

Charles Universal Broadband Enclosure Replacement Door Kit with 6000BTU HVAC General Description and Installation

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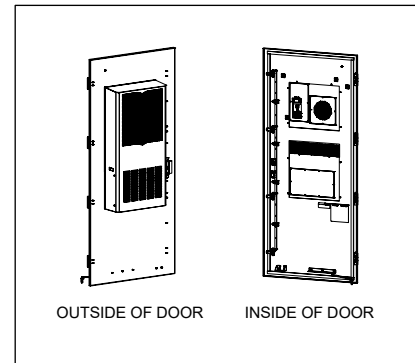


Figure 1 Replacement Door

1. GENERAL INTRODUCTION

1.1. Document Purpose

This document provides general information for the replacement door kit that converts a CUBE-PM639155Nx cabinet into a CUBE-PM63915INx cabinet. Figure 1 shows the replacement door kit.

-NOTE-

Hereafter, the Charles Universal Broadband Enclosure CUBE-PM63915xN1, PM63915xN4, and PM63915xN6 will be referred to as the "CUBE." The replacement door kit will be referred to as the "kit."

1.2. Product Purpose

The kit includes a replacement door for a CUBE that is equipped with a 6000BTU HVAC system. The kit also includes two HVAC cutoff switches, to be mounted at the front and rear doors of the CUBE, as well as new plates for mounting the switches. Additionally, the kit includes insulation panels (Figure 2) to mount to the inside walls of the CUBE.

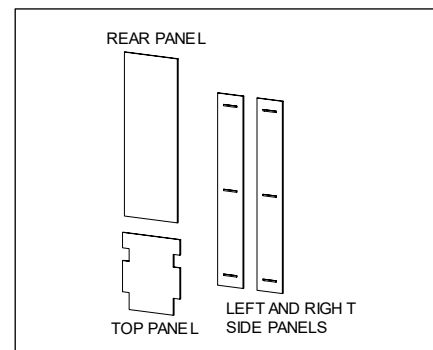


Figure 2 Insulation Panels

2. INSTALLATION

2.1. Inspecting the Product

The kit is shipped upright on a skid. Remove the bolts, unpack the unit, remove and dispose of the packaging material.

If the kit is left lying in a horizontal position, the oil may flow out of the compressor. Leave the door upright for 24 hours before installing or operating the HVAC to allow the oil to flow back to the reservoir.

-INSPECTION NOTE-

Visually inspect the unit for damages prior to installation. If the equipment was damaged in transit, immediately report the extent of the damage to the transportation company.

2.2. Following and Using Safety Precautions

Read the following site and safety tips, cautions, and warnings, then proceed with the paragraphs that follow.

- For installation, follow all National Electrical Codes (NEC) ANSI/NFPA 70, local, environmental, workplace, and company codes, safety procedures, and practices.
- Minimum spacing between the accessories and components and the housing for ITE equipment shall be maintained for safe operation of the equipment when installed in accordance with NEC ANSI/NFPA 70.
- Read all instructions, warnings and cautions on the equipment and in the documentation shipped with the product.
- Do not place this product on weak or unstable surfaces which may allow the product to fall, resulting in potentially serious damage(s) to persons or product.
- Only authorized trained personnel shall install the kit.

2.3. Obtaining Tools and Equipment

Obtain the following recommended or needed items for installing the kit.

- Safety glasses
- Work gloves
- Slotted, hex, and Phillips screwdrivers
- Permanent marker
- Torque wrench
- Can wrench (216 tool)
- 7/16 and 11/32 socket and wrench
- Wrench for 1/4"-20 nuts
- Hammer or mallet
- Lifting equipment (e.g. hand truck, dolly)
- Clean, dry cloth
- Isopropyl alcohol
- Tarp or moving blanket
- Zip ties
- Tape

2.4. Disassembling the Packaging

CAUTION: Keep the door kit upright at all times. If the HVAC system is left lying down, then the compressor oil can flow out of its reservoir, which will impair the HVAC operation when it is turned on. Store the door in an upright position for 24 hours prior to installation and keep it upright during the installation process.

Instructions:

1. Remove the shrink wrap from the shipping pallet.
2. Locate the cross braces on the back of the frame. Remove these by removing the screws that hold them in place.
3. Remove the insulation panels and set aside.
4. Support the replacement door so that it remains upright while removing the screws that hold the next set of cross braces in place.
5. When all cross braces have been removed, use proper lifting equipment to move the replacement door off the pallet. Make sure the door remains in a vertical position when transporting.

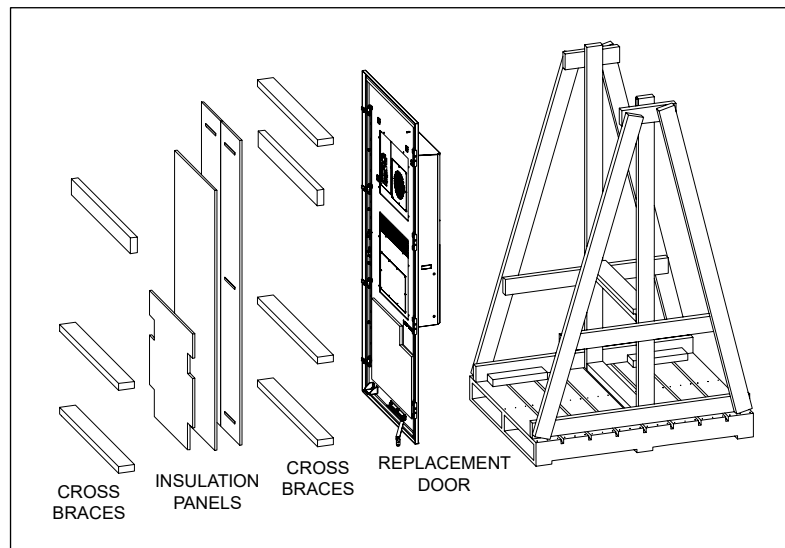


Figure 3 Unpack the Kit

2.5. Installing the Door and Alarm Switches

	WARNING	<p>Improper hoisting equipment and unsafe lifting procedures can result in serious injury or death. Charles recommends up to three people to lift, move, and install the kit. Follow local safety practices. Turn off all power connections to the CUBE before beginning this procedure.</p>
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2.5.1. Torque Requirements

Torque all hardware as shown below (unless otherwise noted). These values apply to SAE Grade 1 & 2 Low Carbon Steel, ASTM A307 Low Carbon Steel, and Stainless Steel Grade 18-8.

Thread Size	In-lbs	Ft-lbs
4-40	4±10%	
6-32	8±10%	
8-32	16±10%	
10-32	26±10%	
12-24	50±10%	
1/4-20/M6	60±5%	5±5%
5/16-18	125±5%	10.4±5%
3/8-16	180±5%	15.0±5%
1/2-13	500±2%	41.7±2%
5/8-11	1000±1%	83.3±1%

2.5.2. Removing the Existing Door

1. Remove all power and alarm wiring from the thermal device on the existing CUBE door. Note the wire positions for later re-connection.
2. Remove the two nuts that connect the wind latch to the CUBE (Figure 6). Save the nuts for later use.
3. Disconnect the grounding strap from the door. Save the nut for later use.
4. For each of the hinges, locate the hinge pin (Figure 4). Use a hammer or mallet to move the pin upward to its highest position (Figure 5). If the retainer clip becomes dislodged, be sure to retain it for re-installation.
5. Remove the door from the CUBE (Figure 5). The hinge plate and hinge knuckle (one piece) remain attached to the door. The hinge base with the hinge pin remains attached to the CUBE door frame.
6. If there is any identifying information on the existing door (e.g. part number, serial number, etc.), use a permanent marker to copy this information onto the new door surface. Discard or store the removed door according to local practice.

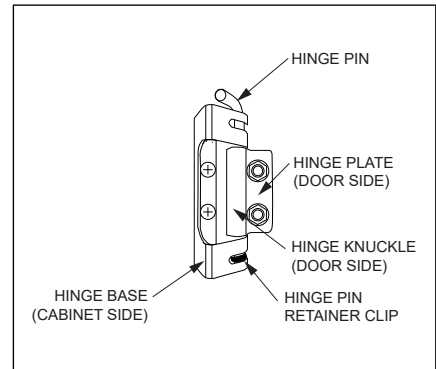


Figure 4 Hinge Assembly

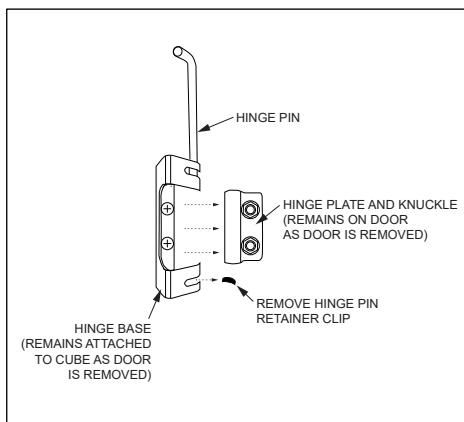


Figure 5 Hinge Separation

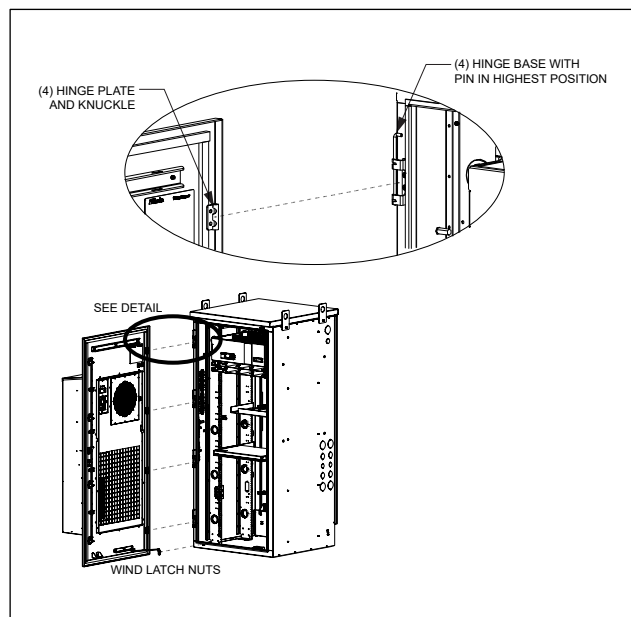


Figure 6 Door Removal and Mounting

2.5.3. Mounting the Kit onto the CUBE

1. Move the replacement door into position so that the hinge knuckles on the replacement door line up with the hinge pin holes on the hinge base on the CUBE door frame (Figure 5). Use local safety practice for lifting the door. Charles recommends using two people to support the weight and a third person to maneuver the hinges into position.
2. While supporting the door weight, secure the door into position by replacing the hinge pins through the hinge knuckles into the lowest pin position. A hammer or mallet may be necessary to lower the hinge pin all the way through the knuckle. Secure the pin by placing the retainer clip in the bottom position (Figure 5).

Note: it is recommended to secure the top and bottom hinge pins first, then the middle two.

3. Connect the wind latch on the replacement door to the CUBE door frame using hardware from Section 2.4.2, step 2.
4. Connect the grounding strap to the replacement door using hardware from Section 2.4.2, step 3.
5. If the thermal unit on the existing door had a wiring service loop, then cut the zip ties to free up the slack. This will make reconnecting wires to the new door easier.

2.5.4. Mounting the Cutoff Switch

The CUBE is equipped with a door intrusion alarm switch at both the front door and the rear panel. This switch is mounted onto the CUBE with a metal plate.

The kit includes two new mounting plates and two HVAC cutoff switches, one for the front door and one for the rear panel. The existing 4-wire door intrusion switch fits into the opening at the right side of the plate, and the new HVAC cutoff switch fits into the left opening. See Figure 7 for mounting hole position numbers.

1. Open the front door, verify the breaker for the door lights is off, and remove the intrusion alarm and light wiring from the door intrusion switch by pulling the connectors. Remove the switch from the existing mounting plate (Figure 8). Set the switch aside for re-installation.
2. Remove the two nuts from the studs at the back of the mounting plate. Keep the nuts. Store or discard the mounting plate per company practice.
3. Push the door intrusion alarm switch (removed previously) into the right side opening in the new mounting plate until it clicks. Push an HVAC 2-wire cutoff switch into the left side opening (Figure 9).
4. Use the two nuts removed previously to mount and secure the new plate onto the same pair of studs that the old plate occupied (Figure 9, studs are on the inside of the door frame). Use mounting hole positions 5 and 6 (Figure 8).
5. Remove the rear panel and repeat this procedure for the rear door intrusion switch.

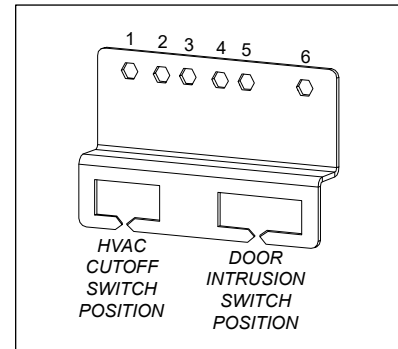


Figure 7
Mounting Hole Positions

Note: The mounting plate must be mounted as close as possible to the center of the CUBE. If the plate is mounted symmetrically on the studs or too close to the side, then there will be interference between the latching hardware and the switches.

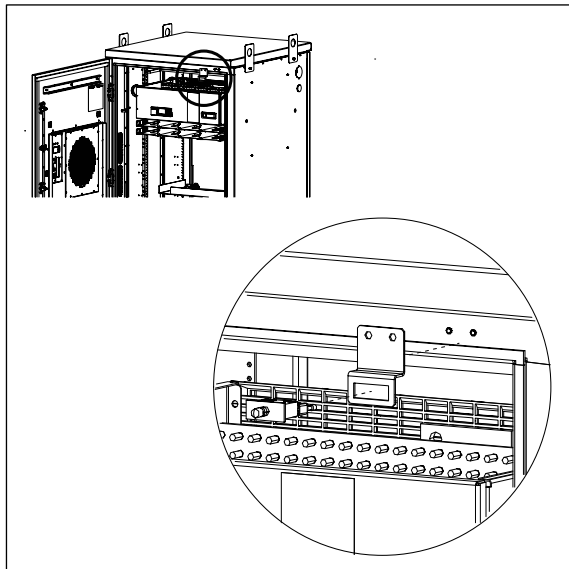


Figure 8 Remove Mounting Plate from CUBE

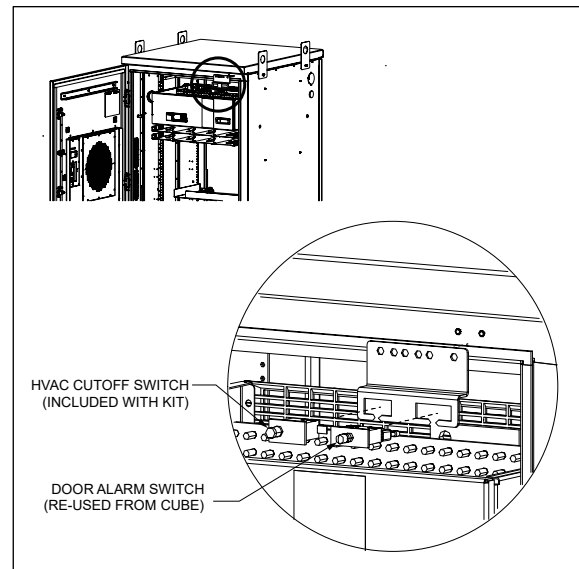


Figure 9 Attach Kit Mounting Plate

2.6. Wiring the HVAC and Switches

Once the replacement door is mounted on the CUBE, connect the new HVAC system, as well as the door intrusion alarm and HVAC cutoff switch wiring. Wires for the new HVAC system are included with the kit.

The door intrusion alarm switch is connected to the lights and to the alarm terminal block. Reconnect the violet and red wires (light) and the brown and brown/white wires (intrusion alarm) to the same positions on the front intrusion switch that they were removed from previously.

The HVAC cutoff switch is connected to the HVAC ON and OFF alarm terminals. Connect the original alarm wires removed previously from the heat exchanger to positions 7 and 8 on the HVAC alarm terminal block. Route all wiring to prevent strain and to avoid pinching in the door. Secure the new HVAC cutoff switch wiring along the existing wire harness using cable ties. Adhesive-backed cable tie mounts are provided on the inside of the door to assist with wire routing above the connection block (preferred), or use cable ties to route wires below the connection block if there is insufficient slack.

Switch wiring is shown in Figures 10, 11, and 12. The completed full wiring schematic is shown in Figure 13. Routing options are shown in Figure 15.

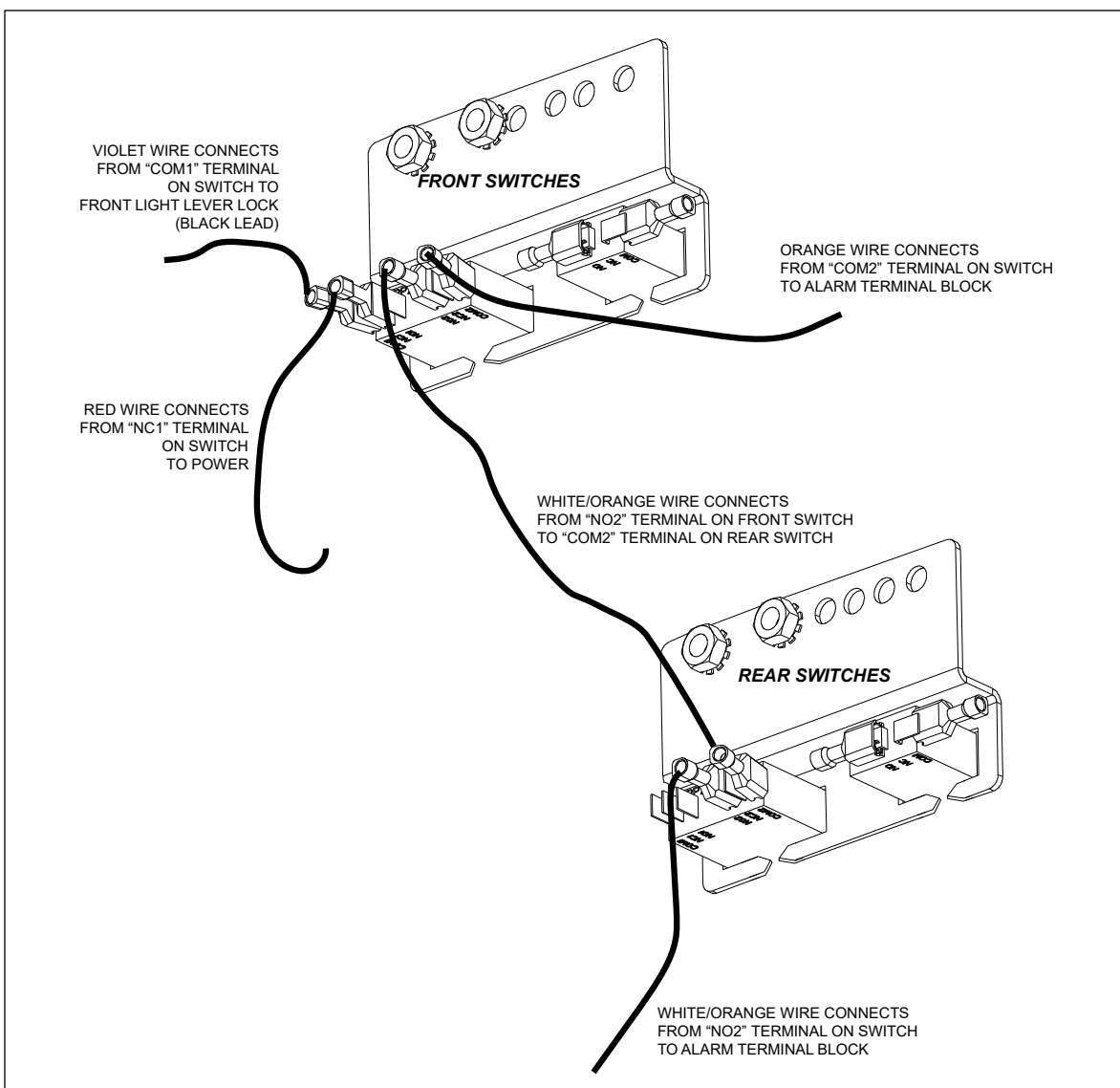


Figure 10 Door Intrusion Switch Wiring

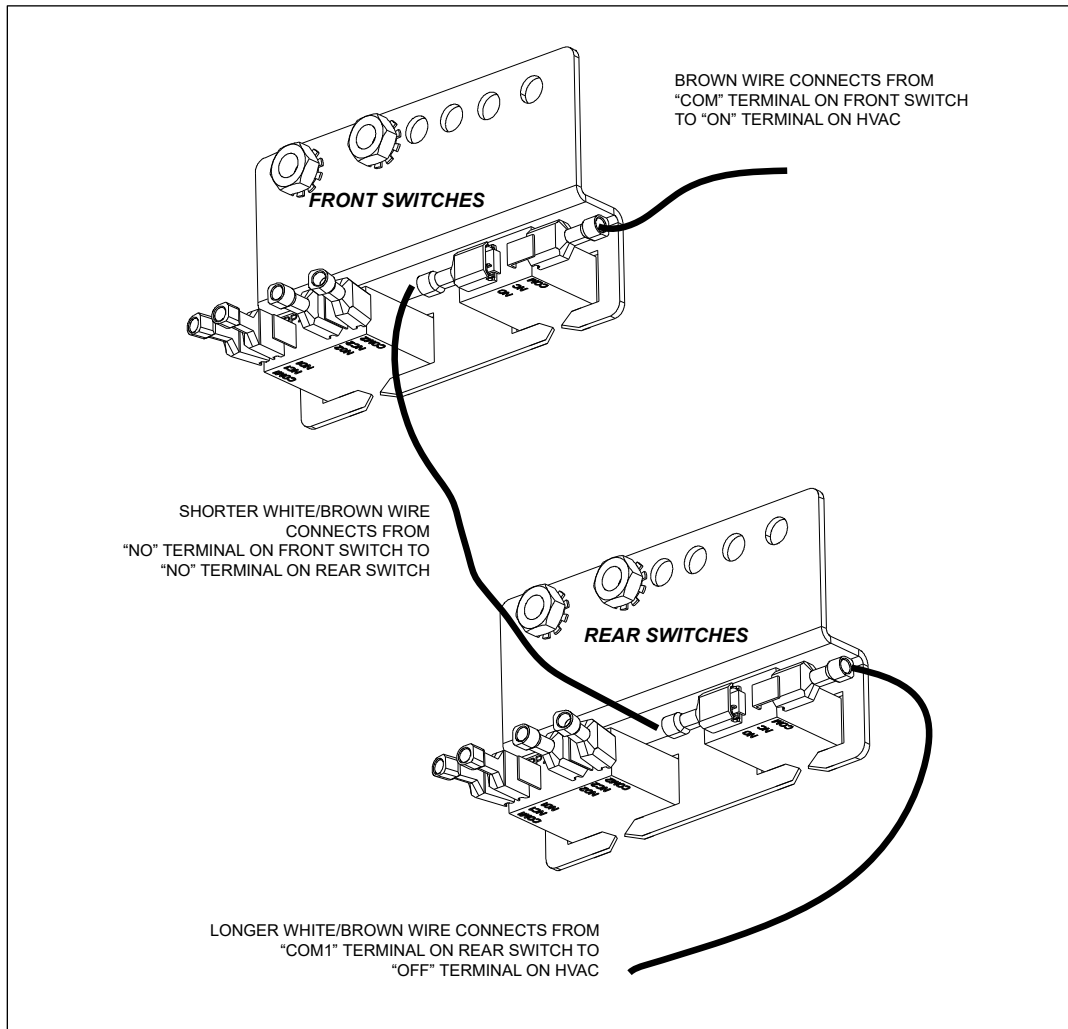


Figure 11 HVAC Cutoff Switch Wiring

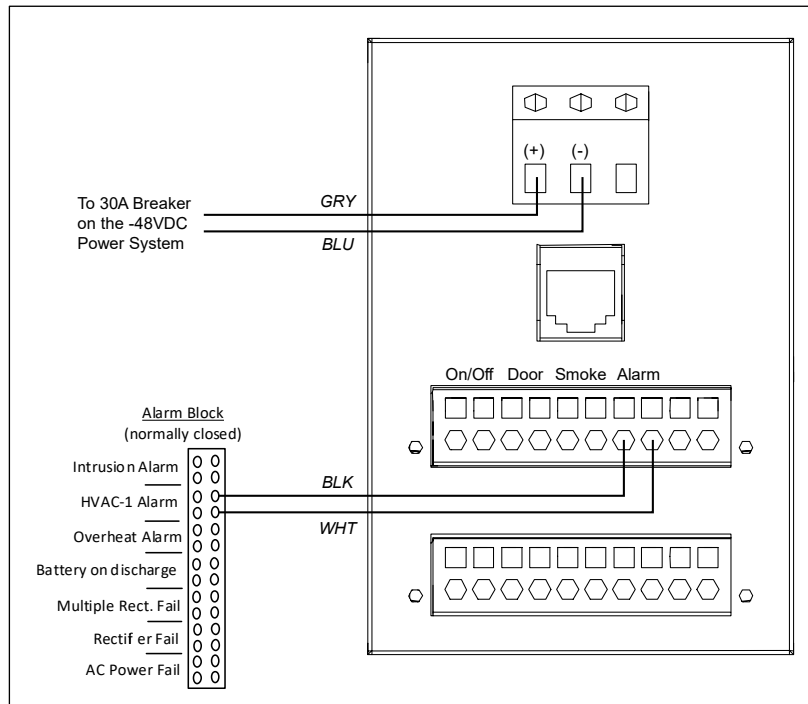


Figure 12 HVAC Wiring Terminals

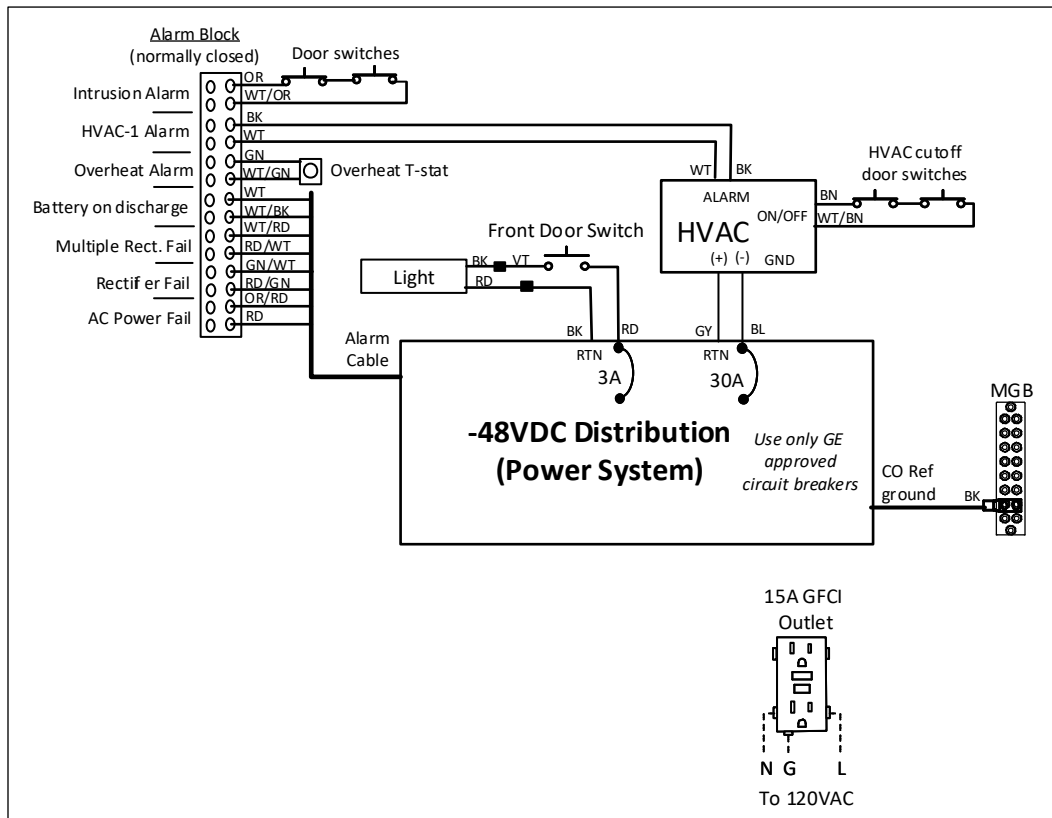


Figure 13 Electrical Diagram of Complete Installation

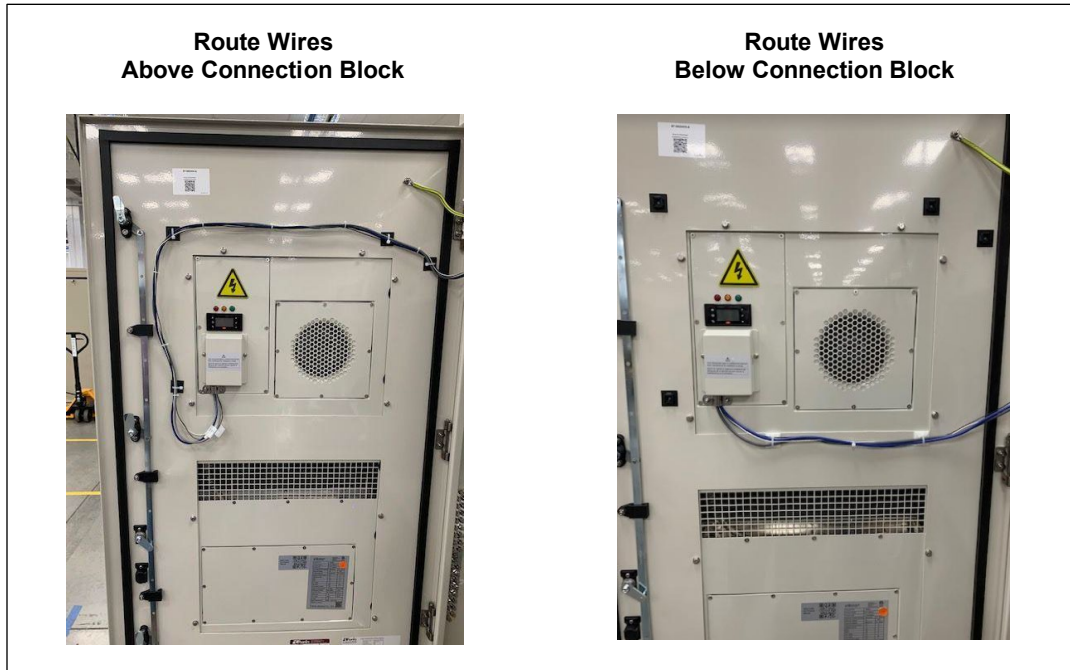


Figure 14 Wire Routing Options

2.7. Installing the Insulation Panels

Note: If customer equipment has been installed in the CUBE, it might need to be removed for better access to the CUBE side and top panels.

Note: If needed, the side and top insulation panels can be cut to make installation easier (Figure 15). When installing the cut panels, ensure that the pieces are placed so that there is no gap in between.

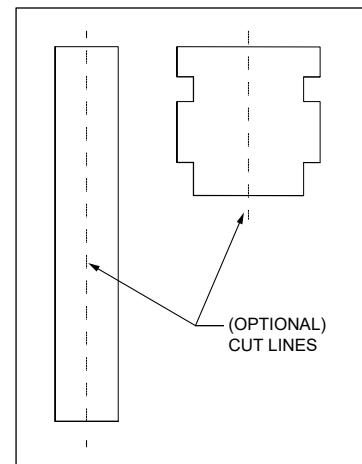


Figure 15 Cut Lines

Use isopropyl alcohol and a clean, dry cloth to clean all surfaces where insulation will be installed. The insulation panels are equipped with VHB tape installed on the back of the panel. Remove the adhesive backing from the tape and affix the insulation panel to the inside of the CUBE where pictured (Figures 16-18). In all images below, the insulation panels are shown in gray.

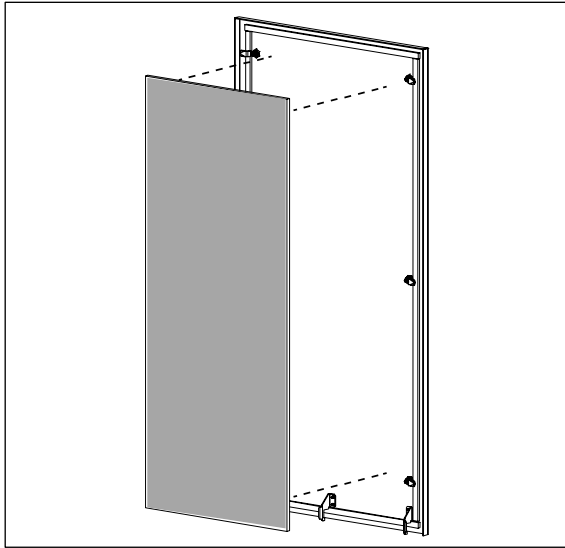


Figure 16 Removable Rear Panel

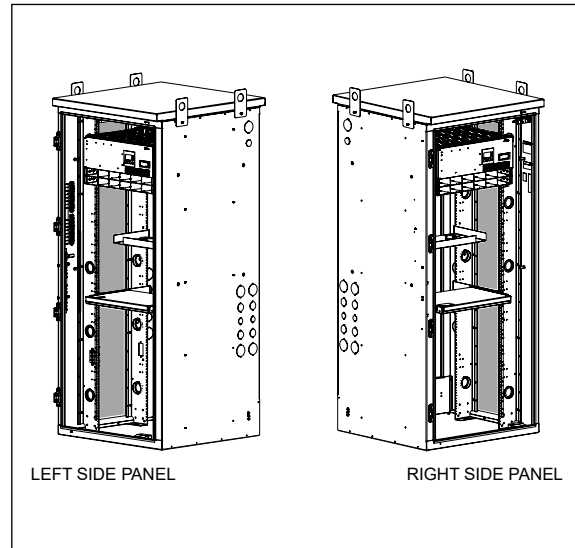


Figure 17 Side Panels (Door hidden)

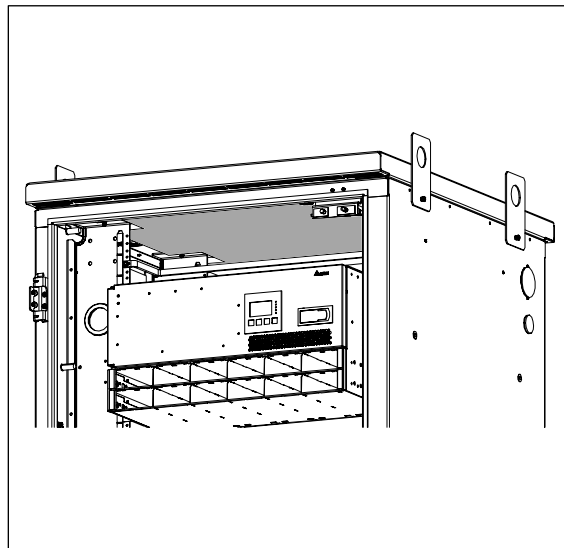


Figure 18 Top Panel

2.8. HVAC Operation

The 6000BTU DC powered HVAC compressor and fans are PID (proportional integral derivative) controlled. The compressor turns on at 33°C at low speed and will increase speed as needed to maintain that temperature. The compressor turns off at 28°C. The internal fan is always on at low speed to continually circulate heat within the cabinet. The heating cycle turns on at 8°C and off at 13°C. The CUBE is equipped with a cutoff switch that shuts off the HVAC compressor when a door is opened to minimize condensation buildup on the coils. For further information, refer to the HVAC documentation that ships with the CUBE.

-NOTE-

Changing the cooling or heating cycles' default factory set points can lead to system performance issues, such as equipment failures, increased power use, unnecessary alarms, noise, condensation build up, compressor or fan failure caused by excessive runtimes and vibration. Avoid placing items in front of the HVAC's return and supply vents. Maintain a minimum of 2" clearance to enable proper air flow.

2.9. Storing the Unused Door

The packing materials can be repurposed to store the door that was removed from the cabinet (Figure 3). Place the door on the pallet in a vertical position, resting the door on top of the pallet. Assemble the cross braces to support the door, ensuring that one cross brace is underneath the thermal unit for additional support. Maintain contact between the door and the pallet and between the thermal unit and the cross brace. If needed, use zip ties to secure the cables to the door and use heavy-duty tape to secure the wind latch. Place any unused hardware and other loose items removed from the cabinet into a manilla envelope and staple or tape this envelope to the pallet for storage. When the packing assembly is re-built, wrap and store according to local practice.

2.10. Completing the Installation

Verify that there is a normally closed connection between the HVAC ON/OFF alarm block positions with the rear panel in place and front door cutoff switch pressed in. Verify that there is a normally closed connection on the alarm block for intrusion alarm with the front door switch pulled out all the way. Apply power and verify that the light turns on when the front door is opened.

3. PERIODIC MAINTENANCE

In the event that the enclosure needs to be opened in freezing conditions, a narrow, pointed metallic object such as a screwdriver or chisel, along with a non-metallic device such as a rubber mallet, may be used to remove excessive ice buildup around the door and locking mechanism. Use a commercial aerosol de-icer spray to free up locks and latches if needed.

Refer to the HVAC manual supplied with the unit (if equipped) for periodic maintenance requirements.

4. TECHNICAL ASSISTANCE AND REPAIR SERVICE

For questions on product repair or if technical assistance is required, contact Charles Technical Support.

847-806-8500

techserv@charlesindustries.com (email)

<http://www.charlesindustries.com/techserv.htm>

5. WARRANTY & CUSTOMER SERVICE

Charles Industries LLC offers a one-year warranty on the kit product. The Charles warranty is limited to the operation of the kit hardware as described in this documentation and does not cover equipment which may be integrated by a third party. The terms and conditions applicable to any specific sale of product shall be defined in the resulting sales contract. For questions on warranty or other customer service assistance, contact your Charles Customer Service Representative.

847-806-6300

mktserv@charlesindustries.com (email)

http://www.charlesindustries.com/main/telecom_sales_support.htm

6. SPECIFICATIONS

Physical	
Weight	Approx. 105 lbs. as shipped
Materials	0.125" aluminum
Color	Off-white
Thermal	
HVAC System	48VDC, Vikinor VAK-1500-DC
Cooling Capacity	6000BTU
Kits and Replacement Parts	
Touch-up Paint	02-000290-0
Swing Handle	39-000148-0
Latch	39-200974-0
Door Intrusion Switch (4-wire)	17-400329-1
HVAC Cutoff Switch (2-wire)	17-400322-0

Table 1 Kit Specifications