SAFEGUARD POWER SOLUTIONS

PROBLEM SOLVED

HUGO User Manual

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IMPORTANT

Read this User Manual carefully before operation.

- Retain this manual for future reference.
- It is prohibited to connect any appliance or electrical load other than those for which this product is intended.

NOTE: Throughout this document the HUGO-X1R (Uninterruptible Power Supply) may also be referred to as "UPS".

PRECAUTIONS AND GENERAL GUIDELINES

The basic condition for safe use and proper operation of the UPS is the knowledge and attention to the safety information provided in this manual.

The following safety information must be observed by all persons who will work with the UPS.

<table>
<tr><td>  </td><td colspan="2">This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The symbol, defined below, indicates the severity of the hazard. The message after the symbol provides information for preventing or avoiding the hazard.</td></tr>
<tr><td colspan="2">  WARNING</td><td>Hazards which, if not avoided, COULD result in severe injury or death.</td></tr>
<tr><td colspan="2">  CAUTION</td><td>Hazards or unsafe practices which, MAY result in injury or property damage.</td></tr>
<tr><td colspan="2" rowspan="2">  </td><td>  WARNING</td></tr>
<tr><td>• Read all safety warning and all instructions. Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.
• Save all warnings and instructions for future reference.</td></tr>
<tr><td rowspan="3">  </td><td colspan="2">HUGO recommends the UPS be used with all installed safety features. Customer assumes all liability for injury that could result from improper use of this UPS and responsibility for all necessary training to ensure safe operation of this UPS.</td></tr>
<tr><td colspan="2">For installation and use by trained personnel only.</td></tr>
<tr><td colspan="2">If any damage to the product is apparent or suspected, do not use the product. Refer product to qualified service personnel.</td></tr>
<tr><td rowspan="2">  </td><td colspan="2">FCC WARNING: Changes or modifications to the product could void the user's authority to operate the product.</td></tr>
<tr><td colspan="2">Use recommended accessories. Consult the owner's manual for recommended accessories. The use of improper accessories may cause risk of injury to person.</td></tr>
</table>

ELECTRICAL SAFETY PRACTICES

GROUNDING:
In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current which reduces the risk of electrical shock.

Improper connection of the equipment grounding conductor can result in a risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor.

Check with a qualified electrician, or service personnel if the grounding instructions are not completely understood; or if in doubt as to whether the UPS is properly grounded.

Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is earthed or grounded.

DO NOT remove the ground connection from the UPS's power plug.

WARNING

Use personal protective equipment. Safety glasses must be worn at all times by all persons installing the UPS.

Have your UPS serviced by a qualified repair person using only identical replacement part.

ELECTRICAL SAFETY PRACTICES

	**WARNING** ONLY OPERATE THE UPS IN A CLEAN ENVIRONMENT. DO NOT EXPOSE THE UPS INTERIOR TO RAIN OR WET CONDITIONS. WATER ENTERING A UPS WILL INCREASE THE RISK OF ELECTRIC SHOCK.
	**KEEP AWAY FROM LIVE CIRCUITS** • Operating personnel must not remove covers. • Replacement of components and internal adjustments must be made by qualified maintenance personnel. • Disconnect power when replacing components. • Dangerous voltages may exist even with the power removed. • To avoid injuries, always disconnect power and tum power switch to OFF. • Input connection to the product must remain accessible as a disconnect device. • DO NOT work on the product; connect or disconnect cables during periods of lightning. • Provide wiring per national and local electrical codes.

BATTERY WARNING

- Turn off the UPS and unplug it from the AC power source before battery replacement.
- This UPS contains a sealed lead-acid battery. DO NOT open the battery.
- DO NOT short or bridge the battery terminals with any object.
- The battery must be charged within 80 days from receiving the UPS. If the UPS is stored away, it is strongly recommended to cycle the charge within the battery every 90-120 days for battery to maintain its optimum performance.
- Ensure to charge the battery fully with each charge. Battery damage may occur if these instructions are not followed.
- Before replacing battery, make sure the replacement battery has the same charging voltage (12V/38 Amp Hours.) If any doubt, contact the manufacturer.
- Once the battery has reached the end of its life, properly dispose of the battery. **REFER TO YOUR LOCAL LAWS AND REGULATIONS FOR BATTERY DISPOSAL REQUIREMENTS.**
- DO NOT alter the system in any way.

INTRODUCTION

The new and improved HUGO-X1R is a 350W interruptible power supply (UPS) that is designed to support gas tankless water heaters, direct vent space heaters, vent free space heaters, boilers, furnaces, or any other gas-powered appliances. The UPS can also be used to charge mobile devices such as mobile phones, tablets, laptops, modems, and routers.

NOTE: The UPS shall be used for its intended purposes listed above only. Any alternation to the product or if used inappropriately will void all warranties. Please consult with SPS prior to any such actions.

PACKING LIST

- HUGO Power Supply
- Flow Sensor, if applicable
- Hanging brackets (4)
- Wall mount screws and anchor (4 sets)
- Bracket screws (9)
- User Manual (1)
- Door Key (1)
- Rubber pads to support floor standing installs (4)

KEY FEATURES

- Low output harmonic

The output wave form is pure sinewave, the harmonic is at minimal.

- Intelligent MCU Technology

The intelligent MCU (Micro-Computing Unit) automatically monitors the input voltage surge, sags, break, output loads and battery status, providing the downstream application with maximum protections.

- Highly Reliable

The UPS constantly monitors input voltage for surge, sags, or breaks, whenever such occurs, the UPS will transfer to battery mode within 15ms. It will also constantly monitor output load to prevent over-load and provide LED indications and chirp sequence alarm to alert user of such event. The UPS is also built with self-protect and self-reset functions.

- DC Start and Restart

The UPS is capable to switch on from the battery mode without city power, it will also automatically re-start after 10 minutes of the city power source is restored.

- Green Power

This series is equipped with high efficiency, EMC standard meet A class, it meets green power standard.

WORKING PRINCIPLE

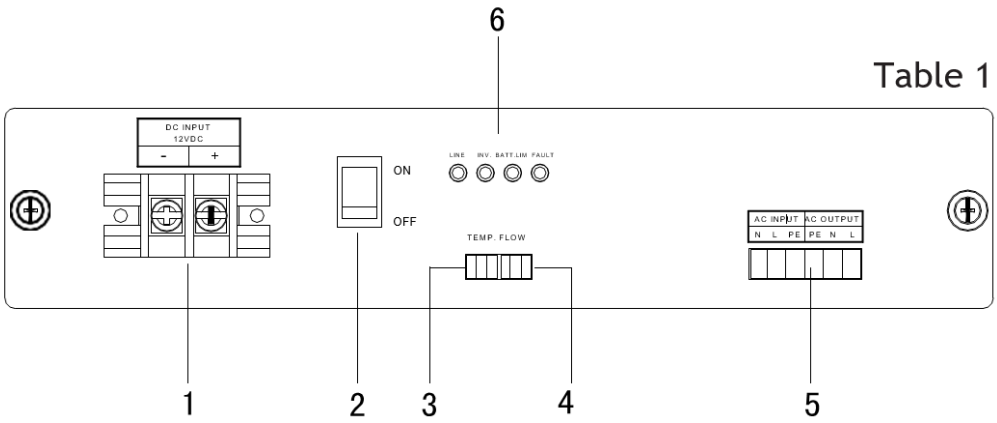
When the utility power is normal, the UPS will transfer the utility power to downstream application. During a power outage or when the utility power is below 92v or above 138v, the UPS will transfer to inverter mode.

While in inverter mode, the UPS will monitor flow and temperature sensor (if purchased). When flow sensor detects a demand for water, it will turn on power output to downstream application. When the temperature senses 37deg f (+/- 2 deg f) or below, it will also override the UPS to turn on AC output. If flow sensor does not detect a flow or if temperature is above 37 deg f, the UPS will be in standby mode.

For non-flow applications, unplug (temp.flow) port in front of inverter to allow flow sensing bypass. For this operation, whenever utility power is lost, the UPS will provide continuous power to downstream application immediately.

MOUNTING AND INSTALLATION

- FRONT PANEL OF UPS



1. DC input connector bar (Connected to the battery)
2. Toggle power switch
3. **Temperature dry contact***
4. **Flow dry contact***
5. Input/output socket
6. Indicator lamp

Note that when the toggle power switch is in the "ON" position, voltage may still be present at the output terminals even when the input terminals are disconnected from power. DO NOT transport or attempt to make connections to the terminals when the toggle switch is in the "ON" position.

***Connected by default, disconnect for no-flow installation only.**

- ## LED DISPLAY

Table 1 LED lamp symbol

	Steady	Flashing	Off
LINE: Utility Power (green light)	Normal Utility	Abnormal Utility	No Utility Power
INV: Inverter Mode (green light)	Inverter Output	Inverter Standby	Inverter Off
BATT.LIM: (Yellow light)	Battery over voltage and under voltage protection	Normal: Battery Charging Rapid: Battery over/under voltage alarm	Normal Battery Voltage
FAULT: (Red light)	Machine Protection	Output overload alarm	Machine normal

- ## INSTALLATION

Ensure that the ON/OFF switch is in the "OFF" position during installation. The UPS can store a significant amount of power for an extended period. AC/DC voltage may be present at the output terminals even when the input terminals are disconnected from power.

1. After unpacking the UPS, check whether there is any mechanical damage due to transportation. If the UPS has been noticeably damaged, contact your sales representative for assistance.
2. Tools Required

Phillips head screwdriver M3/M4		Fastening screw, connecting cable

3. Remove the (4) hangers and (8) M5 screws. Tighten each hanger with (2) screws.

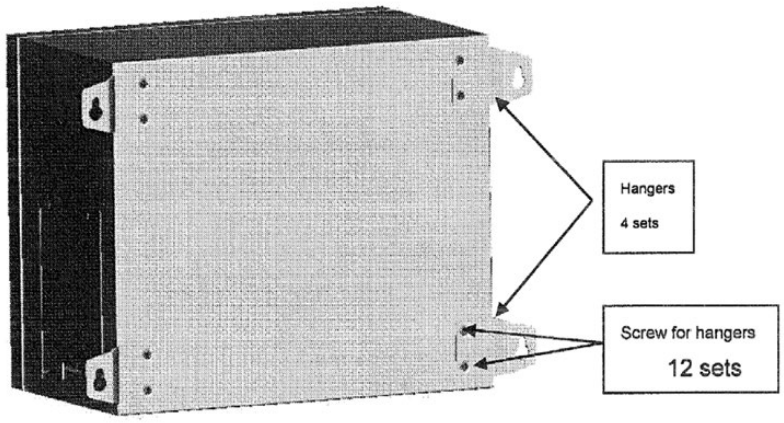


Photo: Hangers installation

4. Choose and prepare proper installation location. Note: Center point distance between left and right hangers is 15.5 inches.
   Warning! Ensure UPS is located above flood and snow lines. If at any time the UPS becomes damaged due to water or other, please consult with SPS customer care.

5. Hang the UPS on a flat surface that will adequately support the weight of the UPS (45 lbs). When replacing hanger screws, please consult with professionals to use the proper mounting screws or bolts. If the unit is to be wall mounted, it is strongly recommended by the manufacturer to mount on wall studs or ¾" plywood panels only due to the heavy weight of the unit (45 lbs). SPS is not liable for any installation errors such as improper use of mounting material and/or mounting methods.

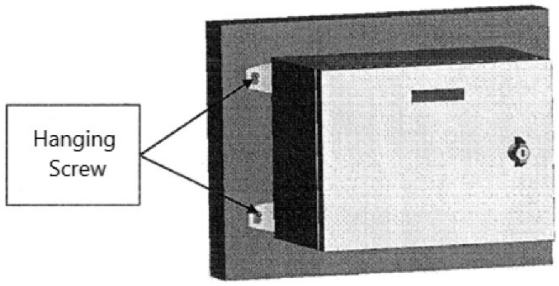


Photo: Installation Illustration

6. Using a Phillips head screwdriver, remove the wiring cover at right side of the UPS, connect appliance to "utility output socket", Flow Sensor to "Flow signal interface" (if applicable), as shown below:

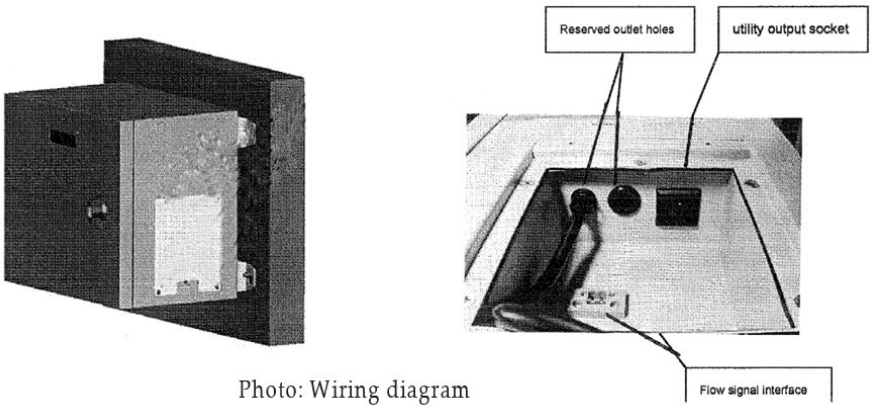


Photo: Wiring diagram

7. Double check wiring to ensure the connection is correct, close and lock the side panel as shown below.

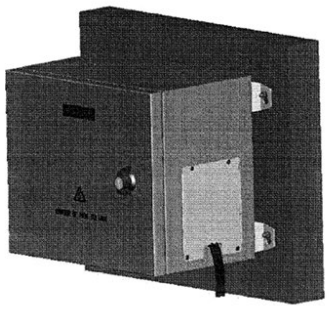


Photo: Installation diagram

8. Finally, connect HUGO's power cord with the main power outlet. NOTE: HUGO's rated input and output is 115 volts, can be fitted to any circuit breaker rated 15A. Ensure all connects are correct and that the input and output power cord is properly grounded.

9. Turn the front door cam clockwise to "OPEN" and using the supplied KEY turn the lock counterclockwise to open the front door.

10. If the UPS is used for tankless water heaters and the flow sensor is installed, then plug in "temp.flow" port in front of the UPS panel. Otherwise, leave this port unplugged.

11. Turn the UPS on via the toggle switch on the left side of the inverter panel. When turned on, the unit shall chirp once, and the indicator lamp "LINE" will stay lit if utility power is normal.

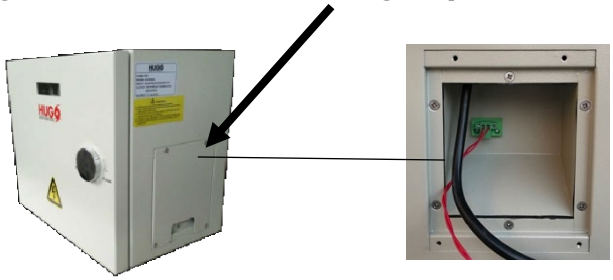
12. Indicator lamps on the front panel will display the operational status of the UPS as shown in Table 1 above. The UPS is also equipped with chirping alerts as shown in schedule below.

Chirp Alarm Indication				
	Chirp once every 30s, silence after 5 minutes	Chirp twice every 30s, silence after 5 minutes	Chirp 3 times every 30s, silence after 5 minutes	Chirp 4 times every 30s, silence after 5 minutes
Inverter Normal Operation	ON			
Battery under/over Voltage		ON		
Output Overload			ON	
Machine Protection, No Output				ON

At any time, the UPS detects overload or under/over voltage as indicated by the LED display or chirping alarm, it will attempt delay restarts. Once such issue is resolved, i.e., battery charge is normal or load is under 350w, the UPS will automatically restart and remove any fault indicators.

FLOW SENSOR INSTALLATION

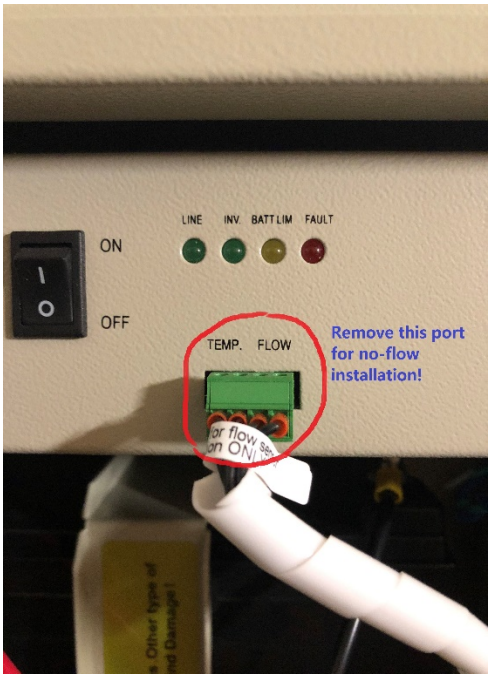
- **NOTE: Before installing the flow sensor, make sure water is shut off at the cold-water supply side.**
- Once water pipe is disconnected, some water will drip out of the pipe. Place a bucket or towel directly under the disconnect point of the water pipe to catch any dripping.
- Flow sensor should be installed in the cold-water piping with the arrow pointing in the same direction as the cold-water flow (towards the tankless water heater) and in the horizontal (preferred position) with the 4 screw heads of the sensor on top pointing upward. The flow sensor can also be mounted vertically. However, in this orientation, when water flow is less than 0.5gpm, the flow sensor may not be able to open the mechanical flap inside to activate.
- The included flow sensor will require two (2), ***not provided***, ¾" Female BSP "G" Thread Adapters to transition from G Thread to desired piping (PEX, CPVC, Copper, NPT Etc.)
    - Ensure Female Hose Thread Adaptors utilize proper sealing gaskets (washers).
    - Make sure to never over-tighten the adapters to the flow sensor. It is also critical to align the threads correctly to avoid stripping of the threads on the flow sensor.
    - If flow sensor is installed outdoors, please make sure it is properly jacketed to protect from direct sunlight and freezing conditions.
- Once Flow Sensor is installed and tested for leaks, connect the flow sensor Molex plug securely into flow signal interface located in the wiring compartment on the right side of the unit.



- After flow sensor is properly installed, turn on the cold-water supply and double check for leakage.

NO-FLOW INSTALLATION

If this product is to be used with no-flow appliances such as furnace, boiler, direct vents, wall heaters, etc. or if this product is intended to be used with gas tankless water heaters without the need of flow sensing function, you MUST unplug the "Temp.Flow" port as shown below in order for HUGO to function properly. With this setup, HUGO will provide AC output automatically and continuously whenever there is a power loss and operate in battery mode; when power restores, city power will automatically recharge HUGO and pass-thru city power to downstream appliances. Flow sensor can also be purchased separated from SPS, please visit www.safeguardpowersolutions.com for more details.



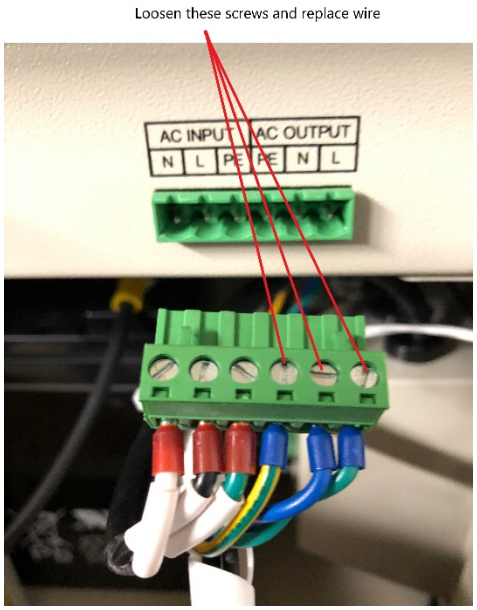
TEMPERATURE SENSOR SETUP

- Guide the temperature sensor out of HUGO's right compartment.
- Attach the sensor's silver plate to a location on the cold-water supply line that is closest to the tankless water heater and not jacketed, this will ensure maximum protection of the tankless water heater's heat exchanger from freezing.
- Use the provided string tie to secure the silver plate to the cold-water piping.

HARDWIRING INSTRUCTION

If your appliance does not have a plug and requires hardwiring, it is strong recommended that the following procedures to be completed by a certified electrician and the installer must follow all codes to ensure the safety of installation and operation. Improper install may cause personal harm and may void the warranty for the HUGO product. Upon completion, please send a photo of the completed install to support@sps-us.net to ensure warranty will still be intact.

a) Make sure HUGO is disconnected to any and all power sources both input and output.
b) Make sure the battery is disconnected from the inverter.
c) Make sure the on/off toggle switch is set to the OFF position.
d) Unplug the terminal block as indicated below.
e) Loosen the three wiring screws on the "AC Output" as shown in photo below:



f) Remove the three wires from factory:
   - Green-yellow (Output Ground, or "PE")
   - Blue (Output Neutral, or "N")
   - Green (Output Hot, or "L")
g) Place wire cap or insulation tape over the removed wires to ensure no conductors are exposed if touched accidentally.
h) Feed your appliance's power cord from the outside of HUGO's wiring box to get inside the HUGO unit, as shown below:

i) Make sure not to tangle the wires inside the HUGO unit for easier maintenance and service calls in the future.
j) Connect your appliance's wire cords G (green), N (white), and L (red or black) to the corresponding positions on HUGO's "AC Output" of the green MOLEX plug.
   - G to PE
   - N to N
   - L to L
k) Ensure no bare wires are exposed to the outside.
l) Tighten the flat head screws on the green connector.
m) Pull the newly installed wires to ensure a tight connection.
n) Plug the green connector back to the inverter.

OPERATIONS

- When city power is normal, HUGO will bypass power to downstream application while monitors for input voltage. At this time, the "line" LED light on the front panel should be steady green. When input voltage reaches beyond the safety zone as set under "input voltage" on section 13 below, HUGO will automatically switchover to battery mode to protect downstream appliances. At this time, the "INV" LED light will be steady green.

- Once a power outage is detected, HUGO will first chirp once to alert user HUGO is in inverter mode. The chirp will continue once every 30 seconds and will auto shutoff after 5 minutes. During this mode, there are two operation sequences:
  - The "INV" LED light is blinking green indicating HUGO is in Standby mode and there is no AC power output from HUGO. This will occur if the flow sensor is installed and the "temp.flow" port is plugged in and there is no flow detected in the water line.
  - The "INV" LED light is steady green indicating HUGO is in operation mode and is providing AC power to downstream application. This happens when:
    a. "temp.flow" port is NOT plugged in for no-flow installation;
    b. "temp.flow" port is plugged in and the installed flow sensor has detected a flow in the water supply line.

- When HUGO is operating with the flow sensor, there is a delay shutoff feature that works as followed:
  - During inverter mode, at any time the flow sensor senses a signal, HUGO will turn on AC

output continuously for 5 minutes.

- After 5 minutes, if no flow is detected, HUGO will turn off AC output.

  This feature will prevent frequent restart cycle of tankless water heaters and will allow users to freely turn the faucet on/off in between water usage.

  Note: when tankless water heater is restarting, some models may experience minimized or stopped water flow, this is due to servo valve inside the tankless water heater is closed. Once tankless water heater completes its restart cycle, full flow will resume. If at any time the water flow has stopped and does not return to full flow within 30 seconds, unplug the temp.flow port to force HUGO to provide power to the tankless water heater. Once the tankless water heater restarted completely, push in the "temp.flow" port again to resume water sensing operation.

- When the supply 12v sealed lead acid battery is not fully charged, the third LED light (batt. Lim) will continue to blink amber. When city power restores and HUGO is charging the battery, this light will be a steady amber. Once battery is fully charge, this light will be off.

  When the supplied battery drops below 20% of its full capacity, HUGO will sound the audio alert by 2 chirps and 1 pause, after 2 seconds the audio alert will be off. At the same time, the "batt.lim" LED light will blink twice then pause and continue to blink this sequence until HUGO is connected to a power source or when city power restores.

- The fourth LED light "Fault" will be steady red when the following occurs:
  - The battery is no longer holding a charge, a replacement is needed. Refer to "Protection – Battery Under Voltage Protection" in section 13 below.
  - The downstream appliance connected to HUGO has reach above 350W, remove the load and HUGO will auto reset. Refer to "Protection – Overload or Short Circuit Protection" in section 13 below.

- When city power is restored after a power outage, HUGO will start charging itself and reset to utility power mode after 10 minutes. This time delay will allow power grid to become steady to avoid possible spikes that may harm appliances.

STORAGE AND TRANSPORTATION

Retain the packing box and packing materials. The UPS is a sensitive piece of power equipment. When storing or transporting, place the unit back into the original packing box to avoid any damage from moisture, dust, dirt, or chemical corrosion.

MAINTENANCE AND TROUBLESHOOTING

1. Maintenance

- Upon successful installation of the unit, user shall visit the manufacture's website

(www.safeguardpowersolutions.com) to register the UPS under "Product Registration". Once registered, the UPS's serial number will activate its warranty starting date.

- If the unit has not been activated by any power outage for a long period of time, it is recommended to unplug the UPS from the main power source to allow the unit to operate on battery mode until battery depletes. Once battery depletes, plug the unit back to main power source to allow battery recharge. This maintenance shall be done every 6 months for the battery to maintain its optimum performance.
- It is recommended to periodically unplug the UPS from the main power source to check the UPS's normal operation. If any fault is detected, read the LED indicator and note the chirping sequence, then report this information back to point of purchase or consult with the manufacture.
- Though no necessary, but it is strongly recommended to install any 3rd party surge protection on the wall outlet where HUGO is plugged in. This added protection will also prevent any HUGO board burnouts when city power is unstable.

2. Troubleshooting

Scenario: The unit does not operate in battery mode.

Possible Cause and Solution:

- **Flow sensor installed:** If the flow sensor is installed, the UPS will ONLY operate when it detects cold-water flow. Turn on any faucet and check the operating status of the UPS. If problem persists, unplug the "temp.flow" port in front of the UPS panel to bypass the flow sensing loop. Once unplugged, if the UPS's operation is normal under battery mode, then contact point of purchase to replace the flow sensor. If problem persists, call the manufacture at 855.484.6797.

- **Battery low voltage:** Charge up the battery for a full 24 hours. If problem persists, replace the battery. Battery can be purchased off-the-shelf, 12V, 35Ah, sealed lead-acid battery.

- **Output overload:** Remove the appliance connected to the UPS, wait for 5 minutes. Double check the connected appliance is rated under 350W. Plug the appliance back into the UPS. Turn on the UPS.

- **Output short circuit:** Contact point of purchase or the manufacture for inverter replacement if under warranty.

TECHNICAL SUPPORT

SafeGuard Power Solutions, LLC.

Email: support@sps-us.net

Phone: 855.484.6797 (M-F, 9-5 pst)

REGISTER YOUR HUGO

URL: https://safeguardpowersolutions.com/register-your-product/

DATE OF PURCHASE: _____

POINT OF SALE: _____

ORDER NUMBER: _____

MODEL: _____

SERIAL NUMBER: _____

INSTALLER: _____

TECHNICAL SPECIFICATIONS

Model No.	HUGO-X1R	
Input	AC Voltage	92-138V
	Frequency	50 Hz/60Hz ±10%
Output	P.F. (VA/W) = 0.6	500VA/350W
	Voltage	113-117V (at Battery Mode)
	Frequency	Utility power mode: Output frequency is the same as input. Battery mode: 50/60Hz ±0.1
Battery	Battery Charging	2.5 A, about 8-10 hours to charge a fully depleted 38A sealed lead acid battery
Protection	Utility Power Under Voltage	Under 92 VAC
	Utility Surge Protection	When the utility power is >138VAC, it will transfer to battery mode
	Battery Under Voltage Protection	The UPS turns off automatically when the battery voltage too low
	Overload or Short-Circuit Protection	Battery mode: 105%<load<150%, it lasts 5s then protect; 150%≤load, it lasts 200ms then protect; when short circuit, it protects immediately. Utility mode: 105%<load<130%, alarm but no protection; 130%≤load<150%, it lasts 5min then protect; 150%≤load, it last 10s then protect.
	Transfer Time	less than 15ms
Others	LED display	Refer to this manual
	Weight	43 lbs.
	Dimensions (W x D x H)	14 x 9 x 12 inches
	Operating Temperature	23 to +104°F
	Humidity	< 95% (non-condensing)