

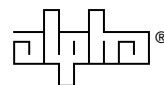
# UPE Series Ground Mount Enclosures



## Installation and Operation Manual

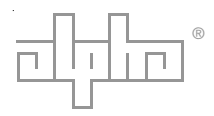
UPE-3L and UPE-6L Enclosures

*Effective: January, 2003*



*Power*

Alpha Technologies



# UPE-3L, UPE-6L

## Enclosure Installation Manual

**031-178-C0-001, Rev. A**  
**Effective Date: January, 2003**  
**Copyright© 2003**  
**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)*

# UPE Series Enclosures

---

<u>Preface Topic</u>	<u>Page</u>
Overview	4
About This Manual	4
Table of Contents	5
List of Figures	5
Product Safety	6
Battery Safety Notes	9
Installation Notes	10

**Overview:** The purpose of this UPE Series Enclosure Installation Manual is to provide a high-level overview of the system and to detail the installation procedure for the enclosures.

**Audience:** This manual intended for the installers of the system.

**About this manual:**

**Contents:** This Installation Manual is comprised of two sections.

**Section 1** Pre-Installation. This section describes site selection, pad layout, and enclosure grounding.

**Section 2** Installation. This section describes the installation of the enclosure to the pad, and the installation of batteries and power supplies

## Table of Contents

### SECTION ONE Pre-Installation

1.1	Site considerations .....	10
1.2	Enclosure Dimensions .....	11
1.3	Pedestal support .....	13
1.4	Enclosure Grounding .....	15

### SECTION TWO Installation

2.1	Enclosure Protection .....	17
2.2	Transportation and Lifting .....	18
2.3	Enclosure Installation .....	19
2.4	Utility Power Connection .....	20
2.5	Power Supply Placement .....	27
2.6	Battery Installation .....	27
2.7	Battery Temperature Sensor .....	31
2.8	Lightning Arrester Option .....	32
2.9	Battery Heater Mat and LRI-ACI Lamp Options .....	33
2.10	Enclosure Door Tamper Switch / Rain Deflector Options .....	34

## List of Figures

Fig. 1-1	UPE-3L Enclosure Dimensions .....	11
Fig. 1-2	UPE-6L Enclosure Dimensions .....	12
Fig. 1-3	Typical Pedestal Configurations .....	13
Fig. 1-4	Typical Pedestal Installation .....	14
Fig. 1-5	Enclosure Grounding .....	16
Fig. 2-1	Post placement .....	17
Fig. 2-2	External Coax Raceway .....	20
Fig. 2-3	Service Entrance Option .....	22
Fig. 2-4	Typical Service Entrance Wiring .....	23
Fig. 2-5	Breaker-Quad-Option Wiring .....	24
Fig. 2-6	120 and 240VAC UL Wiring (030-051-C7-A) .....	25
Fig. 2-7	Battery Hazard Warning Label .....	27
Fig. 2-8	Battery Terminal Connections .....	28
Fig. 2-9	UPE-3L Battery placement .....	30
Fig. 2-10	UPE-6L Battery placement .....	30
Fig. 2-11	RTS Placement .....	31
Fig. 2-12	LAP Plus .....	32
Fig. 2-13	Surge Arrester .....	32
Fig. 2-14	ACI/LRI Wiring .....	33
Fig. 2-15	Tamper Switch Wiring .....	34

## 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.



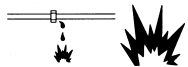
### **NO MATCHES OR OPEN FLAMES**

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.



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.

For general product information and Customer Service  
7:00AM to 5:00PM Pacific Time  
1-800-863-3930

---

To obtain complete Technical Support,  
7:00AM to 5:00PM Pacific Time  
*or*  
For after-hours Emergency support  
7 days per week, 24 hours a day  
1-800-863-3364



**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. Pre-Installation

### 1.1 Site considerations

The site must be planned so that the enclosure will receive good air flow. If possible, in areas of extreme heat, it is best to position the enclosure so that it will be shaded from the afternoon sun. If no shade is available, a factory installed fan kit is highly recommended. In areas of prevailing winds, it is best that the enclosure be located so that the sides of the cabinet face the winds instead of the doors. This will greatly reduce the buildup of sand or snow against the enclosure's air vents.

In areas of potential flooding, the geographical site and concrete pad must be located above the 100 year flood plain.

The enclosure must be placed where it will be free of obstructions, allowing easy access to the doors for service or equipment access. For ventilation and maintenance, allow a minimum space of 36 inches in the front and 36 inches in the rear, between the enclosure and other solid structures.

Place the enclosure well away from sources of forced water, such as underground sprinkler systems and direct roadway splash.

The concrete pad drawing provided in this manual contains all of the required mounting details, including electrical service and cable plant entrances.

For ease of installation, lightweight polymer concrete pads are available from Alpha Technologies for all UPE series enclosures.

The vapor barrier material (such as 30 lb. felt, neoprene pond liner, or heavy grade tar paper) must initially extend at least 6" in all directions around the perimeter of the enclosure and be trimmed closer to the enclosure. Contact local utilities, building maintenance departments and cable/pipe locating services to ensure that this installation does not interfere with existing utility or building cables or piping. It is the responsibility of the installer/owner to position and protect the enclosure to minimize/prevent traffic related hazards.



**WARNING:**

**Never transport the unit with batteries installed.**

Batteries must ONLY be installed after the unit is transported to the site and secured to the pad. Transporting the unit with batteries installed may cause a short circuit, fire, explosion, and/or damage to the battery pack, enclosure and installed equipment. Damage caused by improper shipping or transporting a unit with batteries installed is not covered by the warranty.

The batteries used in this application may vary slightly depending upon optional configurations, battery types, or customer requirements. The batteries are typically gelled-electrolyte, valve-regulated such as the Alpha Cell. Should a battery be found damaged, refer to the battery manufacturer's documentation regarding the safe handling of the battery.

1.2 Enclosure dimensions

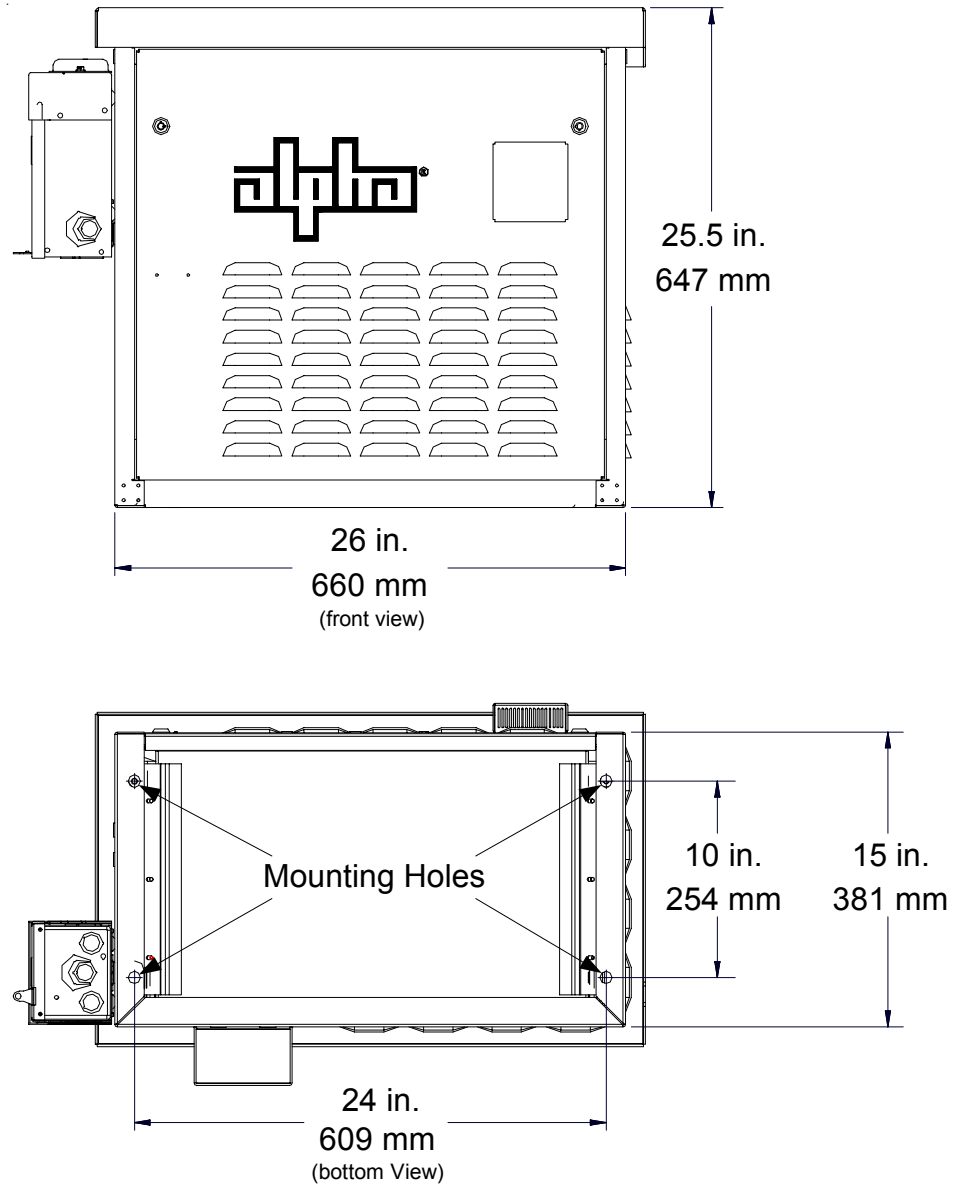


Figure 1-1 UPE-3L Enclosure Dimensions

# 1. Pre-Installation

## 1.2 Enclosure dimensions, *continued*

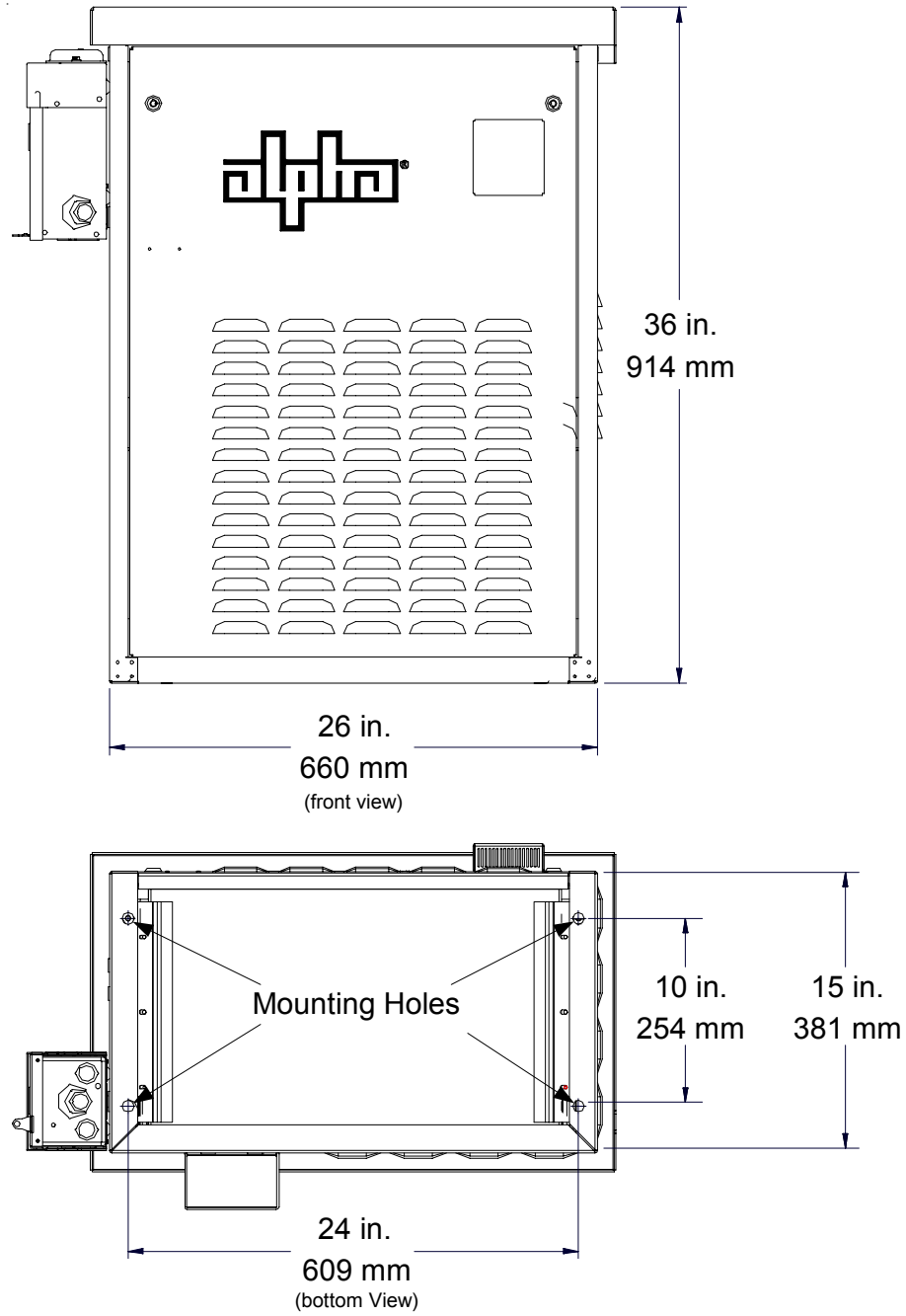


Figure 1-2 UPE-6L Enclosure Dimensions

### 1.3 Precast Enclosure Pedestal Support

Alpha's precast pedestal support system provides a quick, one-step solution for installing the UPE series enclosures.

Contact Alpha Technologies Customer Service (1-800-863-3930) to determine which Pedestal Support is needed for your installation.

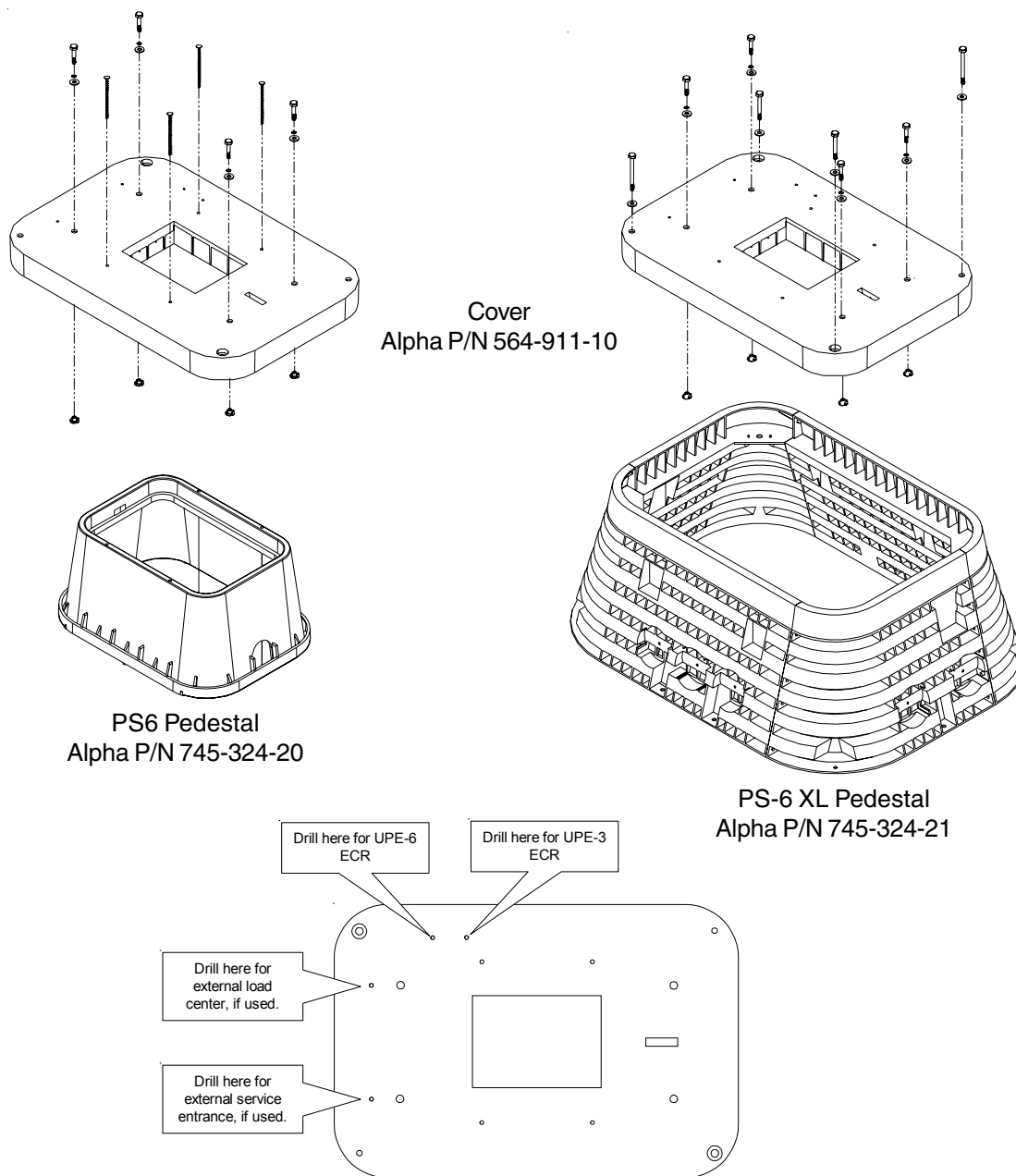


Fig. 1-3 Typical Pedestal Configurations

## 1. Pre-Installation

### 1.3 Precast Enclosure Pedestal Support, *continued*

For detailed installation instructions, refer to the Manufacturer's Installation Documentation included with the Pedestal Support Package.

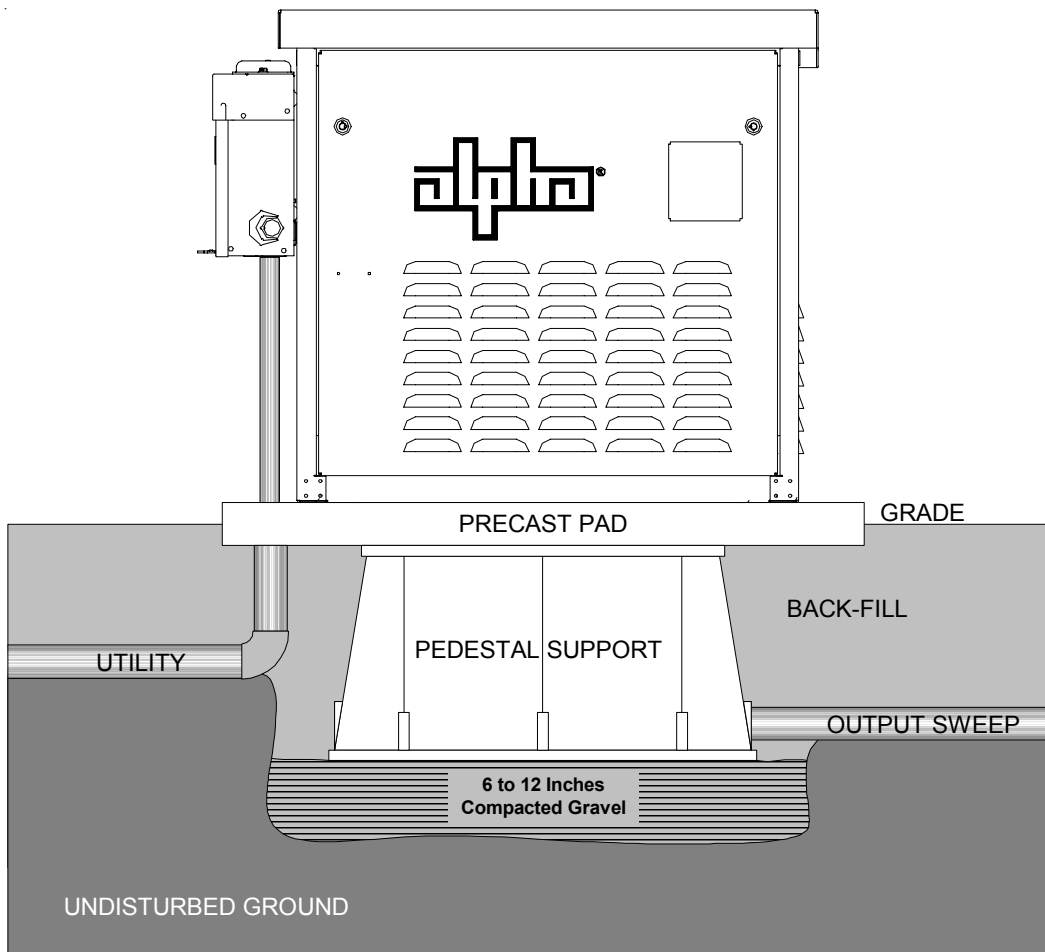


Fig. 1-4 Typical Pedestal Installation

## 1.4 Enclosure Grounding

In order to provide a ready, reliable source of backup power it is necessary to establish a grounding 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 will provide protection with respect to operator safety, system communication, and equipment protection.

### **Safety Ground**

The safety ground is a two-part system. The first part is a return path for stray current back to the input breaker, and the second is a return path from the Alpha enclosure to a second ground rod.

Typically, the safety, or utility ground, provides a return path to the input breaker or fuse panel by means of a connection to an appropriate driven ground rod at the base of the power pole. This path must meet National Electric Code (NEC) as well as local codes to ensure the breaker will open, preventing unwanted current flow from posing a hazard to service personnel.

The second part of the safety ground arrangement is the ground path between the Alpha enclosure and a second ground rod located at least 6 feet away from the driven ground rod at the power pole. The second ground rod and enclosure are connected via an AWG #6 solid copper wire buried at a depth of 8-12 inches. The wire is connected to the cabinet by means of a ground lug on the back of the cabinet (for pole-mounted enclosures), or to a ground lug inside the cabinet (for ground-mounted enclosures), and connected to the ground rod by means of a listed grounding clamp suitable for direct burial, or exothermic weld. Normally it is specified that the impedance of this ground can be no greater than 25 ohms at 60 Hertz. If, however, dual ground rods are installed approximately eight feet apart, it is not necessary to measure the impedance of the ground rods to meet the maximum 25 ohms specification—it is assumed that the impedance specification is met.

### **Signal Ground**

For proper operation, the Service Power Inserter must be securely grounded to the enclosure chassis. This is of particular importance in systems utilizing an external status monitoring transponder. The transponder chassis is grounded via a separate ground wire to the SPI case. For systems utilizing an embedded transponder, the ground connection is made either through a separate chassis ground block, or by means of the internal mounting hardware which then grounds the transponder through the XM Series 2 Power Supply.

### **Strike (Lightning) Ground**

Lightning strikes, grid switching, or other aberrations on the power line all have the potential to cause “fast rise-time currents” which can cause damage to the powering system. Without a low-impedance path to ground, the current, while traveling through wires of varying impedance, can produce high voltages which will damage the powering equipment. The most viable method available to protect the system from damage is to divert these unwanted “fast rise-time currents” along a low-impedance path to ground. A low-impedance path to ground will prevent 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 ground rods, so the components of the grounding system appear as a single point of uniform impedance.

Low impedance grounding is not only critical for the proper operation of the cable system, but also is **mandatory for personnel safety**.

# 1. Pre-Installation

## 1.4 Enclosure Grounding



**NOTE:** Alpha Technologies recommends using the grounding method illustrated below. The grounding method for a particular site will be dependant upon soil type, available space, local codes, NEC (National Electric Code), and other site-specific characteristics.

**It is the responsibility of the installer to ensure the requirements of all applicable national and local codes are met. 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.**

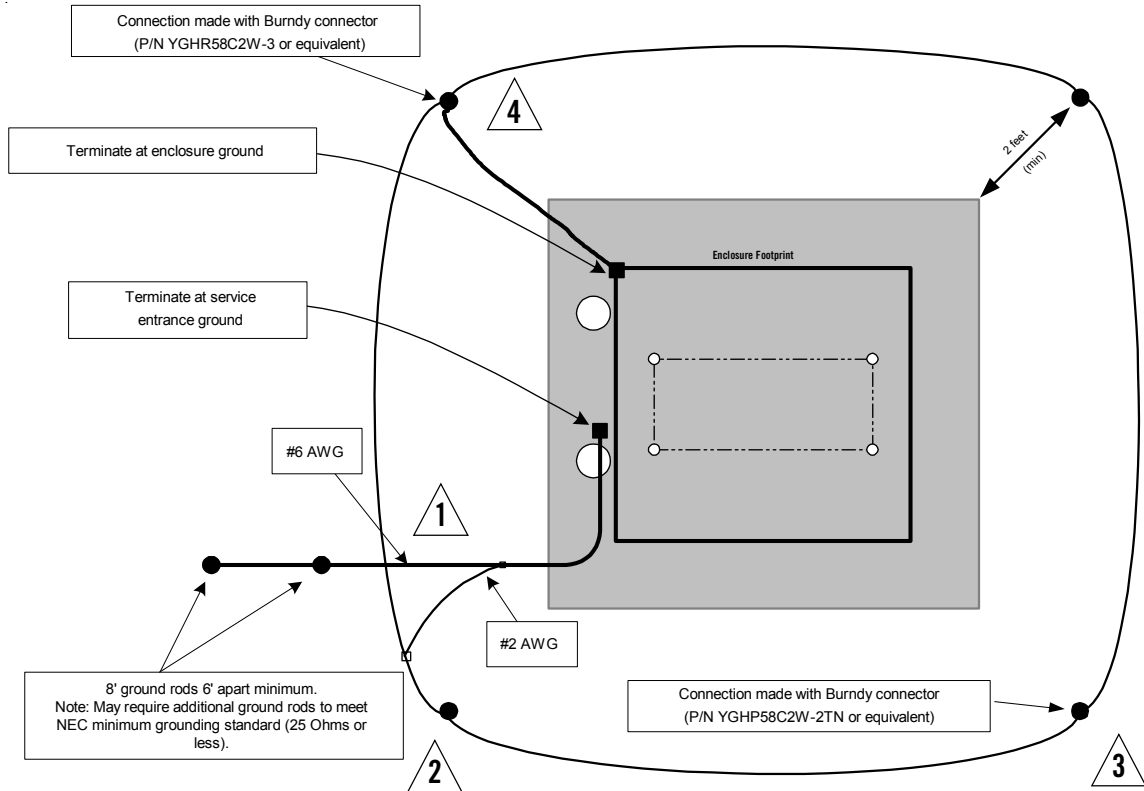


Fig. 1-5 Enclosure Grounding

### Service Grounding (required)



#6 bare copper wire from Service Neutral / Ground Bar with 2 ground rods located 6' apart.

### Lightning Protection (optional)



1/2" x 8' copper ground rod, four places, driven about 2 feet (typical) from the corners of the pad.



#6 bare copper wire loop terminated to each ground rod and buried below grade 30 inches min. Corrosion-proof connections (25+ year life-span) and hardware suitable for direct burial MUST be used.



#6 bare copper wire from loop to the enclosure



2.1 Enclosure Protection

Alpha Technologies, Inc. cannot anticipate all of the ways a vehicle may potentially threaten an installed system or the specific type of protection that is appropriate for a particular location. The determination of the threat to the equipment and the means of protection are the responsibility of the end user of the equipment and the authority having jurisdiction. 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, site surveys, traffic patterns and local codes.

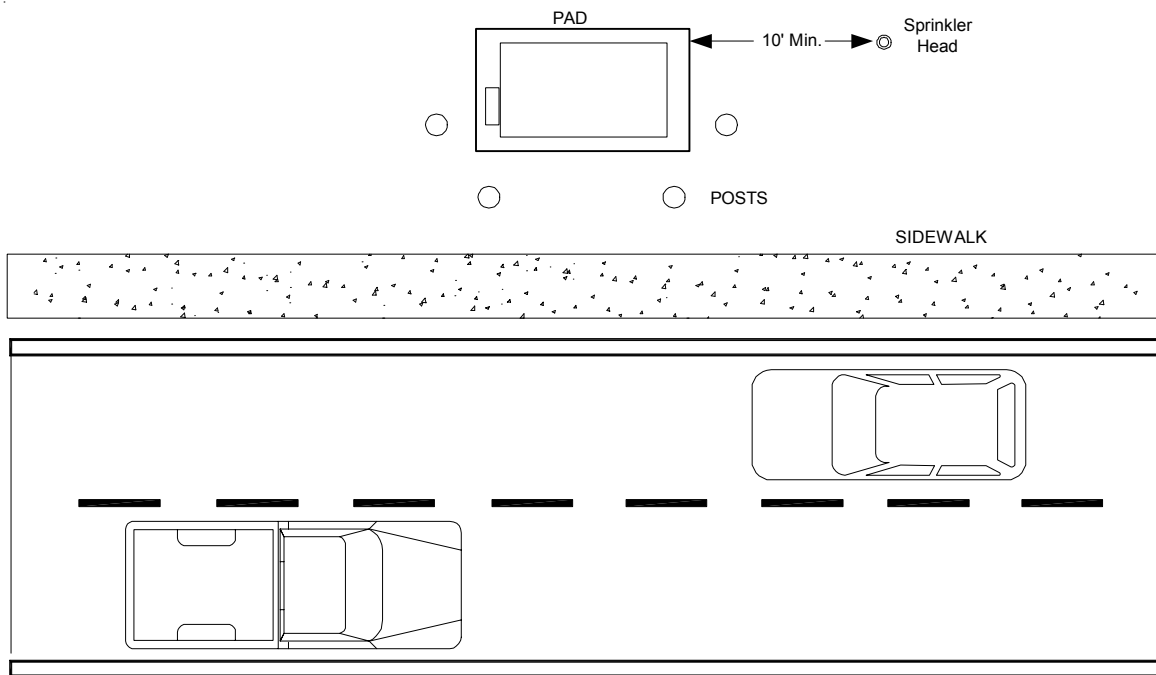


Fig. 2-1 Post placement

## 2. Installation

### 2.2 Transportation and Lifting

A safe means of transportation to the site and a safe procedure for unloading the enclosure is necessary. At least **two installation personnel** are required to place the enclosures on the pad. Installation team must assess the transport path for all obstructions. An obstruction free path should be selected for transport. Use safe lifting practices.

Approximate shipping weight:

Enclosure	Approximate Shipping Weight
UPE-3L	56 Pounds
UPE-6L	68 Pounds



**NOTE:**

Enclosure must always remain in the upright position during the shipping, storage and installation process. Damage may result from enclosure being shipped or stored on its side.



**NOTE:**

Electronic modules, batteries or other components must not be installed until the enclosure is securely set in place at its permanent location.



**NOTE:**

DO NOT lift the enclosure by the cover, unless empty.

## 2.3 Enclosure Installation

### 2.3.1 Attaching enclosure to the Pedestal Support or Pad

#### Tools Required:

Ratchet set with 6" extension.  
Vapor Barrier  
Utility Knife

#### Procedure:



#### **NOTE:**

A 25+ year *continuous vapor barrier* must be used between the enclosure and 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) should initially extended at least 6" in all directions around the perimeter of the enclosure and later be trimmed closer to the enclosure.

1. Unwrap the enclosure and inspect the contents. If items are missing or damaged, contact Alpha Technologies and the shipper immediately.
2. Place the vapor barrier material on the pad.
3. Unbolt the enclosure from the shipping pallet.
4. With no less than 2 installation personnel, lift the enclosure off the shipping pallet, and place over the mounting studs on the pad.
5. Secure the enclosure to the pad using the hardware supplied with the Precast Pad or Pedestal Support.
6. Trim the vapor barrier material.

## 2. Installation

### 2.3 Enclosure Installation, *continued*

#### 2.3.2 Attaching the External Coax Raceway

The external coax raceway is held in place by two tabs at the bottom of the raceway that fit into slots at the bottom of the enclosure, and a wingnut at the top.

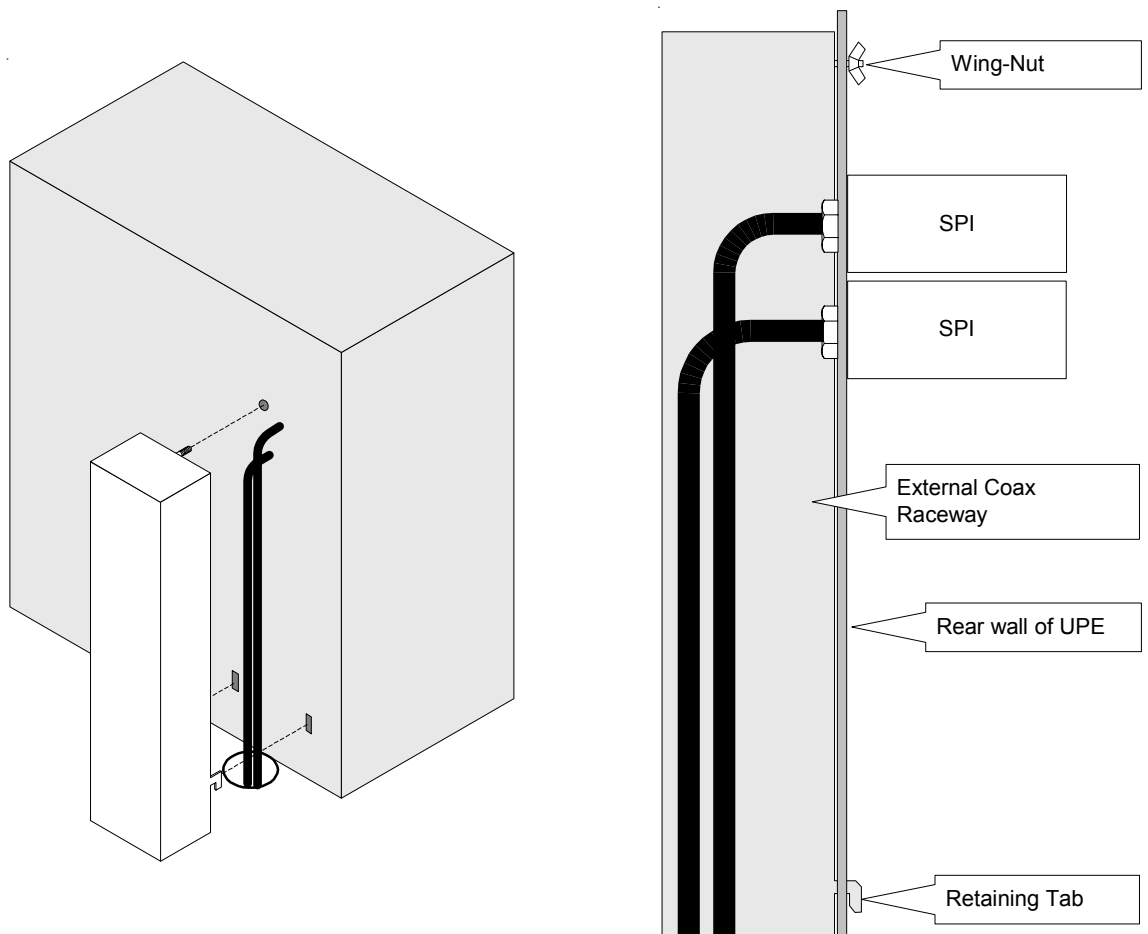


Fig. 2-2 External Coax Raceway

## 2.4 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:** CSA and NEC require that a service disconnect switch 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

Utility power enters the enclosure through the side or bottom of the UPE. The enclosure accepts a standard electrical fitting. The UPE Series can be equipped with an optional circuit breaker assembly located in the enclosure’s module compartment.



**NOTE:** A “high-magnetic” or HACR (Heating, Air Conditioning, Refrigeration) 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.

**240VAC Service** (XM Series 2 915-240 Power Supply for UPE-3L and UPE-6L): Enclosures used with the XM Series 2 915-240 is equipped with one or two 240VAC duplex receptacles 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 one or two 120VAC duplex receptacles to provide power to the power supply and peripheral equipment. The receptacle, NEMA 5-20R, is protected by a single pole 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.



**NOTE:** Alpha recommends wiring with 12AWG, in case the enclosure is to be upgraded from 240 VAC 15 Amp to 120 VAC 20 Amp

## 2. Installation

### 2.4 Utility Power Connection, *continued*

The UPE Series enclosures may be configured with the following service options. Please contact your Alpha Technologies representative for assistance selecting the configuration that best suits your requirements.

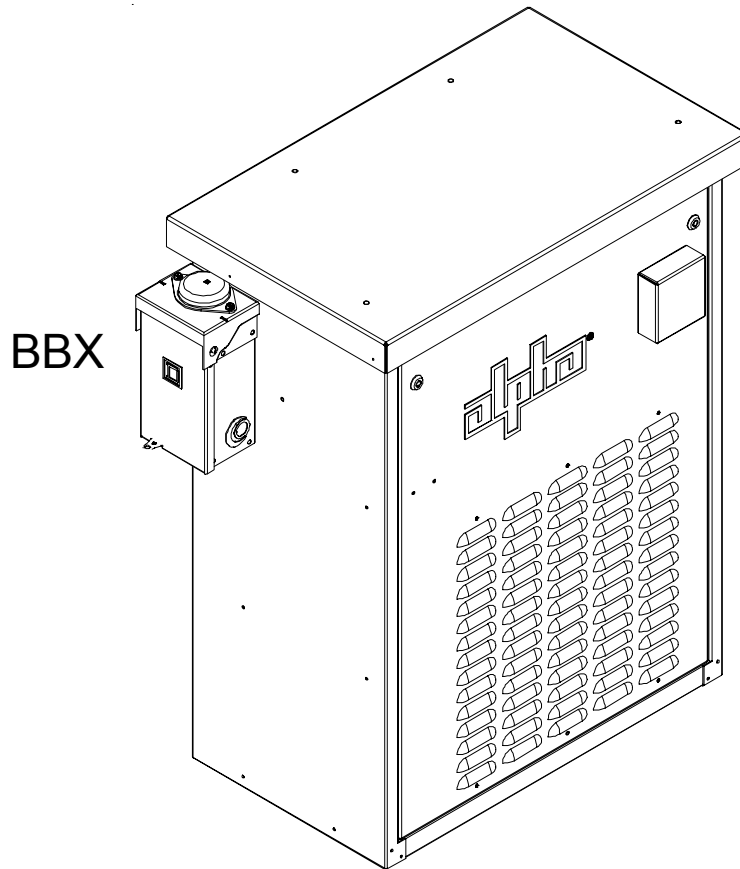
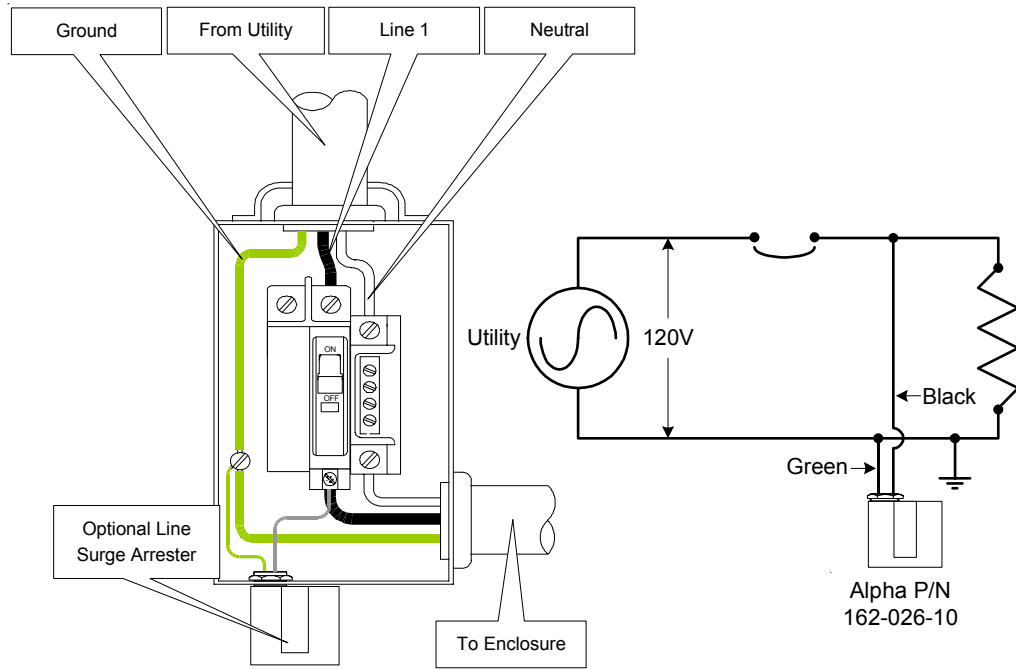
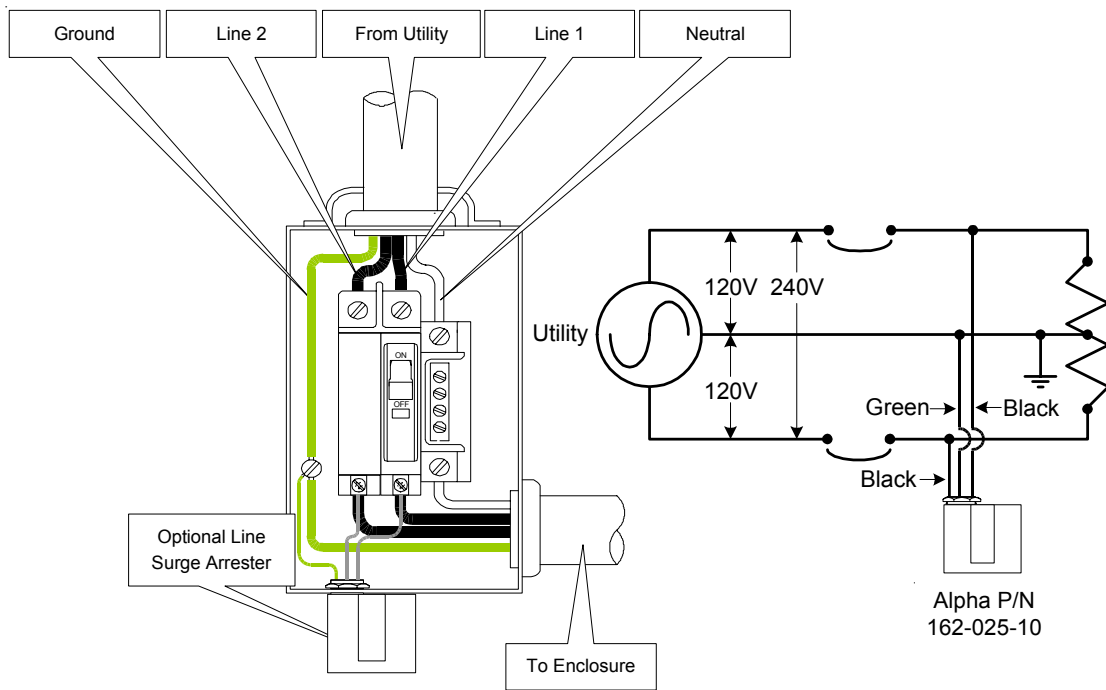


Fig. 2-3 Service Entrance Option

2.4 Utility Power Connection, *continued*



120 VAC Service Entrance



240 VAC Service Entrance

Figure 2-4 Typical Service Entrance Wiring

## 2. Installation

### 2.4 Utility Power Connection, *continued*

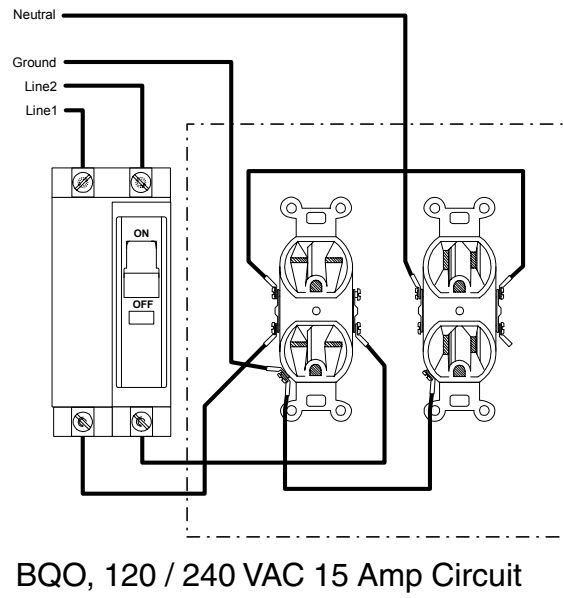
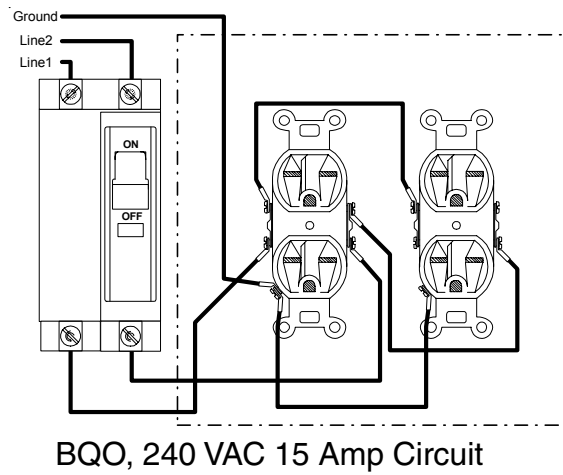
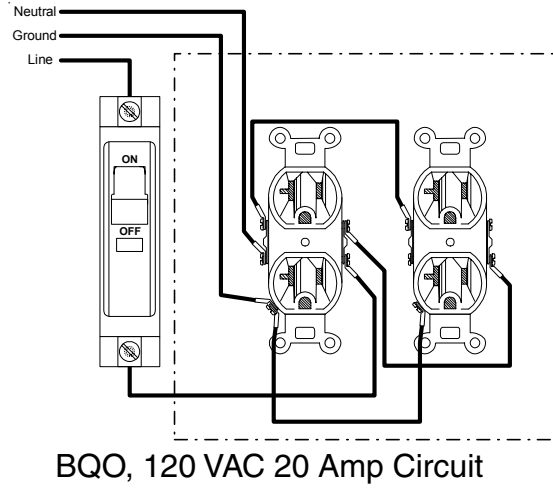
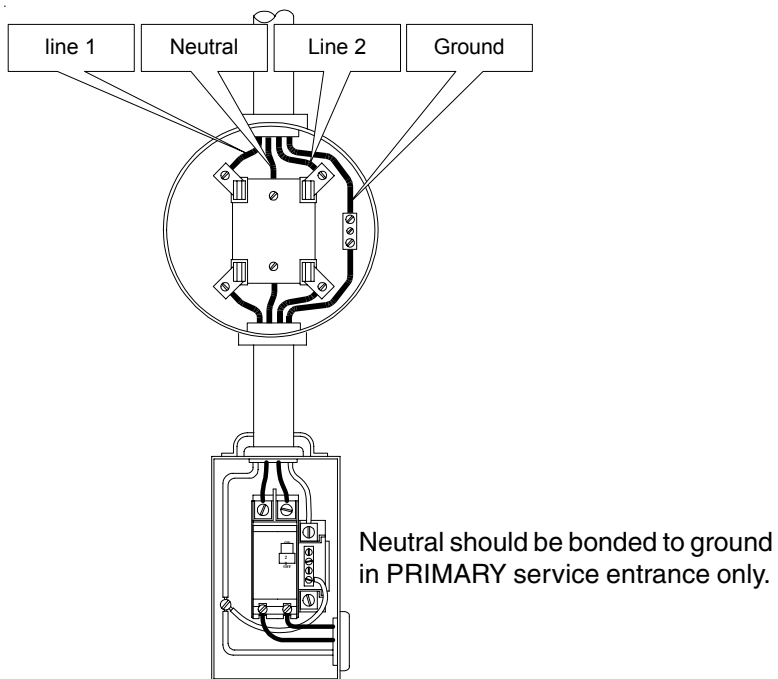


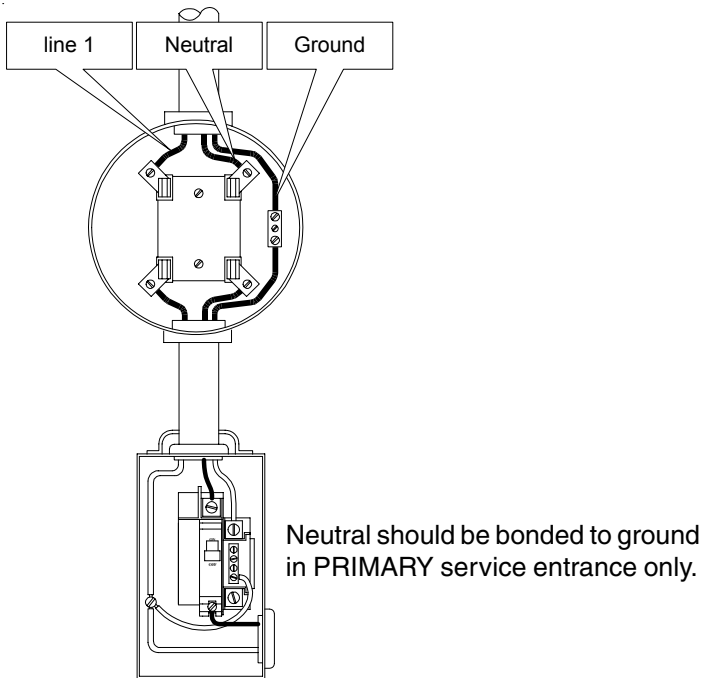
Figure 2-5 Breaker-Quad-Option Wiring



2.4 Utility Power Connection, *continued*



240 VAC Meter Base



120 VAC Meter Base

Figure 2-6 120 and 240VAC UL Wiring

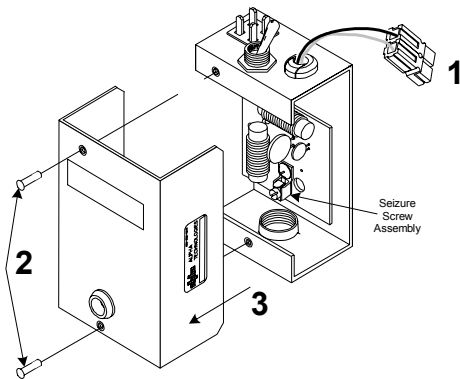
## 2. Installation

### 2.4 Utility Power Connection, *continued*

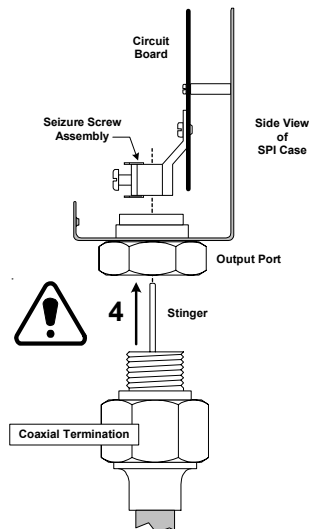
#### Coaxial Cable Connection



1. DO NOT remove SPI cover until all sources of power have been removed. Verify SPI IS NOT connected to power supply
2. Remove the two screws holding the cover onto the SPI's chassis.
3. Remove the SPI's cover, exposing the circuit board and seizure screw assembly.

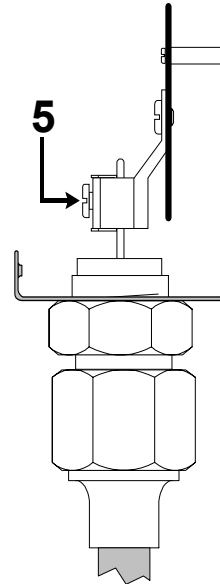


4. Insert the Coaxial Termination into the Output Port on the bottom of the SPI.

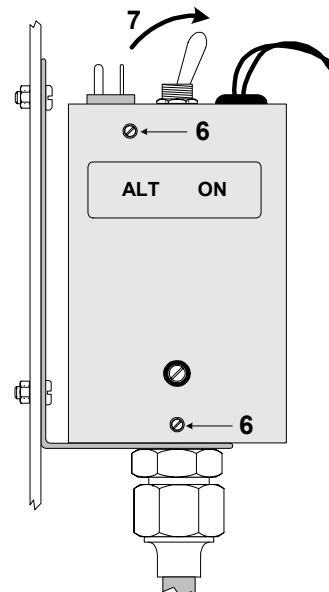


**NOTE:** To prevent arcing, and failure of the unit, the center conductor (stinger) of the coaxial termination must go fully **inside** the seizure screw assembly.

5. Tighten the Seizure Screw to 35 Inch-Pounds.



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



## 2.5 Power Supply Placement

### 2.5.1 Placement

Place the power supply on the top shelf over the vent louvers on the right. Do not connect any cables or connectors to the power supply at this time.

## 2.6 Battery Installation

### 2.6.1 Battery Safety



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

### 2.6.2 Battery Identification

Each battery contains a DATE CODE usually located on a sticker near the center of the battery or stamped in white ink near the POS terminal. 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 manufacturers' documentation for date code type and placement.

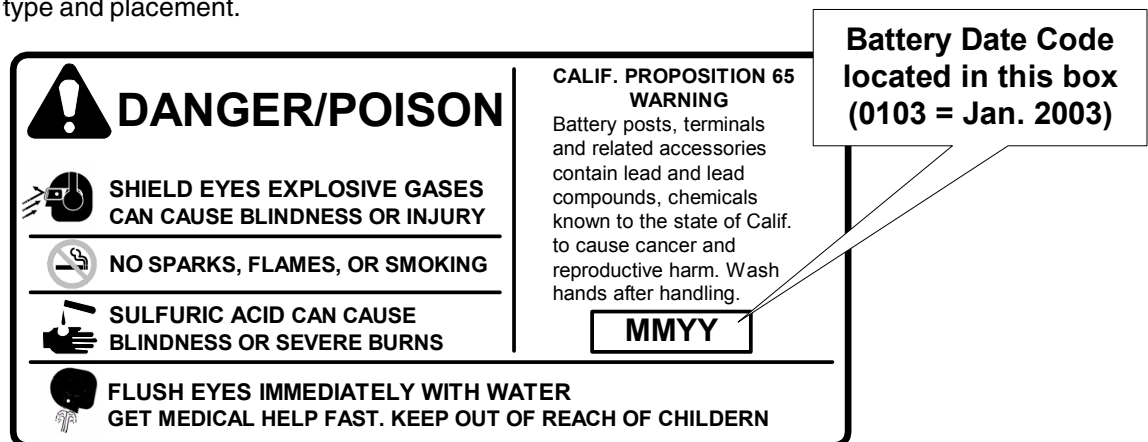


Fig. 2-7 Battery Hazard Warning Label

## 2. Installation

### 2.6 Battery Installation, *continued*

#### 2.6.3 Battery Terminal Connections

The accompanying drawings are for *illustrative* purposes only. Various types of batteries with different mounting styles and hardware may be shipped with the system. ALWAYS refer to the battery manufacturers' specifications for correct mounting hardware and torque requirements. During maintenance procedures, refer to the manufacturers' specifications for the maintenance torque requirements.

For AlphaCell batteries, use 65 Inch-Pounds upon installation, torque to 50 Inch-Pounds during maintenance.

A corrosion inhibitor should be used on all bare metal connections and crimps

Mounting hardware requirements may vary with battery manufacturers. Use only the hardware recommended by your particular battery manufacturer.

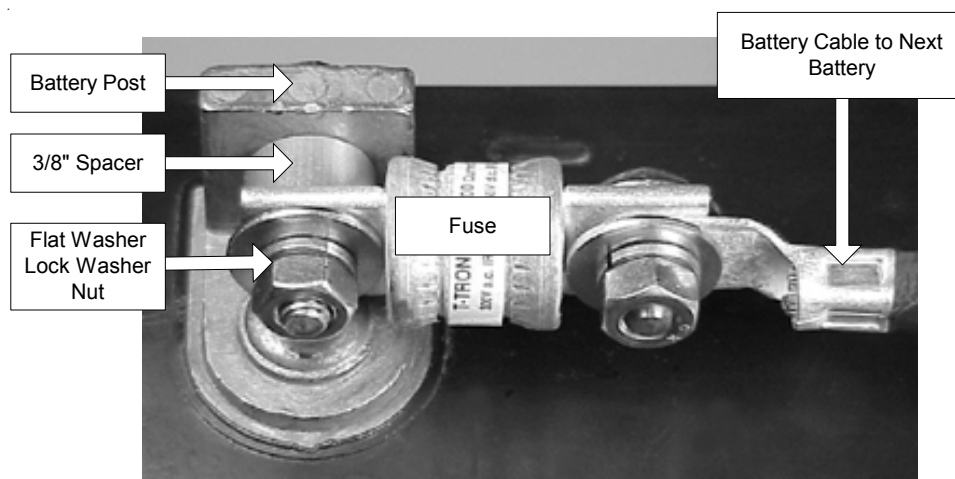


Fig. 2-8 Battery Terminal Connections

## 2.6 Battery Installation, *continued*

### 2.6.4 Battery Connection

#### Tools Needed:

Two 7/16" open end wrenches

DC Voltmeter

Torque wrench 0-100 In-Lbs

Battery Cable Kit - For part numbers and descriptions of Cable Kits,  
Please refer to the power supply Order Guide

#### Procedure:

For UPE-3L:

1. Unlatch and slide the battery tray out to the stops.
2. Install three batteries, position batteries as shown in Fig. 2-5.
3. Wire in accordance with Fig. 2-5. Torque connections to manufacturers recommendation. Apply corrosion inhibitor to terminals and connections.



**DANGER:** Battery drawer slides may be damaged if drawer is forced into enclosure while slide latch is engaged.

4. Unlatch and slide the tray evenly into the enclosure.
5. Using a DC Meter, measure the voltage at the power supply connector, verify that the voltage is between 36 and 40.5 VDC.
6. DO NOT connect the battery pack to the power supply at this time.

For UPE-6L:

1. Unlatch and slide the upper battery tray out to the stops.
2. Install three batteries, position batteries as shown in Fig 2-6.
3. Wire in accordance with Fig. 2-6. Torque connections to manufacturers recommendations. Apply corrosion inhibitor to terminals and connections.



**DANGER:** Battery drawer slides may be damaged if drawer is forced into enclosure while slide latch is engaged.

4. Unlatch and slide the upper battery tray evenly into the enclosure.
5. Unlatch and slide the lower battery tray out to the stops.
6. Install three batteries, position batteries as shown in Fig 2-6.
7. Wire in accordance with Fig. 2-6.
8. Unlatch and slide the lower battery tray evenly into the enclosure.
9. Using a DC Meter, measure the voltage at the power supply connector, verify that the voltage is between 36 and 40.5 VDC.
10. DO NOT connect the battery pack to the power supply at this time.

## 2. Installation

### 2.6 Battery Installation, *continued*

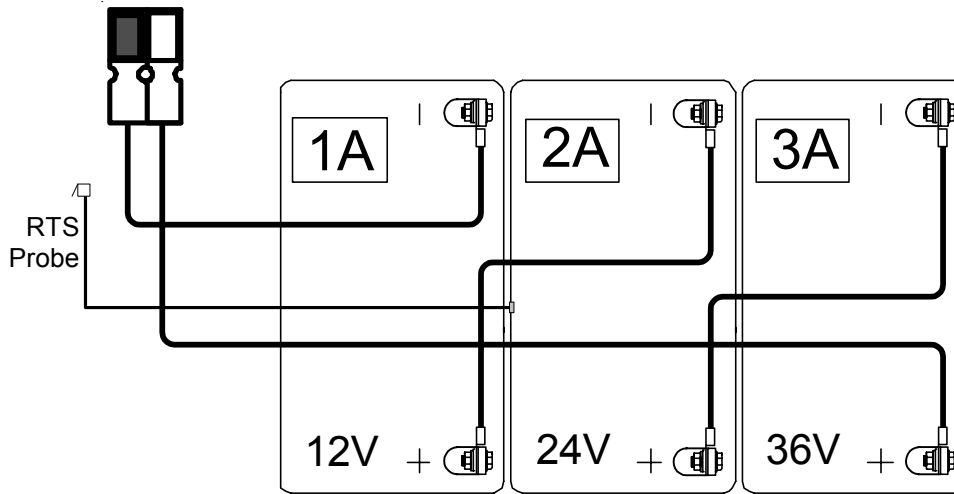


Fig. 2-9 UPE-3L Battery Placement

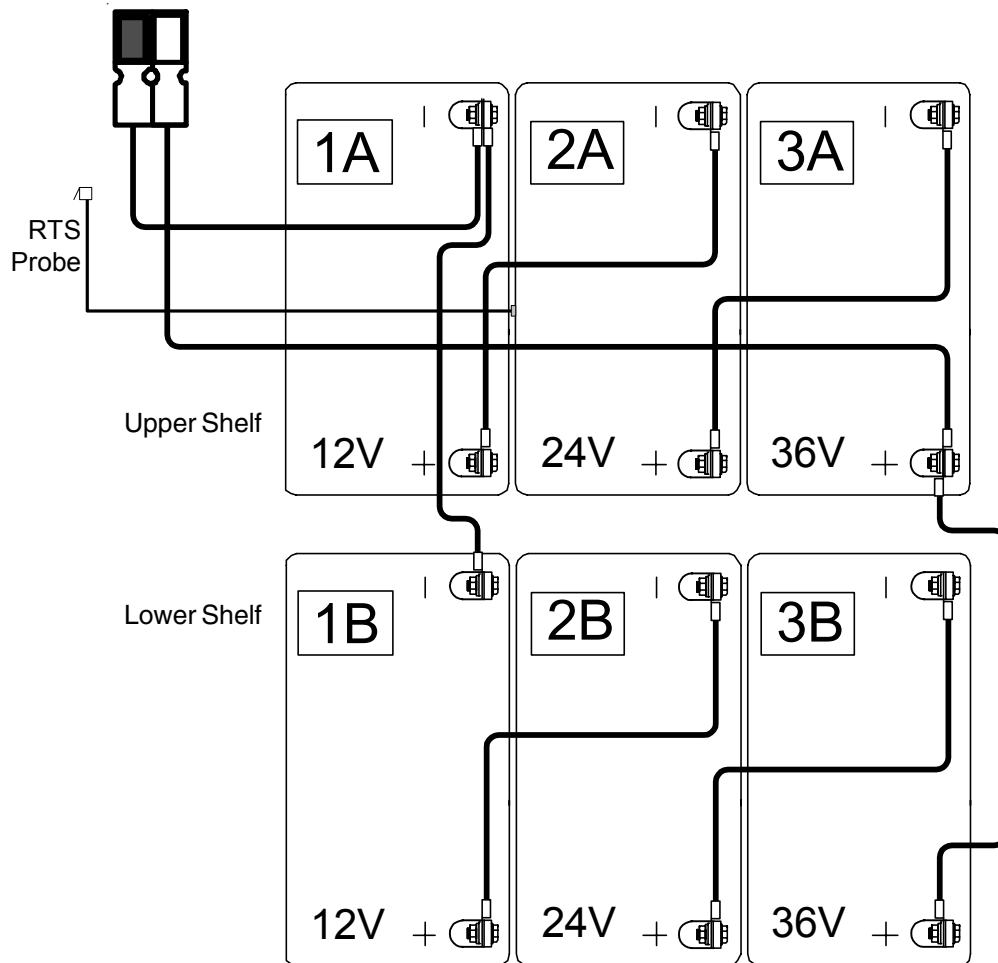


Fig. 2-10 UPE-6L Battery Placement

## 2.7 Battery Temperature Sensor

### **Tools Needed:**

Adhesive Tape

### **Procedure:**



**NOTE:** For enclosures with multiple battery strings, the RTS must be located with the warmest (normally the topmost) 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.

1. Attach the RTS Probe to the inner side of battery 2A 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.

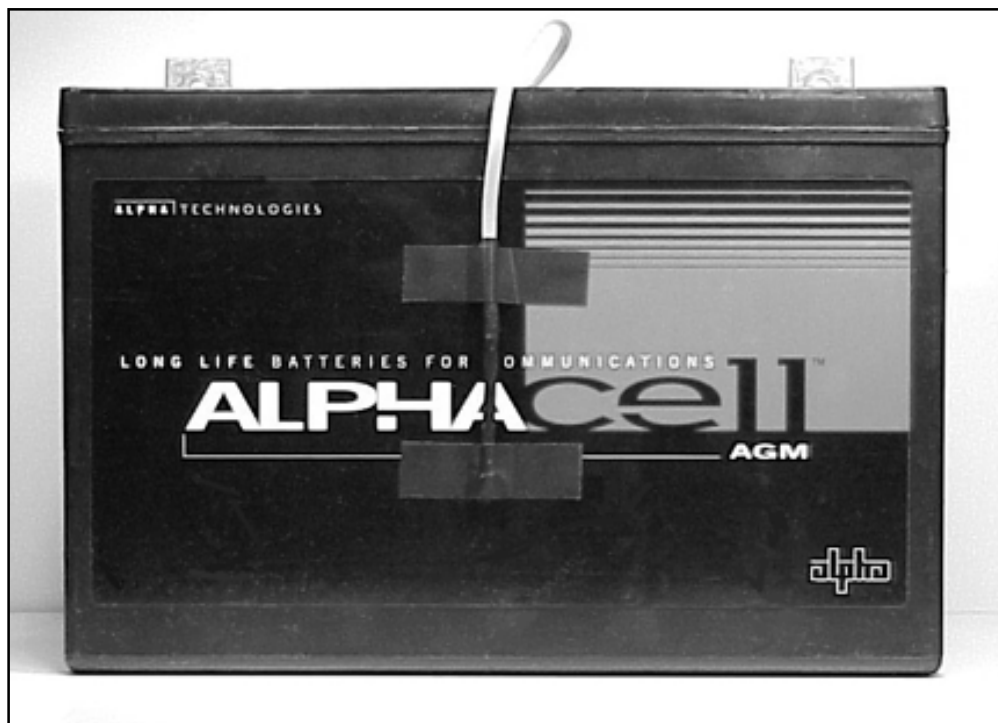


Fig. 2-11 RTS Placement

## 2. Installation

### 2.8 Lightning and Surge Arrester Options

Alpha's LA Series voltage suppressors provide reliable protection of power supplies and related equipment from the damaging powerline disturbances common to cable TV and broadband applications. The LA Series incorporates MOV's that effectively limit voltage surges and absorb excessive energy levels. Housed in a durable polymer casings with standard electrical plugs, the LA Series plugs directly into any electrical outlet.



**NOTE:** LED On - Operation Normal, LED Off - LAP has failed, Replace LAP

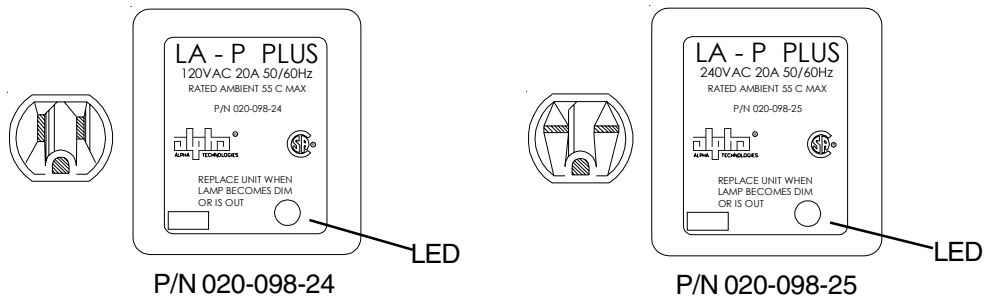


Fig. 2-12 LAP Plus

This hard-wired surge arrester is designed to protect against lightning induced surges for electrical equipment and wiring. When installed, the arrester will quickly divert to ground the lightning surges attempting to enter your electrical system. Refer to Fig.2-2 for wiring. The surge protector is designed to handle repetitive operations. Excessive severe lightning can cause the device to fail, and it should be replaced under the following conditions: If any portion of the indicating window is black, or if the indicating window is completely black.

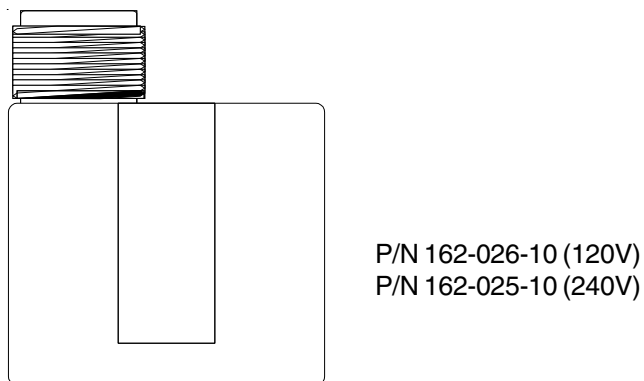


Fig. 2-13 Line Surge Arrester



## 2.9 Battery Heater Mat, and LRI-ACI Lamp Option

### Battery Heater Mat Option

Battery Heater Mats are designed to increase battery capacity in cold environments. To install the mats:

1. Remove the batteries from the tray(s).
2. Place the heater mat in the bottom of the tray(s).
3. Replace the batteries.
4. Plug the AC line cord into the closest receptacle.

The heater mat is thermally fused at 180° F. The thermostat is set to open on rise at 50° F, and close at 40° F.

### LRI Option

The LRI lamp (red lamp) is located on the outside, on either the right or left side of the enclosure. The lamp comes ON only when the power supply is running on backup power (STANDBY). During normal AC line operation, the lamp remains OFF. Whenever a fault is detected, the lamp flashes to indicate that service is required. The LRI can be used as a simple form of status monitoring by allowing cable technicians to check the operational status of the power supply without having to climb the pole and open the enclosure. Connect the LRI lamp to the jack on the front of the power supply labeled LRI.

### ACI Option

The AC indicator (green lamp) is located on the outside, on either the right or left of the enclosure. When the lamp is ON, it indicates AC power is available at the power supply output. This allows a cable technician to drive by and determine the status of the power supply without having to climb the pole. Connect one connector of the ACI lamp to the OUTPUT 1 jack on the front of the power supply, and the other to the SPI.

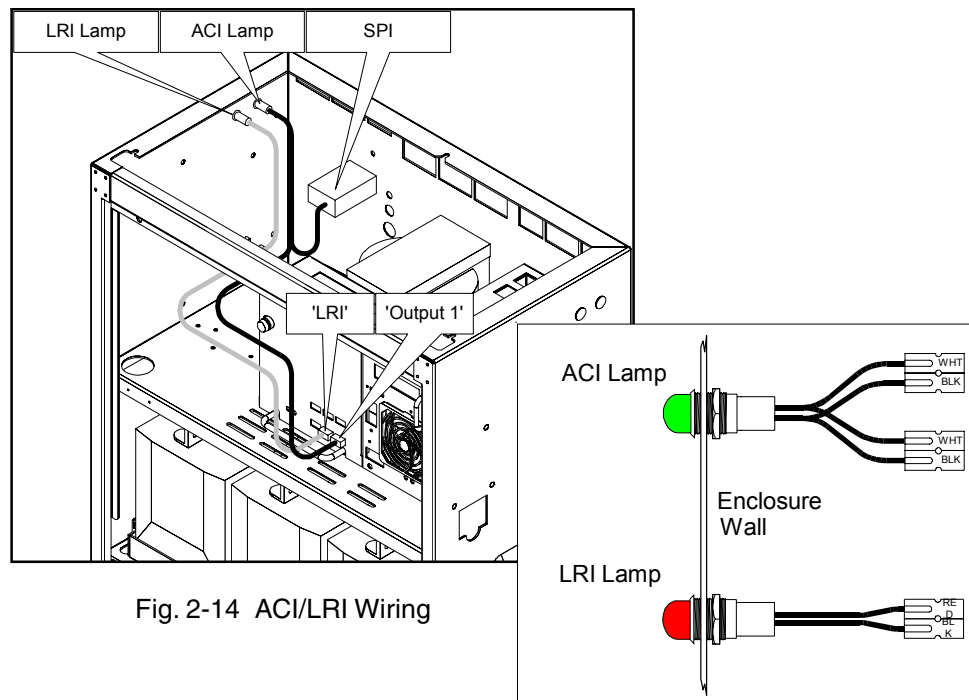


Fig. 2-14 ACI/LRI Wiring

## 2. Installation

### 2.10 Enclosure Door Tamper Switch Option

#### **Tamper Switch**

The Tamper Switch is located on the edge of the power supply shelf, opposite the power supply. The switches are available in Normally Closed (P/N 740-216-21) and Normally Open (740-216-26). The USM2, USM-2.5, or DSM options are required to monitor the Tamper Switch.

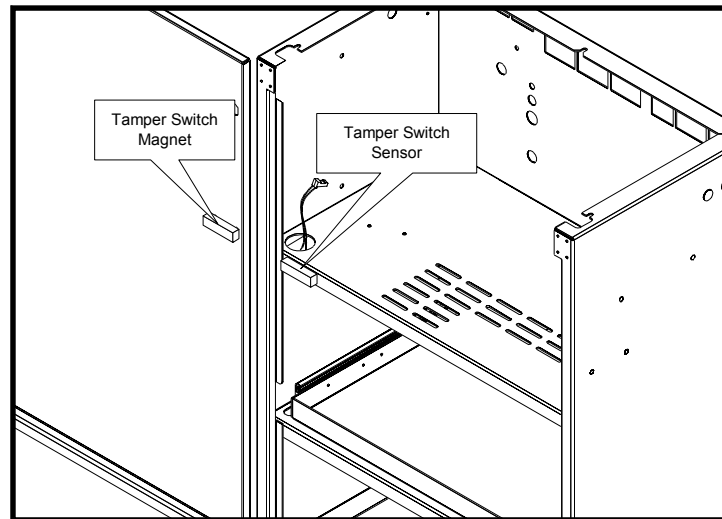


Fig. 2-15 Tamper Switch Wiring





# Power

Alpha Technologies



#### Corporate

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