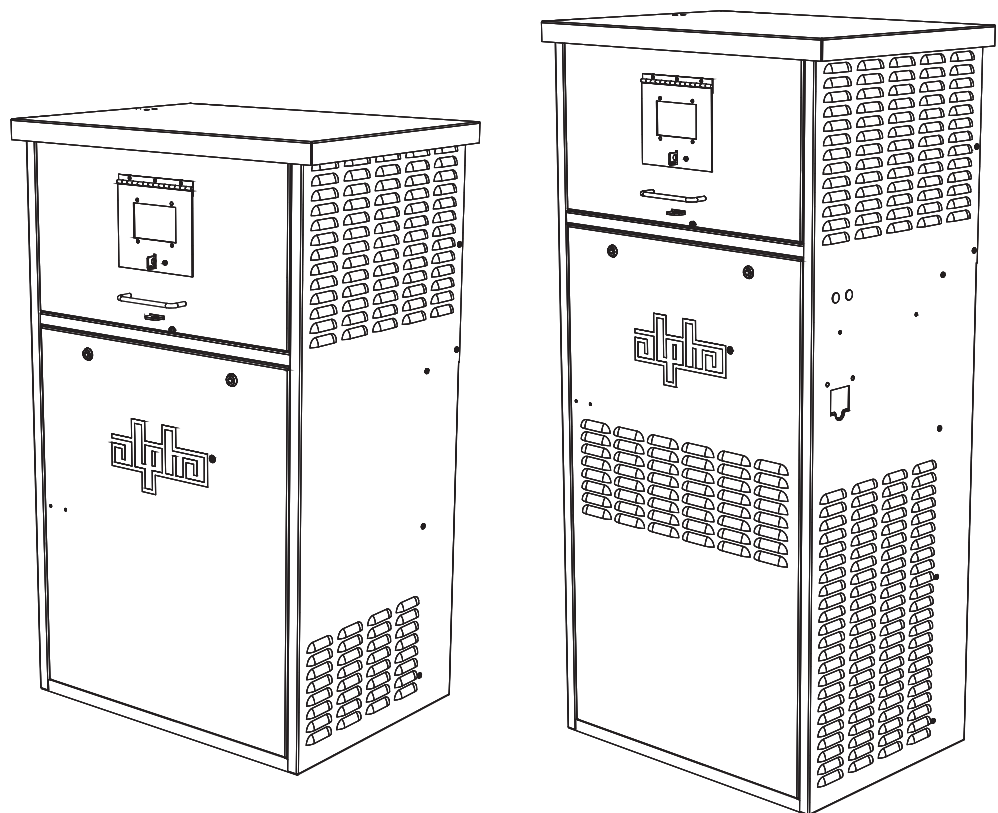


an EnerSys® company

UPE-M Series Metered Ground Mount Enclosures Installation and Operation Manual

Effective: June 2022



Safety Notes

Alpha® considers customer safety and satisfaction its most important priority. To reduce the risk of injury or death and to ensure continual safe operation of this product, certain information is presented differently in this manual. Alpha tries to adhere to ANSI Z535 and encourages special attention and care to information presented in the following manner:



WARNING! GENERAL HAZARD

GENERAL HAZARD WARNING provides safety information to PREVENT INJURY OR DEATH to the technician or user.



WARNING! Electrical Hazard

ELECTRICAL HAZARD WARNING provides electrical safety information to PREVENT INJURY OR DEATH to the technician or user.



WARNING! FUMES HAZARD

FUMES HAZARD WARNING provides fumes safety information to PREVENT INJURY OR DEATH to the technician or user.



WARNING! FIRE HAZARD

FIRE HAZARD WARNING provides flammability safety information to PREVENT INJURY OR DEATH to the technician or user.

There may be multiple warnings associated with the call out. Example:



WARNING! ELECTRICAL & FIRE HAZARD

This WARNING provides safety information for both Electrical AND Fire Hazards



CAUTION!

CAUTION provides safety information intended to PREVENT DAMAGE to material or equipment.



NOTICE:

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

ATTENTION:

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

The following sections contain important safety information that must be followed during the installation and maintenance of the equipment and batteries. Read all of the instructions before installing or operating the equipment, and save this manual for future reference.

UPE-M Series

Installation and Operation Manual
031-145-C0-002, Rev. C1

Effective Date: June 2022

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Disclaimer

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

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 Services, Inc. or your nearest Alpha® representative.

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.

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Table of Contents

1.0 Pre-Installation	8
1.1 Introduction	8
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 Connections	28
3.6 Lightning Arrester (LA-P+) Option	29
3.7 LRI Option	29
3.8 Enclosure Cooling Fan (optional)	30

Figures

Fig. 1-1, UPE-M3 and UPE-M6 Meter Compartment with Test Bypass Blocks	8
Fig. 1-2, UPE-M8 Meter Compartment with Test Bypass Blocks	8
Fig. 1-3, UPE-M8 Dimensions	9
Fig. 1-4, UPE-M6 Dimensions	10
Fig. 1-5, UPE-M3 Dimensions	11
Fig. 2-1, Pedestal Support (PS-1) Dimensions Alpha P/N 744-006-20	13
Fig. 2-2, Concrete Pad Dimensions	14
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, UPE-M3 Battery Wiring Diagram (for use with slide tray)	25
Fig. 3-12, Battery Pack	26
Fig. 3-13, Eight Battery Pack	27
Fig. 3-14, Battery and Output Power Connections	28

UPE-M Series 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 this product, contact Alpha Technologies Services, Inc. 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.



WARNING! GENERAL HAZARD

- Only authorized and trained personnel should maintain or service the enclosure.
- Always lock the enclosure after servicing.
- Read and follow all installation, equipment grounding, usage, and service instructions for this product and products used in conjunction with it.
- Servicing and connection of batteries shall be performed by, or under the direct supervision of, personnel knowledgeable of batteries and the required safety precautions.
- Use proper lifting techniques whenever handling enclosure, equipment, parts, or 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.
- Use caution around sheet metal components and sharp edges.



WARNING! Electrical Hazard

- Removal all conductive jewelry or personal equipment prior to servicing equipment, parts, connectors, wiring, or batteries.
- Batteries contain dangerous voltage and corrosive material. Only authorized and trained personnel should install, maintain, or service the batteries.
- Always use insulated tools to install, maintain, or service batteries.
- Use special caution when connecting or adjusting battery cabling. An improperly connected battery cable or an unconnected battery cable can result in arcing, fire, or possible explosion.



WARNING! FUMES Hazard

- Avoid any contact with gelled or liquid emissions from valve-regulated lead-acid (VRLA) batteries. Emissions contain dilute sulfuric acid that is harmful to the skin and eyes. Emissions are electrolytic, and are electrically conductive and are corrosive. Follow the Chemical Hazards notes if contact occurs.
- All battery compartments must have adequate ventilation to prevent an accumulation of potentially dangerous gas.
- 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).



WARNING! FIRE HAZARD

- Batteries produce explosive gases. Do not smoke or introduce sparks in the vicinity of batteries.
- Power supplies can reach extreme temperature under load.



CAUTION!

- Always verify that ALL equipment is rated for both the input and output voltages of the current application and is in proper working condition.
- To prevent damage, inspect batteries every 3 months

ATTENTION:

- Prior to installation, contact local utilities, building maintenance departments, and cable/piping locator services to ensure that installation does not interfere with existing utility cables or piping
- Installer must check local codes regarding the placement of equipment with flammable material installed on utility equipment.
- 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.

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 the National Electrical Code® (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-M series enclosures have been designed for the XM2 and XM3 series power supplies with 36V inverters. The UPE-M8 model is designed for the XM2-924 power supply with a 48V inverter.

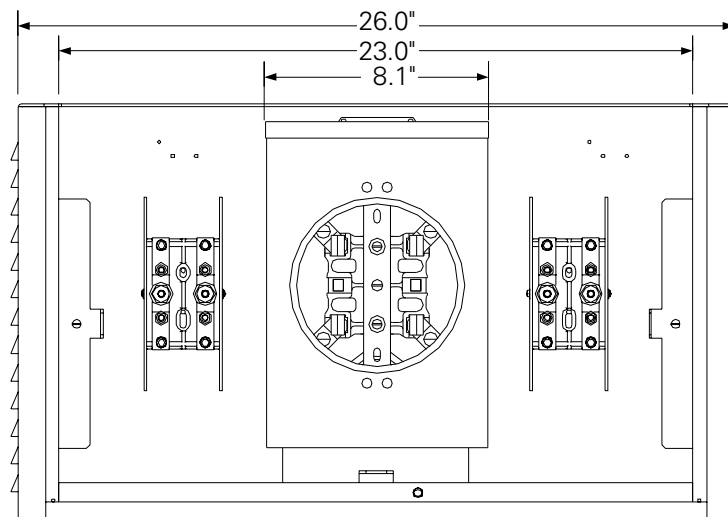


Fig. 1-1, UPE-M3 and UPE-M6 Meter Compartment with Test Bypass Blocks

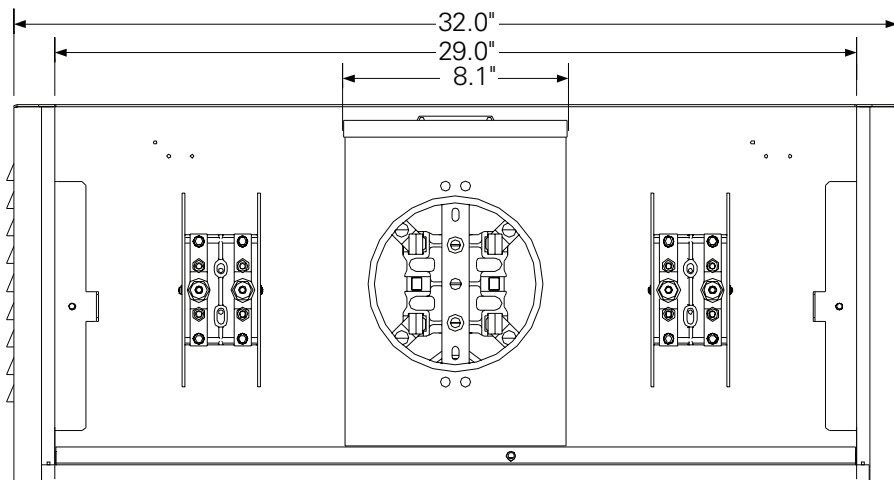


Fig. 1-2, UPE-M8 Meter Compartment with Test Bypass Blocks

1.0 Pre-Installation, continued

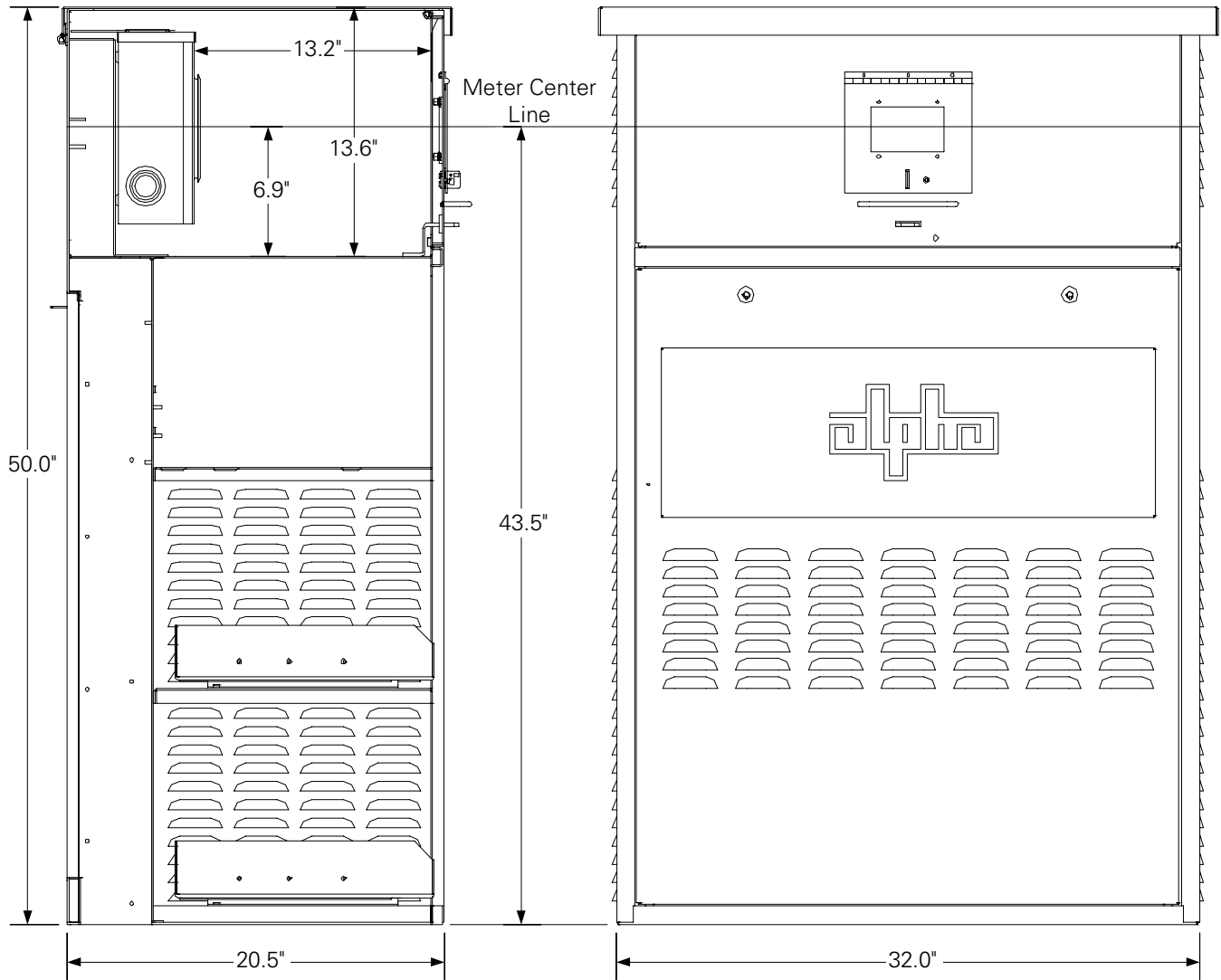


Fig. 1-3, UPE-M8 Dimensions

1.0 Pre-Installation, continued

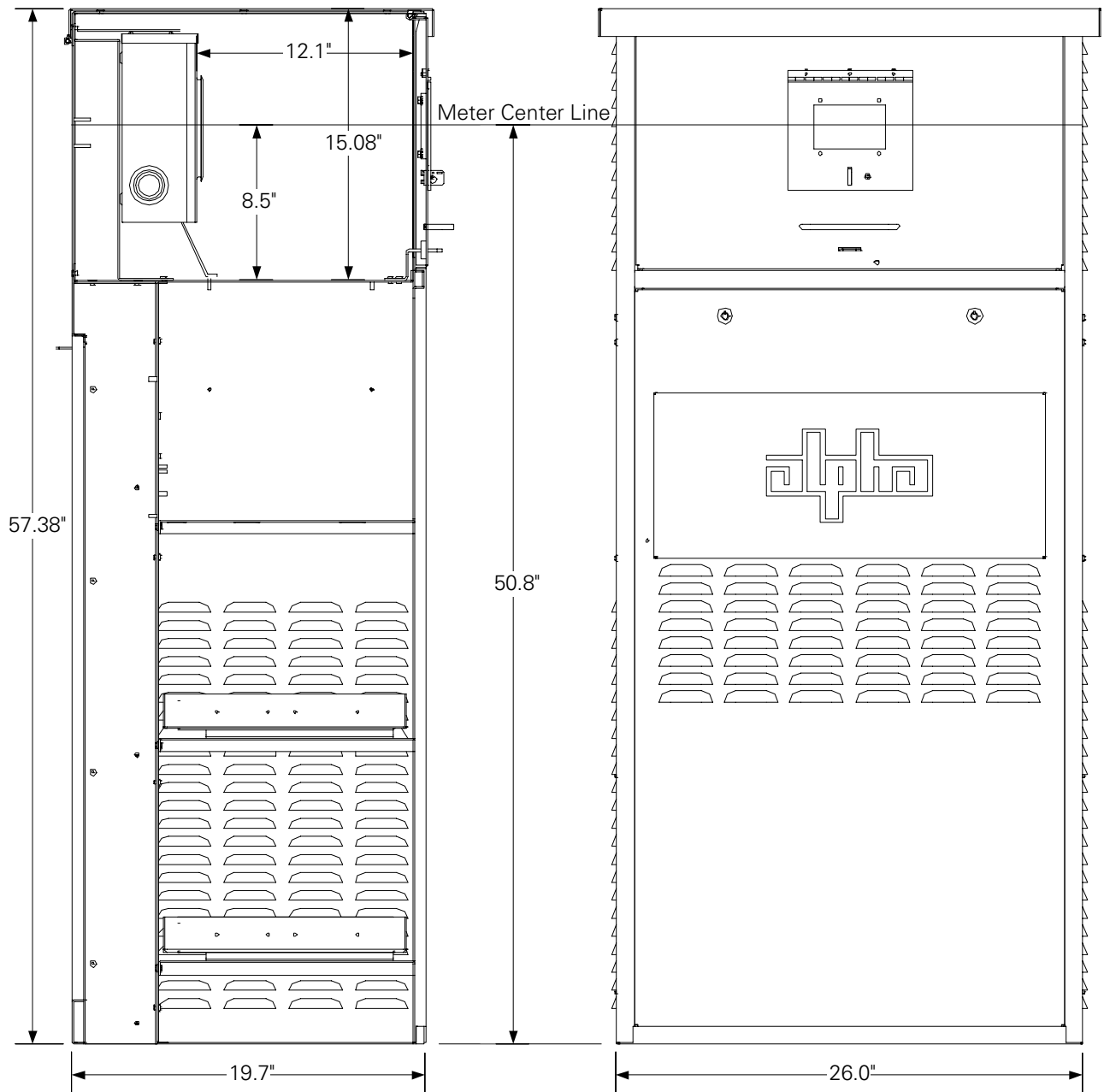


Fig. 1-4, UPE-M6 Dimensions

1.0 Pre-Installation, continued

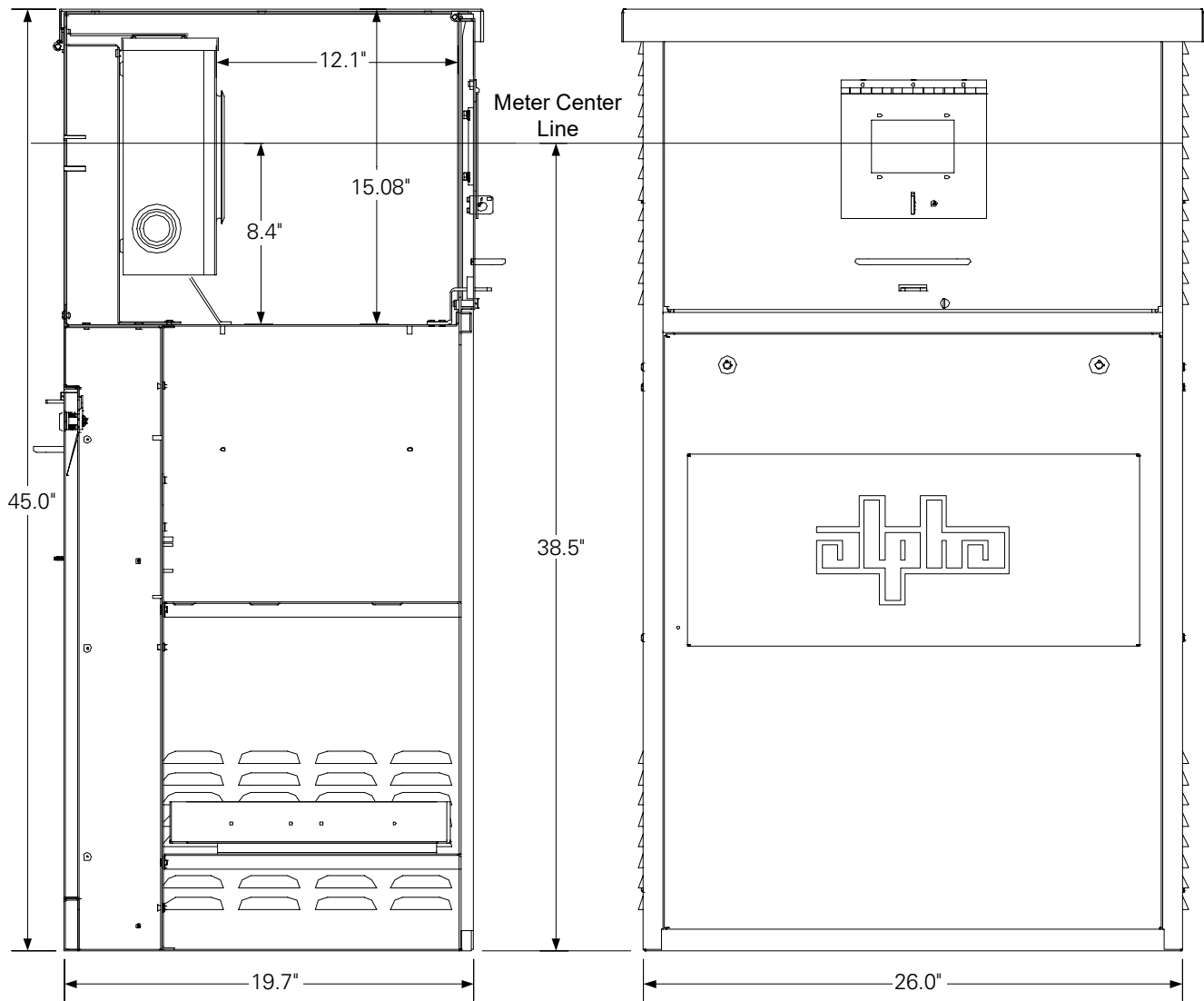


Fig. 1-5, UPE-M3 Dimensions

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 Services, Inc. for UPE-M series enclosures.
- A vapor barrier material (such as a 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® battery. If a battery is found damaged, refer to the battery manufacturer's documentation regarding the safe handling of the battery.

2.2 Enclosure Pedestal Support

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

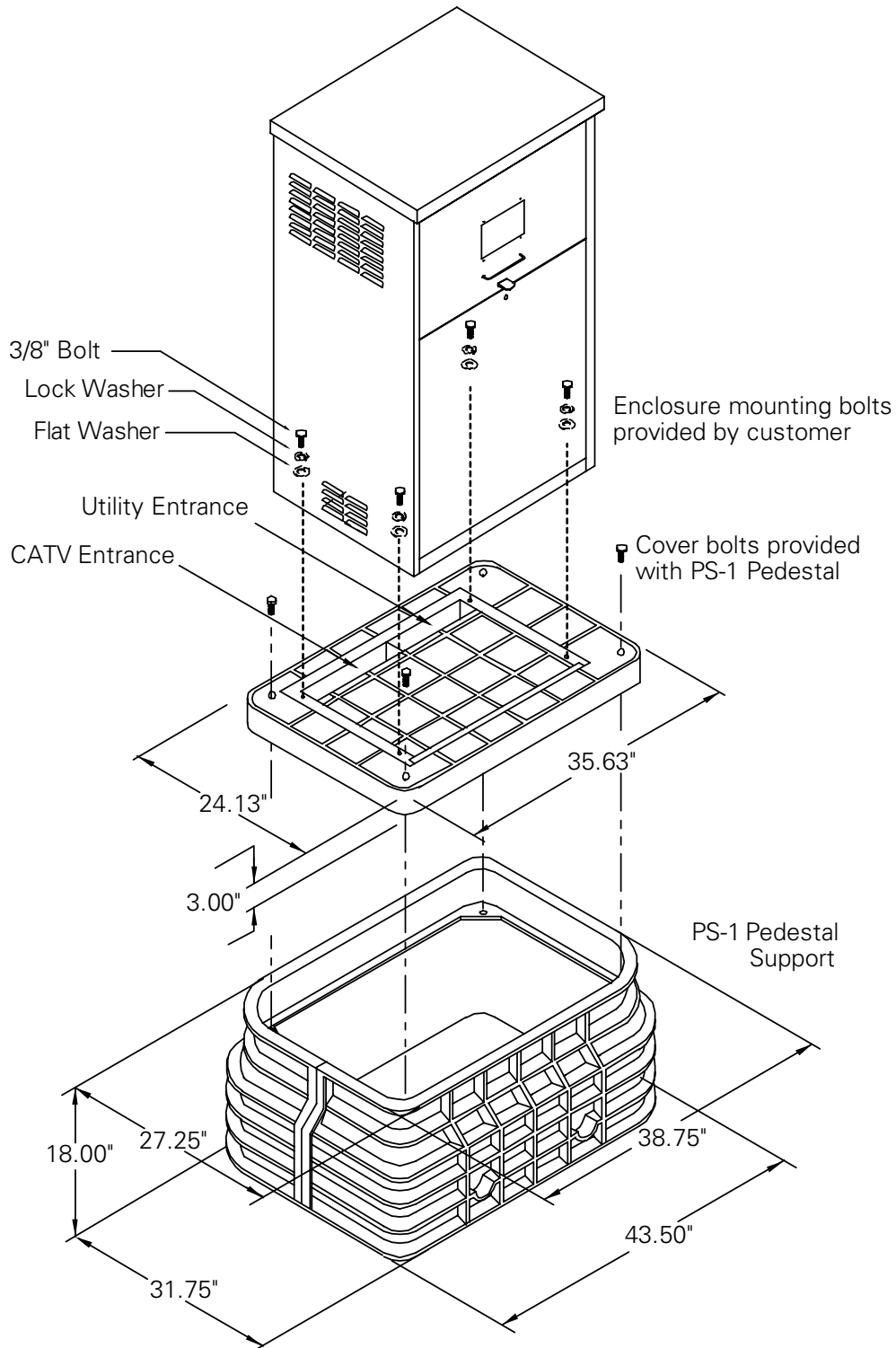


Fig. 2-1, Pedestal Support (PS-1) Dimensions Alpha P/N 744-006-20

2.0 Site Preparation, continued

2.3 Pad Fabrication

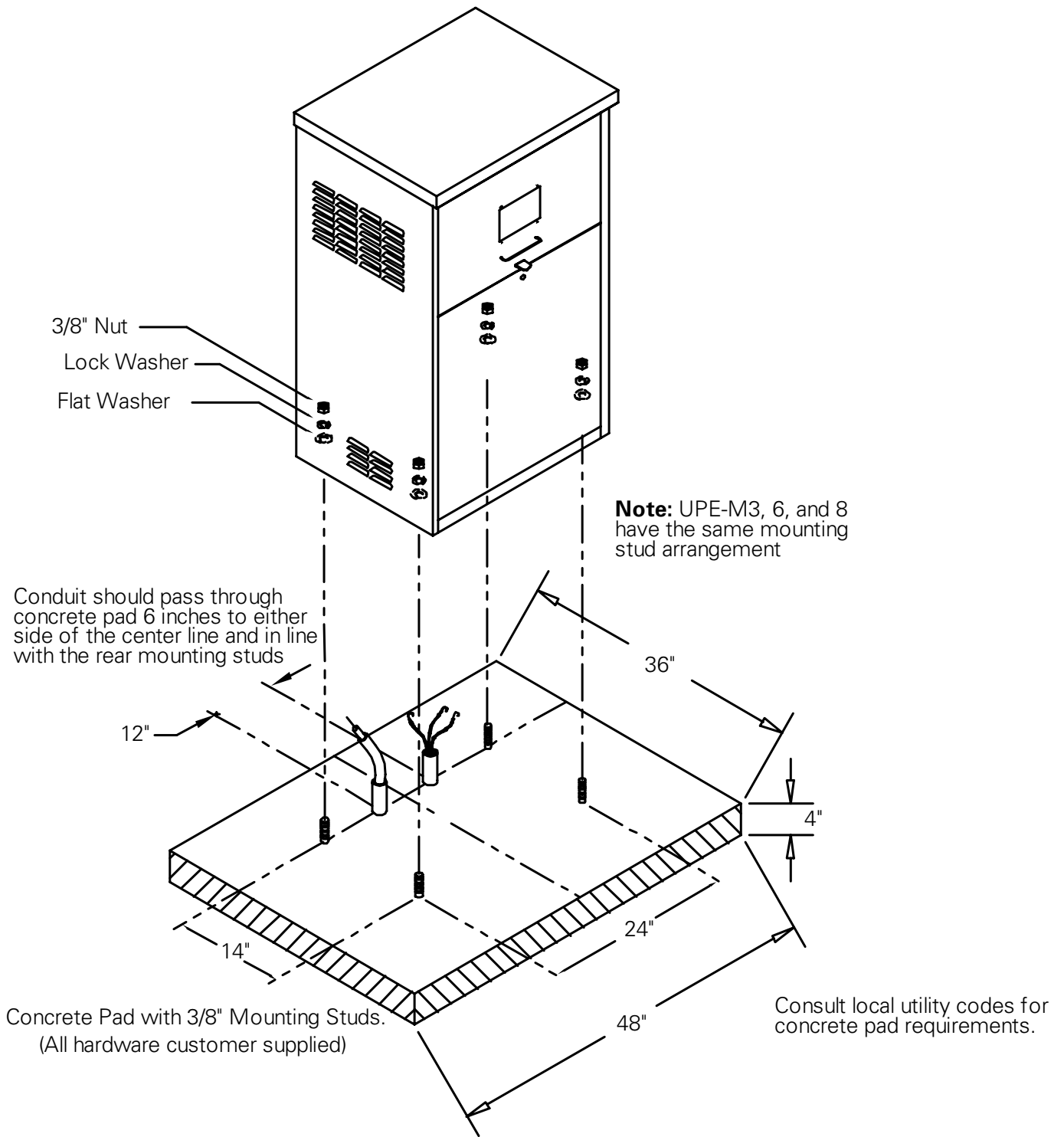


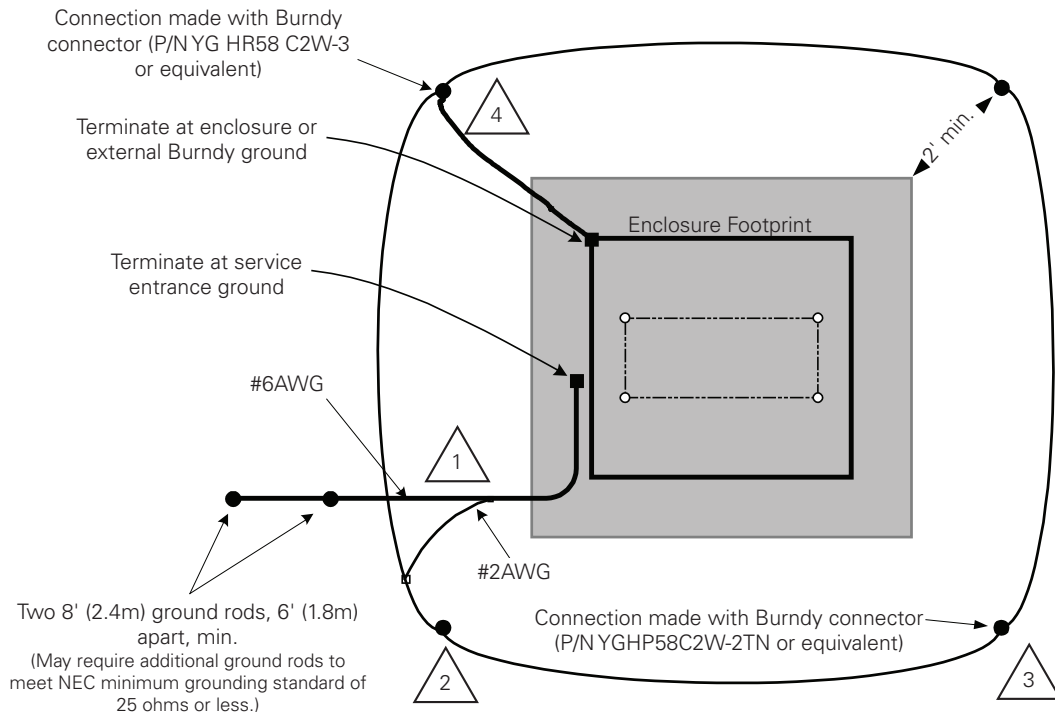
Fig. 2-2, Concrete Pad Dimensions

2.0 Site Preparation, continued

2.4 Enclosure Grounding

✓ **NOTICE:**

- Alpha Technologies Services, Inc. recommends using the grounding method illustrated below. The grounding method for a particular site will be dependent upon soil type, available space, local codes, National Electrical Safety Code (NESC®), National Electrical Code (NEC®), and other site-specific characteristics.
- Alpha® recommends less than 25 ohm ground resistance in the grounding system in accordance with NESC Section 9 and NEC Article 250, 820 Part IV.
- Alpha recommends that if there are other electrical services in the area of any part of the enclosure or grounding system shown below that you contact your local code authority on possible 20' (6.0m) bonding conductor requirements for connecting the different grounding systems.
- Alpha Technologies Services, Inc. assumes no responsibility or liability for failure of the installer to comply with the requirements of applicable local and national codes. Where allowed, exothermic welding may be used as an alternative to Burndy® clamps and connectors.



Service Grounding (required)

- 1 #6 bare copper wire from Service Neutral / Ground Bar with 2 ground rods located 6' (1.8m) apart. If system ground resistance is greater than 25 ohms consult with local code authority for a suitable grounding system.

Lightning Protection (optional)

- 2 1/2" x 8' (13mm x 2.4m) copper ground rod, four places, driven about 2' (0.6m) (typical) from the corners of the pad.
- 3 #6 bare copper wire loop terminated to each ground rod and buried below grade 30" (.762m) (min). 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 Services, Inc. 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:

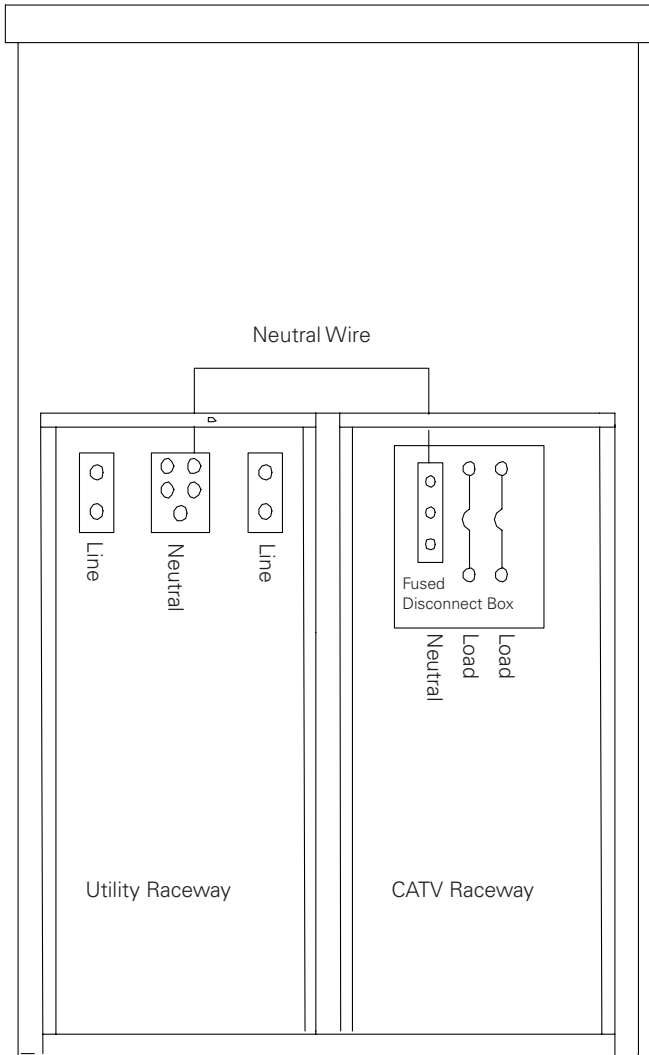
- The XM2 and XM3 Power Supplies are powered by either 120VAC or 240VAC (120/120 grounded neutral) attached to an internal service entrance. The size of the service conductors must be based upon the actual size of the utility service, and must comply with applicable electrical code requirements.
- Proper 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.



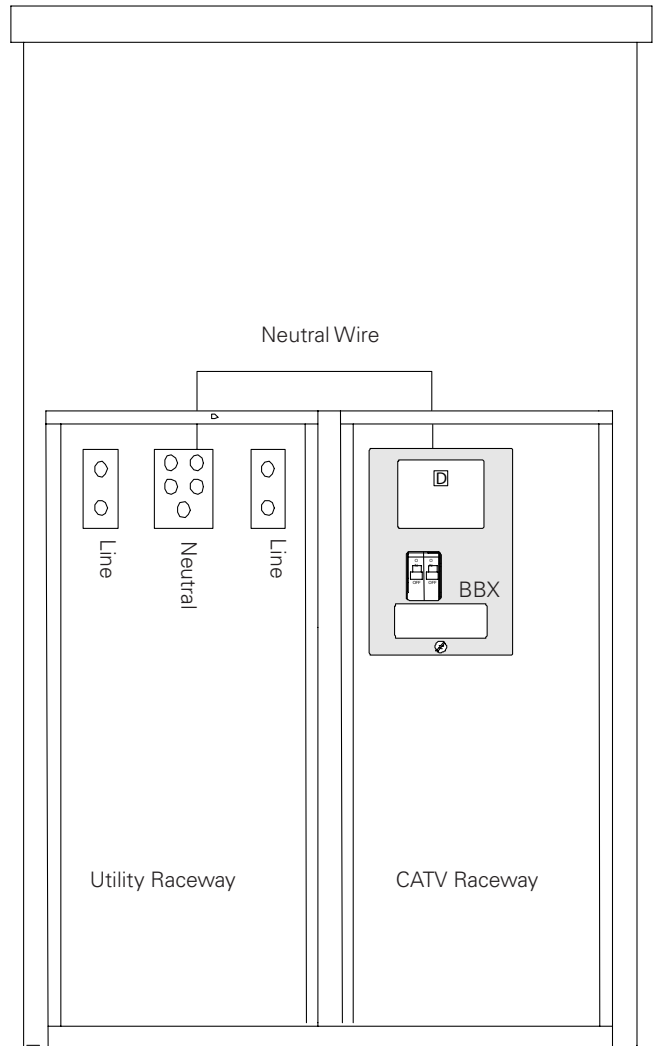
CAUTION!

- 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 Services, Inc. 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



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



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

3.0 Installation, continued

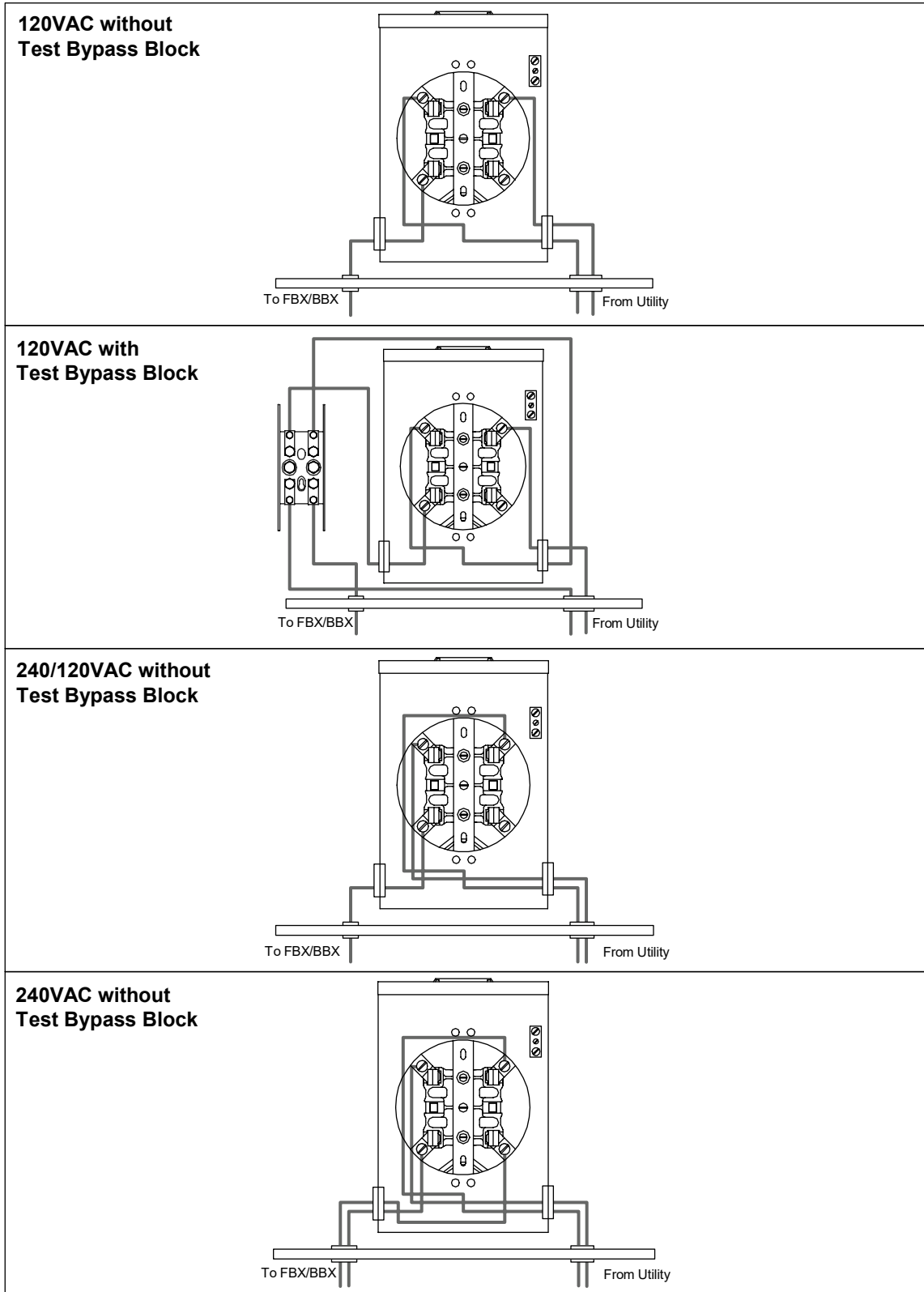


Fig. 3-4, Meter Base Configurations

3.0 Installation, continued

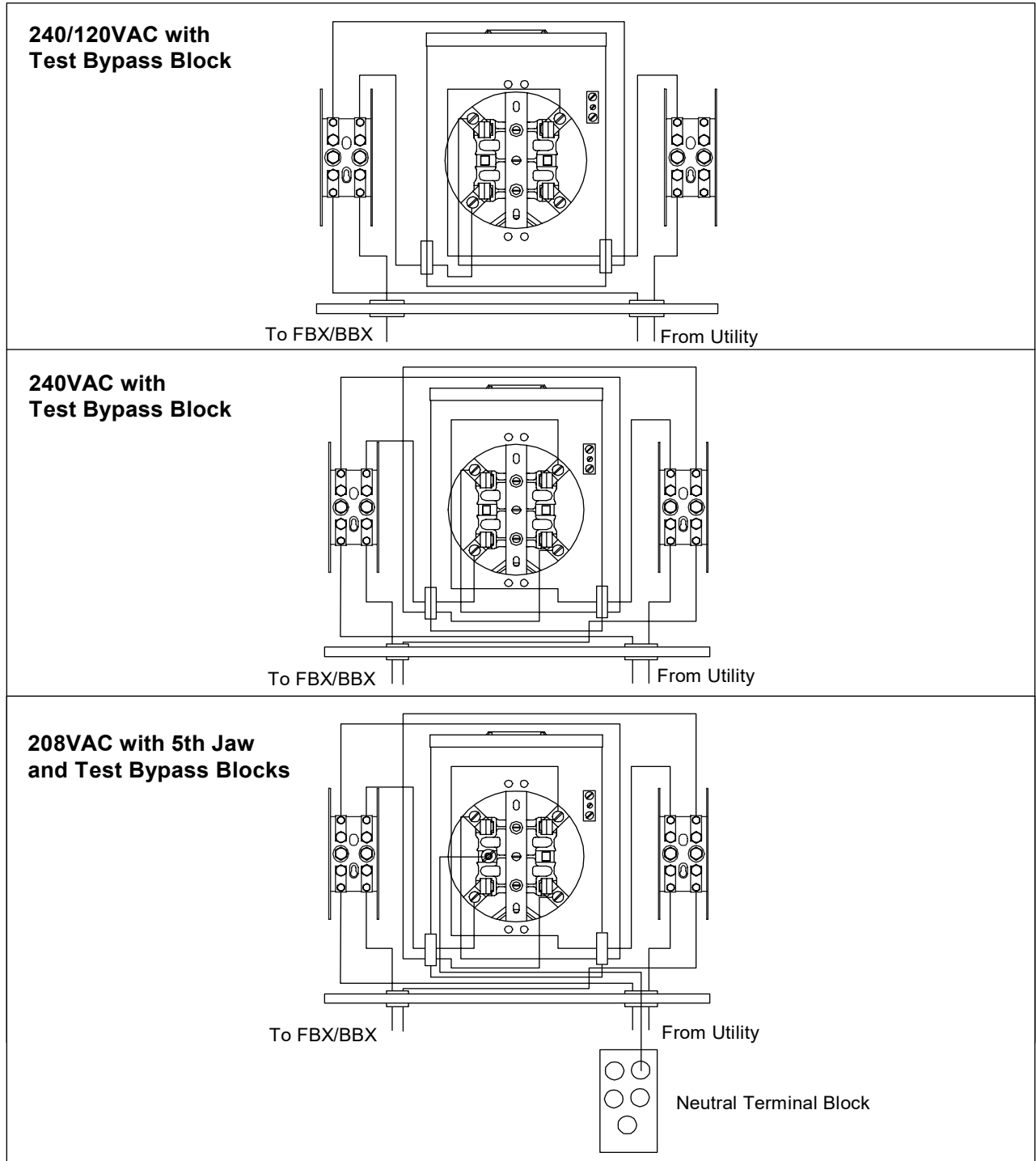


Fig. 3-5, Meter Base Configurations

3.0 Installation, continued

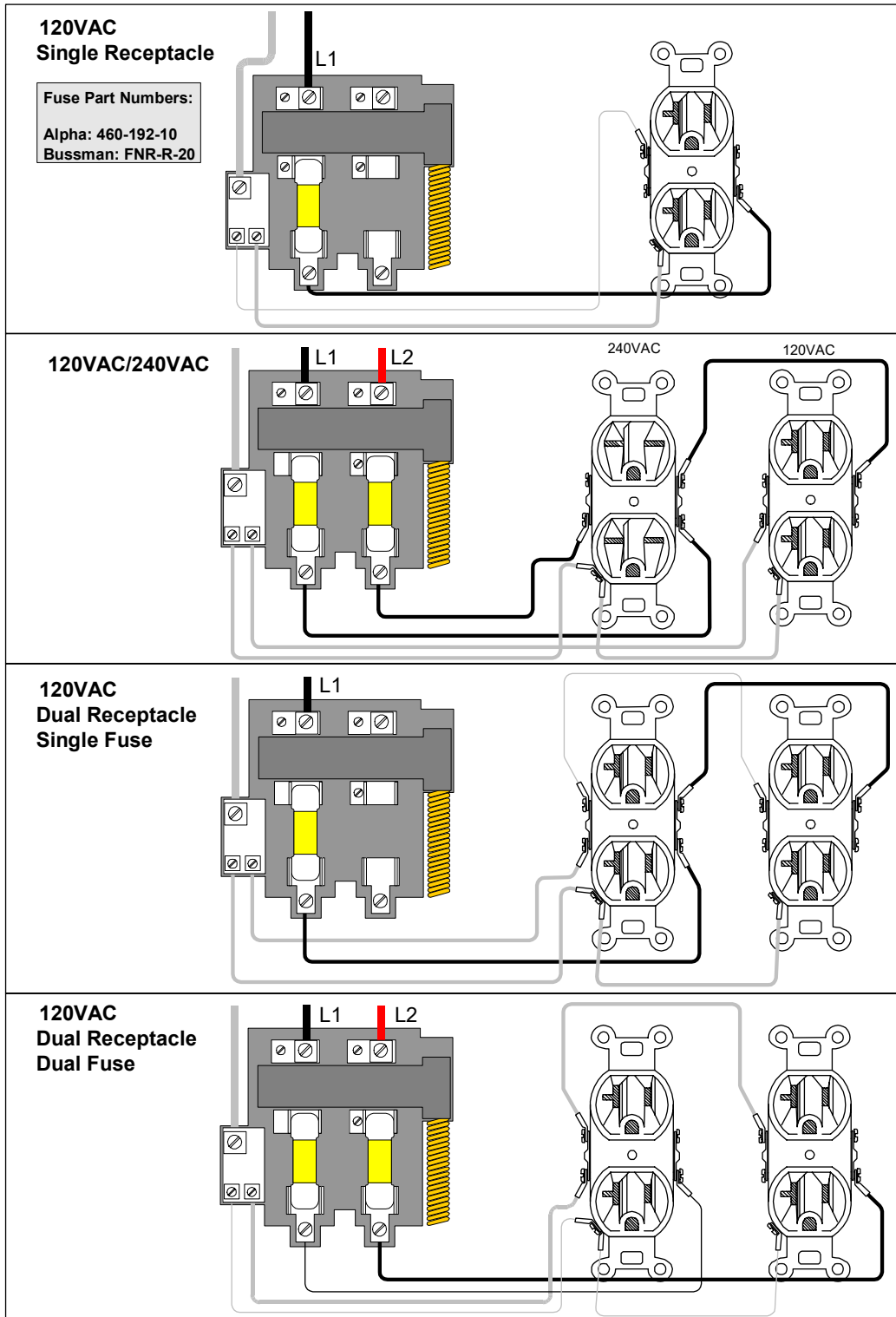


Fig. 3-6, Fuse/Receptacle Configurations for 65K-AIR Enclosures

3.0 Installation, continued

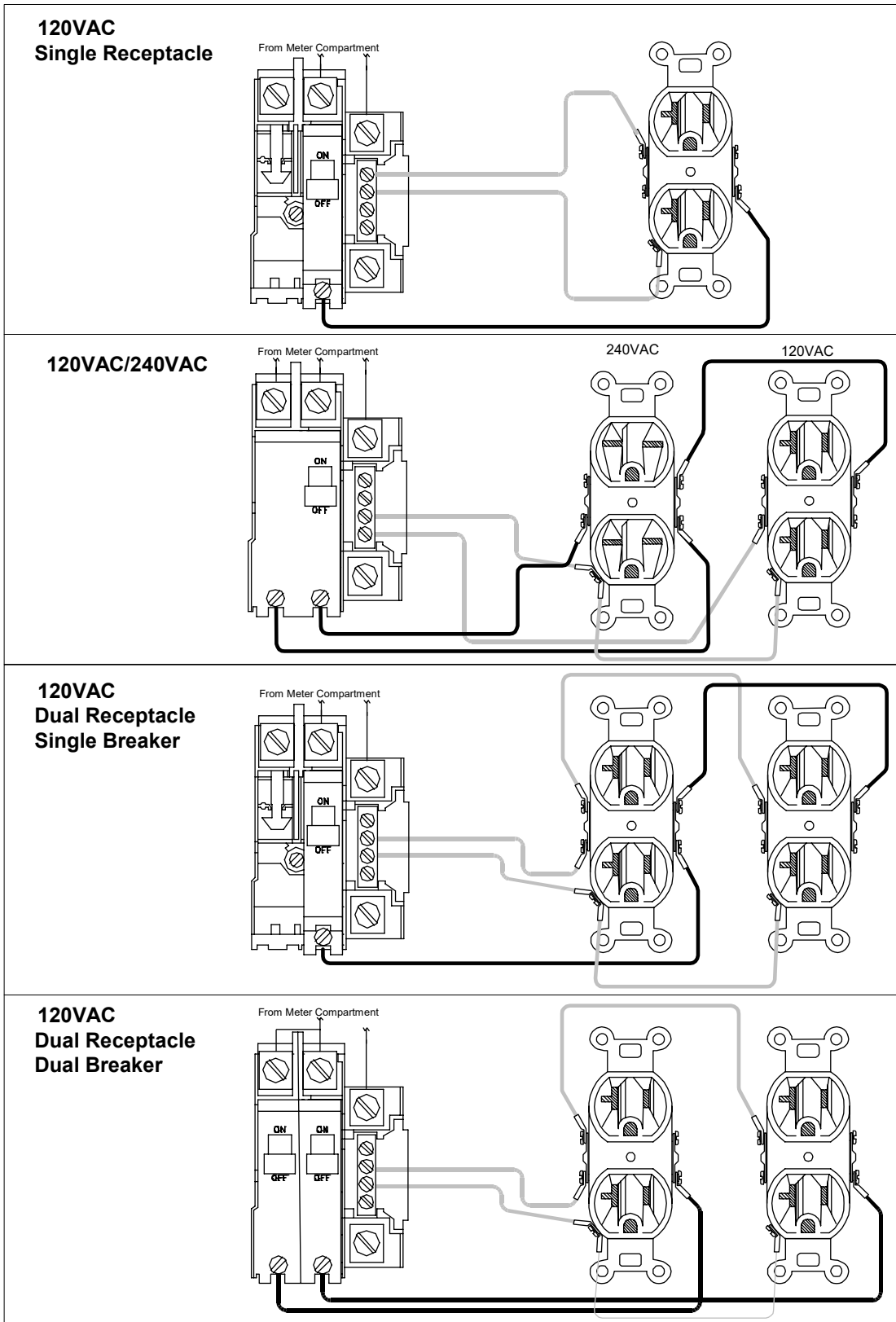


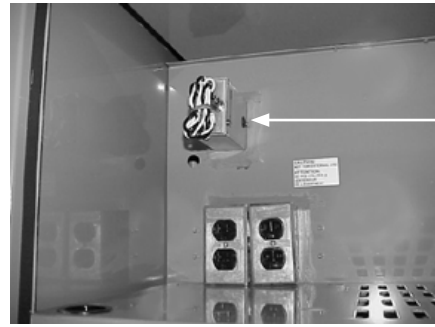
Fig. 3-7, Fuse/Receptacle Configurations for Standard Enclosures

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.
2. 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.
4. Tighten the coaxial termination.
5. Tighten the seizure screw to 35 in-lb.
6. 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.



Service Power Inserter

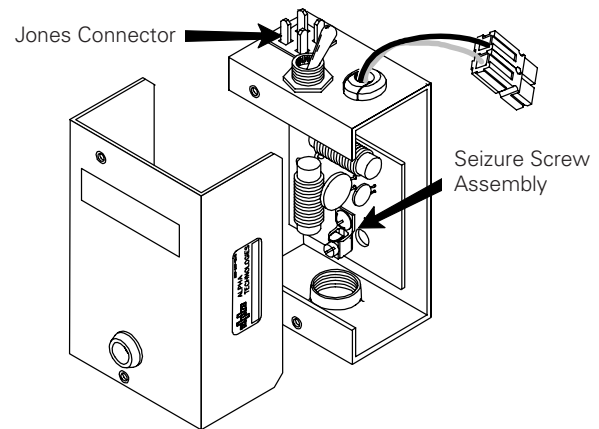


Fig. 3-8, Removing SPI Cover

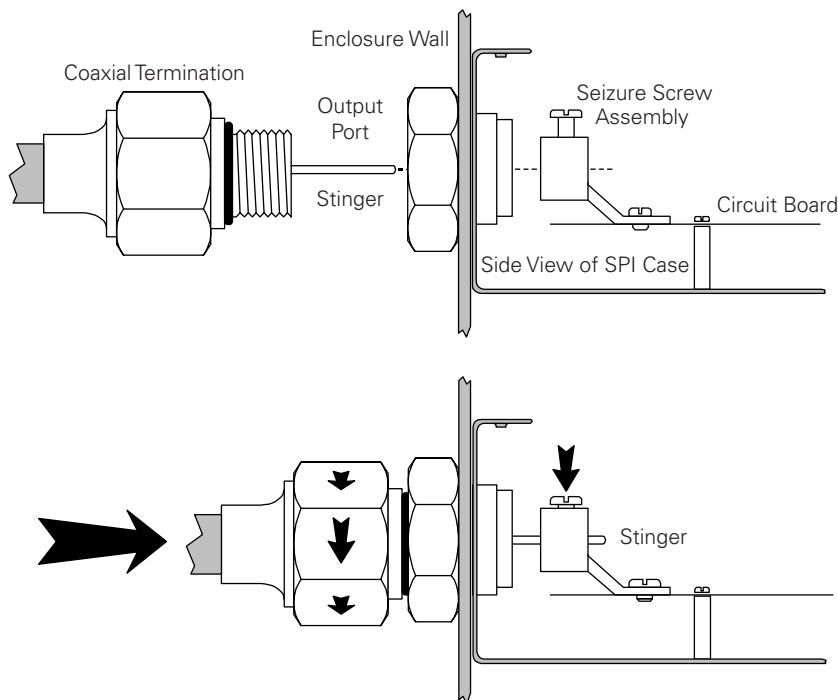


Fig. 3-9, Connecting Coax to SPI Output Port



CAUTION!

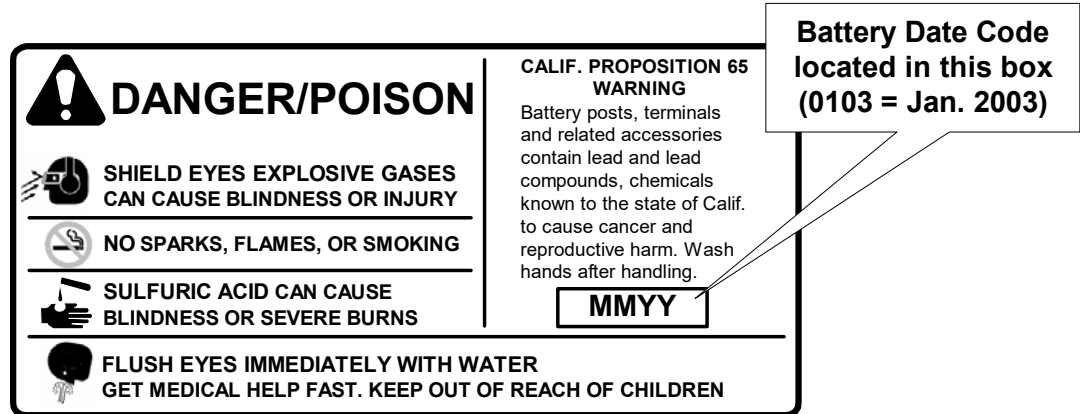
To prevent arcing, the center conductor (stinger) of the coaxial termination must go fully inside the seizure screw assembly. Tighten to 35 inch-pounds.

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 in-lb upon installation, then re-torque to 50 in-lb.

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

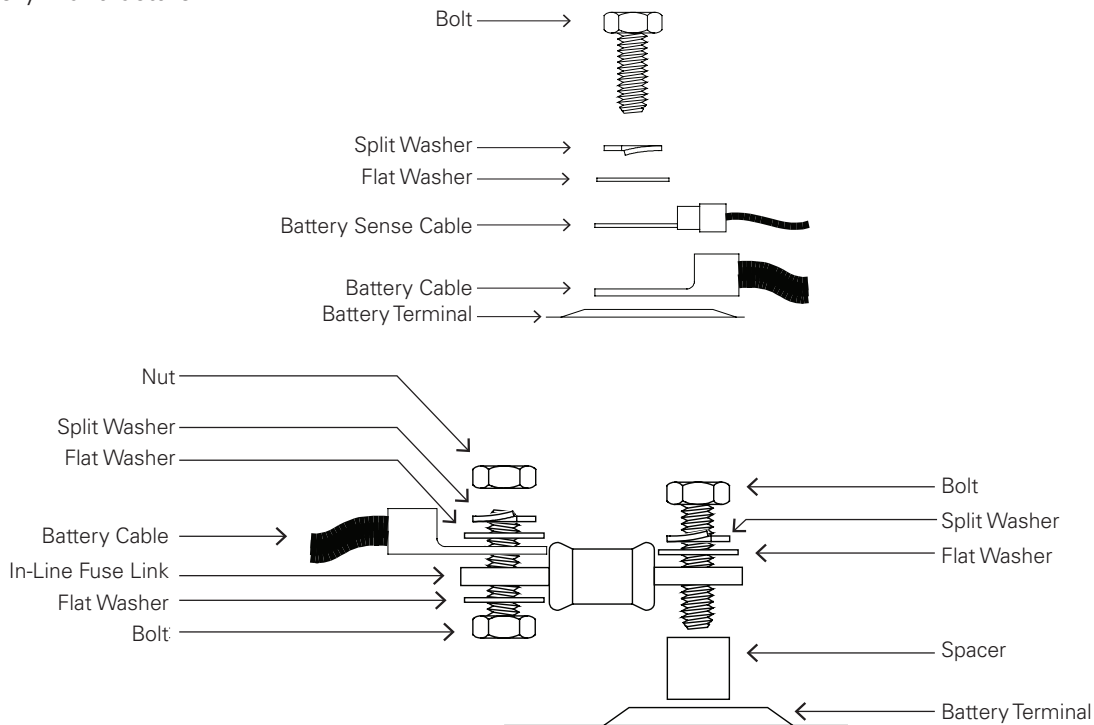


Fig. 3-10, Battery Terminal Assembly

3.0 Installation, continued

Tools Needed:

- 7/16" open end wrench
- Torque wrench

Procedure:

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

1. Release the latch on the left slide. Pull the (lower) tray out until it reaches the stops.
2. Place the batteries on the enclosure's battery slide tray or battery shelf. The correct arrangement of the batteries on the tray or shelves varies between enclosure models. See Figs. 3-11 and 3-12 for the correct battery arrangement. Leave a minimum of one inch of ventilation space between the batteries.
3. 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.
4. Using the battery arrangement diagrams as a reference, connect the batteries in series to achieve 36VDC or 48VDC. Refer to the diagrams for the location of the optional in-line fuses. For AlphaCell® batteries, torque terminal connections to approximately 65 in-lb (7.3 Nm) at installation and re-torque to 50 in-lb (5.6 Nm) during routine maintenance. For non-Alpha batteries, torque to manufacturer's specifications.
5. Verify the batteries are properly connected by checking the polarity and voltage of the battery cable connector with a digital voltage meter. DO NOT connect the battery string or strings to the power supply at this time.
6. 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 Fig. 3-11 or Fig. 3-12 to determine the RTS attachment point. See Section 3.1 for RTS the attachment procedure.
7. Route the battery cable connector into the power supply compartment. DO NOT connect to the batteries to the power supply at this time.
8. Disengage the hold-open latch and slide the battery tray into the enclosure.
9. Repeat for the center tray (UPE-M6 and UPE-M8 only).

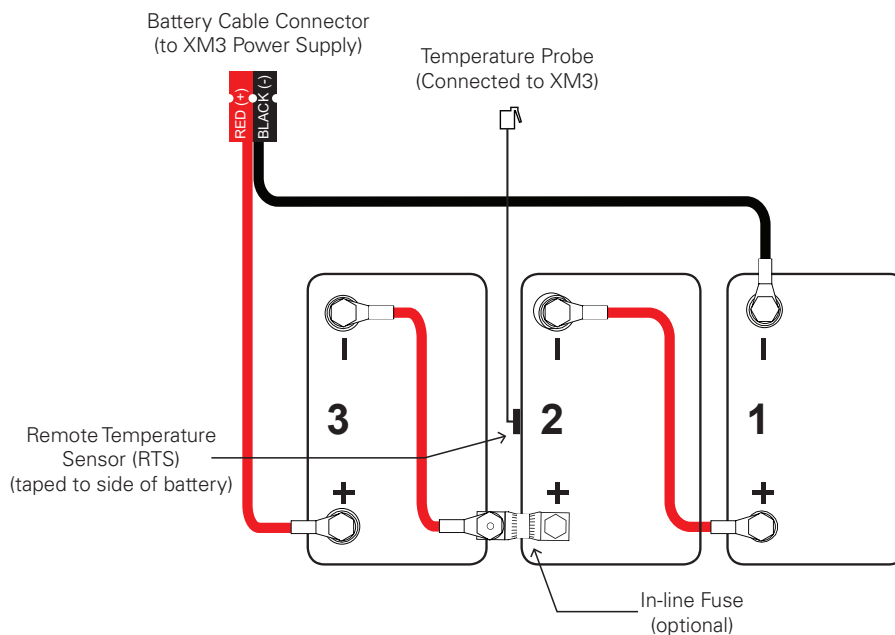


Fig. 3-11, UPE-M3 Battery Wiring Diagram (for use with slide tray)

3.0 Installation, continued

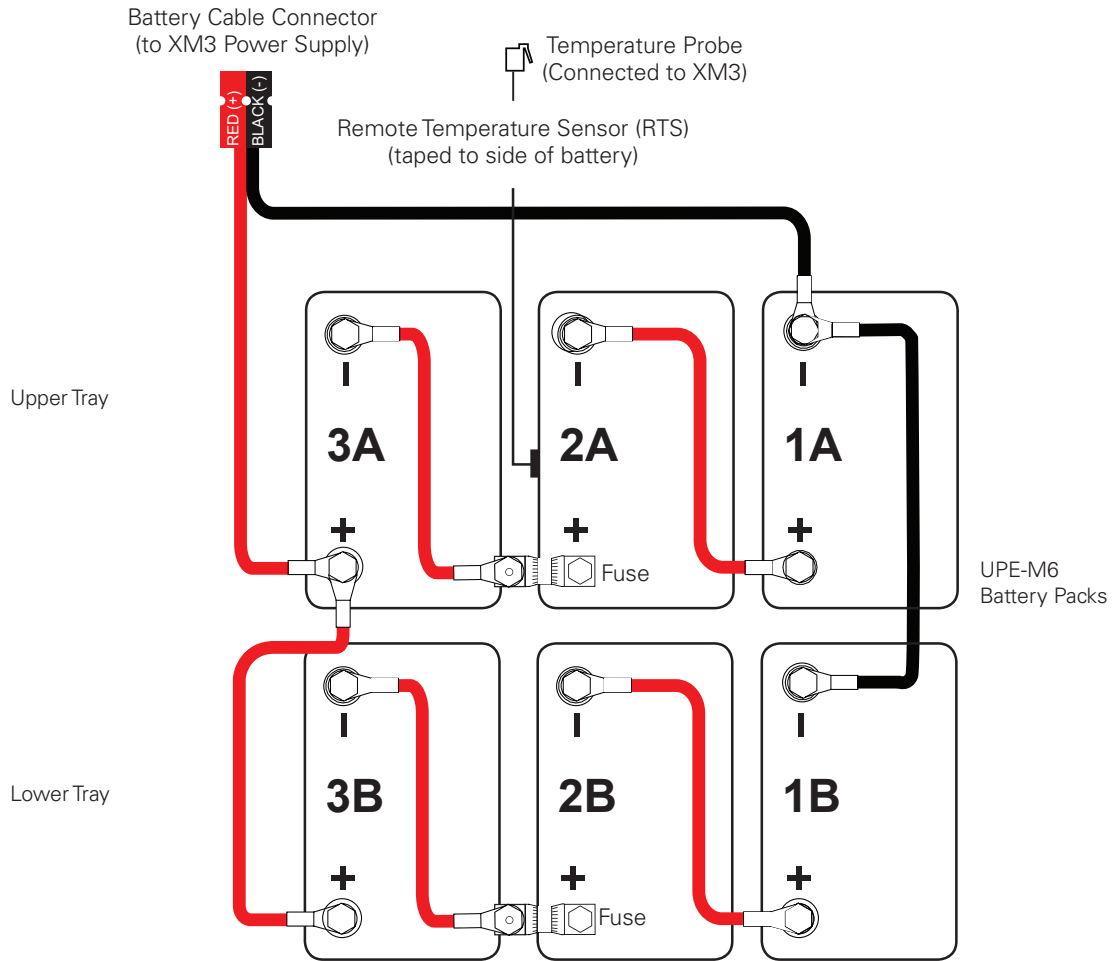


Fig. 3-12, UPE-M6 Battery Pack

3.0 Installation, continued

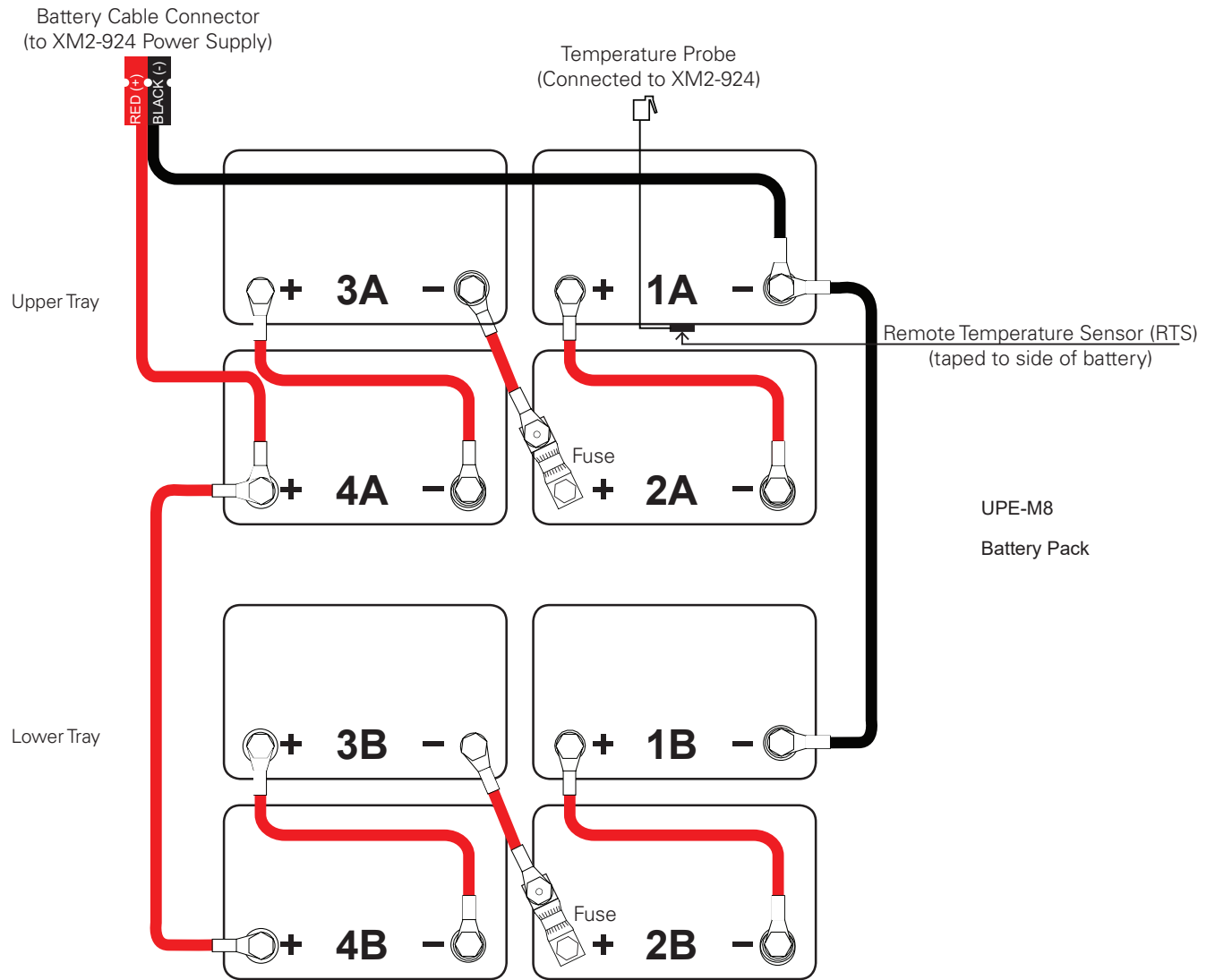


Fig. 3-13, UPE-M8 Battery Pack

3.0 Installation, continued

3.5 Power Supply Connections

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

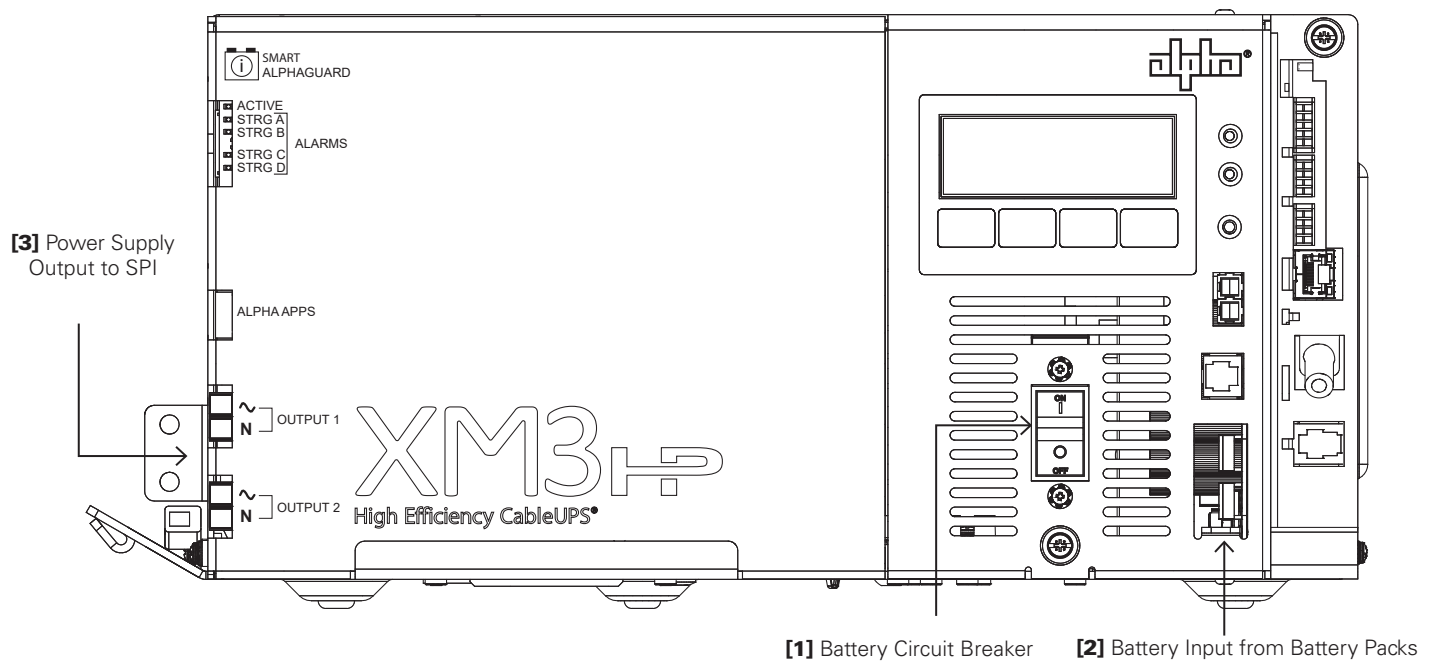
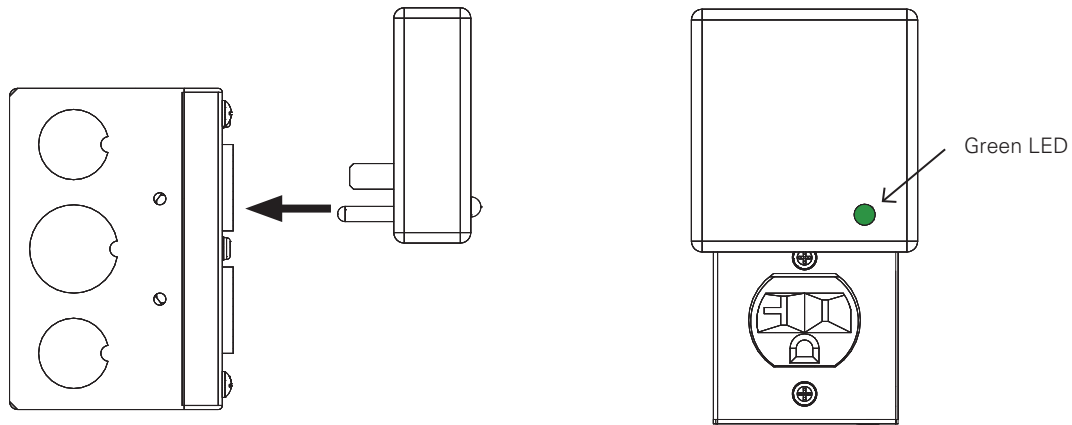


Fig. 3-14, Battery and Output Power Connections

3.0 Installation, continued

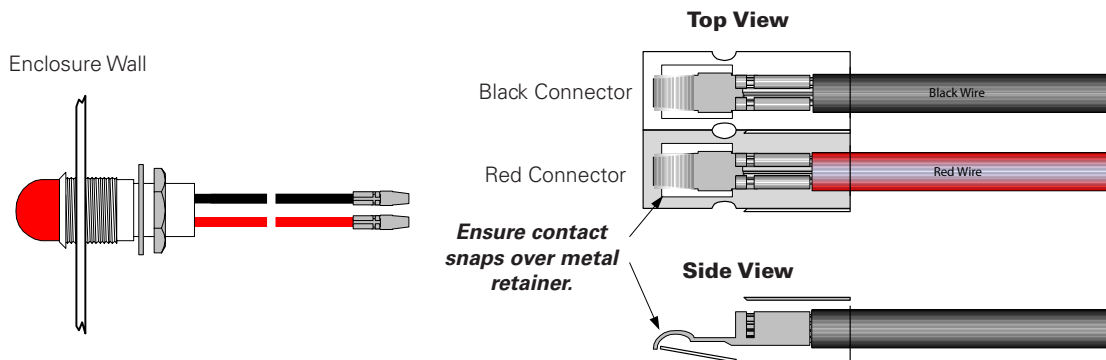
3.6 Lightning Arrester (LA-P+) Option

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.

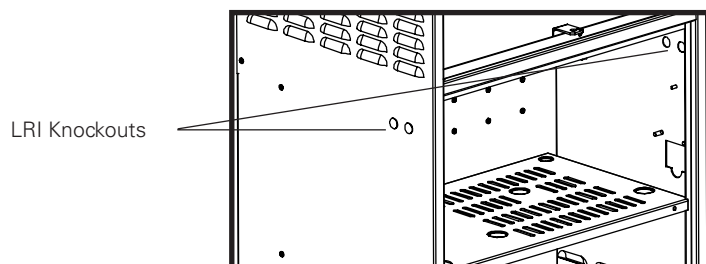


3.7 LRI Option

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.

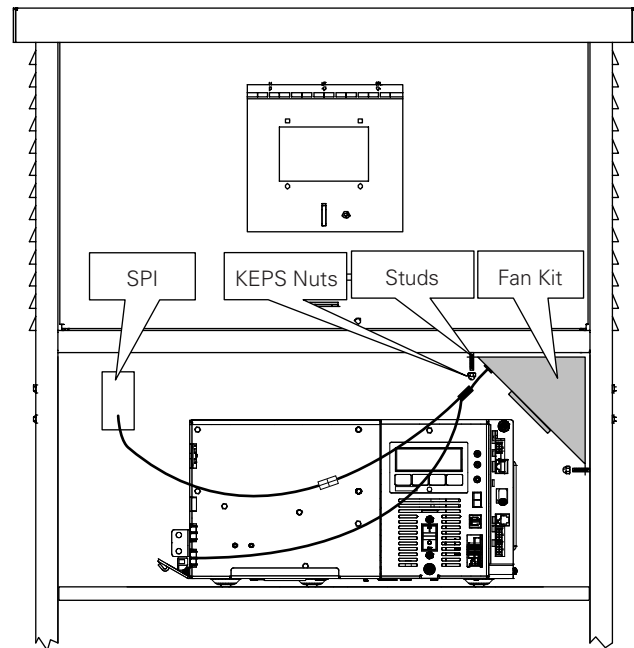
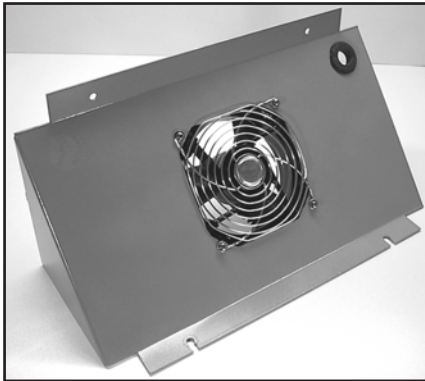


3.0 Installation, continued

3.8 Enclosure Cooling Fan (optional)

The cooling fan is required whenever an XM3-915 or XM2-924 is installed in a UPE-M6 or M8 enclosure 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 enclosure, and upper right corner for UPE-M3 and UPE-M6 enclosures). 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 × 1-1/4", 5A, 250V (*Alpha P/N 460-025-10*).





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