



samlexpower®

DC-AC Inverter
Pure Sine Wave
120 Watt

PST-120-12

Owner's
Manual

Please read this
manual BEFORE
installing your
Inverter

OWNER'S MANUAL | Index

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SECTION 1 | Safety Instructions

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important Safety and Operating Instructions. Please read before using this unit .

The following safety symbols will be used in this manual to highlight safety and information:



WARNING!

Indicates possibility of physical harm to the user in case of non-compliance.



CAUTION!

Indicates possibility of damage to the equipment in case of non-compliance.

Please read these instructions before installing or operating the unit to prevent personal injury or damage to the unit.



WARNINGS!

1. This unit is Intertek-ETL listed as a Recognized Component conforming to ANSI/AAMI Standard ES60601-1 for Medical Electrical Equipment. Following should be considered when this unit is used in or with another product:
 - Suitability of its enclosure should be evaluated when installed in the end product
 - Temperature testing should be performed on this unit when installed in the end product
 - The installation of this unit has been evaluated as "Means of Operator Protection (MOOP)"
2. **DO NOT OPEN TO REDUCE RISK OF FIRE OR ELECTRIC SHOCK. THERE ARE NO USER SERVICEABLE PARTS INSIDE—REFER TO QUALIFIED SERVICE PERSONNEL.**
3. It is recommended that you return your inverter to a qualified dealer for any service or repair. Incorrect assembly may result in electric shock or fire.
4. To reduce the risk of electric shock, unplug the DC input from the battery before attempting any maintenance or cleaning.
5. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting the unit.

SECTION 1 | Safety Instructions

6. An extension cord should not be used unless absolutely necessary. If an extension cord is used, make sure that it has 2-prong, male plug (NEMA1-15P) and 2-prong, female receptacle (NEMA1-15R). The size of the current carrying conductors should be such that they are able to carry at least 2.5A for the length of the extension.
7. Place the unit in an area that will allow air to flow freely around the unit. DO NOT block or obstruct vent openings or install the unit in an enclosed compartment.
8. Keep the unit away from moisture and water.
9. NEVER OPERATE TWO OR MORE UNITS IN PARALLEL.
10. **Precautions when working with batteries.**
 - Batteries contain very corrosive diluted Sulphuric Acid as electrolyte. Precautions should be taken to prevent contact with skin, eyes or clothing.
 - Batteries generate Hydrogen and Oxygen during charging resulting in evolution of explosive gas mixture. Care should be taken to ventilate the battery area and follow the battery manufacturer's recommendations.
 - NEVER smoke or allow a spark or flame near the batteries.
 - Use caution to reduce the risk of dropping a metal tool on the battery. It could spark or short circuit the battery or other electrical parts and could cause an explosion.
 - Remove metal items like rings, bracelets and watches when working with batteries. The batteries can produce a short circuit current high enough to weld a ring or the like to metal and thus cause a severe burn.
 - If you need to remove a battery, always remove the Negative Ground Terminal from the battery first. Make sure that all the accessories are OFF so that you do not cause a spark.



CAUTIONS!

1. Please refer to 12V Plug Adapter (8) at Fig 2.3. Please ensure that the battery is connected with correct polarity - Positive of the battery to the tip of the Adapter (8) and the Negative of the battery to the spring contacts of the Adapter (8). Reversal of polarity will blow 15A fuse (5). Reversal of polarity may result in permanent damage to the unit and to the load. **DAMAGE DUE TO REVERSE POLARITY IS NOT COVERED UNDER WARRANTY.**
2. The inverter has no ON/OFF switch. It will switch ON automatically after plugging into 12V battery through the 12V Plug Adapter. Unplug the inverter from the battery when not in use, as it will drain 0.5A from the battery even if no load is connected.
3. Ensure that the unit is connected to 12V battery and the battery charger voltage is $\leq 16.5V$. Higher DC input voltage will damage the unit.

SECTION 2 | Description, Layout & Installation

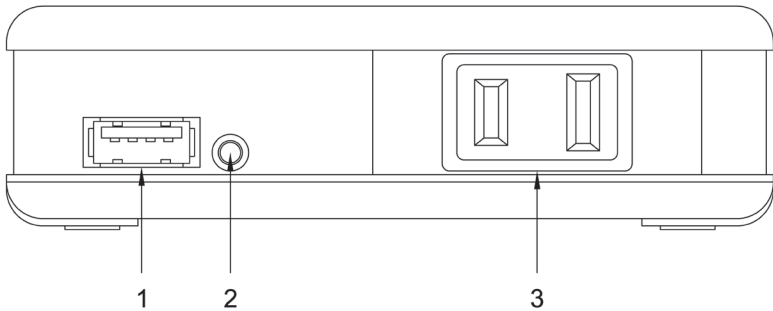
DESCRIPTION

This inverter converts 12 VDC from a battery or from a suitable 12 VDC power source to 120 VAC, 60 Hz Pure Sine waveform at rated power of 120W.

DESIGN FEATURES

- Pure Sine Wave AC output with Total Harmonic Distortion (THD) of < 3%
- USB Charging Port: 5V, 500 mA with overvoltage protection
- Compact and lightweight
- 3 color LED indicator for operational status
- Temperature controlled fan for higher efficiency
- Detachable DC Power Cord with 12V Power Plug
- For use with small laptops, portable electronics, small TVs VCRs, sound systems and other sensitive portable electronics
- Intertek-ETL Listed Recognized Component conforming to ANSI/AAMI Standard E560601-1 for Medical Electrical Equipment
- Complies with FCC Part 15(B), Class B

LAYOUT



LEGEND	
1.	USB Charging Port (5 VDC / 500mA)
2.	LED Status Indicator
3.	AC Outlet – NEMA1-15R

Fig. 2.1: Front View

SECTION 2 | Description, Layout & Dimensions

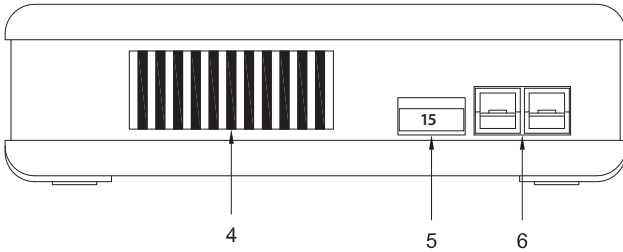


Fig. 2.2: Rear View

LEGEND

4. Slots for Fan Suction
5. DC Input Fuse - Automotive Mini Blade Type 32V, 15A
6. Battery Modular Inlet Connector for DC Input Power Cord

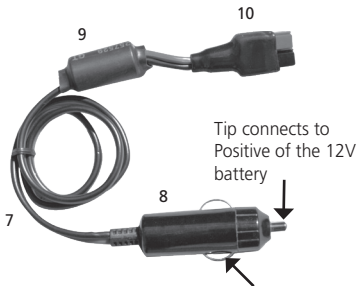


Fig. 2.3: DC Input Cord

Spring contacts connect to Negative of 12V battery

LEGEND

7. Detachable DC Input Power Cord (2')
8. 12V Plug Adaptor for Battery Side
9. Ferrite Bead for Noise Suppression
10. Mating Battery Modular Connector for inverter side

DIMENSIONS

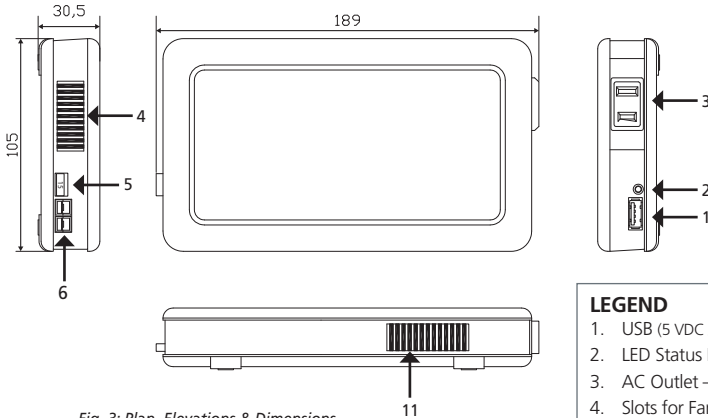


Fig. 3: Plan, Elevations & Dimensions

LEGEND

1. USB (5 VDC / 500 mA)
2. LED Status Indicator
3. AC Outlet – NEMA1-15R
4. Slots for Fan Suction
5. DC Input Fuse - 32V, 15A
6. Battery Modular Inlet Connector
11. Slots for Fan Discharge (Fan is located behind the slots)

SECTION 3 | Installation & Operation

INSTALLATION & OPERATION

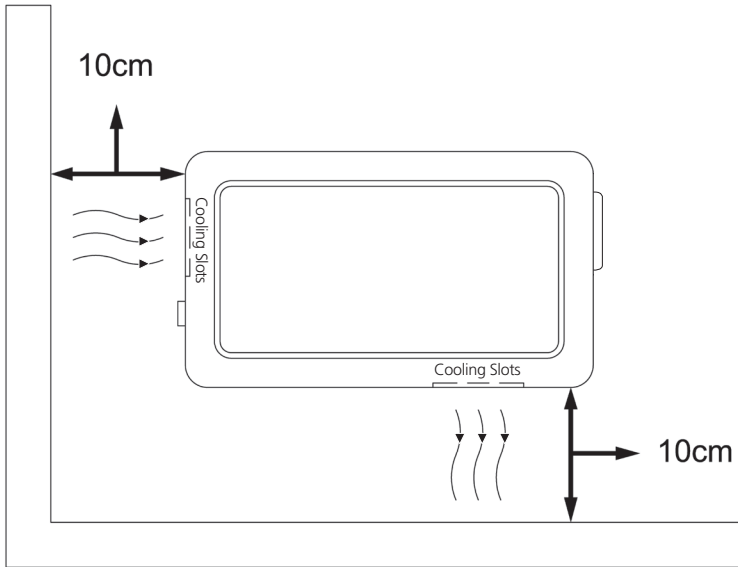


Fig. 3.1: Installation Clearances

- Read and comply with the safety instructions in Section 1.
- As the unit has been listed as a Recognized Component, compliance based on Srl. 1 of Warnings on page 3 is mandatory.
- Ensure installation clearances are as shown in Fig. 3.1 above for proper cooling.
- A detachable 2' DC input power cord (7, Fig. 2.3) has been provided.
- This unit does not have a power ON/OFF switch. The unit will switch ON automatically as soon as 12 VDC power is fed from the battery through the 12V plug adaptor (8, Fig. 2.3).
- Connect the detachable DC input power cord (7, Fig. 2.3) by sliding the mating Battery Modular connector (10, Fig. 2.3) into the DC input connector (6, Fig. 2.2).
- Plug in the 12V Plug Adaptor (8, Fig. 2.3) of the DC input cord into the 12V outlet of the battery supply.
- When the LED Status Indicator (2, Fig. 2.1) is GREEN, the inverter's AC Outlet (3, Fig. 2.1) and USB port (1, Fig. 2.1) will have voltage outputs.
- Insert plug of your electrical appliance into the AC Outlet (3, Fig. 2.1) of the inverter.
- Remove the inverter from the 12V outlet when not in use. This will prevent unnecessary drain from the battery.

SECTION 3 | Installation & Operation

PROTECTIONS

Overload and short circuit on the AC output side

- If the load exceeds 120W, the output voltage will start dropping, but the unit will NOT shut down.
- The LED Status Indicator (2, Fig. 2.1) will remain GREEN.
- The output voltage waveform will be distorted and will not have pure sine waveform, but will be clipped at top and bottom and will look like a square waveform.
- There will be excessive RF noise.
- The unit will reset automatically once the overload/short circuit is removed.

Over temperature due to fan failure or due to lack of cool replacement air

- The unit will shut down if temperature of hot spot inside the unit $> 105^{\circ}\text{C}$. The LED Status Indicator (2, Fig. 2.1) will turn ORANGE.
- The unit will reset automatically on cooling.

Low DC Input Voltage

- The unit will shut down if DC input voltage is < 10 VDC.
- The LED Status Indicator (2, Fig. 2.1) will turn ORANGE.
- The unit will reset automatically when the voltage rises to 11.5 VDC.

High DC Input Voltage

- The unit will shut down if DC input voltage > 16.5 VDC.
- The LED Status Indicator (2, Fig. 2.1) turns ORANGE.
- The unit will reset automatically when voltage is < 16.5 VDC.

Over Voltage On USB Port

- USB output is shut down if USB output ≥ 6.2 VDC.
- The LED Status Indicator (2, Fig. 2.1) will be OFF or RED.

Operational conditions indicated by the LED Status Indicator (2, Fig. 2.1) are given in the following table:

SECTION 3 | Installation & Operation

LED STATUS INDICATOR	STATUS OF INVERTER	STATUS OF USB PORT
OFF	AC output is available	No output from USB port due to: - Over voltage $\geq 6.2V$ - USB section is defective
	AC output is not available	No DC input, check: - 12V Plug Adaptor (8) is firmly connected to the 12 VDC power source - 15A fuse (5) is not blown
GREEN	AC output is available	USB output is available
ORANGE	AC output is not available due to operation of one or more of the following protections: - Over temperature - Low DC input voltage - High DC input voltage	USB output is available
RED	AC output is not available due to operation of one or more of the following protections: - Over temperature - Low DC input voltage - High DC input voltage	No output from USB port due to: - Over voltage $\geq 6.2V$ - USB section is defective

Cooling

- The inverter has a temperature controlled fan for cooling.
- The fan will start once the temperature of the hot spot inside the unit exceeds $70^{\circ}C / 158^{\circ}F$. **Note:** In cooler ambient temperature and/or at no/low loads, the hot spot may not reach $70^{\circ}C / 158^{\circ}F$ and hence, the fan will be OFF.
- If the fan fails, or if adequate cool air change is not available, temperature of hot spot will continue to rise and at $\geq 105^{\circ}C / 221^{\circ}F$, AC output will be shut down. AC output will be restored when the unit cools down sufficiently.
- Place the unit in a cool, well ventilated space that has adequate cool replacement air (Fig. 3.1).

SECTION 4 | Specifications

MODEL NO. PST-120-12		
AC OUTPUT		
OUTPUT VOLTAGE	120 VAC \pm 3%	
OUTPUT CURRENT	1A	
OUTPUT FREQUENCY	60 Hz \pm 1%	
TYPE OF OUTPUT WAVEFORM	Pure Sine Wave	
TOTAL HARMONIC DISTORTION OF OUTPUT WAVEFORM	< 3%	
CONTINUOUS OUTPUT POWER (At Power Factor = 1)	120 Watts	
SURGE OUTPUT POWER (At Power Factor = 1)	120 Watts	
PEAK EFFICIENCY	88%	
AC OUTPUT CONNECTION	NEMA1-15R Receptacle	
DC INPUT		
NOMINAL DC INPUT VOLTAGE	13 VDC	
DC INPUT VOLTAGE RANGE	10 - 16.5 VDC	
MAXIMUM INPUT CURRENT	15A	
DC INPUT CURRENT AT NO LOAD	< 500 mA	
DC INPUT CONNECTION	- Battery Modular Connector on the inverter - 2 ft. detachable Power Cord with: - AWG #14 wires - Mating Battery Modular Connector on inverter side - 12V Plug Adapter on battery side	
DISPLAY	3 COLOR LED For Operational Conditions	
PROTECTIONS		
LOW DC INPUT VOLTAGE	Shutdown at \leq 10V; Auto-reset at \geq 11.5V	
HIGH DC INPUT VOLTAGE	Shutdown at \geq 16.5V; Auto-reset at \leq 16.5V	
SHORT CIRCUIT / OVERLOAD	Output voltage drops, but does not shut down. Auto-reset on removal.	
OVER TEMPERATURE	Shut down when internal hot spot is \geq 105°C / 221°F. Auto-reset on cooling	
REVERSE POLARITY ON DC INPUT SIDE	Automotive Mini Blade Fuse: 32V, 15A	
HIGH DC OUTPUT OF USB PORT	Shuts down USB Port at \geq 6.2V	
COOLING	Temperature Controlled Fan	
COMPLIANCE	SAFETY	Intertek - ETL Listed Recognized Component. Conforms to ANSI/AAMI Standard ES60601-1
	EMI	FCC Part 15(B), Class B / EN 55022: 2006; EN 55024: 1998+A1; 2001 +A2; 2003
	EMC	EN 61000-3-2: 2006 / EN 61000-3-3: 1995+A1; 2001+A2: 2005
ENVIRONMENT	OPERATING TEMPERATURE RANGE	0°C to 40°C / 32°F to 104°F
DIMENSIONS & WEIGHTS	(W x D x H), MM	105 x 189 x 30.5
	(W x D x H), INCHES	4.13 x 7.44 x 1.2
	KG	0.453
	LBS	1.0

SECTION 5 | Warranty

3 YEAR LIMITED WARRANTY

PST-120-12 manufactured by Samlex America, Inc. (the “Warrantor”) is warranted to be free from defects in workmanship and materials under normal use and service. The warranty period is 3 years for the United States and Canada, and is in effect from the date of purchase by the user (the “Purchaser”).

Warranty outside of the United States and Canada is limited to 6 months. For a warranty claim, the Purchaser should contact the place of purchase to obtain a Return Authorization Number.

The defective part or unit should be returned at the Purchaser’s expense to the authorized location. A written statement describing the nature of the defect, the date of purchase, the place of purchase, and the Purchaser’s name, address and telephone number should also be included.

If upon the Warrantor’s examination, the defect proves to be the result of defective material or workmanship, the equipment will be repaired or replaced at the Warrantor’s option without charge, and returned to the Purchaser at the Warrantor’s expense. (Contiguous US and Canada only)

No refund of the purchase price will be granted to the Purchaser, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so. Warranty service shall be performed only by the Warrantor. Any attempt to remedy the defect by anyone other than the Warrantor shall render this warranty void. There shall be no warranty for defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion.

No other express warranty is hereby given and there are no warranties which extend beyond those described herein. This warranty is expressly in lieu of any other expressed or implied warranties, including any implied warranty of merchantability, fitness for the ordinary purposes for which such goods are used, or fitness for a particular purpose, or any other obligations on the part of the Warrantor or its employees and representatives.

There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives for injury to any persons, or damage to person or persons, or damage to property, or loss of income or profit, or any other consequential or resulting damage which may be claimed to have been incurred through the use or sale of the equipment, including any possible failure of malfunction of the equipment, or part thereof. The Warrantor assumes no liability for incidental or consequential damages of any kind.

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