

# UPE-M Series

Metered Ground Mount Enclosures

Power



## Installation and Operation Manual

UPE-M3, UPE-M6, UPE-M8, 10KAIR and 65KAIR

*Effective: November, 2004*

Alpha Technologies



*Power* Alpha Technologies 

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# UPE-M Installation

031-145-C0-002, Rev. B

Effective Date: November, 2004

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## **NOTE**

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



## **NOTE**

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Operator is cautioned to 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.



## **NOTE**

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Alpha shall not be held liable for any damage or injury involving its enclosures, power supplies, generators, batteries, or other hardware if used or operated in any manner or subject to any condition not consistent with its intended purpose, or is installed or operated in an unapproved manner, or improperly maintained.

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*

# Table of Contents

Safety Notes .....	6
1.0 Pre-Installation .....	7
1.1 Introduction .....	7
1.2 Inner Tray Layout .....	11
2.0 Site Preparation .....	12
2.1 Site Considerations .....	12
2.2 Enclosure Pedestal Support .....	13
2.3 Pad Fabrication .....	14
2.4 Enclosure Grounding .....	15
3.0 Installation .....	16
3.1 Enclosure Installation .....	16
3.2 Utility Powering .....	17
3.3 Service Power Inserter .....	23
3.4 Battery Installation .....	24
3.5 Power Supply Installation .....	27
3.6 Power Supply Connections .....	28
3.7 Lightning Arrester (LA-P+) Option .....	29
3.8 LRI Option .....	29
3.9 Enclosure Cooling Fan (optional) .....	30

# List of Figures

Fig. 1-1,	UPE-M3 and UPE-M6 Meter Compartment .....	7
Fig. 1-2,	UPE-M8 Meter Compartment .....	7
Fig. 1-3,	UPE-M8 Dimensions .....	8
Fig. 1-4,	UPE-M6 Dimensions .....	9
Fig. 1-5,	UPE-M3 Dimensions .....	10
Fig. 1-6,	Inner Trays .....	11
Fig. 2-1,	Pedestal Support (PS-1) Dimensions .....	13
Fig. 2-2,	Concrete Pad Dimensions .....	14
Fig. 2-3,	Enclosure Grounding .....	15
Fig. 3-1,	Enclosure Mounting Holes .....	16
Fig. 3-2,	65K-AIR Enclosure (Rear View) .....	18
Fig. 3-3,	10K-AIR Enclosure (Rear View) .....	18
Fig. 3-4,	Meter Base Configurations .....	19
Fig. 3-5,	Meter Base Configurations .....	20
Fig. 3-6,	Fuse/Receptacle Configurations for 65K-AIR Enclosures .....	21
Fig. 3-7,	Fuse/Receptacle Configurations for Standard Enclosures .....	22
Fig. 3-8,	Removing SPI Cover .....	23
Fig. 3-9,	Connecting Coax to SPI Output Port .....	23
Fig. 3-10,	Battery Terminal Assembly .....	24
Fig. 3-11,	Battery Pack .....	26
Fig. 3-12,	Battery and Output Power Connections .....	28

# 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 is for specific regulatory/code requirements that may affect the placement of equipment and installation procedures.



## **NOTE**

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



## **CAUTION!**

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A CAUTION presents safety information to prevent damage to equipment.



## **WARNING!**

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

# 1.0 Pre-Installation

## 1.1 Introduction

The Alpha UPE-M series of metered CATV power supply enclosures are a secure, ruggedly designed, water-resistant enclosure with separate raceways for utility power and CATV wiring. The enclosure is designed to meet code and safety standards specified by EUSERC and the NEC.

The utility meter compartment is isolated from the CATV compartment. Utility access doors contain padlock hasps with separate sealing screws. A small hole is provided in each screw and hasp to accommodate a lead wire seal. The CATV doors have flush-mounted key locks installed.

The utility meter compartment contains a hinged, lockable, Lexan window for meter reading. The utility meter can be accessed by lifting the hinged door.

The standard UPE-M enclosure has a fault current interrupt rating of 10,000A. A 65,000A version is also available.

There are three basic models in the UPE-M series, available in both 10KAIR and 65KAIR configurations. The UPE-M3 and UPE-M6 models are designed for the XM2-615, XM2-915, and XM2-1350 power supplies with 36V inverters. The UPE-M8 model is designed for the XM2-1350, XM2-615, and XM2-922 power supplies with 48V inverters.

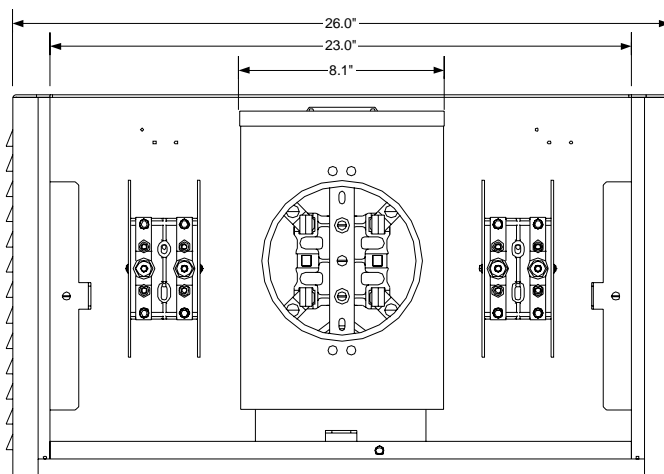


Fig. 1-1, UPE-M3 and UPE-M6 Meter Compartment, with Test Bypass Blocks

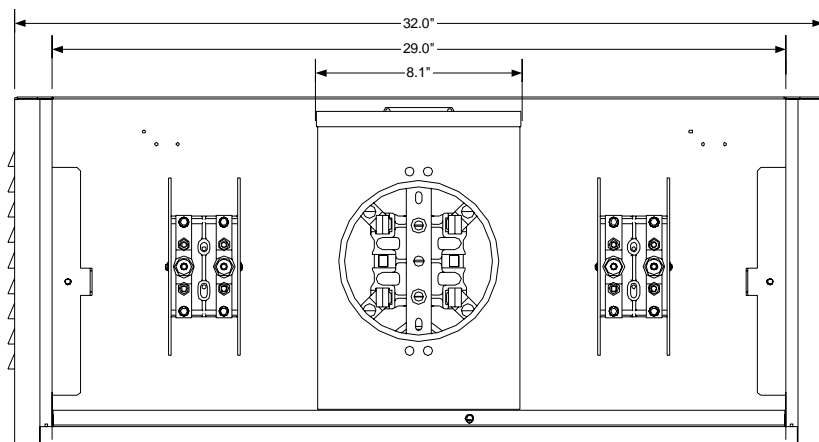


Fig. 1-2, UPE-M8 Meter Compartment, with Test Bypass Blocks

1.0 Pre-Installation, continued

1.1 Introduction, continued

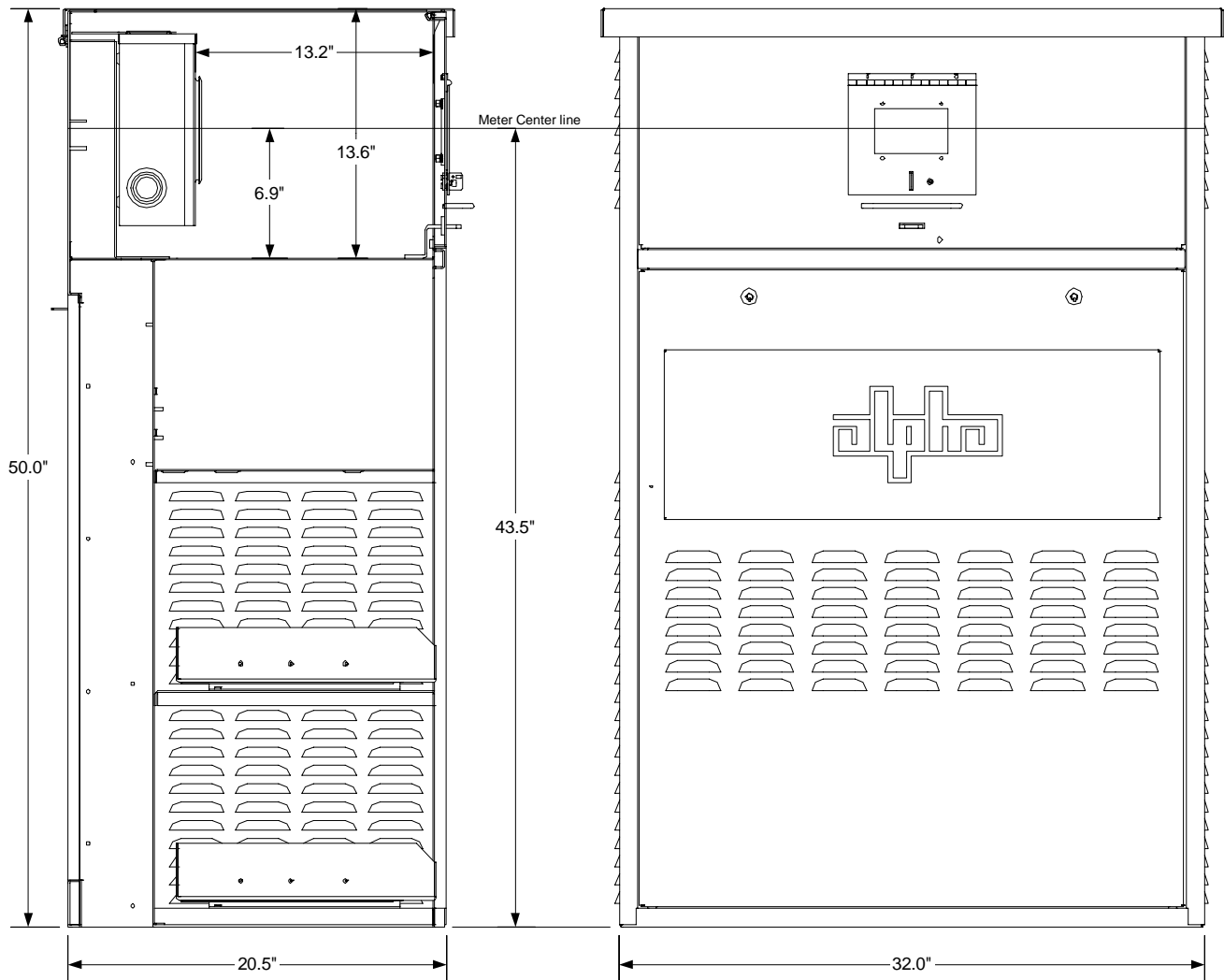


Fig 1-3, UPE-M8 Dimensions

1.0 Pre-Installation, continued

1.1 Introduction, continued

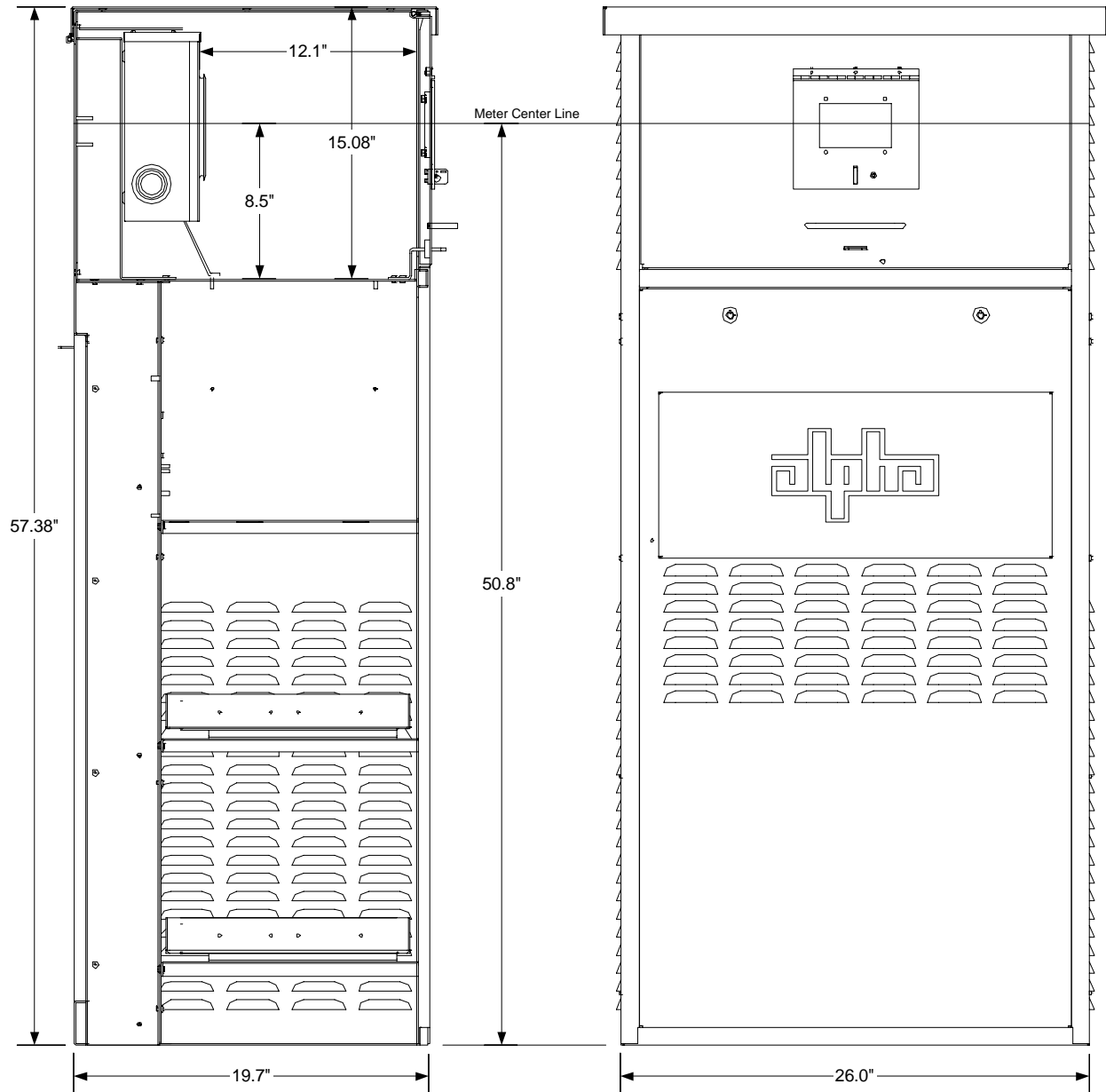


Fig 1-4, UPE-M6 Dimensions

1.0 Pre-Installation, continued

1.1 Introduction, continued

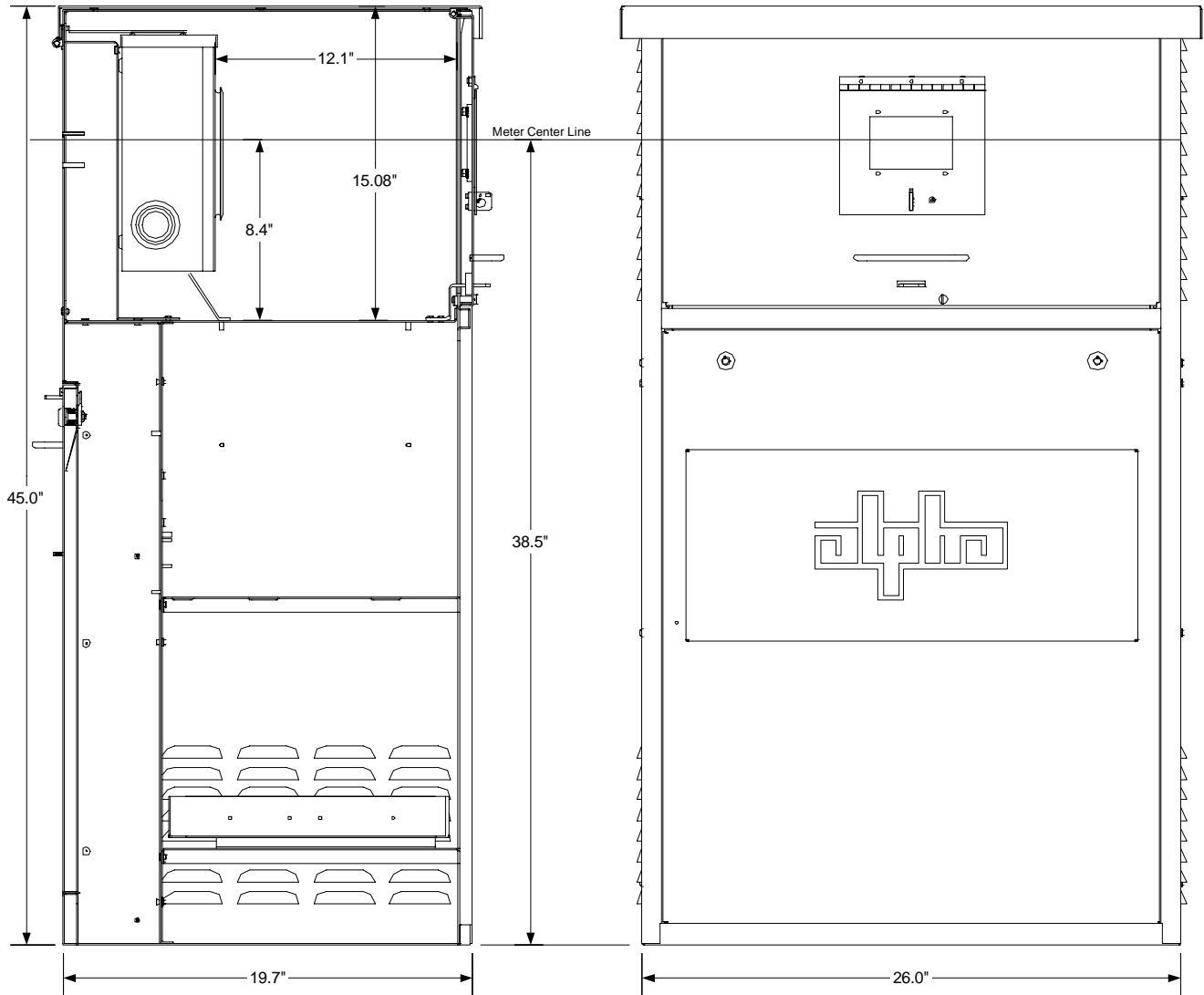
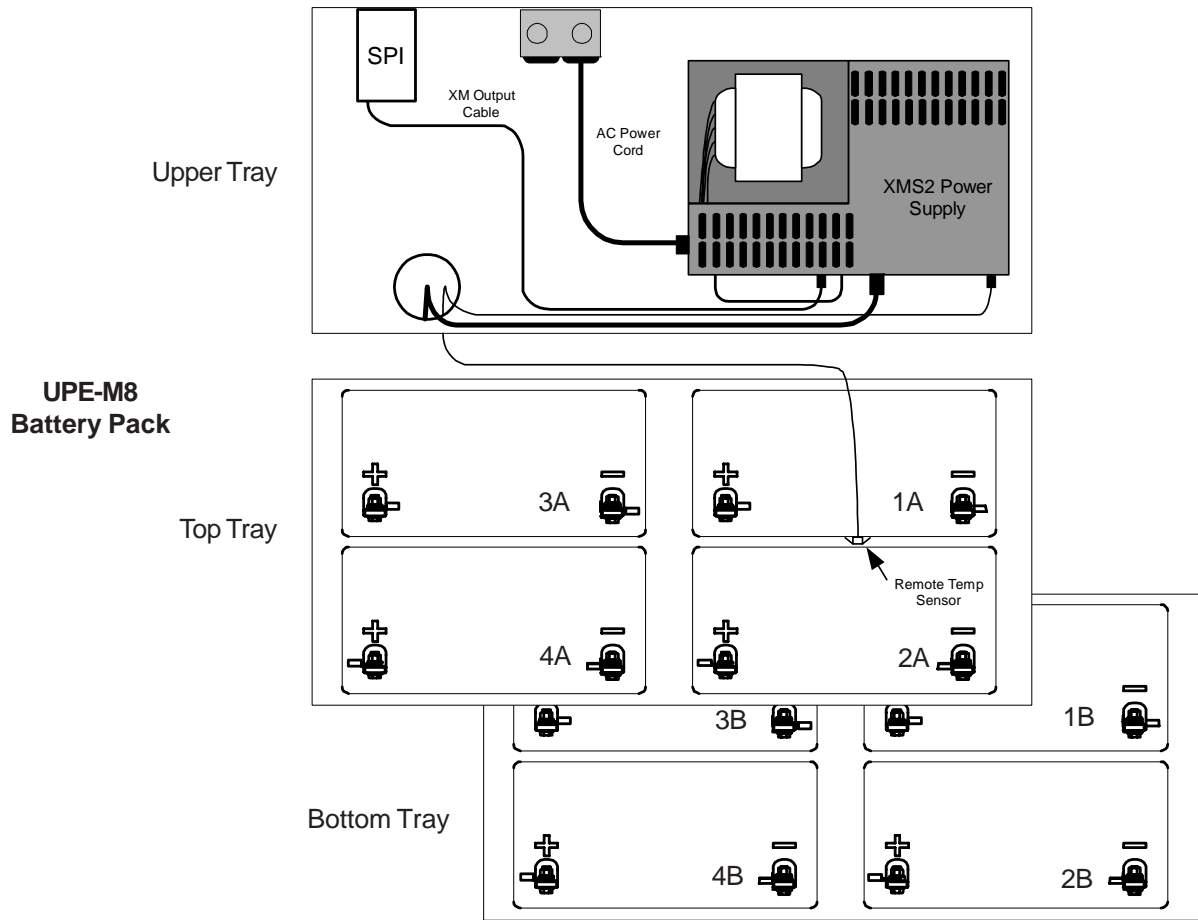


Fig 1-5, UPE-M3 Dimensions

## 1.0 Pre-Installation, continued

### 1.2 Inner Tray Layout



#### UPE-M3, 6 Battery Pack

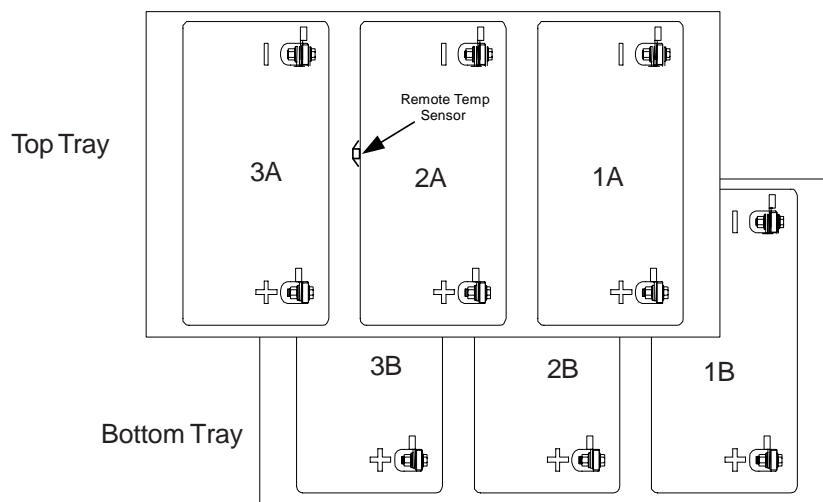


Fig. 1-6, Inner Trays

## 2.0 Site Preparation

### 2.1 Site Considerations

The following points must be considered when choosing a location for the enclosure installation:

- Plan the site so the enclosure will receive good air flow. If possible, in areas of extreme heat, position the enclosure so it is shaded from the afternoon sun.
- In areas of prevailing winds, locate the enclosure so the back of the cabinet faces the wind instead of the sides. This will reduce the buildup of sand or snow against the enclosure's air vents.
- In areas of potential flooding, locate the installation above the 100-year flood plain .
- Place the enclosure where it will be free of obstructions and allows easy access to the doors for service or equipment access. For ventilation and maintenance, allow a minimum of 36 inches in the front and rear of the enclosure.
- Place the enclosure well away from ground level sources of forced water, such as underground sprinkler systems or direct roadway splash.
- The concrete pad drawing provided in this manual contains the required mounting details, including electrical service and cable plant entrances.
- For ease of installation, lightweight polymer, high density polyethylene mounting supports (Alpha PS Series) are available from Alpha Technologies for UPE-M series enclosures.
- A vapor barrier material (such as 30 lb. felt, neoprene pond liner, or heavy grade tar paper) should extend at least six inches in all directions around the perimeter of the enclosure. It can be trimmed closer to the enclosure after installation.
- Install batteries only after the unit is on site and secured to the pad. Transporting the unit with installed batteries may cause a short circuit, fire, explosion, and/or damage to the battery pack, enclosure or installed equipment. Damage caused by improperly shipping or transporting a unit with installed batteries is not covered under warranty.
- The batteries used in this application may vary slightly depending upon optional configurations, battery types, or customer requirements. The batteries are typically valve-regulated gelled-electrolyte, such as the AlphaCell. If a battery is found damaged, refer to the battery manufacturer's documentation regarding the safe handling of the battery.

## 2.0 Site Preparation, continued

### 2.2 Enclosure Pedestal Support

The polymer pedestal support system provides a stable foundation for UPE-M series enclosure installations.

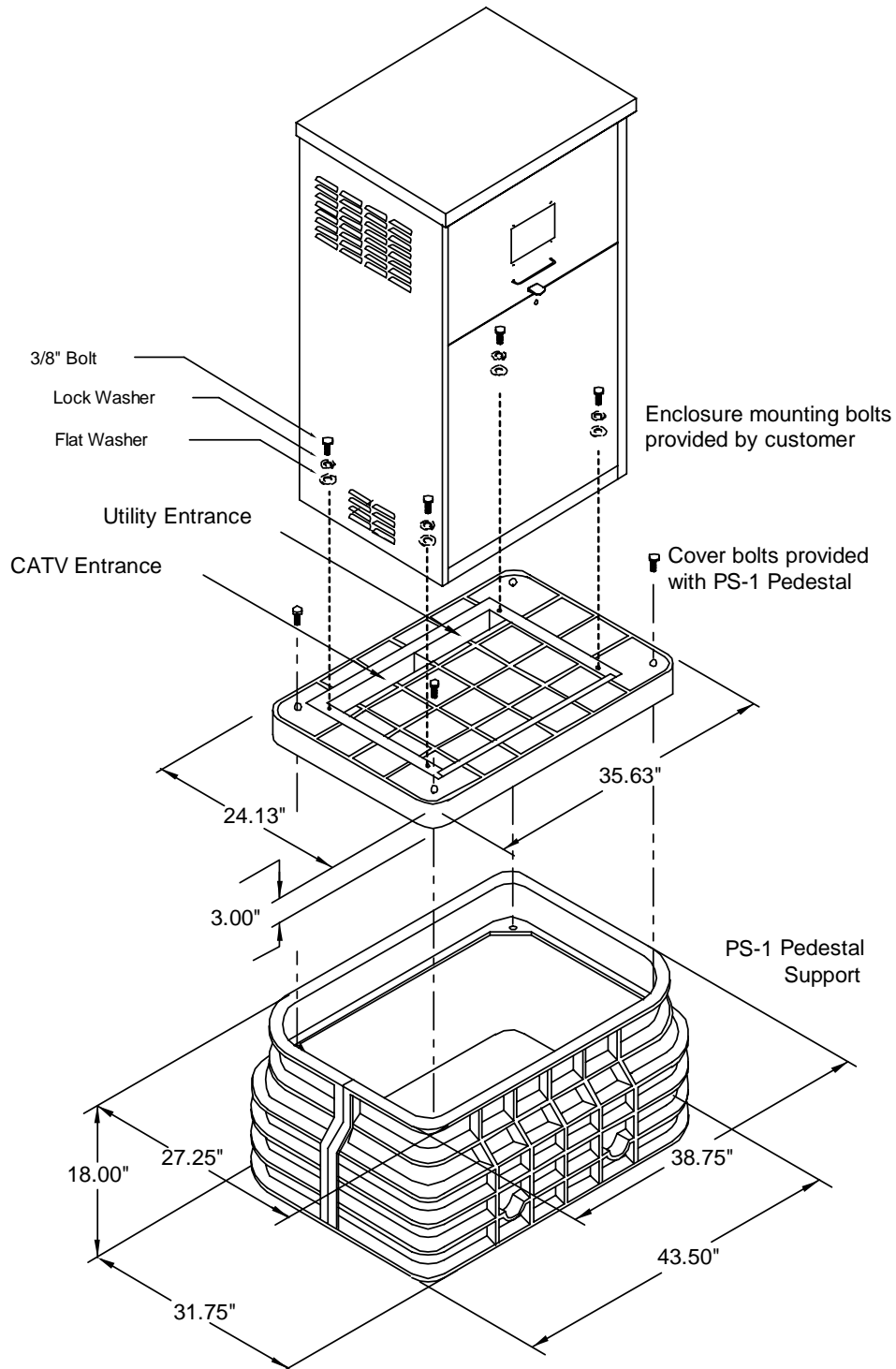


Fig. 2-1, Pedestal Support (PS-1) Dimensions  
Alpha P/N 744-006-20

2.0 Site Preparation, continued

2.3 Pad Fabrication

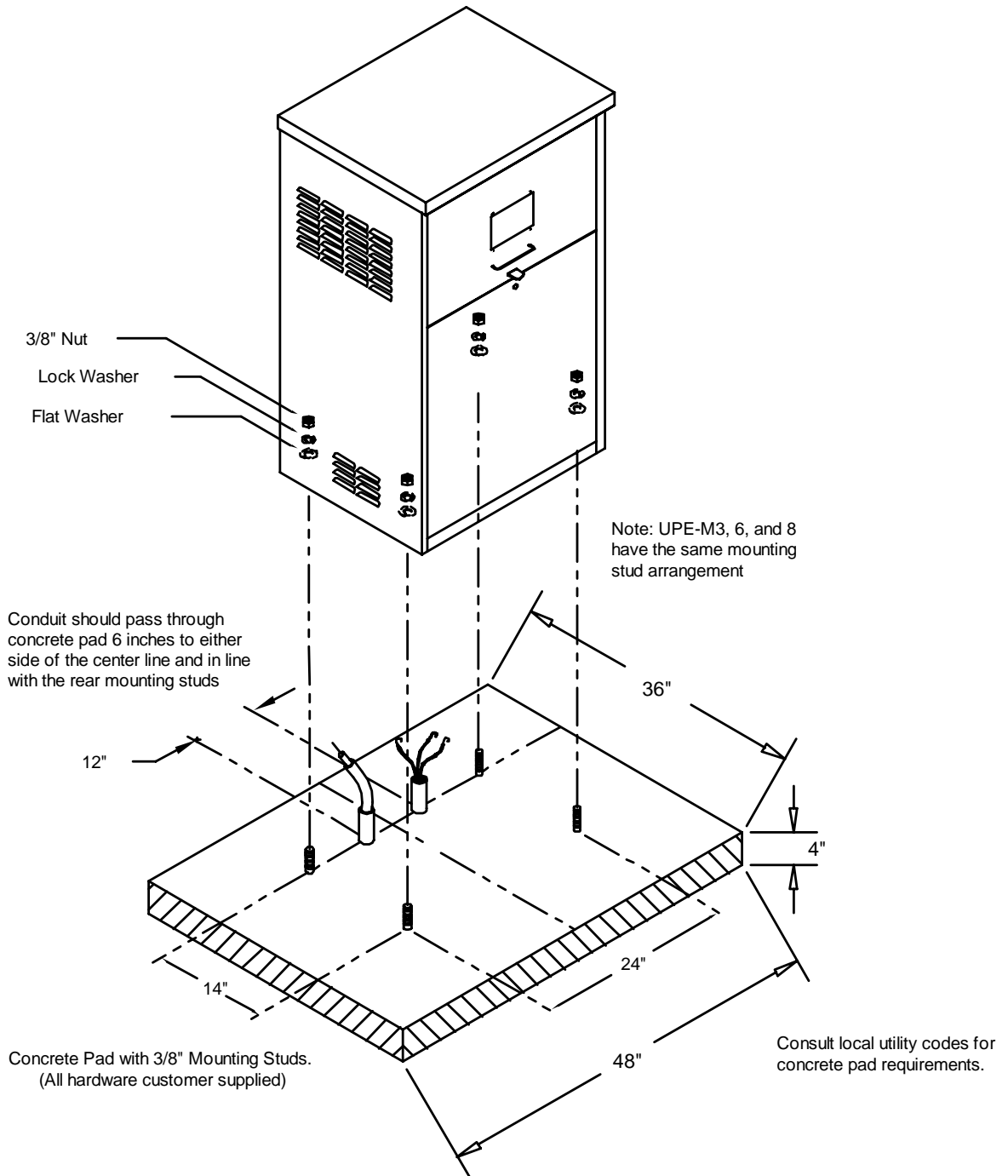


Fig. 2-2, Concrete Pad Dimensions

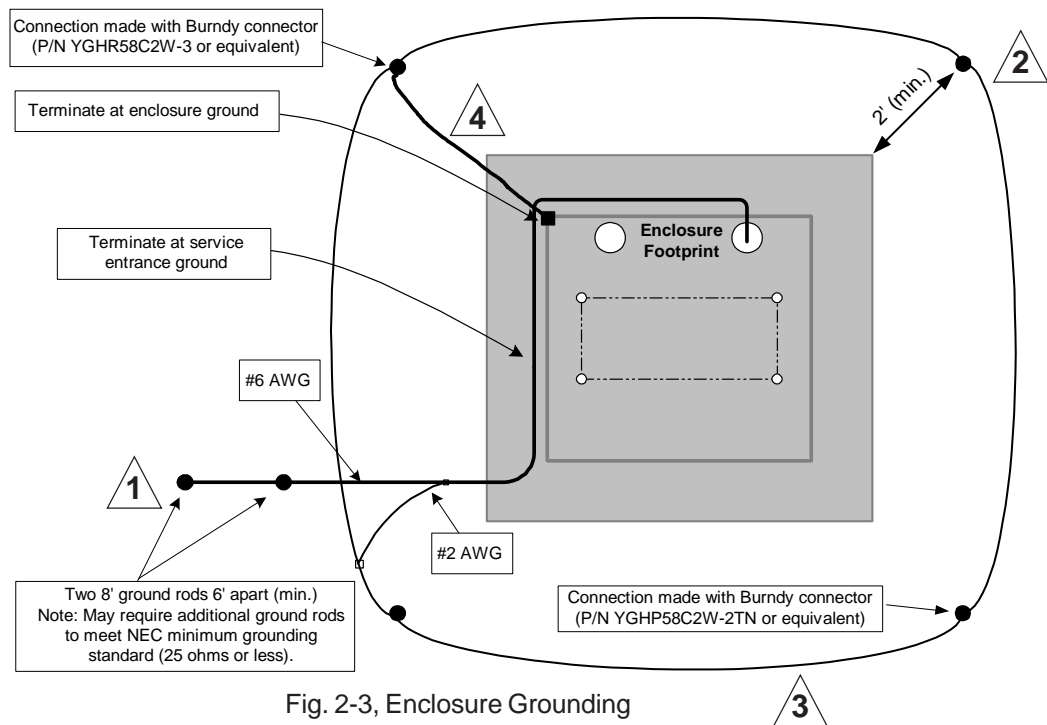
## 2.0 Site Preparation, continued

### 2.4 Enclosure Grounding

Alpha Technologies recommends using the grounding method illustrated below. The grounding method for a particular site is depends on soil type, available space, local codes, National Electric Code (NEC) requirements, and other site-specific characteristics.

Alpha Technologies recommends a minimum of five ohms ground resistance between the enclosure and ground rods, but resistance shall not exceed 25 ohms, 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.



- 1 Service Grounding (required)**  
#6 bare copper wire from Service Neutral / Ground Bar with 2 ground rods located 6' apart.
- 2 Lightning Protection (optional)**  
1/2" x 8' copper ground rod, four places, driven about two feet (typical) from the corners of the pad.
- 3** #6 bare copper wire loop terminated to each ground rod and buried 30 inches (min.) below grade. Corrosion-proof connections (25-year life span) and hardware suitable for direct burial must be used.
- 4** #6 bare copper wire from loop to the enclosure.

## 3.0 Installation

### 3.1 Enclosure Installation

**Tools Needed:**

- Ratchet set with 6" extension
- Vapor Barrier
- Utility Knife

**Procedure:**

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 extend at least six inches in all directions around the perimeter of 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. Using an appropriate lifting device, lift the enclosure off the shipping pallet and place over the mounting studs on the pad.
5. Secure the enclosure to the pad using four (two front, two rear) stainless steel flat washers, lock washers, and nuts.
6. Trim the vapor barrier material with an appropriate cutting tool.



Fig. 3-1, Enclosure Mounting Holes

### 3.0 Installation, continued

## 3.2 Utility Powering

### **ATTENTION!**

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- The XM2 Power Supplies are powered by either 120VAC or 240VAC (120/120 grounded neutral) attached to an internal service entrance. The size of the service conductors must be based upon the actual size of the utility service, and must comply with applicable electrical code requirements.
- Proper grounding is critical. A qualified electrician should verify that grounding complies with applicable electrical codes. All applicable codes must be adhered to when installing a system, pouring concrete, or placing a preformed pad. Local codes supersede any procedures outlined in this document.
- The following should be performed only by qualified service personnel and in compliance with local electrical codes. Verify electrical codes prior to installation. Codes may vary and contain specific conduit and wire sizes for connection to the service entrance. Connection to utility power must be approved by the local utility before installing the power supply.



### **CAUTION!**

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- All mounting hardware should be *stainless* or *galvanized*, depending on local environmental conditions. Use of improper hardware may cause corrosion not covered under warranty.
- Soil conditions vary and may affect the integrity of the pad. Alpha Technologies recommends that proper steps be taken to ensure that the soil supporting the pad is stable. Improper installation of the pad may cause uneven settling or cracking not covered under warranty.

3.0 Installation, continued

3.2 Utility Powering, continued

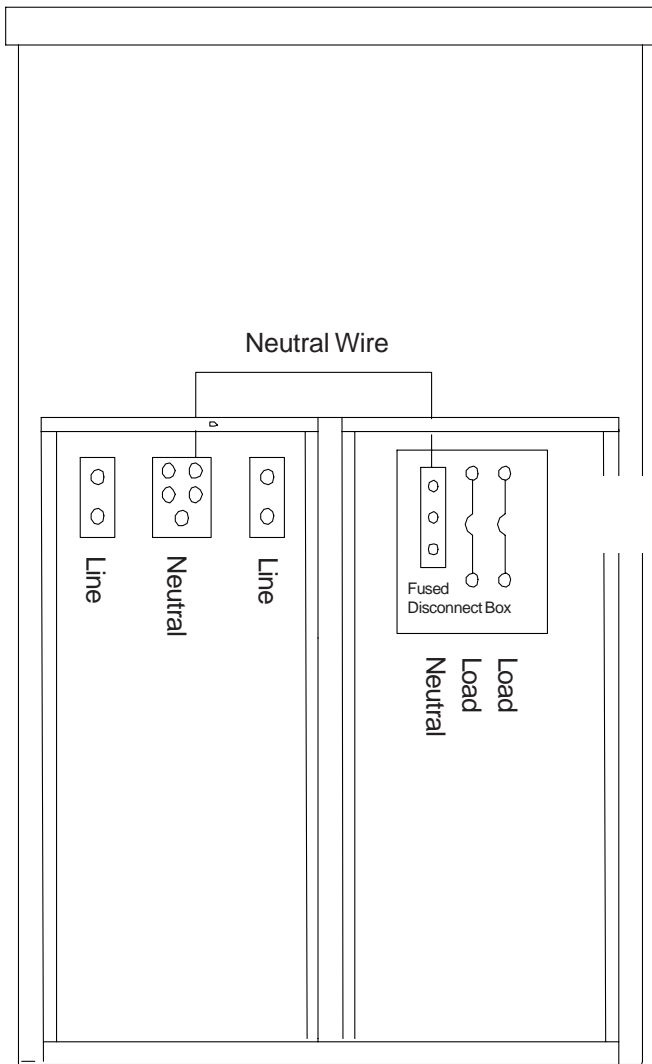


Fig. 3-2, 65K-AIR Enclosure  
(Rear View)

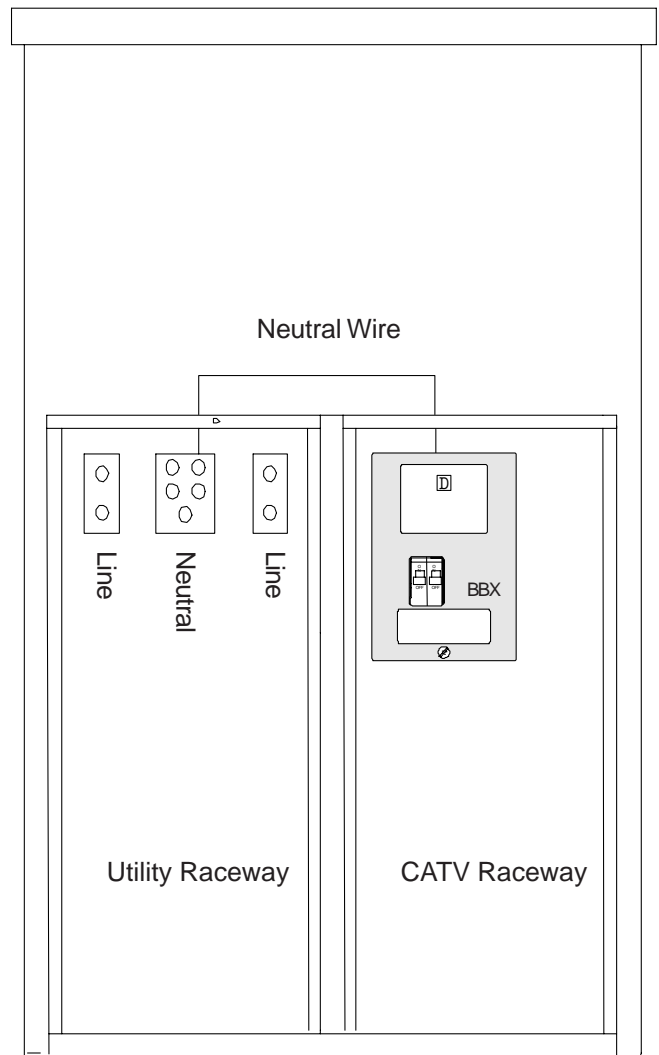


Fig. 3-3, 10K-AIR Enclosure  
(Rear View)

### 3.0 Installation, continued

#### 3.2 Utility Powering, continued

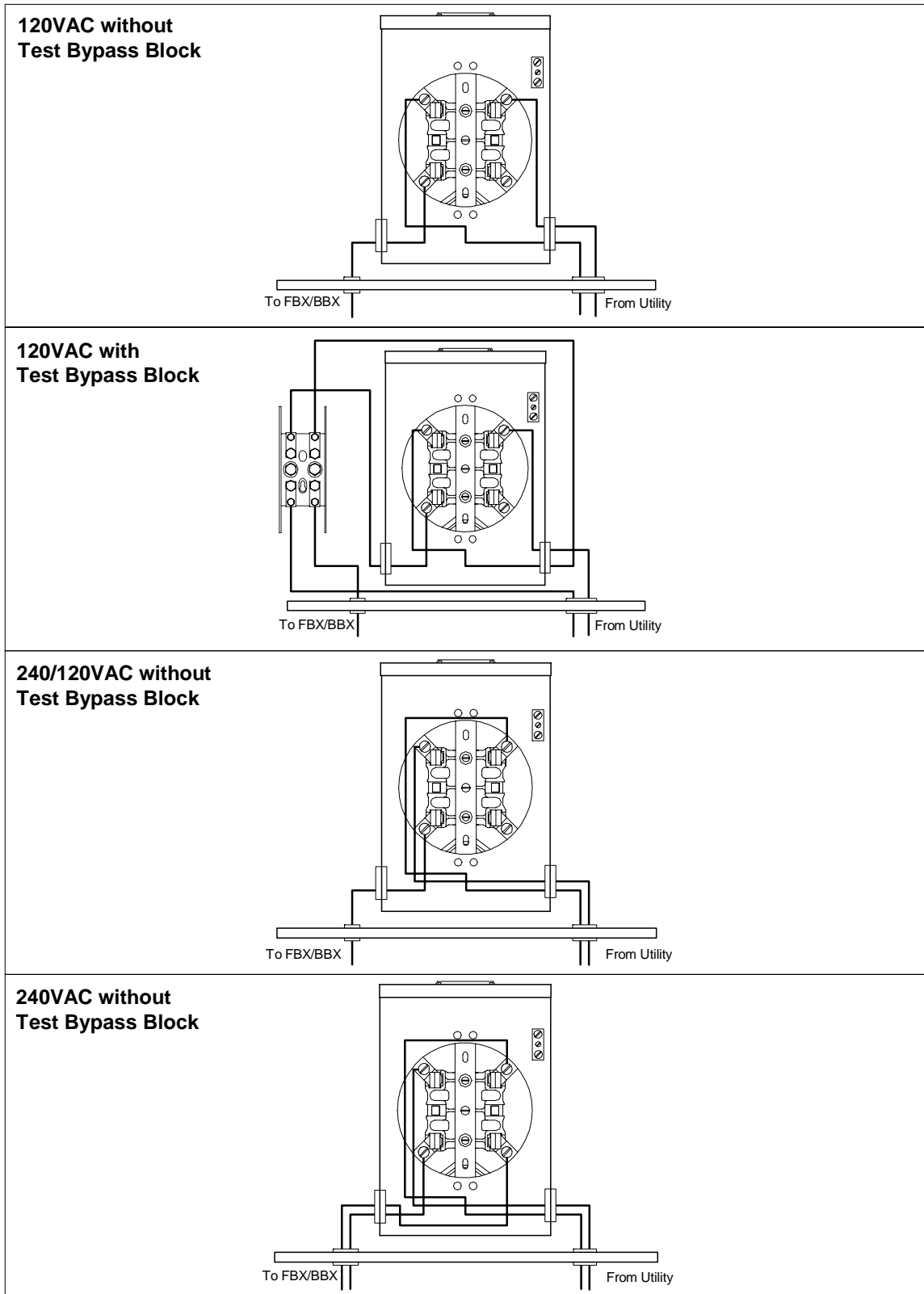


Fig. 3-4, Meter Base Configurations

3.0 Installation, continued

3.2 Utility Powering, continued

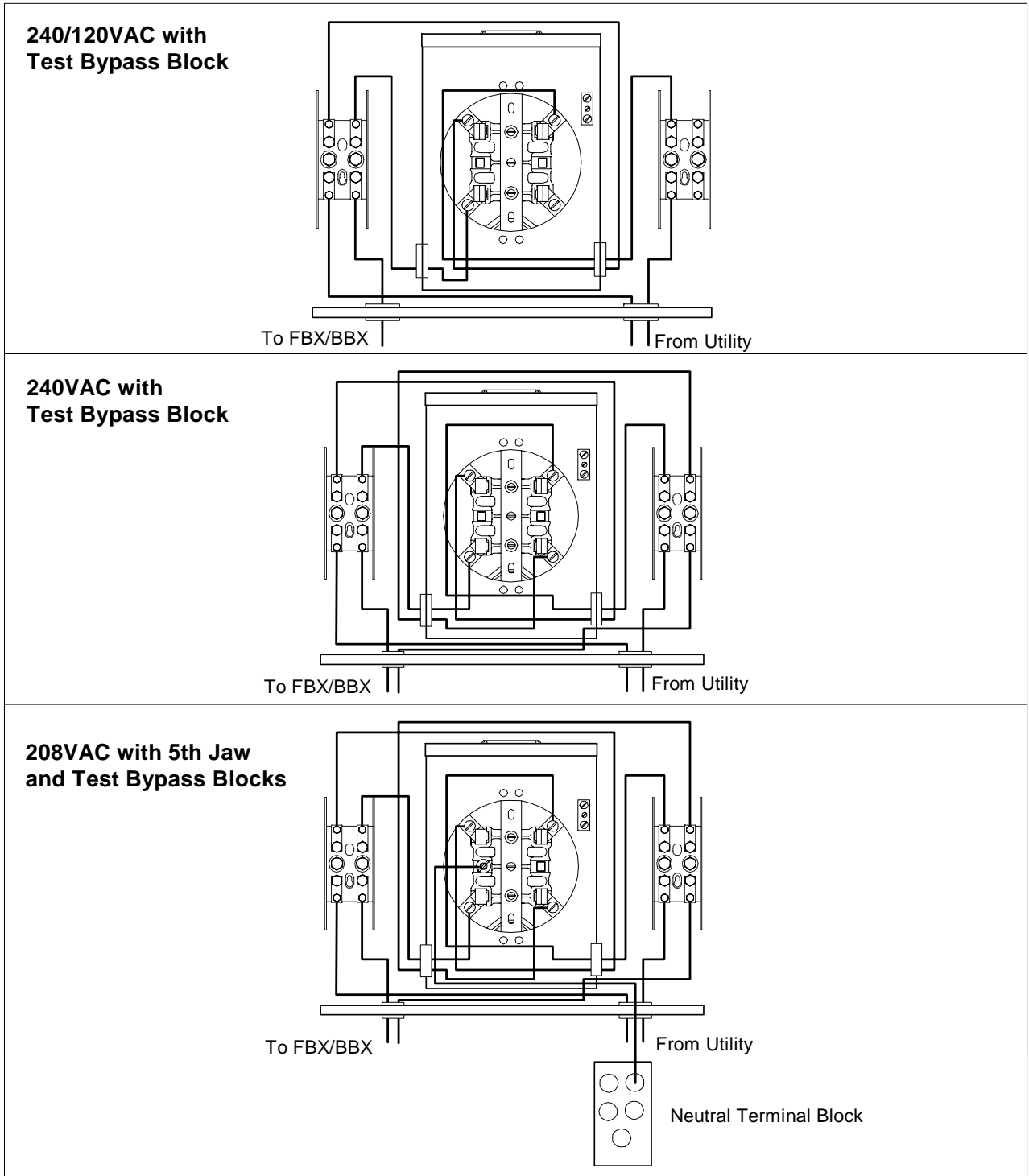


Fig. 3-5, Meter Base Configurations

### 3.0 Installation, continued

#### 3.2 Utility Powering, continued

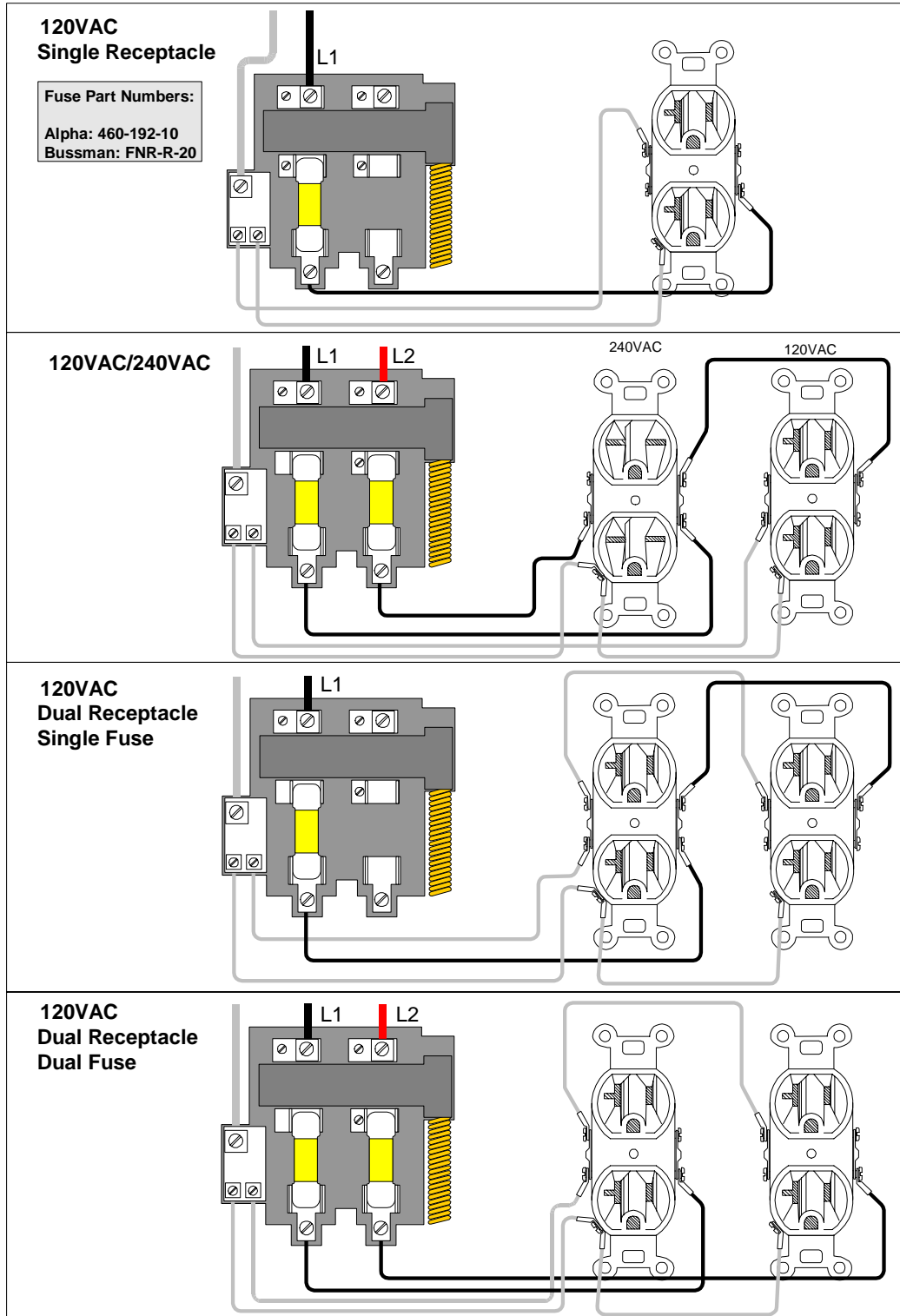


Fig. 3-6, Fuse/Receptacle Configurations for 65K-AIR Enclosures

### 3.0 Installation, continued

### 3.2 Utility Powering, continued

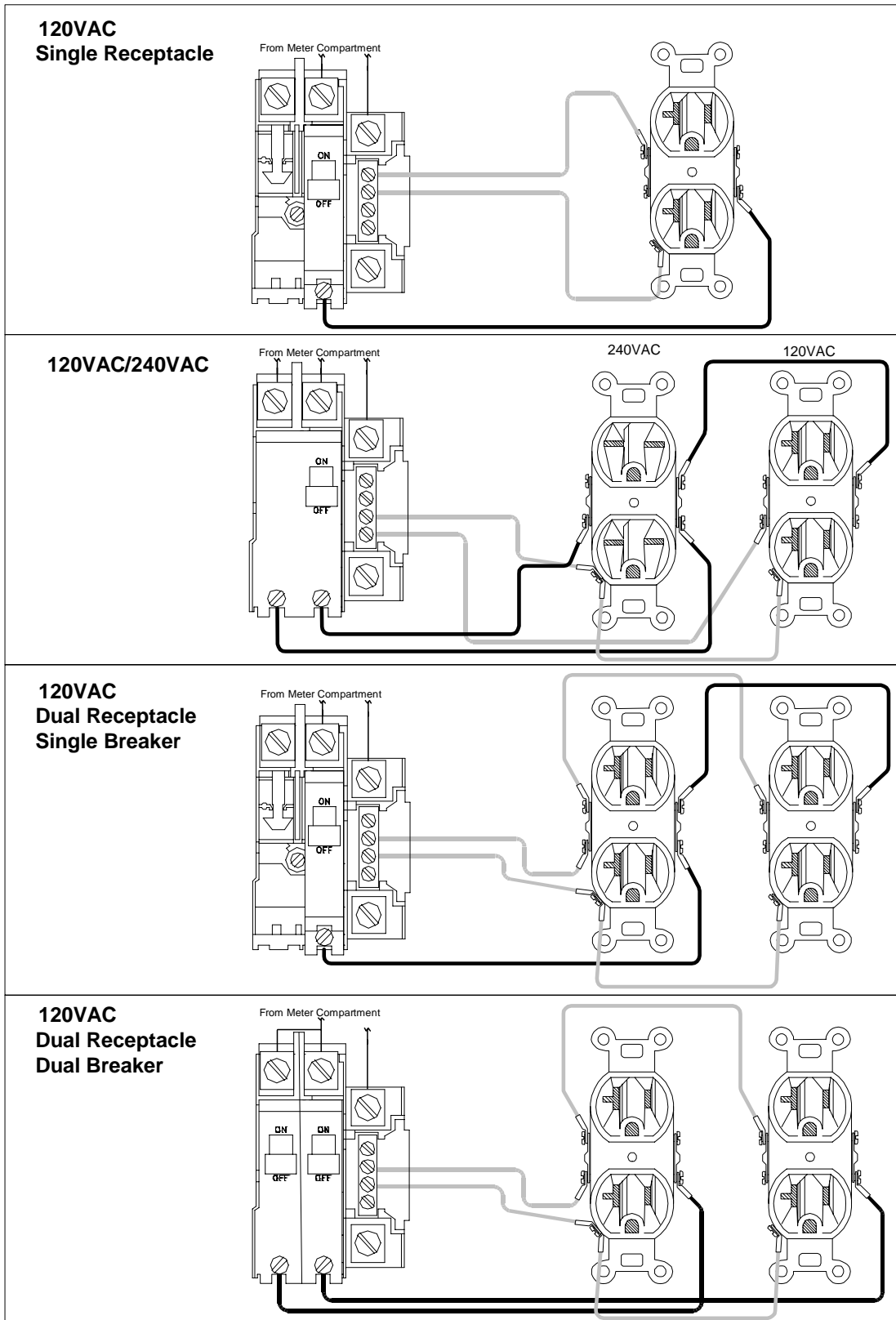


Fig. 3-7, Fuse/Receptacle Configurations for Standard Enclosures

## 3.0 Installation, continued

### 3.3 Service Power Inserter

Mount the SPI box(es) on the back wall of the Power Supply compartment.

1. 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 the stinger will pass through the clamp.
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 inch-pounds. Replace the SPI cover and screws. Ensure the switch on the top or the SPI is in the ON position, the AUX position is used only when an alternate power source is connected to the Jones connector on the top of the SPI.

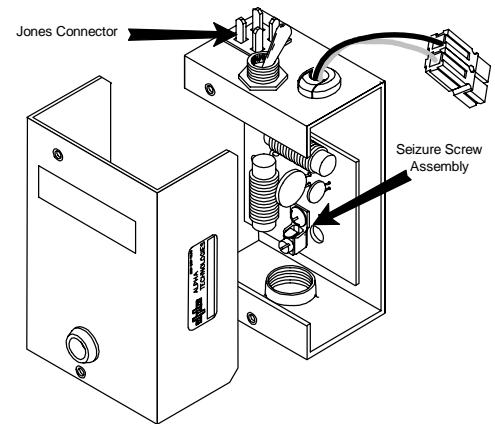
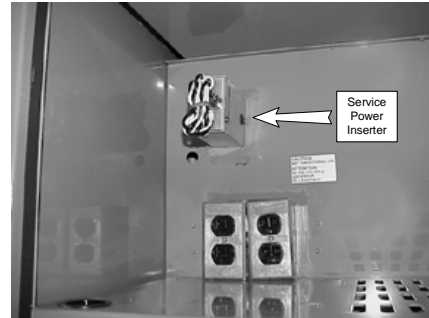


Fig. 3-8, Removing SPI Cover

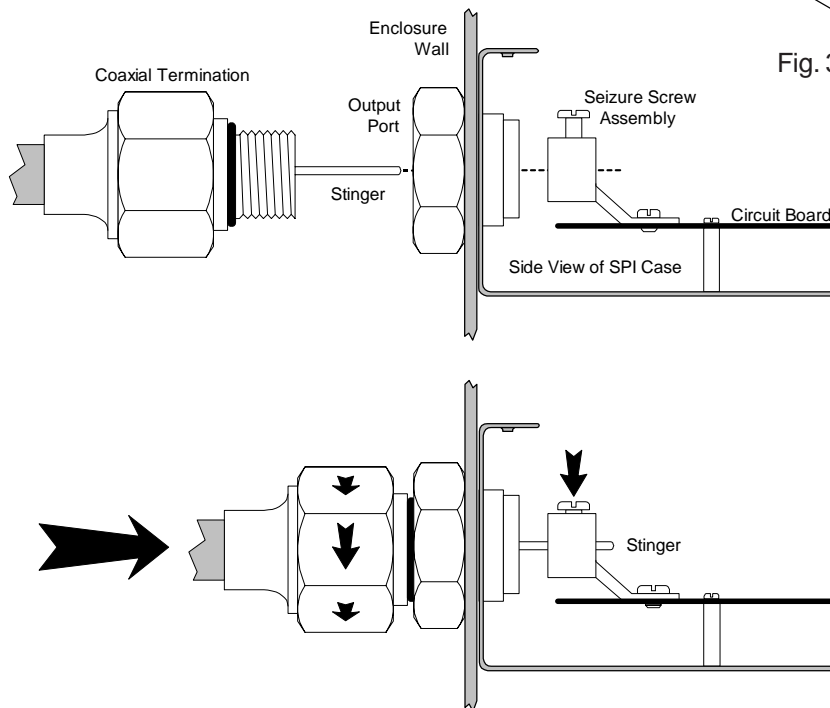


Fig. 3-9, Connecting Coax to SPI Output Port



#### CAUTION!

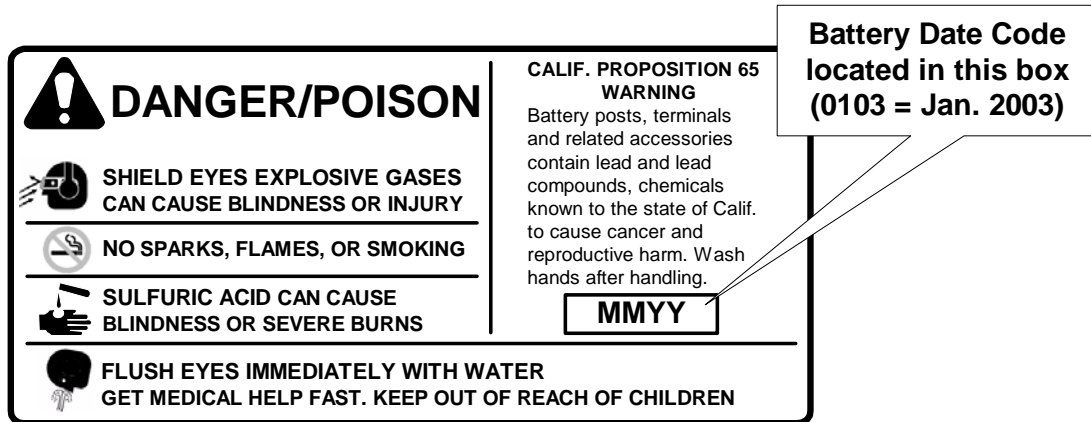
To prevent arcing, the center conductor (stinger) of the coaxial termination must go fully inside the seizure screw assembly. Tighten to 35 inch-pounds.

### 3.0 Installation, continued

## 3.4 Battery Installation

### 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 marketed by Alpha are used, consult the battery's manufacturers' documentation for date code type and placement.



### 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, then re-torque to 50 inch-pounds. Mounting hardware requirements may vary between battery manufacturers. Use only the hardware recommended by your particular battery manufacturer.

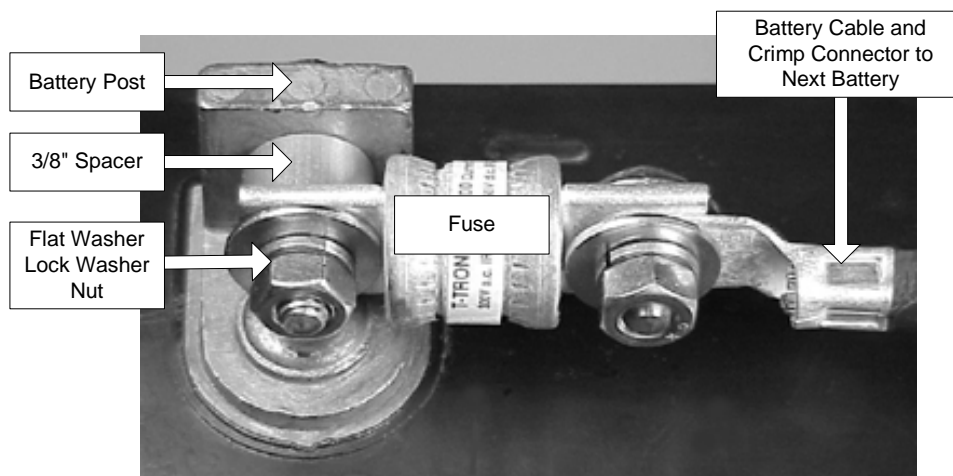


Fig. 3-10, Battery Terminal Assembly

### 3.0 Installation, continued

#### 3.4 Battery Installation, continued

**Tools Needed:**

Two 7/16" open end wrenches

**Procedure:**

This section is for reference only, follow instructions included in the battery cable kit. This procedure covers the UPE-M3 (one tray), and the UPE-M6 and UPE-M8 (two trays).

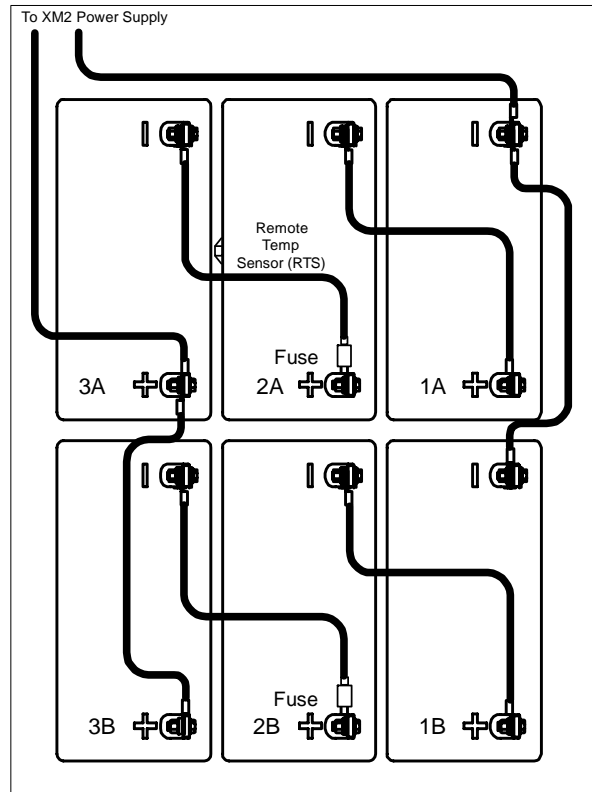
1. Release the latch on the left side. Pull the (lower) tray out until it reaches the stops.
2. Install three or four batteries as shown in Fig. 3-11 (following page). Wire in accordance with the diagram included in the Battery Cable Kit.
3. Disengage the hold-open latch and slide the battery tray into the enclosure.
4. Repeat for the center tray (UPE-M6 and UPE-M8 only).

3.0 Installation, continued

3.4 Battery Installation, continued

Upper Tray  
or UPE-M3

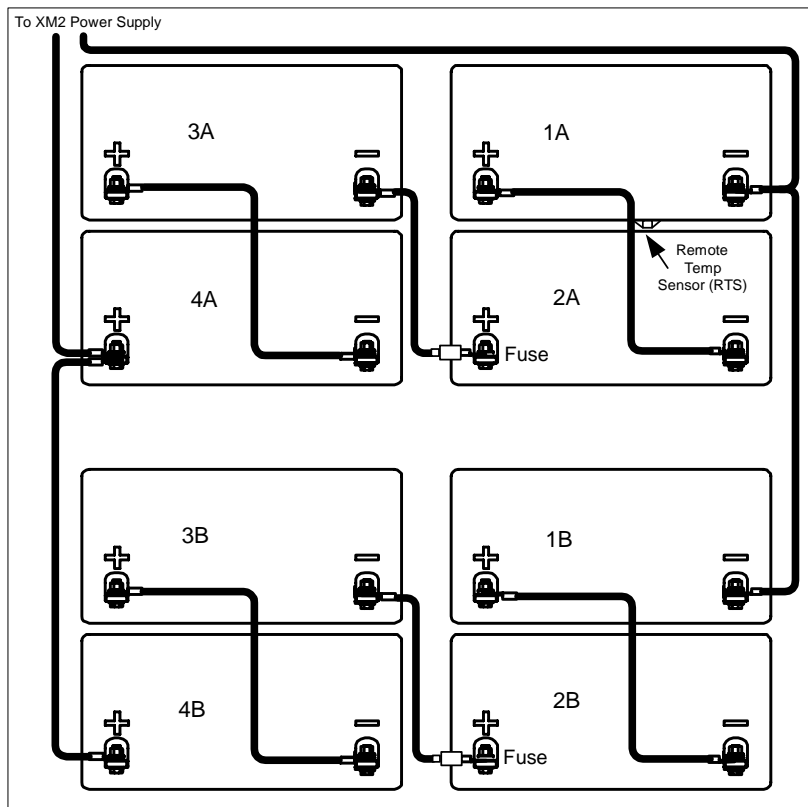
Lower Tray



UPE-M3 and UPE-M6  
Battery Packs

Upper Tray  
(UB)

Lower Tray  
(LB)



UPE-M8  
Battery Pack

Fig. 3-11, Battery Pack

### 3.0 Installation, continued

## 3.5 Power Supply Installation

#### Tools Needed:

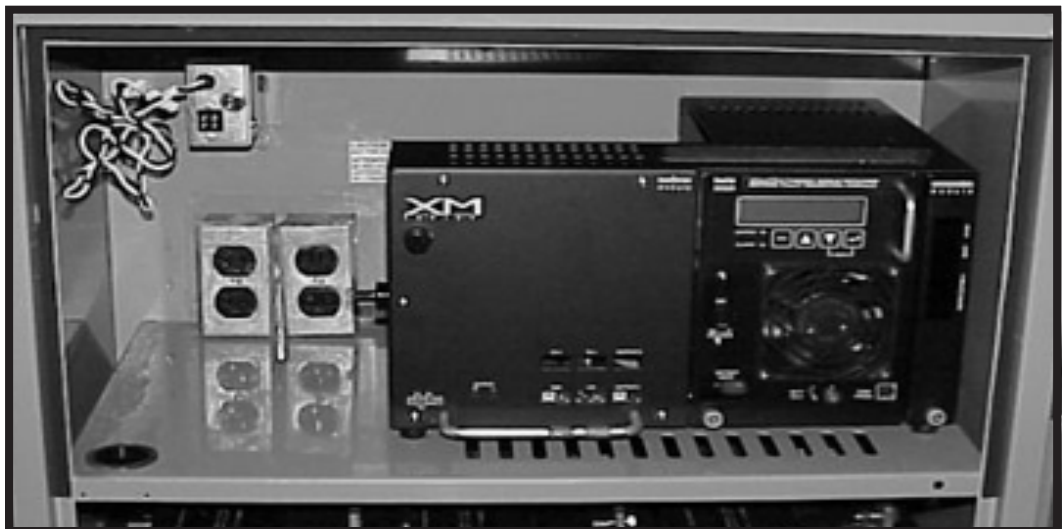
11/32" nut driver (see step 2)

#### Procedure:

1. The upper tray of the enclosure has five dimples that line up with the feet of the XMS2 power supply. The feet of the power supply must rest in these dimples so the ventilation snorkel on the front cover aligns with the fan to form a seal when the door is closed.
2. If a power supply other than Alpha's XMS2 is used, remove the four (4) #8-32 Keps nuts holding the ventilation snorkel to the inside of the front door and remove the snorkel.



3. Place the power supply on the top tray.



### 3.0 Installation, continued

## 3.6 Power Supply Connections

1. Verify that the Battery Circuit Breaker is in the OFF position. Connect the red and black cable from the battery pack to the Battery Input connection on the front of the power supply.
2. Connect the black and white wire leading from the Service Power Inserter (SPI) to the plug labeled Output 1A on the front of the power supply. If a second SPI is installed, connect it to Output 2.
3. Verify that the Input Breaker in the Service Entrance Panel is in the OFF position. Plug the power supply's AC power cord into the Input Power Panel (IPP) or Breaker Duplex Option (BDO).

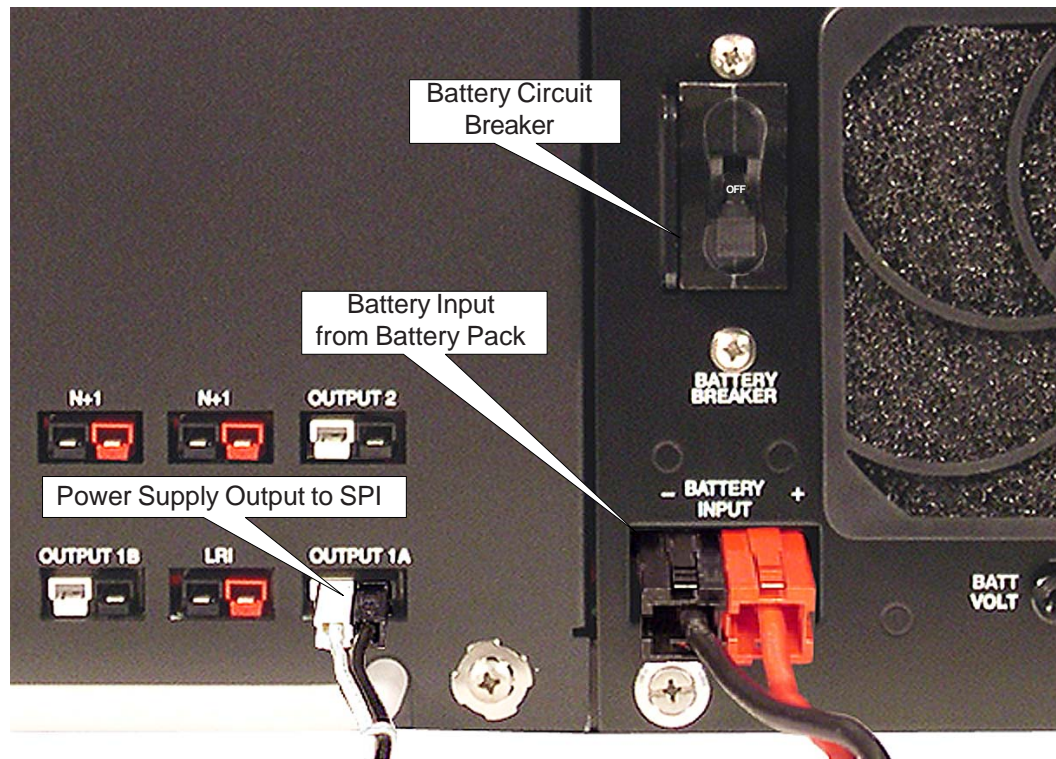


Fig. 3-12, Battery and Output Power Connections

### 3.0 Installation, continued

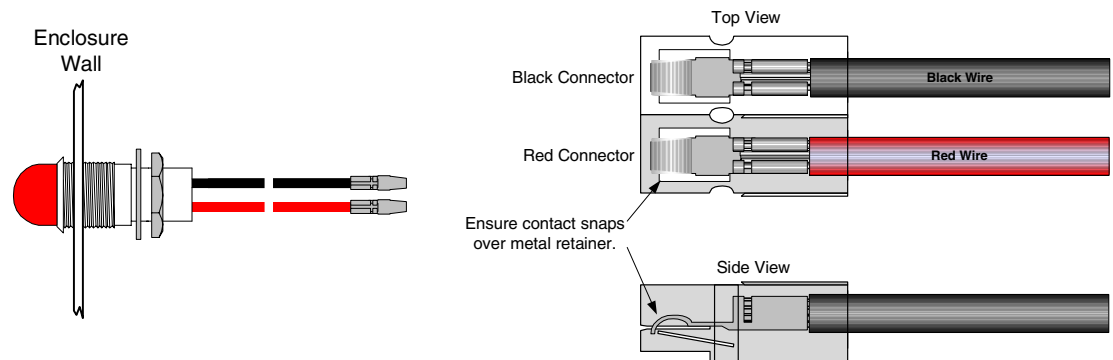
#### 3.7 Lightning Arrester (LA-P+) Option

The Lightning Arrester option is available in 120VAC and 240VAC, and is installed by plugging into an Input Power Panel (IPP) or Breaker Duplex Option (BDO). The unit is operating properly when the green LED is lit.

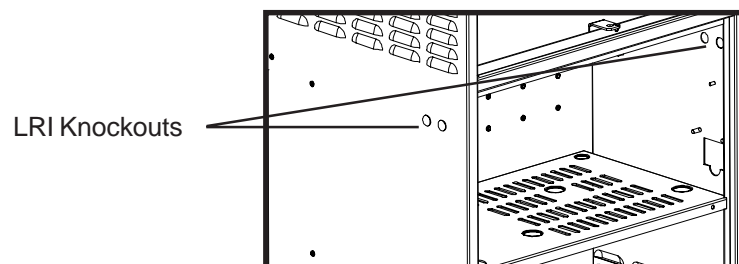


#### 3.8 LRI Option

The LRI lamp assembly can be inserted into one of four knockouts in the enclosure walls (see below). Remove the nut and washer from the base and insert the base into the knockout from the outside. Replace the nut and washer, and tighten.



Snap the plastic connector housing over the connectors as shown above, with the black housing on the black wire. Insert the assembled connector into the LRI connection on the front of the power supply.

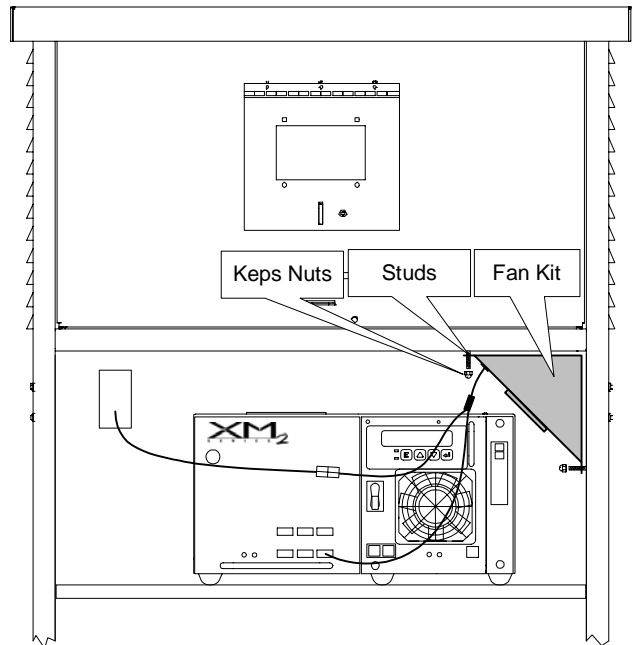
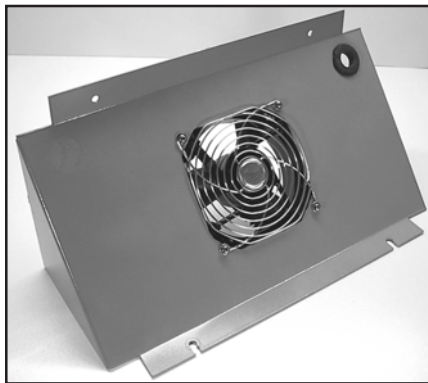


### 3.0 Installation, continued

#### 3.9 Enclosure Cooling Fan (optional)

The cooling fan is required whenever an XM2-915 or 922 is installed in a UPE-M6 or M8 where the average temperature of any month exceeds 95°F (35°C).

Install the optional Enclosure Cooling Fan (ECF) using four #8-32 Keps nuts (included) on existing threaded studs (upper left corner for the UPE-M8, and upper right corner for UPE-M3 and UPE-M6). Plug one end of the supplied “Y” cable into the output connection of the power supply, and connect the other end to the wire leading from the SPI. Connect the fuse end to the fan wire kit. The cooling fan is thermostatically controlled to turn on at 110°F (43°C), and off at 80°F (27°C). Replace fuse only with 1/4" X 1-1/4", 5A, 250V (Alpha P/N 460-025-10).



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