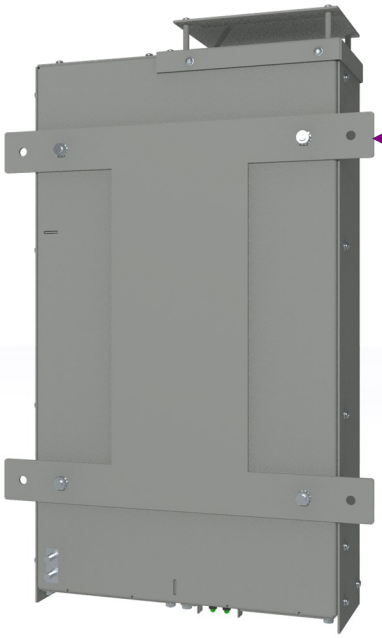
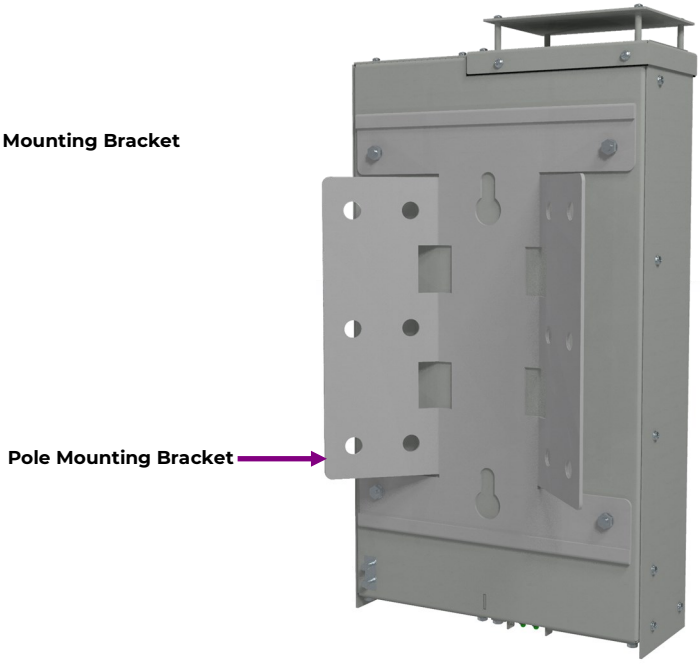
SC4500 Small Cell -48V Power Source



SC4500 Power Source with H-Frame Mounting Bracket



SC4500 Power Source with Pole Mounting Bracket (Optional)

Document – 8600486558P

Contents

List of Figures

Important Safety Instructions

1. SAVE THESE INSTRUCTIONS – This document contains important safety and operating instructions for the Small Cell 48V Power Source.
2. Before using the Small Cell 48V Power Source, read all instructions and cautionary markings on the AC Panel Feeding the unit, the radio, and all other connected equipment.
3. Rules and Regulations - Follow all national and local rules and regulations when making field connections.
4. Field-wired Conductors - Follow all National Electric Code (NEC) and local rules and regulations.
    a. Insulation rating: 90°C minimum; 105°C (minimum) if internal to enclosed equipment cabinets.
    b. Size AC field-wired conductors with 75°C ampacity (NEC) equal to or greater than their panel board circuit breaker rating.
    c. Size DC field-wired conductors with 90°C ampacity (NEC) equal to or greater than the output circuit breaker ratings.
    d. If equipped, size the battery input conductors with 90°C ampacity (NEC) equal or greater than 90A.
5. AC input disconnect/protection - Provide accessible devices to remove input power in an emergency.
6. Compression Connectors
    a. U. S. or Canada installations - use Listed/Certified compression connectors to terminate Listed/Certified field-wire conductors.
    b. All installations - apply the appropriate connector to the correct size conductor as specified by the connector manufacturer, using only the connector manufacturer's recommended or approved tooling for that connector.
    c. An all-pole mains switch must be incorporated in the electrical installation of the building for this equipment.
7. Electrical Connection Securing: Torque to the values specified on labels or in the product documentation.
8. Cable Dress - dress to avoid damage to the conductors and undue stress on the connectors. Always provide a drip loop to shed water off cables before they enter the strain reliefs.
9. Grounding - Connect the equipment chassis directly to ground.
10. This equipment is to be mounted directly and permanently above non-combustible surface, such as concrete or metal. At least 3" of space shall be allocated below the unit to allow for proper airflow into the fan assembly. This space should be free of debris that may be pulled into the fan assembly.
11. CAUTION: Double Pole / Neutral Fusing. Disconnect mains before servicing.
12. WARNING: Equipment is not designed to charge an external battery source.
13. WARNING: A battery can present a risk of electrical shock, burn from high short circuit current, fire or explosion from vented gases. Observe proper precautions.

Consignes de sécurité importantes

1. CES INSTRUCTIONS – Ce document contient des instructions de sécurité et d'utilisation importantes pour la source d'alimentation à petites cellules 48 V.
2. Avant d'utiliser la source d'alimentation à petite cellule 48 V, lisez toutes les instructions et les mises en garde sur le panneau CA alimentant l'appareil, la radio et tous les autres équipements connectés.
3. Règles et réglementations - Suivez toutes les règles et réglementations nationales et locales lors des connexions sur le terrain.
4. Conducteurs câblés sur site : respectez tous les codes nationaux de l'électricité (NEC) ainsi que les règles et réglementations locales.
    a. Degré d'isolation : 90°C minimum ; 105°C (minimum) s'il est interne à des armoires d'équipement fermées.
    b. Dimensionnez les conducteurs câblés sur site CA avec une intensité admissible de 75 °C (NEC) égale ou supérieure à la valeur nominale du disjoncteur de leur panneau.
    c. Dimensionnez les conducteurs câblés sur site CC avec une intensité admissible de 90 °C (NEC) égale ou supérieure aux valeurs nominales du disjoncteur de sortie.
    d. Le cas échéant, dimensionnez les conducteurs d'entrée de la batterie avec une intensité admissible à 90 °C (NEC) égale ou supérieure à 90 A.
5. Déconnexion/protection de l'entrée CA - Fournir des dispositifs accessibles pour couper l'alimentation d'entrée en cas d'urgence.
6. Connecteurs à compression
    a. Installations aux États-Unis ou au Canada - utilisez des connecteurs à compression répertoriés/certifiés pour terminer les conducteurs de fils de terrain répertoriés/certifiés.
    b. Toutes les installations - appliquez le connecteur approprié au conducteur de taille correcte, tel que spécifié par le fabricant du connecteur, en utilisant uniquement l'outillage recommandé ou approuvé par le fabricant du connecteur pour ce connecteur.
    c. Un interrupteur secteur omnipolaire doit être intégré à l'installation électrique du bâtiment pour cet équipement.
7. Sécurisation des connexions électriques : serrez aux valeurs spécifiées sur les étiquettes ou dans la documentation du produit.
8. Habillage des câbles - habillez-vous pour éviter d'endommager les conducteurs et de stresser excessivement les connecteurs. Prévoyez toujours une boucle d'égouttement pour évacuer l'eau des câbles avant qu'ils ne pénètrent dans les serre-câbles.
9. Mise à la terre - Connectez le châssis de l'équipement directement à la terre.
10. Cet équipement doit être monté directement et de façon permanente au-dessus d'une surface incombustible, telle que du béton ou du métal. Au moins 3" d'espace doivent être alloués sous l'unité pour permettre une bonne circulation de l'air dans l'ensemble ventilateur. Cet espace doit être exempt de débris qui pourraient être entraînés dans l'ensemble ventilateur.
11. ATTENTION: Double pole/fusible sur le neutre. Debrancher l'alimentation avant l'entretien
12. AVERTISSEMENT: L'équipement n'est pas conçu pour charger une source de batterie externe.
13. AVERTISSEMENT: Une batterie peut présenter un risque de choc électrique, de brûlure due à un courant de court-circuit élevé, d'incendie ou d'explosion due aux gaz évacués. Observez les précautions appropriées.

Precautions

- Install, service, and operate equipment only by professional, skilled and qualified personnel who have the necessary knowledge and practical experience with electrical equipment and who understand the hazards that can arise when working on this type of equipment.
- Do not disconnect permanent bonding connections unless all power inputs are disconnected.
- Verify that equipment is properly safety earth grounded before connecting power. High leakage currents may be possible.
- Exercise care and follow all safety warnings and practices when servicing this equipment. Hazardous energy and voltages are present in the unit and on the interface cables and connectors that can shock or cause serious injury.
- Use safe lifting practices.
- Use the following precautions in addition to proper job training and safety procedures:
    - Use only properly insulated tools.
    - Remove all metallic objects (key chains, glasses, rings, watches, or other jewellery).
    - Follow Lock Out Tag Out (LOTO) procedures: customer specified, site specific, or general as appropriate. Disconnect all power input before servicing the equipment. Check for multiple power inputs.
    - Wear safety glasses.
    - Follow Personal Protective Equipment requirements: customer specified, site specific, or general as appropriate.
    - Test circuits before touching.
    - Be aware of potential hazards before servicing equipment.
    - Identify exposed hazardous electrical potentials on connectors, wiring, etc.
    - Avoid contacting circuits when removing or replacing covers;
    - Use a personal ESD strap when accessing or removing electronic components.
- Personnel with electronic medical devices need to be aware that proximity to DC power and distribution systems can affect medical electronic devices, such as pacemakers. Effects decrease with distance.
- This equipment is not suitable for use in locations where children are likely to be present.

Précautions

- Installer, entretenir et faire fonctionner l'équipement uniquement par du personnel professionnel, qualifié et qualifié qui possède les connaissances et l'expérience pratique nécessaires avec les équipements électriques et qui comprend les dangers qui peuvent survenir lors de travaux sur ce type d'équipement.
- Ne débranchez pas les connexions de liaison permanentes à moins que toutes les entrées d'alimentation ne soient déconnectées.
- Vérifiez que l'équipement est correctement mis à la terre de sécurité avant de connecter l'alimentation. Des courants de fuite élevés peuvent être possibles.
- Faites preuve de prudence et suivez tous les avertissements et pratiques de sécurité lors de l'entretien de cet équipement. De l'énergie et des tensions dangereuses sont présentes dans l'unité et sur les câbles et connecteurs d'interface, susceptibles de provoquer des chocs électriques ou des blessures graves.
- Utilisez des pratiques de levage sûres.
- Utilisez les précautions suivantes en plus d'une formation professionnelle appropriée et des procédures de sécurité :
    - Utilisez uniquement des outils correctement isolés.
    - Retirez tous les objets métalliques (porte-clés, lunettes, bagues, montres ou autres bijoux).
    - Suivez les procédures de verrouillage et d'étiquetage (LOTO): spécifiées par le client, spécifiques au site ou générales, selon le cas.Débranchez toute entrée d'alimentation avant de réparer l'équipement. Vérifiez s'il y a plusieurs entrées d'alimentation.
    - Portez des lunettes de sécurité.
    - Respectez les exigences en matière d'équipement de protection individuelle : spécifiées par le client, spécifiques au site ou générales, selon le cas.
    - Testez les circuits avant de les toucher.
    - Soyez conscient des dangers potentiels avant de réparer l'équipement.
    - Identifiez les potentiels électriques dangereux exposés sur les connecteurs, le câblage, etc.
    - Évitez de toucher les circuits lors du retrait ou du remplacement des couvercles.
    - Utilisez une sangle ESD personnelle pour accéder ou retirer des composants électroniques.
- Le personnel équipé d'appareils médicaux électroniques doit être conscient que la proximité des systèmes d'alimentation et de distribution CC peut affecter les appareils électroniques médicaux, tels que les stimulateurs cardiaques. Les effets diminuent avec la distance.
- Cet équipement ne convient pas à une utilisation dans des endroits où des enfants sont susceptibles d'être présents.

Safety

Read and follow all safety statements, warnings, and precautions in this manual before installing, maintaining or repairing this equipment.

Sécurité

Lisez et suivez toutes les consignes de sécurité, les avertissements et les précautions de ce manuel avant d'installer, d'entretenir ou de réparer cet équipement.

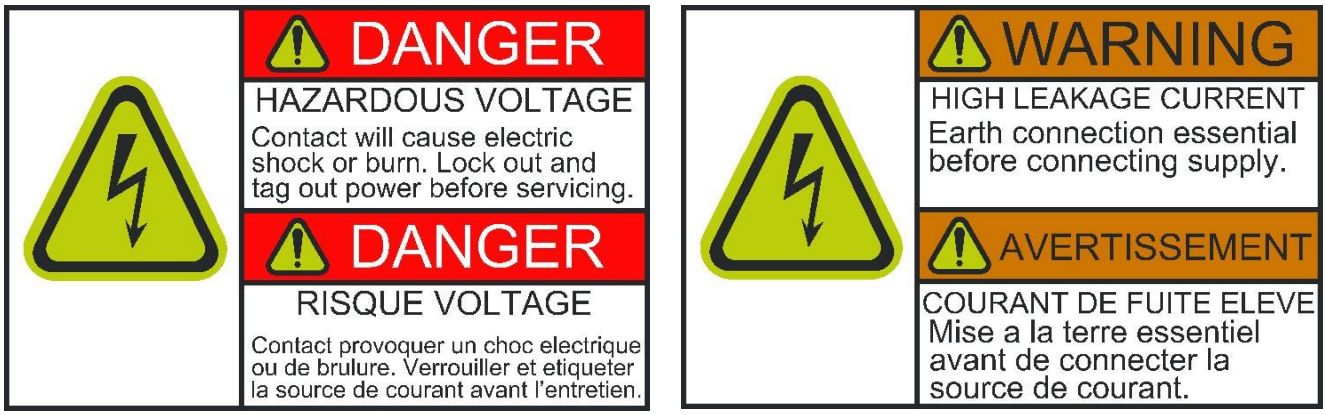


Figure 1. Warning Label

Equipment Identification

The product ID label on the front door of the SC4500 model is shown below. It includes the product serial number and input - output specifications of the cabinet.

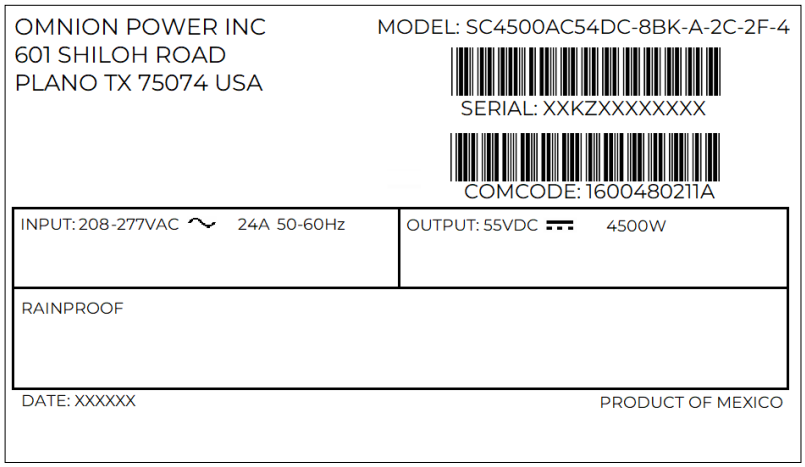


Figure 2. Product ID Label Information

Customer Care

+1 877 546-3243

Introduction

The OmniOn Power™ Small Cell -48V Power Source provides -48V_{DC} power to next generation radios used in small cell sites. It delivers 4500 Watts of DC Power from a 208-277V_{AC} source.

Basic Features

One DC output can be wired to as many as 8 different devices through configurable output breakers. The positive voltage is referenced to ground. The output is -48V nominal. It can be powered off of 208-277V_{AC} with operational parameters as shown here:

Input Voltage	Input Current	Min. Breaker Size	Min. Wire Size
208V_{AC}	22.9A	30A	10AWG
240V_{AC}	19.8A	25A	12AWG
277V_{AC}	17A	25A	12AWG

Note: The SC4500 was qualified to AC transients up to 2500V and DC transients up to 1,500V. It is recommended to use a UL listed external surge protection limiting to 2500V transient connected to the AC input in installations where these surge levels may be exceeded.

Installation

Regulations, standards, site engineering instructions, MOPs, etc. take precedence over these general installation instructions.

Tools required

- Steel toed safety shoes
- Wire cutters, strippers, Termination & Channel Lock Tools
- Torque wrench: 0-65 in-lb (0-10 Nm) and 40 ft-lbs
- Volt Meter for Lock-Out Tag-Out procedures.
- Sockets: as needed for mounting hardware
- Screwdrivers: #2 pozi drive screwdriver. Flat and Torx bit set with security pin

Step 1 – Mounting Locations for the small cell -48V Power Supply

Step 1A – H-Frame Mounting

A. Remove the H-frame mount bracket from the packaging.

   Select location on H-frame or wall to mount the power supply.
   Note: Wires must dress out of the bottom of the unit when installed.

B. Secure system to mounting bracket using 1/4-20 stainless hex nuts; torque to 63 in-lbs using a 7/16 socket drive.

C. Align the system on the H-Frame or mounting surface to the proper mounting position. Using 1/4-20 mounting screws, secure the system to the mounting surface; torque to 63 in-lbs using appropriate socket drive.

Step 1B – Pole Mounting - Optional

A. Remove the pole mount bracket from the packaging.

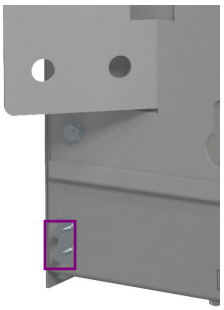
B. Select an elevation and orientation on the pole.
   Note: Wires must dress out of the bottom of the unit when installed. Attach mounting bracket to equipment pole with stainless steel metal straps.

C. Secure system to mounting bracket using 1/4-20 stainless hex nuts; torque to 63 in-lbs using a 7/16 socket drive.

Follow below steps while choosing a location for the Small Cell -48V Power Source.

1. The rectifier must be mounted in “portrait” orientation so that air can flow vertically by natural convection.
2. Leave 3 inches above and below the unit to allow air to feed the fins and exit from the fins.
3. Mount the unit above the flood line. Weep holes to equalize pressure and drain any water/condensate that may enter.
4. Orient the wiring entrance toward the ground and provide drip loops to shed any water running down the jacket.

Step 2 – Ground the Unit

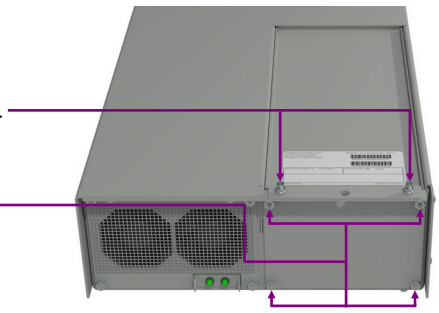


There are #10-32 studs on 5/8 centers on the lower right corner of the SC4500 Unit. Use this location to provide external grounding as required by code or network standard. 6 AWG minimum recommended ground wire.

Torque each nut to 26 in-lbs.

Step 3 – Open the Field Wiring Compartment

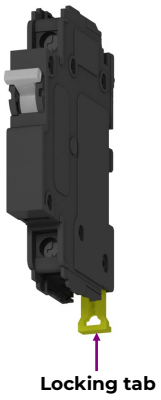
The field wiring compartment is located on the lower right of the unit. The front cover is secured by 2 captive screws. The bottom cover is secured by 4 nuts.



1. Use a #2 pozi drive screwdriver to loosen the captive screws on the front door.
2. Once two screws are loose, open the door to expose the internal wiring cover.
3. Use a Torque wrench to loosen each of the 4 nuts of wiring compartment bottom cover and remove.
4. Once the wiring compartment cover has been removed, the output breakers and AC input cover will be exposed as shown below.

Step 4 – Breaker Installation

1. Loosen upper wire/bus clamp to provide enough space to allow for entry of breaker bus tab.
2. Insert breaker bus tab into upper clamp.
3. Tighten clamp to bus tab 35lbs-in.
4. Repeat process for remaining 7 breaker slots.
5. Ensure the yellow din rail locking tabs are pulled down to allow the breakers can easily fit on the din rail.
6. Once in place, align breakers with appropriate bus position 1 2 3 etc.
7. Push each of the yellow locking tabs towards the breaker housing to secure breakers to din rail.



Step 5 – Wire the DC Output

This SC4500 Unit configuration can utilize up to 8 breaker positions to feed independent loads. These breakers are located on the right side of the wiring space and can be sized from 5A to 50A. Select a wire and jacket suitable for the size of breaker and load.

1. Add knockouts in panel using a knockout hole punch (Do not drill holes in panel while panel is attached to system).
2. DC wiring knockouts need to be sized per the users desired strain relief (0.875 hole for 10AWG and 12AWG wire pair; 0.75 for 14AWG wire pair).
3. Run the DC output cable through the strain relief and into the bottom of the unit.
4. Strip the outer jacket to reveal 2 inches of inner conductor.
5. If there are more than 2 conductors in the jacket, apply 1 inch of heat shrink tubing to the conductor that will be unused, leaving 1/2 inch of free tubing past the end of the conductor to assure that that conductor will never be energized.

6. Strip the inner jacket off the two conductors to expose 7/16 inches (11mm) of bare conductor.
7. Connect the first pair of the wires to the first breaker, toward the left end. Connect the -48V cable to the breaker while connecting the return wire (+48V) to the return bar. A #6 ring terminal will need to be crimped to the end of the wire that is terminated to the return bus bar. Torque the #6-32 nuts to 12 in-lbs using a 5/16 socket.
8. Torque each screw compression fitting to 12 in-lbs. using a flat bladed screw driver.3e, or #2 pozi drive screwdriver.
9. Pull wire to verify.
10. Repeat 1-10 for the remaining installed breaker positions.

Step 6 – Wire the AC Input

Terminal Block for AC connections

DANGER: Shock Hazard – Turn OFF and lock-out tag-out the AC source before making AC connections.

CAUTION: Ensure that wires do not come in contact with sharp or rough surfaces that may damage insulation and cause a short circuit.

When connecting to AC mains, follow all local and national wiring rules.

Verify all AC breakers are off!

The SC4500 Unit is designed to accept 12-10 AWG three wires(L1, L2 and GND) to be terminated in the terminal block located on the left side of the wiring space.

Select a wire suitable for the application as per below table. Use the suitable outdoor rated conduit.

Note: 25A or 30A circuit protection is required.

Input Voltage	Input Current	Min. Breaker Size	Min. Wire Size
208V_{AC}	22.9A	30A	10AWG
240V_{AC}	19.8A	25A	12AWG
277V_{AC}	17A	25A	12AWG

1. Add knockouts in panel using a knockout hole punch (Do not drill holes in panel while panel is attached to system).
2. AC wiring knockout should be sized for ½" conduit fitting and located directly under AC terminal blocks when knockout panel is installed in system.
3. On the left hand side of the wiring space locate the AC insulator cover and pull it back to reveal the AC input terminal blocks.
4. Run the AC input wire through the conduit fitting and into the bottom of the unit.
5. Strip the outer jacket to reveal 2 inches of inner conductor.
6. Strip the inner jacket off each of the 3 conductors to expose 7/16 inches (11mm) of bare conductor.
7. Connect the ground wire first toward the middle position of the terminal block.
8. Torque the screw compression fitting to 12 in-lbs. using a flat bladed screw driver, or #2 pozi drive screwdriver.
9. Pull wire to verify.
10. Connect the Line 1 wire to the left of the terminal block.
11. Torque the screw compression fitting to 12 in-lbs. using a flat bladed screw driver, or #2 pozi drive screwdriver.
12. Pull wire to verify.
13. Connect the Line 2 or neutral conductor to the right end of the terminal block.
14. Torque the screw compression fitting to 12 in-lbs. using a flat bladed screw driver, or #2 pozi drive screwdriver.
15. Pull wire to verify.
16. Insert AC insulator back into place covering the AC terminal blocks.

AC Input Terminal Block

Pin	1	2	3
Potential	Line 1	Ground	Line 2/Neutral

Step 7 – Close the Field Wiring Compartment

The field wiring compartment is closed in two steps: A) Complete the wire dress, strain relief and secure the bottom cover, and B) Close the front cover, making sure to establish separate compartment for the AC and DC wiring. Strain reliefs provided may be different by application.

Step 7A

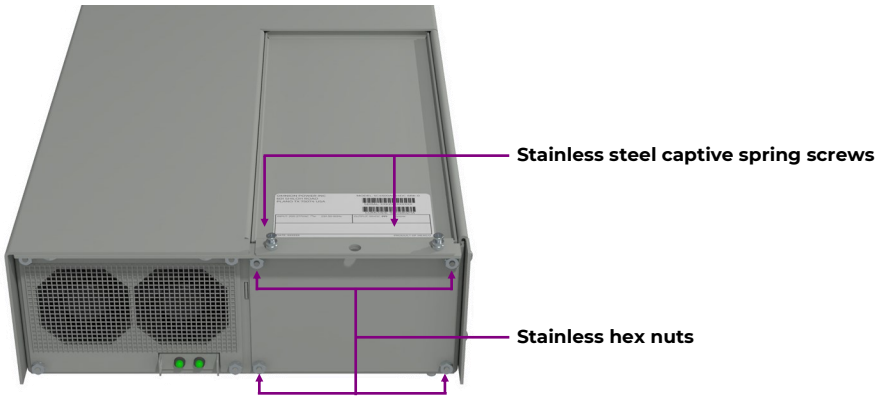
1. Position the knockout cover on the chassis.
2. Use a 5/16 nut driver to secure the 4 stainless hex nuts that attach the cover to the chassis.
3. Torque to 13 in-lbs.
4. Pull the leftmost DC cables out through the strain relief hole until it runs straight from the breaker and bus bar to the strain relief hole.
5. Secure the strain relief fitting in the hole on the bottom cover, using channel lock for snap in type strain relief as needed.
6. Again, pull the leftmost DC cable out through the strain relief hole until it runs straight from the terminal block to the strain relief hole.

Drip Loop dress and strain relief shall be provided for each wire and cable exiting the rectifier.

7. Dress the wire with a drip loop and visibly relaxed region outside the unit.
8. Strain relieve the external wire to the environment to maintain this relaxed region even under load.
9. Repeat steps 4 through 8 for remaining loads.
10. Pull the AC wire out through the strain relief hole until it runs straight from the terminal block to the strain relief hole.
11. Secure the strain relief fitting in the hole on the bottom cover by compressing and inserting from the outside. Use a Channel Lock plier if mechanical assistance is needed.
12. Dress the wire with a drip loop and visibly relaxed region outside the unit.
13. Strain relieve the external wire to the environment to maintain this relaxed region even under load.

Step 7B

1. Lower and close the outer cover until each of the tails of the captive screws is captured in the pilot holes.
2. There is no undue force as would be encountered.
3. Torque each of the captive screws to 13 in-lbs.



Step 8 – Apply AC Power and Confirm -48V Power Delivery

1. Terminate, insulate or protect the far end of the DC cables, as these will be energized when AC is applied.
2. Return to the AC panel feeding the unit.
3. Unlock the panel.
4. Energize the panel. (25A circuit protection required for $208V_{AC}$ and 30A circuit protection is required for 240 or $277V_{AC}$)
5. Turn on the circuit breaker feeding the Small Cell -48V Power Source.
6. Observe the LED illuminates green, indicating that DC is present on the output terminations.
7. Confirm that DC is present on the outputs by observing a signal from the radio(s).

Information – LED States

State	State Description	LED Color/State	Customer Action
1	No AC Input	Dark	Restore AC
2	Rectifier FAULT asserted	Red	Replace the SC4500 Unit*
4	DC Output >38V	Green	Good

*Unit Replacement

If the unit has been determined to be in state #2 replace the unit. Replacing the unit requires removal of all wiring, using Lock-Out Tag-Out procedures, before the existing unit is removed.

Information – Lifting the Unit

The SC4500 Unit assembly is 33 lbs. (15kg)and should have two installers to place the unit into position to the pole or wall mounting bracket.

Information – External Icing

When external icing affects the access to the four hardware screws a plastic or rubber hammer can be used to break the ICE to remove the securing screws.

Information – For Site Upgrade Applications

1. Turn off the power feeding the unit following Lock-Out Tag-Out procedures.
2. Remove the ACCESS cover and disconnect wiring.
3. Secure all wiring.
4. Remove hardware holding the system in position by removing the four 1/4-20 stainless hex nuts.
5. Two installers shall remove the wall mounted or pole mounted unit.
6. Install the upgrade unit and secure with the appropriate hardware.
7. Install the electrical and dc output following removal using the installation procedure in reverse.
8. Close all openings and power the input and verify the AC and DC LEDs are now green.
9. Close all openings and secure the access cover.

Information – Touch Up Paint

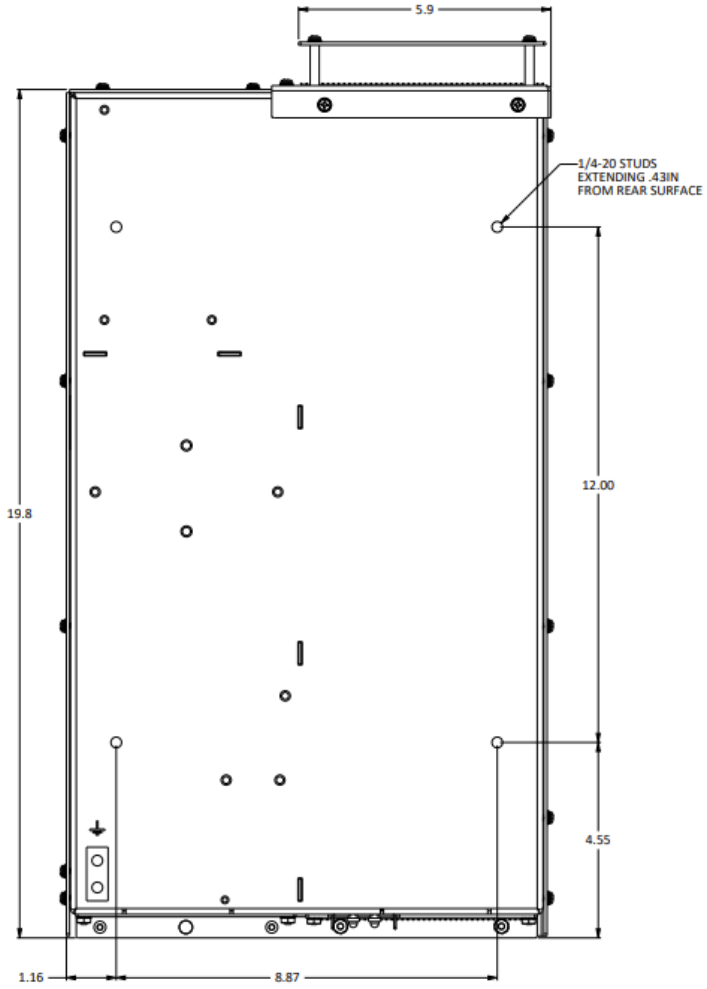
Should any part of the unit coating be damaged, repaint using:

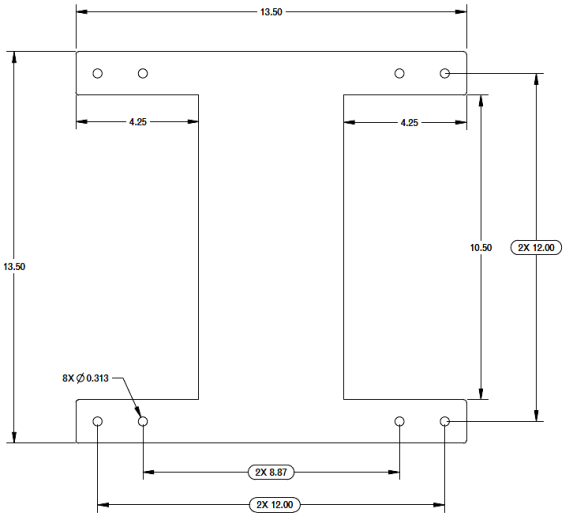
LVP Powder and Paints

RAL7035 Touch Up Paint – Light Grey – 12 oz Spray Can.

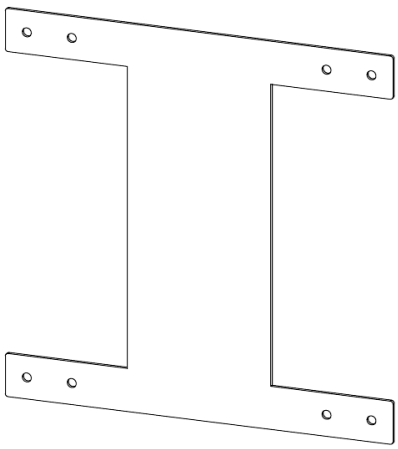
https://www.lowvolumepowder.com/RAL-7035-12-Oz-Touch-Up-Paint

Information – H-Frame Mount Bracket Detail Drawing



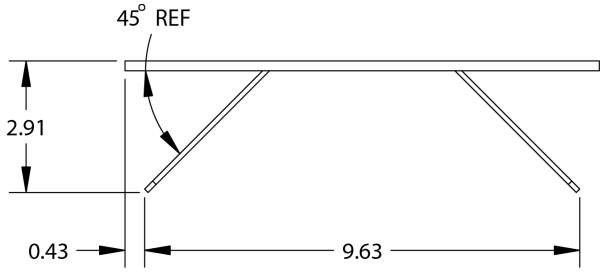


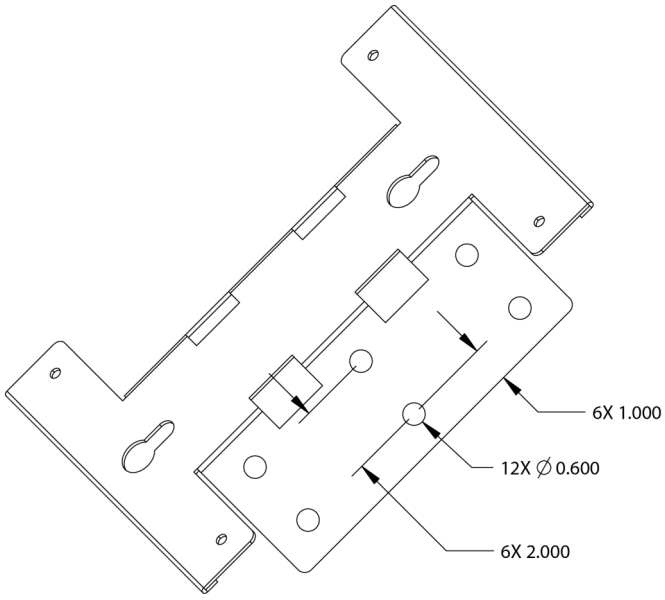
FRONT VIEW

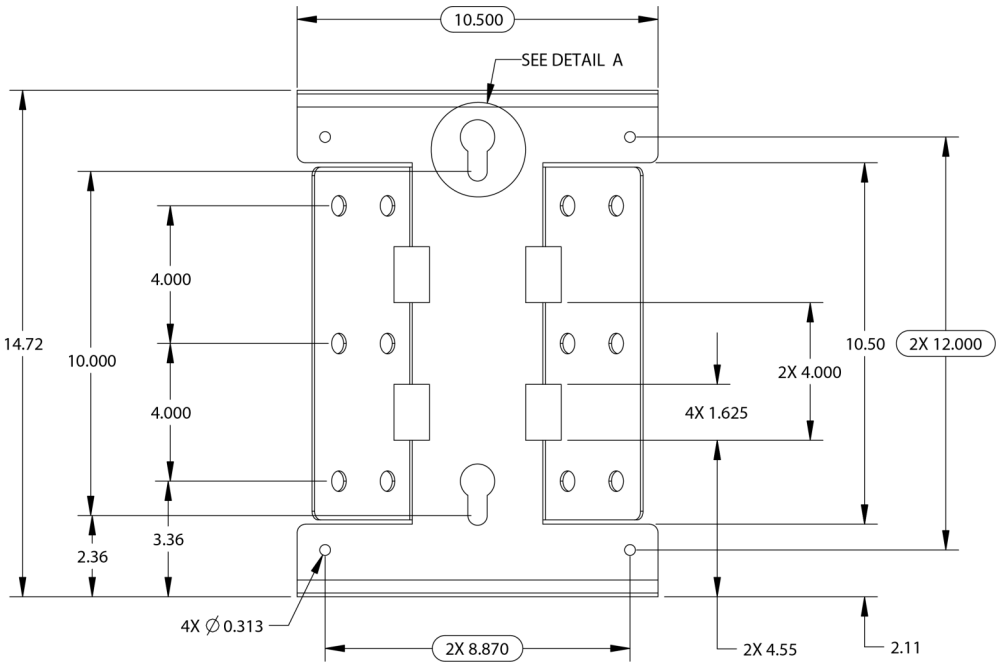


ISO VIEW

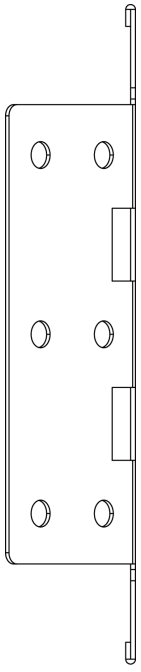
Information – Pole Mount Bracket Detail Drawing (Optional)







FRONT VIEW



SIDE VIEW

Part List

Small Cell -48V Mounting Kits	
Ordering Code	**Description**
1600487086A	Pole mount bracket kit
1600487087A	Stand off bracket kit
1600487088A	H-Frame Mounting Bracket

Additional Accessories (Mounting Hardware, Filters, etc.)	
Ordering Code	**Amperage**
450029223	5 Amp Breaker
450029222	10 Amp Breaker
450029220	15 Amp Breaker
450029219	20 Amp Breaker
450029218	25 Amp Breaker
450029217	30 Amp Breaker
450029214	35 Amp Breaker
CC408654288	40 Amp Breaker
450029213	50 Amp Breaker

Specifications and Application

- The SC4500 was qualified to AC transients up to 2500V and DC transients up to 1,500V. It is recommended to use a UL listed external surge protection limiting to 2500V transient connected to the AC input in installations where these surge levels may be exceeded.
- Equipment Safety is Approved to UL62368-1 Equipment to be Installed Outdoors in environments with ambient temperature up to 46°C. Thermal rating is up to 45°C. Thermal rating is extended up to 65°C with output de-rating of 60W/°C above 45°C.
- Equipment and subassembly ports:
    1. are suitable for connection to intra-building or unexposed wiring or cabling;
    2. can be connected to shielded intra-building cabling grounded at both ends.
- Grounding / Bonding Network – Connect to an Isolated Ground Plane (Isolated Bonding Network) or an Integrated Ground Plane (Mesh-Bonding Network or Common Bonding Network).
- Installation Environment - Install where NEC applies.

Reference Documents

Notes:

Change History (excludes grammar & clarifications)

Revision	Date	Description of the change
1.0	02-11-2025	Initial release

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