

Charles Universal Broadband Enclosure

CUBE-PM4110-A

General Description and Installation

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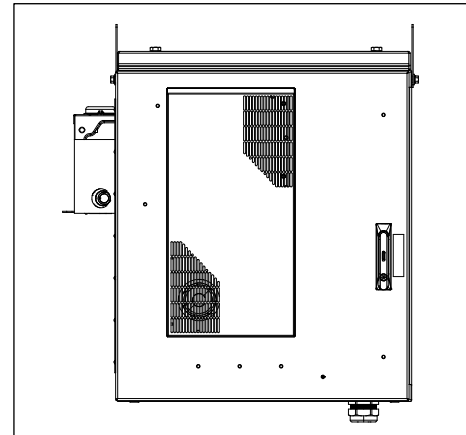


Figure 1 Front View of the CUBE

1. GENERAL INTRODUCTION

1.1. Document Purpose

This document provides general information for the CUBE-PM4110-A of the Charles Industries' Universal Broadband Enclosure (CUBE) product line. Figure 1 shows a closed front view of the enclosure.

-NOTE-

Hereafter, the Charles Universal Broadband Enclosure CUBE-PM4110-A will be referred to as the "CUBE."

1.2. Product Purpose

The CUBE consists of a protective enclosure for an integrated system of electronic components and equipment that can serve fiber and copper interfaces.

1.3. Product Mounting and Location

This enclosure is suitable for outside plant-type (OSP) locations and those that may require NEC compliance. The outdoor, weather-resistant CUBE is to be mounted on a concrete pad, wall, pole, or H-frame. The installer connects the power, fiber, and copper connections. Detailed mounting and installation information is covered in Section 3.

2. PRODUCT DESCRIPTION

CUBE consists of a single equipment compartment with 10RU of 23” rack spacing, a 2-position AC load center, and a 760W heat exchanger.

Figure 2 shows the CUBE dimensions and Figure 3 shows the CUBE components.

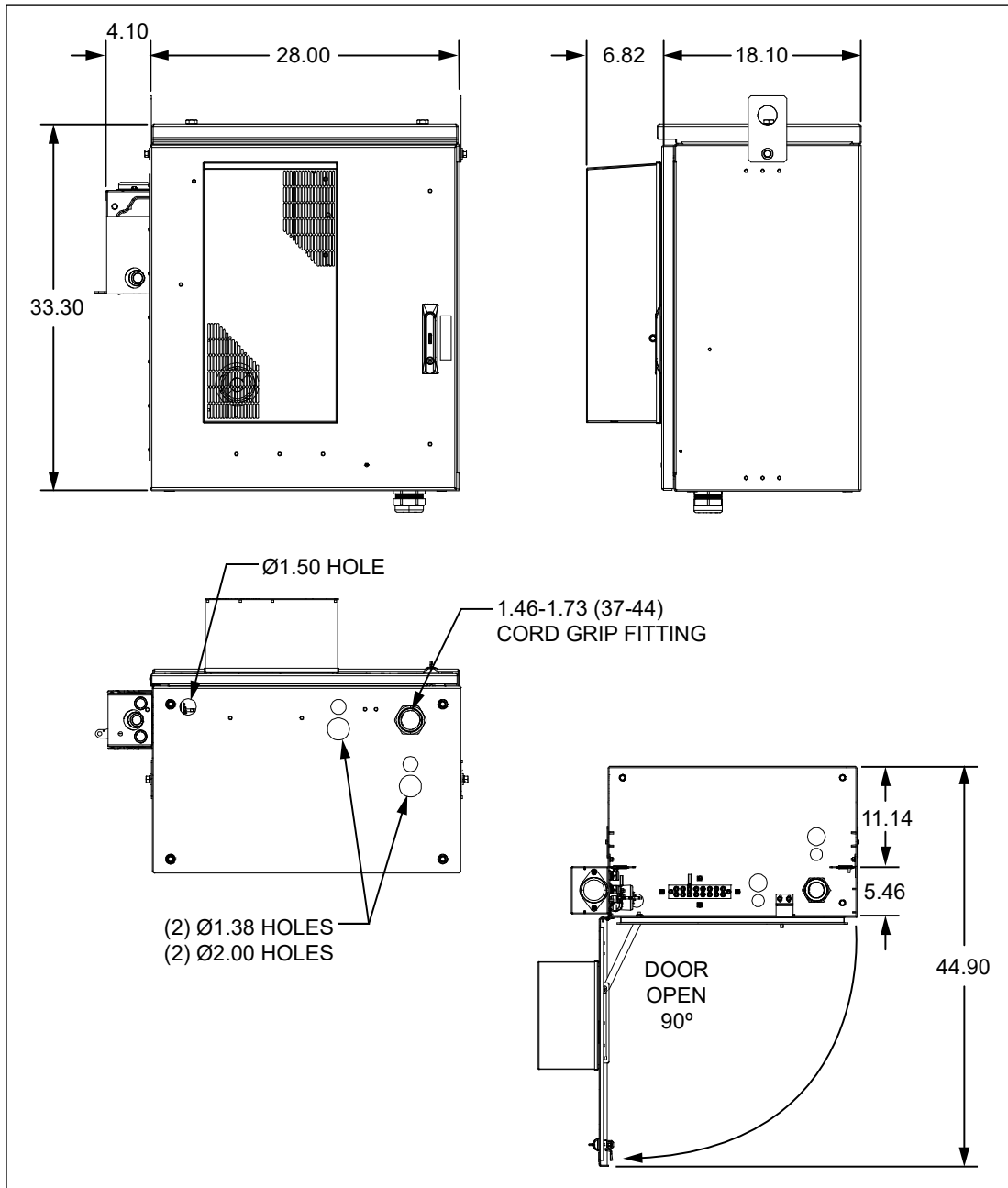


Figure 2 CUBE Dimensions (in inches)

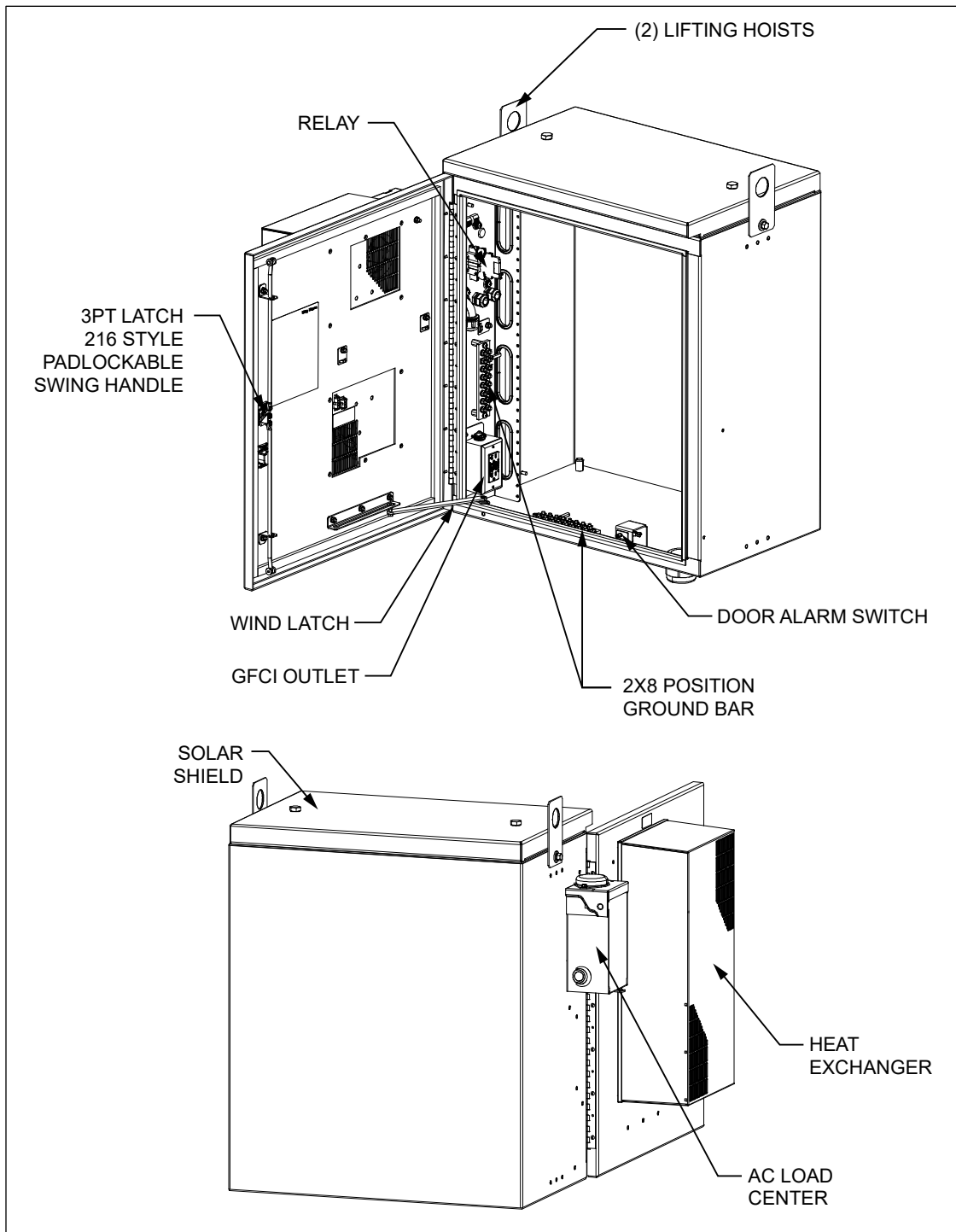


Figure 3 CUBE Components

3. INSTALLATION

3.1. Inspecting the Product

The CUBE is shipped mounted upright on a skid. Remove the bolts, 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.

3.2. 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.
- Always connect ground connections first.
- 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 CUBE.
- In windy conditions, be sure to engage the door latches to secure the door in a stationary position.

3.3. Obtaining Tools and Equipment

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

- Protective and/or insulated work gloves
- Safety glasses
- Tape measure
- Marking utensil
- #6 ground wire or rod and earth ground materials
- Bond strap (optional, from cable bond clamp to bond post)
- Any exterior cable strain relief, per company practice
- Slotted, hex, and Phillips screwdrivers
- Torque wrench
- Assorted cable ties, clips, or fasteners (optional)
- Can wrench (216 type tool)
- Derrick for lifting
- Level

3.4. Preparing the Installation Site

Observe the following site preparation recommendations.

- Leave adequate horizontal and vertical space between multiple installations to allow for proper cable access, as well as enough room around the enclosure to open the door(s).
- The site must meet minimal personnel and equipment safety requirements.
- The distance from the cable entry point should be consistent with local installation practices.
- The pad, wall, pole, or h-frame must be able to support the weight of the CUBE.
- Run all fiber and copper facilities to the site.

3.5. Lifting the CUBE

See Table 1 for CUBE weight. Use appropriate lifting equipment (e.g. hand truck) when moving and installing the CUBE.

3.6. Mounting the CUBE

Enclosures can be mounted on a wall, H-frame, pole, or pad. Refer to Figure 2 for mounting dimensions for positioning mounting hardware. Charles recommends using a minimum SAE Grade 2, corrosion-resistant bolts, washers and nuts for all mounting applications. Use 1/2" diameter hardware for pad mounting or 3/8" diameter hardware for all other mounting styles. Bolts need to be of sufficient length depending on which type of mounting is used.

A minimum of 3/4" thick plywood or similar surface is required for wall mounting.

Charles kit 97-CABPMTKIT is available for pole-mount applications.

Charles kit 97-001971-A contains hardware for mounting to H-frame unistruts.

Charles kit 97-PM4X18PLTH-A contains a 24" plinth and hardware for mounting to a pad. Kit 97-002002-A contains a 10" plinth.

3.6.1. 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%

3.7. CUBE Wiring and Equipment

After the CUBE is properly mounted in the desired location, apply No-Ox where bus bar and other 2-hole lug connections will be made. Install ground and power connections. Always ground the equipment first, before making any other connections.

	WARNING	Perform all bonding and grounding connections prior to any electrical and communications connections.
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In order to prevent condensation prior to being placed in service, do not remove the desiccant until the CUBE is sealed and power is applied. A basic electrical diagram is shown in Figure 4.

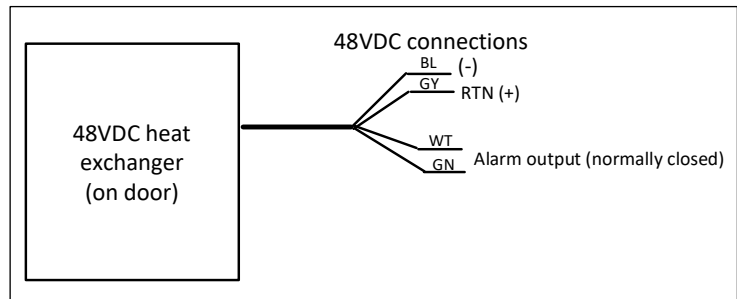


Figure 4 Electrical Diagram

3.7.1. Ground Connection

Use the two 2x8 position ground bars provided in the equipment compartment for all grounding of internal equipment and for connecting a site ground wire. Stack hardware as shown in Figure 5.

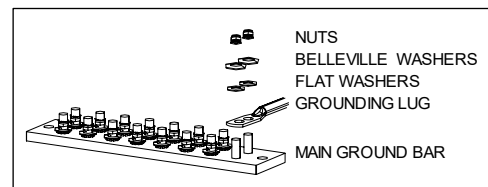


Figure 5 Ground Bar Hardware Stack

3.7.2. Heat Exchanger Operation

The 760W DC powered heat exchanger in the equipment compartment has a fan speed controller and includes an internal and an external fan. Both fans’ speed increases with increasing internal cabinet temperature. Fans and heat exchanger settings are defined below, and are based off of the cabinet interior temperature. The maximum airflow amount supplied to the equipment by the heat exchanger is 147CFM.

Setting	Internal	External
Turn-on Setting (5°C Differential)	0°C	30°C
Medium Temp Setting	30°C	35°C
High Temp Setting	45°C	50°C
High Temp Alarm Setting	70°C	N/A
Low Temp Alarm Setting	-40°C	N/A

For more information, refer to the heat exchanger documentation found inside the CUBE.

-NOTE-

Changing the speed controller default factory set points can lead to system performance issues, such as equipment failures, increased power use, unnecessary alarms, noise, condensation build up, fan failure caused by excessive runtimes and vibration. Avoid placing items in front of the heat exchanger’s return and supply vents. Maintain a minimum of 6” clearance to enable proper air flow.

3.7.3. Alarm Block Connections

A 10-position, labeled alarm block monitors components in the equipment compartment. See the electrical diagram for information about alarm connections. All connections are normally closed and will open upon alarm.

3.7.4. Fiber and Copper Entry

The CUBE has multiple holes and one cord grip fitting on the bottom for routing conduit. See Figure 2 for locations. The Ø1.38”, Ø1.50” and Ø2.50” holes accommodate Ø1.00”, Ø1.25”, and Ø1.50” conduit fittings, respectively.

3.8. Conduit Seals

All internal and external conduit openings on the CUBE must be completely sealed with a duct seal compound to prevent moisture from entering the equipment compartment. Use a moldable, flame-retardant putty style duct seal material. Do not use an expanding foam seal. Mold the putty so that the open space around the wire or conduit is completely sealed, as shown in Figure 6. If the openings must be accessed at any time, remove the putty and set it aside. When work is complete, re-mold the putty to re-seal the opening.

3.9. Verifying the Installation

Verify that earth ground and all grounding and bonding is complete and functional. After verifying that all installer connections are secure and complete, apply voltage.

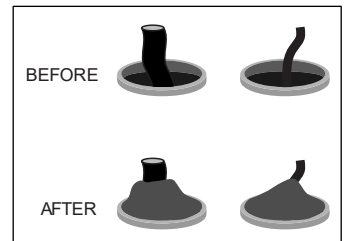


Figure 6 Applying Putty Seal

4. 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.

The heat exchanger requires no scheduled maintenance other than cleaning the fans and heat exchanger core if they become contaminated with dust or residue. Remove the cover by removing the screws on the outside. Examine periodically to determine the required cleaning periods based on the installed environmental conditions.

5. 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>

6. 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 (email)

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

7. SPECIFICATIONS

7.1. Regulatory Specifications

- Designed to meet GR-487
- GFCI: UL-943 Listed

If CUBE's are field-modified, a customer provided ETL field evaluation of the modified components may be required to re-establish ETL certification to UL standards. Consult local jurisdictions for guidance on a site-by-site basis.

7.2. Product Specifications

Physical	
Dimensions	33"Hx28"Wx18"D
Weight	Approx. 105 lbs. as shipped
23" Equipment Rack Space and Hole Spacing	17.5" (10RU) rack spacing with tapped EIA #12-24 mounting holes
Maximum Supported Weight	Rack Rails: 110 lbs.
Materials	0.125" aluminum
Color	Off-white
Electrical	
AC Load Center	Square D QO24L70
Bonding and Grounding	Two 2x8 position ground bars inside CUBE
Cable Entry	See Figure 2, section 3.7.4
Thermal	
Heat Exchanger	760W, 48VDC, Vikinor VHC-040-DC
Maximum Heat Dissipation	720W@19°C above ambient with solar
Environmental	
Operating Temp. Range, Outside Enclosure	-40° to +115°F, -40° to 46°C
Operating Temp Range, Inside Enclosure	-40° to +149°F, -40° to 65°C
Humidity	0 to 95% (non-condensing)
Altitude	Up to 2,000 meters (6560 feet)
Kits and Replacement Parts	
Touch-up Paint	02-000290-0
216 Type Security Tool	07-002070-0
Swing Handle	39-000335-0
H-frame Mounting Kit	97-001971-A
Pole Mounting Kit	97-CABPMTKIT
Plinth Kits	24": 97-PM4X18PLTH-A 10": 97-002002-A
2-Wire Door Alarm Switch	17-400314-0
GFCI Outlet	15A, 04-100244-0

Table 1 CUBE Specifications