

Radium MiniBay

Utility 1 and Utility 2



RMB Utility 1



RMB Utility 2

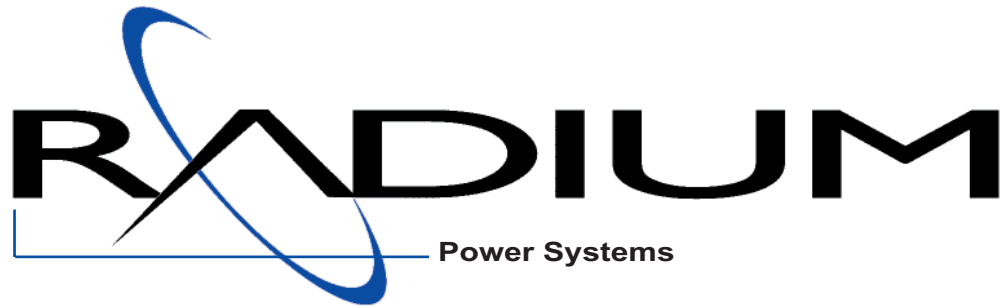
Radium MiniBay Utility 1 and Utility 2 Enclosure Installation Manual

Effective: September, 2005

Power

Alpha Technologies





MiniBay Utility 1 and Utility 2 Enclosure Installation Manual

044-010-C0-006 Rev. F

Effective Date: September, 2005

Copyright© 2005

Alpha Technologies, Inc.

member of The  Group™



NOTE:

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



NOTE:

Review the drawings and illustrations contained in this manual before proceeding. If there are questions regarding the safe operation of this powering system, please contact Alpha Technologies or your nearest Alpha representative.



NOTE:

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

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)



Table of Contents

Document Revision History	7
Important Safety Instructions.....	8
1.0 Overview and Specifications	13
1.1 Radium MiniBay Utility 1 and Utility 2 Enclosures	13
1.2 Components of RMB-Utility 1	14
1.3 Components of RMB-Utility 2	15
1.4 Specifications for RMB-Utility 1 and RMB-Utility 2	16
1.5 Internal and External Components	17
1.5.1 Distribution Center and Pathfinder Rectifier.....	19
1.5.2 Powerwave® Shelf.....	20
1.5.3 Powerwave® Modules	20
1.5.4 Wireless Location Sensor	20
1.5.5 Data Multiplexer	20
1.5.6 IceQube Air Conditioner Overview	21
1.5.7 Verifying Alpha Default Settings for the IceQube Air Conditioner	21
1.6 System Wiring Schematic.....	25
2.0 Site Preparation	26
2.1 General Information	26
2.2 Required Tools and Materials	26
2.3 Site Selection	27
2.4 Pre-existing Concrete Pad.....	28
2.5 Polymer Precast Pad (optional).....	29
2.6 Pour-in-Place Pad Frame	30
2.7 Enclosure Grounding.....	31



Table of Contents, continued

3.0	Installation	32
3.1	Lifting	32
3.2	Utility 1 Enclosure Installation	33
3.3	Roxtec Panel Assembly Instructions.....	34
3.4	Battery Installation	35
3.5	Service Power Connections.....	36
3.6	Air Conditioner Condensate Hose Mounting	37
3.7	Solar Shield Removal	38
3.8	Mounting Utility 2 Enclosure	40
3.9	MCPA Chassis Installation	42
3.10	Integration Cable Installation	43
4.0	Maintenance	44
4.1	Cabinet Air Filtration	44
4.1.1	Air Filter Maintenance - (Utility 1).....	44
4.1.2	Air Filter Maintenance - (Utility 2).....	44
	Appendix A	45



Tables and Figures

Fig. 1-1, RMB Utility System (shown without Roxtec panels)	13
Fig. 1-2, Battery Cable Kit/Documentation Kit.....	16
Fig. 1-3, Front of Utility 1.....	17
Fig. 1-4, Utility 1 Internal Components (front view).....	17
Fig. 1-5, Utility 2 Components.....	18
Fig. 1-6, Utility 1 Connections (rear view).....	19
Fig. 1-7, IceQube Air Conditioner Front Panel Display.....	22
Fig. 1-8, Interior of Front Door Sensors/Connections, Utility 1	22
Fig. 1-9, System Wiring Schematic.....	24
Fig. 2-1, Swing Arc of Enclosure Door.....	27
Fig. 2-2, Pre-existing Concrete Pad Layout (top view).....	28
Fig. 2-3, Polymer Precast Pad for Single-wide Enclosure.....	29
Fig. 2-4, Pad Dimensions for Single-wide Enclosure	29
Fig. 2-5, Pad Frame Template-Single Enclosure (isometric view).....	30
Fig. 2-6, Suggested Grounding Method	31
Fig. 3-1, Block and Tackle Lifting Arrangement.....	32
Fig. 3-2, Lifting Utility 2 on to Utility 1	32
Fig. 3-3, Shipping Pallet Arrangement.....	33
Fig. 3-4, Battery Installation.....	35
Fig. 3-5, Enclosure Breaker Box Wiring Schematic	36
Fig. 3-6, Enclosure Breaker Box	36
Fig. 3-7, Condensate Hose Mounting.....	37
Fig. 3-8, Location of Keps Nuts(rack structure removed for clarity)	38
Fig. 3-9, Solar Shield Removal and Tape Location	39
Fig. 3-10, Mounting Hardware for Utility 2.....	41
Fig. 3-11, Powerwave Support Shelf Installation Location	41
Fig. 3-12, DC Breaker Panel	42
Fig. 3-13, DC Integration Cable.....	43
Fig. 3-14, Tamper Switch Shorting Plug	43
Fig. 4-1, Air Filter Location and Maintenance	44
Table 1-1, Form 66 Alarm Pin Assignments	25

Document Revision History

<i>Document Name</i>	<i>Control/Rev Number</i>	<i>Release Date</i>
Radium MiniBay Utility 1 & 2 Enclosure Installation Manual	044-010-C0-001, Rev. A	
“	044-010-C0-002, Rev. B	May 26, 2004
“	044-010-C0-003, Rev. C Added procedure to access filter on Page 40.	August 17, 2004
“	044-010-C0-004, Rev. D Added Revision History, page 6.	October 5, 2004
“	044-010-C0-005, Rev. E Added Condenser Drain Hose Installation Kit, page 13. Added condensate hose mounting instructions page 35. Updated Alpha default settings for Ice Qube Air Conditioner (FIL default changed from 30 to 0 days) on page 21. Updated system schematic, page 22. Updated air filter maintenance schedule, page 42.	November 20, 2004
“	044-010-C0-006 Rev. F Air Filter and screen cleaning issues addressed, page 42. Specifications corrected, page 13, 14. Air Conditioner default settings, Audible Alarm setting, Hi Temp Set point, page 21 Enclosure Over-temp Thermostat and Auxiliary Fan Thermostat setpoints clarified, page 21	September, 2005

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, 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 indicates regulatory/code requirements that may affect the placement of equipment or installation procedures.



NOTE:

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



CAUTION!

A CAUTION presents safety information to PREVENT DAMAGED EQUIPMENT.



WARNING!

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

ATTENTION:

Alpha Technologies' products are subject to change through continual improvement processes. Therefore, specifications or design layouts may vary slightly from the descriptions included in this manual. Updates to the manual are 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 that have 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. Battery cables that are either improperly or unconnected 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 that 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 will 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



WARNING!

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

Chemical Hazards

To avoid injury:

- All 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.
- 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 place 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.

Battery Safety Notes, continued

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

Recycling and Disposal Instructions

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

Electrical Safety

- Lethal voltages are present within the power supply and electrical boxes. Never assume that an electrical connection or conductor is not energized. Check the circuit with a volt meter with respect to the grounded portion of the enclosure (both AC and DC) prior to any installation or removal procedure.
- Always use the buddy system when working under hazardous conditions.
- A licensed electrician is required to install permanently wired equipment.
- Input voltages can range up to 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 Radium MiniBay Utility 1 and Utility 2 Enclosures

The RMB-Utility 1 enclosure houses:

- One Pathfinder three-module rectifier shelf and up to three 24V 3kW rectifiers.
- Two 24VDC strings of 155Ah batteries.
- 400A universal distribution center with SM03 supervisory panel.
- AC distribution and 19" rack spaces for additional customer installed equipment, including a WLS panel from Grayson and a DSU/CSU from ADC Kentrox.

The RMB-Utility 2 enclosure will support up to three **Multicarrier Power Amplifiers (MCPA's)** from Powerwave® Technologies. MCPA's expand existing cellular sites by accommodating a greater number of cellular users per antenna and extending range, filling in pockets with little to no coverage.

The Utility 2 enclosure can be stacked on the Utility 1 enclosure by removing the solar shield and replacing the blanking panel with an integration panel. Integration cables are then routed through the integration panel and connected to their various components.

Utility 1

A 5,000BTU AC air conditioner provides cooling for the electronics and batteries in the Utility 1 enclosure. A 24VDC thermostatically controlled, forced-air system provides an extra level of thermal protection in the event of utility or air conditioner failure.

Utility 2

Fans on the MCPA modules pull exterior air through two (2) removable, washable, electrostatic filters located on the front of the Utility 2 door. A large duct directs the MCPA exhaust directly through venting on the rear enclosure door.

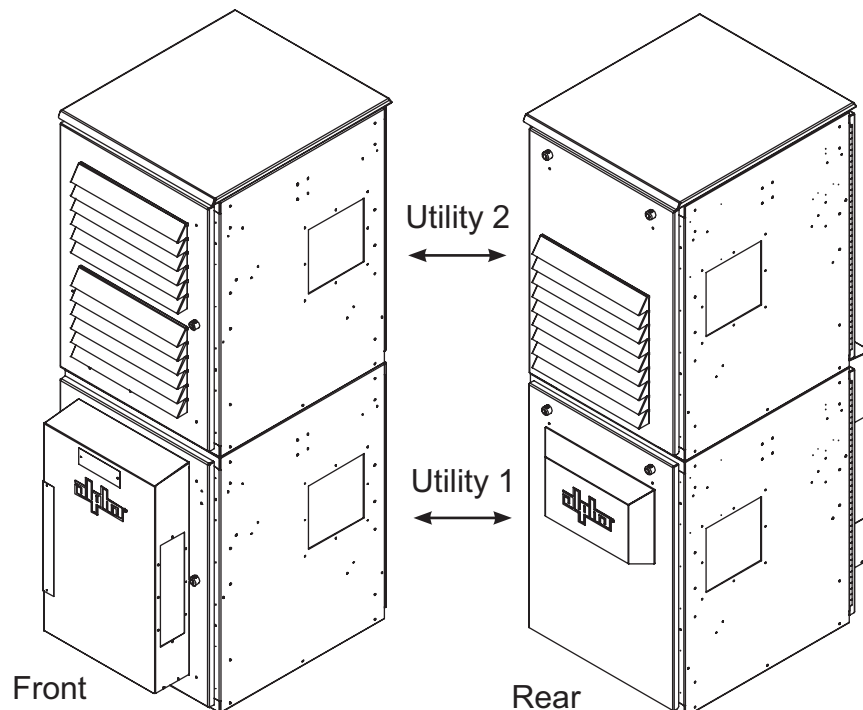


Fig. 1-1, RMB Utility System (shown without Rextec panels)

1.0 Overview and Specifications, continued

1.2 Components of RMB-Utility 1

Major Components	Component No.	Qty
<i>Radium MiniBay E-911 Utility 1 Power Enclosure</i>		
AC Air Conditioner	044-010-20	1
*Argus Pathfinder Rectifier Module, 24V, 3KW	010-539-20-A002	3
*GNB Marathon Battery, M12V155FT	M12V155FT	4
Circuit Breaker, 5A, Bullet Type	470-234-10-A000	2
Circuit Breaker, 10A, Bullet Type, AM SER	470-235-10-A000	1
Battery Cable Kit for TEL12-155, 24V W/FU 250A	745-607-20	1
Battery Restraint Kit, GNB M12V155FT, RAD-MB	745-212-30	1
Enclosure, 30"X32"X44", E-911, RAD-MB	031-171-24	1
DC Power Kit for MCPA with Temperature Sensor	038-696-20	1
Enclosure Installation Manual for Utility 1 and Utility 2	044-010-C0	1
Mounting Rail Kit, 19"W, 2"OFS, 23RU, RAD-MB	745-200-40	1
Cable Seal Blank bottom Kit, RAD-MB	745-201-23	1
Front Air Conditioner, 5,000BTU Left Hinged Door, RAD-MB	745-204-57	1
Rear Lift-off Door, Vented	745-207-20	1
Enclosure Ground Bar, 12-Position 5/8" X two 1/4" hole	745-235-21	1
Enclosure Insulation Kit	745-301-23	1
Door, Pin Allen Hex Key Kit with Two Keys	745-306-20	1
Cable Entry Side Panel, E-911, RAD-MB	745-580-20	1
Cable Entry Side Panel Blank, E-911, RAD-MB	745-580-21	1
Alarm Terminal Block 66 Type 50 Pair with Cover	745-585-20	1
Kit, Enclosure Over-temperature Alarm, Adjustable	745-611-20	1
Thermostat (Open on Rise) For Enclosure Over-Temp	175-035-10	1
Seismic Bracing Kit, E-911, STKBL, RAD-MB	745-612-20	1
Battery Tray E-911, RAD-MB	745-613-20	1
Distribution Panel 100A, RAD-MB	745-614-20	1
Air Conditioner Supply Kit, 240VAC, W/BRKR, RAD-MB	745-616-20	1
Pathfinder Integration Kit, PAD-MB	745-617-20	1
Enclosure Tamper Switch with Interface, RAD-MB	745-619-20	1
Quick Connect MCPA Interface Kit, RAD-MB	875-322-20	3
Customer Equipment Load Cable Kit, RAD-MB	875-330-20	1
Recommended Spare/Replacement Parts	010-539-G0-A001	
Pathfinder 24V-3kW UPF Spare Parts Kit (Fan, Fuses)		1
Pathfinder 24V-3kW UPF Power Module, Ext. Temp. Operation, Grey, Without LCD	010-539-20-002	1
		1
Air Conditioner, 5000 BTU/HR, 230VAC, 60Hz	745-636-20	1
Fan, 24VDC, for Utility 1 Auxiliary Fan System	500-086-10	1
Thermostat (Close on Rise) for Auxiliary Fan	175-036-10	1
Circuit Breaker, 5A, Bullet Type	470-234-10-A000	1
Circuit Breaker, 10A, Bullet Type, AM SER	470-235-10-A000	1
Battery Fuse, 250A	460-270-10	1
Washer, Shoulder, Fuse Isolating	633-257-10-001	1
Electrostatic Filter, 6" X 16" (inside front door)	565-003-10	1
Electrostatic Filter, 12" X 16" (inside rear door)	561-234-10	1
Electrostatic Filter for Air Conditioner (inside AC shroud)	565-020-10	1
AC Air Conditioner Condensate Drain Hose Kit	745-690-20	1
<i>* Batteries and Pathfinder modules may ship separately</i>		

1.0 Overview and Specifications, continued

1.3 Components of RMB-Utility 2

Major Component	Component No.	Qty
<i>Radium MiniBay Utility 2 Enclosure System Supporting Powerwave® MCPA Chassis and Modules</i>		
Enclosure, 30"X32"X44", E-911, RAD-MB	031-171-24	1
Mounting Rail Kit 19", 9.5"CTR, 23RU, T12-24, RAD-MB	745-200-50	1
Front Door, Hinged Left, Ducted with Removable, Washable, Electrostatic Filters for MCPA RAD-MB	745-204-60	1
Rear Door, Removable, Ducted for MCPA RAD-MB	745-207-30	1
Mounting Hardware Kit, RAD-MB	745-215-20	1
Enclosure Isolated Bus Bar Kit, 12 Position DL HL	745-235-20	1
Enclosure Ground Bar, 12-Position 5/8" X two 1/4" hole	745-235-21	1
Cable Entry Side Panel, E-911, RAD-MB	745-580-20	1
Cable Entry Side Panel Blank, E-911, RAD-MB	745-580-21	1
Seismic Bracing Kit, E-911, Horizontal Duct, E-911,RAD-MB	745-612-21	1
Integration Kit for MCPA, RAD-MB	745-624-20	3
Exhaust Ducting, E-911, RAD-MB	745-626-20	1
Wire Kit Utility 2 Ground Integration, RAD-MB	875-323-20	1

Radium MiniBay 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)	745-592-20	
Hilti Kit Sleeve Anchors 4 - KBII Sleeve Anchors, 1/2" X 3 3/4" (00045367 Hilti)	745-592-21	
Pour-in-Place Pad Template	604-039-N1	
Vapor Barrier, die cut to enclosure dimensions	564-990-10	

Recommended Spare/Replacement Parts

Electrostatic Filter, 16" X 16" (2 per front door)	565-014-10	1
CB-AM SER,10 KAIC,80AMP,BLT TYPE,5/16"	470-243-10-A000	
CB-AM SER,10 KAIC,100AMP,BLT TYPE,5/16"	470-245-10-A000	



NOTE:

A regional spares kit is available via your Alpha Sales Representative. It includes many of the above items.

1.0 Overview and Specifications, continued

1.4 Specifications for RMB-Utility 1 and RMB-Utility 2

Weight:	Utility 1	Utility 2
Enclosure	407 lbs.	265 lbs.
Batteries (4 @117lbs. ea.)	468 lbs.	
Pathfinders (3 @ 27lbs. ea)	81 lbs.	

Total Pad Weight	956 lbs.	265 lbs.
Pallet	79 lbs.	79 lbs.
Total Shipping Weight	1035 lbs.	344 lbs.

Dimensions: 44"Hx30"Wx32"D 44"Hx30"Wx32"D = (stacked)88"Hx30"Wx32"D

Environmental:

Thermal

Ambient Operating Temperature: -30°C to +40°C (-22° F to 104°F).

Rating

Utility 1- NEMA 3R rating with air conditioner and emergency bypass fan filter

Utility 2- NEMA 3R rating

Seismic: Designed to Telcordia Zone 2, ground installations.

Mechanical:

Material- Aluminum

Filter Material- Electrostatic (washable)

Latches- Pad lockable 5/16" pin-Allen ¼ turn three point latch

Finish- Powdercoat

Color- Almond

Hardware- Stainless steel with select fasteners plated steel

Service:

DC- See Pathfinder rectifier installation and operating documents

AC- 90A 240VAC single phase required (3-wire plus ground: L1, L2, N, G). See Section 3.5 for service power connections.



Fig.1-2, Battery Cable Kit/Documentation Kit

1.0 Overview and Specifications, continued

1.5 Internal and External Components

Refer to the illustrations below for recommended locations of customer installed components.



Fig.1-3, Front of Utility 1

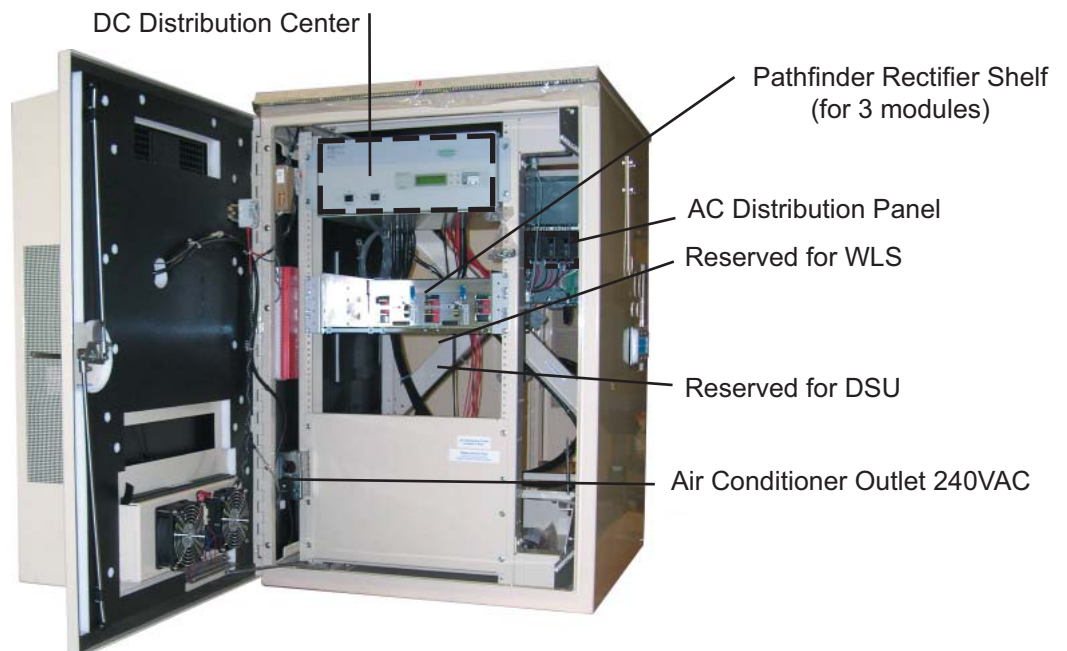


Fig.1-4, Utility 1 Internal Components (Front View).

1.0 Overview and Specifications, continued

1.5 Internal and External Components, continued



Duplexers

1900 MHz PCS
Powerwave®
Modules

Front of Utility 2;
PAF-1943-002
Configuration



Duplexers

800 MHz PCS
Powerwave®
Modules

Front of Utility 2;
PAF-0843-002
Configuration



Duplexers

Powerwave®
Modules

Back of Utility 2;
PAF-1943-002
Configuration
(with ducting removed)



Duplexers

Powerwave®
Modules

Back of Utility 2;
PAF-0843-002
Configuration
(with ducting removed)

Fig. 1-5, Utility 2 Components

1.0 Overview and Specifications, continued

1.5 Internal and External Components, continued

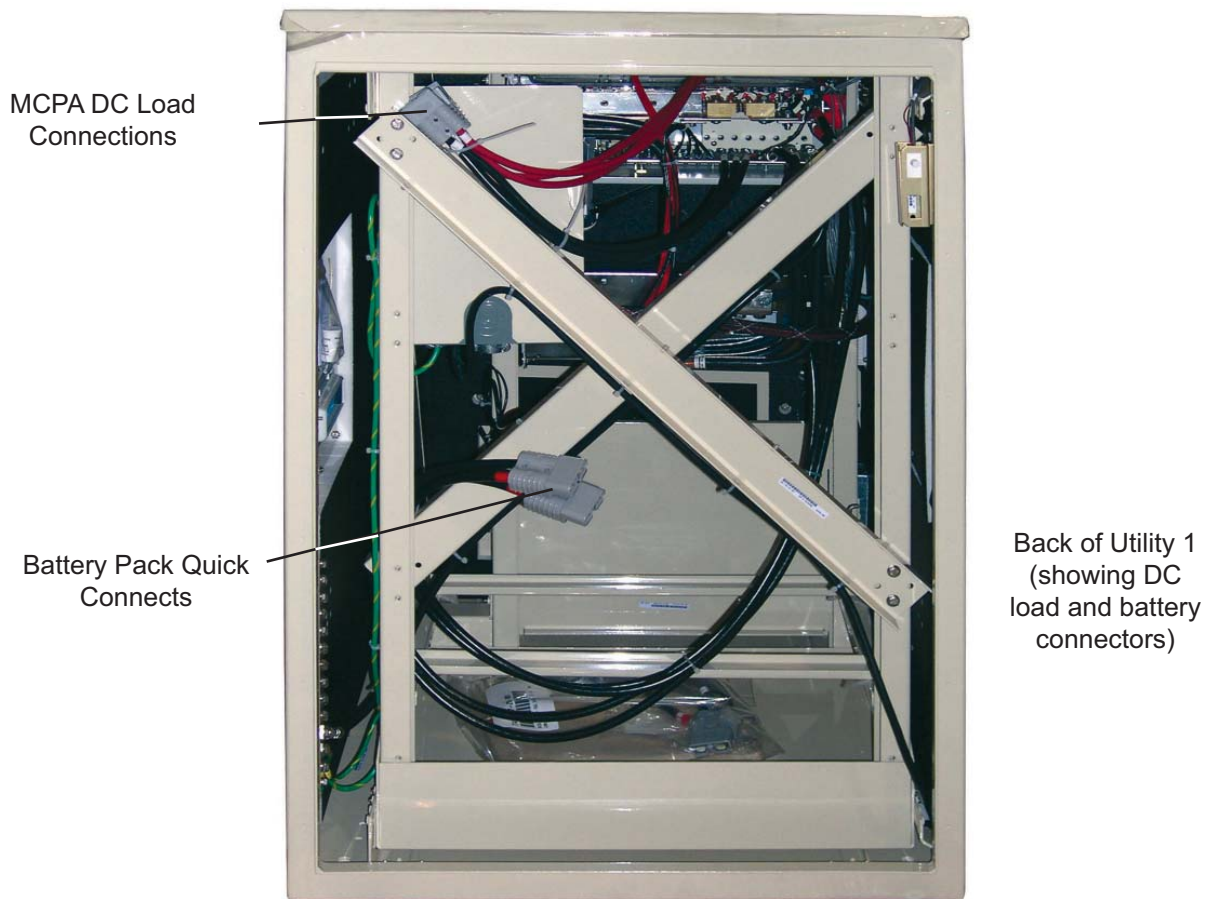


Fig. 1-6, Utility 1 Connections, (rear view)

1.5.1 Distribution Center and Pathfinder Rectifier

The DCP01 is an integrated distribution and supervisory package designed for mid-sized power applications. The compact unit installs in four rack units (RU) of space. The front access design ensures quick, easy installation and setup for 24V breakers.

The DCP01 incorporates the SM03 supervisory panel as part of the standard package which includes the following alarms: high/low volt alarm, fuse/breaker alarm, load in/out, temperature compensation and autoequalize.

The Pathfinder 24V-3kW rectifier system uses a high-frequency switched-mode conversion technique to provide a fully regulated and isolated DC output from the AC mains. A complete rectifier system consists of one or more (3 maximum per shelf) power modules in the Utility 1 enclosure. Rectifier power modules are “hot swappable” meaning they can be inserted or removed from the cabinet without cutting power to or from the system or the load. The cabinet has connections for AC input, DC output, and various alarm/control relays. It also includes two RS-485 connectors: one for communications with the SM03 and the other for future enclosure configurations.

✓ NOTE:

Alpha recommends that rectifier power modules be powered off prior to removal to prevent arcing on output contacts. Refer to the included Technical and Installation Manual for detailed instructions on the installation and operation of the DCP01 and Pathfinder power supplies.

1.0 Overview and Specifications, continued

1.5 Internal and External Components, continued

1.5.2 Powerwave® Shelf

The Powerwave Shelf is supplied by Powerwave Technologies and bolts to the MCPA chassis in the Utility 2 enclosure. It is the bottom support for the subrack assemblies for up to four 140W G3S-800-140-032 plug-in amplifiers or up to four 180W G3S-800-180-029 plug-in amplifiers. The Powerwave modules are described in detail in Powerwave manuals numbered 044-05095 and 044-05112, respectively. See page 37 for installation illustrations.

**NOTE:**

Refer to the Technical and Installation Manual provided with the Powerwave equipment for detailed instructions on the installation, connection and operation of the Powerwave subrack system.

1.5.3 Powerwave® Modules

Powerwave modules are linear, feed-forward power amplifiers that can simultaneously transmit multiple frequencies. They are designed for use in an amplifier system that is modular in design, and are ideally suited for use in AMPS/TDMA/CDMA/CDPD/W-CDMA base stations. They operate in parallel to produce high, peak power output and system redundancy for remote applications, when installed in multi-module amplifier subracks manufactured by Powerwave.

The G3S-800-180 operates from 869 MHz to 894 MHz with better than -60 dBc third order intermodulation distortion (IMD). The plug-in Model G3S-800-180-029 amplifier modules can each provide 180 watts of power and function completely independently of each other.

The G3S-1900-125 operates from 1930 MHz to 1990 MHz with better than -63 dBc third order intermodulation distortion (IMD). The plug-in Model G3S-1900-125 amplifier modules can each provide 125 watts of power and function completely independently of each other.

**NOTE:**

Refer to the Technical and Installation Manual provided with the Powerwave® equipment for detailed instructions on the connection and operation of the Powerwave® Module system.

1.5.4 Wireless Location Sensor

The WLS is a digital receiver unit that makes measurements on a mobile uplink RF signal in order to aid in a location computation. Multiple WLS units work together as coordinated by the Geolocation Control System (GCS) to locate a mobile.

1.5.5 Data Multiplexer

DataSMART® MAX™ T1/FT1 multi-port DSU/CSUs from Kentrox help you consolidate traffic at remote sites, and save access charges month after month. By leveraging unused bandwidth and merging voice, data and video traffic onto a single T1 link, you can reduce the number of T1/FT1 lines needed for WAN access. DataSMART MAX DSU/CSUs maximize your network uptime with convenient features, such as optional 10Base-T Ethernet for simplified management. Each DSU CSU includes a front panel LCD for easy local setup and management, along with support for standards-based SNMP management.

**NOTE:**

Refer to the Technical and Installation Manuals provided with the WLS and DSU/CSU equipment for detailed instructions on the connection and operation of the WLS DataSMART systems.

1.0 Overview and Specifications, continued

1.5 Internal and External Components, continued

1.5.6 IceQube Air Conditioner Overview

Basic Theory of Refrigeration:

1. The compressor pump draws in and compresses cool, low-pressure gas into a high pressure gas. Compression raises the boiling point of the gas.
2. The hotter, high-pressure gas passes through a coil called a *condenser*. A fan blows air over the coil which cools the gas into a liquid.
3. This high-pressure liquid passes through an expansion valve, where the liquid expands to boil off as a gas. As the gas expands, it absorbs heat.
4. The cool low-pressure gas is sent through another set of coils called an *evaporator* or *heat exchanger*. 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 air conditioning system is actually three systems, which function simultaneously to maintain environmentally friendly conditions for your equipment within the enclosure: The closed-loop cold air system, warm air system, and vapor-compression refrigeration system.

The closed-loop cold air system circulates cold air from the cooling system to the electronics enclosure. This air captures the heat and humidity within the enclosure and carries it through the heat exchanger (part of the vapor-compression system) which removes the heat/humidity.

The vapor-compression refrigeration system is run by an efficient rotary compressor which circulates NON-CFC refrigerant to transfer heat from the heat exchanger (evaporator) in the closed-loop air stream to a condenser located in the warm air system. Heat from the enclosure transfers from the warm air heat exchanger and dissipates to the ambient.

1.5.7 Verifying Alpha Default Settings for the IceQube Air Conditioner

Procedure:

1. Remove IceQube controller's access panel on the enclosure door shroud (2 screws).
2. Turn on the AC power
3. Record the temperature information that is currently displayed.
4. Check the STATUS LED's status (On/Off/Blink):
 - COOL - On if temperature is above 70°F
 - HEAT - On if temperature is below 32°F
 - ALM - Contact Alpha
 - FILT - Turn off filter alarm (if on) and clean filter if needed

1.5 Internal and External Components, continued

1.5.7 IceQube Air Conditioner Overview, continued

5. To enter programming mode, enter the default PIN code in sequence on the front panel display. The code must be entered with less than 2 seconds between keystrokes.
 - ADJUST up arrow (1)
 - ADJUST down arrow (2)
 - SELECT (3)
 - EXIT (4)
6. The programming LED will flash and a pattern of boxes will appear in the digital display to indicate program mode has been entered. If no selection is made within one minute, the system will return to normal operating mode.
7. To verify or adjust the AC default parameters use the ADJUST up and down arrows. Press SELECT to accept the current setting and cycle to the next.

Parameter	Default Setting
HI Temp set point:	72°F
LO Temp set point:	Set to lowest limit (approx. 40°F)
HI Alarm set point:	100°F
LO Alarm set point:	Set to lowest limit (approx. 33°F)
ALL:	On
AUD:	OFF
-F-:	Do not change
PIN:	Do not change
FIL:	0.0 Days
Add:	0.0

8. Pressing the EXIT button at any time will save setting changes and return the unit to normal operating mode.

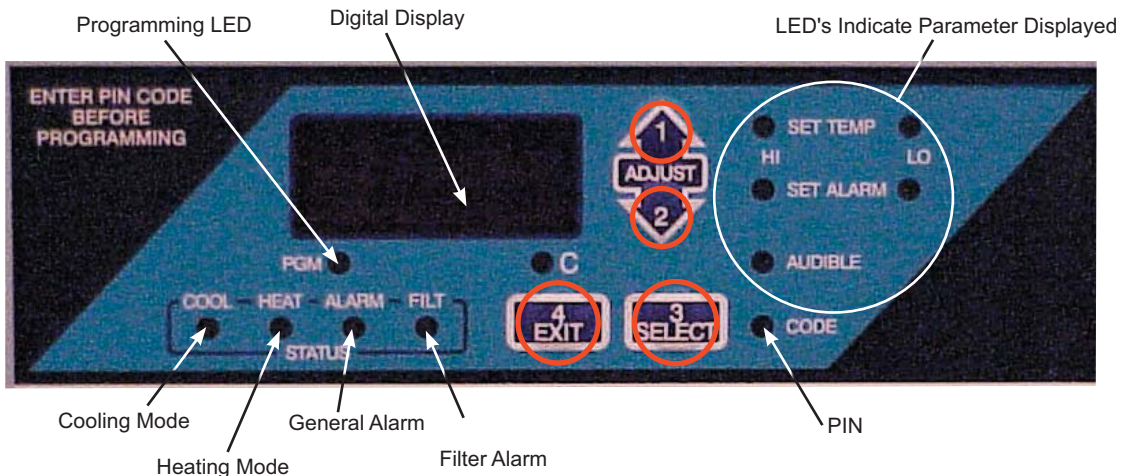


Fig. 1-7, IceQube Air Conditioner Front Panel Display

1.5 Internal and External Components, continued

1.5.7 IceQube Air Conditioner Overview, continued



NOTE:

For more detailed information, refer to the IceQube air conditioner manufacturer owner's manual included with this system.



NOTE:

Call Alpha Customer Service prior to changing setpoints.

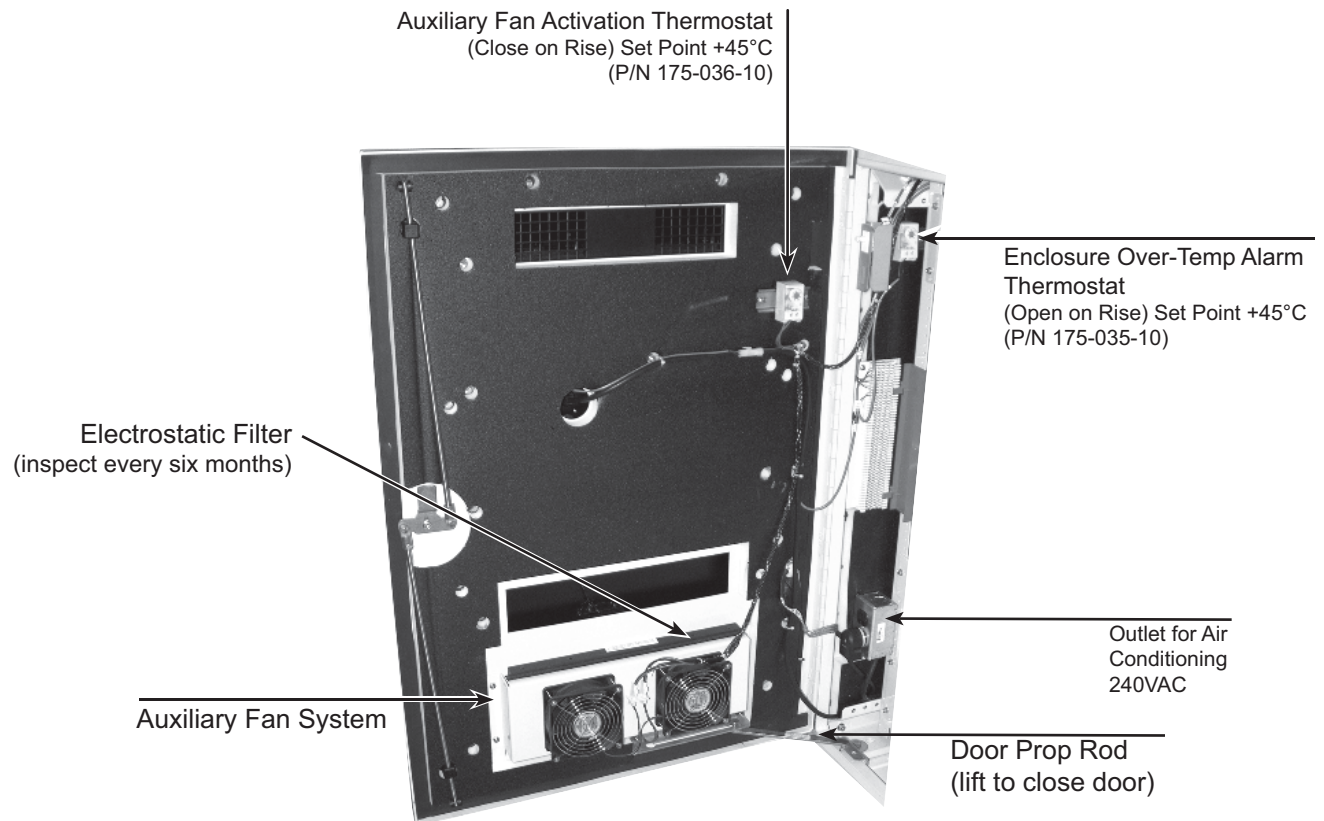


Fig. 1-8, Interior of Front Door Sensors/Connections, Utility 1

1.0 Overview and Specifications, continued

1.6 System Wiring Schematic

Radium MiniBays arrive at their destination with all internal components preassembled and installed (excluding batteries and Pathfinder rectifier modules) in the enclosure. The following diagram will help the installer/engineer to understand the wiring schematic of the RMB-Utility 1 and 2 enclosures.

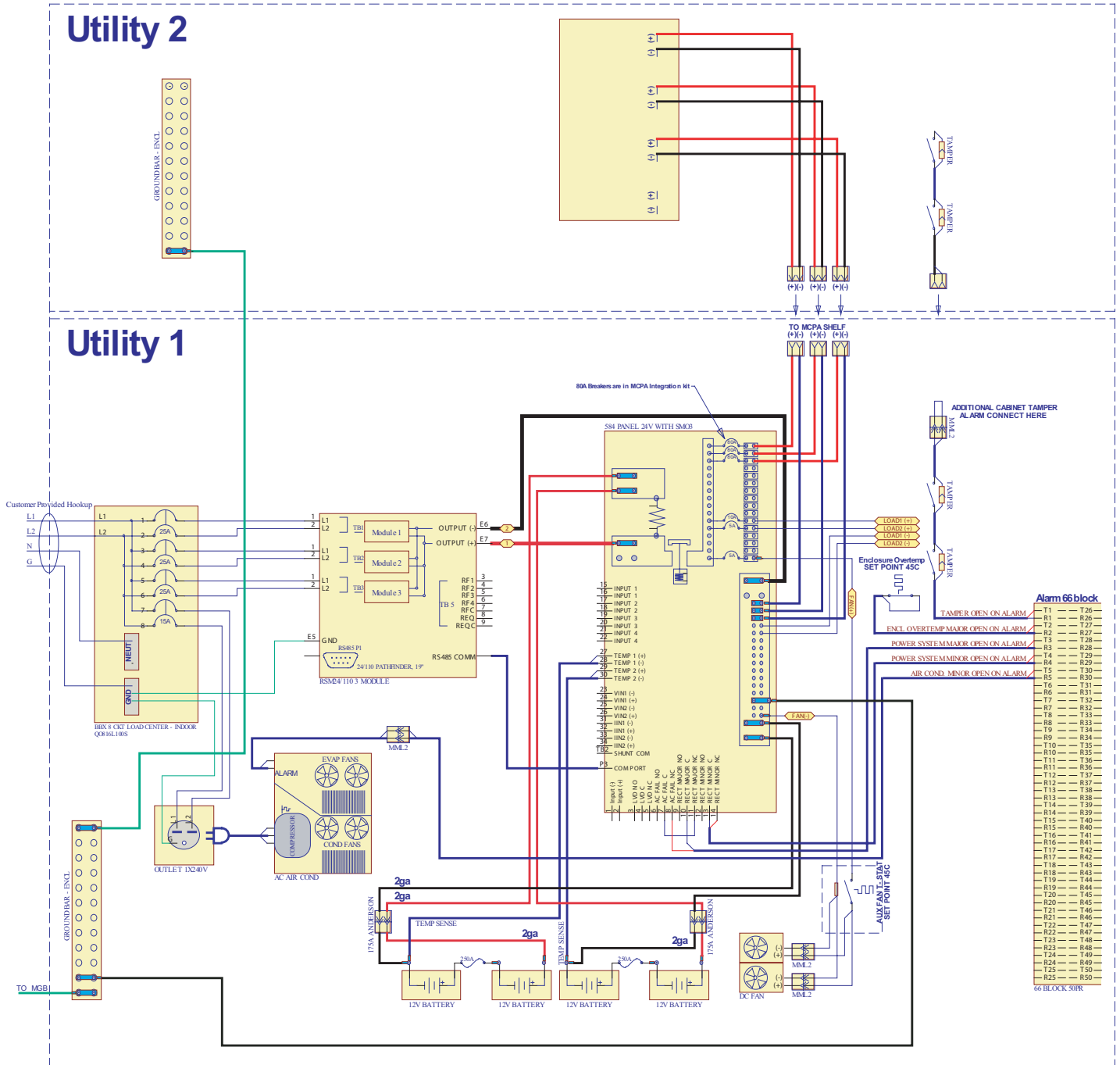


Fig. 1-9, System Wiring Schematic

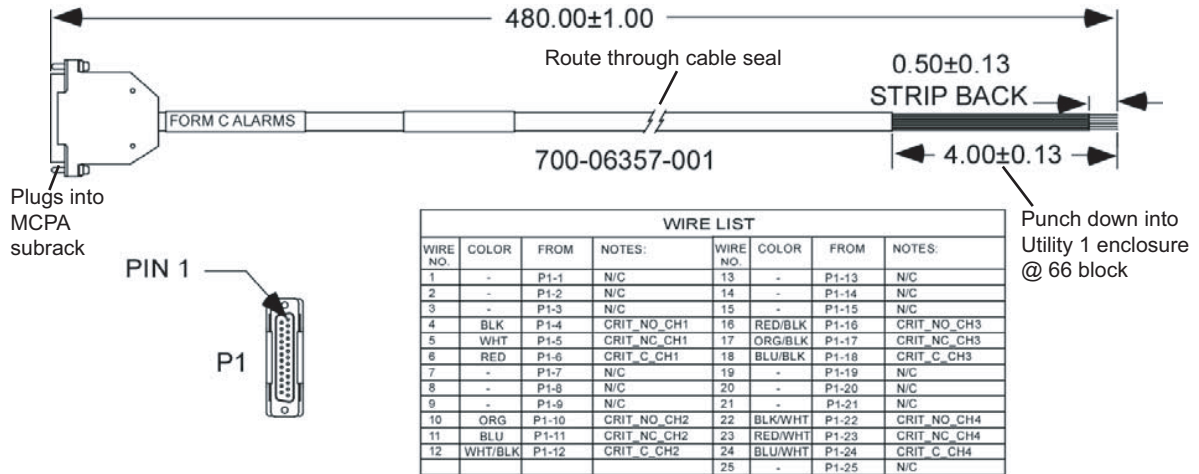
NOTE:

The first release of the Utility 1 system and its documentation included a green ground wire connecting the AC distribution panel's ground bar to the enclosure's ground bar. If this ground wire connection is present, you must remove and discard it.

1.0 Overview and Specifications, continued

1.6 System Wiring Schematic, continued

The following Powerwave wire list and Form-C Alarm pin assignments are for the Site Alarm 66 Block located in the Utility 1 enclosure.



Site Alarm 66 Block

	P1	Alarm Type	Function	Operating State	Alarm State
R25	1	Minor Alpha	Continuity with common if no fan fault	Closed	Open
T25	2	Minor Alpha	Common	Common	Common
R24	3	Minor Alpha	Continuity with common if one or more fan faults	Open	Closed
T24	4	Critical Alpha	Continuity with common if MCPA is active	Closed	Open
R23	5	Critical Alpha	Common	Common	Common
T23	6	Critical Alpha	Continuity with common if MCPA are disabled	Open	Closed
R22	7	Minor Beta	Continuity with common if no fan fault	Closed	Open
T22	8	Minor Beta	Common	Common	Common
R21	9	Minor Beta	Continuity with common if one or more fan faults	Open	Closed
T21	10	Critical Beta	Continuity with common if MCPA is active	Closed	Open
R20	11	Critical Beta	Common	Common	Common
T20	12	Critical Beta	Continuity with common if MCPA are disabled	Open	Closed
R19	13	Minor Gamma	Continuity with common if no fan fault	Closed	Open
T19	14	Minor Gamma	Common	Common	Common
R18	15	Minor Gamma	Continuity with common if one or more fan faults	Open	Closed
T18	16	Critical Gamma	Continuity with common if MCPA is active	Closed	Open
R17	17	Critical Gamma	Common	Common	Common
T17	18	Critical Gamma	Continuity with common if MCPA are disabled	Open	Closed
R16	19	Minor N	Continuity with common if no fan fault	Closed	Open
T16	20	Minor N	Common	Common	Common
R15	21	Minor N	Continuity with common if one or more fan faults	Open	Closed
T15	22	Critical N	Continuity with common if MCPA is active	Closed	Open
R14	23	Critical N	Common	Common	Common
T14	24	Critical N	Continuity with common if MCPA are disabled	Open	Closed

Table 1-1, Form 66 Alarm Pin Assignments

2.0 Site Preparation

2.1 General Information

This document describes the installation procedures for the RMB Utility 1 and 2 enclosures. The process of installing the enclosure(s) are broken into four discrete procedures.

- Site Selection
- Utility 1 and 2 Installation
- Battery Installation and Connection
- Utility Power Connection

2.2 Required Tools and Materials

1. Locate the key to the enclosure doors (*P/N 964-022-10 — Pin Allen type*) and the Battery Cabling Kit (*P/N 745-607-20*) included with the Utility 1.
2. The installer may require some of the following equipment, depending on the location and siting for the Utility 1 and 2 enclosures:
 - “Pour-in-place” pad template (*P/N 604-039-N1*),
 - Polymer Precast pad (*P/N 641-110-10*)
 - Die-cut Vapor Barrier, cut to enclosure dimensions (*P/N 564-990-10*)
 - Concrete Pad Mounting Hardware (*Hilti Anchors, P/N 745-592-20 and/or 745-592-21*)
3. Additionally, the installer will require the following tools and materials:
 - Digital RMS voltmeter
 - Torque wrench with insulated handle and 7/16" socket
 - 7/16" insulated box-end wrench
 - NO-OX or other suitable corrosion inhibiting agent
 - Silicone sealant (*GE RTV123*)
 - 1/4" drive insulated flex extension bar *or universal joint*
 - 1/4" insulated teardrop ratchet
 - 3/8" SAE insulated flex socket set, 1/4" flex drive
 - Punch down tool for 66-type block
 - Crane and/or platform lift, to lift enclosure from shipping pallet to site, and to lift Utility 2 on to Utility 1



NOTE:

A 25+ year continuous vapor barrier must be used between the enclosure and the 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) must initially extend at least 6" in all directions around the perimeter of the enclosure. After the enclosure is secured to the pad, the material can be cut closer to the enclosure, using an appropriate knife or cutting tool.

2.0 Site Preparation, continued

2.3 Site Selection

Prior to installation, you must decide on the location, mounting platform, and connection/grounding options available for the Utility 1 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 of 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?

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.



CAUTION!

The Utility 1 and Utility 2 enclosures require at least 16" to 18" of space behind the cabinet for maintenance access and airflow. Unobstructed air flow is critical to the operation of the MCPA equipment.

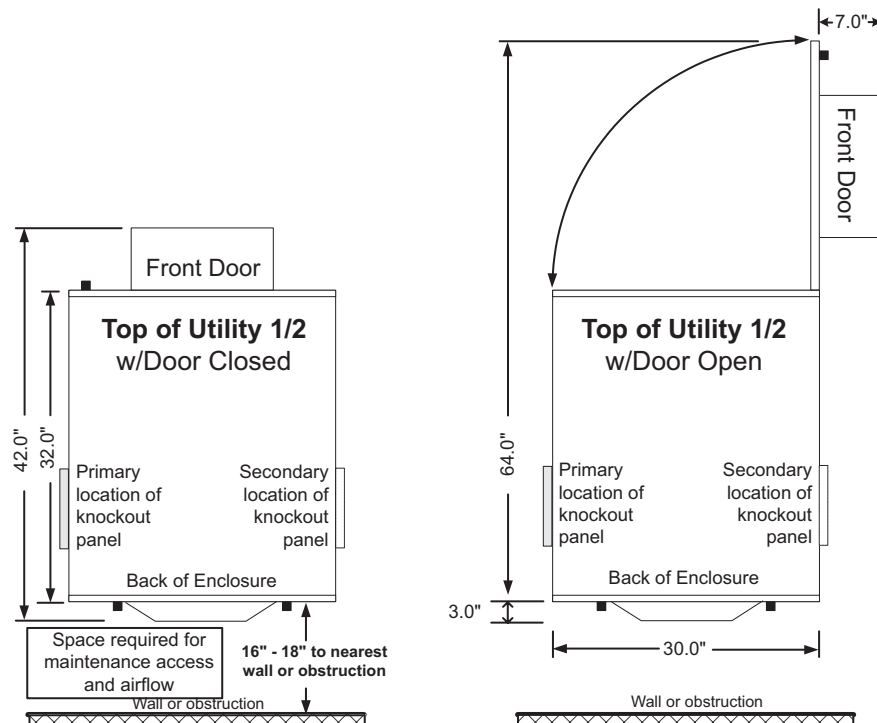


Fig. 2-1, Swing Arc of Enclosure Door

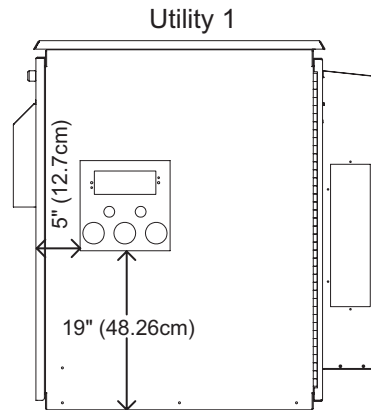
2.0 Site Preparation, continued

2.3 Site Selection, continued



NOTE:

The MiniBay features a removable, rotatable Roxtec side panel that allows for the exit and entry of cables and conduits. This panel includes three 2" and two 1" knockouts, and a Roxtec CF frame with 16 glands. The panel is square allowing it to be rotated in 90° increments. Provide clearance for cable routing to either primary or secondary panel locations. See Fig. 2-1.



2.4 Pre-existing Concrete Pad

Concrete Anchor Template

The illustration below shows the location for concrete anchor placement for a single MiniBay enclosure. The actual location and placement of an enclosure are dependent on customers' requirements. The optional Vapor Barrier (P/N 564-990-10) may be used as a template.

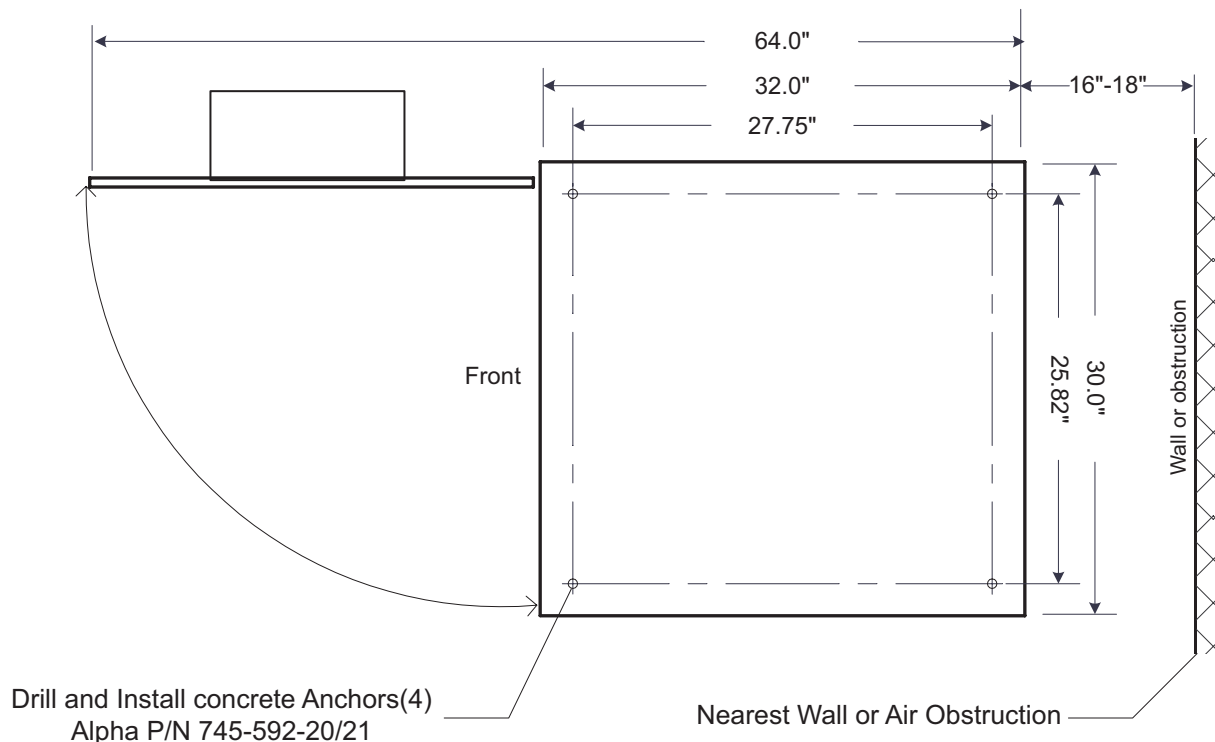


Fig. 2-2, Pre-existing Concrete Pad Layout (top view)

2.0 Site Preparation, continued

2.5 Polymer Precast Pad (optional)

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

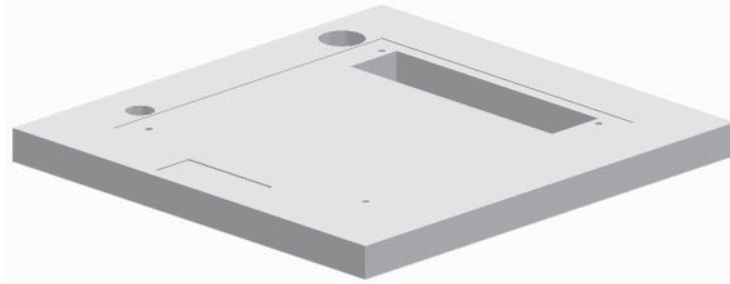


Fig. 2-3, Polymer Precast Pad for Single-wide Enclosure
3" H X 42" W X 44" D 170 lbs.
Alpha P/N 641-110-10

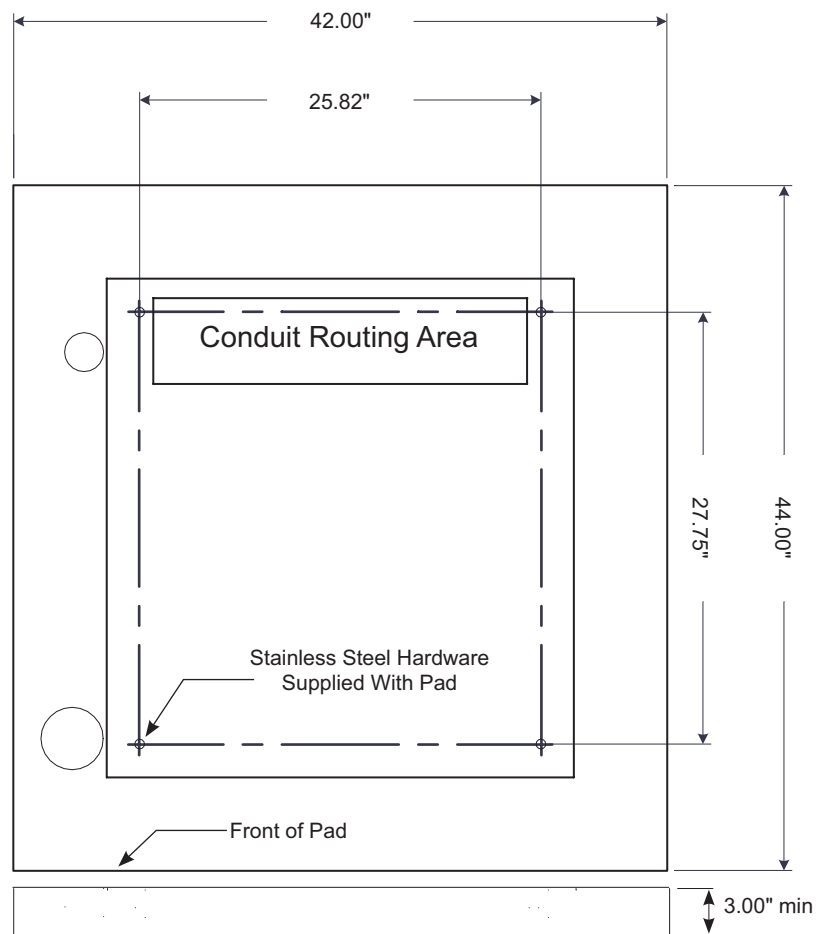


Fig. 2-4, Pad Dimensions for Single-wide Enclosure

2.0 Site Preparation, continued

2.6 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.

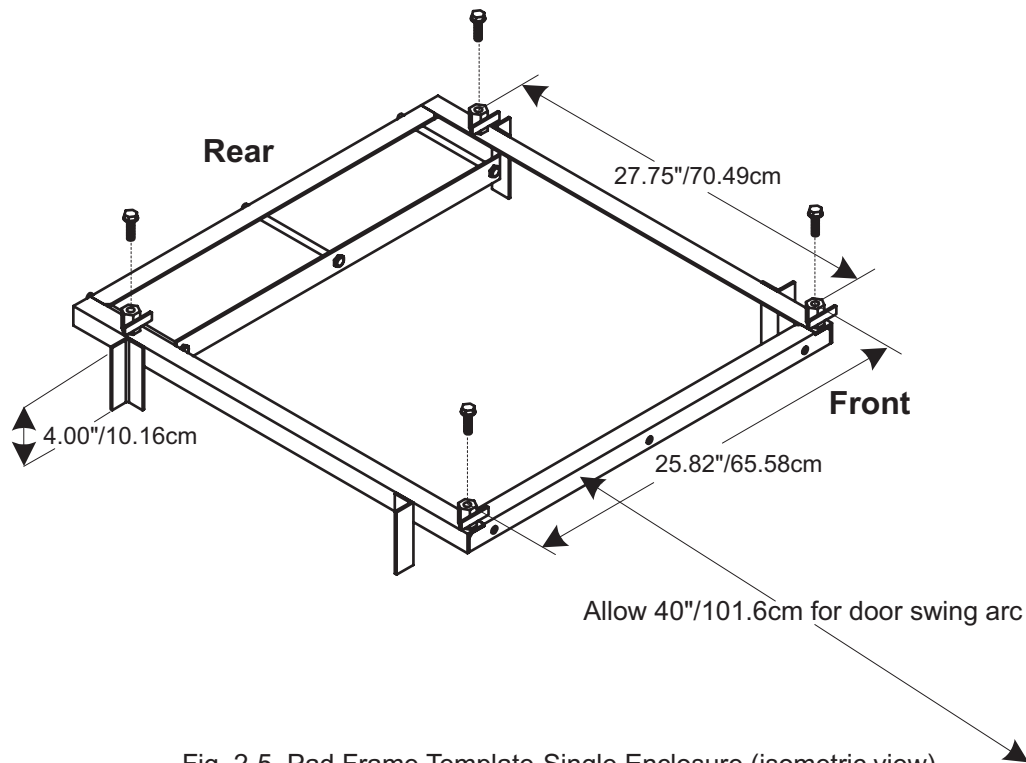


Fig. 2-5, Pad Frame Template-Single Enclosure (isometric view)
P/N 604-039-N1-001



NOTE:

The four 1/2" bolts provided with the frame should remain installed to prevent debris from fouling the threads. Remove just prior to positioning enclosure.

2.0 Site Preparation, *continued*

2.7 Enclosure Grounding

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

Grounding Specifications:

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

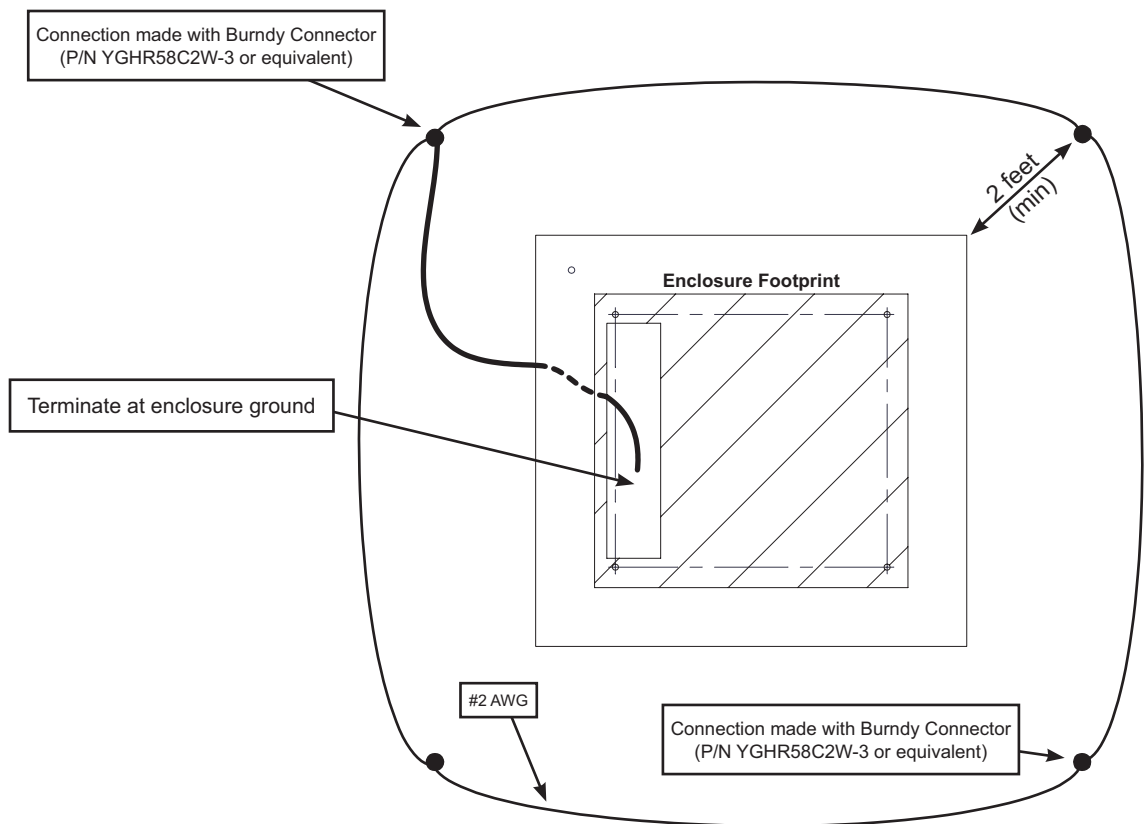


Fig. 2-6, Suggested Grounding Method

ATTENTION:

The grounding method for a particular site will be dependent upon soil type, available space, local codes, NEC (National Electric Code), and other site-specific characteristics. 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 ($2 \times 32" = 64"$). This will ensure that the lifting angle of the chain is greater than 60 degrees.

Unbolt the lifting plates from their shipping positions to reposition for use. See illustration below. After the enclosure is in place, the lifting plates may be either removed or left in place.

 **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. 27 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.

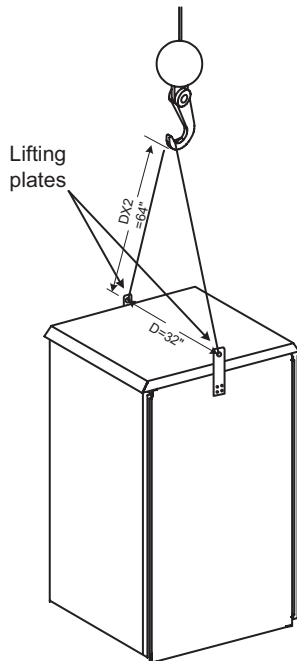


Fig. 3-1, Block and Tackle Lifting Arrangement



Fig.3-2, Lifting Utility 2 onto Utility 1 (photo is for illustration only)

 **WARNING!**

DO NOT lift the enclosure with the batteries, rectifiers, or customer-installed equipment in place.

 **CAUTION!**

Do not transport, lift, or place the unit on any surface unable to fully support its weight. Use lifting platform to remove enclosures from pallet.

3.0 Installation, continued

3.2 Utility 1 Enclosure Installation

Alpha Technologies ships the MiniBay enclosure bolted to a wooden pallet. The following steps are necessary before and after lifting the enclosure from the pallet and positioning it on the pad.

1. After removing all packing material from the enclosure, inspect it for damage.
2. Unwrap the pallet. Remove the box. Remove the batteries from the pallet and inspect for damage or leaking (batteries must be removed to open rear door).
3. Remove the Pathfinder rectifiers from the top of the enclosure, open boxes and inspect. Open the front and rear doors of the enclosure. Remove the bolts holding the enclosure to the pallet.
4. If the unit is to be placed on a pre-existing concrete pad, follow the steps below. Otherwise, follow the instructions included with the precast pad or pad template.
5. Use the optional Vapor Barrier as a template or use the dimensions in Fig. 2-2 (page 28) to mark drilling locations. Ensure the pad is smooth, level and free of bumps.
6. Drill and install pad mounting anchor bolts according to manufacturer's recommendation.
7. Place the enclosure over the pad mounting bolts and tighten the bolts to their required torque specification.
8. Refer to the rectifier manual included in the battery cable kit, and install the Pathfinder rectifier units into the pre-installed shelf.
9. Connect AC service to AC distribution panel (See Section 3.5).
10. Install batteries (Section 3.4).

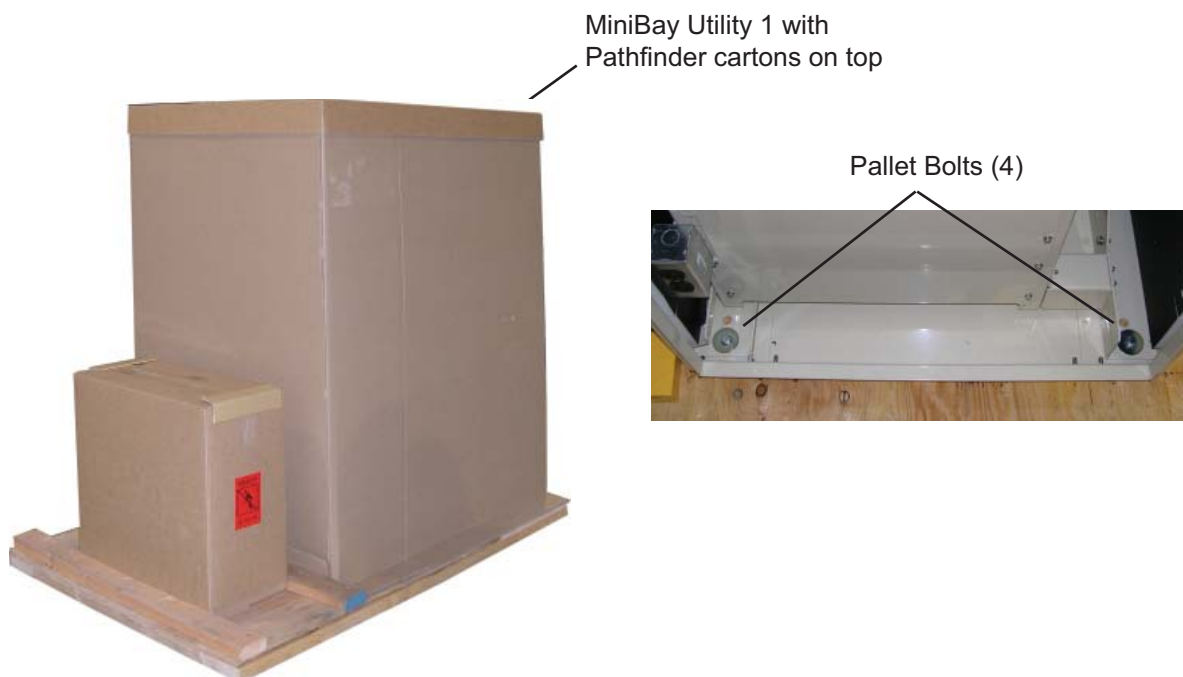
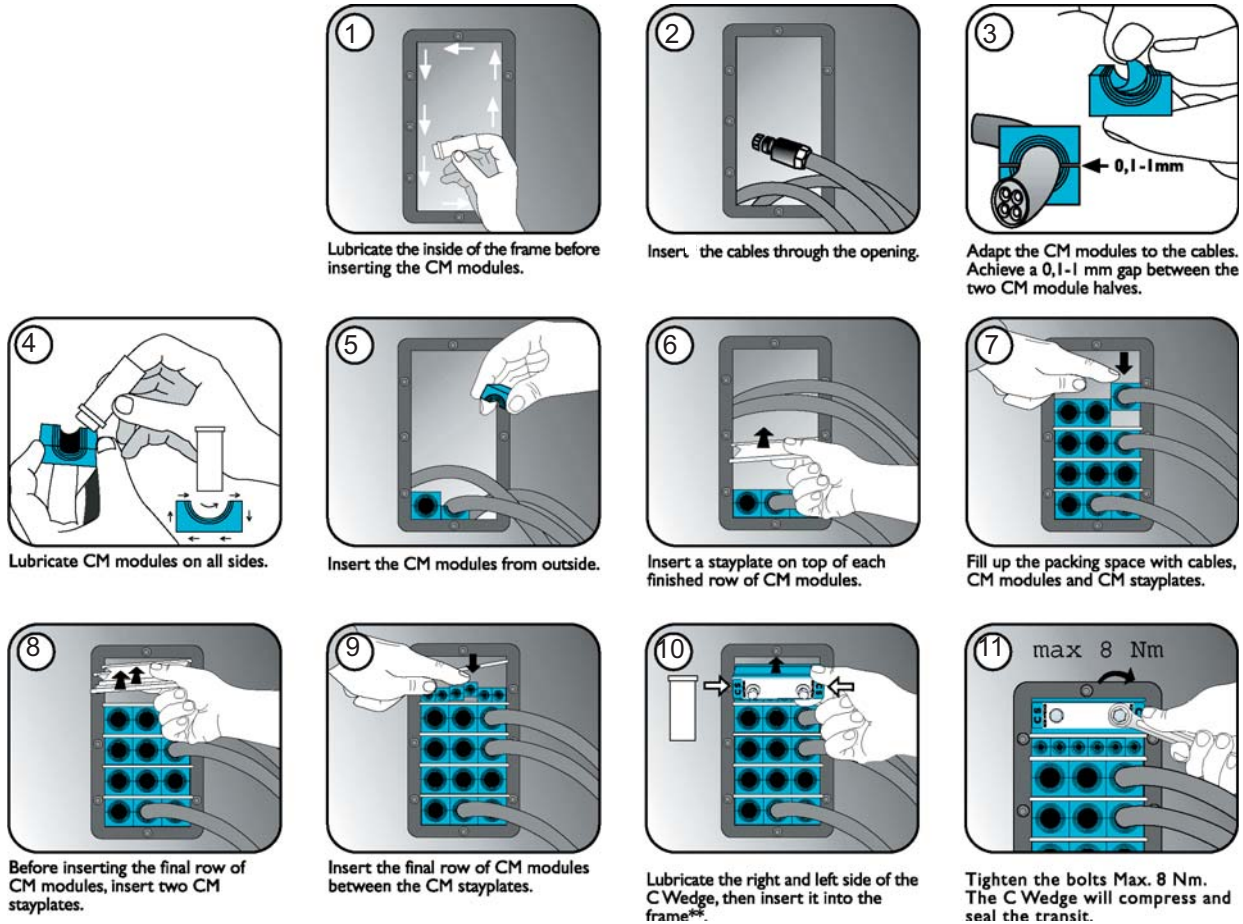


Fig.3-3, Shipping Pallet Arrangement

3.0 Installation, continued

3.3 Roxtec Panel Assembly Instructions

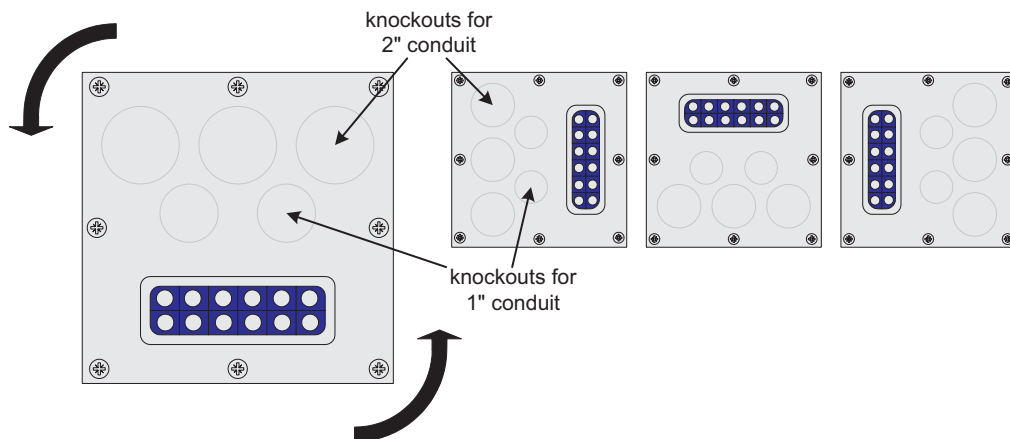
The illustrations below are a generic overview of the operation of the Roxtec panel. For detailed instructions, please refer to the manufacturer's instructions included with the panel.



The 13" x 13" 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 plate to maintain proper pressure on the rubber sealing gasket: 25 Inch-Pounds (2.83 Newton-Meters).



3.0 Installation, continued

3.4 Battery Installation

1. Remove the access panel from inside the front door of Utility 1.
2. Place the batteries into the enclosure with the terminals facing the FRONT door.
3. Remove the protective covers over the battery terminals.
4. Secure batteries with the battery restraint bar.
5. Wire the batteries as shown in the diagram below.

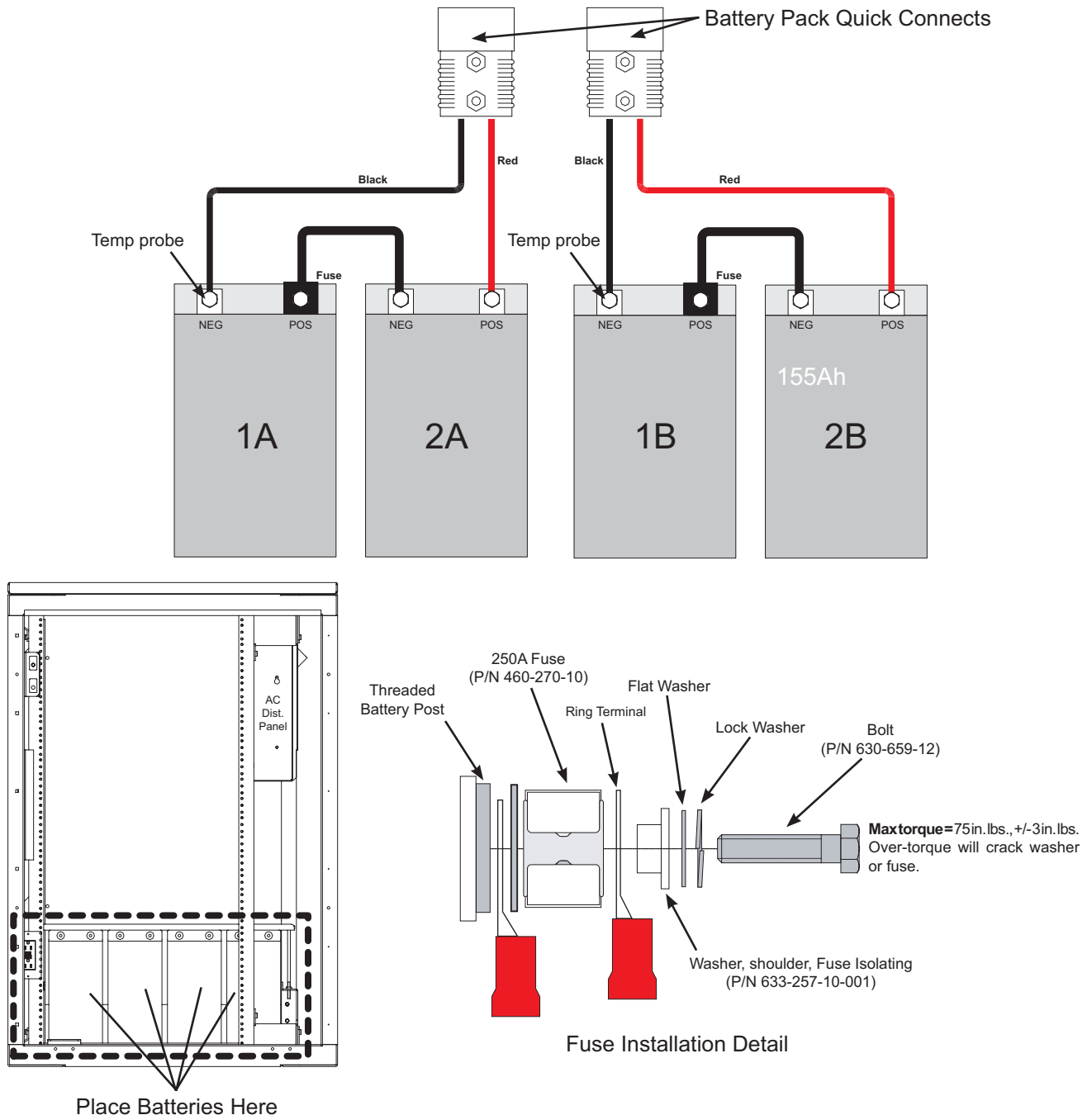


Fig. 3-4, Battery Installation

3.0 Installation, continued

3.5 Service Power Connections

The service power breaker box is located near the right hand wall of the lower enclosure (Utility 1). The enclosure ground bus is located in the rear-right corner of the enclosure. The ground bus bolts have a spacing of 5/8" with a bolt size of 1/4". The breaker box should be wired as shown below, following all local codes and regulations.

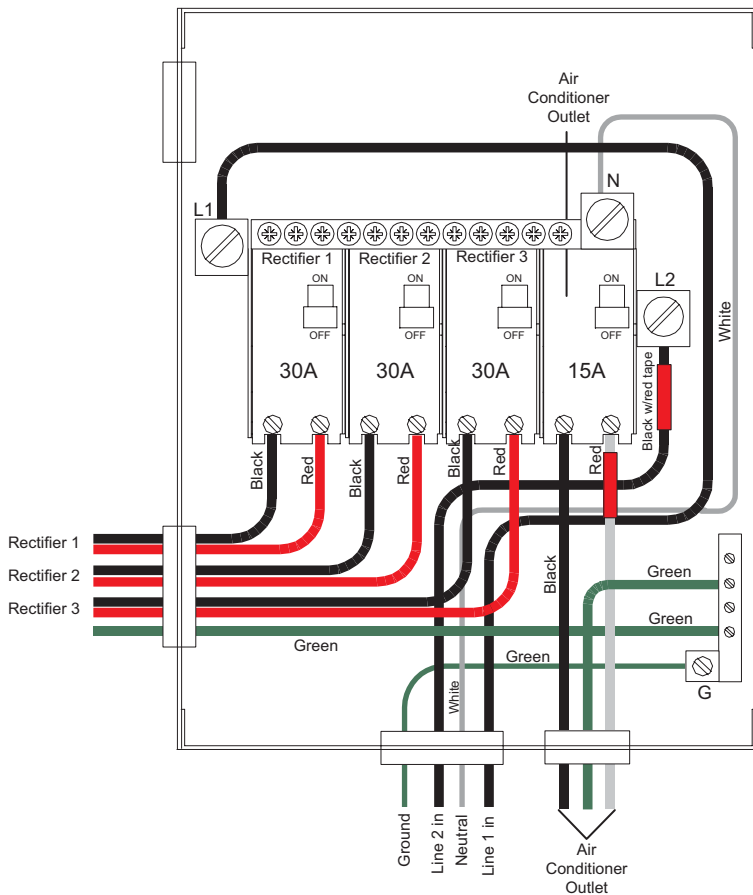


Fig. 3-5, Enclosure Breaker Box Wiring Schematic



Fig. 3-6, Enclosure Breaker Box

3.0 Installation, continued

3.6 Air Conditioner Condensate Hose Mounting

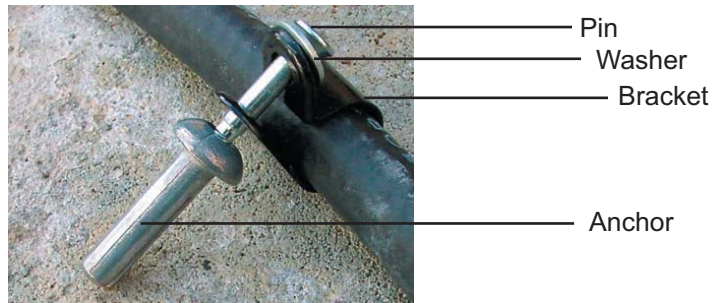
The MiniBay Utility 1 air conditioner comes with a condensate hose that must be secured to the mounting pad. The hose may be run out the front or back of the pad, and should extend three inches from the edge.

Tools Required:

- Rotary Hammer Drill with 1/4" bit
- Hammer

Procedure:

1. Locate the hose hardware kit (packaged with the battery cable kits).
1. Extend the hose out in the desired direction and position brackets.
2. Locate the anchor holes so the hose will not interfere with the door opening. Drill two holes for the anchors into the pad.
3. Place anchors in anchor holes.
4. Run the pins through the brackets and hammer them into the anchors.
5. Trim the hose to approximately three inches over the edge of the pad.



✓ NOTE:

The condensate hose should have a minimum two-inch bend radius and should not kink when the door is opened. Check the hose every six months for blockage or disconnection.

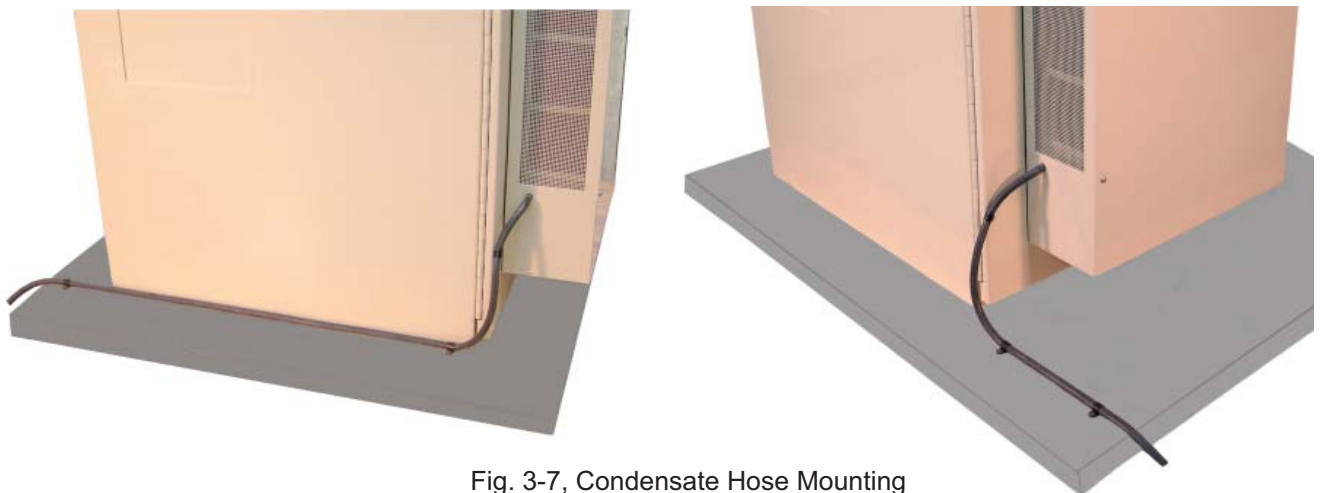


Fig. 3-7, Condensate Hose Mounting

3.0 Installation, continued

3.7 Solar Shield Removal

Prior to stacking the Utility 2 enclosure, the solar shield of the Utility 1 enclosure must be removed.

To remove the shield, remove the six #10 Keps nuts and lift the shield off. Some models may use four 1-inch long 3/8" hex fasteners in each corner instead of the six Keps nuts.

If not already present, place foam insulating tape around the perimeter of the enclosure top. Allow a corner gap in the tape for drainage. See Fig. 3-9 on opposite page.



NOTE:

Some units may use four 1-inch long 3/8" hex fasteners in each corner instead of Keps nuts.



Fig. 3-8, Location of Keps Nuts
(rack structure removed for clarity)

3.0 Installation, continued

3.7 Solar Shield Removal, continued

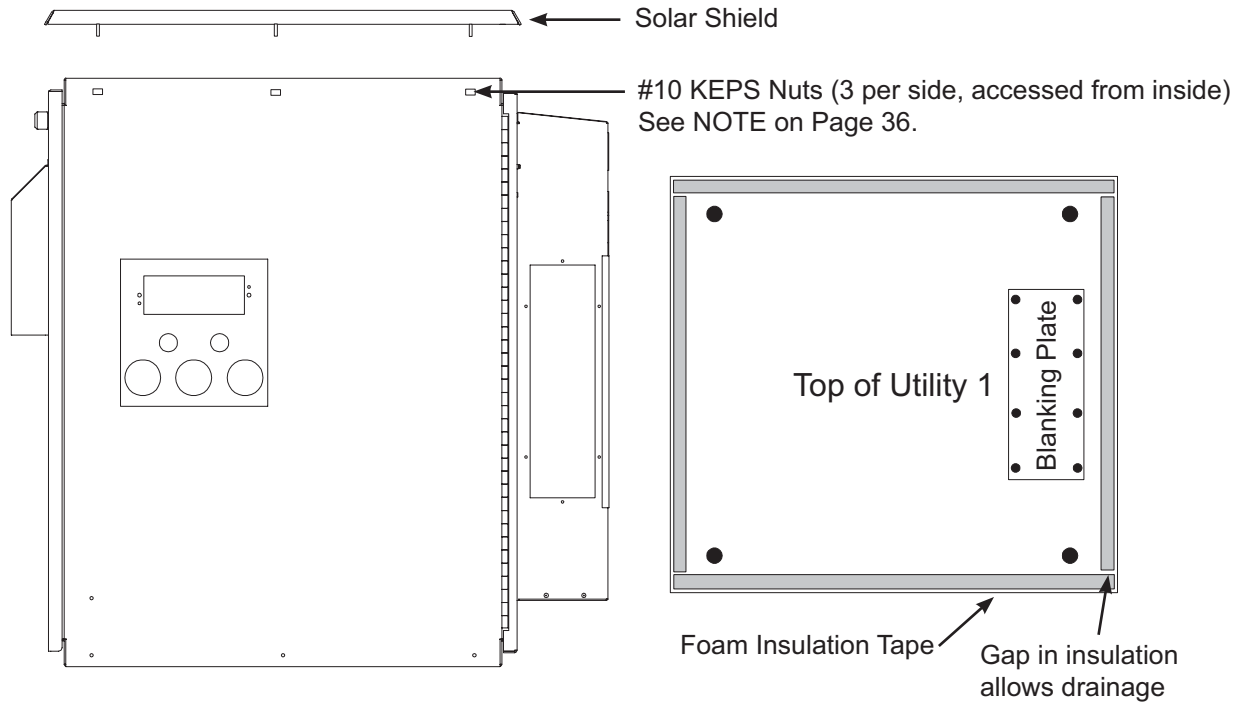


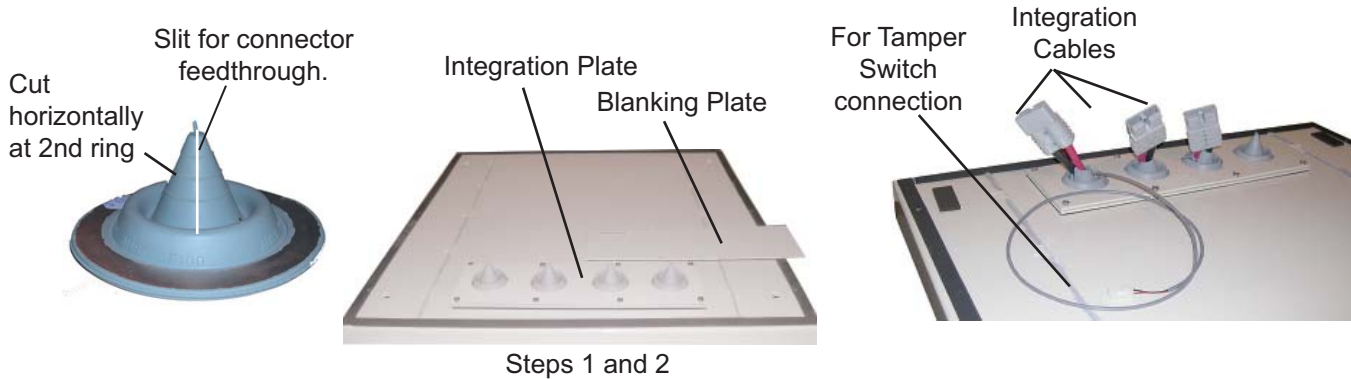
Fig. 3-9, Solar Shield Removal and Tape Location

3.0 Installation, continued

3.8 Mounting Utility 2 Enclosure

Preparing Utility 1

1. Remove the solar shield (roof) from Utility 1 enclosure, and ensure that the foam insulation tape has been positioned around the top of the enclosure. Remember to allow a drainage gap in the insulation.
2. Remove the blanking plate from the top of Utility 1 and install the integration plate. Slit rubber cones on the integration plate just enough to allow connectors to fit through. Feed integration cables from Utility 1 through the rubber cones.



NOTE:

Install the Powerwave support shelf into the rear of Utility 2 enclosure prior to mounting Utility 2 on to Utility 1. The exhaust ducting must snugly fit the rear of the MCPA (the ducting must be removed to install the support shelf).

3. At the duct, remove the four screws mounting the duct to the horizontal rails.
4. Install the Powerwave support shelf as shown in Fig. 3-11, using the hardware provided with the Powerwave equipment. The bottom hole of the support shelf should align with the 6th hole up from the bottom of the rack. See Fig. 3-10.
5. Reinstall the duct. The Utility 2 enclosure is now ready to be placed on top of Utility 1.



CAUTION!

Use caution when lifting Utility 2 on top of Utility 1. Refer to Section 3.1, for proper lifting techniques.

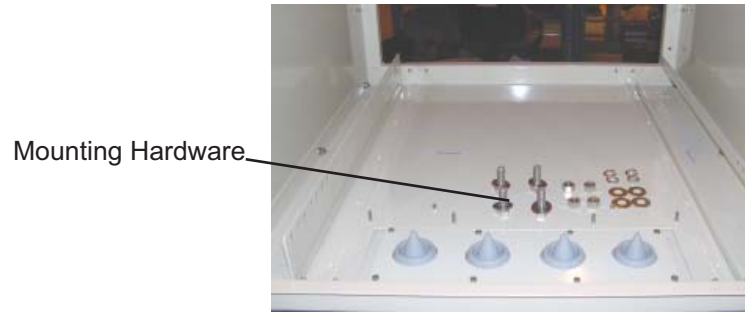
6. Place the Utility 2 enclosure atop the Utility 1 enclosure with a suitable lifting device (see page 30), ensuring that the mounting bolt holes are lined up.



7. Connect the two enclosures with four 1/2" x 1 1/2" stainless steel bolts, washers, and nuts. Tighten the bolts to 40 foot-pounds (54 newton-meters).
8. Cut the fourth seal cone and run the enclosure ground cable down to Utility 1 ground lug.

3.0 Installation, continued

3.8 Mounting Utility 2 Enclosure, continued



Step 7
Fig. 3-10, Mounting Hardware for Utility 2

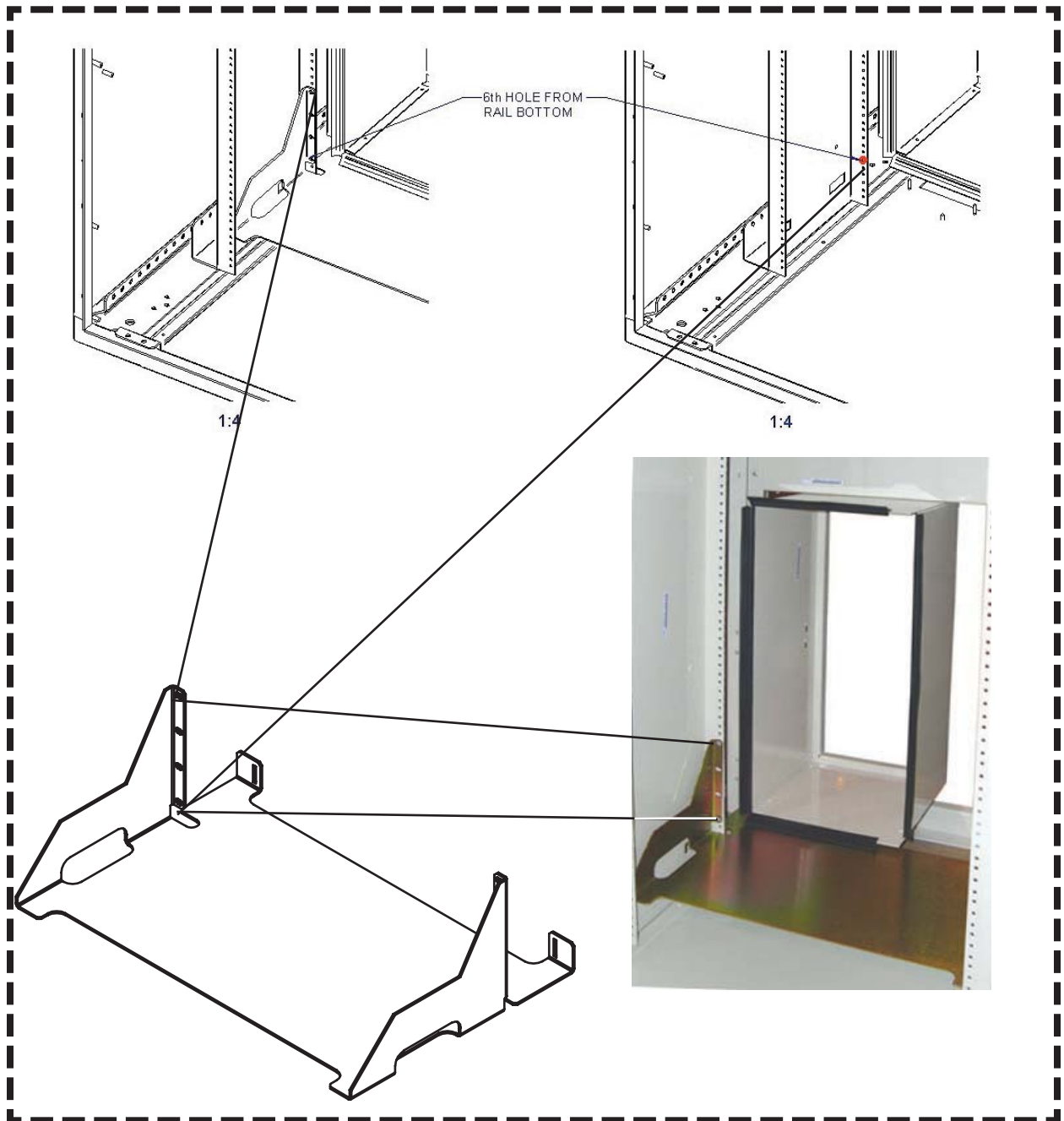




Fig. 3-11, Powerwave Support Shelf Installation Location

3.0 Installation, continued

3.9 MCPA Chassis Installation

MCPA modules are designed for installation in a subrack for connection of DC power, RF, and monitor cables. The scope of this manual is limited to locating the MCPA support shelf within the Utility 2 enclosure, proper alignment with the exhaust ducting, and proper thermal management.

 **NOTE:**
Consult the appropriate Powerwave installation and service manual for specific detail on disassembly of MCPA modules from their PAF-0843-002 and PAF-1900 equipment frames prior to installation into the Utility 2 enclosure.

 **CAUTION!**
A Powerwave blanking panel must be installed in any unused power module location to assure proper air movement and cooling. Refer to Section 3.8.

 **WARNING!**
Turn off all external primary DC power before connecting DC power cables.

1. Route the DC cables and tamper switch jumper from the Utility 1 enclosure into Utility 2 enclosure via the integration plate or Roxtec panels. See Section 3.8.
2. Remove the shorting plug and connect the tamper switch jumper to the tamper switch cable from Utility 1 to the Utility 2 tamper circuit cable (see Fig. 3-14).
3. Connect DC cables with the Quick Connection Battery cables provided with the integration kit to the subrack (see pages 18 and 33).
4. Slide the subrack onto the support shelf and back. Note: The subrack may need to be moved side to side to allow it to fit snugly into the rear air ducting seal.
5. Secure the subrack using mounting hardware provided with the Powerwave equipment.
6. Plug the DC cables together. The subrack is now ready to receive the MCPA modules. Consult the appropriate Powerwave installation and service manual for additional information.
7. Install the 80A DC breakers into the breaker bar located at the front of Utility 1. Ensure that the breakers are in the OFF position.



Fig. 3-12, DC Breaker Panel

3.0 Installation, continued

3.10 Integration Cable Installation



NOTE:

For additional information, consult the Powerwave® MCPA manual.

100 in-lbs.
torque



Coaxial connector torque specifications:
SMA = 5 to 6 inch-pounds,
Type "N" = 12 to 15 inch-pounds



Fig. 3-13, DC Integration Cable

Shorting Plug

Tamper Switch Cable

Back Panel of
Utility 1

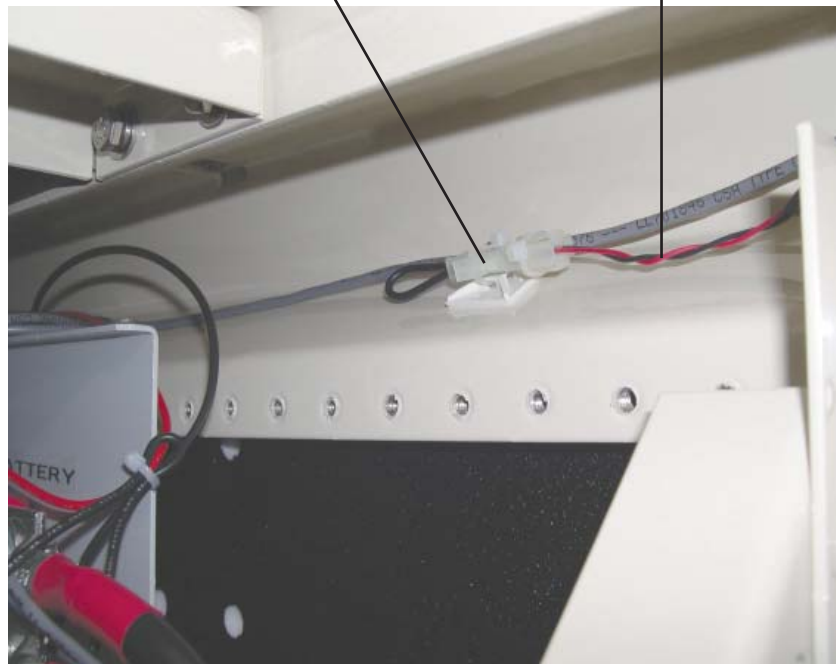


Fig. 3-14, Tamper Switch Shorting Plug

4.0 Maintenance

4.1 Cabinet Air Filtration

The system has directional filters that should be inspected for cleaning or replacement every six months depending on time of year or environment. Clean the filters by back flushing with water in the direction indicated and reinstall the filter. Filter placement is directional depending on their location. See Figure 4-1.

4.1.1 Air Filter Maintenance - (Utility 1)

- *Air Conditioner Filter:* Open the lower-left access panel on the exterior air conditioner shroud. Carefully lift the filter up and out. Inspect, clean, and/or replace every six months.
- *Auxiliary Fan System Filter:* Remove filter from above the fans located inside the front door. Inspect and/or replace every six months.
- *Rear Door Filter:* Can be inspected with a flashlight. Under normal circumstances it should not need cleaning or replacement.

4.1.2 Air Filter Maintenance - (Utility 2)

- Utility 2 has two MCPA front door filters that should be inspected, cleaned, and/or replaced every six months.
- Removable rear door with permanently mounted screen. Screen should be cleaned every six months. Brush or vacuum from inside; back blow if needed.



NOTE:

Some environments may require more frequent inspections to maintain optimum airflow.

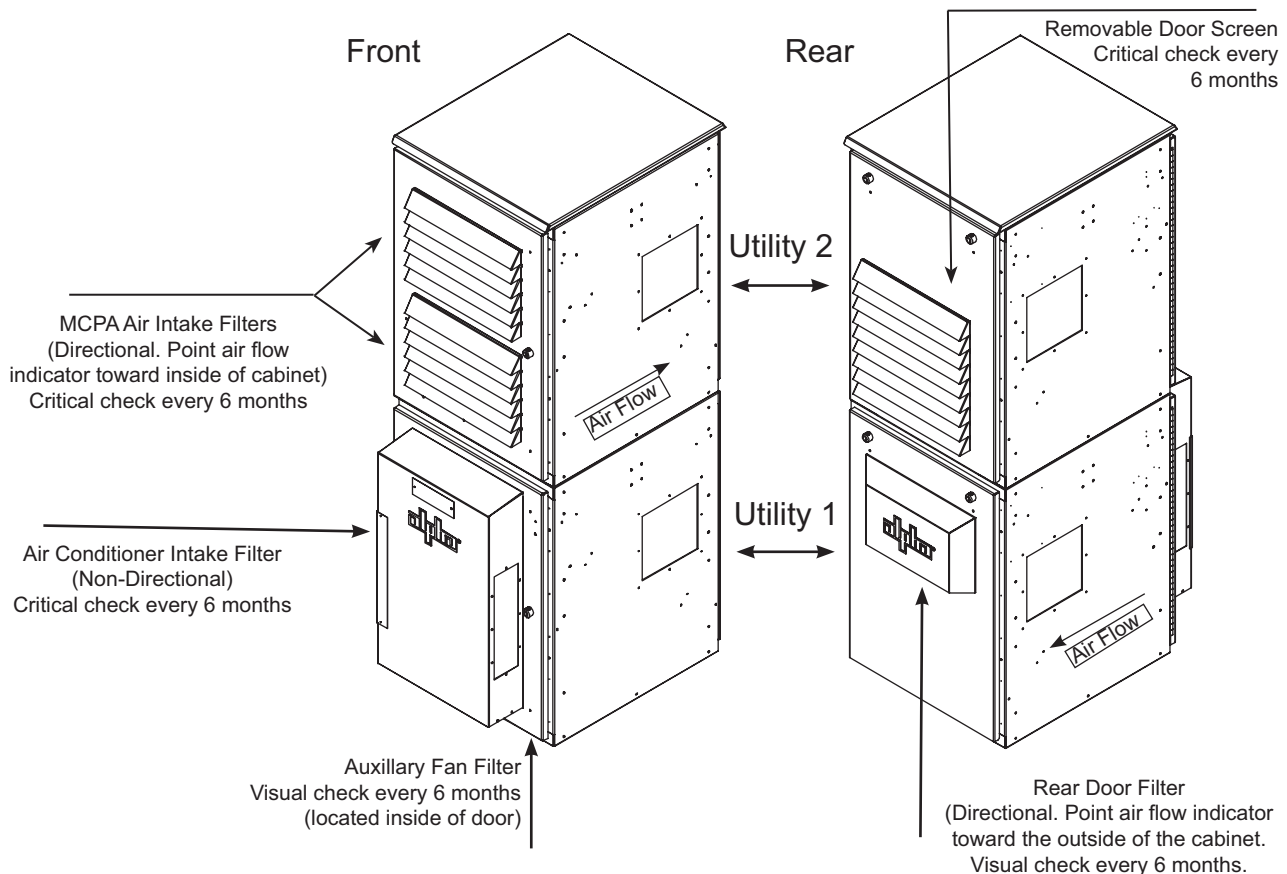


Fig. 4-1, Air Filter Location and Maintenance

Appendix A (CSA Marks)



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 website as follows:

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

www.osha-slc.gov/fedreg_oseha_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)

Alpha Technologies™ products bear the CSA NRTL/C Mark are certified to CSA C22.2 No. 60950 and UL 60950.



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)

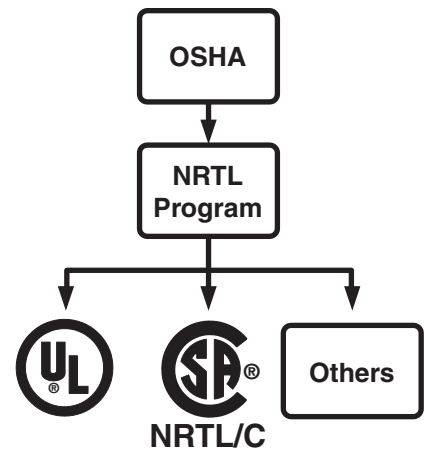
The NRTL determines that a product meets the requirements of an appropriate consensus based product safety standard either by successfully testing the product itself, or by verifying that a contract laboratory has done so. The NRTL certifies that the product meets the requirements of the product safety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



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/certification_marks/
- (2) www.ul.com/mark/ulmark.htm
- (3) www.osha-slc.gov/dts/optca/nrtl/nrtl/slide02.html
- (4) www.osha-slc.gov/dts/optca/nrtl/nrtl/slide04.html
- (5) www.osha-slc.gov/dts/optca/nrtl/nrtl/slide18.html

Power

Alpha Technologies 

Alpha Technologies
3767 Alpha Way
Bellingham, WA 98226
USA
Tel: +1(360) 647-2360
Fax: +1(360) 671-4936
Web: www.alpha.com

Alpha Technologies Ltd.
4084 McConnell Court
Burnaby, BC, V5A 3N7
CANADA
Tel: +1(604) 430-1476
Fax: +1(604) 430-8908

Alpha Technologies
Europe Ltd.
Twyford House
Thorley
Bishop's Stortford
Hertfordshire
CM22 7PA
UNITED KINGDOM
Tel: +44 (0)1279-501110
Fax: +44 (0)1279-659870

Alpha Technologies GmbH
Hansastrasse 8
D-91126 Schwabach
GERMANY
Tel: +49-9122-79889-0
Fax: +49-9122-79889-21

Alphatec, Ltd
P.O. Box 56468
Limassol, Cyprus
CYPRUS
Tel: +357-25-375675
Fax: +357-25-359595

Alpha Technologies
5 Avenue Victor Hugo
F-92140 Calmart France
FRANCE
Tel: +33-3-41-90-07-07
Fax: +33-1-41-90-93-12