.5 Reset to Default

Selecting the 'Reset to Default' will reset the following items to the factory default settings:

Configurable Settings	Factory Default Settings
Audible Alarm	ON
Load Bank 1	ON
Load Bank 2	ON
Battery Install Date	Jan-20
Battery Aging Coefficient	1.0
External battery Packs No.	Auto
Output Voltage	120V
Load Shedding	Enabled
Password Setup	'0000'
Sensitivity L1	OFF
Sensitivity L2	OFF
Auto Restart	Enabled
Power On Delay Time	0 – Seconds
Fault Logs 1,2,3	Empty, no faults listed
Warning Logs 1,2,3	Empty, no warnings listed

3.4 ON / OFF / TEST BUTTON

1. Press and release the On/Off/Test Button after one beep to turn the UPS on and supply power to the load.
2. The load is immediately powered while the UPS runs a five second self-test.
3. Press and release the On/Off/Test Button after one beep to turn the UPS off.
4. The UPS will continue to charge the batteries whenever there is acceptable AC voltage present.

3.5 SELF-TEST

The self-test feature is useful to verify the correct operation of the UPS and the condition of the batteries.

1. With the UPS in the AC normal mode, press and hold the On/Off/Test Button for four beeps, then release the button.
2. The UPS will perform a ten second self-test.

During the self-test, the UPS will switch to the battery mode and the On-Battery icon will illuminate and the audible alarm will sound.

The UPS will automatically perform a five second inverter test on start-up to verify the correct operation of the UPS and the condition of the batteries.

If the UPS fails a self-test, there will be an error message on the LCD screen indicating the type of problem.

3.6 ALARM SILENCER BUTTON

When the UPS is operating in battery mode, the audible alarm can be silenced.

1. Press the Enter button on the front panel for three seconds.
2. Once the UPS reaches a Low Battery Warning alarm the audible alarm will turn back on and cannot be silenced.
3. The UPS audible alarm will be reset to default once the utility power returns.
4. The alarm cannot be silenced during a general fault alarm.

3.7 SERVICE MODE

The UPS has a Service mode function activated through the LCD screen. The Service mode items are:

- Password Setup
- Input Voltage Sensitivity Adjustment

3.7.3 PASSWORD SETUP

Changing the password:

1. Enter the old password first and then hit the enter key.
2. Enter the new password and then hit the enter key to save the changes.

3.7.4 INPUT VOLTAGE SENSITIVITY ADJUSTMENT

The input voltage sensitivity can be adjusted through the LCD screen. When the input waveform distortion is causing the UPS to transfer to the Battery mode too often, adjusting the sensitivity will allow the UPS to remain in the AC mode without depleting the battery reserves. The following chart shows the adjustments for Level 1 and Level 2.

Mode	<u>Level 1</u>	<u>Level 2</u>
Brownout Transfer Point	63%	62%
Brownout Reset Point	66%	65%
Input Frequency Range	60Hz: 53.4~66.6Hz 50Hz: 43.5~56.5Hz	60Hz: 52.8~67.2Hz 50Hz: 43.0~57.0Hz

3.8 ALARMS

3.8.1 ON BATTERY

When the UPS is operating on the Battery mode, the On-Battery icon will illuminate, and the audible alarm will sound once every ten seconds. The alarm will stop once the UPS returns to the AC normal mode.

3.8.2 LOW BATTERY WARNING

The audible alarm will sound two beeps every five seconds when the battery reserve runs low. This condition will continue until AC returns or the UPS shuts down from battery exhaustion.

3.8.3 WEAK/BAD/DISCONNECTED BATTERY

The UPS automatically tests the battery's condition. If the battery is weak, bad, or disconnected, the Weak/Bad/Disconnected Battery icon will illuminate, and the audible alarm will beep three times every five minutes until the battery is reconnected or replaced. This alarm will be repeated until the batteries pass a self-test.

It is recommended that the UPS be allowed to charge overnight before performing a battery test to confirm a Weak/Bad Battery condition.

3.8.4 OVERLOAD

When the amount of load attached to the UPS exceeds 110% of its power rating; the audible alarm will sound a constant alarm, and the LCD screen will display the error message 'UPS is overloaded - UPS will shutdown'. This alarm and error message will remain on until the excess load is removed, or the UPS's self-protection circuit shuts the UPS down. If the UPS shuts down because of an Overload condition, the UPS must perform an Inverter function and/or a Self-Test to clear the Overload Alarm.

3.8.5 UPS FAULT

When the UPS detects a hardware fault, the Fault icon will illuminate, and the audible alarm will sound a constant alarm, and the LCD screen will display an error message identifying the fault. The fault condition, in some instances, may be reset by turning the UPS off and then on.

3.9 Configurable Parameters and Settings

Function	Factory Default	User Choices	Description
UPS ID	EXR Series	Up to 64 characters to define the UPS	Use this function to uniquely identify the UPS in your network environment
Battery Install Date	Date of manufacture	Date of battery replacement – month/day/year	Enter the current date of when the batteries were replaced
Battery life in days	1826	Up to 5 characters	At first battery replacement, reset to reflect actual number of days experienced in your environment or leave at factory default
Enable / Disable Auto Restart	Enabled	Enable or Disable	When enabled, the UPS will automatically restart from a low battery shutdown when normal AC returns
Set audible alarm state	Enabled	Enabled, at Low Battery, Disabled	Enabled – the UPS will emit a short beep when in the battery mode. At Low Battery - the UPS will emit two beeps from low battery warning until shutdown. Disabled - Use only when software is controlling the UPS or to silence the alarm
Shut-down type	Entire UPS	Entire UPS or UPS output	Entire UPS - Turns off the entire UPS. UPS Output - Turns off the UPS's output receptacles only.
Enable/ Disable REPO	Disabled	Enable or Disable	Enabled - the UPS will be powered off and remain off until the UPS is reset.

5. Specifications

5.1 General Specification

kW	0.675	0.90	1.35
Phase	Single phase with ground		
INPUT			
Nominal Voltage	120/208/240/277 VAC		
Voltage Range	+/-10% @ 100% load		
Frequency Range	60 Hz, ±6Hz		
OUTPUT			
Nominal Voltage, VAC	120/208/240/277 VAC		
AC Voltage Regulation	± 10%		
Frequency Sync Range	54 – 66Hz		
Freq Range (Bat. Mode)	60 Hz ± 0.1 Hz		
Overload	110% for 20-sec, 125% for 10-sec, 150%Shutdown Immediately		
Transfer Time	6 ms (typical)		
Waveform (All Modes)	Pure Sinewave		
BATTERY			
Nominal Voltage	36VDC		
Battery Type	VRLA, 12 V		
Battery Size	200W	280W	390W
Numbers	3		
Recharge Time	24 hrs. maximum, 12-24 hrs. typical		
Float Charging Voltage	40.9 VDC		
PHYSICAL			
Dimension, in (mm)	24.99 x 33.68 x 15.01 (634.9 x 855.4 x 381.3) [WxHxD]		
System Weight lbs (kg)			
No Transformer	240 (109)	300 (136)	345 (156)
One Transformer	285 (129)	340 (154)	385 (175)
Two Transformer	300 (136)	355 (161)	405 (184)
ENVIRONMENT			
Operation Temperature	0 ~ 40°C (32°F ~ 104°F)(the battery life will decrease when > 25°C (77°F))		
Operation Humidity	0-95 % RH @ 0- 40°C (non-condensing)		
Noise Level	Less than 65dBA @ 1 Meter		
Operation Altitude ¹	<1000m		
COMMUNICATIONS			
SNMP Card	SNMP/ Web Browser/ MODBUS; TC/IP capability		
Standards			
Lighting System	UL924, OUST		
Inverter: EMI	FCC Class A		
Inverter: Safety	cUL 1778 5 th Ed.,		

1. If the unit is installed or used in a place where the altitude is above 1000m (maximum 2000m), the output power must be derated one percent per 100m.

Product specifications are subject to change without further notice.

5.2 Nominal ELI Current

kW	Input		Output	
	Input Voltage (Vac)	Nom Input Current (A)	Output Voltage (Vac)	Output Current (A)
0.675	120	6.9	120	5.6
0.675	208	4.1	208	3.2
0.675	240	3.5	240	2.8
0.675	277	3.0	480	1.4
0.90	120	9.1	120	7.5
0.90	208	5.4	208	4.3
0.90	240	4.7	240	3.8
0.90	277	4.1	480	1.9
1.35	120	13.7	120	11.3
1.35	208	8.1	208	6.5
1.35	240	7.0	240	5.6
1.35	277	6.1	480	2.8

5.3 Recommended Wiring

NOTE 1: It is recommended to use 75°C copper wire.

NOTE 2: Recommended cable sized based on THW cables at 30°C ambient (NEC Table 310.16). If different cables are used or installed at higher ambient temperatures, the cable size needs to be reviewed

kW	Input			Output		
	Input Voltage (Vac)	Recommended Cables	Recommended Torque	Output Voltage (Vac)	Recommended Cables	Recommended Torque
0.675	120	14AWG	14 lb-in	120	14AWG	14 lb-in
0.675	208	14AWG	14 lb-in	208	14AWG	14 lb-in
0.675	240	14AWG	14 lb-in	240	14AWG	14 lb-in
0.675	277	14AWG	14 lb-in	277	14AWG	14 lb-in
0.90	120	14AWG	14 lb-in	120	14AWG	14 lb-in
0.90	208	14AWG	14 lb-in	208	14AWG	14 lb-in
0.90	240	14AWG	14 lb-in	240	14AWG	14 lb-in
0.90	277	14AWG	14 lb-in	277	14AWG	14 lb-in
1.35	120	14AWG	14 lb-in	120	14AWG	14 lb-in
1.35	208	14AWG	14 lb-in	208	14AWG	14 lb-in
1.35	240	14AWG	14 lb-in	240	14AWG	14 lb-in
1.35	277	14AWG	14 lb-in	277	14AWG	14 lb-in

6. Storage

Before storing equipment, charge the ELI for at least 24 hours. Store the ELI covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

Storage Temperature	Recharge Frequency	Charging Duration
-25°C - 30°C (-13°F - 86°F)	Every 6 months	5-8 hours
30°C - 40°C (86°F - 104°F)	Every 90 days	5-8 hours
40°C - 45°C (104°F - 113°F)	Every 30 days	5-8 hours

7. Recommended Replacement Intervals

The Staco SEL has a long design life. Due to the characteristics of the part, not the design of the ELI, certain components used in the design have a limited life, even with proper maintenance.



Service and maintenance work must be performed only by factory authorized personnel.

Staco recommends these limited-life components be periodically inspected and replaced before the expected expiration of their life cycle. The recommended replacement schedule is an estimate only. The life of these parts depends on site conditions such as ambient temperature, load profile, cleanliness of environment and other factors.

Staco Recommends a Factory Authorized Preventative Maintenance Review is scheduled at least once a year.

Component	Recommend Replace in:
Fans	4-5 years
Batteries	4-5 years

The functional lifetime of VRLA batteries is significantly affected by the temperature at which they are stored and operated. Ideally, VRLA batteries should be used in a 25° C (77° F) environment. For every 8.3° C (15° F) increase in temperature, the life expectancy of a battery will be halved.

Exposure to temperatures in excess of 32° C (90° F) should be limited to no more than 30 days per year. Under no circumstances should the VRLA battery be exposed to temperatures over 40° C (104° F) which can lead to thermal runaway, a condition that damages the battery. Thermal runaway can cause batteries to swell. If the battery cases burst, the hazardous contents may be exposed.

Replace batteries with the same manufacturing and type. Contact your Staco Representative for approved alternate batteries

Maintaining proper ambient temperature usually requires installing the product in a temperature-controlled space. Equipment rooms without cooling systems do not generally maintain the proper conditions for good battery life.

See Staco's website for warranty details:

<http://www.stacoenergy.com/support/literature-download-center.html>

8 Troubleshooting

Symptom / Error Message	Cause / What to do
UPS will not turn on.	Press the On/Off button and release after one beep.
UPS operates in battery mode only, even though there is AC present.	Reset the input circuit breaker. If it trips after the UPS restarts, reduce the load on the UPS.
Bad Battery - PLS replace battery	Check the battery connections, charge the batteries for 8-hours and retest, or replace the batteries.
Battery Depleted - UPS has shutdown	The UPS's batteries have been depleted. The UPS has shut down due to battery exhaustion. Charge the batteries for 24-hours.
Charger Failure - UPS has shutdown	The charger has failed, call for service.
Fan Failure - PLS replace fan	The fan has either failed or stopped due to excessive dirt. If the fan has failed, call for service. If the fan is dirty, use a can of "Canned Air" to clean the fan.
High Input Current - PLS Reduce Load	The input voltage is very low, and the UPS is heavily loaded. Reduce the load.
High Internal Temperature - UPS has shutdown	The internal or ambient temperature has exceeded the temperature ratings. Check the specifications.
Internal Bus Fault - UPS has shutdown	The UPS has an internal problem, call for service.
Inverter / Output Failure - UPS has shutdown	The UPS has an internal problem, call for service.
Low Battery - Shutdown imminent	The UPS's battery reserve is low. This condition will continue until AC returns or the UPS shuts down from battery exhaustion.
Low Internal Temperature - UPS has shutdown	The internal or ambient temperature has exceeded the temperature ratings. Check the specifications.
Output Short Circuit - UPS has shutdown	Disconnect the attached equipment. If the error does not clear the UPS has an internal problem. Call for service.
Site Wiring Fault - PLS check input connection	Have a qualified electrician to correct the service wiring.
UPS is overloaded - UPS will shutdown	Check the specifications and remove part of the load. If the UPS shuts down because of an Overload, the UPS must perform an Inverter function or a Self-Test to clear the Overload Alarm.

NOTES: