

# Charles Retrofit Kit

## 97-002490-A

### General Description and Installation

- 1. GENERAL INTRODUCTION ..... 1
  - 1.1. Document Purpose ..... 1
  - 1.2. Product Purpose..... 1
- 2. INSTALLATION..... 2
  - 2.1. Inspecting the Product ..... 2
  - 2.2. Following and Using Safety Precautions..... 2
  - 2.3. Obtaining Tools and Equipment ..... 2
  - 2.4. Installing the Kit..... 2
- 3. TECHNICAL ASSISTANCE AND REPAIR SERVICE ..... 6
- 4. WARRANTY & CUSTOMER SERVICE ..... 6
- 5. SPECIFICATIONS..... 6

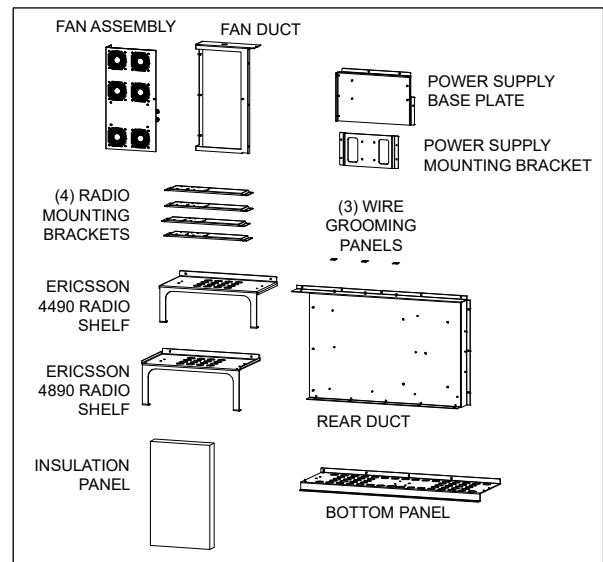
### 1. GENERAL INTRODUCTION

#### 1.1. Document Purpose

This document provides general information for the 97-002490-A retrofit kit for the of the Charles Industries’ Universal Broadband Enclosure CUBE-SC2NN12HN4. Figure 1 shows the kit components. Hardware and a 50A breaker are not pictured.

-NOTE-

*Hereafter, the Charles 97-002490-A retrofit kit will be referred to as the kit. The CUBE-SC2NN12HN4 will be referred to as the “CUBE.”*



**Figure 1 Kit Components**

#### 1.2. Product Purpose

The kit includes a set of mounting brackets, direct air cooling (DAC) fans, and hardware to retrofit the CUBE to a new configuration. A 50A breaker is included, to be mounted in the AC breaker box in the CUBE.

The brackets support one Ericsson 4467 radio, one Ericsson 4490 radio, one Ericsson 4890 radio, one Ericsson 4478 radio, and one Ericsson 6308 power supply. Radios and power supply are customer supplied.

Note: for best thermal performance, all radios must include the manufacturer-provided fan module.

## 2. INSTALLATION

### 2.1. Inspecting the Product

The kit is shipped in a carton. Unpack the unit and dispose of the packaging material.

*-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.

- 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.

- Protective and/or insulated work gloves
- Safety glasses
- Slotted, hex, and Phillips screwdrivers
- Torque wrench
- Utility knife
- Cable ties

### 2.4. Installing the Kit

#### 2.4.1. 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%

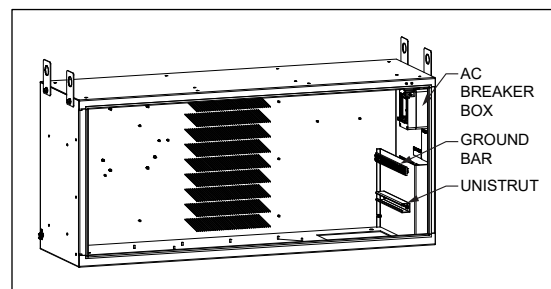
#### 2.4.2. Preparing the CUBE

The CUBE includes brackets and equipment from the previous configuration. Remove all equipment, fans, and brackets (Figure 2). The exceptions are the bracket on the right-side panel that holds the ground bar and the unistrut bracket and the AC breaker box (these components remain in the CUBE).

Store or discard equipment, fans, and brackets per company practice.

When installing the kit components, unless otherwise specified, mounting hardware is included with the kit.

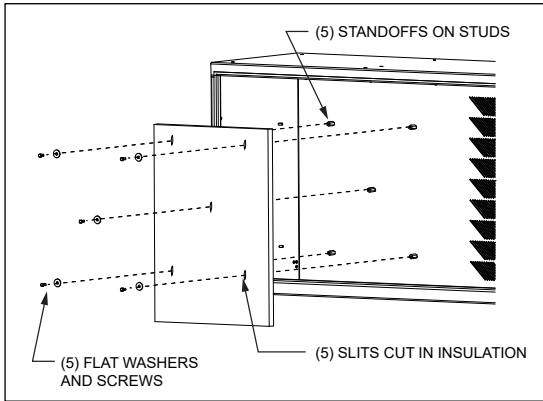
Inspect the insulation panel in the CUBE. If it is damaged, then remove it so that it can be replaced with the new panel included with the kit. If the existing panel is in good condition, then it can be left in place.



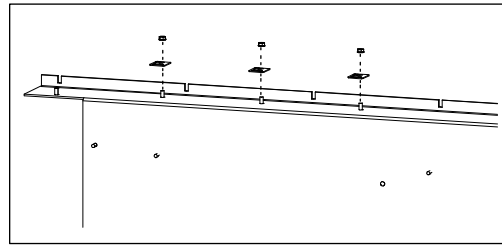
**Figure 2 Empty CUBE**

**2.4.3. Installing the Kit**

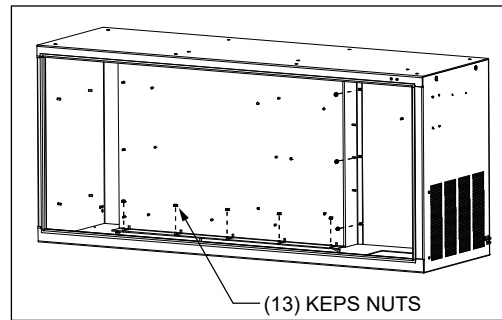
1. If replacing the insulation panel, locate the five standoffs on the CUBE rear panel. The standoffs are used to keep the insulation panel stationary.
2. Place the insulation panel over the standoffs and push the insulation back against the CUBE rear panel. Use a utility knife to cut small slits in the insulation panel where it will align with the standoffs.
3. Use five screws with flat washers to secure the insulation panel to the CUBE rear panel (Figure 3).
4. Install the three wire grooming plates to the studs on top of the rear duct using one Keps nut per plate (Figure 4).
5. Install the rear duct to the CUBE rear panel using thirteen Keps nuts along the top, right side, and bottom of the rear duct (Figure 5).



**Figure 3 Insulation Panel**

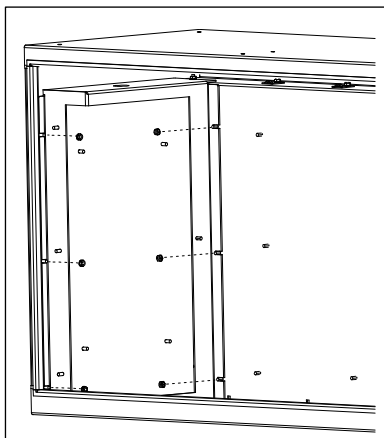


**Figure 4 Wire Grooming Plates**

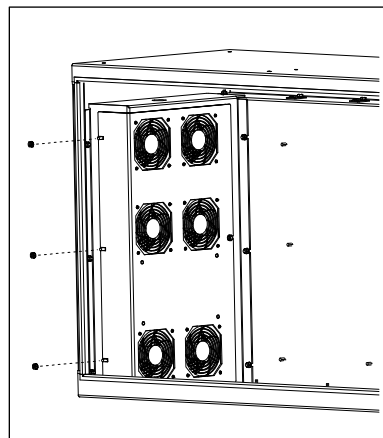


**Figure 5 Rear Duct**

6. Install the fan duct and secure it against the left side panel of the CUBE using three Keps nuts and to the studs on the rear duct using three more Keps nuts (Figure 6).
7. Install the fan assembly into the fan duct using three Keps nuts (Figure 7).



**Figure 6 Fan Duct**



**Figure 7 Fan Assembly**

8. The fan control sensor is a thermistor on the end of a wire that comes out of the hole at the top of the fan assembly. This thermistor must be placed as far as possible toward the right side rear duct to monitor thermal performance. Route the thermistor wire along the top of the rear duct, securing to the wire grooming plates using customer supplied wire ties (Figure 8).
9. Install the power supply base plate to the CUBE rear panel, to the right of the rear duct using five Keps nuts (Figure 9).
10. Install the bottom panel to the bottom of the CUBE using eight Keps nuts (Figure 10).

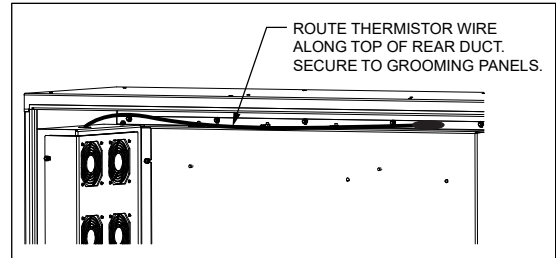


Figure 8 Thermistor Wire

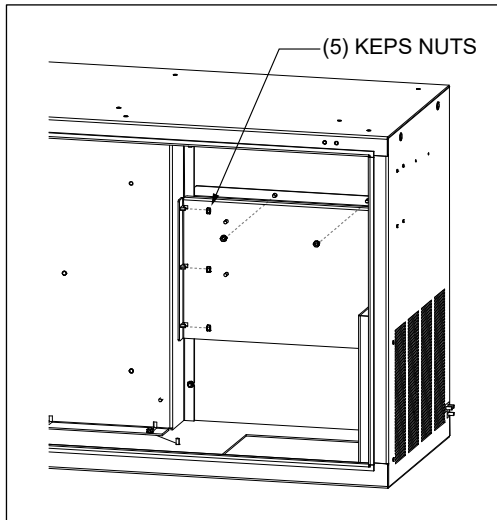


Figure 9 Power Supply Base Plate

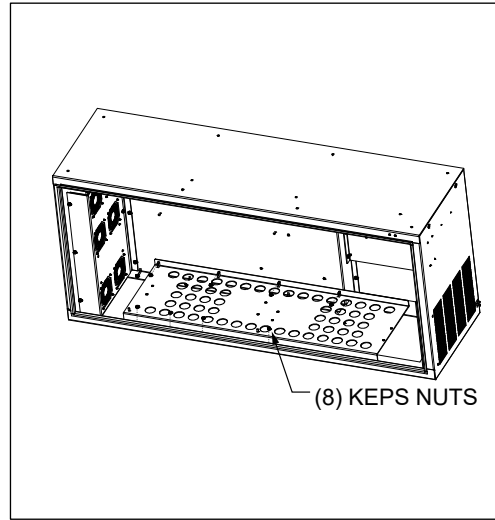


Figure 10 Bottom Panel

11. The two radio shelves are stacked together, with the taller of the two shelves (for the 4890 radio) on the bottom. Secure the lower shelf to the bottom panel and then secure the upper shelf to the top of the lower shelf (Figure 11). For each shelf, use two Keps nuts with flat washers to the panel below and two Keps nuts to the rear panel)
12. Attach the power supply and radios to their mounting brackets before installing them in the CUBE (Figure 12). Use customer supplied hardware to secure the brackets to the back of the equipment.

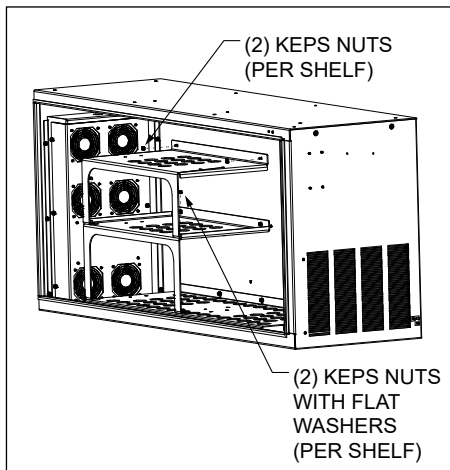


Figure 11 Radio Shelves

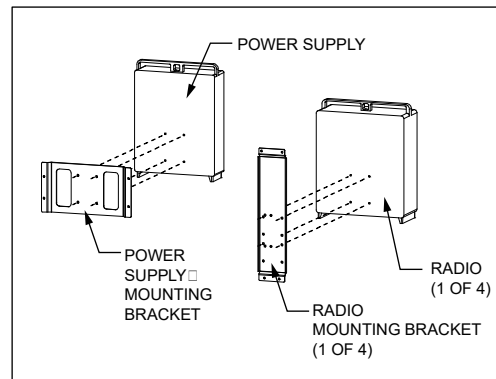
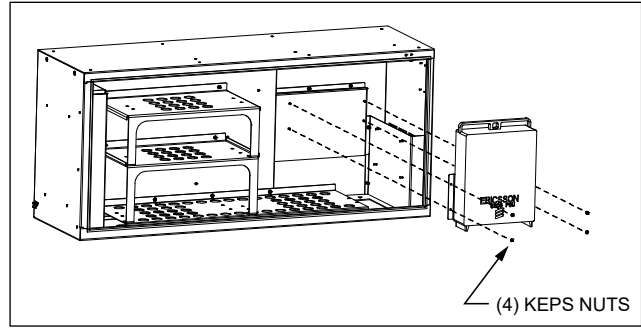


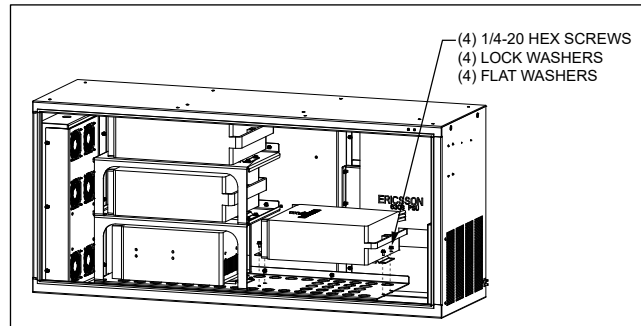
Figure 12 Power Supply and Radios to Brackets

13. Use four Keps nuts to mount the power supply and bracket to the power supply base plate (Figure 13).
14. Install the radios. Make sure all radios are equipped with the manufacturer-supplied fan modules. For optimum thermal performance, install radios in the locations given here. Use four screws, lock washers, and flat washers per radio bracket (Figure 14).
  - o 4490 radio on upper shelf
  - o 4890 radio on lower shelf
  - o 4478 radio on bottom panel, underneath shelves
  - o 4437 radio on bottom panel, to the right of the 4478 radio

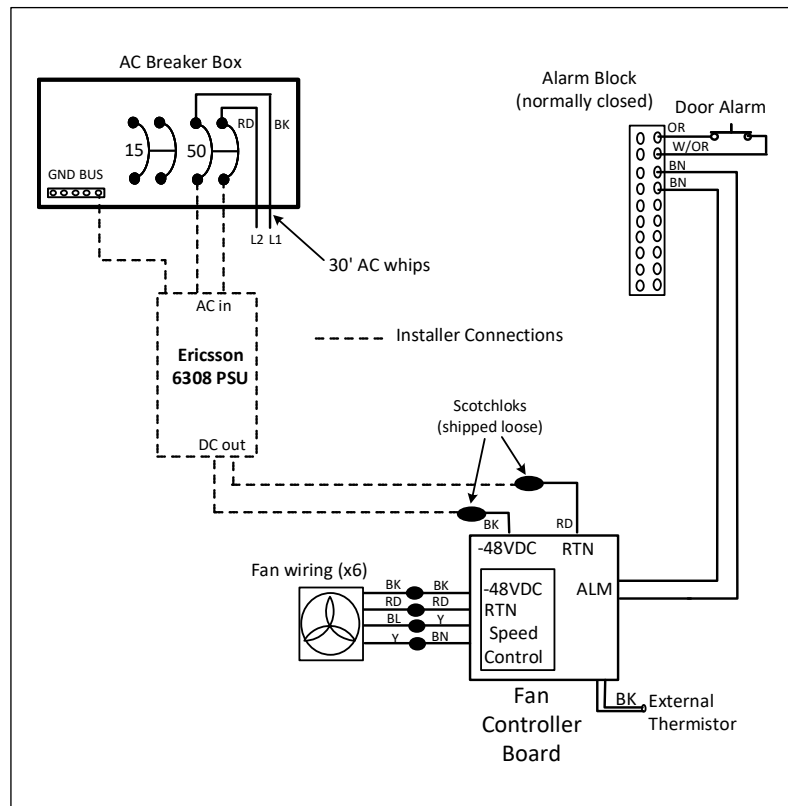


**Figure 13 Power Supply**

15. Connect the 6308 power supply to the AC breaker box by replacing the breakers in the box with a 50A 2-pole breaker (included with the kit). To install this breaker, first remove the box from the CUBE and route 8AWG wiring through the hole in the underside of the box. Reattach the box to the CUBE. Connect the 6308 power supply to the 50A breaker, and route fan wiring to the power supply (Figure 15).

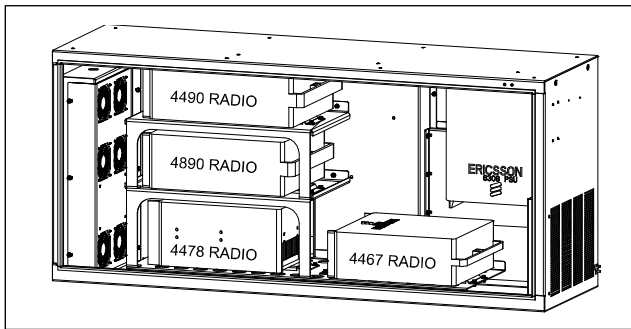


**Figure 14 Radios**



**Figure 15 Fan Wiring**

Figure 16 shows the complete installation.



**Figure 16 Complete Installation**

### 3. 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](mailto:techserv@charlesindustries.com) (email)  
<http://www.charlesindustries.com/techserv.htm>

### 4. WARRANTY & CUSTOMER SERVICE

Charles Industries LLC offers a one-year warranty on the CUBE product. The Charles warranty is limited to the operation of the CUBE hardware as described in this documentation and does not cover equipment that 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](mailto:mktserv@charlesindustries.com) (email)  
[http://www.charlesindustries.com/main/telecom\\_sales\\_support.htm](http://www.charlesindustries.com/main/telecom_sales_support.htm)

### 5. SPECIFICATIONS

Physical	
Weight	Approx. 110 lbs. as shipped CUBE, kit, and customer equipment total weight: 536 lbs.
Materials	0.125" aluminum: power supply base plate and bracket, rear duct, fan duct 0.063" aluminum: wire grooming plates Steel: radio mounting brackets, bottom panel, radio shelves
DAC Fans	48VDC, 243CFM, Delta PFB1248UHE-EP

**Table 1 Kit Specifications**