



## LPE Enclosure

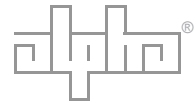
# Installation and Operation Manual

LPE Enclosure  
Effective: 05/2010




*Power*

Alpha Technologies



# LPE Enclosure Installation and Operation Manual

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 **NOTE:**

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Alpha denies responsibility for any damage or injury involving its enclosures, power supplies, generators, batteries or other hardware, manufactured by Alpha or members of the Alpha Group, when used for an unintended purpose, installed or operated in an unapproved manner, or improperly maintained.

 **NOTE:**

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Photographs and drawings contained in this manual are only for illustrative purposes. These photographs and drawings may not exactly match your installation.

 **NOTE:**

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Review the written and illustrative information contained in this manual before proceeding. If there are questions regarding the safe installation or operation of this product, please contact Alpha Technologies or your nearest Alpha representative.

**Contacting Alpha Technologies: *www.alpha.com***

or

For general product information and customer service (7 AM to 5 PM, Pacific Time), call

**1-800-863-3930**

For complete technical support, call

**1-800-863-3364**

*7 AM to 5 PM, Pacific Time or 24/7 emergency support*

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# Safety Notes

Review the drawings and illustrations contained in this manual before proceeding. If there are any questions regarding the safe installation or operation of the system, contact Alpha Technologies or the nearest Alpha representative. Save this document for future reference.

To reduce the risk of injury or death, and to ensure the continued safe operation of this product, the following symbols have been placed throughout this manual. Where these symbols appear, use extra care and attention.

## **ATTENTION**

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The use of ATTENTION indicates specific regulatory/code requirements that may affect the placement of equipment and /or installation procedures.



## **NOTE:**

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A NOTE provides additional information to help complete a specific task or procedure.



## **CAUTION!**

The use of CAUTION indicates safety information intended to PREVENT DAMAGE to material or equipment.



## **WARNING!**

WARNING presents safety information to PREVENT INJURY OR DEATH to the technician or user.

# Battery Maintenance Guidelines

The battery maintenance instructions listed below are for reference only. Battery manufacturer's instructions for transportation, installation, storage or maintenance take precedence over these instructions.

- To prevent damage, inspect batteries every 3 months for:
  - **Signs of battery cracking, leaking or swelling.** The battery should be replaced immediately by authorized personnel using a battery of the identical type and rating.
  - **Signs of battery cable damage.** Battery cable should be replaced immediately by Authorized Personnel using replacement parts specified by vendor.
  - **Loose battery connection hardware.** Refer to battery manufacturer's documentation for the correct torque and connection hardware for the application.
- Apply battery manufacturer's specified antioxidant compound on all exposed connections.
- Verify battery terminals and/or exposed connection hardware is not within 2 inches of a conductive surface. Reposition batteries as necessary to maintain adequate clearance.
- Clean up any electrolyte (battery emission) in accordance with all federal, state, and local regulations or codes.
- Proper venting of the enclosure is recommended. Follow the Battery Manufacturer's approved transportation and storage instructions.
- 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.

# Recycling and Disposal Instructions

Spent or damaged batteries are considered environmentally unsafe. Always recycle used batteries or dispose of the batteries in accordance with all federal, state and local regulations.

# Electrical Safety

- Lethal voltages are present within the power supply and electrical boxes. Never assume that an electrical connection or conductor is not energized. Check the circuit with a volt meter with respect to the grounded portion of the enclosure (both AC and DC) prior to any installation or removal procedure.
- Always use the buddy system when working under hazardous conditions.
- A licensed electrician is required to install permanently wired equipment.
- Input voltages can range up to 120 Vac. Ensure that utility power is disabled before beginning installation or removal.
- Ensure no liquids or wet clothes contact internal components.
- Hazardous electrically live parts inside this unit are energized from batteries even when the AC input power is disconnected.

# Mechanical Safety

- Keep hands and tools clear of fans. Fans are thermostatically controlled and will turn on automatically.
- Power supplies can reach extreme temperatures under load.
- Use caution around sheet metal components and sharp edges.

# Battery Safety Notes



## WARNING!

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

## Chemical Hazards

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, and are electrically conductive and corrosive.

*To avoid injury:*

- Servicing and connection of batteries shall be performed by, or under the direct supervision of, personnel knowledgeable of batteries and the required safety precautions.
- Always wear eye protection, rubber gloves, and a protective vest when working near batteries. Remove all metallic objects from hands and neck.
- Batteries produce explosive gases. Keep all open flames and sparks away from batteries.
- Use tools with insulated handles, do not rest any tools on top of batteries.
- Batteries contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Battery post terminals and related accessories contain lead and lead compounds. Wash hands after handling (California Proposition 65).
- 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.
- Neutralize any spilled battery emission with the special solution contained in an approved spill kit or with a solution of one pound Bicarbonate of soda to one gallon of water. Report chemical spill using your company's spill reporting structure and seek medical attention if necessary.
- All battery compartments must have adequate ventilation to prevent an accumulation of potentially dangerous gas.
- Prior to handling the batteries, touch a grounded metal object to dissipate any static charge that may have developed on your body.
- 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 make contact with an unintended surface that can result in arcing, fire, or possible explosion.

# Grounding Connection Notes

In order to provide a ready, reliable source of backup power, it is necessary to connect the power supply to an effective grounding and Earthing system that not only provides for the safety of the service personnel responsible for its operation and maintenance, but also facilitates the proper operation and protection of the equipment within the network. Such a grounding system provides protection with respect to operator safety, system communication, and equipment protection.

## Safety Ground

The safety ground is a two-part system, comprised of the utility service and the Alpha system.

1. First, utility service;

As a minimum requirement for the protection of Alpha equipment, the local utility service must provide a low-impedance path for fault current return to earth. This must meet or exceed the requirements of the US National Electrical Code. The connection between the Alpha Power Supply and the utility must also meet or exceed the requirements of the US National Electrical Code.

2. Second, the Alpha grounding system;

The Alpha grounding system consists of a low-impedance connection between the enclosure and an Earth Ground (located at least 6' away from the Utility Earth connection).

This impedance between the enclosure and Earth must be 25 Ohms or less at 60 Hertz.

Local soil conditions will determine the complexity of the grounding system required to meet the 25 Ohm (maximum) resistance specified above.

For example, a single 8' ground rod may be sufficient to meet the requirement. In some cases, a more elaborate system may be required such as multiple ground rods connected by a #6AWG solid copper cable buried 8-12" below the surface. Where this is not possible, contact a local grounding system expert for alternate methods that will meet the 25 Ohm (maximum) specification.



## NOTE:

All ground rod connections must be made by means of a listed grounding clamp suitable for direct burial or exothermically welded.

## Strike (Lightning) Ground

Lightning strikes, grid switching, or other aberrations on the power line and/or communications cables have the potential to cause high-energy transients which can damage the powering or communications systems. Without a low-impedance path to the ground, the current, when traveling through wires of varying impedance, produce damaging high voltage. The most viable method available to protect the system from damage is to divert these unwanted high-energy transients along a low-impedance path to ground. A low-impedance path to ground prevents these currents from reaching high voltage levels and posing a threat to equipment. The single-point grounding system provides a low-impedance path to ground, and the key to its success is the proper bonding of the grounding rods, so the components of the grounding system appear as a single point of uniform impedance. Alpha recommends the use of a surge arresting device electrically bonded to the Alpha Ground System.



## WARNING!

Low-impedance grounding is **mandatory for personnel safety** and critical for the proper operation of the cable system.



# 1.0 Introduction

## 1.1 LPE Enclosures

The LPE Enclosures may be equipped with an optional AC service entrance, AC distribution and are supported with a wide range of accessories, including the AlphaCell™ GXL batteries and HPL-FT front terminal batteries providing extended standby runtime and life.

The LPE is specifically designed for indoor or outdoor installations requiring lower power, a smaller footprint and embedded DOCSIS® status monitoring capability. The LPE is available in pole, wall or ground mount configurations. The LPE is an ideal solution for back-up power where traditional equipment is too large and bulky.



Fig. 1-1, LPE Enclosure

## 1.0 Introduction, continued

### 1.2 LPE Specifications and Options

Specifications				
Mechanical		Option	Part Number	Description
Dimensions		Battery Harness:	875-838-20 746-152-20	12V Battery Cable Kit (BCK) 12V Battery Cable Kit - 2 Batteries (BCK-2)
H x W x D (in):	26 X 16.25 X 12	Battery Heater Mat	746-130-20	Used in cold-climate applications
(mm)	660 X 413 X 305	Battery Retaining Bar (BRB)	605-948-A1	Secures batteries within enclosure
Weight (lb/kg):	25 / 11.3	Coax Connection:	020-019-35 SPI, 20A (1-2) 021-080-21 SPI RF, 20A (1)	SPI, 20A (1-2)
Material:	Exterior powdercoated aluminum	Door Locks:	744-229-20	Provisions optional GEM
Battery:	220 GXL or two 70 HPL-FT	Lightning Arrester	020-098-24 162-046-10 745-946-20	LA-P+ 120V LA-P-120T Surge Arrester Kit
Door and Lid Seal:	Poron gasketing	Service Entrance:	744-656-20	70A available
Color:	Gray, white, and seafoam green	Status Indicators:	740-139-25	Local/Remote Indicator (LRI)
Lid:	Removable	Surge Protection:	162-027-10 162-028-10 162-029-10	75 Ω Coax, MF 75 Ω Coax, FF, w/Gnd 75 Ω Coax, FF
Door:	Hinged, removable			

## 2.0 Installation



### CAUTION!

Never transport the unit with installed batteries. Doing so can cause injury to the installer or damage the enclosure and equipment. Install the batteries after you transport the unit to the site and secure it to the pad.

## 2.1 Enclosure Installation, Wall-mount



### CAUTION!

The populated cabinet weighs approximately 150 lbs [68kg]. Installer needs to ensure the wall is capable of supporting the loaded enclosure. Direct mounting to wall studs and 3/4" plywood backing is required.

### ATTENTION:

Before installing an enclosure, the location and method of mounting must be approved by the utility.

#### Recommended Tools and Materials:

- Ratchet with 1/2" and 9/16" socket (or metric equivalent)
- Level
- Two user supplied 3/8" x 4 1/2" (or larger) lag bolts (or metric equivalent)
- Two 3/8" stainless steel flat washers, 1.00" max diameter x .08" min thickness
- Stud finder (optional)
- Drill with 1/4" drill bit or metric equivalent
- Tape measure

#### Installation Procedure:

1. Position the bracket on a wall capable of supporting 150 lbs (68.0kg). Use a 3/4" plywood backing plate.
2. Maintain a minimum distance of 6" (153mm) from the bottom of the bracket to the ground for proper enclosure ventilation.
3. Level the bracket vertically with the tab facing up. Center the bracket on a wall stud.
4. Secure the bracket to the wall using two user-supplied 3/8" x 4 1/2" (or larger) lag bolts and flat washers specified above. The hardware must sit flush inside the bracket dimples for proper installation. Verify there is at least a 6" spacing between the bracket and the ground.
5. Hang the enclosure on the bracket.
6. Securely fasten the enclosure to the bracket using the six 5/16" bolts, lock washers and fender washers (supplied).

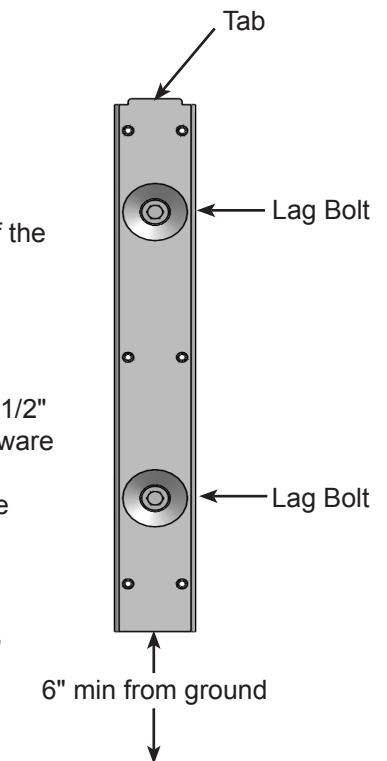


Fig. 2-1, Mounting Bracket

## 2.0 Installation, continued

### 2.2 Enclosure Installation, Steel or Concrete Pole

To mount the LPE on concrete or steel poles, two user-supplied mounting straps are required (straps must be stainless, galvanized or equivalent). Most codes require the base of the enclosure to be located a minimum height from the ground. Always verify height restrictions before proceeding.

#### ATTENTION:

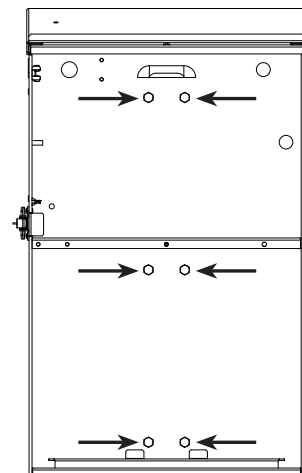
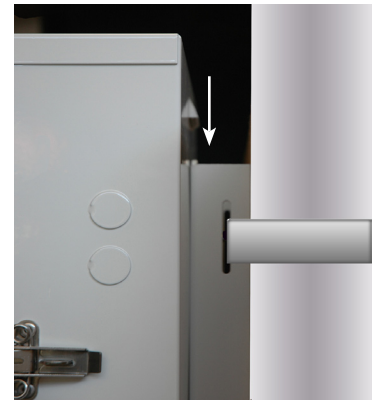
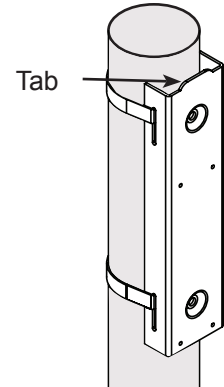
The majority of poles are the property of the local utility. Before installing an enclosure, the location and method of mounting must be approved by the utility.

#### Required Tools and Materials:

- Two user-supplied pole straps to fit pole (straps must be stainless, galvanized, or equivalent)
- Ratchet with 1/2" socket

#### Installation Procedure:

1. Position the bracket so that the bottom of the bracket is at least 6" off of the ground. Also make sure that the tab is facing up. Secure it to the pole using the pole straps.
2. Hang the enclosure on the bracket.
3. Securely fasten the enclosure to the bracket using the six 5/16" bolts, lock washers and fender washers (supplied).



## 2.0 Installation, continued

### 2.3 Enclosure Installation, Ground-mount



#### CAUTION!

Never transport the unit with installed batteries. Doing so can cause injury to the installer or damage the enclosure and equipment. Install the batteries after you transport the unit to the site and secure it to the pad.

#### ATTENTION:

It is the responsibility of the installer to meet the requirements of all applicable national and local codes. Alpha Technologies assumes no responsibility or liability for failure of the installer to comply with the requirements of all applicable local and national codes.

#### 2.3.1 Pre-Installation

Before choosing a location and beginning installation, consider the following:

- Provide adequate room for service personnel to remove the doors for battery installation and removal.
- Wherever possible, select a site that is above the 100-year flood plain and away from residences.
- Locate in the shade to minimize the effects of solar loading.
- Locate in an area with good airflow.
- Locate at least 4" from the backside of the LPE to any wall.
- Locate away from sprinkler systems or other sources of forced water.
- Locate out of the prevailing wind to minimize the buildup of snow or accumulation of wind-borne dust.
- Avoid locating the enclosure where it will be an obstruction or will inhibit visibility.
- Evaluate the soil conditions for suitability for the installation of the grounding system applicable to your particular installation.
- Is utility power cabling run to and terminated at the site?



#### NOTE:

The appropriate grounding method for a particular location depends on soil type, available space, local codes, NEC (National Electric Code), and other site-specific characteristics.

## 2.0 Installation, continued

### 2.3 Enclosure Installation, Ground-mount, continued

#### 2.3.1 Pre-Installation, continued

Alpha Technologies, Inc. cannot anticipate all the ways a vehicle could threaten an installed system or the specific type of protection that is appropriate for a particular location. The following installation drawing for Alpha's Standby Power systems are general recommendations and not intended to be a specific guideline for protecting the equipment. The numbers of bollard posts (or other protection devices) depend upon equipment locations.

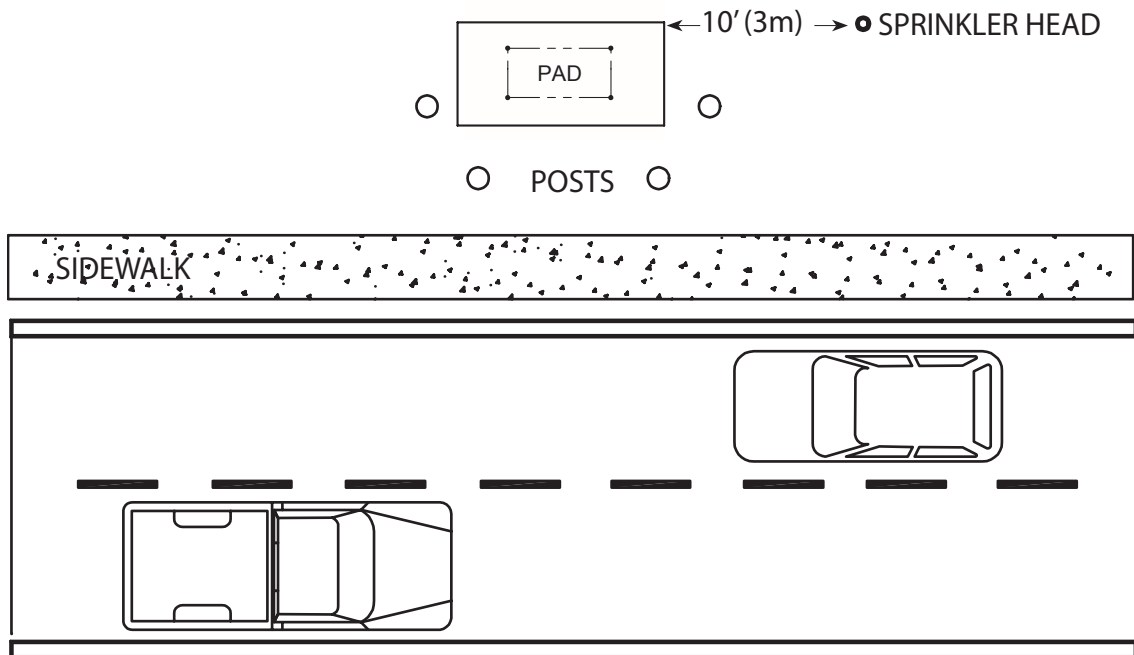


Fig. 2-2, Ground-mount Positioning and Safety

## 2.0 Installation, continued

### 2.3 Enclosure Installation, Ground-mount, continued

#### 2.3.2 Enclosure Grounding: Ground-mount

##### NOTE:

- Alpha generally recommends using the grounding method illustrated below. However, the grounding method appropriate for a particular site depends on local codes, the NEC (National Electric Code), and other site-specific characteristics.
- Alpha Technologies recommends 5 ohms maximum ground resistance between enclosure and ground rods, in accordance with IEEE 1100-1999 Powering and Grounding Electronic Equipment.
- Alpha Technologies assumes no responsibility or liability for failure of the installer to comply with the requirements of all applicable local and national codes. Where allowed, exothermic welding may be used as an alternative to Burndy clamps and connectors.



##### CAUTION!

Corrosion-proof, twenty-five-year connections suitable for direct burial must be used.

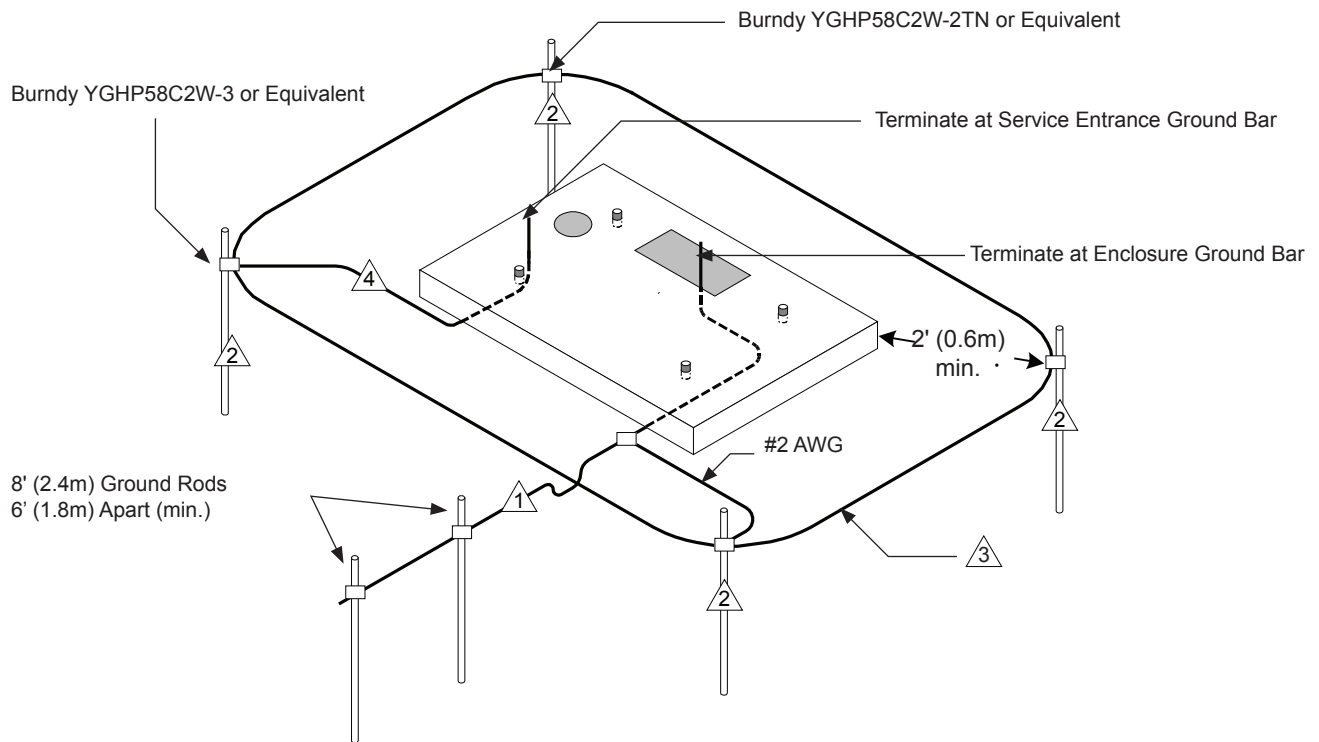


Fig. 2-3, Suggested Grounding Method

##### Service Grounding (required)

- 1 #6 bare copper wire from service entrance ground bar, with two 1/2" X 8' (12.7mm x 2.4m) copper ground rods, driven at least six feet (1.8 meters) apart.

##### Lightning Protection (optional)

- 2 Four 1/2" X 8' (12.7mm x 2.4m) copper ground rods, driven at least two feet from pad.
- 3 #6 bare copper wire loop, at least 30" (762mm) below grade, and terminated at each ground rod.
- 4 #6 bare copper wire from loop to enclosure ground bar in service entrance.

## 2.0 Installation, continued

### 2.3 Enclosure Installation, Ground-mount, continued

#### 2.3.3 Ground-mount Installation



**NOTE:**

LPE enclosures require a pedestal mount kit for ground installation. Pedestal kit part number: 746-146-20 (gray); 746-146-21 (white); 746-146-22 (seafoam green)

**Tools and Materials Required (customer supplied):**

- Four 3/8-16" (10mm) anchor bolts (Hilti-style recommended)
- Four 3/8" (10mm) size stainless steel washers
- 2' x 2' (.6m x .6m) continuous vapor barrier (e.g. 30 lb. felt, neoprene pond liner, or a heavy grade tar paper)
- Hammer drill
- 3/8" (10mm) drill bit
- 9/16" (14mm) wrench
- Metal punch
- Mallet or hammer
- Torque wrench
- Tape measure
- 3/8" socket



**CAUTION!**

A 25+ year continuous vapor barrier must be placed between the pedestal and the pad to prevent moisture ingress and corrosion caused by metal-to-concrete contact.

**Procedure:**

1. Place the vapor barrier material on concrete pad.
2. Using the pedestal as a template, mark the vapor barrier material in the locations of the four anchor bolts holes.
3. Drill 3/8" (10mm) holes through the vapor barrier and into the pad at the four marked anchor points.
4. Position the pedestal over holes and insert anchor bolts. Torque the anchor bolts to bolt manufacturer specifications. If Hilti-style bolts are used, torque until head pops.
5. On the enclosure, remove the three 3/4" (19mm) diameter knock-outs located on the bottom of the enclosure shelf.
6. Lift the enclosure onto the pedestal. Align the three enclosure mounting holes with the mounting holes on the top of the pedestal. Secure the enclosure to the pedestal using the provided 1/4" (11mm) hardware. Torque to 75 in-lbs (8.5 Nm).
7. Trim away excess vapor barrier material.
8. The enclosure is now ready for the utility connection, power module, and batteries.



## 2.0 Installation, continued

### 2.3 Enclosure Installation, Ground-mount, continued

#### 2.3.3 Ground-mount Installation, continued

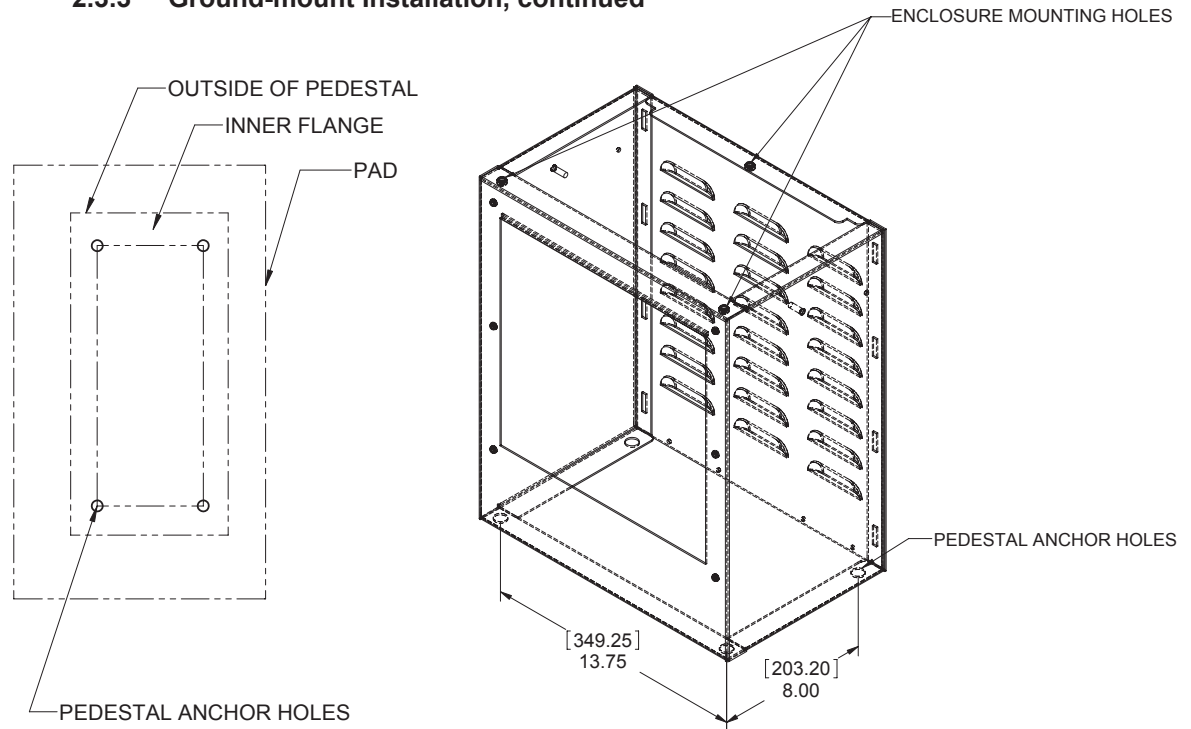


Fig. 2-4, LPE Enclosure Pedestal

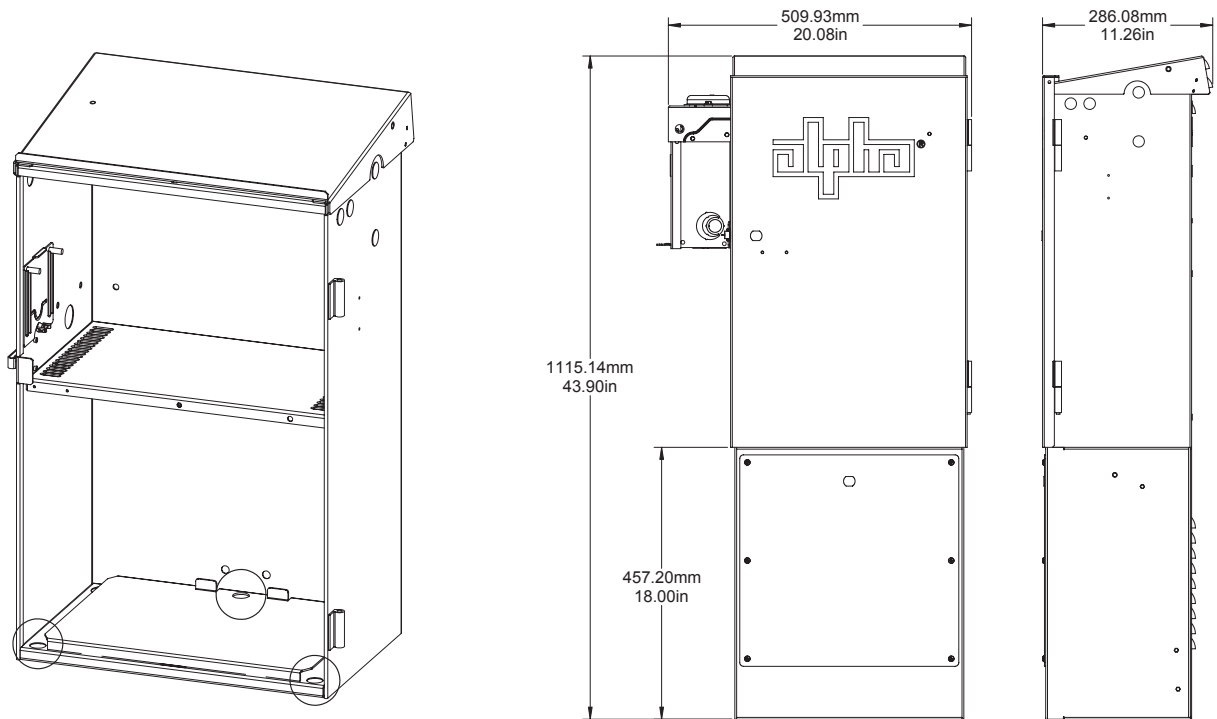
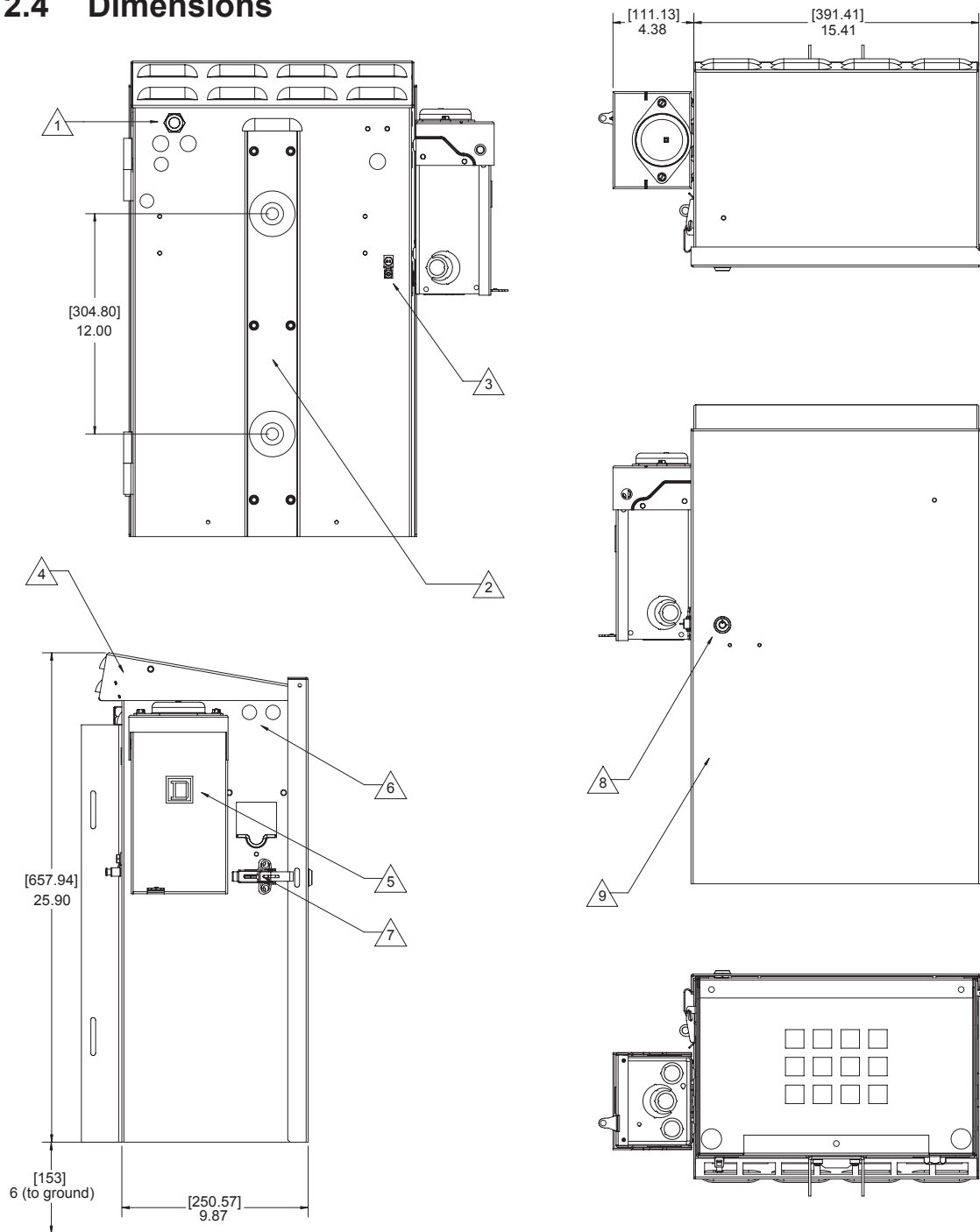


Fig. 2-5, Enclosure-to-Pedestal Mounting

2.0 Installation, continued

2.4 Dimensions



- |   |                           |   |                                                 |
|---|---------------------------|---|-------------------------------------------------|
| ① | Optional SPI or SPI RF    | ⑥ | Knockouts for optional ACI, LRI indicator Lamps |
| ② | Pole/wall mount bracket   | ⑦ | Lockable door latch                             |
| ③ | Enclosure ground point    | ⑧ | Optional GEM lock                               |
| ④ | Removable lid             | ⑨ | Hinged, removable door                          |
| ⑤ | Optional service entrance |   |                                                 |

## 2.0 Installation, continued

### 2.5 Connecting the Utility Power



#### **WARNING!**

ONLY qualified personnel should connect the utility power. Power must be connected in compliance with local electrical codes, and common safety practices must be observed.

#### **ATTENTION**

- Connection to utility power must be approved by the local utility before installing the power supply.
- Electrical codes require that a service disconnect switch be connected between the utility power source and the Alpha power supply.
- Connection to the power supply must include an appropriate service entrance weather head.

Utility power enters the enclosure through an .875" knockout on the side or rear of the LPE. The enclosure accepts a standard electrical fitting.

A “high-magnetic” trip circuit breaker must be used in order to accommodate the high-inrush currents associated with the start-up of transformers (400A, no-trip, first-half cycle). Do not replace this circuit breaker with a conventional service entrance circuit breaker. 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
120V Installation — High-Magnetic (20A)	470-017-10	QO120HM
120V Installation — High-Magnetic (15A)	470-013-10	QO115HM
US BBX — External Service Disconnect	744-656-20	QO2-4L70RB
CAN BBX — External Service Disconnect	744-656-21	QO2-L70RB

## 2.0 Installation, continued

### 2.5 Connecting the Utility Power, continued

#### 2.5.1 Service Power

##### ATTENTION

Connecting to utility power must be performed by qualified service personnel 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.

Electrical codes require that a listed service disconnect switch be installed between the power source and the power supply. Connection to the power supply must include an appropriate service entrance weather head.



##### NOTE:

Utility power enters the enclosure through a 70A rainproof SUSE-rated breaker box.

The service entrance is wired as shown in the diagram below.

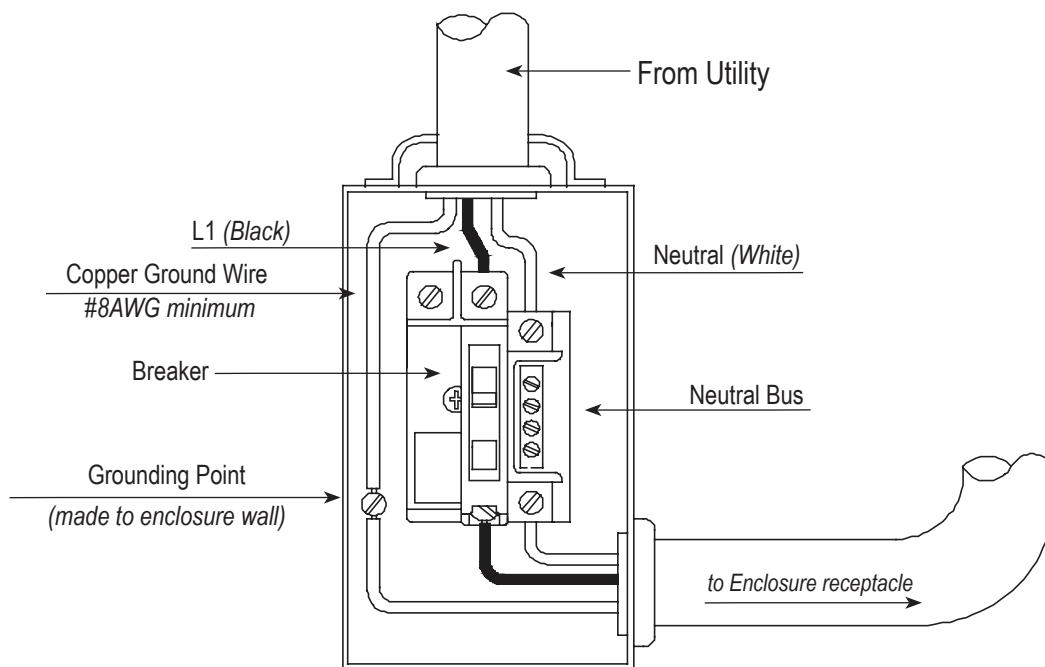


Fig. 2-6, 120Vac Service Entrance Wiring

## 2.0 Installation, continued

### 2.5 Connecting the Utility Power, continued

#### 2.5.1 Service Power, continued

The breaker option is wired as shown in the diagram below.

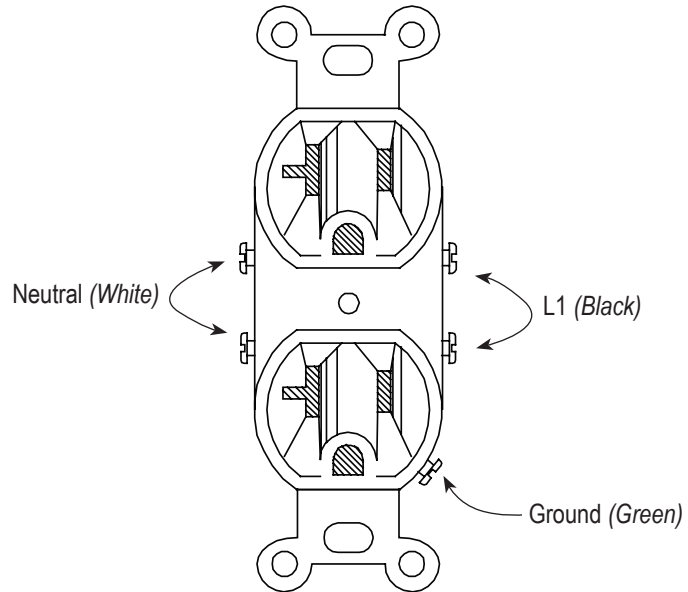


Fig. 2-7, 520-R Receptacle Wiring

## 2.0 Installation, continued

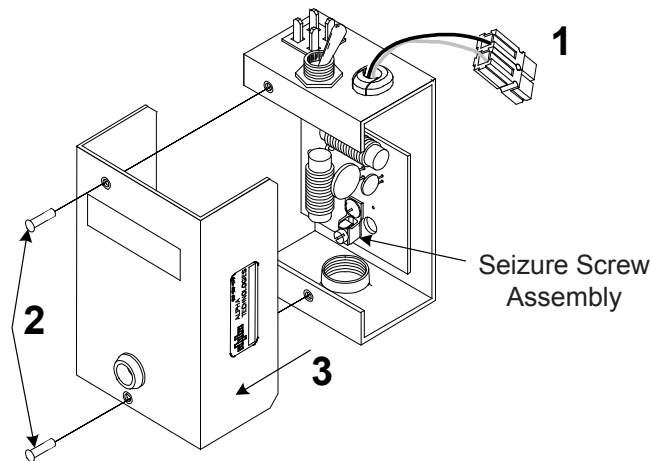
### 2.5 Connecting the Utility Power, continued

#### 2.5.2 Connecting Coaxial Cable

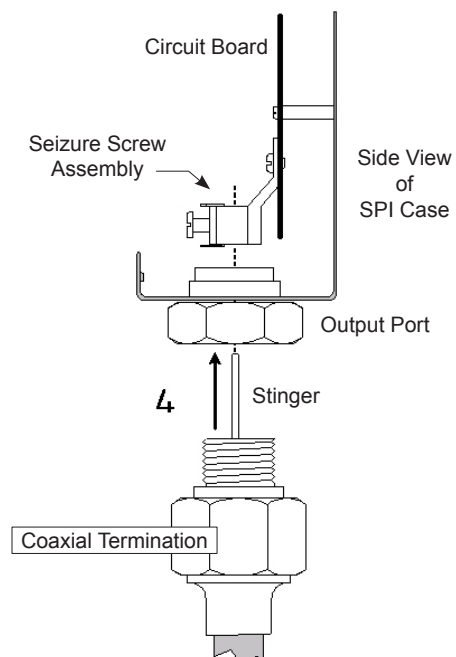
#### **WARNING!**

To prevent injury, DO NOT remove SPI cover until all sources of power have been removed.

1. Verify SPI IS NOT connected to power supply.
2. Remove the two screws holding cover onto SPI chassis.
3. Remove SPI cover, exposing circuit board and seizure screw assembly.



4. Insert Coaxial Termination into Output Port on bottom of SPI.

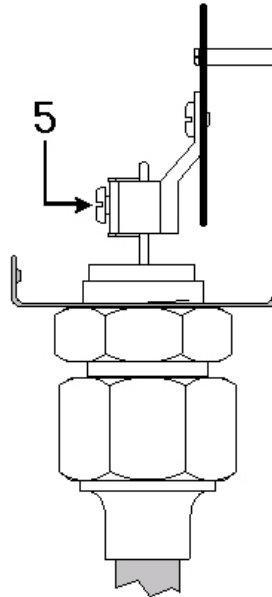


## 2.0 Installation, continued

### 2.5 Connecting the Utility Power, continued

#### 2.5.2 Connecting Coaxial Cable, continued

5. Insert coaxial termination fully inside Seizure Screw assembly and tighten Seizure Screws to 35 Inch-Pounds to prevent arcing and failure of unit.



6. Replace SPI cover and reinstall the screws.
7. Verify switch on top of SPI is in the ON position.

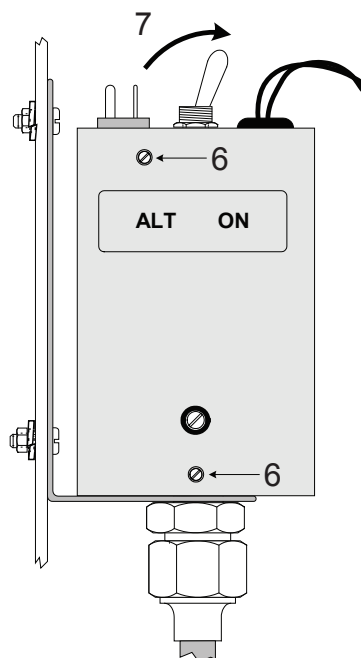


Fig. 2-18, Cover Replaced,  
SPI Switched On

## 2.0 Installation, continued

### 2.5 Connecting the Utility Power, continued

#### 2.5.2 Connecting Coaxial Cable, continued

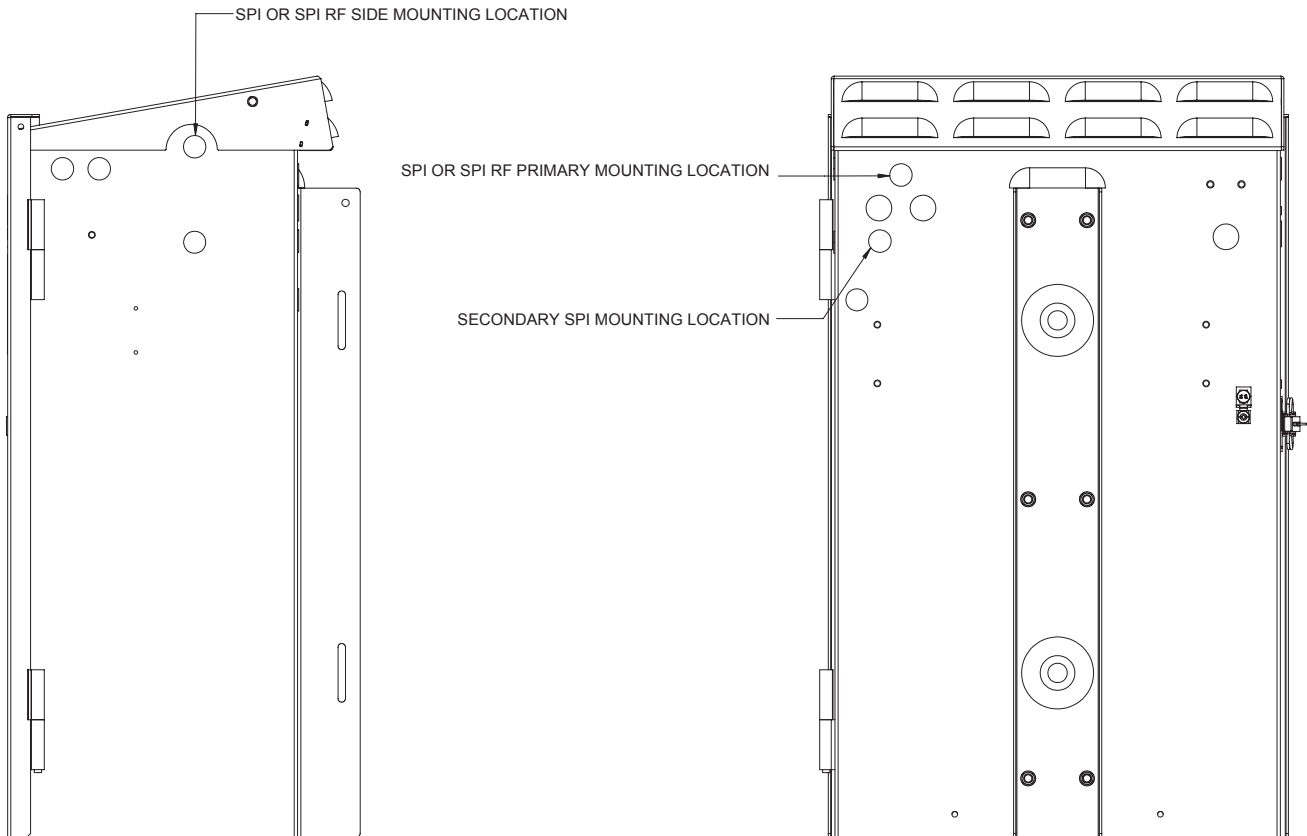


Fig. 2-8, SPI and SPI-RF Mounting Locations



## 2.0 Installation, continued

### 2.6 Battery Installation

#### **WARNING!**

Battery systems represent a risk of electrical shock and high short circuit currents.

The following precautions must be observed when maintaining batteries:

- Remove all personal metal objects (watches, rings, etc.).
- Use insulated tools.
- Wear eye protection and rubber gloves.
- Observe circuit polarities.
- Do not make or break live circuits.
- Do not lay metal tools and hardware on top of the batteries.

The batteries are enclosed in cabinets with limited access. Again, extreme caution must be exercised when maintaining and collecting data on the battery system.

#### **Battery Identification**

Each battery contains a DATE CODE usually located on a sticker between the battery posts. This date code must be recorded in the battery's maintenance log. If batteries other than those installed by Alpha are used, consult the battery's documentation for date code type and placement.

Battery Date Code located in this box  
(1210 = DEC. 2010)

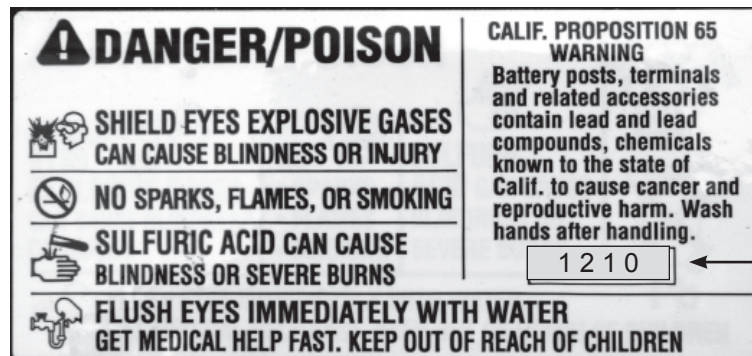


Fig. 2-9, Battery Identification Label

## 2.0 Installation, continued

### 2.6 Battery Installation, continued



#### WARNING!

To prevent arcing, never allow live battery cables to make contact with the enclosure. Disconnect battery leads, or wrap the cable lugs with electrical tape.



#### CAUTION!

Threaded insert terminals require the use of 3/4" bolts. The use of 1" bolts will seriously damage the battery. The only exception is the terminal with the large spacer for the in-line fuse link.



#### NOTE:

In battery configurations made up of multiple battery strings, Alpha strongly recommends the use of in-line fuses.

Procedure:

1. Place the batteries on the enclosure's battery shelf. Position the batteries to allow maximum ventilation space between the batteries.
2. To make identification and record keeping easier, number and label the batteries. Record each battery's number and date code in the power supply maintenance log.
3. Using the battery arrangement diagram as a reference, achieve 12Vdc. Torque terminal connections according to battery recommendations (see battery label for AlphaCell batteries).
4. Check the polarity and voltage of the battery cable connector with a voltmeter to verify correct connections. Do Not connect the battery string or strings to the power supply at this time.
5. The power supply battery charger collects battery temperature compensation information with a Remote Temperature Sensor (RTS) attached to one of the batteries. Refer to the diagrams to determine which battery to attach the RTS to. Co-term the RTS onto the negative battery terminal. Route the RTS connector onto the power supply shelf and attach to provided cable clip. Do Not connect the RTS to the power supply at this time.



#### CAUTION!

Recheck the polarity and voltage of the battery cable connector before proceeding.

6. Route the battery cable connector into the power supply compartment. Do Not connect to the batteries to the power supply at this time.

## 2.0 Installation, continued

### 2.6 Battery Installation, continued

#### 2.6.1 Battery Terminal Connections

#### NOTE:

Various types of batteries with different mounting styles and hardware may be shipped with the system. ALWAYS refer to the battery manufacturer's specifications for correct mounting hardware and torque requirements. Use only the hardware and torque recommended by the battery manufacturer.



#### CAUTION!

Threaded insert terminals require the use of 3/4" bolts. The use of 1" bolts will seriously damage the battery. The only exception is the terminal with the large spacer for the in-line fuse link.

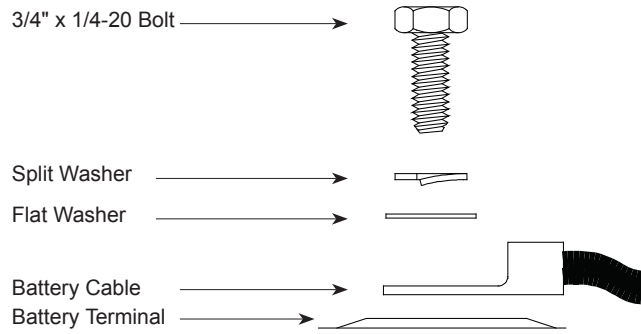


Fig. 2-10, Hardware stack-up, Threaded Battery Insert

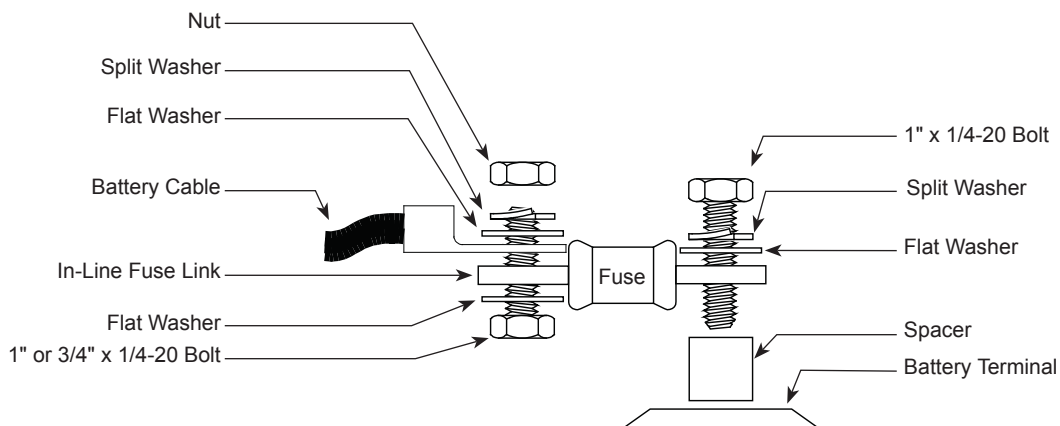


Fig. 2-11, Hardware stack-up, Threaded Battery Insert with optional in-line fuse

## 2.0 Installation, continued

### 2.7 Power Supply Installation

For XM2-300 HP initial setup, please refer to the XM2-300 HP Quick Start Guide (p/n 017-877-B0-001), or the XM2-300 HP Technical Manual (p/n 017-877-B1-001).

For ELPM 300-48D initial setup, please refer to the ELPM 300-48D Installation Manual (p/n 010-322-C0-003).

## 3.0 LPE Enclosure Maintenance

Preventive Maintenance must be performed every three to six months. By establishing a routine maintenance program and following the guidelines contained in this manual, the LPE Enclosure will continue to provide years of trouble free operation.

### Inspect the LPE Enclosure

Perform a complete inspection of the LPE Enclosure. Look for signs of rust and corrosion, paying particular attention to the battery tray. Clean any rust or corrosion immediately.

### Inspect the Mounting Brackets and Hardware

Carefully inspect the LPE Enclosure's Mounting Bracket and mounting hardware. Look for signs of unusual wear and loose hardware. Correct all mounting hardware failures immediately.

### Check Battery Terminals and Connecting Wires

Care of the batteries is a critical step in any maintenance program. In addition to voltage checks, visually inspect the batteries for signs of cracking, leaking, or swelling. To aid in quick identification and tracking of voltages in the maintenance log, number the batteries inside the enclosure using labels or masking tape, etc. Batteries are temperature sensitive and susceptible to overcharging and under-charging. Since batteries behave differently in the winter than in the summer, Alpha's battery chargers automatically compensate for changes in temperature by adjusting float and accept charge voltages. See the power supply Operator's and Technical Manual for complete Power Supply Preventive Maintenance instructions.

Check each battery terminal and connection. Verify the posts are clean and the crimped connectors are tight. Terminal connectors must be torqued to manufacturer specifications at installation. If there is an "in-line" or battery-mounted fuse in the battery cable, check the fuse holder and fuse. Verify the terminals are properly greased with an approved battery terminal corrosion inhibitor such as NCP-2. Record date of maintenance in the maintenance log.

### Check Battery Open Circuit Voltage

Switch the power supply's BATTERY BREAKER to the OFF position. Disconnect the battery connector from the Inverter Module and measure the individual voltage across each battery. The difference between any battery in the string must not be greater than 0.3 Vdc. Defective or marginal batteries must be replaced with an identical type of battery. Record the unloaded battery voltages in the maintenance log.



#### NOTE:

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Whenever the power supply's BATTERY BREAKER is turned OFF or the batteries are not connected, the power supply will not operate in Inverter Mode in the event of a utility power failure.



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*Power*