



STX SERIES

PURE SINE WAVE EMERGENCY LIGHTING INVERTER

Installation Instructions and User Manual
***SAVE THESE INSTRUCTIONS**



IMPORTANT!!

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

IMPORTANT SAFEGUARDS

WHEN USING ELECTRICAL EQUIPMENT, YOU SHOULD ALWAYS FOLLOW BASIC SAFETY PRECAUTIONS, INCLUDING THE FOLLOWING:

1. **Read and follow all safety instructions.**
2. **Do not install this lighting inverter outdoors.**
3. **Do not install near heaters or in any other high-temperature environment.**
4. **Exercise extreme caution when servicing batteries. Battery acid can cause burns to skin and eyes. If acid comes in contact with skin or eyes, flush with fresh water and contact a physician immediately.**
5. **Inverter should be installed in locations where it will not be readily subjected to tampering by unauthorized personnel.**
6. **The use of any accessory equipment not recommended by the manufacturer may cause an unsafe condition and will void the warranty.**
7. **Prior to installation, read through the instructions thoroughly and follow all steps outlined in the instructions during the installation. Failure to do so may cause premature failure of the equipment and may cause an unsafe condition.**
8. **If this lighting inverter needs servicing, all work must be performed by a qualified personnel.**

SAVE THESE INSTRUCTIONS

The installation and use of this equipment must comply with all national, federal, state, municipal, and local codes that apply.

Thank you for choosing this inverter. For phone-assisted startup and any technical assistance, please contact IEP Technical Support Department at 610-628-1488 during normal working hours (Eastern Standard Time) during standard work-days.

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1. INVERTER SPECIFICATIONS

1.01 Inverter Specification - STX Series

Inverter:

| | |
|--|--|
| Input voltage: | 120, or 277 VAC, 60Hz, Single Phase |
| Input power factor: | ≥95% |
| Output voltage: | 120, or 277 VAC, 60Hz, Single Phase |
| Overall inverter efficiency: | ≥95% |
| Minimum loading: | none required |
| Noise: | 48-55dB (4ft from inverter) |
| Harmonic distortion: | < 3% Linear load, non-linear load <5% |
| Overload capacity: | 110% for 5 minutes, 125% for 10 seconds |
| Time to transfer to inverter after utility power failure: | < 8ms |

Battery:

Battery charger: Fully automatic and temperature compensated

Recharge time: Meets UL 924

Battery protection: Automatic low-battery voltage disconnect
automatic restart upon utility return

Standard battery: Sealed VRLA, 10 year design life.

Runtime: 90 minutes standard

Operating Temperature: 20° C-30° C (68° F-86° F)

Battery performance and life are rated at 25°C (77°F)

Relative humidity: 95% non-condensing.

2. INSTALLATION INSTRUCTIONS

2.01 Shipment Inspection

Upon delivery of the lighting inverter, inspect the outer cartons for any sign of damage or mishandling and verify the total carton count received against the total carton count indicated on the shipping documents. Do not attempt to install the system if damage is apparent. If any damage is noted or any item is missing, file a damage claim or material loss claim with the carrier within 24 hours and inform the factory of the claim and the condition of the equipment. The manufacturer's contact information is in section 5.01.

Remove the system from its outer packaging materials and recycle the materials if possible, then visually examine the inverter system and all of its components for any transit damage. Report any damage to the carrier and the factory immediately.

Check the system rating of the inverter to verify the model number and rating of the inverter shipped is as specified. Record all relevant information in the back of this manual under section 5.02. This information is necessary in the event service is required.

2.02 Temporary Storage of Inverter and Batteries

If the inverter will not be installed immediately, the inverter must be stored indoors where the humidity is no higher than 90%, the temperature is no higher than 30°C (86°F) and the location should be clean with normal ventilation for human habitation.

Batteries for this inverter system should be stored at 25°C (77°F). If the batteries are to be stored for more than three (3) months, the batteries must be charged at least once every three (3) month period.



Lengthy storage of batteries will cause irreversible damage to the cells. Batteries should not be stored for more than 6 months from when they are shipped.

Do not allow smoking, sparks, or flames in battery storage vicinity due to explosion hazard from concentrated hydrogen.

2.03 Installation Room Selection

Choose a location that offers:

- Enough space to service the inverter
- Air circulation to expel any heat generated by the inverter
- Protection against moisture and excessive humidity
- Protection against dust and other particulate matter

INSTALLATION INSTRUCTIONS



The system is very heavy. Proper equipment and practice must be taken to ensure safety. Verify that the floor is capable of safely bearing the overall weight of the system.

This inverter system is designed to operate from 0°C to 40°C (32°F to 104°F) at up to 95% relative humidity. For optimal performance, avoid installing the inverter in an environment at the temperature extremes of the designated operating range.

Batteries will be less efficient at temperatures below 18°C (65°F). High temperatures will reduce the useful service life of the batteries. The battery life will typically be reduced to half (½) at 35°C (95°F) and reduced to one-fourth (¼) at 45°C (113°F).

Battery performance and service life is maximized if the operating temperature is maintained at 25°C (77°F)

The system must be installed in an area in which the air is free of dust, corrosive chemicals, and other contaminants. Do not place this inverter system or batteries in a sealed room or container.



Never install batteries in a sealed room or enclosure.

The maximum operating temperature drops 1°C per 300 meters (2°F per 1000 feet) above sea level. Maximum elevation is 3000 meters (10,000 feet)

The inverter must be installed on a surface that is capable of supporting the overall weight of the system.

2.04 Installation Requirement

Tools:

- Socket Set
- Phillips Screwdriver
- Personal Safety Equipment
- Electrical Tape
- Digital Multimeter
- Other Safety Equipment Required by Code
- Slotted Screwdriver
- Torque Wrench



Always use insulated tools for battery and AC connection and installation. Always torque to the manufacturer's recommendations.

Follow all federal, state and local codes as it pertains to emergency circuit raceways

2.05 Inverter Placement

There must be a minimum of 36 inches of clearance space in front of the inverter for service, and a minimum of 12 inches of clearance on each side of the inverter for ventilation.

The unit must be secured from the back to the wall, or secured to the floor via means of floor-mounting brackets.

Necessary hardware to fasten the unit to the mounting surface is to be supplied by the installing contractor. Prior to opening any conduit entrance, contact factory for assistance on locating acceptable zones within the cabinet to connect conduit.



Follow all federal, state and local codes as it pertains to emergency circuit raceways. Exercise and observe all safety practices.

2.06 Inverter Battery (DC) Placement Connection

Prior to installing batteries, the installer must read and observe the following precautions and any other safety measures dealing with DC and battery wiring.

1. Wear protective clothing, eye-wear, rubber gloves and boots. Batteries contain corrosive acids or caustic alkalis and toxic materials and can rupture or leak if mistreated. Remove rings and metal wristwatches or other metal objects and jewelry. Don't carry metal object in pockets where the objects can fall onto the batteries or into the inverter system.
2. Tools must have insulated handles so that they will not short battery terminals. Do not allow a tool to short a battery terminal to another battery terminal or to the cabinet at any time. Do not lay tools or metal parts on top of the batteries, and do not lay any objects where they can fall onto the batteries or into the cabinet.
3. Install the batteries as shown on the battery wiring diagram provided in this manual or with the battery cable kit. Important: When connecting cables, never allow a cable to short across a battery's terminals, the string of batteries, or to the cabinet.
4. Align the cables on the battery terminals so that the cable lug will not contact any part of the cabinet even if the battery is moved. Keep the cable away from any sharp metal edges.
5. Install the battery cables so that they cannot be pinched by the inverter system cover.
6. Where conductors may be exposed to physical damage, protect conductors in accordance with NEC requirements.
7. Full voltage and current are always present at the battery terminals. The batteries used in this system can produce dangerous voltages, extremely high currents, and possible risk of electric shock. Batteries may cause severe injury if the terminals are shorted together or to ground (earth). Be extremely careful to avoid electric shock and burns caused by contacting battery terminals or shorting terminals during battery installation. Do not touch insulated battery terminals.
8. A qualified electrician who is familiar with battery systems and required precautions must install and service the batteries. Any battery used with this inverter must comply with the applicable requirements for batteries in the standard for emergency lighting and power equipment, UL924. Replacement batteries must be approved by the factory for use with this inverter system. If using substitute batteries not supplied by the factory, the inverter may fail to perform properly and will void the warranty. The installation must conform to national and local codes as well. Keep unauthorized personnel away from batteries.

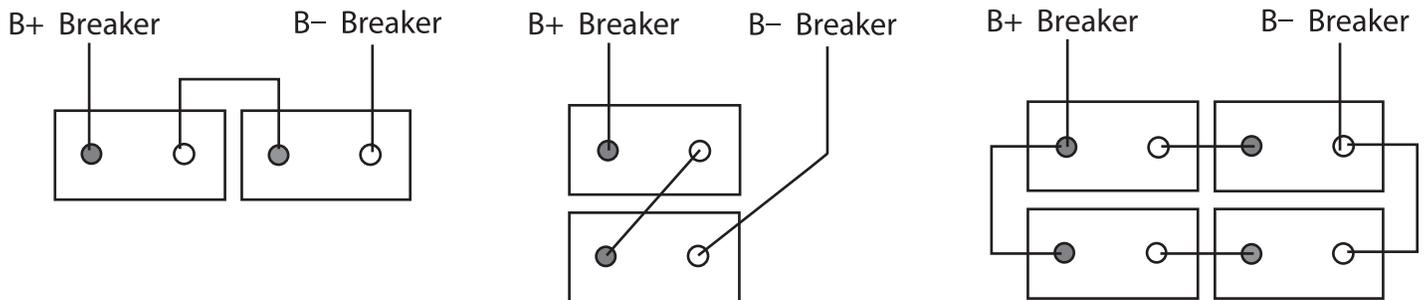


A qualified electrician who is familiar with battery installation and applicable building and electrical codes should install the batteries.

The nominal battery voltage for this lighting inverter is indicated on the system. Batteries must be installed at the correct DC voltage. Failure to do so will damage the inverter!



Be careful! Observe the correct polarity on the battery terminals. Any illustration provided below is given as a guide only. Polarity markings may vary from battery to battery. There may be a small arc and pop when the last battery is connected.



Always follow the system label for proper DC voltage applicable to the system on which you are working. Ensure that the DC voltage reading is within 10% of the nominal DC rating on the system label. Contact the factory for any question.

DO NOT TURN ON THE BREAKER TO CHECK DC VOLTAGE.



Make sure the DC connection is made before energizing the inverter. Applying AC voltage to the inverter without installing the battery will damage the inverter and void the warranty.

Install batteries bottom shelf back first and work forward. Torque battery connection as you install each battery. Connect the next shelf of battery when the bottom shelf are connected. Voltage should be within 10% of nominal.

2.07 AC Connection

Prior to making the AC connections, the installer must read and observe the following precautions and any other safety measures dealing with AC wiring.

1. This equipment contains hazardous AC and DC voltage. Because of these voltages, only a qualified electrician can install this system. The electrician must install the AC line service according to local, state, NEC and other applicable safety practices, and must be familiar with batteries and battery installation.
2. Before installing, maintaining or servicing this unit, always de-energize all sources of AC power first, then disconnect the DC power, and shut off this inverter according to the section on Safe Shutdown Procedures (4.01). Disconnect the AC line input at the service panel and make sure the inverter will not supply output voltage.

INSTALLATION INSTRUCTIONS

3. Whenever AC and/or DC voltage is applied, there will be AC voltage inside this inverter system. The unit is designed to supply power from AC line or from the DC power from the batteries. To avoid equipment damage or personal injury, always assume that there may be voltage inside the equipment.
4. Remove rings, watches and other jewelry before installing the AC wiring. Always wear protective clothing and eye protection and use insulated tools when working near batteries. Whenever servicing an energized system with the cover open, electric shock is possible; follow all applicable safety codes.
CONFIRM THE UNIT IS SAFE TO TOUCH BEFORE TOUCHING!
5. To reduce the risk of fire or electric shock, install this inverter and the batteries in a temperature controlled and humidity-controlled indoor area free of contaminants.

1. The system's front door/cover. Make sure the input AC is off.
2. Identify the input and output terminals.
3. Confirm the service input and output voltage matches with the inverter voltage and that the inverter voltage is correct for the application.



This inverter works and supplies single phase power only.

4. The input circuit breaker in the input service panel provides the means for disconnecting AC to the inverter. Only authorized persons shall be able to disconnect the AC to the unit.
5. If not done previously, select entrance into the cabinet for AC input and AC output in the system cabinet.



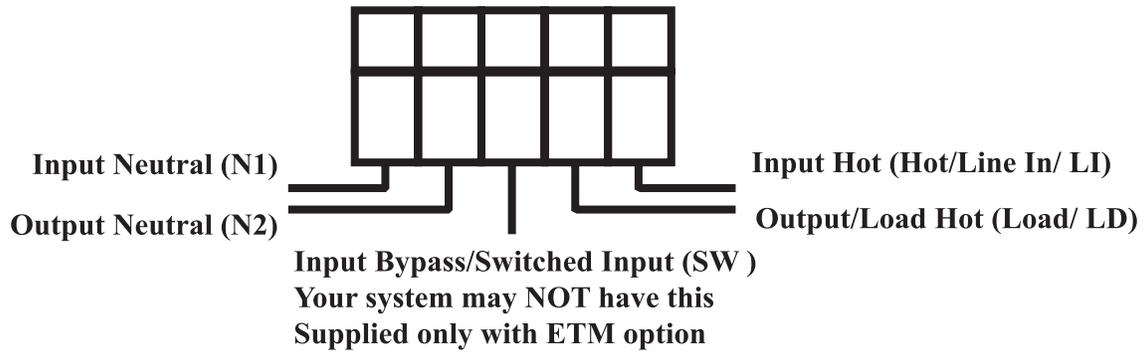
Drill filings may damage the unit and prevent it from operating. Be mindful when opening conduit entrances into the cabinet.

6. Install the input and output conduits.
7. Run the AC input service conductors and AC output conductors through separate conduits. The inverter emergency output circuits shall be installed in dedicated conduit systems and not shared with other electrical circuits as described in NEC 700-9 (b)
8. Replace the terminal coverings.
9. Connect ground wire to the ground studs in the enclosure.

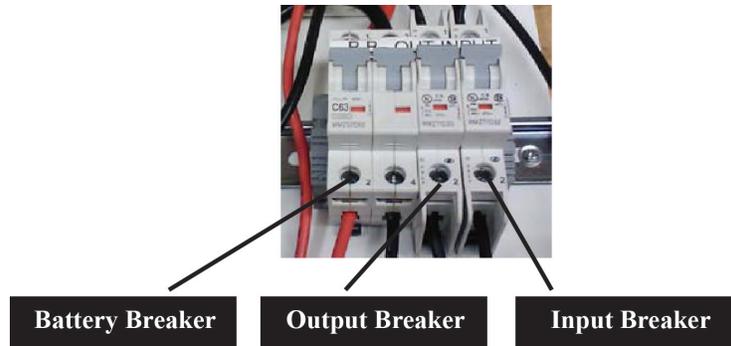


Any illustration provided below is given as a guide only. Wire color may vary. Observe the internal marking. When in doubt, contact the factory for assistance.

INSTALLATION INSTRUCTIONS



**The terminals may differ on your system.
Follow the labels on each of the terminals and
breaker pole for proper identification.
DO NOT TURN ON ANY BREAKER PRIOR TO STARTUP.**



2.08 Startup Checklist



Before proceeding to the Inverter Start-up procedures (2.09), complete the Checklist below.

1. Ensure the inverter cabinet is securely fastened to a wall or other structure.
2. Ensure that the input circuit breaker in the building service panel serving as the AC disconnect to the inverter is in the OFF position.
3. Check for proper ground connections in the inverter cabinet, the building service panel, and the external load distribution panel if one is present.
4. Check for any loose wiring connection in the inverter cabinet, the building service panel, and the external load distribution panel if one is present.
5. Check that the correct nominal battery voltage is present in the inverter cabinet between the DC Input Positive and Negative wires. Refer to the section on Battery (DC) Connection (2.06) and system label for proper DC system voltage.

STX Chart

| SYSTEM SIZE | INPUT VOLTAGE | MAXIMUM AMPS | RECOMMENDED BREAKER | Battery voltage | Strings |
|-------------|---------------|--------------|---------------------|-----------------|---------|
| 500 | 120 | 12.5 | 15 | 24 | 1 |
| | 277 | 5.4 | 10 | | |
| 720 | 120 | 14.3 | 20 | 24 | 1 |
| | 277 | 6.2 | 10 | | |
| 1000 | 120 | 16.7 | 20 | 24 | 2 |
| | 277 | 7.2 | 10 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

2.9 Inverter Start-up Procedures

1. **Contact the factory for start-up assistance. (5.01)**
2. **Measure the voltage on the input to the inverter. At this time, the reading should be at 0 volt.**
3. **Turn on the AC supply to the unit - not the input breaker located within the unit! Measure the voltage and confirm that the input voltage matches the voltage indicated on the inverter.**
4. **Measure the DC voltage and confirm that the DC voltage is as indicated on the inverter.**
5. **Turn on the battery breaker at this time.**
6. **Turn on the Input breaker located inside the inverter at this time. Press the “On” Button - at this time the inverter will start and perform an internal diagnostics procedure. When the system is ready, proceed to the next step.**
7. **Turn on the Output breaker located inside the inverter at this time.**
8. **Measure the output voltage.**
9. **Make sure all load connected to this inverter is on and confirm that the total load does not exceed the rated load of the inverter.**
10. **Close the cover.**
11. **Allow at least a 48 hour charge period before conducting a full load test. After an outage that fully depletes the battery reserve of the inverter, the inverter may require up to 168 hours to fully recharge. The recharge time is dependent on the depth of discharge, age of the batteries and temperature.**

2.10 System Verification

Conduct this test after the battery has been fully charged. To simulate a power failure, turn off the AC power to the inverter. At this time, the connected load will either come on for normally off loads or remain on for normally on loads. Record the information on Section 5.02 of this manual after start-up.

3. OPERATION INSTRUCTIONS

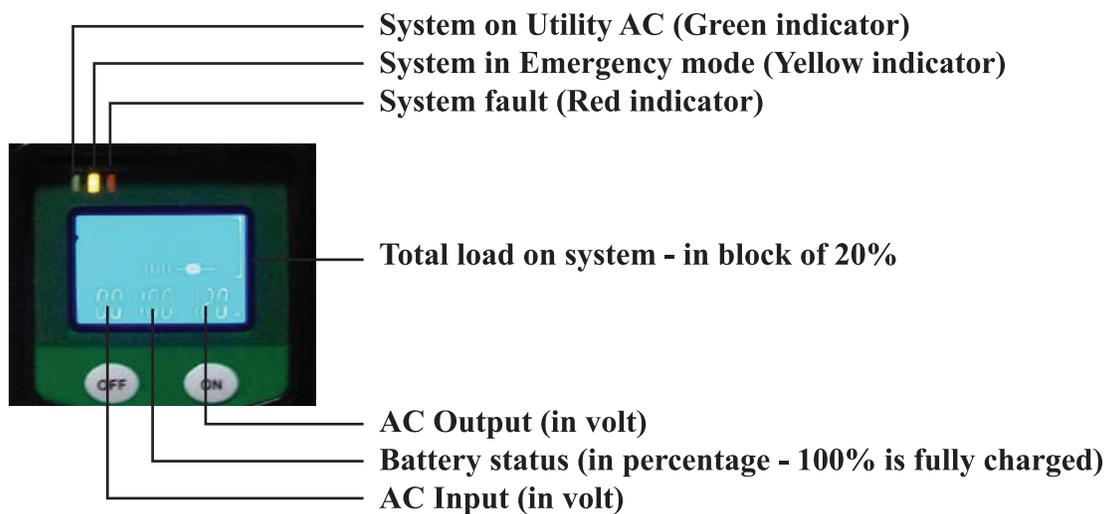
3.1 Indicator Panel / Status Indicators

This inverter system is equipped with LED indicators and a LCD panel.

This inverter also uses an audible alarm to alert the user of any abnormal conditions.

During normal operation, only the System on Utility AC indicator should be lit.

The audible alarm will be activated during emergency operation.



In normal operation, the input and output voltage should be within 5% of the nominal rated voltage.

3.02 Routine Inverter Test

NFPA 101 requires that Emergency Lighting Equipment be tested on a monthly basis for a period of at least 30 seconds, and a minimum of 90 minutes once a year.

It is strongly recommended that these guidelines be followed to ensure system readiness and to prolong battery life. To perform tests, simply turn off the AC input breaker.

After a prolonged discharge, the inverter may require up to 168 hours to recharge the battery fully.

4. MAINTENANCE INSTRUCTIONS

4.01 Safe Shutdown Procedures



To avoid possible equipment damage or personal injury, always assume that there is AC voltage present inside the inverter. Never attempt to open the electronic module of the inverter in an attempt to service it. The inverter electronic module has no user-serviceable components.

1. Hold down the “Off” buttons until the system output shuts down.
2. Turn off the AC input
3. Open the front cover.
4. Turn off the output breaker.
5. Turn off the input breaker.
6. Turn off the battery breaker



If the unit will be shut off for an extended period of time, recharge the batteries at least once every 60 days. Prolonged period in a discharged state will damage the battery and void the warranty.

4.02 Routine Inverter Maintenance

This inverter is designed to be maintenance free and to provide years of trouble free operation. The internal diagnostic features and routine inverter test also help to ensure proper operation of this equipment. However, routine attention and basic maintenance outlined below will assure the peak performance of this inverter at all times. Due to the nature of this equipment, only qualified personnel should perform the following type of steps of system maintenance.

- Inspect and clean the unit. Be mindful that the unit is energized.
- Inspect all batteries for leaks, case swelling or terminal corrosion.
- Perform an operational test of this inverter to verify all critical connected loads are operational.

4.03 Battery Maintenance and Replacement

Prior to replacing the batteries, please read the section on Battery (DC) connection (section 2.06) of this manual.



ONLY QUALIFIED PERSONNEL SHOULD PERFORM THE PROCEDURES BELOW.



A battery can present a risk of electrical shock and high short circuit current. Battery replacement should only be performed by qualified service personnel familiar with battery systems. All safety precaution outlined previously in this manual (2.06) and other best safety practices must be observed when servicing, maintaining or replacing batteries.

This inverter utilizes VRLA maintenance-free batteries. By design, this type of battery is as maintenance free as a battery can be. However, a quarterly visual check on the physical state of the batteries, and an annual check on battery connection for tightness of the connections will help in ensuring the useful service life of these batteries and the reliability of the inverter.

If any battery is determined to be problematic, all batteries used in this inverter must be replaced.

To replace batteries for this inverter system, follow the Safe Shutdown Procedures outlined in section 4.01 and then proceed to disconnect the batteries following all applicable safety practices.

Do not dispose of these batteries in a fire, the batteries could explode.

Do not open or intentionally damage the battery casing.

The electrolytes within these batteries is harmful to the skin and eyes.

Batteries contain lead. Many state and local governments have regulations about used battery disposal. Please dispose of the batteries properly.

Contact the factory (5.01) for help if you are unsure how to dispose of the battery properly.

Only batteries recommended by the manufacturer can be used with this inverter system. Contact the factory (5.01) for information on how to obtain replacement batteries.

Follow the section on Battery (DC) connection (2.06) for proper steps in connecting new batteries.

5. Technical Support

5.01 Technical Support Information

During or after installation, IEP's Technical Support team is available to provide assistance with any aspect of this inverter. Out service representatives are available during normal operating hours (Eastern Standard Time) in answering questions about these inverters.

IEP's customer service number is: 1-610-628-1488

5.02 Troubleshooting Guide

This inverter is designed to operate with minimal maintenance. If there is any abnormality in the operation of this system, please contact qualified service personnel or the manufacturer (5.01)

If the red indicator light (System Fault) is lit, please contact the factory immediately for support.

Do not attempt to service this system.

5.03 Warranty

WARRANTY

This inverter is guaranteed, under normal and proper use, against defects in workmanship and materials for a period of twelve (12) months from the date of successful start-up, or eighteen (18) months from the date of shipment, whichever occurs first. Batteries supplied as part of this system are covered under a separate pro-rated warranty described below. One (1) year from the date of successful start-up and operating temperatures. Nine (9) years pro-rated. Failure in properly storing batteries will result in permanent damage to the batteries and will void the battery warranty.

5.04 Inverter Model and Serial Number

Inverter Information:

Model Number: _____

Serial Number: _____ Date Installed: _____

System Voltage: _____ VAC Load Current: _____ Amps

Battery P/N: _____ Number of Batteries: _____

Company Name: _____ Installer: _____

By registering this product with IEP, you can extend the warranty on this inverter system by three (3) months. Please register this system with IEP.

IEP SYSTEMS P.O BOX 20302, LEHIGH VALLEY, PA 18002

IEP's customer service number is: 1-610-628-1488

WARRANTY

WARRANTY

This inverter is guaranteed, under normal and proper use, against defects in workmanship and materials for a period of twelve (12) months from the date of successful start-up, or eighteen (18) months from the date of shipment, whichever occurs first. Batteries supplied as part of this system are covered under a separate pro-rated warranty described below. One (1) year from the date of successful start-up and operating temperatures. Nine (9) years pro-rated. Failure in properly storing batteries will result in permanent damage to the batteries and will void the battery warranty.

5.05 Mail In Warranty Card

**IMPORTANT - RETURN THIS CARD COMPLETED AT ONCE TO:
IEP SYSTEMS P.O BOX 20302, LEHIGH VALLEY, PA 18002**

Model Number: _____

Serial Number: _____ Date Installed: _____

System Voltage: _____ VAC Load Current: _____ Amps _____

Battery P/N: _____ Number of Batteries: _____

Installation Company: _____

Installer: _____ Contractor license number: _____

Company Name: _____

Address: _____

City: _____ State: _____ Zip: _____

E-Mail: _____ Telephone: _____

Web: _____

By registering this product with IEP, you can extend the warranty on this inverter system by three (3) months. Please register this system with IEP.

