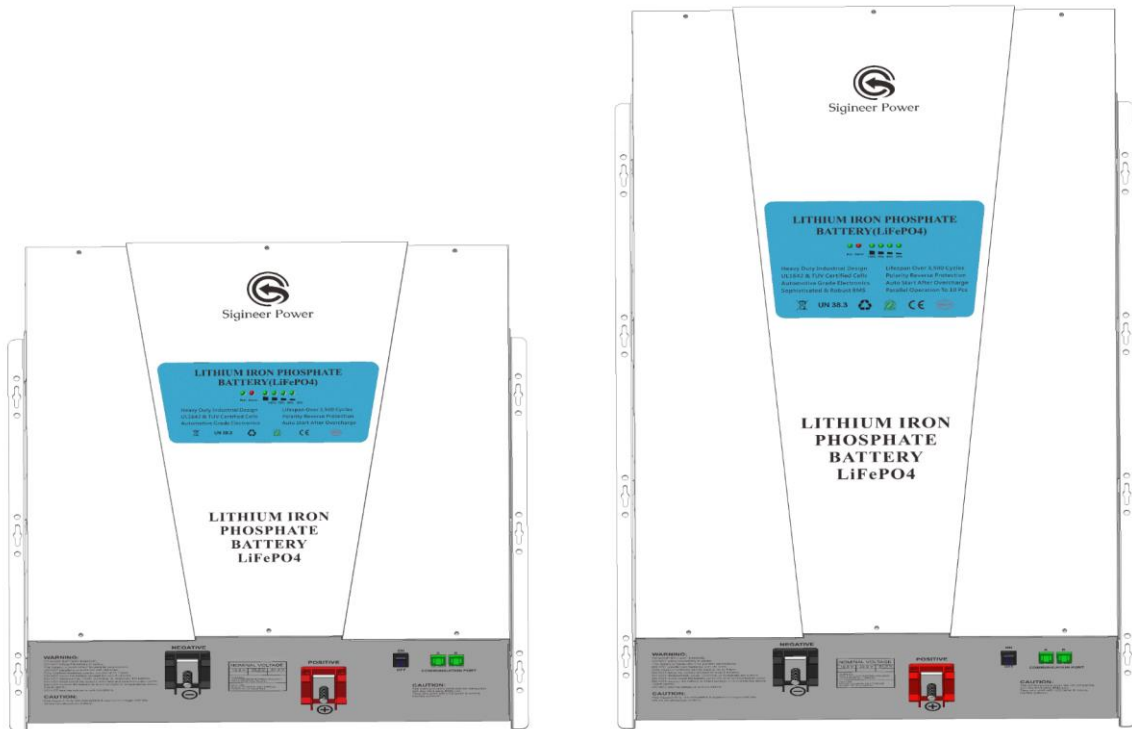


Sigineer Power Lithium Iron Phosphate Battery Pack



Version 1.2 (PN:50000-2020948)

Model #

LFP12.8V400AH

LFP25.6V400AH

LFP51.2V200AH

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Manufacturer Information

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Please record the Sigineer Power unit's model and serial number in case you need to provide this information in the future. It is much easier to record this information now than try to gather it after the unit has been installed.

Model Number:_____

Serial Number:_____

1 Important Safety Information

Save This Manual! Read this manual before installation, it contains important safety, installation and operating instructions. Keep it in a safe place for future reference.

All wiring must follow the National Electric Code, Provincial or other codes in effect at the time of installation, regardless of suggestions in this manual. All wires should be copper conductors.

Warning: Read this entire document before installing or using this product. Failure to do so or to follow any of the instructions or warning in this document can result in electrical shock, serious injury, or death, or can damage this product, potentially rendering it inoperable.

1.1 General Safety Precautions

1.1.1 For safety reasons, installers are responsible for familiarizing themselves with the contents of this document and all warnings before performing installation.

1.1.2 Over-voltages or wrong wiring can damage the battery pack and cause deflagration, which can be extremely dangerous. All types of breakdown of the product may lead to a leakage of electrolyte or flammable gas. Avoid installing the battery pack where flammable materials are stored. Do not install in places where explosive gas or chemicals are present. The utility grid, solar input, and battery voltage must be disconnected from the Battery Pack wiring. Wiring must be carried out by a qualified person.

Battery Pack is not user serviceable.

CAUTION: Equipment damage

When the battery is powered on, reverse its polarity may damage the DC loads.

Installation should ensure that the battery's DC output is, at no time, reversed with power on.

WARNING: LIMITATIONS ON USE

SPECIFICALLY, PLEASE NOTE THAT THE BATTERY SHOULD NOT BE USED IN CONNECTION WITH LIFE SUPPORT SYSTEMS OR OTHER MEDICAL EQUIPMENT OR DEVICES. WE MAKE NO WARRANTY OR REPRESENTATION IN CONNECTION WITH THEIR PRODUCTS FOR SUCH USES. USING THE BATTERY WITH THESE PARTICULAR EQUIPMENTS IS AT YOUR OWN RISK.

1.2 Precautions When Working with Batteries

Do not store this product in a place exposed to direct sunlight.

Do not expose battery to open fire or flame.

Do not place the product nearby flammables. It may lead to fire or explosion in case of accident.

Do not expose or place near water sources like downspouts or sprinklers.

A ventilated area is strongly recommended for handling the product.

Store the battery at cool and dry place. (Do not store in greenhouses and storage areas for hay, straw, chaff, animal feed, fertilizers, vegetables or fruit products.)

Store the product on a flat surface.

Store the product out of reach of children and animals.

Store the product where it should be minimal dust and dirt in the area.

Do not disconnect, disassemble or repair by unqualified personnel. Service must be made by qualified personnel only.

Do not damage the unit in such ways as dropping, deforming, impacting, cutting or penetrating with a sharp object. It may cause a leakage of electrolyte or fire.

Do not touch if liquid is spilled on the product. There is a risk of electric shock. Handle the battery wearing the insulated gloves.

Do not step on the product or the product package. The product may be damaged.

Do not place any foreign objects on the top of the Battery Pack.

Do not put the battery pack upside down on the ground.

Do not connect anode and cathode terminal block opposite direction.

Do not charge or discharge damaged battery.

If the battery pack is installed in the garage then ensure the product is above the height of the vehicle bumper.

The battery pack can only be installed indoors. If installed outdoors, do not allow the battery pack to be

exposed to direct sunlight and water source as it may cause:

- Power limitation phenomena in the battery (resulting in a decreased energy production by the system)
- Premature wear of the electrical/electromechanical components and mechanical components.
- Reduction in performance, service life and possible damage of the battery

Only use the product with supplier recommend inverter and MPPT solar charge controller.

Do not connect any AC conductors or Photo-voltaic conductors directly to the battery pack and should be only connected to the Inverter

1.3 Handling Emergency Situations

The battery comprises multiple batteries and sophisticated BMS that are designed to prevent hazards resulting from failures. However, we cannot guarantee their absolute safety if battery is mishandled.

If a user happens to be exposed to internal materials of the battery cell due to damage on the outer casing, the following actions are recommended.

Inhalation: Leave the contaminated area immediately and seek medical attention.

Eye contact: Rinse eyes with running water for 15 minutes and seek medical attention.

Contact with skin: Wash the contacted area with soap thoroughly and seek medical attention

Ingestion: Induce vomiting and seek medical attention.

If a fire breaks out in the place where the battery pack is installed, perform the following countermeasures:

Fire extinguishing media

Respirator is not required during normal operations.

Use FM-200 or CO2 extinguisher for battery fire.

Use an ABC fire extinguisher, if the fire is not from battery and not spread to it yet.

Firefighting instructions

If fire occurs when charging batteries, if it is safe to do so, power off the switch.

If the battery pack is not on fire yet, extinguish the fire before the battery pack catches fire.

If the battery pack is on fire, do not try to extinguish but evacuate people immediately

Effective ways to deal with accidents

On land: Place damaged battery into a segregated place and call local fire department or service engineer.

In water: Stay out of the water and do not touch anything if any part of the battery, inverter, or wiring is submerged.

Do not use submerged battery again and contact the service engineer.

1.3 Qualified Personnel

This guide and the tasks and procedures described herein are intended for use by skilled workers only. A skilled worker is defined as a trained and qualified electrician or installer who has all of the following skills and experience:

Knowledge of the functional principles and operation of on-grid and off-grid (backup) systems.

Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.

Knowledge of the installation of electrical devices

Knowledge of and adherence to this guide and all safety precautions and best practice

Make sure all power is off and wires/breakers are disconnected when maintaining/servicing the lithium battery

2 Introduction

2.1 General Information

Thank you for purchasing the Legend Series LiFePO4 Battery Pack.

The Legend Series LiFePO4 Battery Pack is designed with UL listed battery cells and a very sophisticated automotive grade BMS.

Packed with unique features, it is one of the most technically advanced lithium battery pack on the market. Its strong BMS can be discharged at 1C and charged at 0.5C.

Suitable for applications such as Industrial/ Household/ Commercial/ Land Vehicle/ Solar Energy Storage

More features are listed below

2.3 Battery Features

***Heavy Duty Industrial Design**

The DC terminal of the battery is rated at 500 amps and the enclosure structure is designed to withstand the strong vibrations from vehicles & boats.

***UL1642 & TUV Certified Battery Cells Ensures Long Lifespan of 3,500 Cycles at 80% DOD, 6000 Cycles at 60% DOD.**

***Sophisticated BMS with Automotive-Grade Electronics**

Unlike other MOSFETs based BMS on the market, our BMS is designed with high current DC contactor with much higher reliability. Apart from the software protection, we have two layers of hardware protection: DC contactor and fuse. These protections ensure the cells will be well protected in the event of abnormalities.

***Polarity Reverse Protection For DC Loads**

When the MOSFETs based BMS is powered on, it will immediately output full current without detecting the polarity of the connected DC loads, this high current will inevitably result in the load damage when the battery polarity is reversed.

While for our DC contactor based BMS, we have a detector for polarity, once the load polarity is reversed, the battery will not be powered up.

The protection only works at start up, if the battery is already powered on before the polarity reverse, the load could still be damaged.

***Auto Recovery After Overcharge Protection**

For the Sigineer BMS, the BMS will be automatically recovered when overcharge releases condition is met. The battery pack will output power automatically.

***Parallel up to 10 pcs**

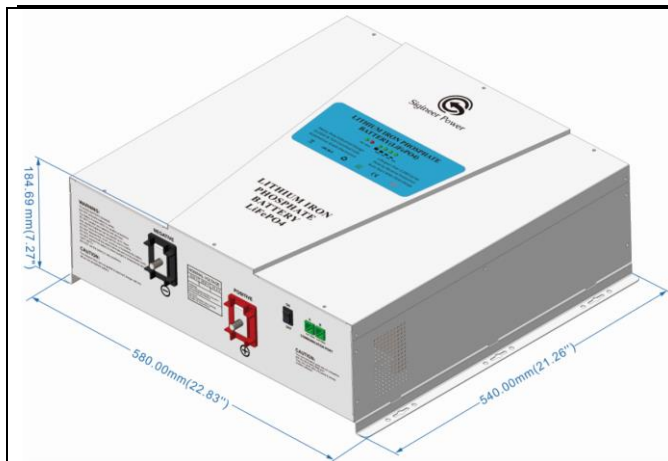
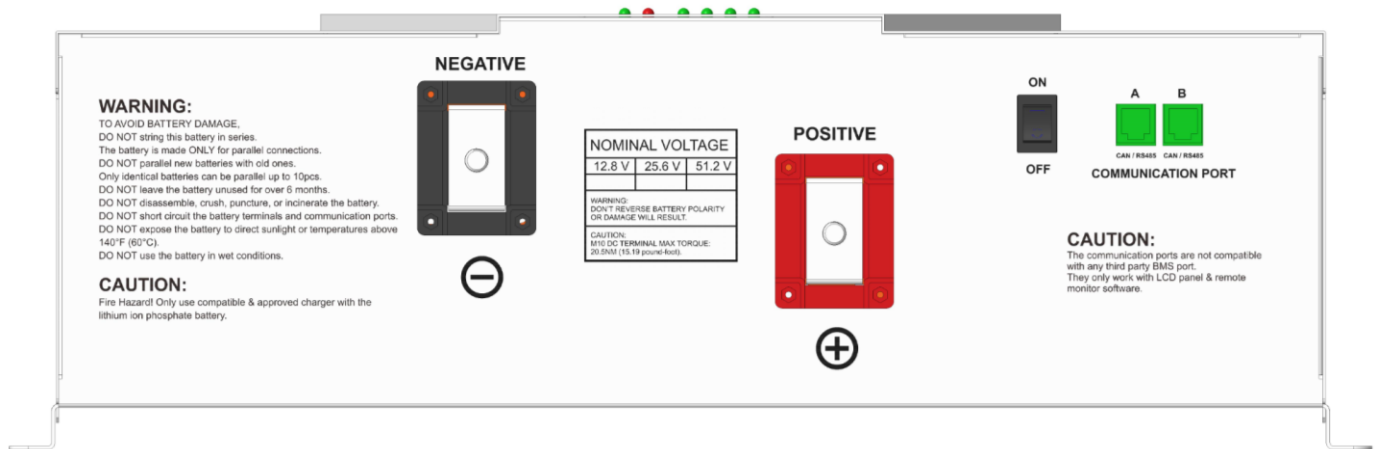
***Remote LCD Display & Computer Monitor Available**

***Independent Operation Without BMS port**

Most lithium battery packs on the market need to communicate with inverters to avoid overcharge or discharge damage. The reason for this is that the MOSFET based BMS can't give the battery full protections if the battery doesn't know the inverter status. For our packs, the automotive grade BMS prevents the battery from these risks even the battery to inverter communication is not available.

2.3 Mechanical Drawing

DC SIDE



LFP12.8V400AH



LFP25.6V400AH
LFP51.2V200AH

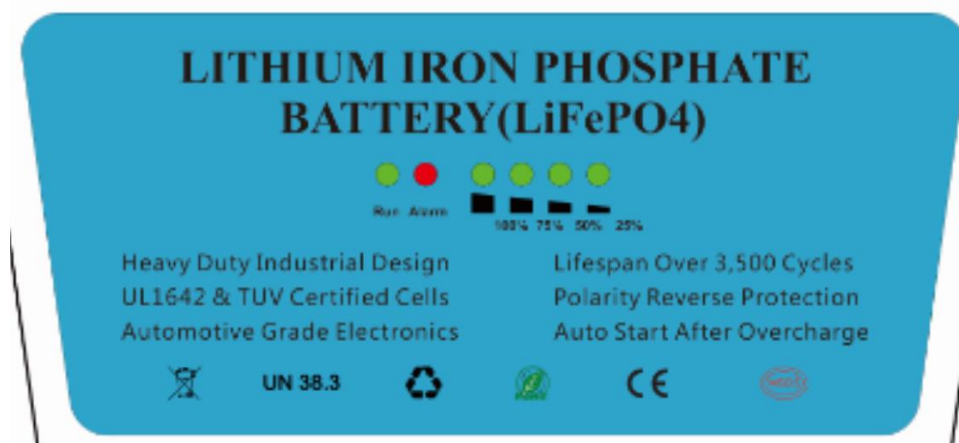
2.4 Battery Specification

Model #	LFP12.8V400AH	LFP25.6V400AH	LFP51.2V200AH
Nominal voltage	12.8V	25.6V	51.2V
Battery Voltage	48V	48V	48V
Rated Capacity	400AH	400AH	200AH
Rated Energy	5.12kWh	10.24kWh	10.24kWh
Output Voltage Range	10-14.6V	20-29.2V	40-58.4V
Battery Cell Type	Prismatic Pouch	Prismatic Pouch	Prismatic Pouch
Battery Cell	3.2V100AH	3.2V100AH	3.2V100AH
Battery Cell Configuration	16 strings	16 strings	16 strings

Rated Charge Voltage	14V	28V	56V
Max Charge Voltage	14.2V	28.4V	56.8V
Over Charge Protection	14.6V	29.2V	58.4V
Charge Mode	CC-CV	CC-CV	CC-CV
Over Discharge Protection	10V	20V	40V
Rated Charge Current	200A	200A	100A
Rated Discharge Current	400A	400A	200A
Peak Discharge Current	400A	400A	200A
Reverse Polarity Protection	Yes	Yes	Yes
Lifespan 25℃	>10 Years		
Cycle Life	> 3500 times [80%DOD,@20℃]		
Charge Temp Range	0℃ ~ 55℃ /32 ℱ-131 ℱ		
Discharge Temp Range	/-20℃ ~ 65℃ /-4 ℱ ~ 149 ℱ		
IP Level	IP21		
Storage temperature	0℃~40℃/32 ℱ-104 ℱ		
Self Discharge Rate	≤3% monthly		
Communication	RS232 / RS485 / CAN		
Unit Size (W×D×H)	580*540*185/22.8*21.3*7.3"	860*580*185/33.9*22.8*7.3"	860*580*185/33.9*22.8*7.3"
Shipping Size (W×D×H)	700*680*340mm	1000*700*350mm	1000*700*350mm
Net Weight	53KG/116lbs	90KG/198lbs	92KG/203lbs
Gross Weight	60KG/130lbs	100KG/220lbs	102KG/224lbs
Storage Temp & Period	6 Months @+25℃	3 Months @+35℃	1 Months @+45℃
Regular Transportation	UN38.3		
Warranty	3-Year		

2.4 BMS Specification

2.5 LED Indication



The 6 LED indicators on the front panel show the battery pack operational state as below:

RUN LED(Green)	Constantly On: Normal Operation
Alarm LED(Red)	Flash once/3S: Warning
	Flash once/1S: Protection Triggered
	Constantly On : Fault
SOC LEDs (4 Green)	<p>In Charge Mode</p> <p>SOC<25%, LED1, LED2, LED3, LED4 flash in turn</p> <p>25%<SOC <50%, LED1 Constant On, LED2, LED3, LED4 flash in turn</p> <p>50%<SOC<75%, LED1, LED2 Constant On , LED3, LED4 flash in turn</p> <p>75%<SOC<95%, LED1, LED2, LED3 Constant On , LED4 flash</p> <p>SOC>95%, LED1, LED2, LED3, LED4 Constant On</p> <p>In Discharge Mode</p> <p>SOC< 10%, LED1, LED2, LED3, LED4 off</p> <p>10%<SOC<25%, LED1 flash, LED2, LED3, LED4 off</p> <p>25% <SOC<50%, LED1 Constant On, LED2 flash, LED3, LED4 off</p> <p>50% <SOC <75%, LED1, LED2 Constant On, LED3 flash, LED4 off</p> <p>SOC>75%, LED1, LED2, LED3 Constant On, LED4 flash</p>

3 Installation

3.1 Location

Follow all the local regulations to install the Battery.

Please install the equipment in a location of Dry, Clean, Cool with good ventilation.

Working temperature: - 10°C to 40°C (-14°F to 104°F)

Storage temperature: - 40°C to 70°C (-40°F to 158°F)

Relative Humidity: 0% to 95%, non-condensing

Cooling: Forced air

Warning! Operation in a condensing environment will invalid warranty.

3.2 DC Wiring Recommendation

It is suggested the battery bank be kept as close as possible to the inverter. The following table is a suggested wiring option for DC cable with length from 1 meter to 5 meters.

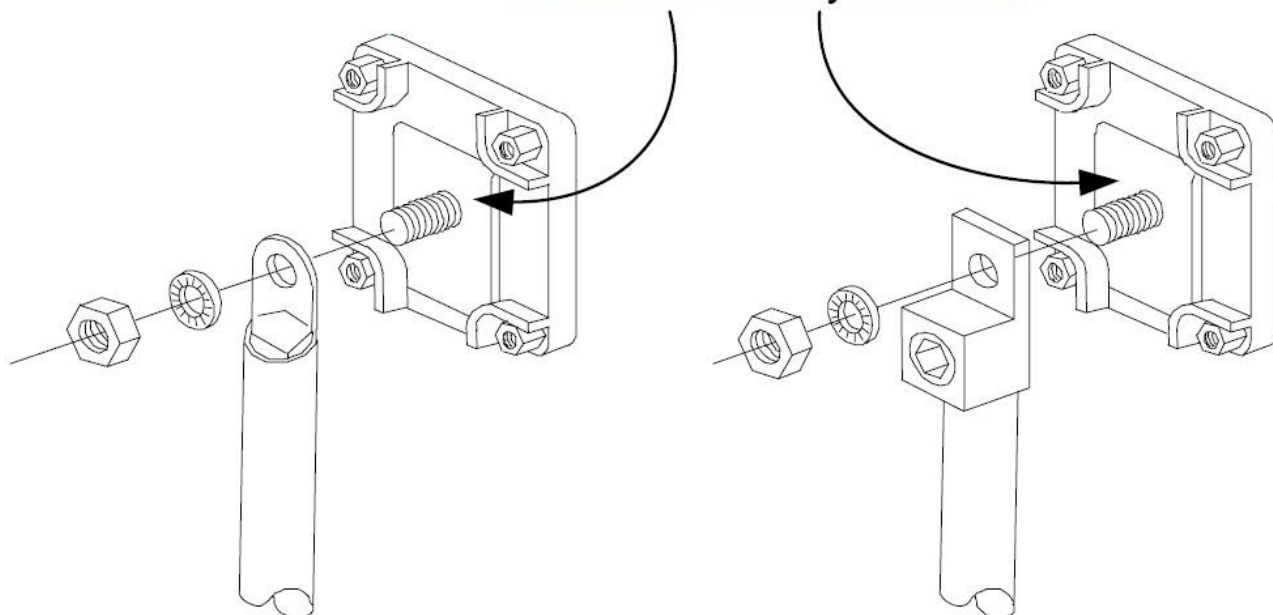
Please follow the above minimum wire size requirement.

One cable is always best, but if there is a problem obtaining for example 100mm² cable, use 2*50mm² or 3*35mm² instead, as long as the square area adds up. Performance of any product can be improved by thicker cable and shorter runs, so if in doubt round up and keep the length as short as possible.

Battery cables must have crimped (or preferably, soldered and crimped) copper compression lugs unless aluminum mechanical lugs are used. Soldered connections alone are not acceptable. High quality, UL-listed battery cables are available. These cables are color-coded with pressure crimped, sealed ring terminals.

Battery terminal must be clean to reduce the resistance between the DC terminal and cable connection. A buildup of dirt or oxidation may eventually lead to the cable terminal overheating during periods of high current draw. Use a stiff wire brush and remove all dirt and corrosion from the battery terminals and cables.

Do not place anything
between battery cable lug
and terminal surface.
Assemble exactly as shown.



2/0 Copper Compression Lug

2/0 Aluminum Mechanical Lug

Reducing RF interference

To reduce the effect of radiated interference, twist the DC cables. To further reduce RF interference, shield the cables with sheathing /copper foil / braiding.

Taping battery cables together to reduce inductance

Do not keep the battery cables far apart. In case it is not convenient to twist the cables, keep them taped together to reduce their inductance. Reduced inductance of the battery cables helps to reduce induced voltages. This reduces ripple in the battery cables and improves performance and efficiency.



WARNING

The torque rating range for DC terminal is 12.5NM-20.5NM(9.25-15.19 pound-foot), and the suggested torque rating is 17NM(12.6 pound-foot). Over torquing may cause the bolt to break.

Equipment Damage

The battery is reverse polarity protected at start up. Reversing the battery polarity when it is powered on could damaged your DC loads.

3.3 Grounding

Connect an AWG 8 gauge or greater copper wire between the grounding terminal on the battery and the earth grounding system or the vehicle chassis.

3.4 Mounting Flange

5 Warranty

We warrant this product against defects in materials and workmanship for a period of one year from the date of purchase and will repair or replace any defective High Power Inverter when directly returned, postage prepaid, to manufacturer. This warranty will be considered void if the unit has suffered any obvious physical damage or alteration either internally or externally and does not cover damage arising from improper use such as plugging the unit into an unsuitable power sources, attempting to operate products with excessive power consumption requirements, reverse polarity, or use in unsuitable climates.

WARRANTY DOES NOT INCLUDE LABOR, TRAVEL CHARGES, OR ANY OTHER COSTS INCURRED FOR REPAIR, REMOVAL, INSTALLATION, SERVICING, DIAGNOSING OR HANDLING OF EITHER DEFECTIVE PARTS OR REPLACEMENT PARTS. THE WARRANTOR ASSUMES NO LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND.

LOSS OR DAMAGE: Loss or damage in transit is the responsibility of the carrier. Any claim should be filed with the delivering transport company. Invoice, Bill of Lading and Delivery receipt with damage noted therein must accompany any claims for freight damage. Claims for shortage and lost shipments must be made in writing to the shipper within 3 days of the receipt of shipment. Claims not reported within this time frame will not be honored.

This warranty does not apply to and we will not be responsible for any defect in or damage to:

- a) the product if it has been misused, neglected, improperly installed, physically damaged or altered, either internally or externally, or damaged from improper use or use in an unsuitable environment; violations of the warnings in the manual will invalid the warranty.
- b) the product if it has been subjected to fire, water, generalized corrosion, biological infestations, or input voltage that creates operating conditions beyond the maximum or minimum limits listed in the product specifications including high input voltage from generators and lightning strikes;
- c) the product if repairs have been done to it other than by us or its authorized service centers;

SAVE THIS MANUAL!

**READ THIS MANUAL BEFORE INSTALLATION, IT
CONTAINS IMPORTANT SAFETY, INSTALLATION AND
OPERATING INSTRUCTIONS. KEEP IT IN A SAFE PLACE
FOR FUTURE REFERENCE.**

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