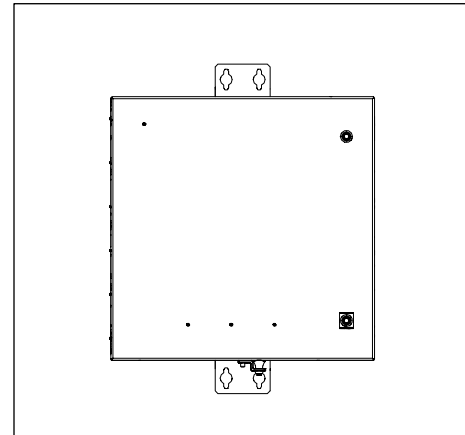


# Charles Universal Broadband Enclosure

## CUBE-MP2424AMRx Series

### 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-MP2424AMRx series 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-MP2424AMRx series will be referred to as the “CUBE” or by individual part numbers.*

### 1.2. Product Purpose

This 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 wall or pole. The installer connects the power, fiber and copper connections. Detailed mounting and installation information is covered in Section 3.

## 2. PRODUCT DESCRIPTION

The AMR1, AMR2, AMR3, and AMR4 each include three 6-position connectors, an AC surge suppressor, a housing for a CCH connector, and a CCH splice cassette that ships loose with the CUBE. They differ in the number of -48VDC power supplies and the number of Transition Network injector-converters, as described below. The AMR7 model includes an AC surge suppressor, terminal blocks, and DIN mounting plates.

Model	Number of Injector-Converters	Number of Power Supplies
CUBE-MP2424AMR1	1	1
CUBE-MP2424AMR2	2	1
CUBE-MP2424AMR3	3	2
CUBE-MP2424AMR4	4	2
CUBE-MP2424AMR7	n/a	n/a

Figure 2 shows the CUBE dimensions. Figures 3 through 6 show the main components of each model.

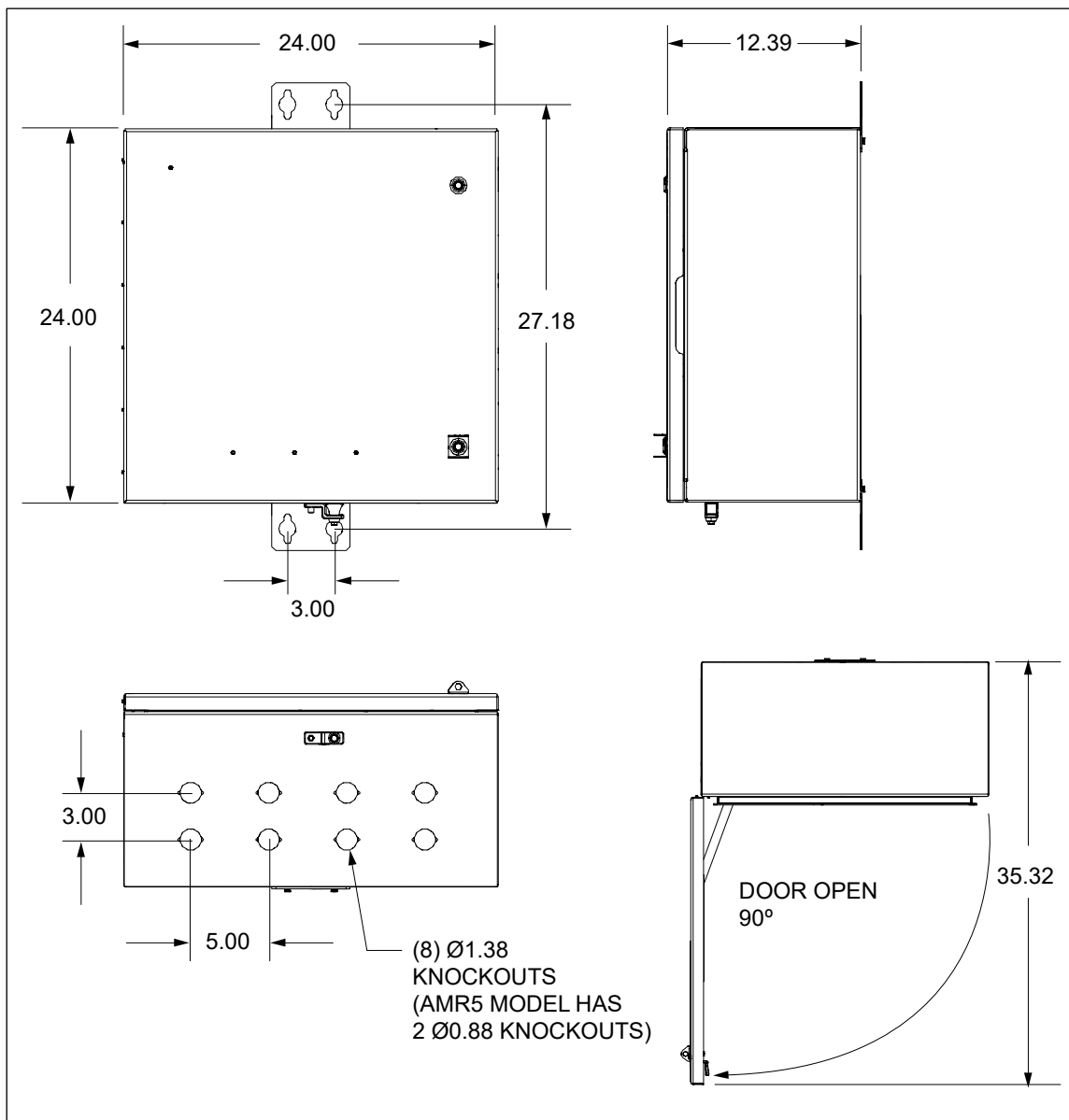
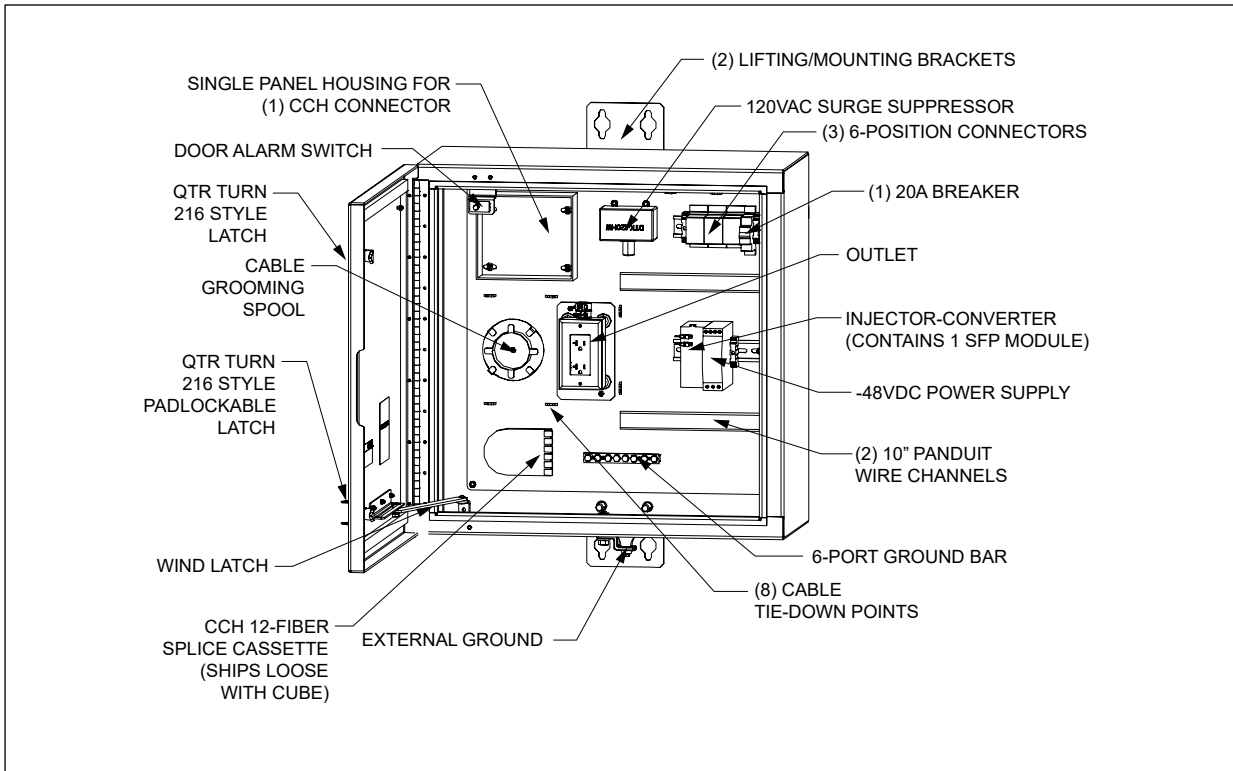
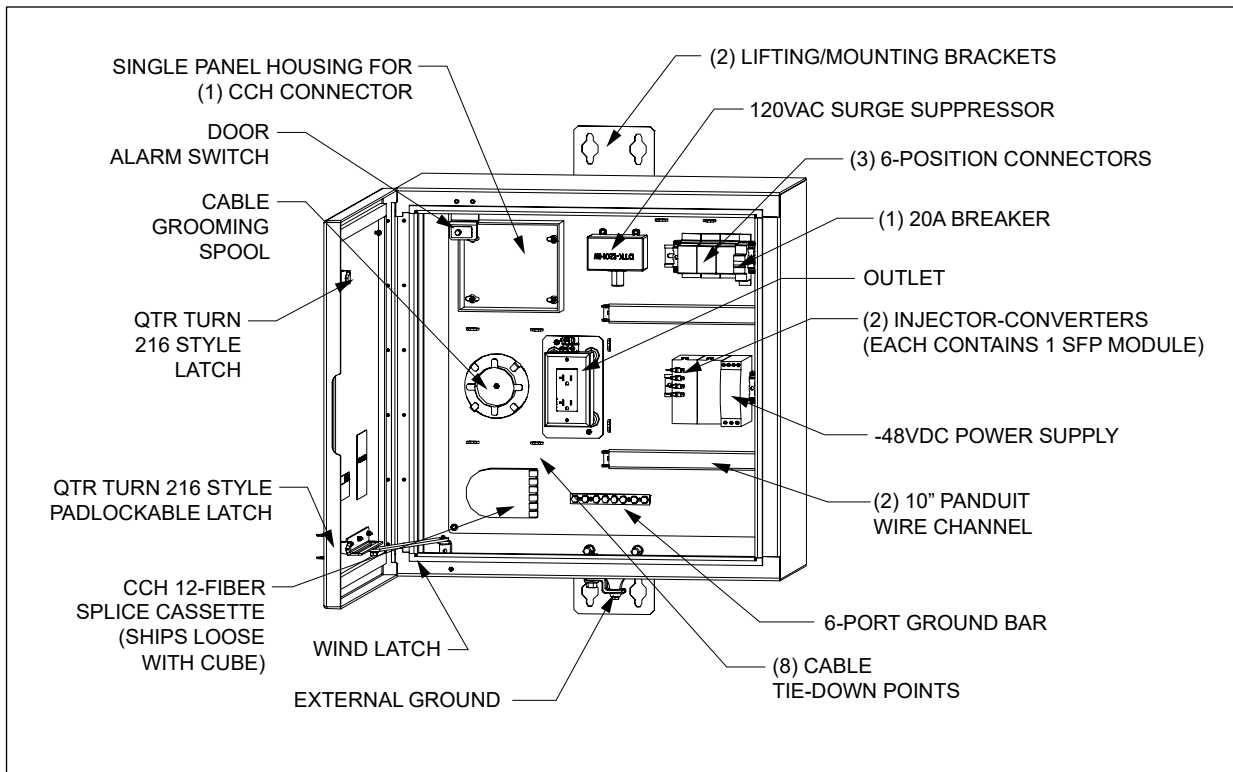


Figure 2 CUBE Dimensions (in inches)



**Figure 3 MP2424AMR1 Components**



**Figure 4 MP2424AMR2 Components**

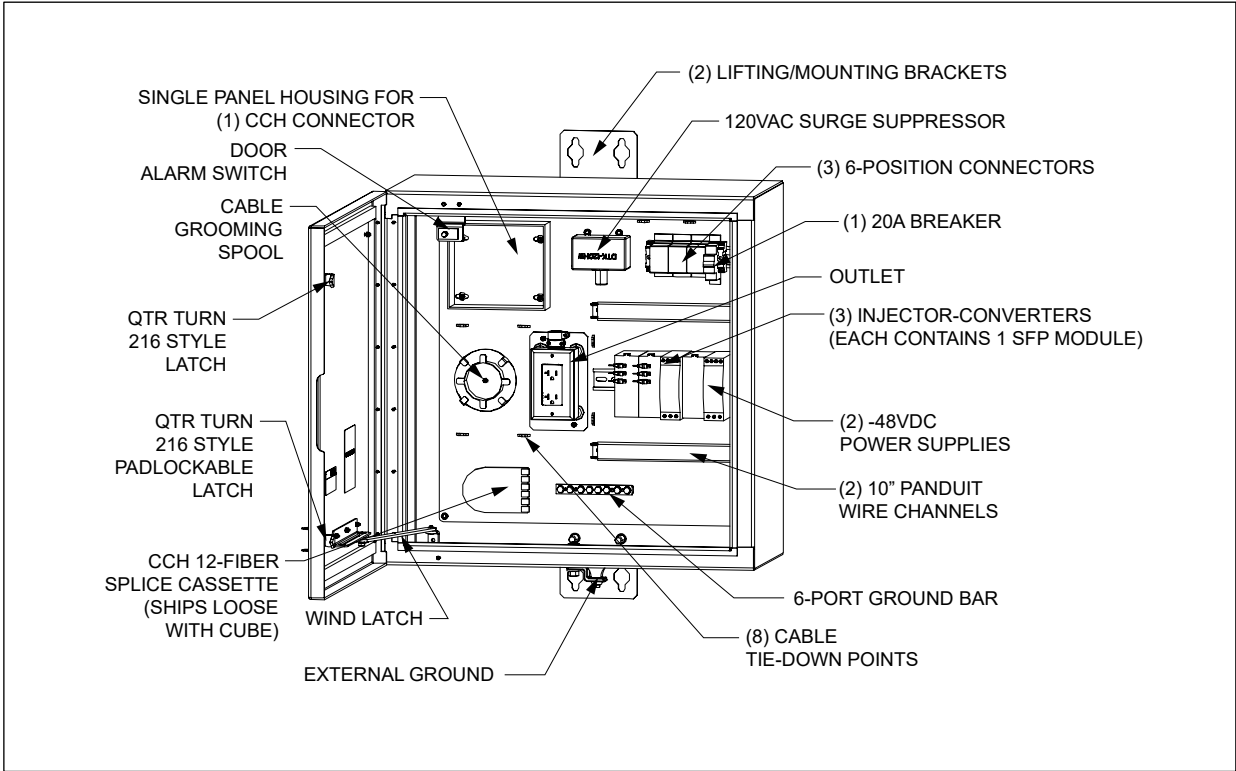


Figure 5 MP2424AMR3 Components

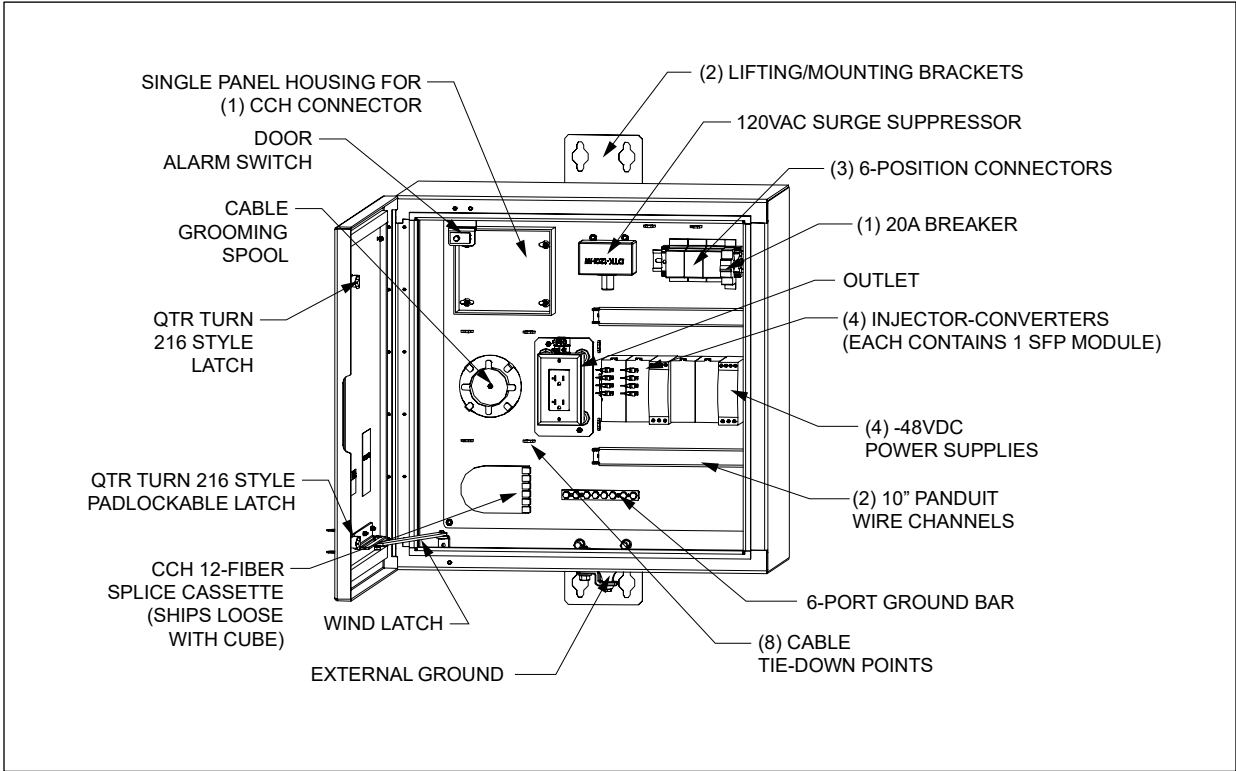
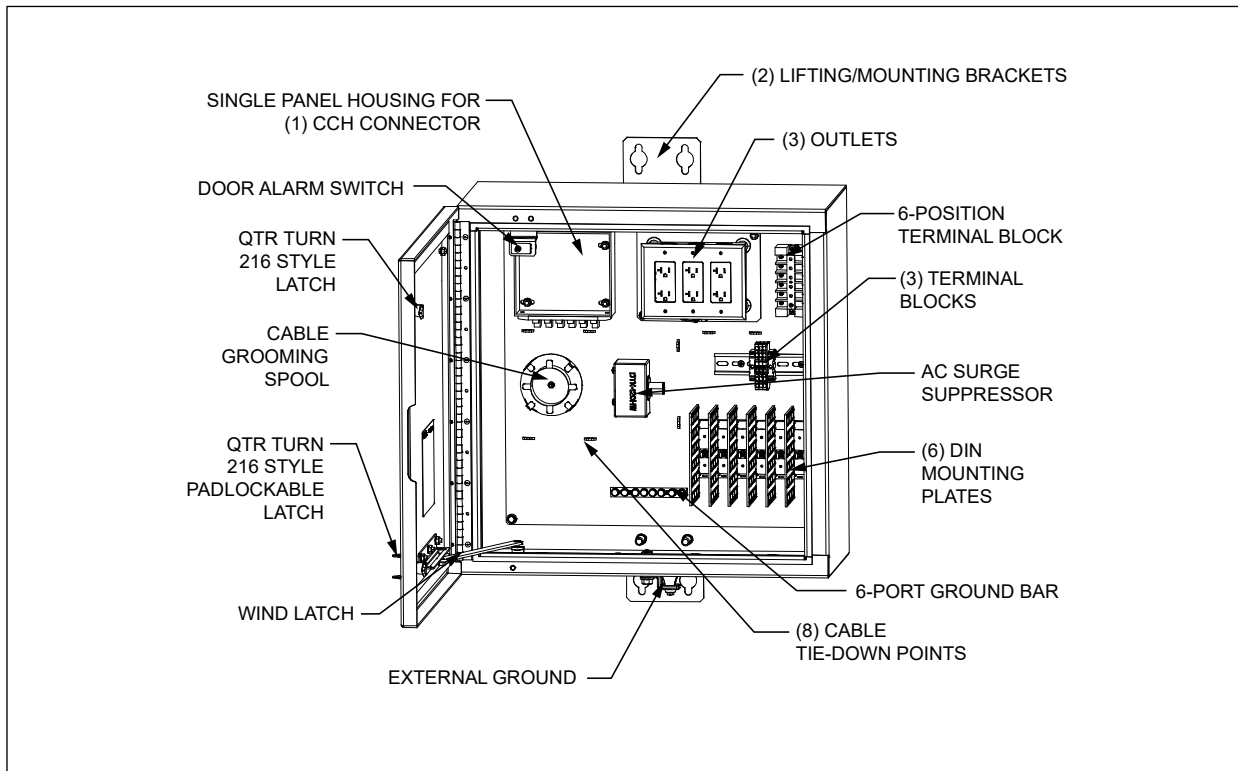


Figure 6 MP2424AMR4 Components



**Figure 7 MP2424AMR7 Components**

### 3. INSTALLATION

#### 3.1. Inspecting the Product

The CUBE 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.*

#### 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.

- Sufficient length and quantities of fiber cable (or pigtails)
- Cable scoring, opening, and cutting tools for cable sheathing, shields, wrappings, strength members and buffer tubes
- Wire strippers
- Crimpers
- Cable, tube, wire, and fiber cleaning materials
- 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)
- 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 wall or pole 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 local practice and appropriate lifting and transport equipment to move the CUBE into its mounting position.

#### 3.5.1. Warnings and Specific Safety Precautions

	<b>WARNING</b>	<b>Improper hoisting equipment and unsafe lifting procedures can result in serious injury or death</b>
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Observe the following local safety procedures when performing the tasks in this section.

- Keep the CUBE away from any power lines.
- Keep bystanders away from the work operations at all times.
- Do not suspend loads over people or equipment.
- All persons working with hoisting equipment shall wear standard safety gear according to local practices including safety helmets and steel-toed shoes.

### 3.6. Mounting the CUBE

Enclosures can be mounted on wall or pole. The CUBE is shipped with the mounting brackets attached flush with the top and bottom of the CUBE. Prior to mounting, remove these brackets, rotate them 180°, and re-attach. All views in this document show the brackets in the correct position for mounting. See Figure 2 for mounting dimensions.

Charles recommends using a minimum SAE Grade 2, 3/8" diameter, corrosion-resistant bolts, washers and nuts for all mounting applications. 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. For pole mounting, use the Charles Industries pole mounting kit (97-CABPMTKIT) Ensure that the unit is level.


#### 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.

	<b>WARNING</b>	<b>Perform all bonding and grounding connections prior to any electrical and communications connections.</b>
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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. Basic electrical diagrams are shown in Figures 8-12.

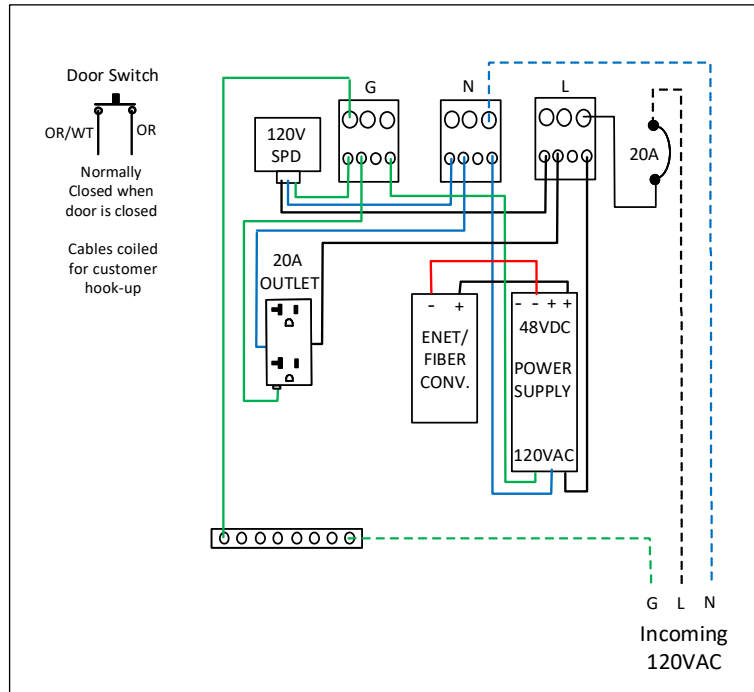


Figure 8 MP2424AMR1 Electrical Diagram

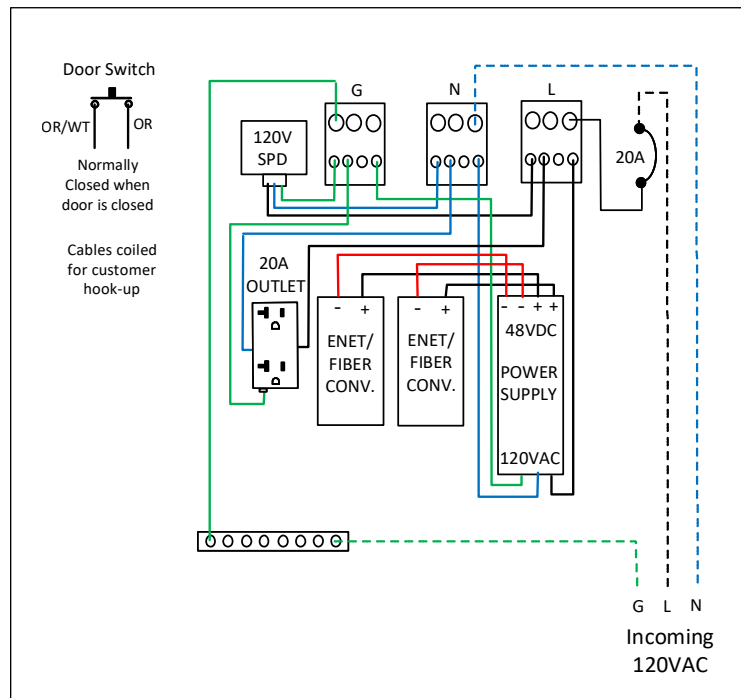
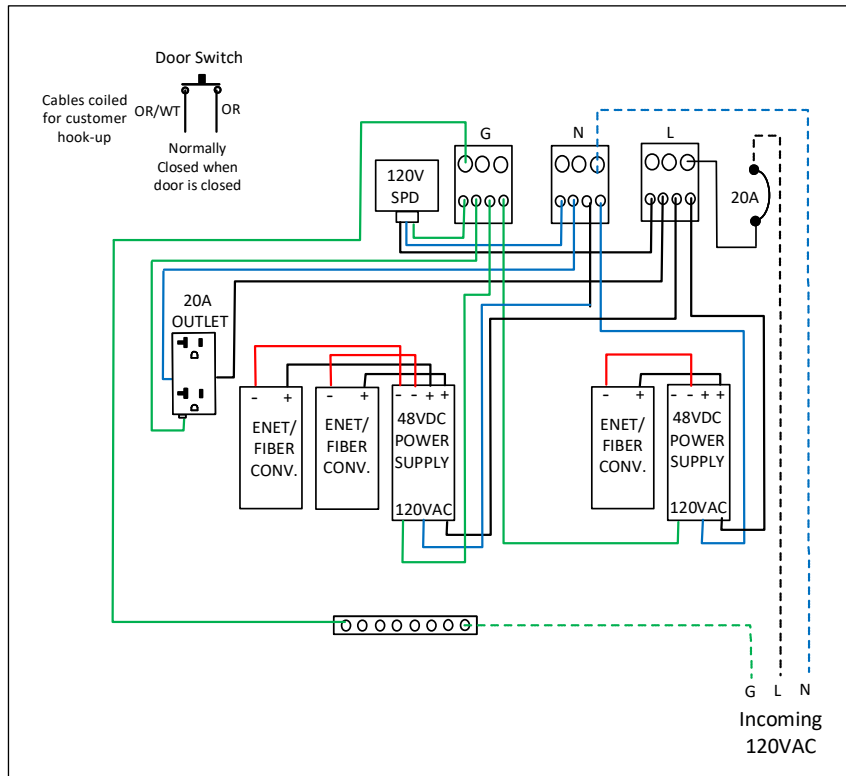
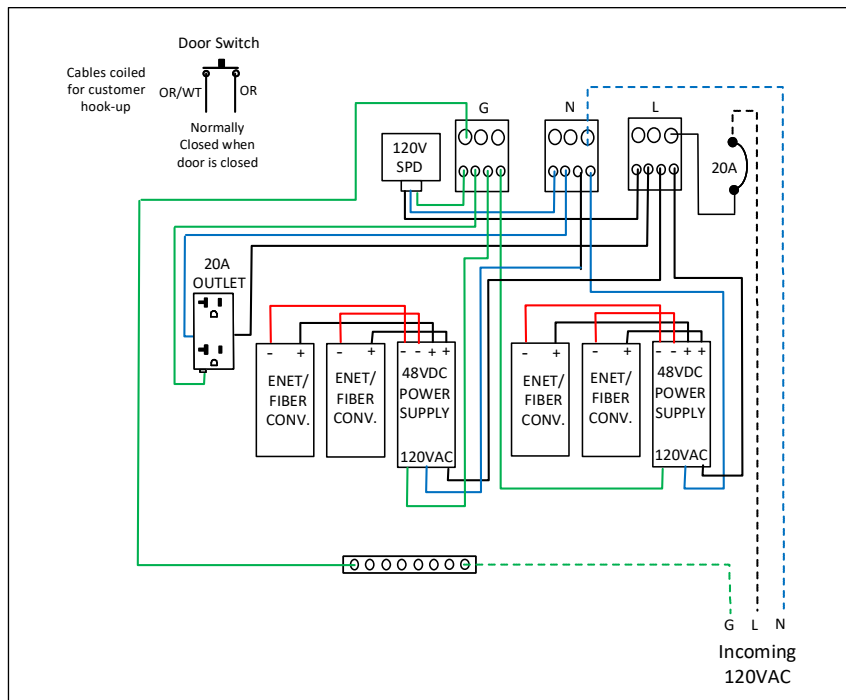


Figure 9 MP2424AMR2 Electrical Diagram





**Figure 10 MP2424AMR3 Electrical Diagram**



**Figure 11 MP2424AMR4 Electrical Diagram**

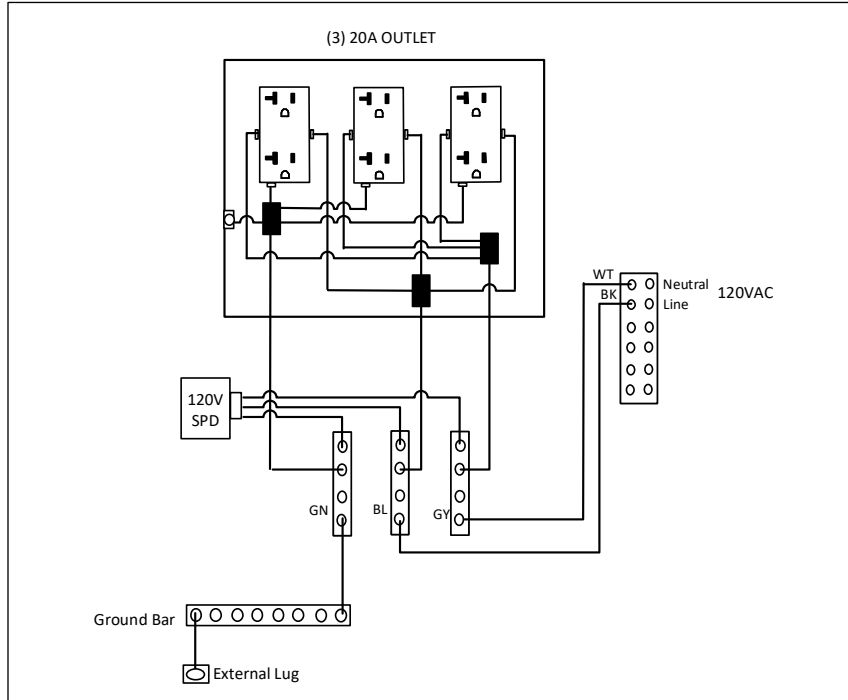


Figure 12 MP2424AMR7 Electrical Diagram

**3.7.1. Ground Connection**

Use the 6-port ground bar provided in the CUBE for all grounding of internal equipment. An external ground point is available on the bottom of the cabinet for connecting a site ground wire.

**3.7.2. AC Voltage Connection**

The incoming AC voltage is connected to the 20A main circuit breaker in the CUBE. The installer connects the hot (line) wire to the breaker, the neutral wire to the neutral bus and the ground wire to the 6-port ground bar.

**3.7.3. Fiber and Copper Entry**

The CUBE has eight Ø1.38” knockouts on the bottom that accommodate Ø1.0” conduit fittings.

See Figure 2 for all knockout locations.

**3.8. Conduit Seals**

All conduit openings on the CUBE must be completely sealed with a duct seal compound to prevent moisture from entering the CUBE. 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 13. 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.

**4. PERIODIC MAINTENANCE**

In the event that the enclosure must be opened in freezing conditions, use a narrow, pointed metallic object such as a screwdriver or chisel, along with a non-metallic device like a rubber mallet, to remove excessive ice buildup around the door and locking mechanism. A commercial aerosol de-icer spray can be used to free up locks and latches if needed. Use protective gloves and safety glasses when applying de-icer sprays.

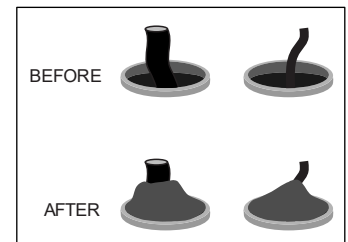


Figure 13 Applying Putty Seal

## 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](mailto: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 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](mailto:mktserv@charlesindustries.com) (email)

[http://www.charlesindustries.com/main/telecom\\_sales\\_support.htm](http://www.charlesindustries.com/main/telecom_sales_support.htm)

## 7. SPECIFICATIONS

<b>Physical</b>	
Dimensions	24"Hx24"Wx12"D
Weight	MP2424AMR1: approx. 50 lbs. as shipped MP2424AMR2: approx. 52 lbs. as shipped MP2424AMR3: approx. 58 lbs. as shipped MP2424AMR4: approx. 60 lbs. as shipped MP2424AMR7: approx. 50 lbs. as shipped
Materials	0.125 aluminum
Color	Off-white
<b>Electrical</b>	
Power Supply	Meanwell SDR-75-48
Injector-Converters	Transition Networks SI-IES-111D-LRT
SFP Transceiver	Cisco Systems GLC-FE-100FX-RGD-RF (SPF modules are installed inside the Injector-Converters)
6-Position Connectors	Erico UD-80A
Bonding and Grounding	(1) 6-port ground bar, (1) external ground stud
Cable Entry	See Figure 2 and section 3.7.4
<b>Environmental</b>	
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)
<b>Kits and Replacement Parts</b>	
Touch-up Paint	02-000290-0
216 Type Security Tool	07-002070-0
1/4 Turn Latch	39-000142-0
1/4 Turn Latch with Padlock Hasp	39-000311-0
20A Duplex Outlet	04-100225-0

**Table 1 CUBE Specifications**