QUICK START GUIDE

# Infinity D Converter Shelf

## Quick Start Guide: CC848862433

## Models: Cabled Input Converter-only Shelf Options

### Primary shelf (with controller)

CC109161956 - 24V input to 48V output, 19"/ 23"

CC109144267 - 24V input to 48V output, 19", 10 Additional CBs

CC109164876 - 24V input to 48V output, 23", 10 Additional CBs

CC109149893 - 48V input to 24V output, 19"/ 23"

CC109161171 - 48V input to 24V output, 23", 10 Additional CBs

1600232357A - 48V input to 12V output, 19"

1600247442A - 48V input to 12V output, 23"

### Supplementary shelf (without controller)

150050193 - 24V input to 48V output, 23"

150024075 - 48V input to 24V output, 23"

## Safety Statements

- Do not install this equipment over combustible surfaces.
- Rules and Regulations - Follow all national and local rules and regulations when making field connections.
- Compression Connectors
    - U. S. or Canada installations - use Listed/Certified compression connectors to terminate Listed/Certified field-wire conductors.
    - 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.
- Electrical Connection Securing: Torque to the values specified on labels or in the product documentation.
- Cable Dress - dress to avoid damage to the conductors and undue stress on the connectors.
- Circuit Breakers and Fuses
    - Use only those specified in the equipment ordering guide.
    - Size as required by the National Electric Code (NEC) and/or local codes.
- Safety Tested Limits - Refer to the equipment ratings to assure current does not exceed: Continuous Load (List 1) - 60% of protector rating
    - Maximum Load (List 2 - typically end of discharge) - 80% of protector rating.
        - GMT Style Fuses - Use only fuses provided with safety caps.
- Field-wired Conductors - Follow all National Electric Code (NEC) and local rules and regulations.
    - Insulation rating: 90°C minimum; 105°C (minimum) if internal to enclosed equipment cabinets.
    - Size AC field-wired conductors with 75°C ampacity (NEC) equal to or greater than their panel board circuit breaker rating.
    - Size DC field-wired conductors with 90°C ampacity (NEC) equal to or greater than circuit breaker/fuse rating.
- AC and DC input disconnect/protection - Provide accessible devices to remove input power in an emergency.
- Alarm Signals - Provide external current limiting protection. Rating 60V, 0.5A unless otherwise noted.
- Grounding - Connect the equipment chassis directly to ground. In enclosed equipment cabinets connect to the cabinet AC service ground bus. In huts, vaults, and central offices connect to the system bonding network.

## 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.
- Disconnect batteries from outputs and/or follow safety procedures while working on equipment. Batteries may be connected in parallel with the output of the rectifiers. Turning off the rectifiers will not necessarily remove power from the bus.
- 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 that can shock or cause serious injury. When equipped with ringer modules, hazardous voltages will be present on the ringer output connectors.
- 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 jewelry).
    - 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, including batteries and cables, typically found in telecommunications utility rooms, can affect medical electronic devices, such as pacemakers. Effects decrease with distance.

## Déclarations de sécurité

- N'installez pas cet équipement sur des surfaces combustibles.
- Règles et règlements-respectez toutes les règles et réglementations nationales et locales lors de la réalisation de connexions sur le terrain.
- Connecteurs de compression
    - U. S. ou installations du Canada-utiliser des connecteurs de compression répertoriés/certifiés pour mettre fin aux conducteurs de fil de champ répertoriés/certifiés.
    - toutes les installations-appliquer le connecteur approprié au conducteur de taille correct tel que spécifié par le fabricant du connecteur, en utilisant uniquement l'outillage recommandé ou approuvé par le fabricant du connecteur pour ce connecteur.
- Fixation de la connexion électrique: Serrez les valeurs spécifiées sur les étiquettes ou dans la documentation du produit.
- Robe de câble-robe pour éviter d'endommager les conducteurs et une contrainte excessive sur les connecteurs.
- Disjoncteurs et fusibles
    - n'utiliser que ceux spécifiés dans le Guide de commande de l'équipement.
    - la taille exigée par le National Electric Code (NEC) et/ou les codes locaux.
- Limites de sécurité testées-référez-vous aux cotes de l'équipement pour assurer que le courant ne dépasse pas: charge continue (Liste 1)-60% du degré de protection
- Charge maximale (liste 2-typiquement fin de décharge)-80% du degré de protection.
    - fusibles de type GMT-Utilisez uniquement des fusibles fournis avec des capuchons de sécurité.
- Conducteurs câblés-suivez tout le code national de l'électricité (NEC) et les règles et réglementations locales.
    - indice d'isolation: 90 ° c minimum; 105 ° c (minimum) si interne aux armoires d'équipement fermées.
    - la taille des conducteurs câblés de champ AC avec une ampacité de 75 ° c (NEC) égale ou supérieure à leur indice de disjoncteur de la carte de panneau.
    - la taille des conducteurs de champ DC avec une ampacité de 90 °c (NEC) égale ou supérieure à la puissance nominale du disjoncteur/fusible.
- Déconnexion/protection d'entrée AC et DC-fournissez des dispositifs accessibles pour enlever la puissance d'entrée en cas d'urgence.
- Signaux d'alarme-fournir une protection de limitation de courant externe. Note 60V, 0.5 A sauf indication contraire.
- Mise à la terre-raccorder le châssis de l'équipement directement à la terre. Dans les armoires d'équipement fermées, raccorder au bus de masse du service AC de l'armoire. Dans les cabanes, les coffres et les bureaux centraux se connectent au réseau de liaison du système.

## Precautions

- Installer, mettre en service et utiliser l'équipement uniquement par du personnel professionnel, compétent et qualifié possédant les connaissances et l'expérience pratique nécessaires en matière d'équipement électrique et qui comprennent les dangers qui peuvent survenir lors de l'utilisation de ce type de Équipement.
- Débranchez les piles des sorties et/ou suivez les procédures de sécurité tout en travaillant sur l'équipement. Les batteries peuvent être connectées parallèlement à la sortie des redresseurs. Éteindre les redresseurs n'enlèva pas forcément l'alimentation du bus.
- Ne débranchez pas les raccords de liaison permanents à moins que toutes les entrées d'alimentation ne soient déconnectées.
- Vérifiez que l'équipement est correctement mis à la terre avant de brancher l'appareil. Des courants de fuite élevés peuvent être possibles.
- Exercez des soins et respectez tous les avertissements et pratiques de sécurité lors de l'entretien de cet équipement. L'énergie et les tensions dangereuses sont présentes dans l'unité et sur les câbles d'interface qui peuvent choquer ou causer des blessures graves. Lorsqu'il est équipé de modules de sonnerie, des tensions dangereuses seront présentes sur les connecteurs de sortie de la sonnerie.
- Utiliser les précautions suivantes en plus des procédures appropriées de formation et de sécurité d'emploi:
    - n'utiliser que des outils correctement isolés.
    - Enlevez tous les objets métalliques (porte-clés, lunettes, bagues, montres ou autres bijoux).
    - suivez les procédures de lock out tag out (LOTO): client spécifié, spécifique au site ou général selon le cas. Débranchez toutes les entrées d'alimentation avant d'entretenir l'équipement. Vérifiez l'alimentation de plusieurs entrées.
    - Portez des lunettes de sécurité.
    - respectez les exigences relatives aux équipements de protection individuelle: client spécifié, spécifique au site ou général selon le cas.
    - tester les circuits avant de les toucher.
    - être conscient des dangers potentiels avant d'entretenir l'équipement.
    - identifier les potentiels électriques dangereux exposés sur les connecteurs, le câblage, etc.
    - Évitez de contacter les circuits lors du démontage ou du remplacement des couvercles.
    - utilisez une sangle ESD personnelle lors de l'accès ou de la suppression de composants électroniques.
- Le personnel équipé de dispositifs médicaux électroniques doit être conscient que la proximité des systèmes de distribution et d'alimentation en courant continu, y compris les piles et les câbles, généralement dans les salles de télécommunication, peut affecter les appareils électroniques médicaux, tels que les stimulateurs cardiaques. Les effets diminuent avec la distance.

The Infinity converter shelf converts -48Vdc to +24Vdc using NE075DC24A converters, +24Vdc to –48Vdc using NE030DC48A converters, or -48Vdc to +12Vdc using NE075DC12A converters.

The shelf can be mounted in a 19”, 23” or 26” frame/rack.
Convert Shelf to install in 19 inch framework if necessary - Page 9.

Install the shelf with a minimum gap of 3 inches behind the system to allow proper airflow. Attach the shelf to the frame using a minimum of six (three on each side) 12-24 screws included with the shelf.

Read and follow all safety statements and precautions in this guide.

Lire et suivre toutes les consignes de sécurité et les précautions dans ce guide

## Tools Required

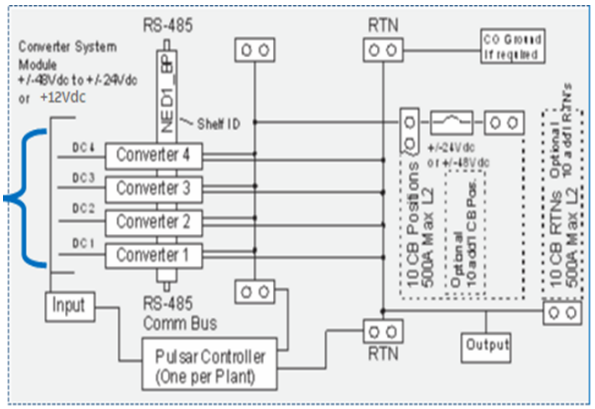
- Cable crimpers
- Torque wrench - 0-65 in-lb (0-10Nm)
- 5/16” and 7/16” nut drivers
- Screw drivers - Philips #1 and #2, Flat #1
- Wire cutters and strippers

## Step 1 - Plan DC Feeds

Four input bus bar pairs are located behind the cover on the left side of the shelf. Each bus bar has two sets of landings for 1/4-20 double hole lugs on 5/8” centers. Bus straps are provided for input jumper options. Use the tables below to determine the input protector and cable sizes based on the jumper and the number and type of converters used for the application. Input cable sized for worst case input current.

Note: Some installations do not require protectors on the inputs. (* Input breaker sizes are for reference only.)

| CC109141893, NE075DC24A Converters | | | | | |
|---|---|---|---|---|---|
| **Jumper Option** | **Converters Per feed** | **Input Amps @42Vdc** | **Input Amps @54.5Vdc** | **Input Cable Size** | ***Input Brkr. Size** |
| None | 1 | 53A | 40A | 6 AWG | 60A |
| “A” | 2 | 106A | 80A | 2 AWG | 100A |
| “B” | 4 | 212A | 160A | 4/0 AWG | 200A |
| | Burndy lug YAV29-L2TC14-FX can be used for option B. | | | | |
| **CC109161956, NE030DC48A Converters** | | | | | |
| **Jumper Option** | **Converters Per Feed** | **Input “Amps” @21Vdc** | **Input Amps @27.2Vdc** | **Input Cable Size** | ***Input Brkr. Size** |
| None | 1 | 85A | 65A | 4 AWG | 80A |
| “A” | 2 | 170A | 130A | 2/0 AWG | 175A |
| **1600232357A, NE075DC12A Converters** | | | | | |
| **Jumper Option** | **Converters Per Feed** | **Input “Amps” @42Vdc** | **Input Amps @ 54.5Vdc** | **Input Cable Size** | ***Input Brkr. Size** |
| None | 1 | 31A | 24A | 8 AWG | 40A |
| “A” | 2 | 62A | 48A | 4 AWG | 80A |
| “B” | 4 | 124A | 96A | 0 AWG | 125A |



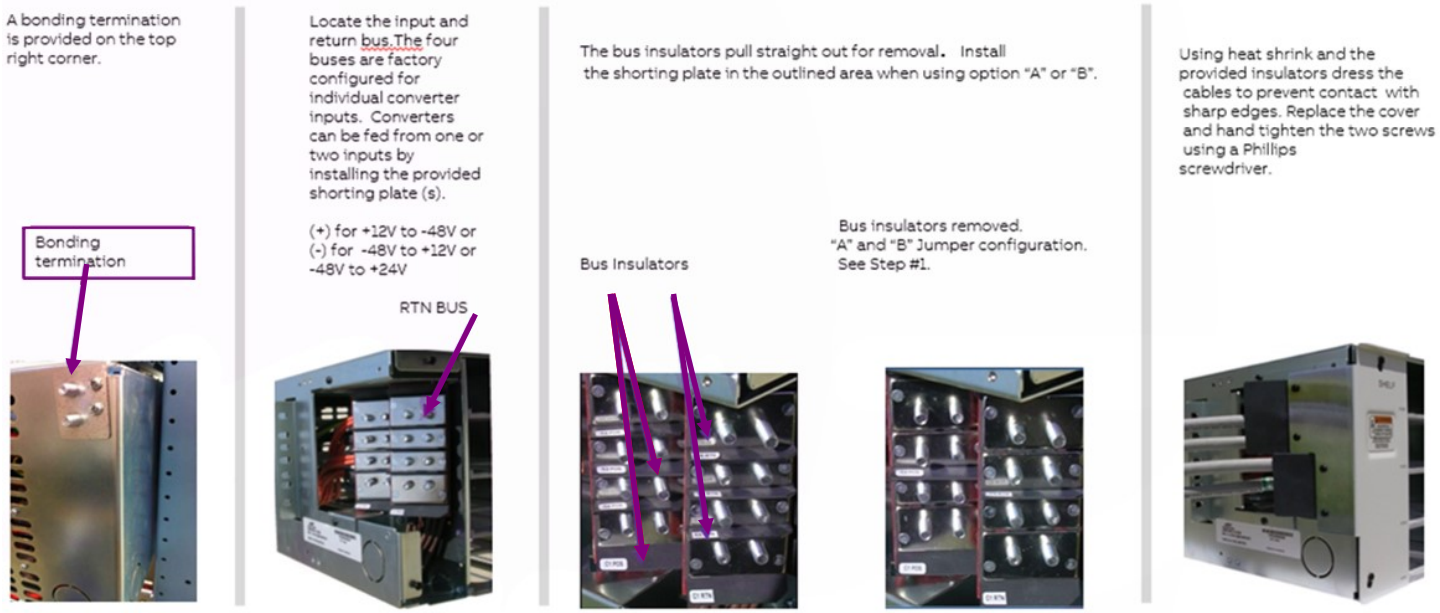
## Step 2 - Connect Chassis Ground Bond and DC Inputs

Loosen the two screws on the front of the input section and remove the cover. Bonding and Bus terminations are 1/4-20 double hole lugs on 5/8" centers. Minimum 10 gage wire is recommended. Torque to 65 in-lb (7.3Nm) - 7/16 socket.

**Danger:** Disconnect all input circuit protectors prior to making connections to the system.

Danger: Débranchez tous les protecteurs de circuit d'entrée avant de faire des connexions au système.
**Note**: Input DC Returns must be externally connected to DC Reference (CO) ground

**Note**: Power System return must be referenced to the Site Ground Bus!



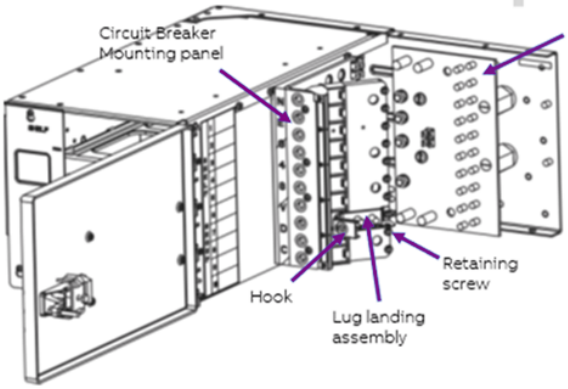

## Step 3 - Installing DC output circuit breakers

Circuit breakers and lug landing assemblies are required for each circuit. Install circuit breakers and distribution cables from the bottom to the top to allow cables to dress properly. Cables can dress up or down; knock outs are provided on the rear and side of the distribution area. One, two, three, four and five pole breakers are available. One, two and three pole lug landing assemblies mount to the circuit breaker mounting panel. Four and five pole lug landing assemblies attach to the circuit breaker before installation. Bus terminations are 1/4-20 double hole lugs on 5/8" centers. Torque to 65 in-lb (7.3Nm) - 7/16 socket.

**Danger:** Disconnect all input circuit protectors prior to making connections to the system.

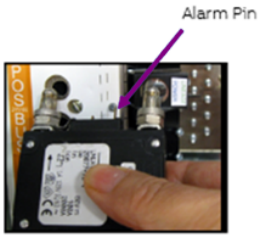
**Danger:** Débranchez tous les protecteurs de circuit d'entrée avant de faire des connexions au système.

Slide the rear of the lug landing assembly under the retaining screw. Verify the hook engages in the slot at the front of the circuit breaker panel. Torque the retaining screw to 4 in-lb.




One, two and three pole lug landing assemblies;

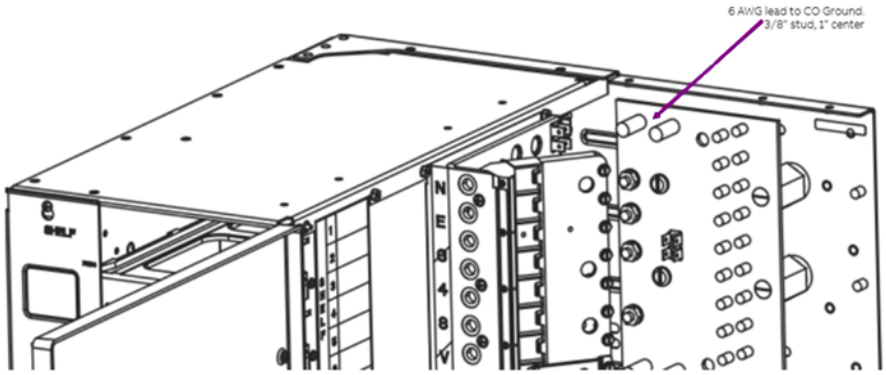
Install the circuit breaker with the alarm pin in the correct orientation as shown below.




Correct circuit breaker orientation. Note Alarm pin position.

## Step 4 - Connect CO (Reference) Ground

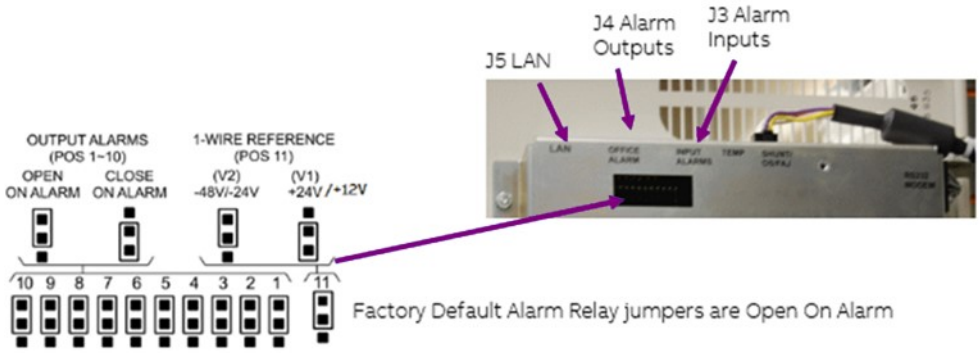
Connect a 6 AWG lead from the return bus to CO Ground.




## Step 5 - Controller Connections & Jumpers

The Pulsar controller is mounted inside the door.

See the picture to the right for LAN, Alarm Outputs, Alarm Inputs and alarm relay jumper options, (close or open on alarm), for the 10 available relays.



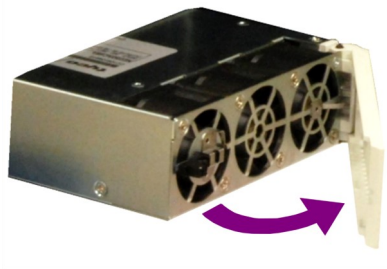

Factory Default Alarm Relay jumpers are Open On Alarm

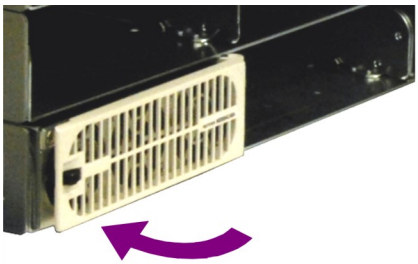
## Step 6 - Converters Installation

Slide the converter into the converter slot approximately 3/4 of the way.

Open the faceplate by sliding the faceplate latch to the left until the faceplate releases and swings outward.

Slide the unit into the slot until it engages with the back of the shelf. Swing the faceplate closed to fully seat the converter. Verify the faceplate is latched.





## Step 7 - Initial Set Up

Verify all connections are complete and secure. Once this is complete turn on the DC input protectors. As each converter powers up the controller automatically identifies the new converter and begins communication. If there are no alarms, make adjustments to the default settings on the controller as required. Using the menu to configure settings is intuitive.

### Information: Controller Basic Operation

Viewing and changing system parameters from the factory defaults can be accomplished in several ways; A) front display, B) Craft Port on front of controller using a laptop with EasyView2 software or HyperTerminal. EasyView2 (GUI) software can be downloaded from https://omnionpower.com, C) J5 LAN port in Static, Client, or Server mode. Static and Client modes are for accessing web pages through a network. Server mode allows local access to the controller web pages directly from a laptop connected to J5 LAN port; Server default IP address is 192.168.2.1. With the controller set to Server type the default IP address in the web browser address field. Server mode is a temporary setting, once configuration is complete reset the controller to Client or Static before connecting to the network. Static is the factory default setting and the typical setting for most networks.

**Warning:** Do not connect J5 LAN port to a network when set to Server.

**Avertissement:** Ne connectez pas le port J5 LAN à un réseau lorsqu'il est défini sur serveur.

## Step 8 - Controller Basic Operation - (continued)

**Controller Alarm Status:** The display changes colors; Green = Normal, Amber = Minor Alarm, Red = Critical/Major Alarm.

**Retiring Major/Minor Communication Fail Alarms:** This alarm occurs when removing converters from the shelf. To clear alarm reinstall the converter or select Control/Operation > Uninstall equipment from the controller menu.

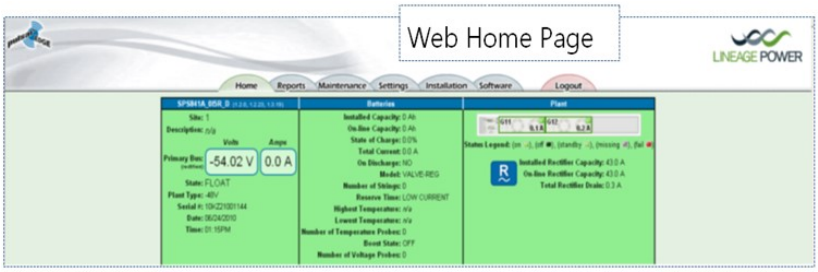
Using web pages or EasyView2; Select the Maintenance tab > clear latched events and clear missing devices.

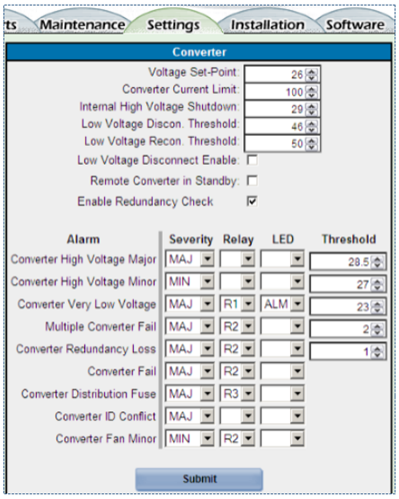
**Battery Discharge Alarm (BD):** To stop the nuisance BD alarm, the threshold can be reset from the controllers front panel.

Menu > Configuration > Float Settings > Voltage Alarms > BD Major, set to the appropriate voltage level.

**Installation Settings (Web pages):** Select the Installation tab to set the date, time, site ID and site description.

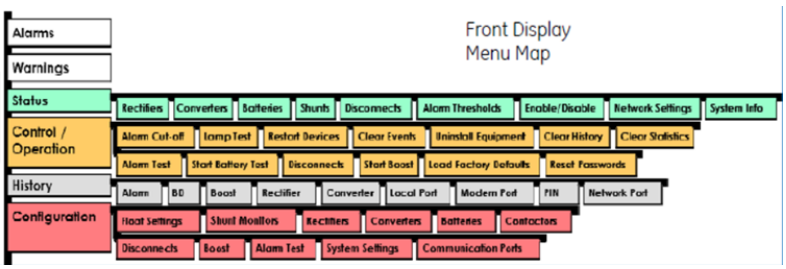
**Defining Alarm Outputs (Web pages):** Select the Settings tab > Converters to set alarm thresholds, severity and relays on J1 connector. Select the drop-down arrow next to the LED field and select ALM to activate the ALM LED for that alarm condition. Factory defaults are shown in the table below.

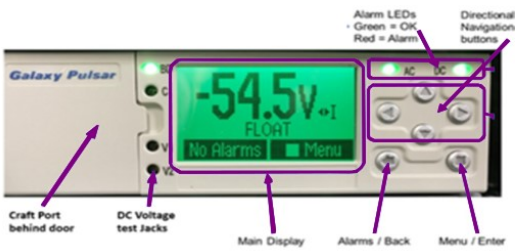



Settings Tab > Converter

| CONTROLLER DEFAULT VOLTAGE SETTINGS AND RANGES | | | | | | |
|---|---|---|---|---|---|---|
| Controller Default Voltage Settings and Ranges | Range 12V | Range 24V | Range 48V | 48V Defaults | 24V Defaults | 12V Defaults |
| Converter Internal Selective Hight Output Voltage Shutdown | 11.5 to 15.5V | 25.0 to 30.0V | 50.0 to 60.0V | 58.0 | 29.0 | 14.5 |
| High Output Voltage Major Alarm | 11.5 to 15.5V | 25.0 to 30.0 V | 50.0 to 60.0V | 56.0 | 28.5 | 14.0 |
| High Output Voltage Minor Alarm | 11.0 to 15.5V | 24.0 to 27.2V | 48.0 to 60.0V | 54.0 | 27.0 | 13.5 |
| Output Voltage Set-Point | 10.5 to 14.5V | 23.0 to 27.2 | 46.0 to 54.5V | 52.0 | 26.0 | 12 |
| Low Voltage Alarm | 7.5 to 14.5V | 20.0 to 27.0V | 40.0 to 54.0V | 46.0 | 23.0 | 9 |



## Information: Office Alarm Connections

Connections for alarm outputs and inputs are located on the controller: J4 is Alarm Outputs and J3 is Alarm inputs. The GUI and Web page interface allows alarm descriptions to be changed when required. Alarm cable pins, wire colors and factory default alarm signal names are in the tables to the right.

| Alarm Output Cables | |
|---|---|
| **Comcode** | **Length** |
| CC848817635 | 50 ft. |
| CC848817643 | 150 ft. |

| Alarm Outputs | | | |
|---|---|---|---|
| **Pin/ Wire Color** | **Signal Name** | **Pin'Wire Color** | **Signal Name** |
| 1/BL | PCR | 11/BL-BK | PCR_C |
| 2/O | PMJ | 12/O-BK | PMJ_C |
| 3/G | PMN | 13/G-BK | PMN_C |
| 4/W | BD | 14/W-BK | UR1_C |
| 5/BL | VLV | 15/BK-W | UR2_C |
| 6/BL-W | FAJ | 16/BL-R | UR3_C |
| 7/O-R | ACF | 17/R | UR4_C |
| 8/G-W | CFA | 18/R-G | UR5_C |
| 9/W-R | MCFA | 19/R-W | UR6_C |
| 10-BK-R | HV | 20/R-BK | UR7_C |

| Inputs | |
|---|---|
| **Pin/Wire Color** | **Signal Name** |
| 1/BK | Aux input 1 (Aux1) |
| 2/BR | Aux input 2 (Aux2) |
| 3/R | Aux Power Major input (AMJ) |
| 4/O | Plant Battery Test/Group Standby/TR (GSTR) |
| 5/Y | Emergency Power Off (EPO) |
| 6/G | Aux Input 3 (Aux3) |
| 7/BL | Aux Input 4 (Aux4) |
| 8/V | Aux input return 1-4 (Aux_R) |
| 9/S | Plant Battery Test/Group Standby/TR Return (GSTR_R) |
| 10/W | Emergency Power Off Return (EPO_R) |

## Convert the Shelf to Install in 19 input Framework

The Shelf ships configured for 23" or 26" framework installation. Convert the Shelf to install in 19" framework using the door 19" door included.

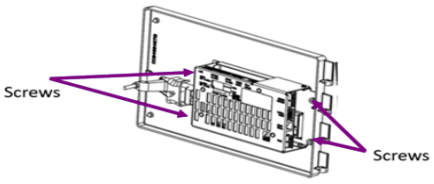


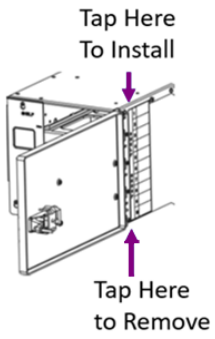
Figure details may differ from product.

### Step C1 – Remove the controller from the Door – if present

a. Open the Door.

### Step C2 – Remove the 23" door

a. Tap the open door upward at the bottom of the hinge.
b. Set the 23" door aside.




### Step C3 - Install the 19" door

a. Position the 19" door on the left chassis hinge points.
b. Tap the open door downward at the top of the hinge until fully seated.

### Step C4 - Mount the Controller to the Door - if present

a. Position the controller on the Door.
b. Secure with 4 screws. Torque to xx.

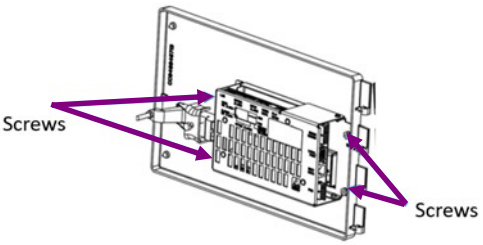


Figure details may differ from product.

## Step C5 - Remove Right Chassis

a. Remove 10 screws securing top and bottom covers to the left chassis. 5screws each, top and bottom - Phillips.
b. Remove the five 1/4-20 screws securing the left chassis to the right chassis - 7/16 socket.
c. Separate the right chassis from the left chassis.

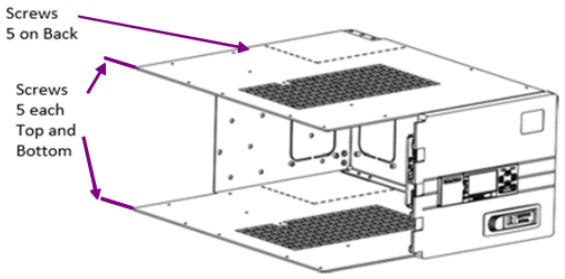



Figure details may differ from product.
Door not part of Right Chassis.

# Convert the Shelf to Install in 19 inch Framework

(continued)

## Step C6 - Remove the Cable Tie Rack

a. Remove 4 screws securing the .Cable Tie Rack to the right chassis.
   2 screws each on right side and on the rear - Phillips
b. Set the Cable Tie Rack and screws aside .

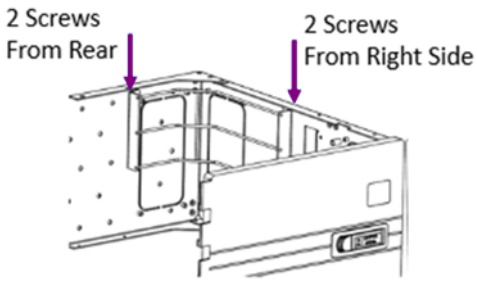



Figure details may differ from product.
Door not part of Right Chassis.

## Step C7 - Join Left and Right Chassis

a. Position Right Chassis

- Overlap the Left Chassis with Right Chassis rear panel, top cover, and bottom cover.
- Align Right Chassis to the right edge of the Door.
- Align holes in the Right Chassis rear panel, top cover, and bottom cover with PEM nuts in the Left Chassis.

b. Secure from Chassis rear with five ¼-20 screws. Torque to 65 in -lb ( 7.3Nm) – 7/16 socket.
   Secure top cover, and bottom cover with 10 screws. 5 screws each, top and bottom – Phillips.

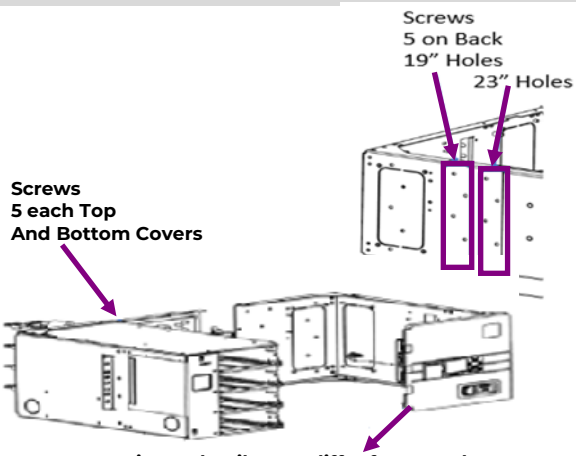



**Figure details may differ from product.**
**Top and Bottom covers not shown.**
**Door not part of Right Chassis.**

Add a Supplementary Shelf

Add a supplementary shelf (without controller) to the primary shelf (with controller).

Step A1 – Remove top & Bottom Covers between Shelves

1. Remove bottom cover of upper shelf – 5 screws – Phillips.
2. Remove top cover of lower shelf – 5 screws – Phillips.
3. Mount shelves using a minimum of six (three on each side) 12-24 screws included with shelves.

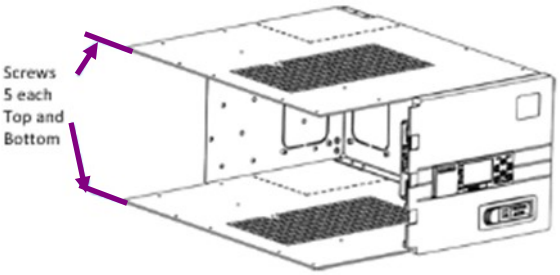
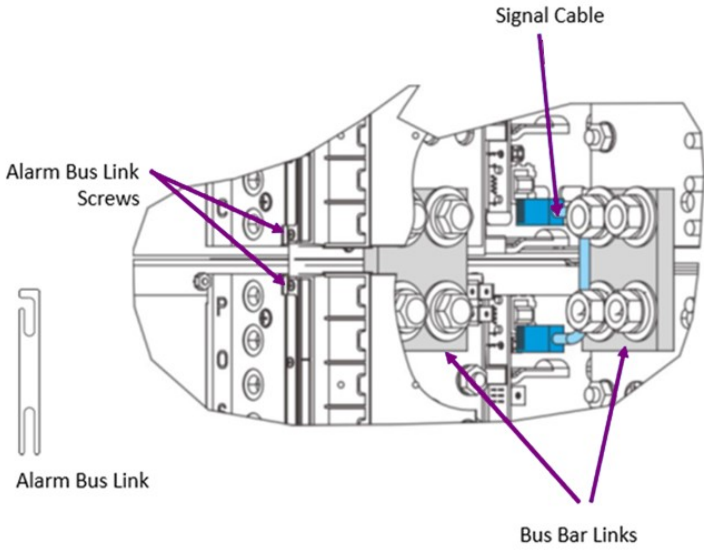



Figure details may differ from product.
Door not part of Right Chassis.

## Step A2 – Install the Shelf to Shelf Connections

All hardware is included in the shelf joining kit.

1. Install two bus bar links with nuts, washers, and lock washers. Torque to 240 in-lb (27Nm) – 9/16" socket.
2. Install Signal Cable.
3. Install Alarm Bus Link – 2 screws. Phillips




## Specifications and Application

- Specifications and ordering information are in the Infinity B Power System Brochure available at https://omnionpower.com
- External Surge Protective Device (SPD) is required on all AC inputs.

  Equipment Safety is Approved in UL1449/IEC 60664-1 Installation Category II environments.
- 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 in Network Telecommunication Facilities, OSP, or where NEC applies.
- Battery return may be either Isolated DC return (DC-I) or Common DC return (DC-C).

## Reference Documents

These documents are available at https://omnionpower.com

| Document | Title |
|---|---|
| CC109145851 | Pulsar Plus Controller Family Product Manual |
| | Infinity D Power System Brochure |

## Change History (excludes grammar & clarifications)

| Revision | Date | Description of the change |
|---|---|---|
| 16.0 | 12/27/2021 | Updated as per template, updated table in step 1 and updated model numbers on page 1. |
| 17.0 | 08/16/2023 | Reformatted p.1 & page footer |
| 17.1 | 10/26/2023 | Updated as per OmniOn template |

**OmniOn Power Inc.**
601 Shiloh Rd.
Plano, TX USA

**omnionpower.com**