Radium MiniBay E-911

RMB-E-911-A48

RMB-E-911-B

RMB-E-911-C

MiniBay E-911

Enclosure Installation Manual

Effective: October, 2004

Alpha Technologies

Alpha Technologies

Power

RADIUM
Power Systems

MiniBay E-911 Enclosure Installation Manual

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NOTE

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

NOTE

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

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:

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)

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Document Revision History

Document Name	*Control/Rev. Number*	*Release Date*
Radium MiniBay E-911 Enclosure Installation Manual	031-171-C0-001 Rev. A	
"	031-171-C0-002 Rev. B Updated dual bus wire labeling and schematic, pages 16 & 18.	September 16, 2004
"	031-171-C0-003 Rev. C Added revision history, page 6.	October 5, 2004

Important Safety Instructions

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 caused by electrical shock, explosion of fuel or moving parts; 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.

Symbols in this Manual

ATTENTION!

The use of ATTENTION is only for specific regulatory/code requirements that may affect the placement of equipment and installation procedures.

NOTE

A NOTE gives readers additional information to help them complete a specific task or procedure.

CAUTION!

A CAUTION presents safety information to PREVENT DAMAGE TO ALPHA or CUSTOMER'S EQUIPMENT. A CAUTION tells you how to correctly perform a procedure or action and what could happen if you fail to follow the instructions.

WARNING!

A WARNING presents safety information to PREVENT INJURY OR DEATH to the technician/ user. A WARNING tells you how to take specific safety precautions and then explains what may happen if those precautions are not followed.

ATTENTION!

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.

General Safety Precautions

CAUTION!

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

To avoid injury:

- This enclosure and its associated hardware must be serviced only by authorized personnel.
- Enclosure 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 enclosure, 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.
- Under certain overcharging conditions, lead-acid batteries can vent a mixture of hydrogen gas which is explosive. Proper venting of the enclosure is required.
- Follow the battery manufacturer’s approved transportation and storage instructions.

CAUTION!

Enclosure, equipment or parts may be damaged or cause damage if used or installed improperly.

To avoid damage:

- Prior to installation, verify that the AC input voltage to the enclosure and its equipment match with respect to voltage and frequency.
- Prior to installation, verify that the output voltage from the enclosure or its equipment match the voltage requirements of the connected equipment (load).
- Prior to installation, verify that the enclosure's utility service panel is equipped with a properly rated circuit breaker for use with the equipment inside. Refer to manufacturer's recommendations.
- Review and upgrade utility service panel circuit breaker requirements whenever the equipment within the enclosure is changed.
- Prior to installation, contact local utilities, local building maintenance departments, and cable/ piping locator services to ensure that installation does not interfere with existing utility or building cables/ piping.
- Do not exceed the output rating of equipment. Verify load requirements prior and during connection process.
- Prior to handling the batteries, touch a grounded metal object to dissipate any static charge that may have developed in your body.

Battery Safety Notes

CAUTION!

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

Chemical Hazards

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

To avoid injury:

- Servicing and connection of batteries shall be performed by, or under the direct supervision of, personnel knowledgeable of batteries and the required safety precautions.
- Always wear eye protection, rubber gloves, and a protective vest when working near batteries. Remove all metallic objects from hands and neck.
- Batteries produce explosive gases. Keep all open flames and sparks away from batteries.
- Use tools with insulated handles, do not rest any tools on top of batteries.
- Batteries contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Battery post terminals and related accessories contain lead and lead compounds. Wash hands after handling. (California Proposition 65)
- Wear protective clothing (insulated gloves, eye protection, etc.) whenever installing, maintaining, servicing, or replacing batteries. If any battery emission contacts the skin, wash immediately and thoroughly with water. Follow your company's approved chemical exposure procedures.

- Neutralize any spilled battery emission with the special solution contained in an approved spill kit or with a solution of 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.
- Prior to handling the batteries, touch a grounded metal object to dissipate any static charge that may have developed on your body.
- Never use uninsulated tools or other conductive materials when installing, maintaining, servicing or replacing batteries.
- Use special caution when connecting or adjusting battery cabling. An improperly connected battery cable or an unconnected battery cable can make contact with an unintended surface that can result in arcing, fire, or possible explosion.
- A battery showing signs of cracking, leaking, or swelling should be replaced immediately by authorized personnel using a battery of identical type and rating.
- Under extreme overcharging conditions lead-acid batteries can vent a mixture of hydrogen gas that is explosive.

Battery Maintenance Guidelines

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

- To prevent damage, inspect batteries every 3 months for:

  Signs of battery cracking, leaking or swelling. The battery should be replaced immediately by authorized personnel using a battery of the identical type and rating.

  Signs of battery cable damage. Battery cable should be replaced immediately by Authorized Personnel using replacement parts specified by vendor.

  Loose battery connection hardware. Refer to battery manufacturer's documentation for the correct torque and connection hardware for the application.
- Apply battery manufacturer's specified antioxidant compound on all exposed connections.
- Verify battery terminals and/or exposed connection hardware is not within 2 inches of a conductive surface. Reposition batteries as necessary to maintain adequate clearance.
- Clean up any electrolyte (battery emission) in accordance with all federal, state, and local regulations or codes.
- Proper venting of the enclosure is recommended. Follow the battery manufacturer's approved transportation and storage instructions.
- Always replace batteries with those of an identical type and rating. Never install old or untested batteries.
- Do not charge batteries in a sealed container. Each individual battery should have at least 0.5 inches of space between it and all surrounding surfaces to allow for convection cooling.
- All battery compartments must have adequate ventilation to prevent an accumulation of potentially dangerous gas.

Recycling and Disposal Instructions

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

Electrical Safety

- Lethal voltages are present within the power supply and electrical boxes. Never assume that an electrical connection or conductor is not energized. Check the circuit with a volt meter with respect to the grounded portion of the enclosure (both AC and DC) prior to any installation or removal procedure.
- Do not work alone under hazardous conditions.
- A licensed electrician is required to install permanently wired equipment.
- Input voltages can range up to 240 VAC. Ensure that utility power is disabled before beginning installation or removal.
- Ensure no liquids or wet clothes contact internal components.
- Hazardous electrically live parts inside this unit are energized from batteries even when the AC input power is disconnected from the MiniBay.

Mechanical Safety

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

1.0 Overview and Specifications

1.1 The MiniBay E-911 Series Enclosures

The Federal Communications Commission (FCC) created the Enhanced 911 program to improve the effectiveness of the national 911 wireless system. The second part of this two-phase effort requires wireless carriers to provide location information of all wireless 911 calls. The portability and flexible design of the MiniBay E911 allows wireless carriers to meet their specific installation and power requirements for the Phase II rollout of the E911 program.

The MiniBay integrates Alpha's comprehensive line of power solutions for the Telcom industry's complex OTN and power requirements, including the RSM 48/10 series high-efficiency hot-swappable switch mode 48VDC rectifiers and the AlphaGen series of telephony-grade DC generators.

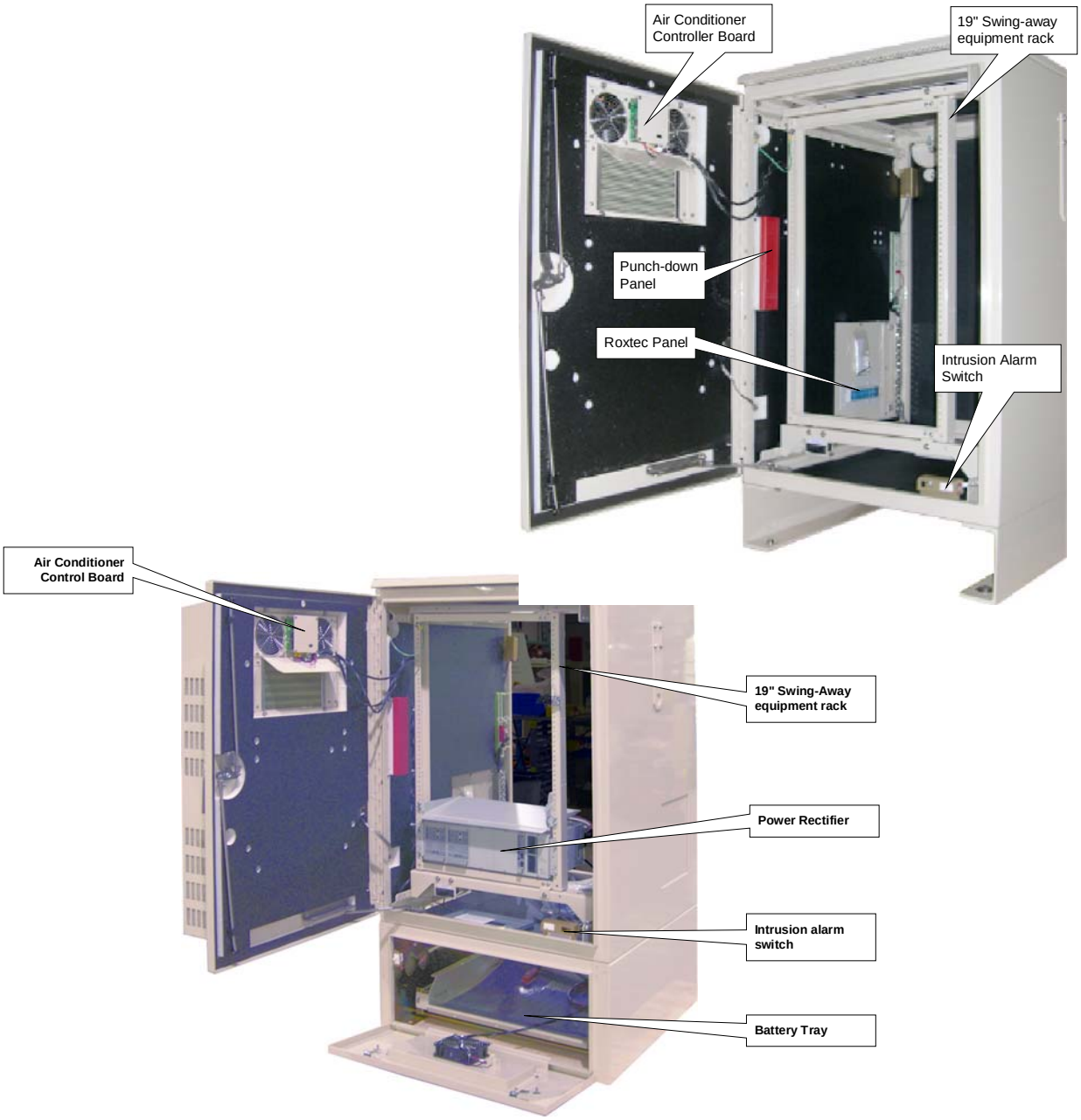


Fig. 1-1, MiniBay RMB-E-911-A48 and -B Cabinets (front view)

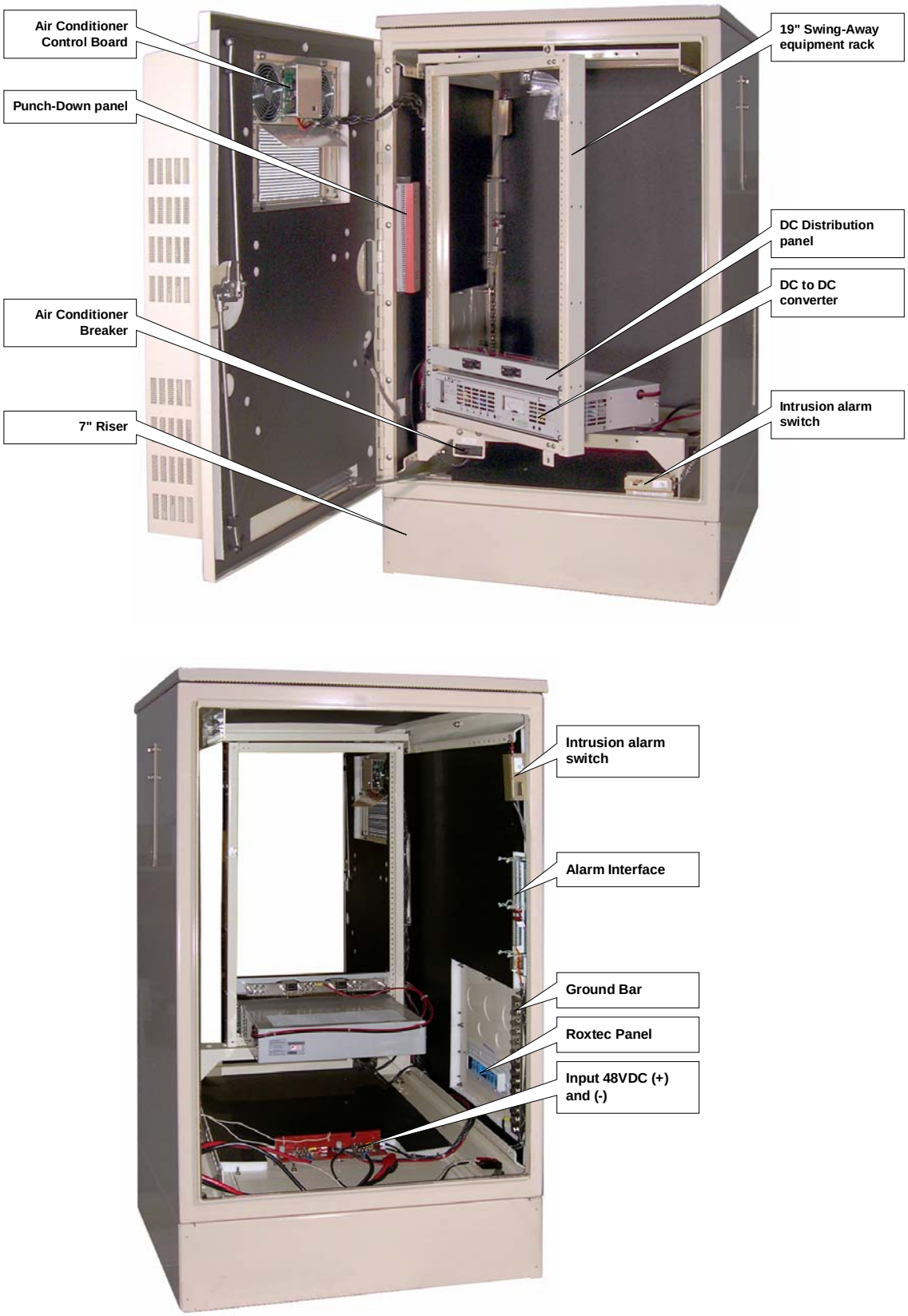


Fig. 1-2, MiniBay RMB-E-911-C Enclosure (front and rear views)

1.2 RMB-E-911 System Specifications

1.2.1 RMB-E-911-A48

Radium MiniBay RMB-E-911-A48 Specifications		***Part Number***
Radium MiniBay Equipment Section	44" H X 30" W X 32" D	031-171-22
Swing Rack	19"	745-307-20
MiniBay "C" Channel/Riser	7'	604-880-F2
MiniBay "C" Channel/Riser Hardware Kit		745-650-20
Dual Term Bar Kit		745-584-20
Ground Bar Kit,	12 X ¼-20, 5/8" OC dual hole lug positions w/bolts	745-235-21
Intrusion Sensor Kit	for 2 doors	745-232-20
Enclosure Insulation Kit		745-301-20
Cable Entry Port Blank	For enclosure bottom cable port	745-201-23
Knockout Panel	3 x 2" conduit knockout, 2 x 1" conduit knockout, 1 x Roxtec CF 16/16	745-580-20
Enclosure Cable Port Blank	For enclosure side cable port	745-580-21
Alarm Terminal Interface Board		745-119-20
50-Pair 66-Block (Alarm Terminations)	w/covers	745-585-20
Key to enclosure doors	Pin Allen type	964-022-10
Thermal Mgmt. Option/Doors		
Air-conditioned Front or Rear Door,	48VDC, w/speed control and alarm, left hinge (front-mount default if single AC)	745-204-51
Non-louvered Door	lift-off (for air-conditioning)	745-207-21
48V Heater Assembly	450W 48VDC	745-588-21
Remote Temperature Sensor		TBD
Replacement Parts and Options		
Cable Entry Options/Additions		
Battery Compartment Back Door	w/3-2" conduit knockouts, 2-1" conduit knockouts, 1 Roxtec CF 16/16	604-734-00
Enclosure side knockout panel	w/ 3-2" conduit knockouts, 2-1" conduit knockouts, 1 Roxtec CF 16/16	604-708-00
Blank Panel (side)		604-709-00
Blank Panel (bottom)		745-201-23
Mounting Options		
Polymer Concrete Pad	Precast for single MiniBay, 3" H X 42" W X 44" D	641-110-10
Hilti HD Kit Sleeve Anchors	4 -12mm HD Sleeve Anchors - Zone 4	00217217 *(Hilti) or* 745-592-20-001 *(Alpha)*
Hilti Kit Sleeve Anchors	4 - KBII Sleeve Anchors, 1/2" X 3 3/4"	00045367 *(Hilti) or* 745-592-21-001 *(Alpha)*
Pour-in-Place Pad Template		604-039-N1
Vapor Barrier	Die cut to enclosure dimensions	564-990-10
48VDC Air Conditioner Ass'y	replacement for equipment enclosure	745-289-20

1.2.2 RMB-E-911-B

Radium MiniBay	***Specifications***	***Part Number***
(24V) RMB-E-911-B		
Radium MiniBay Equipment Section	44" H X 30" W X 32" D	031-171-22
Weight	515 lbs (234kg) with 60 lbs (27kg) pallet	
Swing Rack	19"	745-307-20
Bus bar Kit, isolated,	12 X ¼-20, 5/8" OC dual hole lug positions w/bolts	745-235-20
Ground Bar Kit,	12 X ¼-20, 5/8" OC dual hole lug positions w/bolts	745-235-21
Intrusion Sensor Kit	for 2 doors	745-232-20
Cable Entry Seal Kit		745-201-20
Knockout Panel	3 x 2" cond. knockout, 2 x 1" cond. knockout, 1 x Roxtec CF	745-580-20
Enclosure Cable Port Blank		745-580-21
Alarm Terminal Interface Board		745-119-20
50-Pair 66-Block (Alarm Terminations)	w/covers	745-585-20
Key to enclosure doors	Pin Allen type	964-022-10
Battery Compartment		
Battery Storage Unit,	14" H X 32" W X 32" D, Battery Drawer, Removable Rear Panel	033-083-20
Battery compartment fan	24VDC w/thermal control PCBA	745-214-22
Battery Heater Mat	120V 300W	745-322-20
Battery Compartment Intrusion Sensor		745-231-20
Cable, DC Kit to Battery Compartment Extension	6 Ga, 75A Anderson to 75A Anderson	875-110-20
Battery Cable Kit,	100A, for 2 GNB 12V, 40 Hr Batteries (1 required per battery string)	745-582-20
AC Input		
4-Position 120V/240V AC Dist. Panel,	30 Amp Capacity (requires NEMA 14-30 Input Service/L1, L2, N, G (4-wire)	745-581-20
GFCI outlet	w/2nd convenience outlet	745-203-20
+24VDC Rectifier		
RSM 24/28-Module Cabinet,.	19", Universal Mounting Bracket, Extended Temp Op., etc.	028-006-20-A002
LVD & Load Distribution module	uses GMT fuses w/Contactor (2 x 20 Amps)	028-006-20 L76
RSM 24/18 Power Module,	24V 18 Amp Rectifier, 120VAC, Extended Temp	010-532-20 L0, 42, 55, 8
19" RSM 24/18 & 48/10 Integration Kit	2- 19" 1RU air diverters, alarm interface PCBA, 2X 120VAC, 15A Breakers	745-265-23
GMT Fuse	5 Amp	460-084-10
GMT Fuse	10 Amp	460-069-10
Thermal Mgmt. Option/Doors		
Air-conditioned Front or Rear Door	24VDC, w/speed control/alarm, left hinge (front-mount default if single AC)	745-204-53
Non-louvered Door,	lift-off (for air-conditioning)	745-207-21
Enclosure Heater	450W w/120V Line Cord	745-589-21
Temperature Sensor Assembly	3/8" lug, 12 feet	028-002-20 L098
Temperature Sensor Assembly	1/4" lug, 12 feet	028-002-20 L099

Replacement Parts and Options		
Cable Entry Options/Additions		
Battery Compartment Back Door	w/3-2" conduit knockouts, 2-1" conduit knockouts, 1 Roxtec CF 16/16	745-210-21
Enclosure side knockout panel	w/ 3-2" conduit knockouts, 2-1" conduit knockouts, 1 Roxtec CF 16/16	745-580-20
Blank Panel (side)		745-580-21
Blank Panel (bottom)		745-201-23
Mounting Options		
Polymer Concrete Pad	Precast for single MiniBay, 3" H X 42" W X 44" D	641-110-10
Hilti HD Kit Sleeve Anchors	4 -12mm HD Sleeve Anchors - Zone 4	00217217 *(Hilti) or* 745-592-20-001 *(Alpha)*
Hilti Kit Sleeve Anchors	4 - KBII Sleeve Anchors, 1/2" X 3 3/4"	00045367 *(Hilti) or* 745-592-21-001 *(Alpha)*
Pour-in-Place Pad Template		604-039-N1
Vapor Barrier	Die cut to enclosure dimensions	564-990-10
24VDC Air Conditioner Assembly	Replacement for equipment enclosure	745-289-40

1.2.3 RMB-E-911-C

Radium MiniBay RMB-E-911-C	***Specifications***	***Part Number***
Radium MiniBay Equipment Section	44" H X 30" W X 32" D	031-171-22
Weight	498 lbs (222kg) with 60 lbs (27kg) pallet	
Swing Rack	19"	745-307-20
MiniBay Skirt/Riser	7"	033-084-20
Dual Term Bar Kit		745-584-20
Ground Bar Kit,	12 X ¼-20, 5/8" OC dual hole lug positions w/bolts	745-235-21
Intrusion Sensor Kit	for 2 doors	745-232-20
Enclosure Insulation Kit		745-301-20
Cable Entry Port Blank	For enclosure bottom cable port	745-201-23
Knockout Panel	3 x 2" conduit knockout, 2 x 1" conduit knockout, 1 x Roxtec CF 16/16	745-580-20
Enclosure Cable Port Blank	For enclosure side cable port	745-580-21
Alarm Terminal Interface Board		745-119-20
50-Pair 66-Block (Alarm Terminations)	w/covers	745-585-20
Key to enclosure doors	Pin Allen type	964-022-10
DC-DC Converter		
24V Distribution Option		
CS12, DC-DC Converter	48VDC to 24VDC @ 20A, 19" or 23" rack mounting, 1 3/4" spacing	012-012-20-A003
CS12 Integration Kit		875-290-20
Alpha Circuit Breaker Panel	2-position , 19", Horizontal Mounting	744-731-21
10 Amp AM Breaker (Grayson Feeder)		470-051-10
5 Amp Am Breaker		470-050-10-A000
Thermal Mgmt. Option/Doors		
Air-conditioned Front or Rear Door,	48VDC, w/speed control and alarm, left hinge (front-mount default if single AC)	745-204-51
Non-louvered Door	lift-off (for air-conditioning)	745-207-21
48V Heater Assembly	450W 48VDC	745-588-21
Temperature Sensor Assembly	3/8" lug, 12 feet	028-002-20 L098
Temperature Sensor Assembly	1/4" lug, 12 feet	028-002-20 L099

Replacement Parts and Options		
Cable Entry Options/Additions		
Battery Compartment Back Door	w/3-2" conduit knockouts, 2-1" conduit knockouts, 1 Roxtec CF 16/16	745-210-21
Enclosure side knockout panel	w/ 3-2" conduit knockouts, 2-1" conduit knockouts, 1 Roxtec CF 16/16	745-580-20
Blank Panel (side)		745-580-21
Blank Panel (bottom)		745-201-23
Mounting Options		
Polymer Concrete Pad	Precast for single MiniBay, 3" H X 42" W X 44" D	641-110-10
Hilti HD Kit Sleeve Anchors	4 -12mm HD Sleeve Anchors - Zone 4	00217217 *(Hilti) or* 745-592-20-001 *(Alpha)*
Hilti Kit Sleeve Anchors	4 - KBII Sleeve Anchors, 1/2" X 3 3/4"	00045367 *(Hilti) or* 745-592-21-001 *(Alpha)*
Pour-in-Place Pad Template		604-039-N1
Vapor Barrier	Die cut to enclosure dimensions	564-990-10
48VDC Air Conditioner Assembly	Replacement for equipment enclosure	745-289-20

1.3 System Wiring Schematics

1.3.1 ‘A48’ Configuration

Radium MiniBays arrive at their destination with all internal components preassembled and installed in the enclosure. The following diagram will help the installer/engineer to understand the wiring schematic of the RMB-E-911 enclosures.

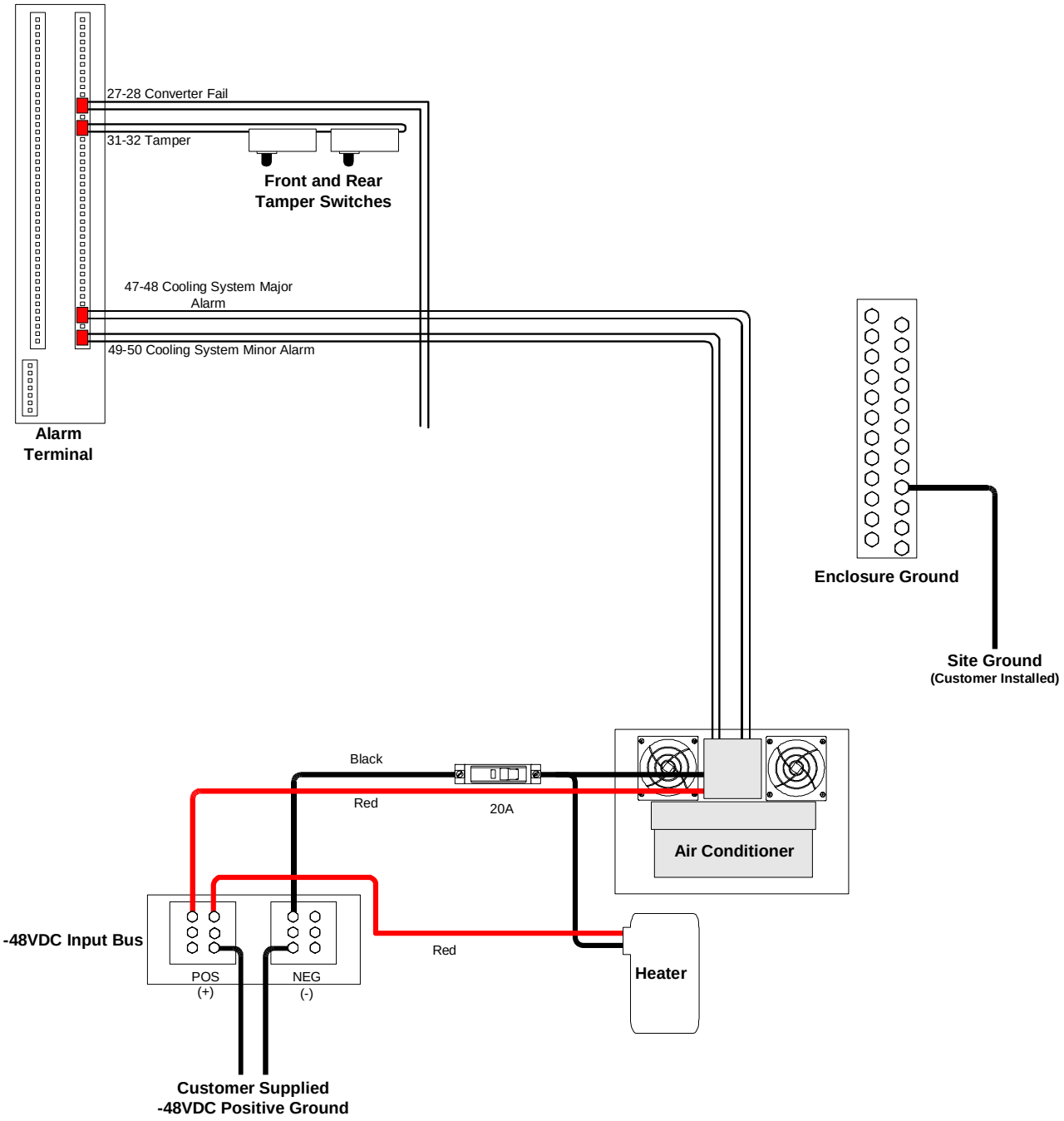


Fig. 1-3, System Wiring Schematic ‘A48’ Configuration

1.3.2 'B' Configuration

Radium MiniBays arrive at their destination with all internal components preassembled and installed in the enclosure. The following diagram will help the installer/engineer to understand the wiring schematic of the RMB-E-911 enclosures.

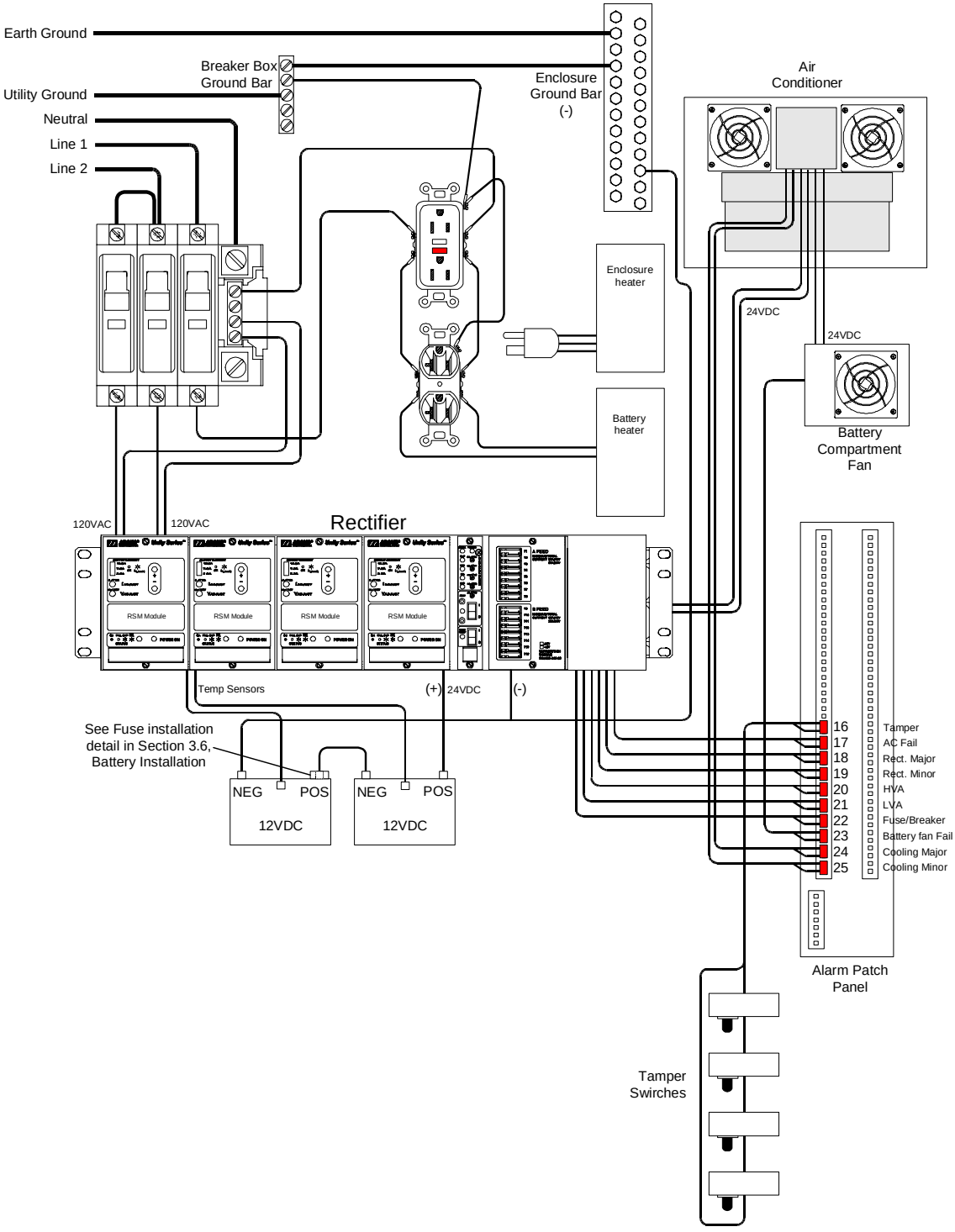


Fig. 1-4, System Wiring Schematic 'B' Configuration

1.3.3 'C' Configuration

Radium MiniBays arrive at their destination with all internal components preassembled and installed in the enclosure. The following diagram will help the installer/engineer to understand the wiring schematic of the RMB-E-911 enclosures.

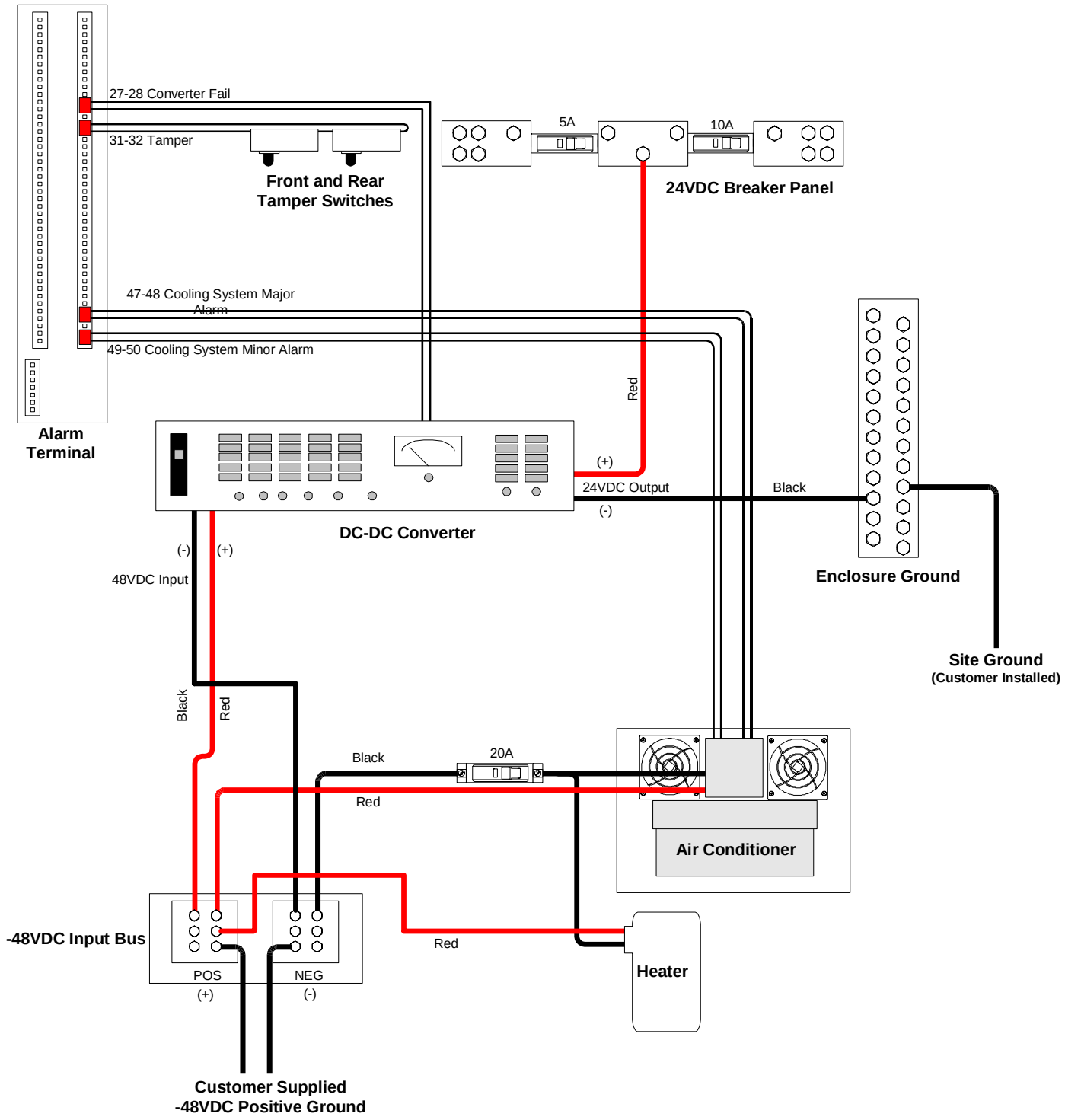


Fig. 1-5, System Wiring Schematic 'C' Configuration

2.0 Site Preparation

2.1 General Information

Description

This document describes the installation procedures for the RMB-E-911-B and -C enclosures. The process of installing the enclosure(s) are broken into four discrete procedures. If viewing this document on-line, click a section below (blue text) to jump directly to it.

- Site Selection
- MiniBay Installation
- Battery Installation and Connection
- Utility Power Connection

2.2 Required tools and materials

For the following procedures, the installer(s) will need the following tools and materials on hand.

- Key to enclosure doors *(p/n 964-022-10 — Pin Allen type, included)*
- Battery Cabling Kit *(included only for RMB-E-911-B)*
- Crane to lift enclosure from shipping pallet and place on pedestal *(not included)*
- Digital RMS voltmeter *(not included)*
- Torque wrench with insulated handle and 7/16” socket *(not included)*
- 7/16” box-end wrench *(not included)*
- NO-OX or other suitable corrosion inhibiting agent *(not included)*
- Silicone sealant *(GE RTV123, not included)*
- “Pour in place” pad template *(optional)*
- Precast pad *(optional)*
- Concrete pad mounting hardware *(optional)*

2.3 Site Selection

Prior to installation, you must decide on the location, mounting platform, and connection/grounding options available for the MiniBay enclosure. The information in this section will help familiarize you with these options and methods.

Considerations

- Where possible, select a site that is above the 100 year flood plain, and away from houses.
- Place in a shaded location to minimize the effects of solar loading.
- Locate in an area where airflow can be maximized.
- Avoid locating the enclosure where it is an obstruction and would inhibit visibility.
- Locate the enclosure away from sprinkler systems or other sources of forced water.
- Locate the enclosure out of the prevailing wind to minimize the buildup of snow or the accumulation wind-borne dust.
- Evaluate the soil conditions for suitability for the installation of the required grounding system applicable to your particular installation.
- Is utility power cabling run and terminated at the site? Verify that installation will not damage or disturb existing underground cable/utility service. A cable locator service can identify existing buried services.

Mounting Options

Several mounting options are available for the MiniBay enclosure: on a precast pad, pour-in-place template, or on an existing concrete pad.

Additionally, a critical consideration prior to installing the enclosure will be the swing arc of the enclosure doors. Ensure adequate room for service personnel to open the door at least 90 degrees. Use the following illustration to inform placement of the enclosure. The MiniBay features a removable, rotatable side panel that allows exit and entry of cables and conduits. This panel includes dimples for locating up to three knockouts and a roxtec CF frame with 16 glands. This panel is square allowing it to be rotated in 90° increments. It can also be moved to the opposite side of the enclosure.

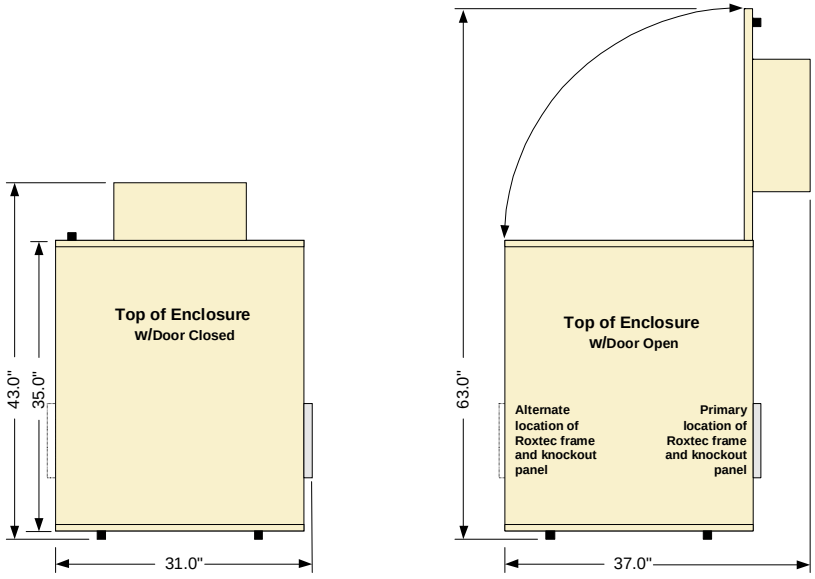


Fig. 2-1, Swing Arc of Enclosure door

2.4 Polymer Precast Pad *(optional)*

If you install the Polymer Precast Pad, you will need to prepare a layered bed of sand and gravel before placing the pad on top. For specific information, consult the instructions that accompany the Precast Pad.

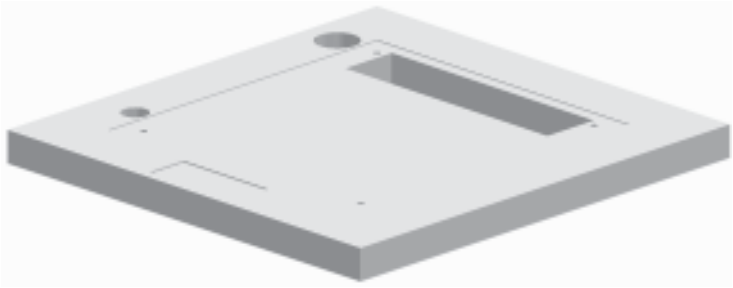


Fig. 2-2, Polymer Precast Pad for Single-wide Enclosure
3” H X 42” W X 44” D
P/N 641-110-10

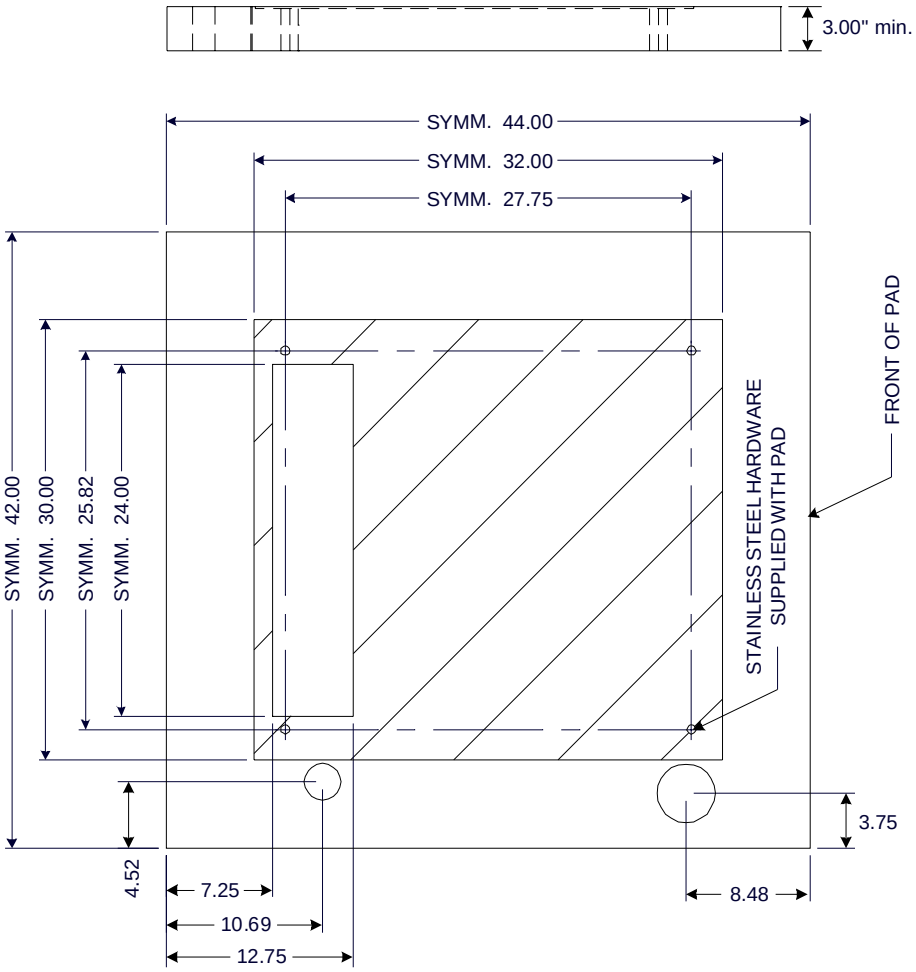


Fig.2-3, Pad Dimensions for Single-wide Enclosure
3” H X 42” W X 44” D
P/N 641-110-10

2.5 Pour-in-Place Pad Frame

Pad Frame Template

The illustration below shows the overall size of the pad frame template for a single MiniBay enclosure. The actual outer dimensions of the pad will be determined by the customer's requirements.

NOTE

When placing the pad, allow at least 40” of clearance for the front enclosure door to fully open. The four 1/2” bolts provided with the frame should remain installed to prevent debris from fouling the threads. See p. 23 for the location of the riser fastenings within the enclosure.

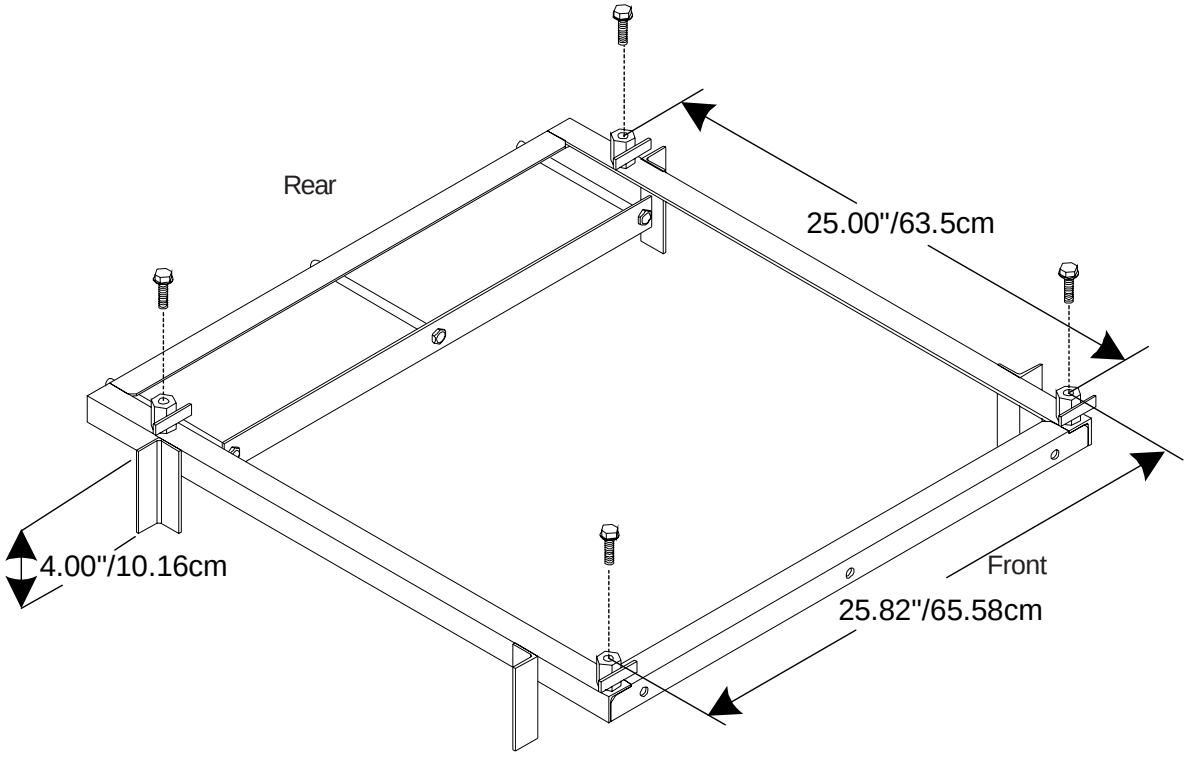


Fig. 2-4, Pad Frame Template-Single MiniBay (Isometric View)
P/N 604-039-N1-001

2.6 Enclosure Grounding

Alpha provides the following grounding method as a suggestion for sites not equipped with accessible grounding facilities.

Grounding Specifications

- Configure enclosure footprint to accommodate swing arc of enclosure door. See Fig. 2-1.
- 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 a minimum of 30 inches below grade. Use only corrosion-proof connections (25+ year life-span) and hardware suitable for direct burial.
- #2 bare copper wire from loop to the enclosure.

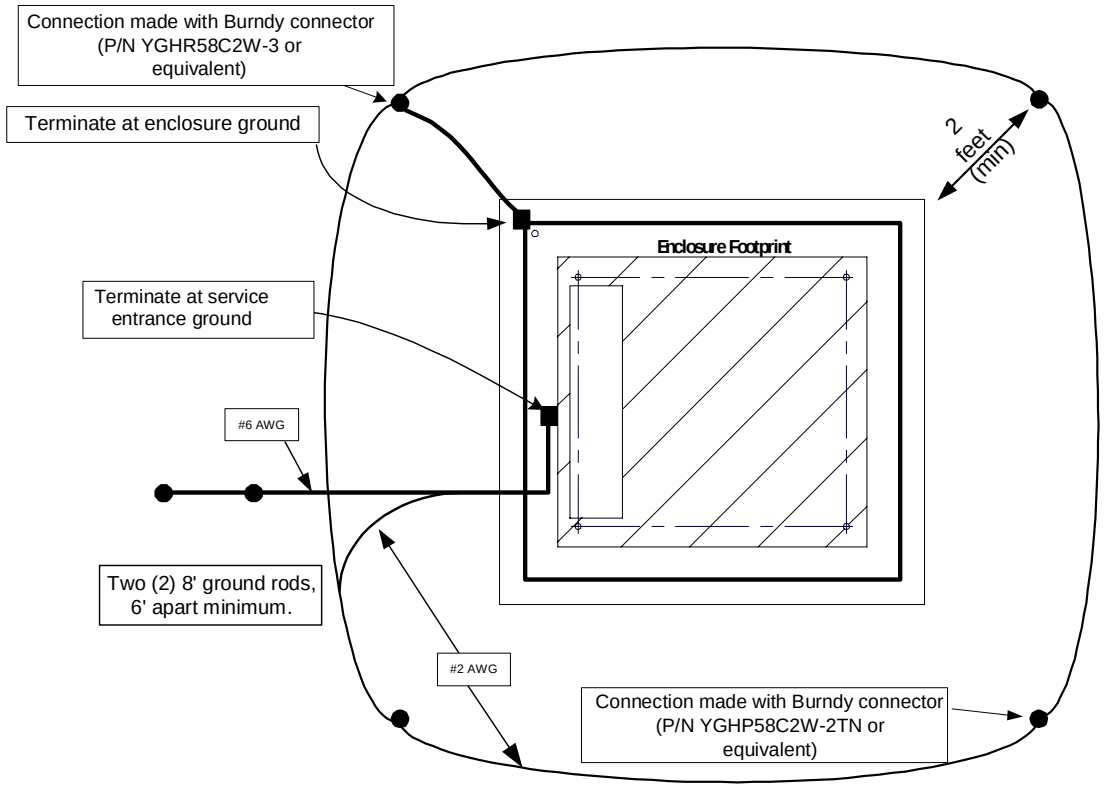


Fig. 2-5, Suggested Grounding Method

NOTE

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

ATTENTION!

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

3.0 Installation

3.1 Lifting

If arranging block and tackle to lift the enclosure, use the following standard rule:
Make the length of the cable between the eyebolts and the lifting hook at least twice the distance between the lifting plates (2 X 32” = 64”). This will ensure that the lifting angle of the chain is greater than 60 degrees.

After the enclosure is in place, the lifting plates may be removed or left in place. The lifting plate fasteners are sealed to prevent water intrusion or seepage.

NOTE

Prior to placing the enclosure, make certain there is adequate swing room for the door. Allow at least 40” for the door’s swing arc (with a few extra inches). See Fig. 2.1 on p. 17 for a detailed schematic of the door’s swing arc. In addition, the enclosure must be on a smooth surface. It is the installer’s responsibility to ensure that the mounting surface for the enclosure is smooth and free of bumps.

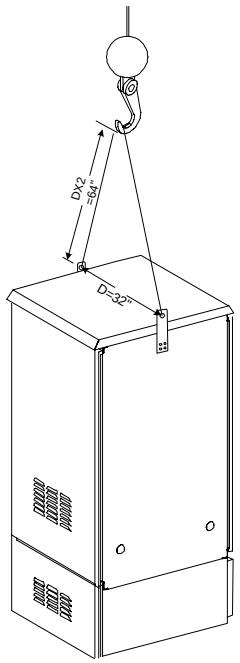


Fig.3-1, Enclosure lifting arrangement *(without side chamber)*

CAUTION!

DO NOT lift the enclosure with the batteries in place.

CAUTION!

- Do not transport, lift, or place the unit on any surface unable to fully support its weight.
- Do not allow personnel to walk beneath the suspended unit during the lifting operation. Use steel-toe work shoe protection. Use “hard hats” at all times during this procedure. Verify transportation path is free of obstructions prior to lifting.

3.2 Enclosure Installation

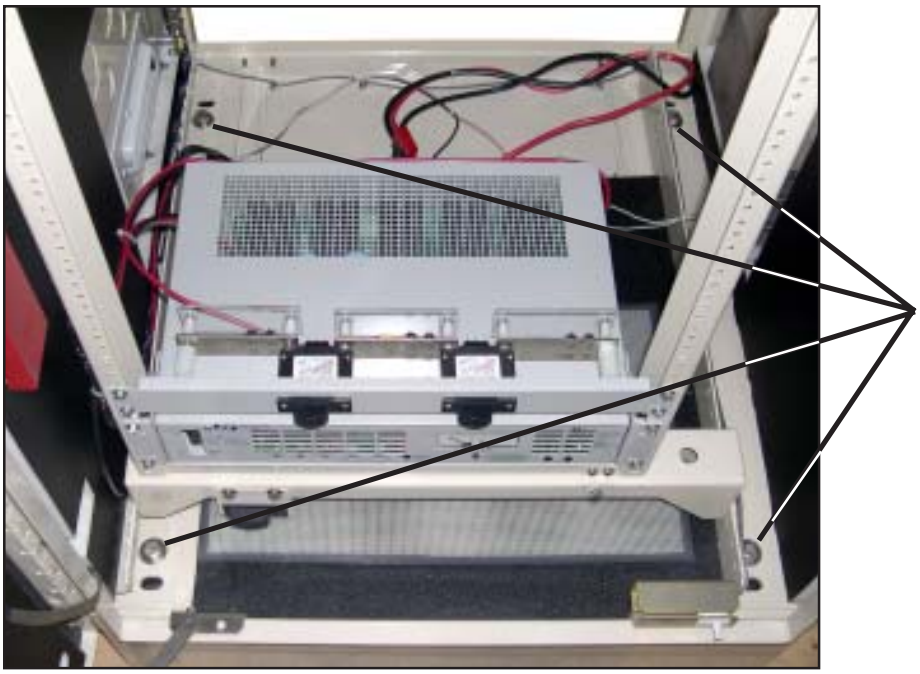
The RMB-E-911 is provided with either a 7” riser or 14” riser/battery module. These two configurations require somewhat different mounting considerations and procedures. The 7” riser is shipped loose (not bolted to the enclosure) for use as a template to mark the pad for hardware and position. Mounting holes are provided in the base of the battery compartment or riser to accommodate the pad’s anchor bolts.

The enclosure is shipped from Alpha Technologies bolted to a wooden pallet. It will be necessary to perform the following prior to and after lifting the enclosure from the pallet and positioning it on the pad.

Installation Procedure, ‘C’ Configuration

Remove all packing material from the enclosure and inspect for damage. Continue with the following steps:

1. Unwrap the pallet and remove the 7” riser. Identify and remove the Riser Hardware Kit taped to the inside of the riser. It contains the bolts that will secure the enclosure to the riser.
2. Position the riser on the pad and use as template to mark drilling locations. Ensure the pad is smooth, level and free of bumps.
3. Remove the 7” riser from the pad and drill and install pad mounting anchor bolts in accordance with manufacturer’s instructions.
4. Place the riser over the pad mounting bolts and tighten the bolts to their required torque specification.
5. Verify all cabling that passes through the riser is bundled and placed within the cutout area of the enclosure (site dependant).
6. Reposition the lifting eyes to accept cabling.
7. Lift and place the enclosure on the secured 7” riser. Fasten the enclosure to the riser with the 1/2”-13 X 1 1/4” bolts in the Riser Hardware Kit. Torque to 23 ft-lbs (52.5 N-M)

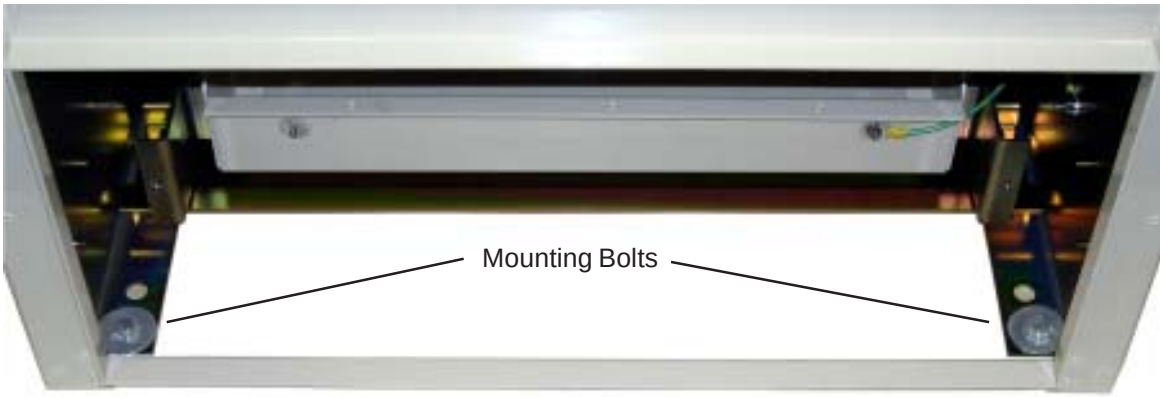


3.2 Enclosure Installation, *cont.*

Installation Procedure, 'B' Configuration

Remove all packing material from the enclosure and inspect for damage. Continue with the following steps:

1. Unwrap the pallet and remove the battery drawer covers. Reposition the lifting eyes to accept cabling.
2. Position the enclosure on the pad and use as template to mark drilling locations. Ensure the pad is smooth, level and free of bumps.
3. Remove the enclosure from the pad and drill and install pad mounting anchor bolts in accordance with manufacturer's instructions.
4. Place the enclosure over the pad mounting bolts and tighten the bolts to their required torque specification.
5. Verify all cabling that passes through the riser is bundled and placed within the cutout area of the enclosure (site dependant).
6. Replace the battery drawer covers.



3.3 Air Conditioner Overview

3.3.1 Basic Theory of Refrigeration:

1. Low pressure gas is drawn into the compressor pump, and compressed into a high pressure gas. The compression of the gas creates heat.
2. The heated high pressure gas is sent through a coil called a condenser. Air is blown over the coil, cooling the gas into a liquid.
3. The high pressure liquid passes through an expansion valve, where the liquid is allowed to expand and boil off into a gas. As the gas expands, it cools.
4. The cool low pressure gas is sent through another set of coils called an evaporator. Warm interior air is blown over the coil and back into the interior, several degrees cooler.
5. The low pressure gas is then drawn into the compressor, where the cycle starts over.

The Alpha Air Conditioner is available in 24VDC or 48VDC, with a brushless DC compressor and a variable speed controller. Capacity is controlled by a temperature control board that varies the speed of the compressor depending on the enclosure internal setpoint temperature. The compressor will run between 50% and 100% full speed depending on the load and the enclosure set point temperature.

When the temperature drops more than 4°C below the set point the compressor and condenser fans will shut off. The evaporator fans run continuously regardless of the set point to maintain an even temperature inside the enclosure.

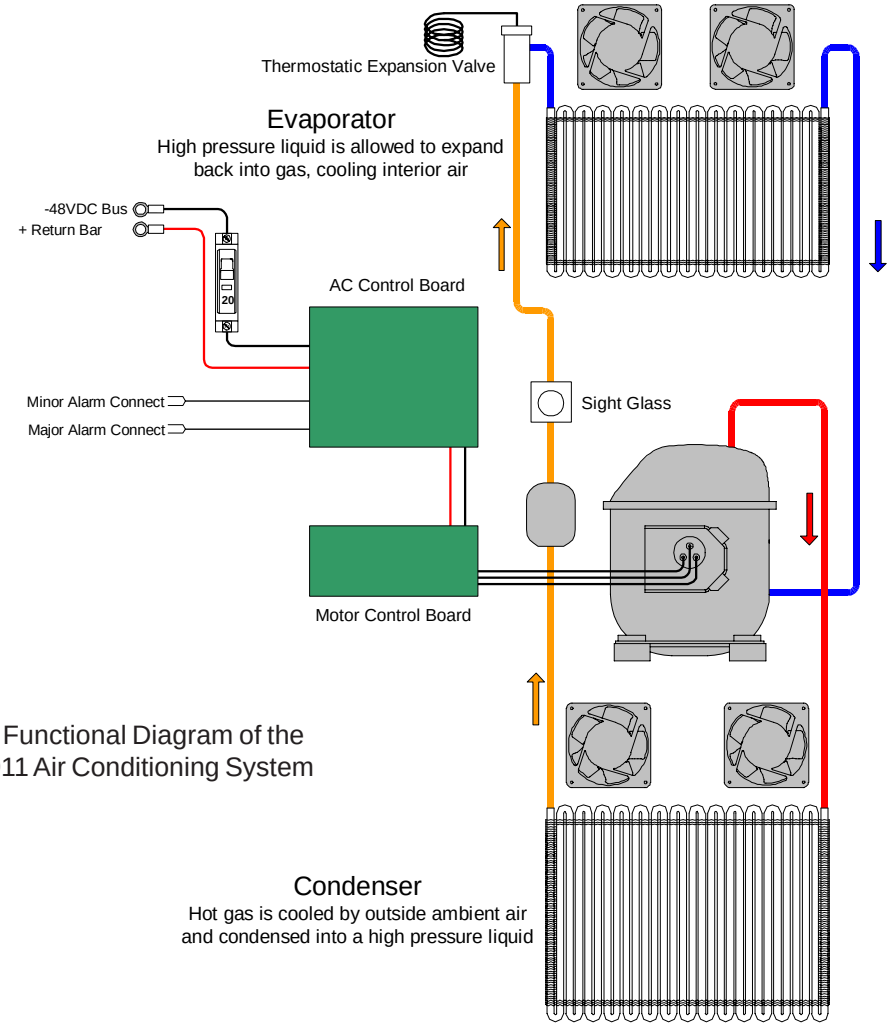


Fig. 3-2, Functional Diagram of the RMB-E-911 Air Conditioning System

3.3.2 Air Conditioner Control Board

The air conditioner control board (see below) has multiple functions for compressor, condenser fan and alarm control. It has remote temperature sensors that monitor compressor discharge and evaporator suction line temperature. It has a board-mounted temperature sensor to monitor the enclosure temperature, or optional remote temperature sensor to monitor a specific area in the enclosure. The board incorporates and L.V. shutdown, fixed at 42V for the 48VDC Air Conditioner, and 21V for the 24VDC Air Conditioner.

The temperature sensor on the discharge line of the compressor helps control the condenser fans. At low outdoor ambient temperatures the condenser fans will cycle on/off to maintain pressure across the expansion valve.

The temperature sensor on the suction line leaving the evaporator monitors low evaporator temperature. This can result from blocked evaporator air flow or bad evaporator fans. This condition will send out a minor alarm and shut down the compressor until the suction lines heat back up.

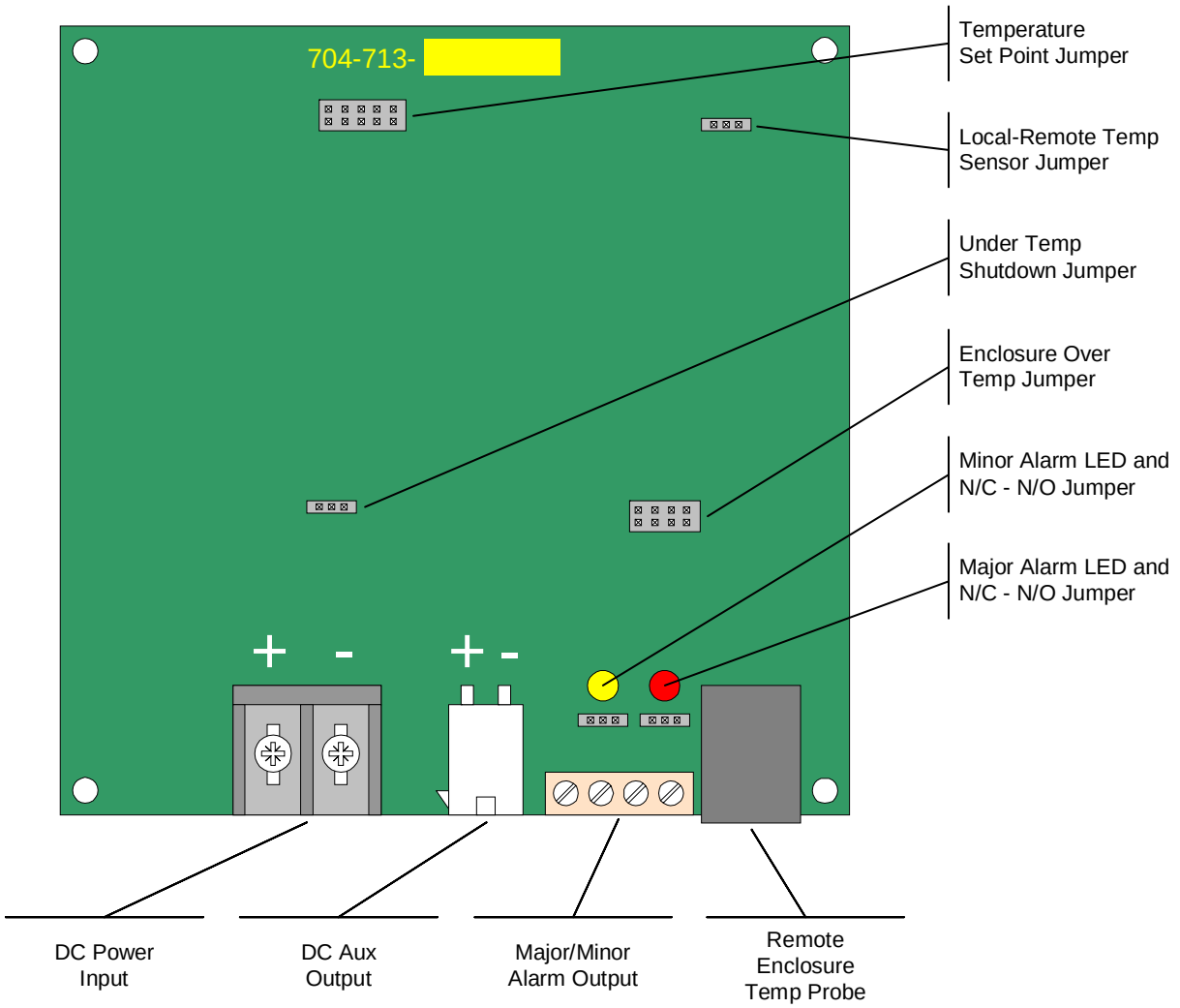


Fig. 3-3, Air Conditioner Control Board

3.3.3 Air Conditioner Temperature Control Card Wiring Diagram

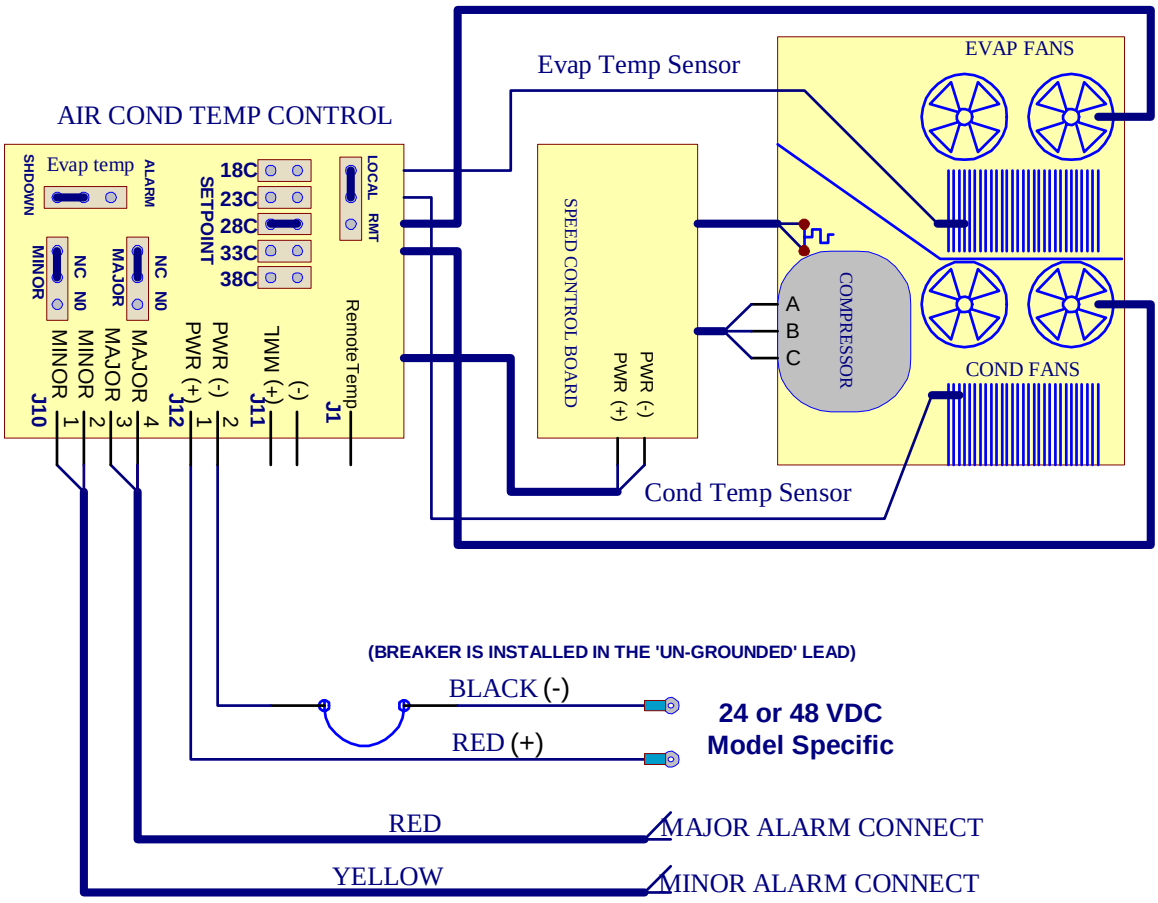
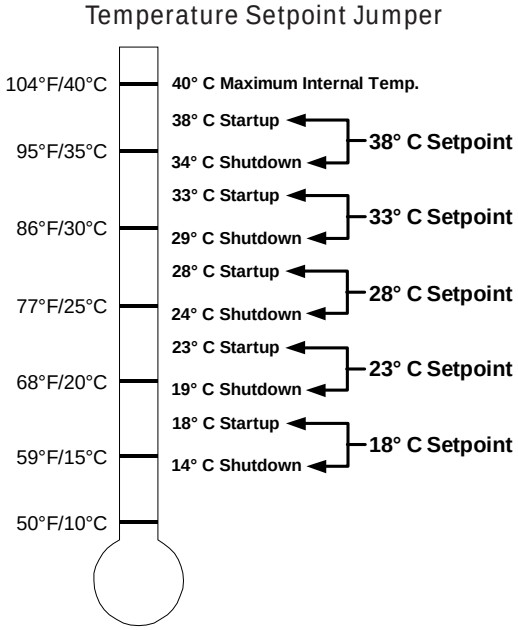


Fig. 3-4, Air Conditioner Wiring Diagram

3.3.4 Air Conditioner Control Card Jumper Settings



System Setpoint Jumper

This jumper determines what temperature the system will maintain inside the enclosure. The diagram details the start and shutdown temperatures for each setting. For default jumper settings, see Fig. 3-4, Air Conditioning Wiring Diagram.

Remote Temperature Sensor Jumper

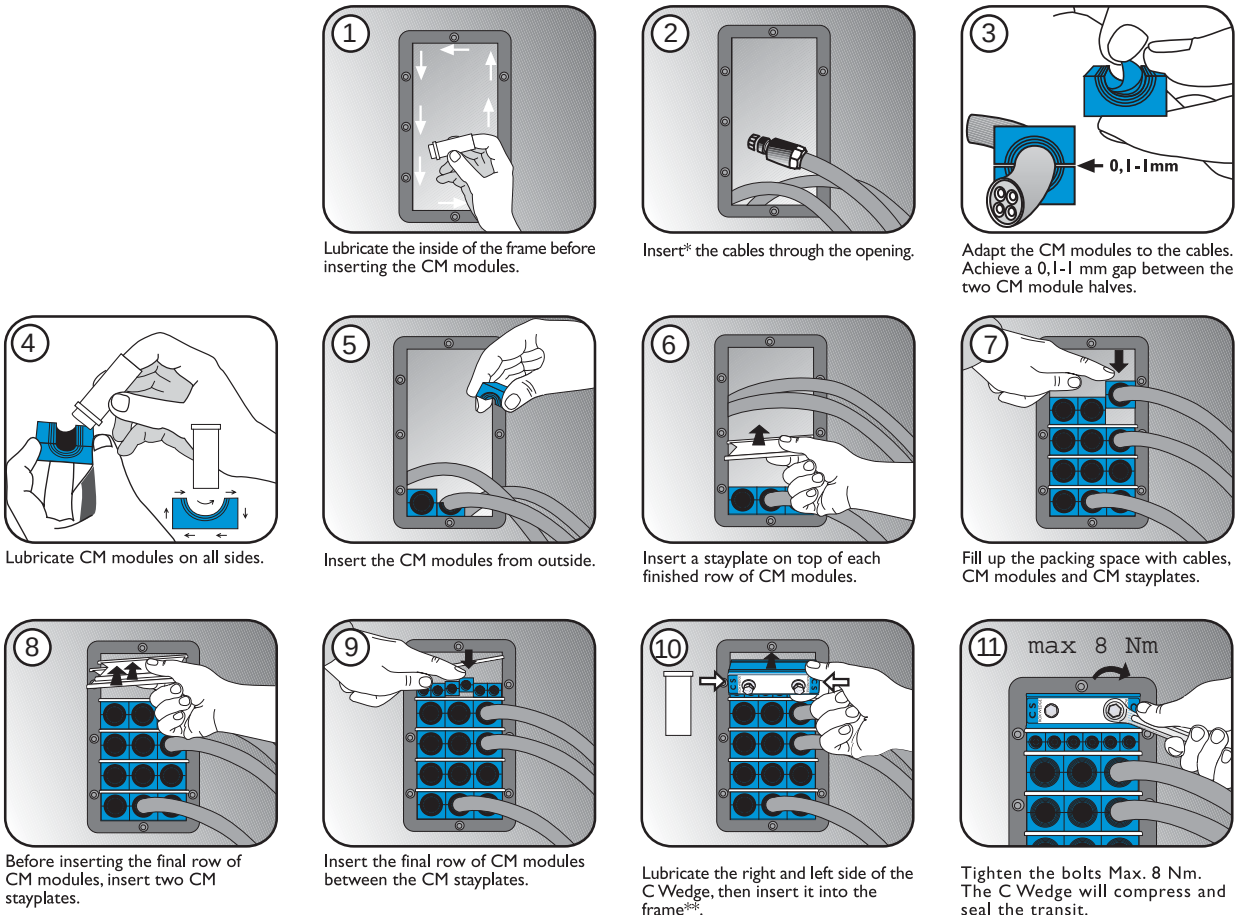
This jumper determines where the control card gets its temperature information. In the LOCAL position the card receives temperature information from it's onboard temperature sensor. In the RMT position, temperature information is received from an optional Remote Temperature Sensor that can be placed anywhere in the enclosure. For default jumper settings, see Fig. 3-4, Air Conditioning Wiring Diagram.

Major and Minor Alarm Jumpers

This jumper determines the state of the alarm relays in the non-alarm state. In the NO position, the non-alarm state is OPEN. In the NC position, the non-alarm state is CLOSED. For default jumper settings, see Fig. 3-4, Air Conditioning Wiring Diagram.

3.4 Roxtec Panel Assembly Instructions

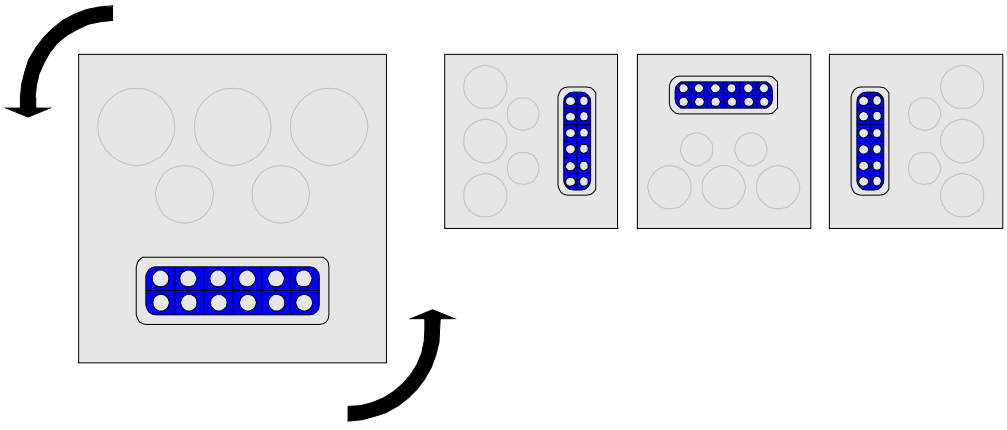
The illustrations below are a generic overview of the operation of the Roxtec panel. For detailed instructions, please refer to the manufacturer's instructions included with the panel.



The Roxtec block panel is designed to allow rotation, as shown below. It can also be moved to the opposite side of the enclosure if required by site design.

Torque Specifications

Adhere to the following torque specifications when mounting the Roxtec block to maintain proper pressure on the rubber sealing gasket: 25 Inch-Pounds (2.83 Newton-Meters)



3.5 19” Swing Rack and Equipment Installation

The 19” swing rack can swing 90° to the left to allow access to the cables and rack-mounted equipment. It is grounded to the enclosure.

1 To swing the rack, loosen the captive securing bolts at the top and bottom right corners and swing the rack to the left.

2 When installing equipment in the rack, provide a long enough service loop to prevent damage to cables when swinging the rack open.

Allow at least a 1” ventilation space between installed rack mount units to allow for air flow in the enclosure.

3 Rack-mounted equipment should be grounded to the enclosure ground bar at the rear of the enclosure.

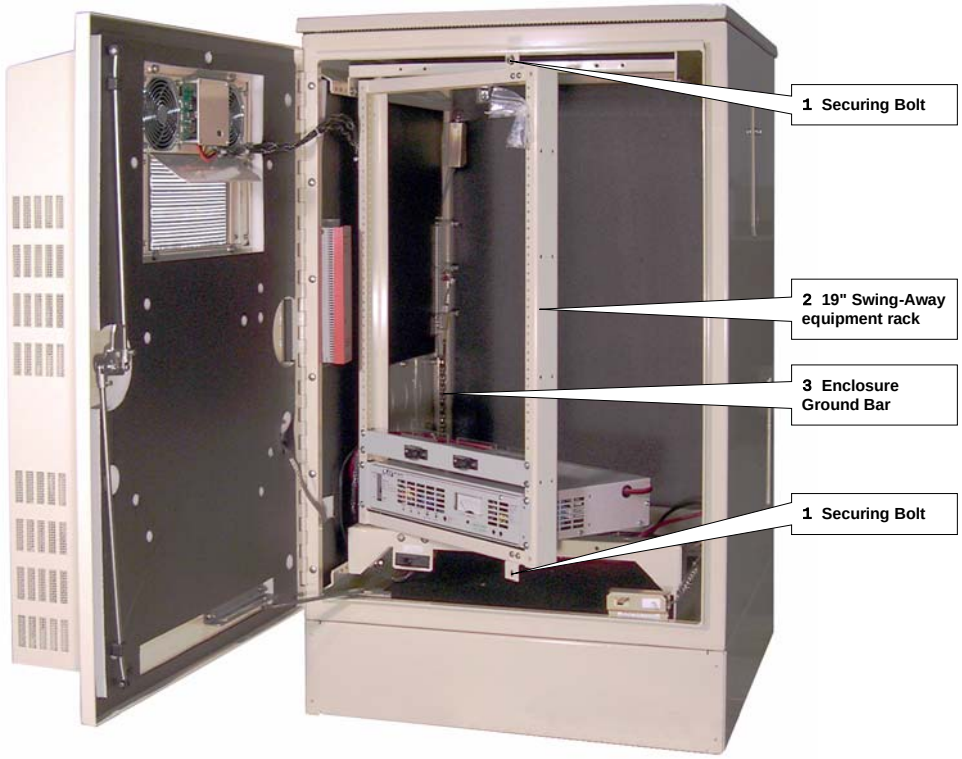
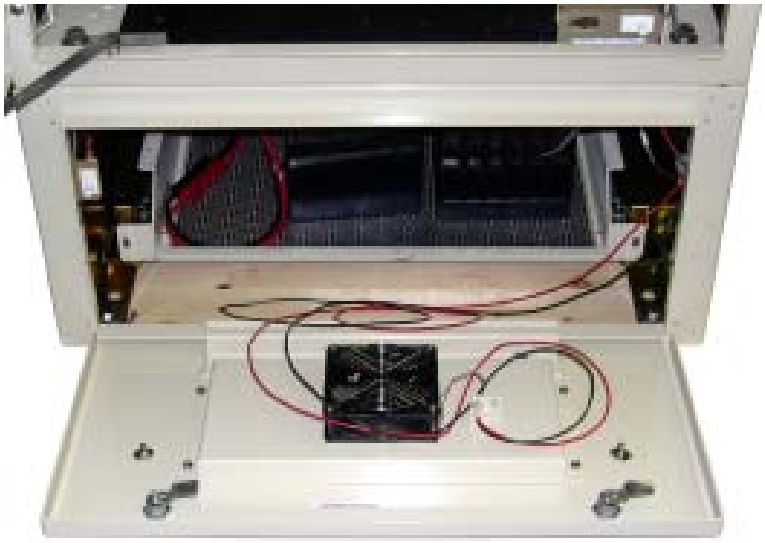


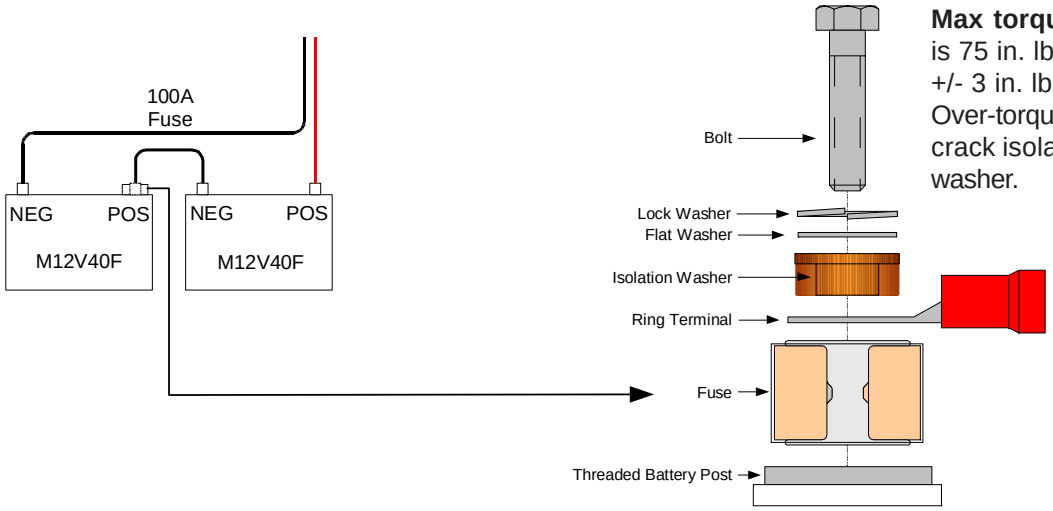
Fig. 3-5, 19” Swing Rack (RMB-E-911-C)

3.6 Battery Installation (RMB-E-911-B)

1 Remove the front battery enclosure cover and set aside.
2 Slide the battery tray towards the front of the enclosure until the tray locks into place.
3 Place two Marathon ‘M’ series batteries onto the battery tray with the connections facing out.
4 Wire in accordance with the diagram below.



Marathon ‘M’ Series Battery

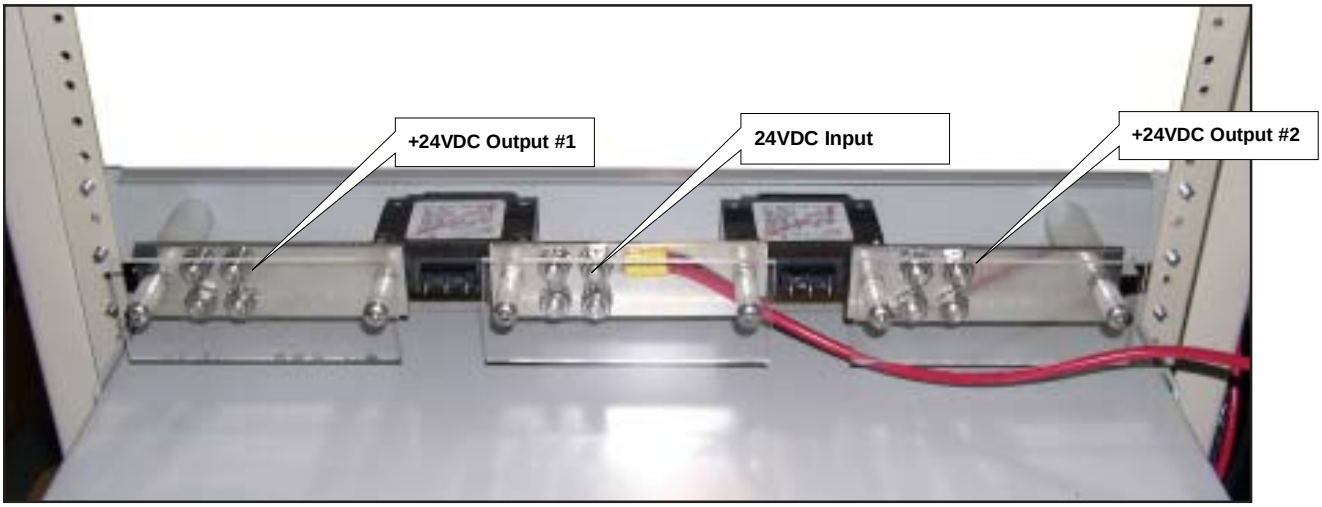


Fuse Installation Detail
Replacement P/N 460-270-10

Fig. 3-6, Battery Installation (RMB-E-911-B)

3.7 24VDC Power Connections (RMB-E-911-C)

24 VDC is distributed through the breaker panel above the DC to DC converter. +24 VDC is available at the bus bars on either end of the breaker panel. A 24VDC ground is located on the enclosure ground bar on the right door jam of the enclosure. Refer to the operator's manual for the Argus DC-to-DC converter, .



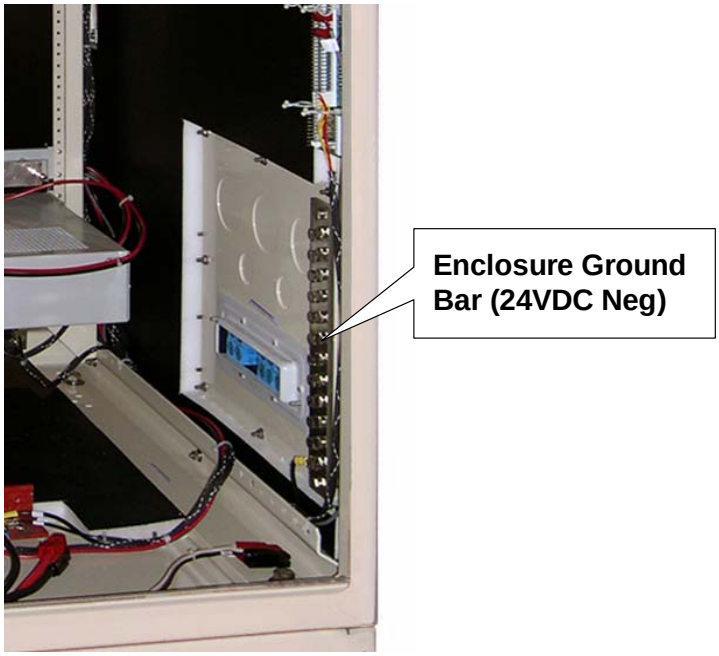


Fig. 3-7, 24VDC Connections (RMB-E-911-C)

3.8 Service Power Connections (RMB-E-911-B)

The service power breaker box is located in the rear of the enclosure on the right hand wall. the breaker box should be wired following all local codes and regulations.

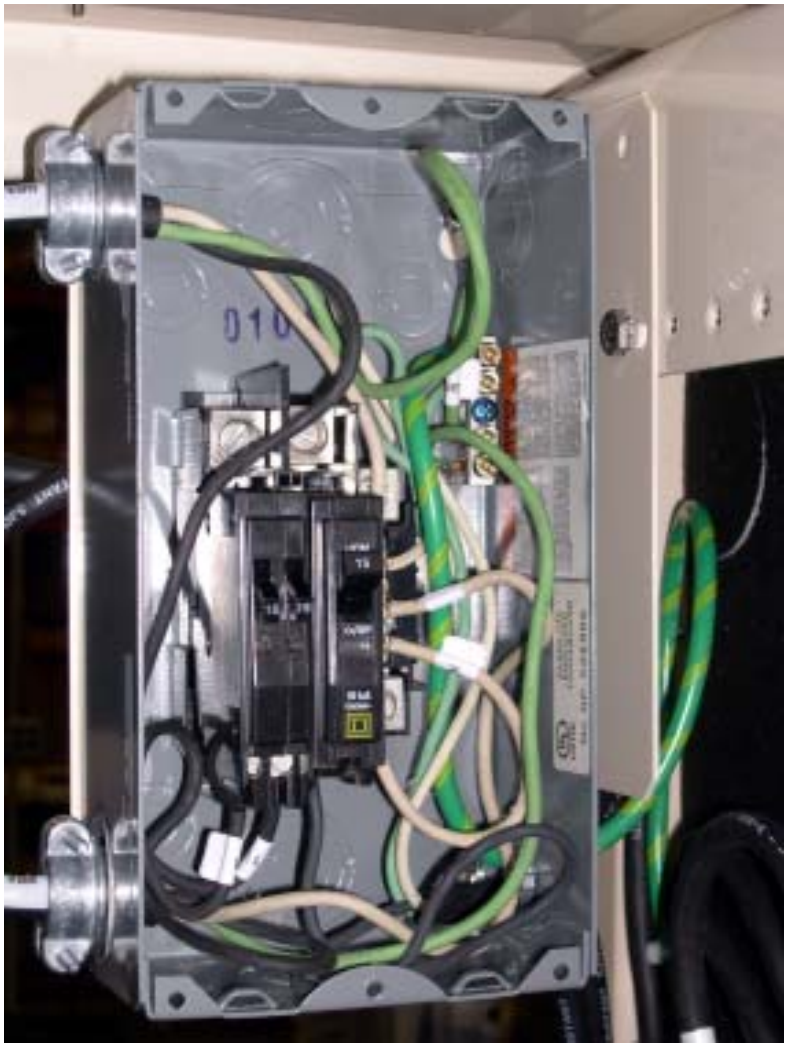


Fig. 3-8, Service Power Breaker box (RMB-E-911-B)

3.9 48VDC Power Connection (RMB-E-911-C and -A48)

48VDC should be brought into the enclosure through the Roxtec panel or enclosure base.

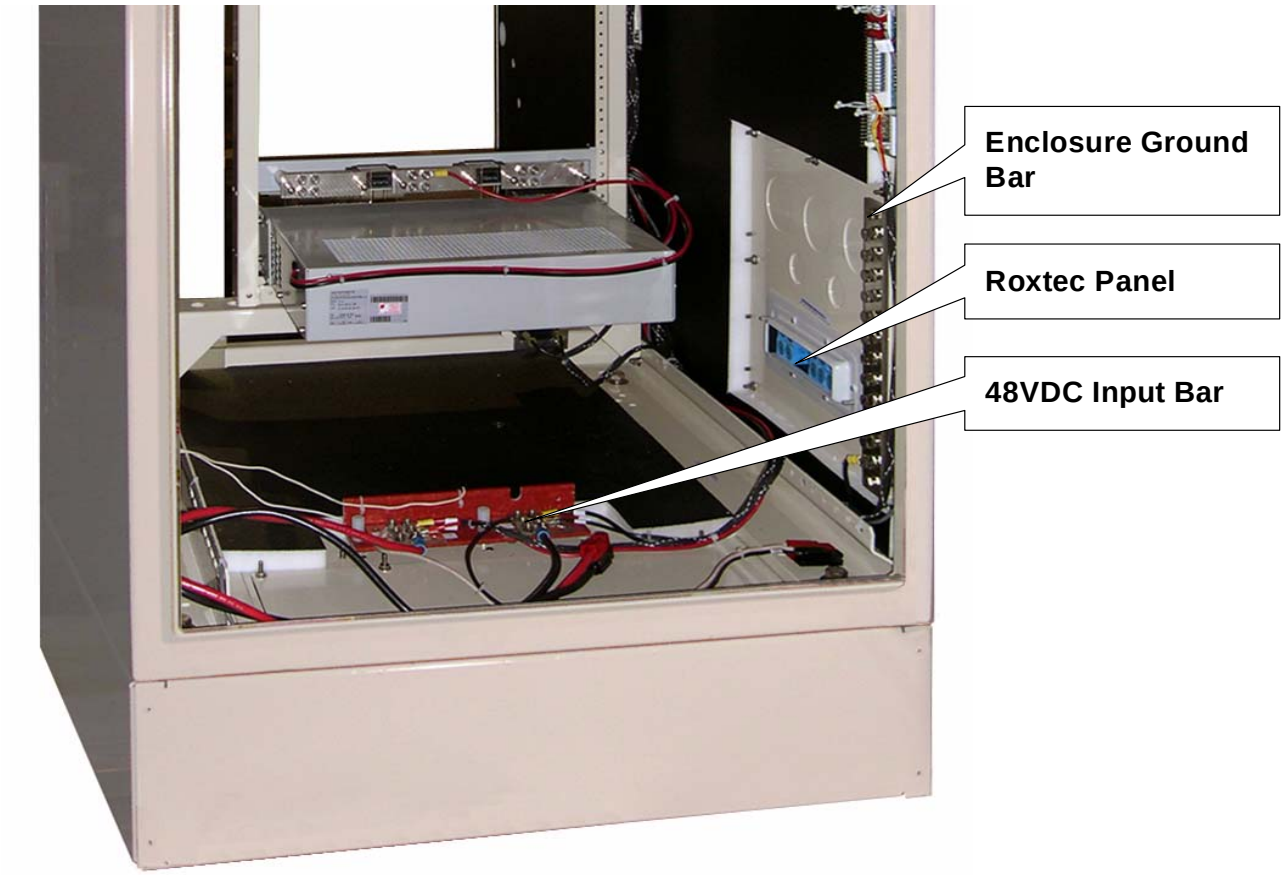


Fig. 3-9, 48VDC Connections (RMB-E-911-C and -A-48)

4.0 Appendix

A CSA Marks

NRTL/C

C US

CSA International (CSA) was established in 1919 as an independent testing laboratory in Canada. In 1994, OSHA granted CSA Nationally Recognized Testing Laboratory (NRTL) status in the United States of America. This was extended in 1999. The specific notifications were posted on OSHA's official Web site as follows:

www.osha-slc.gov/fedreg_osha_data/fed19940809.html

www.osha-slc.gov/fedreg_osha_data/fed19991104.html

When these marks appear with the indicator "C and US" or "NRTL/C" it means that the product is certified for both the U.S. and Canadian markets to the applicable U.S. and Canadian standards.(1)

Argus Rectifier and Power System products bearing the CSA NRTL/C Mark are certified to CSA C22.2 No. 950 and UL 1950.

C UL US

As part of the reciprocal U.S./Canada agreement regarding testing laboratories, Standards Council granted Underwriters Laboratories (UL) authority to certify products manufactured in the U.S. for sale in Canada.

Only Underwriters Laboratories may grant a license for the use of this mark which indicates compliance with both Canadian and U.S. requirements.(2)

What are NRTLs and what do they do?

NRTL's are third party organizations recognized by OSHA, U.S. Department of Labor under the NRTL Program.

The testing and certifications are based on product safety standards developed by the U.S.-based standards developing organizations and often issued by ANSI.(3)

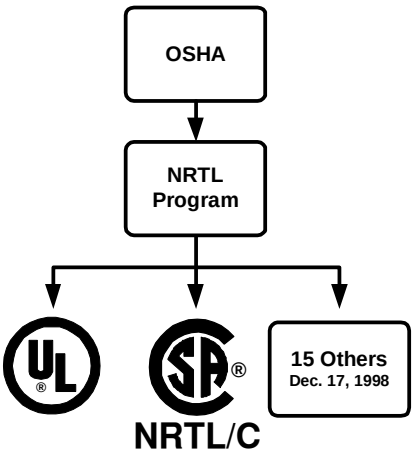
The NRTL determines that a product meets the requirements of an appropriate consensus based product safety standard either by successfully testing the product itself, or by verifying that a contract laboratory has done so, and the NRTL certifies that the product meets the requirements of the product safety standard.(4)

When was the NRTL started, and who governs it?

In 1983, in a suit brought on by an independent testing laboratory, OSHA was court ordered to remove specific references to UL (Underwriters Laboratories) and FRMC (Factory Mutual Research Corporation).

In 1988, OSHA revised its regulations to remove those references and the NRTL program was established.

The NRTL program is both national and international in scope with foreign labs permitted. As of Dec. 17, 1998, 17 recognized labs were permitted, with pending applications from 21 other labs.(5)



References:

Information presented has been developed from the official web sites of the respective organizations. Specific references are as follows:

(1) www.csa-international.org/english/product_services/index_cert.htm
(2) www.ul.com/mark/ulmark.htm
(3) www.osha-slc.gov/dts/otpca/nrtl/slide02.html
(4) www.osha-slc.gov/dts/optca/nrtl/slide04.html
(5) www.osha-slc.gov/dts/optca/nrtl/slide18.html

Alpha Technologies

Power

Alpha Technologies
3767 Alpha Way
Bellingham, WA 98226
USA
Tel: (360) 647-2360
Fax: (360) 671-4936
Web: 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 6, 8 Anella Ave.
Castle Hill, NSW 2154
AUSTRALIA
Tel: +61-2-9894-7866
Fax: +61-2-9894-0234