



## CESC Sidecar Installation Manual

*Effective: March, 2004*

*Power* Alpha Technologies ®

---

# CE Sidecar Enclosure Installation Manual

**031-106-C1-001, Rev. A**  
**Effective Date: March, 2004**  
**Copyright© 2004**  
**Alpha Technologies, Inc.**



**NOTE:** Alpha denies responsibility for any damage or injury involving its enclosures, power supplies, generators, batteries, or other hardware when used for an unintended purpose, installed or operated in an unapproved manner, or improperly maintained.



**NOTE:** Photographs contained in this manual are for illustrative purposes only. These photographs may not exactly match your installation.



**NOTE:** Review the drawings and illustrations contained in this manual before proceeding. If there are questions regarding the safe operation of this powering system, please contact Alpha Technologies or your nearest Alpha representative.

## Contacting Alpha Technologies:

For general product information and customer service

**1-800-863-3930**

*(7:00 AM to 5:00 PM Pacific Time )*

For complete technical support

**1-800-863-3364**

*(7:00 AM to 5:00 PM Pacific Time, or 24/7 emergency support)*

# ALPHAGEN™

## Table of Contents

1. Introduction .....	9
2. Installation .....	10
2.1 Concrete Pad Preparation .....	10
2.2 Utility Power Connection .....	11
2.3 Generator / Sidecar Inter-connecting Cables .....	15
2.4 Internal Components .....	16
2.5 Battery Pack Wiring .....	17
2.6 Power Supply Placement .....	18
2.7 Battery Remote Temperature Sensor (RTS) .....	19
2.8 Service Power Inserter .....	20

## List of Figures

Fig. 1 Sidecar and generator enclosure .....	9
Fig. 2 Pad layout .....	10
Fig. 3 Service Entrance wiring .....	13
Fig. 4 Meter base wiring .....	14
Fig. 5 Interconnection wiring .....	15
Fig. 6 Fan connections .....	16
Fig. 7 Location of IPP, SPI, and ground rail .....	16
Fig. 8 36- & 48-volt battery string wiring .....	17
Fig. 9 Power supply on shelf .....	18
Fig. 10 Location of temperature sensor .....	19
Fig. 11 Seizure screw assembly location .....	20
Fig. 12 Cable connection .....	20
Fig. 13 Location of SPI .....	20

## List of Tables

Table 2-1 Circuit Breaker Requirements .....	11
--	----

## Important Safety Instructions Contained in This Manual



To reduce the risk of electrical shock, injury or death caused by explosion of fuel or moving parts, and to ensure the safe operation of this unit, the following symbols have been placed throughout the manual. Where these symbols appear, servicing should be performed only by qualified personnel.



### **DANGEROUS VOLTAGE**

This symbol indicates a “dangerous voltage” exists in this area of the product. Use caution whenever working in the area to prevent electrical shock.



### **INHALATION HAZARD - DON'T BREATHE VAPORS**

This symbol indicates an “inhalation hazard” exists in this area of the product. Use caution whenever working in the area to prevent possible inhalation of harmful (fuel or exhaust) vapors.



### **NO MATCHES OR OPEN FLAMES**

This symbol indicates a fire or explosive hazard exists in this area of the product. Use caution whenever working in the area to prevent possible combustion fuel vapors.



### **MECHANICAL OR MOVING PARTS HAZARD**

These symbols indicate the presence of a “mechanical or moving parts hazard” in this area of the product. Use caution whenever working in the area to prevent possible injury to the operator or service personnel.



### **LEAK HAZARD**

This symbol indicates a “leak hazard” exists in this area of the product. Use caution whenever working in the area to prevent and correct any leaks detected.



### **CRUSH HAZARD**

This symbol indicates the presence of crushing hazard in this area. Keep hands clear of areas under extended battery trays and equipment drawers.



### **ATTENTION**

This symbol indicates important installation, operation or maintenance instructions. Always follow these instructions closely.

## Preface



A “Warning” identifies conditions and actions that pose a hazard to the user.



A “Caution” identifies conditions and actions that may damage the power supply or associated equipment.

### Warnings



**NOTE:** This power supply and its associated hardware (enclosure, batteries, cabling) may contain equipment, batteries or parts which have accessible hazardous voltage or currents.

*To avoid injury:*

- This power supply and its associated hardware must be serviced by authorized personnel only.
- The enclosure which contains the power supply and associated equipment must remain locked at all times, except when authorized service personnel are present.
- Remove all conductive jewelry or personal equipment prior to servicing equipment, parts, connectors, wiring, or batteries.
- Read and follow all installation, equipment grounding, usage, and service instructions included in this manual.
- Use proper lifting techniques whenever handling equipment, parts, or batteries.
- Batteries contain dangerous voltages, currents and corrosive material. Battery installation, maintenance, service and replacement must be performed by authorized personnel only.
- Never use uninsulated tools or other conductive materials when installing, maintaining, servicing or replacing batteries.
- Use special caution when connecting or adjusting battery cabling. An improperly connected battery cable or an unconnected battery cable can result in arcing, a fire, or possible explosion.
- A battery that shows signs of cracking, leaking or swelling must be replaced immediately by authorized personnel using a battery of identical type and rating.
- Avoid any contact with gelled or liquid emissions from a valve-regulated lead-acid (VRLA) battery. Emissions contain dilute sulfuric acid which is harmful to the skin and eyes. Emissions are electrolytic, which are electrically conductive and are corrosive. Follow the Chemical Hazards notes if contact occurs.
- Do not smoke or introduce sparks in the vicinity of a battery.

## Battery Safety Notes

Lead-acid batteries contain dangerous voltages, currents and corrosive material. Battery installation, maintenance, service and replacement must be performed by authorized personnel only.

### Chemical Hazards



**NOTE:** Any gelled or liquid emissions from a Valve-Regulated lead-acid (VRLA) battery contain dilute sulfuric acid, which is harmful to the skin and eyes. Emissions are electrolytic, which are electrically conductive and corrosive.

*To avoid injury:*

- Wear protective clothing (insulated gloves, eye protection, etc) whenever installing, maintaining, servicing, or replacing batteries.
- If any battery emission contacts the skin, wash immediately and thoroughly with water. Follow your company's approved chemical exposure procedures.
- If any battery emission contacts the eye, wash immediately and thoroughly with water for 10 minutes with pure water or a special neutralizing eye wash solution and seek immediate medical attention. Follow your company's approved chemical exposure procedures.
- Neutralize any spilled battery emission with the special solution contained in an approved spill kit or with a solution of 1 lb. bicarbonate of soda to 1 gal. of water. Report chemical spill using your company's spill reporting structure and seek medical attention if necessary.
- Always replace batteries with those of an identical type and rating. Never install old or untested batteries.
- Do not charge batteries in a sealed container. Each individual battery should have at least 0.5 inches of space between it and all surrounding surfaces to allow for convection cooling.
- All battery compartments must have adequate ventilation to prevent an accumulation of potentially dangerous gas.

## **Important Installation Notes**

---

The system must be installed **ONLY** by qualified service personnel.

Consult local utility codes for additional cabinet grounding and utility requirements.

ALPHA TECHNOLOGIES is not responsible for broken welds or other damage to the cabinet caused by improper installation.

All dimensions are given in inches.

For further information regarding this installation, contact ALPHA TECHNOLOGIES or your nearest ALPHA representative.



**NOTE:**

Alpha Technologies' products are subject to change through continual improvement processes. Therefore, specifications and/or design layouts may vary slightly from descriptions included in this manual. Updates to the manual will be issued when changes affect form, fit or function.

**Save these instructions for future reference**

## 1.1 Enclosure Introductions

The CESC enclosure is a cost effective 'all in one' power system. The side car provides for a single power module, batteries, and generator in a low profile minimum footprint design.

This procedure describes the installation of a side car to an AlphaGen generator, PN-3B or CE3X2B enclosure.



Fig. 1 Sidecar and Generator Enclosure

## 2. Installation

### 2.1 Concrete Pad Preparation

Pads can either be poured on site, or precast by Alpha Technologies. The mounting holes on the bottom of the high security PN-3 will fit both a standard PN-3 pad, and a CE3X pad. Precast pad model number PCC-SC-3X, Alpha P/N 641-061-10 or PCD-SC-3X, Alpha P/N 641-064-10 (east coast) are available for this system.

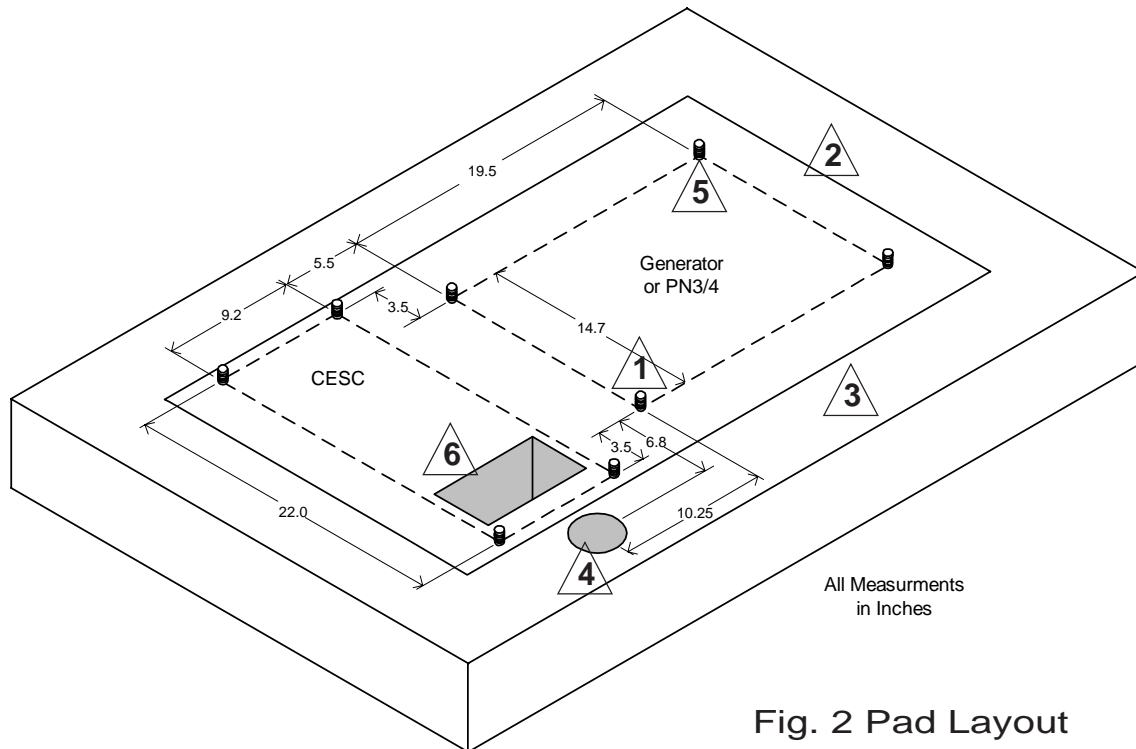


Fig. 2 Pad Layout

- 1 All measurements are indexed to the front left generator mounting stud.
- 2 Indicates outline of enclosure.
- 3 Alpha standard; recommended distance (6" minimum) between edge of pad and cabinet.
- 4 Four inch diameter hole for AC power IN (non-metered installation).
- 5 All mounting hardware must be stainless, galvanized, or better to prevent corrosion.
- 6 5" x 8" rectangular cutout for all internal connections including: generator power and/or coax cable conduit sweeps. Position between mounting studs not critical.

A 25+ year continuous vapor barrier must be used between the enclosure and the pad to prevent moisture ingress and possible corrosion caused by metal to concrete contact. The vapor barrier material (such as 30 lb felt, neoprene pond liner, or heavy grade tar paper) must be initially extended at least 6" in all directions around the perimeter of the enclosure. After the enclosure is secured to the pad, the material can be cut closer to the enclosure, using the appropriate knife or cutting tool.

## 2.2 Utility Power Connection


**CAUTION:**

The “Utility Power Connection” procedure must **ONLY** be performed by qualified service personnel and in compliance with local electrical codes and common safety practices. Connection to utility power must be approved by the local utility before installing the power supply.


**NOTE:**

UL and NEC require that a service disconnect switch (UL listed) be provided by the installer and be connected between the power source and the ALPHA power supply. Connection to the power supply must include an appropriate service entrance weather head.

### Wiring the Utility Service


**NOTE:**

A “high-magnetic” trip circuit breaker must be used in order to accommodate the high-inrush currents normally associated with the start-up of ferroresonant transformers (400 Amp, no-trip, first half cycle). Do not replace this circuit breaker with a conventional service entrance circuit breaker. Alpha recommends Square D circuit breakers **ONLY**, because of increased reliability in this powering application.

Alpha Technologies offers a high-magnetic Square D circuit breaker and a BBX option (a UL Listed service entrance). Contact your local sales representative for more information.

Description	Alpha Part Number	Square D Part Number
240V Installation — HACR (15A)	470-224-10	QO215
120V Installation — High-magnetic (20A)	470-017-10	QO120HM
120V Installation — High-Magnetic (15A)	470-013-10	QO115HM
BBX — External Service Disconnect	020-085-10	QO2-4L70RB
BBX — External Service Disconnect	020-141-10	QO8-16L100RB

Table 2-1 Service Entrance Circuit Breaker Requirements

In most cases, the following configurations (see next page) qualify for service entrance use, however, other codes may apply. Always contact your local utility to verify that the wiring conforms to applicable codes.

## 2. Installation

### 2.2 Utility Power Connection, *continued*

#### **240VAC Service**

(XM Series 2 915-240 Power Supply; XM Series 2 922-48 for UPE-4 and UPE-8): Enclosures used with the XM Series 2 915-240 or 922-48 are equipped with a 240VAC duplex receptacle to provide power to the power supply and peripheral equipment. The receptacle, NEMA 6-15R, is protected by a single, 2-pole, common trip 15 Amp circuit breaker located inside the service entrance. Wiring is typically 14AWG per NEC code, a grounding clamp, located on the enclosure, facilitates dedicated grounding.

#### **120VAC 20A Service**

(XM Series 2 915-120 Power Supply): Enclosures used with the XM Series 2 915-120 are equipped with a 120VAC duplex receptacle to provide power to the power supply and peripheral equipment. The receptacle, NEMA 5-20R, is protected by a single, 2-pole, common trip 20 Amp circuit breaker located inside the service entrance. Wiring is typically 12AWG per NEC code, a grounding clamp, located on the enclosure, facilitates dedicated grounding.

#### **120VAC 15A Service**

(XM Series 2 615): Enclosures used with the XM Series 2 615 are equipped with a 120VAC duplex receptacle to provide power to the power supply and peripheral equipment. The receptacle, NEMA 5-15R, is protected by a single-pole, 15 Amp High Magnetic circuit breaker located inside the service entrance. Wiring is typically 14AWG per NEC code, a grounding clamp, located on the enclosure, facilitates dedicated grounding.



**NOTE:**

Alpha recommends wiring with 12AWG, in case the enclosure is to be upgraded to use 90V power supplies in the future.

2.2 Utility Power Connection, *continued*

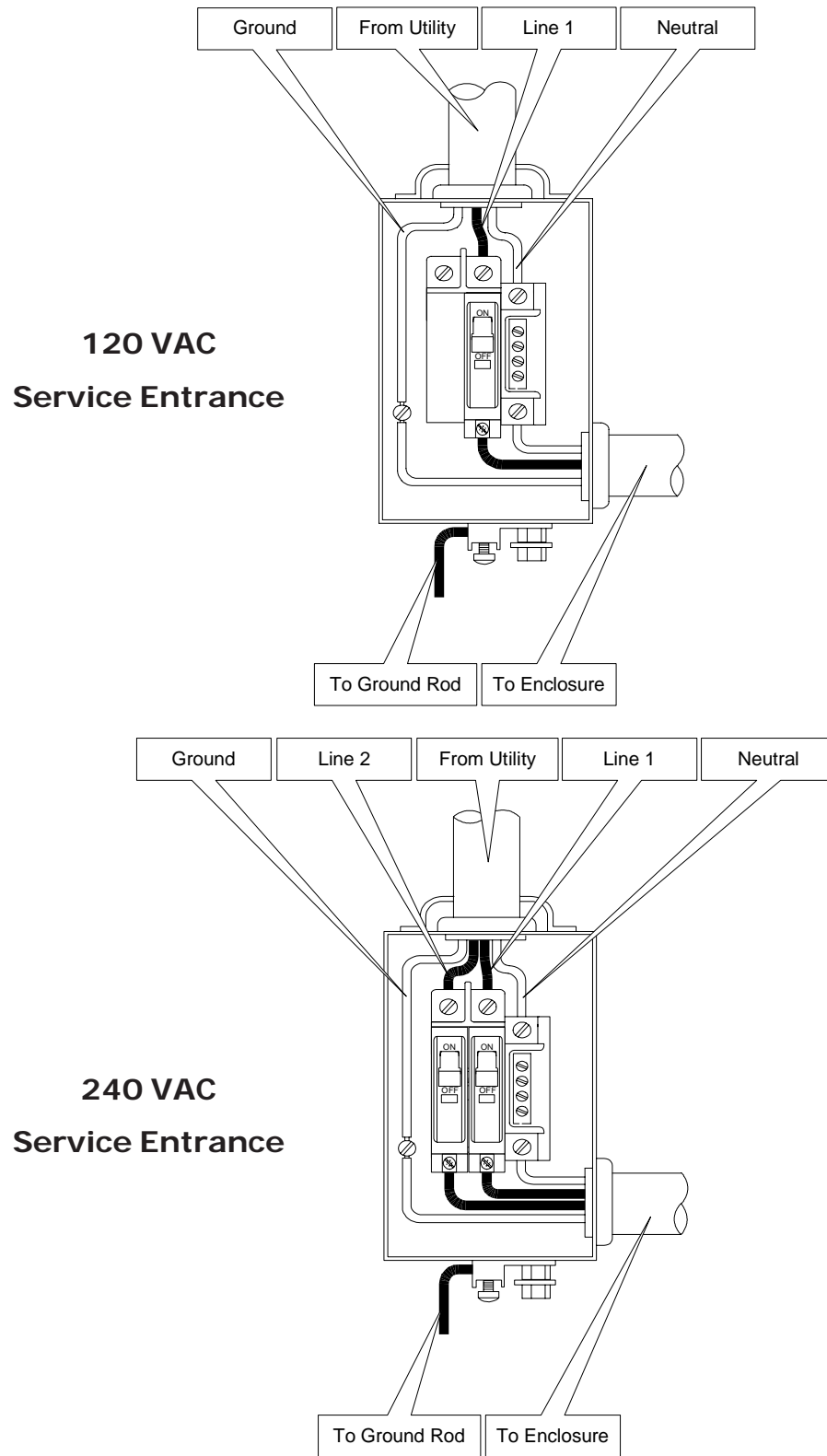
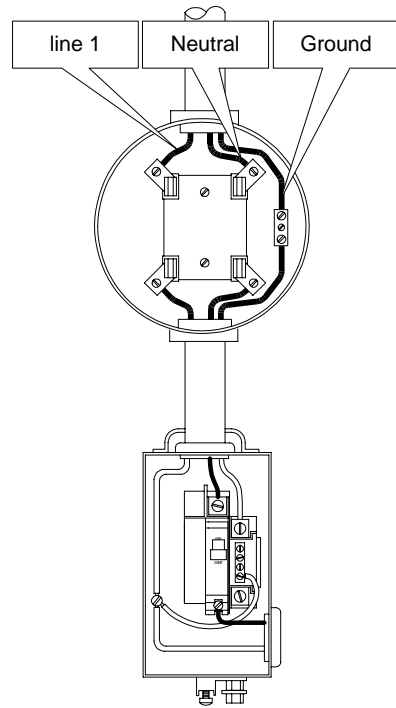


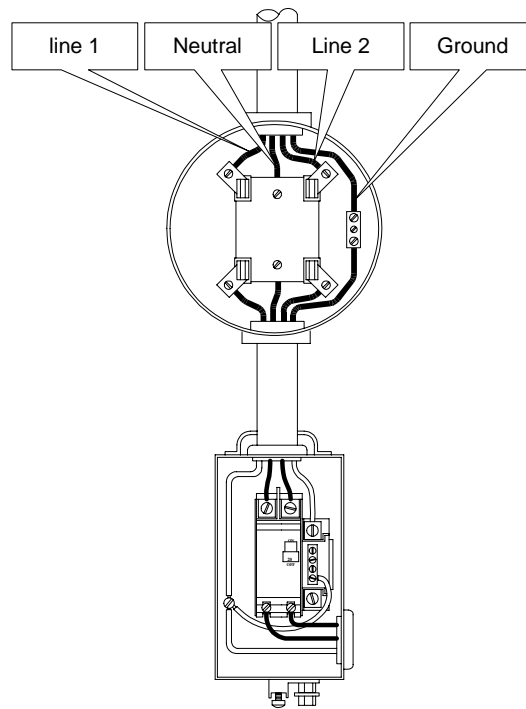
Fig. 3 Service Entrance Wiring

## 2. Installation

### 2.2 Utility Power Connection, *continued*



**120 VAC Meter Base**



**240 VAC Meter Base**

Fig. 4 Meter Base Wiring

### 2.3 Generator / Sidecar Inter-connecting Cables

The following cables must be routed either through a 3" sweep or coupling:

#4 AWG DC Output from the generator

120 VAC power from the CESC sidecar service entrance

ECM or ACU Interface cable (status monitoring)

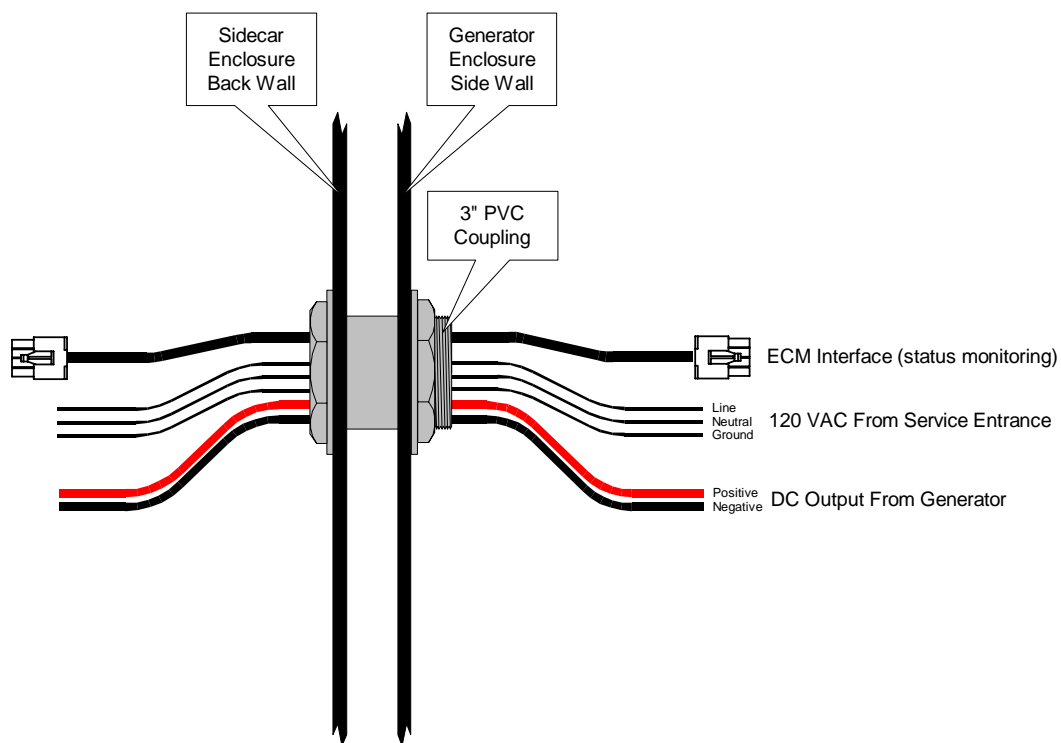


Fig. 5 Interconnection Wiring

## 2. Installation

### 2.4 Internal Components

The Sidecar enclosure contains an Input Power Panel (IPP), one or two Service Power Inserters (SPI), and the Enclosure Grounding Rail. The Power Supply rests on the upper shelf, and a 36 or 48 VDC battery pack on the lower two shelves.

A cooling fan is required any time a Power Supply is housed in the side car. The fan is thermostatically controlled to turn on at ~140 deg F and off at ~110 deg F. The fan cable has a 'T' connector that attaches to the Power Supply output connection. Replace fuse only with a 1/4" X 1-1/4", 5 Amp, 250 Volt (Alpha P/N 460-025-10).

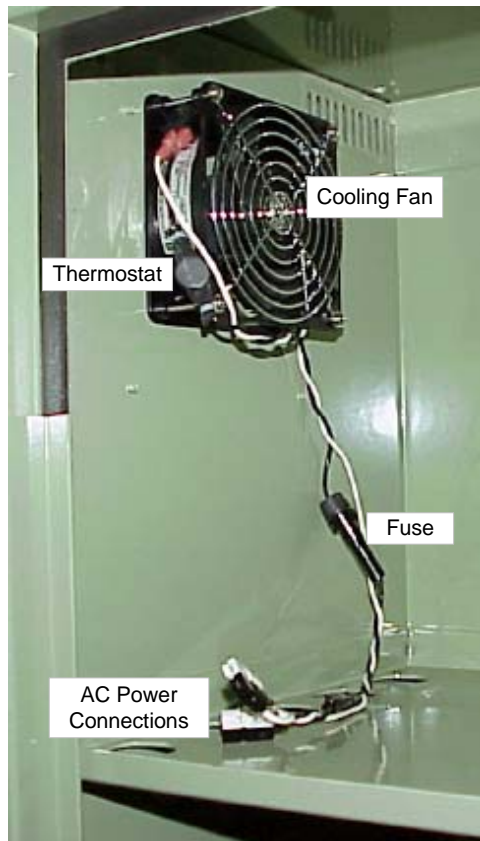


Fig. 6 Fan Connections

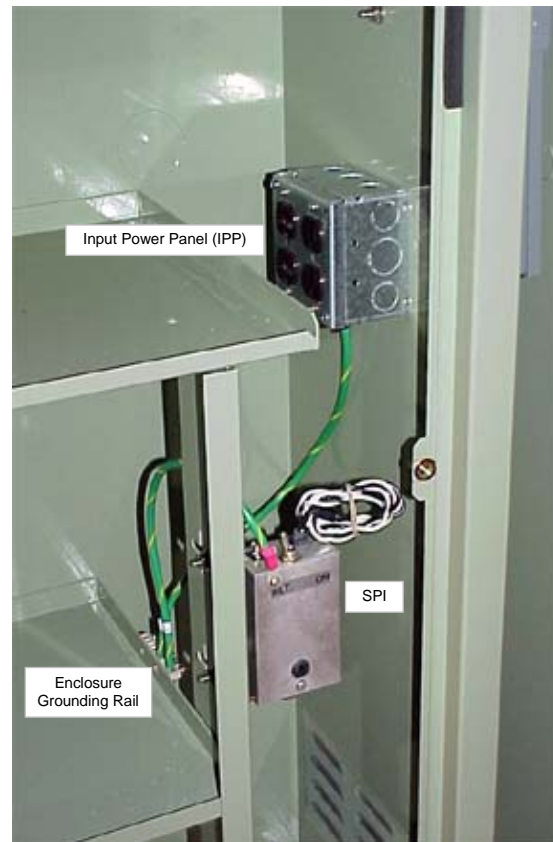


Fig. 7  
Location of IPP, SPI, and  
Ground Rail

2.5 Battery Pack Wiring

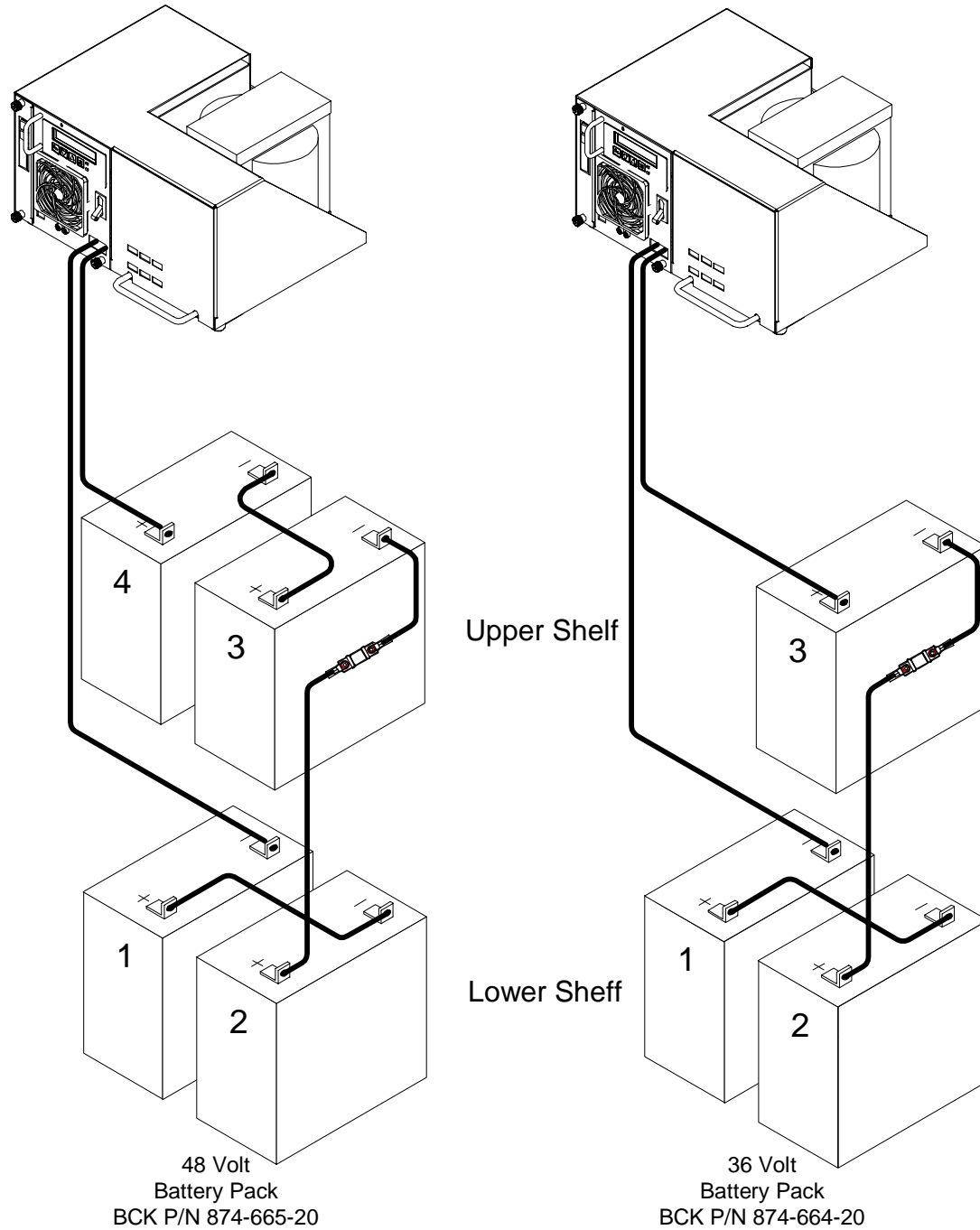


Fig. 8 36- & 48-Volt Battery String Wiring

## 2. Installation

### 2.6 Power Supply Placement

1. Place the XM2 power supply onto the top shelf of the side car.
2. Verify that the AC Input Breaker in the service entrance is in the OFF position.
3. Verify that the Battery Breaker on the front of the power supply is in the OFF position.
4. Plug the AC power cord into the Input Power Panel on the side of the enclosure.
5. Plug the Battery Input Cable from the battery pack into the Battery Input connection on the front of the power supply.
6. Plug the wire leading from the fan into the OUTPUT 1 connection on the front of the power supply.
7. Plug the wire leading from the top SPI into the other set of plugs on the wire from the fan.
8. If a second SPI is installed, plug it into the OUTPUT 2 connection on the front of the power supply.



Fig. 9 Power supply on Shelf

### 2.7 Battery Remote Temperature Sensor (RTS)

#### Tools Needed:

Adhesive Tape

#### Procedure:



For enclosures with multiple battery strings, the RTS must be located with the WARMEST battery string. This ensures proper operation of the battery charger's temperature compensation circuit. Failure to locate the RTS with the warmest battery string could result in overcharging and premature battery failure. In this application, the RTS MUST be attached to a battery in the upper tray of the side-car.

1. Attach the RTS Probe to the inner side of one of the batteries on the upper tray of the side-car with adhesive tape.
2. The other side of the RTS Probe is attached to the front panel of the XM2 power supply, in the jack labeled TEMP PROBE

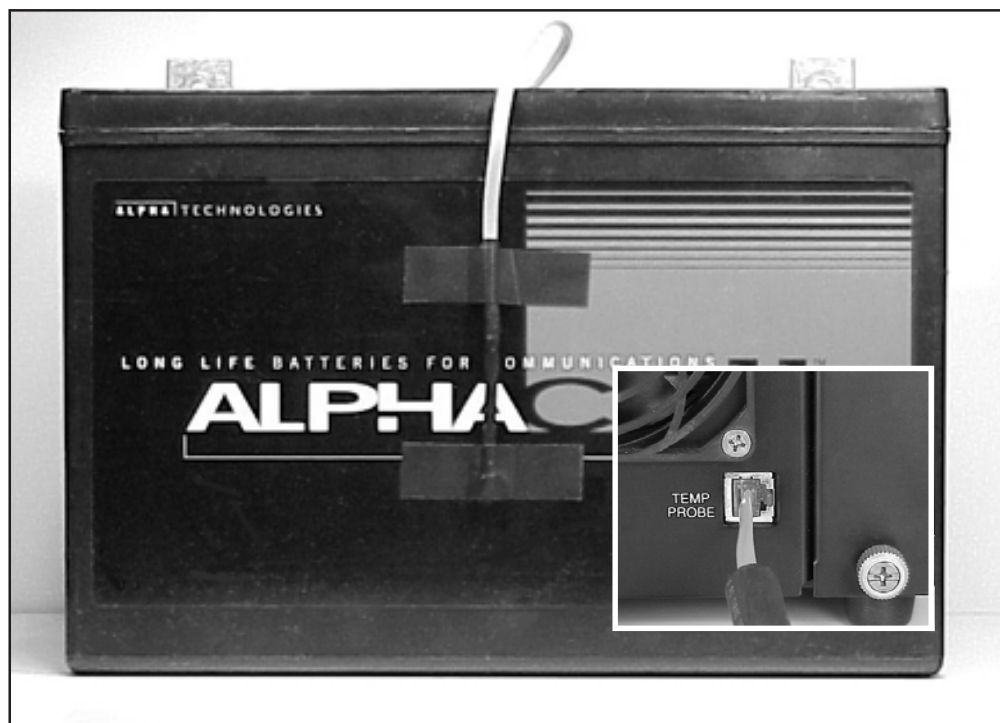


Fig. 10 Location of Temperature Sensor

## 2. Installation

### 2.8 Service Power Inserter

1. The SPI box(es) are mounted on the shelf support bracket.
2. Remove the two screws on the face of the SPI and lift off the cover to gain access to the Seizure Screw Assembly. Loosen the seizure Screw several turns so that the stinger will pass through the clamp. (Fig 2-3)
3. Insert the Coaxial Termination into the output port on the bottom of the SPI. Ensure that the stinger goes through the Seizure Screw Assembly. Tighten the Coaxial Termination.
4. Tighten the seizure screw to 35.0 Inch-Pounds. Replace the SPI cover and screws.

Ensure that the switch on the top of the SPI is in the ON position, the AUX position is used only when an alternate power source is connected to the SPI.



Fig. 13 Location of SPI

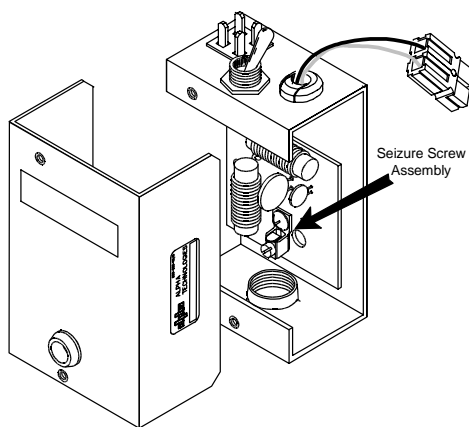


Fig. 11 Seizure Screw Assembly Location

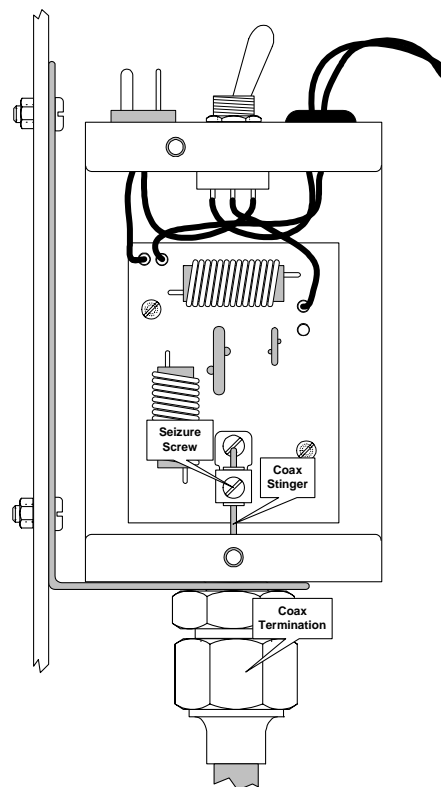


Fig. 12 Cable Connection





# Power

Alpha Technologies 

Alpha Technologies  
3767 Alpha Way  
Bellingham, WA 98226  
**USA**  
Tel: (360) 647-2360  
Fax: (360) 671-4936  
Web: [www.alpha.com](http://www.alpha.com)

Alpha Technologies Ltd.  
4084 McConnell Court  
Burnaby, BC, V5A 3N7  
**CANADA**  
Tel: (604) 430-1476  
Fax: (604) 430-8908

Alpha Technologies  
Europe Ltd.  
Cartel Business Estate  
Edinburgh Way  
Harlow, Essex CM20 2TT  
**UNITED KINGDOM**  
Tel: +44-1279-422110  
Fax: +44-1279-423355

Alpha Technologies  
Hansastrasse 8  
D-91126 Schwabach  
**GERMANY**  
Tel: +49-9122-79889-0  
Fax: +49-9122-79889-21

Alphatec  
339 St. Andrews Street  
Suite 101  
Andrea Chambers  
Limassol, Cyprus  
**CYPRUS**  
Tel: +357-25-375675  
Fax: +357-25-359595

Alpha Technologies  
Unit R5-R7 Regents Park Estate  
Corner Park Rd and Prince's Rd  
East  
Regents Park, NSW 2143  
**AUSTRALIA**  
Tel: +61-2-9722-3320  
Fax: +61-2-9722-3321