

XP125 INSTALLATION AND OPERATION MANUAL



# EXELTECH

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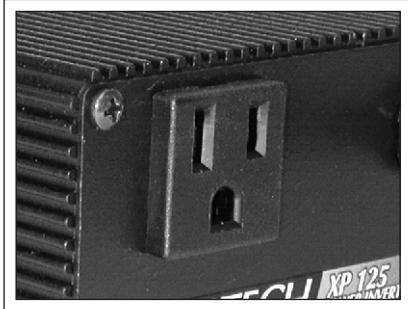


Manufacturer of UL Listed Products

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## Introduction

### 1.0

Thank you for purchasing the finest sine-wave inverter in the power conversion industry. Exeltech's journey to excellence includes the first affordable sine wave inverter, first modular inverter system, first N+1 redundant inverter system, and the cleanest sine wave output in the industry. Exeltech strives to manufacture products of the highest possible quality, and is dedicated to 100% customer satisfaction. Proudly built in the USA with American parts, Exeltech is committed to ISO 9000 standards and beyond, adding people and procedures continually to further improve quality and customer service. We welcome you as a customer to the Exeltech family. Congratulations!

XP series inverters provide the cleanest, best regulated sine wave output over the widest DC input of any inverter on the market today. They are extremely low in Total Distortion; specified to 2%, and typically better than 1.5%. Total Harmonic Distortion is typically 0.8 to 0.9%. Remaining distortion is a result of residual switching noise, which amounts to a very clean 25 KHZ sine wave superimposed on the fundamental output. No significant harmonics of 25 KHZ exist. This spectral purity will exist over the inverter's entire operating envelope, including non-linear and reactive loads. As long as peak output current remains less than 300% of rated current, total harmonic distortion will remain within the 2% spec. Peak current capability of the inverter is key to understanding it's operational envelope. As long as the inverter is supplying less than this amount, it will function properly and operate virtually any load.

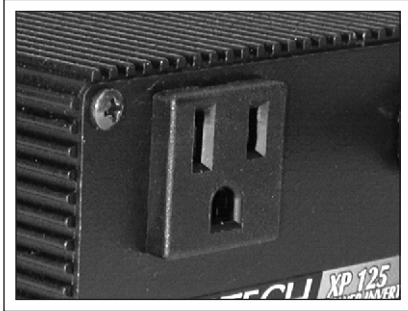
Many inverters are rated in Volt-Amps (VA), as opposed to Watts. This is in an attempt to make an inverter or UPS (Uninterruptible Power Supply) appear larger than it really is. The only fair way to

specify these products is in Watts (W), which is power the inverter can actually deliver. If Exeltech inverters were specified in VA, Our 1100 Watt inverter could be rated at 1375 VA at .8 power factor, 1570 VA @ .7 pf, or an incredible 2200 VA @ .5 pf. It is confusing to specify a product in VA, because the power factor must also be specified. Exeltech's XP-Series inverters can output their full rated power continuously at 30° C (86° F).

The inverter can maintain a spectrally pure output with any load, due to a specially designed non-linear control loop in the primary DC to DC converter. This circuitry is one of three circuits which protect the inverter from any overload condition.

#### **XP-125**

These inverters are capable of exceeding their rated power by 10% for a limited time. The inverter's capability at this level is primarily dependant upon temperature. If output power is exceeded, output voltage is reduced to a level which will provide the inverter's rated power to the load by clipping tops of the waveform. The inverter can operate safely in this mode indefinitely. Should the overload condition clear, the inverter will again provide the cleanest Sine Wave in the industry.



## Standard Features 2.0

**DC INPUTS (12 VDC - 108 VDC):** a 3' non-terminated, two-conductor power cord is provided. Insulation on the **negative (-) conductor is black** and insulation on the **positive (+) conductor is red**.

**AC OUTPUTS:** one NEMA-15 outlet (standard wall receptacle) is located on the Front Panel.

**LOW BATT / THERM BUZZER:** produces an audible alarm if DC input voltage falls to a level within 2% to 4% of the low limit of inverter, or, if there is an over temperature condition.

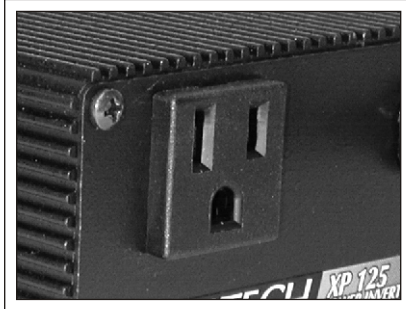
**OVER VOLTAGE PROTECTION:** If input voltage to the inverter exceeds set limits, the inverter will immediately and without warning shut off. When input voltage returns to normal range, the inverter will immediately restart. Since high over voltages tend to have very fast edges, the inverter must shut down quickly to protect itself. This kind of fault usually occurs if the battery is suddenly disconnected from the system and the battery charger continues to supply current.

**UNDER VOLTAGE PROTECTION:** When battery voltage falls to within 2% to 4% of low line voltage, the LOW BATT / THERM buzzer will sound. If the condition continues without reducing load to the inverter or adding charge to the battery, the inverter will shut off. When voltage rises to approximately 95% of nominal battery voltage, the inverter will turn back on and the alarm condition will clear. The inverter can be manually reset by cycling the on/off switch. This will reset the protection circuitry and turn the inverter on at any voltage above minimum voltage.

**OVER TEMPERATURE PROTECTION:** The inverter is also

protected against overheating. It will provide its full rated output up to the temperature listed in the specification sheet. If it is subjected to higher ambient temperatures or air circulation is blocked, the inverter may overheat. If the LOWBATT/ THERM buzzer sounds, immediate action is required or the inverter will shut down. Either reduce load, or provide more cooling in the immediate environment. If no action is taken, the inverter will likely shut down within 2 minutes. When the inverter shuts down, the alarm condition will persist. Since the inverter has eliminated its load, it will cool fairly quickly. It will automatically restart when it has cooled sufficiently, and the LOW BATT/THERM alarm will clear. A warning alarm buzz will occur 5 C before shut off.

If output power is exceeded, output voltage is reduced to a level which will provide the inverter's rated power to the load by clipping tops of the waveform. The inverter can operate safely in this mode indefinitely. The overpower protection circuit will recover instantly when the overpower condition clears.



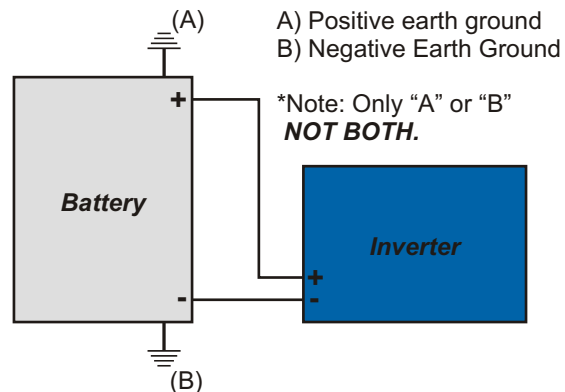
## Installation

### 3.0

**CAUTION:** It is essential to read and understand all Warnings, Cautions, and Notes before any connections are made to the Unit or System. If further assistance is needed call (817)595-4969 and ask for Customer Service.

**WARNING:** The inverter is designed to operate from a Battery. Performance cannot be guaranteed, and damage can result when a charger or power supply is used without a battery in the circuit.

**WARNING:** The AC neutral lead is internally bonded to chassis; chassis should be bonded to earth ground through the external ground connector that is located on the unit. The Negative or Positive terminal of the battery (DC Source) must be bonded to earth ground; it is recommended that it be to the same earth ground used for AC ground. Refer to the figure below for wiring illustration.



**CAUTION:** Before any connections are made to the Unit or System, be sure to disconnect the battery terminals. Always disconnect the grounded battery terminal first. When re-connecting, connect ungrounded terminal first, and grounded terminal last.



**CAUTION:** Polarity of leads is critical to avoid damage to the unit or system. Check batteries and battery cables for correct polarity and voltage.

**CAUTION:** Observe all National and Local Electric Codes when connecting AC Power Connections.

### **INSTALLATION (Location)**

Mounting location is critical to performance and life span of the inverter. Heat and Moisture are the two worst enemies of any electronic device. Therefore when choosing a mounting location, consider the following requirements listed in order of importance:

1. Inverter must be sheltered from the elements. Select a clean, dry location.
2. Inverter requires adequate ventilation for cooling. With proper cooling, the inverter will operate efficiently and meet its published ratings. All models can be mounted in several positions. Best position, face down. Second best, horizontal. Third, vertical with face up. Least preferred, upside down.
3. Inverter should be mounted as close to the battery as possible. Shorter wire has less resistance, which translates to increased efficiencies.

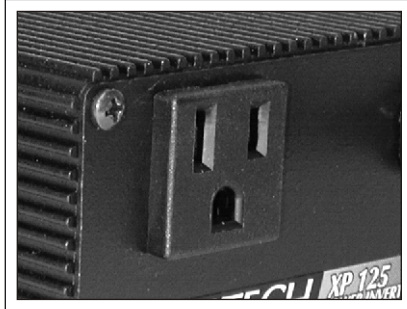
### **INSTALLATION (Wiring)**

An in line fuse is recommended, to protect the battery and wiring to the inverter. This fuse should be located very close to the battery positive (+) terminal. To select appropriate size fuse, consult the "Rated and Peak Current" table in appendix "A".

**XP-125 / 12-108VDC (Rev. 2);** has a two-conductor, 3' long, power cord provided on the Front Panel which is not terminated. \*Conductor with **Red** is **Positive (+)**, and conductor with **Black** is **Negative (-)**.

1. Make connections to the battery, observing polarity.

2. Since this model has no On/Off switch, a DC Relay and external Toggle switch may be employed to turn the unit on and off. (See Appendix “B”)
3. Disconnect the **grounded (-)** terminal of battery and make sure the charger and inverter are off.
4. Make DC input connections to the inverter as illustrated in Appendix “B”.



## Operation

### 4.0

#### TURN ON INVERTER:

**XP-125:** The inverter is on when DC input is connected and within specified range. (See “POWER INVERTER SPECIFICATIONS” sheet for operating range).

#### TURN ON APPLIANCE/LOAD:

1. Check Input Power Requirements of the appliance. Make sure that it is less than Rated Output Power of the inverter. If more than one appliance will be run simultaneously, the sum of their Input Power Requirements must be less than Rated Output Power of the inverter.
2. Plug the appliance into the provided receptacle on Front Panel, then turn appliance on.

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## APPENDIX A

### Input Power Requirements:

MODEL	NORMAL <sup>1</sup> VDC TYPICAL	MINIMUM VDC <sup>1</sup> CUT-OFF / ALARM TYPICAL	MAXIMUM <sup>1</sup> VDC TYPICAL	RATED CURRENT	PEAK CURRENT
XP-125 / 12VDC	13.8 VDC	10.4 / 10.6 VDC	16.5 VDC	12.3 A	13.9 A
XP-125 / 24VDC	27.6 VDC	19 / 21 VDC	33 VDC	6.1 A	7 A
XP-125 / 48VDC	55.2 VDC	41.5 / 42.5 VDC	62 VDC	3.1 A	3.5 A
XP-125 / 66VDC	75.9 VDC	57.5 / 58.5 VDC	91 VDC	2.2 A	2.5 A
XP-125 / 108VDC	124.0 VDC	94 / 95 VDC	149 VDC	1.4 A	1.6 A

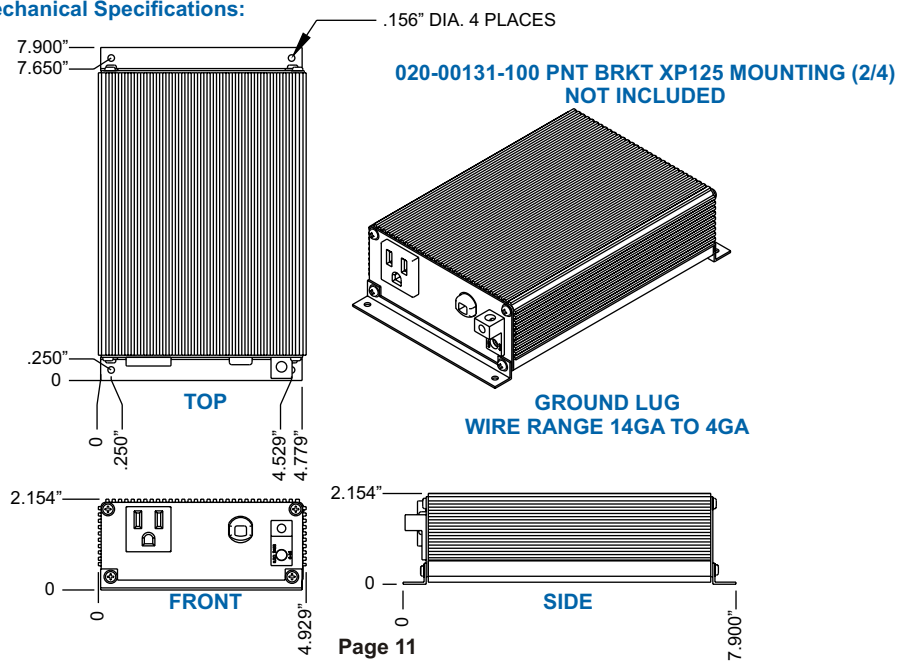
<sup>1</sup> +/- 3%

### Recommended Input Wire Sizes (For Variable Distances from the Battery):

MODEL	LESS THAN 5'	LESS THAN 10'	LESS THAN 15'	LESS THAN 20'
XP-125 / 12VDC	10 AWG	8 AWG	6 AWG	4 AWG
XP-125 / 24VDC	16 AWG	12 AWG	12 AWG	10 AWG
XP-125 / 48VDC	18 AWG	18 AWG	18 AWG	16 AWG
XP-125 / 66VDC	18 AWG	18 AWG	18 AWG	18 AWG
XP-125 / 108VDC	18 AWG	18 AWG	18 AWG	18 AWG

**Note:** The table specifies standard wire sizes (not smaller than 18 AWG) that will provide less than a 2% voltage drop at Low-line Input voltage and Rated Output Power.

### XP-125 Mechanical Specifications:



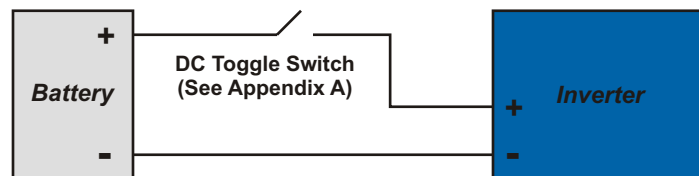
## APPENDIX B

**BAT+ & BAT-** Bat+ is designated by the **RED WIRE/CONNECTOR**, Bat- is designated by the **BLACK WIRE/CONNECTOR**. Be careful to observe proper polarity.

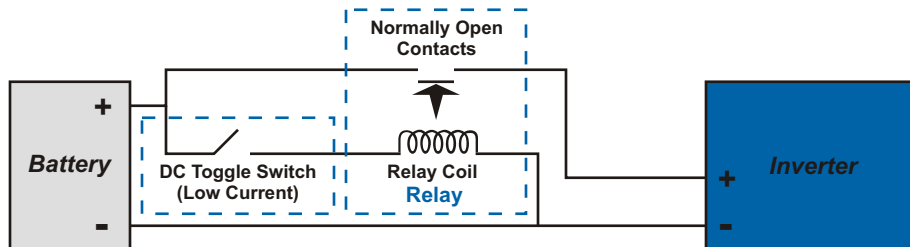
**CHAS** Chassis, or **EARTH GROUND**. This should be connected to the ground lug located on the front plate of the inverter.

**NEUT** Neutral or return line of the AC output. This is internally connected to chassis or EARTH GROUND.

### XP-125 with DC Toggle Switch:



### XP-125 with DC Relay:

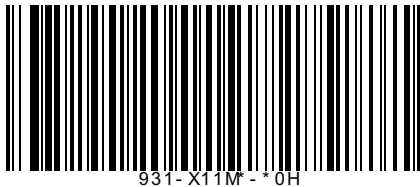


## INSTALLATION

**CAUTION:** Be sure to disconnect all DC power to installation wiring. Be sure to disconnect both batteries and chargers which may be connected. Make all connections to the inverter **BEFORE** connecting DC power to the battery.

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