



Infinity C™ DC to DC Power System Models 663 / 664 dc to dc Power Shelf 24v or 48V dc Output



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Introduction

This manual is intended as a guide in assisting equipment understanding, installation, testing, and troubleshooting. For additional assistance contact Customer Service or access additional information on-line.

Reference Documents

Document	Title
CC848921024	Quick Start Guide
CC848836981	Pulsar Edge Controller Family Product Manual Infinity C™ Product Line Brochure – Specifications and Ordering Guide

Customer Service Contacts

Customer Service, Customer Training, Technical Support, Product Repair and Return, and Warranty Service

Services provided include initiating the spare parts procurement process, ordering documents, product warranty administration, and providing other product and service information.

GE Energy phones are staffed from 7:00 am to 5:00 pm USA Central Time Zone (GMT -6), Monday through Friday, on normal business days. At other times, this number is still available, but for emergencies only.

Calling from	Phone Number
<ul style="list-style-type: none">United States, Canada, Puerto Rico, and the US Virgin Islands	+1 877 546 3243
<ul style="list-style-type: none">All other countries	+1 972 244 9288
	Or
	USADCC ¹ + 877 546 3243

Or contact your local field support center or your sales representative to discuss your specific needs.

On-Line Power Systems Product Manuals and Software

Product manuals, product line brochures, and software are available on-line. Software includes Easy View and SNMP MIB.

<http://www.ge.com/powerelectronics>

¹ the USA direct country code for the country where the call is originating

Product Description

Overview

Infinity C™ dc to dc power shelves convert and distribute available battery voltage to another dc voltage. This allows a single bank of batteries to provide battery reserve for equipment operating at a different dc voltage.

Features

- Positive or Negative output
 - 664 – Positive output
 - 663 – Negative output
- DC to DC Converters
 - 48V 30A output
 - 24V 75A output
- Distribution
 - Plug in circuit breakers
 - Up to 6
 - 5A to 100A
 - GMT fuses
 - Up to 10
 - 0.18A to 15A
- Controller - Galaxy Pulsar Edge
- Ethernet and RS232 or USB
- Windows GUI compatible via GE EasyView software²
- Mounting - 19" or 23" rack mount
- NEBS Level 3

Models				
Model	Input ³	Output ³	Converter	Output per Converter
663	+24V	-48V	NE030DC48A ⁴	30A
664	-48V	+24V	NE075DC24A ⁵	75A

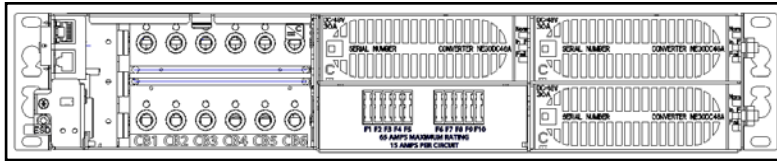
² Available at <http://www.ge.com/powerelectronics>

³ Nominal voltage

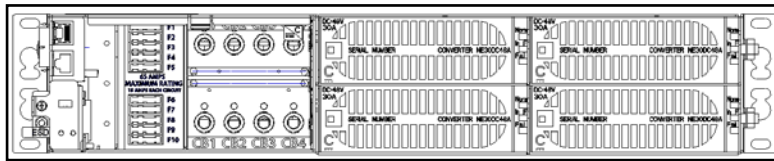
⁴ CC109112471 or SM48N30L

⁵ CC109142881

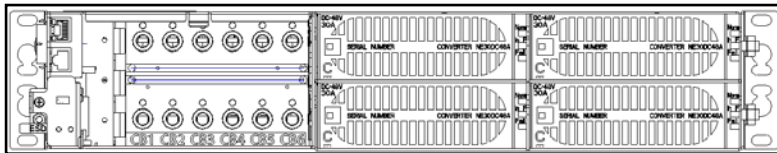
Configurations



6 CB, 10 GMT, 3 Converters

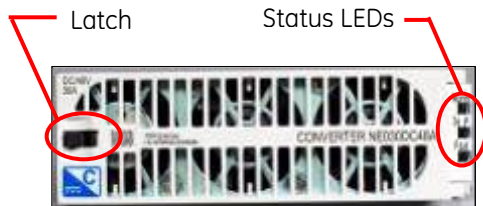


4 CB, 10 GMT, 4 Converters



6 CB, 4 Converters

Converters



Converter Front View



Converter retaining latch open

Installation

Preparation

Safety

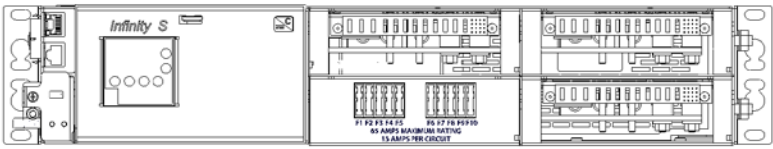
Read and follow all safety statements, warnings, and precautions in the Safety section of this manual and manuals of all other equipment before installing, maintaining or repairing the equipment. Product manuals contain additional safety statements, warnings, and precautions specific to the products.

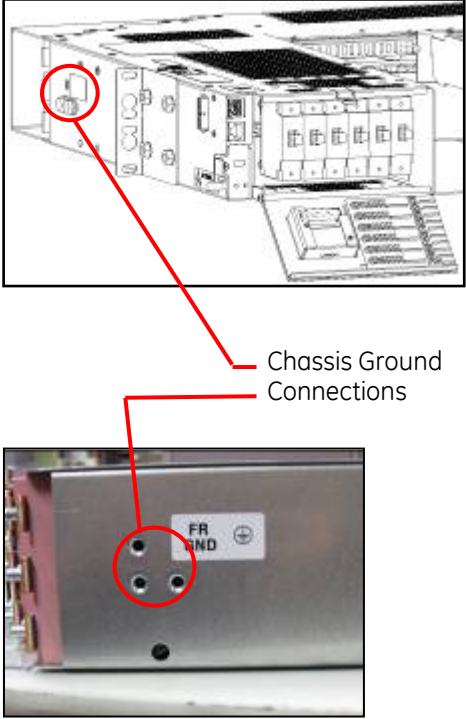
Installation Tools



Even though most initial installations are performed while the system is turned off, the use of properly insulated tools are recommended.

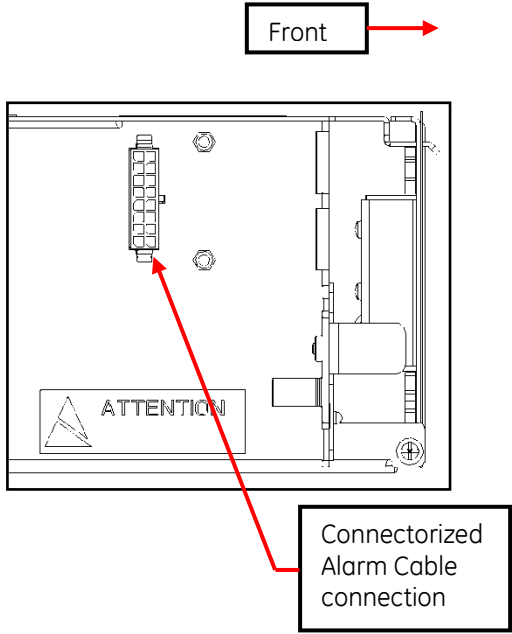
- Wire Cutters and Strippers
- SAE Socket Sets
- Digital Meter, +/- 0.02% accuracy
- Screw Drivers (flat-blade and Phillips)
- Torque Wrench (0-240 in-lb / 28 Nm)
- ESD Wrist or Heel Strap


Installation

Step 1	Mount Shelf
<p>Shelf Mounting</p> <ul style="list-style-type: none"> • The 663/664 shelf power system mounts in a 19 inch relay rack. Additional brackets are required for 23 inch mounting 	 <p style="text-align: center;">19 inch mounting</p>

Step 2	Ground Chassis
<p>Chassis Ground</p> <ul style="list-style-type: none"> Vertical or horizontal chassis ground cable landings are threaded holes 1/4-20 on 5/8 inch centers Torque to 240 in-lb Chassis ground connections are available if customer standards require the power system to have an independent grounding connection. The manufacturer does not require this connection when the relay rack or cabinet housing power system is properly grounded to maintain product operation or product warranty <p>NOTE: Failure to properly ground the power system is hazardous to site personnel and can damage the power system circuit cards and converter modules. It may void the power plant warranty.</p>	 <p>Chassis Ground Connections</p>

Step 3	Run and Terminate dc Input Connections
<ul style="list-style-type: none"> Loosen captive hardware Remove cover by sliding to the left and back. Input supply and return lug landings are 1/4-20 on 5/8 inch centers Torque to 240 in-lb Flex cable is recommended for sizes larger than No. 2 AWG Narrow tough lugs are required for lug sizes larger than No.2 AWG Supply and return tabs are staggered for ease of cabling Cabling exists to the left when facing the rear of the system 	 <p>Loosen captive screws</p> <p>Rear Cover</p>  <p>Supply and return connections</p>

Step 4	Run and Terminate Alarm Cabling
<ul style="list-style-type: none"> • Run and terminate alarm cabling • Jumper settings are available for both Close on Alarm and Open on Alarm extensions • Verify alarm extensions with the Alarm Center • See Pulsar Edge Controller Family Product Manual for additional information 	

Step 5	Run & Term. Supply and Return Cables
<p>Output cabling</p> <ul style="list-style-type: none"> • With GMT fuses and circuit breakers removed, land all supply and return cabling at the rear of the system • Circuit breaker lug landings - 1/4" on 5/8 inch centers Torque to 240 in-lb • GMT wire landings - Strip wire 3/8" Torque to 13 in-lb 	

Step 6	Energize Power Plant
<p>Start up</p> <ul style="list-style-type: none"> Remove all converter modules from the power plant if previously installed Insert a single converter and turn on the input breaker to this converter. This will apply input voltage to the controller and system load bus. The controllers' self-diagnostic will start within 30 seconds after power has been applied to the load bus Normal operation is indicated by the Green illuminated front display 	<div data-bbox="1019 201 1325 495" data-label="Image"> </div> <p data-bbox="1040 499 1304 558">Pulsar Edge Controller Normal Operation</p>

Step 7	Install Converter Modules
<p>Module Installation</p> <p>Insert converter modules</p> <ul style="list-style-type: none"> Converters can be added or removed with the power plant energized <p>Status LEDs:</p> <ul style="list-style-type: none"> Normal = Green Input Fail = Amber Fail = Red 	<div data-bbox="837 781 1203 905" data-label="Image"> </div> <p data-bbox="1276 827 1425 919">Green during normal operation</p>

Step 8	System Verification and Alarm Extension Verification
<p>Using the Controller</p> <ul style="list-style-type: none"> • Verify that the display screen is illuminated Green • Verify that no alarms are reported • Verify status of all converter modules are communicating properly • Verify all extended alarms with the Alarm Center. (see Pulsar Edge Controller Family Product Manual for alarm extension test) • Verify that the plant voltage displayed is within $\pm 0.05V$ of voltage measured between the charge bus and DC Return using a calibrated DVM • A Yellow display indicates the plant is in a Minor Alarm condition • A Red Display indicates the plant is in a Major Alarm condition <p>NOTE: Alarms will be extended to the Network Alarm Center during alarm controller based alarm testing.</p>	<div data-bbox="998 220 1300 514" data-label="Image"> </div> <p data-bbox="1019 516 1279 575" style="text-align: center;">Pulsar Edge Controller Normal Operation</p> <div data-bbox="987 632 1308 827" data-label="Image"> </div> <p data-bbox="1019 829 1279 888" style="text-align: center;">Pulsar Edge Controller Minor Alarm Condition</p> <div data-bbox="984 947 1313 1167" data-label="Image"> </div> <p data-bbox="1019 1169 1279 1228" style="text-align: center;">Pulsar Edge Controller Major Alarm Condition</p>

Step 9	Verify Power Plant Set Points
<ul style="list-style-type: none"> • Using the controller, verify all Power Plant set points are per customer standards • See Pulsar Edge Controller Family Product Manual for additional controller details 	<div data-bbox="912 1388 1214 1682" data-label="Image"> </div> <p data-bbox="933 1684 1193 1743" style="text-align: center;">Pulsar Edge Controller Normal Operation</p>

Safety









Safety Statements

Read and follow these statements and those in equipment manuals.

- Do not install this equipment over combustible surfaces.
- Follow all national and local rules and regulations when making field connections.
- Compression Connectors
 - For installations in the U. S. or Canada, use Listed/Certified compression connectors to terminate Listed/Certified field-wire conductors where required.
 - For 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.
 - If the proper connector for the country of installation is not provided, obtain appropriate connectors and follow manufacturer's requirements and all local requirements for proper connections.
- Torque electrical connections to the values specified on labels or in the product documentation.
- Dress cables to avoid damage to the conductors (caused by routing around sharp edges or routing in areas where wires could get pinched) and undue stress on the connectors.
- Size protectors (fuses or circuit breakers) as required by the National Electric Code (NEC) and/or local codes. Refer to the equipment ratings to assure current does not exceed:
 - Continuous Load (List 1) - 64% of protector rating
 - Maximum Load (List 2 - typically end of discharge) - 80% of protector rating.
- Field-wired Conductors - Follow all National Electric Code (NEC) and local rules and regulations when making field connections.
 - Size field-wired conductors based on listed recommendations, National Electric Code (NEC) and/or local codes based on 70°C ampacity.
 - Insulation rating: 90°C minimum; 105°C (minimum) if internal to enclosed equipment cabinets.
- Provide an accessible AC disconnect/protection device to remove AC power from the equipment in the event of an emergency. This device must open all poles and be connected together.
- Equipment and subassembly ports are suitable for connection to intra-building or unexposed wiring or cabling. The equipment and subassembly ports can be connected to shielded intra-building cabling grounded at both ends.
- Alarm contacts are not fused within the equipment. Current limiting protection for these contacts must be provided by external circuits. Exceeding these maximum ratings could result in fire or damage to the unit. Alarm contacts are rated at 60V and 0.5A unless otherwise noted in the product Specifications section.
- In enclosed equipment cabinets, the equipment chassis must be connected directly to the cabinet ac service ground bus. For applications in huts, vaults, and central offices, the equipment chassis must be connected to the system bonding network.
- Use only fuses and circuit breakers specified in the equipment documentation. Use of other parts may result in injury to personnel or equipment damage.
- Use only GMT fuses provided with safety caps.
- This equipment operates equally well if installed as part of the Isolated Ground Plane (Isolated Bonding Network) or the Integrated Ground Plane (Mesh-Bonding Network, aka, Common Bonding Network). Different grounding techniques are equally successful. Adhere to a commonly accepted and consistent grounding approach to ensure personnel safety, network protection, and proper equipment operation. Multiple low impedance paths to Earth ground are essential.

Warning and Safety Symbols

The symbols may sometimes be accompanied by some type of statement, e.g. "Hazardous voltage/energy inside. Risk of injury. This unit must be accessed only by qualified personnel." Signal words as described below may also be used to indicate the level of hazard

DANGER	Indicates the presence of a hazard that will cause death or severe personal injury if the hazard is not avoided.
WARNING	Indicates the presence of a hazard that can cause death or severe personal injury if the hazard is not avoided.
CAUTION	Indicates the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided.
	This symbol identifies the need to refer to the equipment instructions for important information.
	These symbols (or equivalent) are used to identify the presence of hazardous ac mains voltage.
	This symbol is used to identify the presence of hazardous ac or dc voltages. It may also be used to warn of hazardous energy levels.
	One of these two symbols (or equivalent) may be used to identify the presence of rectifier and battery voltages. The symbol may sometimes be accompanied by some type of statement, for example: "Battery voltage present. Risk of injury due to high current. Avoid contacting conductors with uninsulated metal objects. Follow safety precautions."
	One of these two symbols may be used to identify the presence of a hot surface. It may also be accompanied by a statement explaining the hazard. A symbol like this with a lightning bolt through the hand also means that the part is or could be at hazardous voltage levels.
	This symbol is used to identify the protective safety earth ground for the equipment.
	This symbol is used to identify other bonding points within the equipment.
	This symbol is used to identify the need for safety glasses and may sometimes be accompanied by some type of statement, for example: "Fuses can cause arcing and sparks. Risk of eye injury. Always wear safety glasses."



Precautions

Read and follow these precautions and those in equipment manuals.

- The equipment must be installed, serviced, and operated 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.
- The equipment may be powered by multiple AC inputs. Ensure that the appropriate circuit protection device for each AC input being serviced is disconnected before servicing the equipment.
- Do not disconnect permanent bonding provisions unless all ac inputs are disconnected.
- Batteries may be connected in parallel with the output of the rectifiers. Turning off the rectifiers will not necessarily remove power from the bus. Make sure the battery power is also disconnected and/or follow safety procedures while working on any equipment that contains hazardous energy/voltage.
- High leakage currents may be possible on this type of equipment. Make sure the equipment is properly safety earth grounded before connecting power.
- 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).
 - Wear safety glasses. Fuses can produce sparks. High energy levels on buses and distribution components can produce severe arcing.
 - Test circuits before touching.
 - Lock out and tag circuit breakers/fuses when possible to prevent accidental turn on.
 - Be aware of potential hazards before servicing equipment.
 - Identify exposed hazardous electrical potentials on connectors, wiring, etc. (note the condition of these circuits, especially wiring).
 - Use care when removing or replacing covers; avoid contacting circuits.
 - Use a personal ESD strap when accessing or removing electronic components.
- Electricity produces magnetic fields that can affect implanted medical electronic devices, such as pacemakers. The strength of the magnetic field depends on the amount of current in the circuit, as well as other conditions (such as number of conductors, placement, and distance from the conductor). DC power and distribution systems, including batteries, which are typically used in telecommunications utility rooms, can operate at high current levels. Personnel with electronic medical devices need to be aware of their restrictions when working around electricity.

Revision History

Issue 2	Removed reference to rectifiers, rebrand, reformat
Issue 1	Initial Release