



Infinity Outdoor Cabinet System – Dual Compartment (OCS-DC)

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Notice:

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1 Introduction

Overview

The Lineage Power Outdoor Cabinet System – Dual Compartment (OCS-DC) is an extension of the standard OCS platform. The DC cabinets provide additional rack space in an incremental footprint while maintaining the same height as the adjacent OEM cabinet.

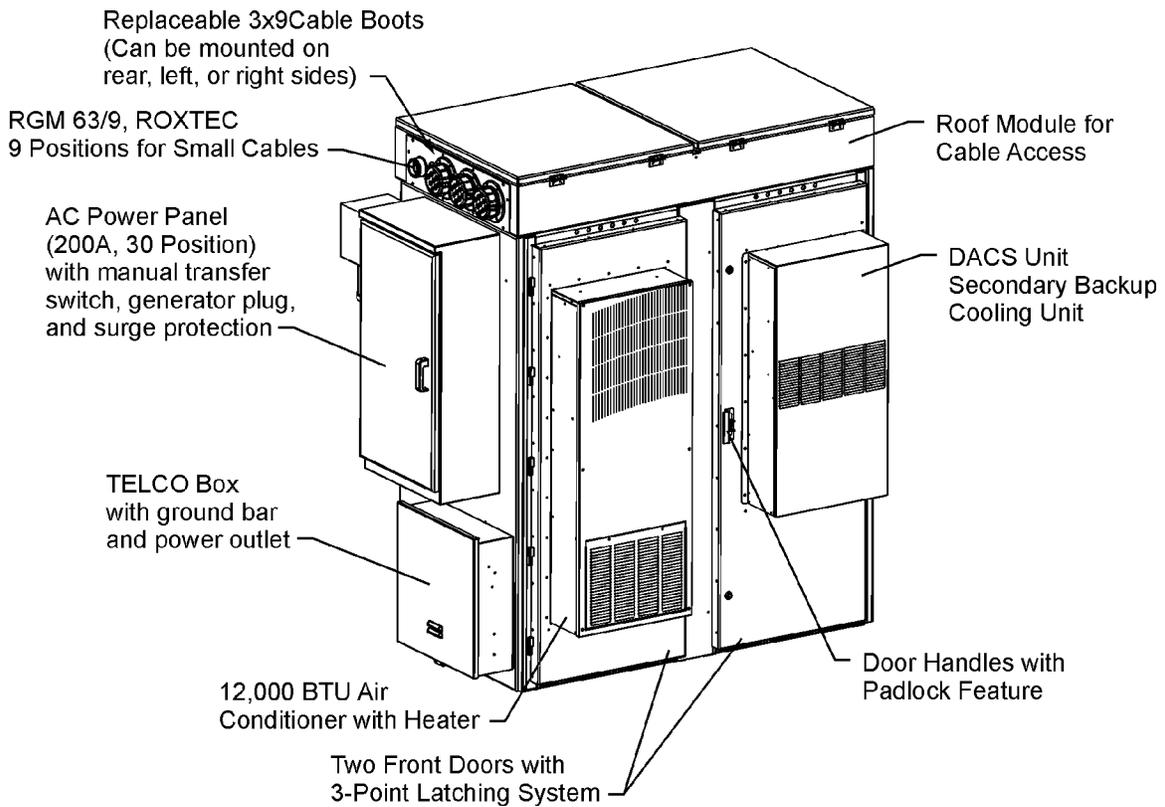


Figure 1-1: G2 Power Cabinet

The Infinity Outdoor Cabinet System – Dual Compartment (OCS-DC) is a weatherproof enclosure that can be equipped with a range of environmental control options allowing the internal compartment to be maintained within the desired temperature range. The modularity of the system design ensures easy access, simplified installation and maintenance, and allows the system to expand in capacity and features as needs grow.

Supplemental OCS Cabinets may be added to a line-up of existing OCS-DC cabinets by placing them next to each other without the need for inter-cabinet spacing. Since all cabling is run through cable box on top of the cabinet, the need for external cable conduit between cabinets is eliminated.

The Infinity OCS-DC Cabinet also offers specialized interface with other OEM cabinets (VIZ- NOKIA, Lucent, etc.). Contact your sales representative for more information on available built-in interfaces.

With its optimized internal capacity, configurability and flexibility, the Infinity OCS-DC is the ideal solution for the outdoor telecom applications of both today and tomorrow, providing both performance and endurance.

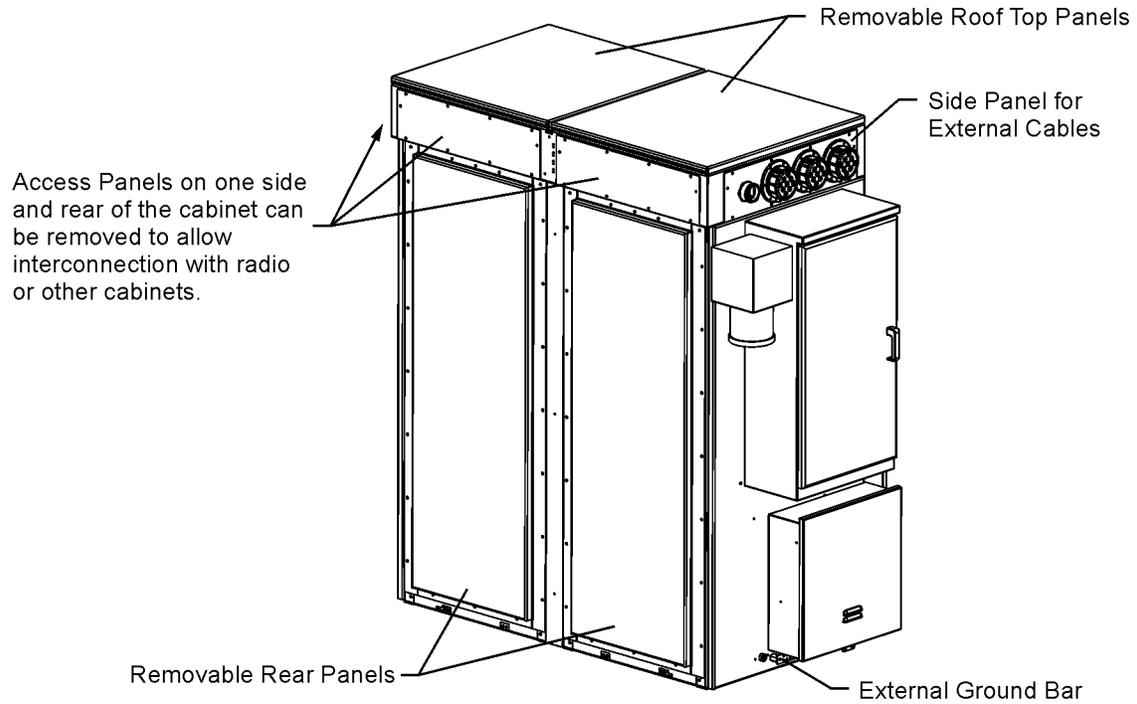


Figure 1-2: Cabinet Rear View

Customer Service Contacts

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

For customers in the United States, Canada, Puerto Rico, and the US Virgin Islands, call 1-800-THE-1PWR (1-800-843-1797). This number is staffed from 7:00 am to 5:00 pm Central Time (zone 6), Monday through Friday, on normal business days. At other times this number is still available, but for emergencies only. Services provided through this contact include initiating the spare parts procurement process, ordering documents, product warranty administration, and providing other product and service information.

For other customers worldwide the 800 number may be accessed after first dialing the AT&T Direct country code for the country where the call is originating, or you may contact your local field support center or your sales representative to discuss your specific needs.

Customer Training

Lineage Power offers customer training on many Power Systems products. For information call 1-972-284-2163. This number is answered from 8:00 a.m. until 4:30 p.m., Central Time Zone (Zone 6), Monday through Friday.

On-Line Power Systems Product Manuals

Power Systems on-line product manuals and EasyView software are available at <http://www.lineagepower.com>

2 Product Description

Overview

Figure 2-1 shows the front view of the G2 Integrated Infinity OCS-DC cabinet

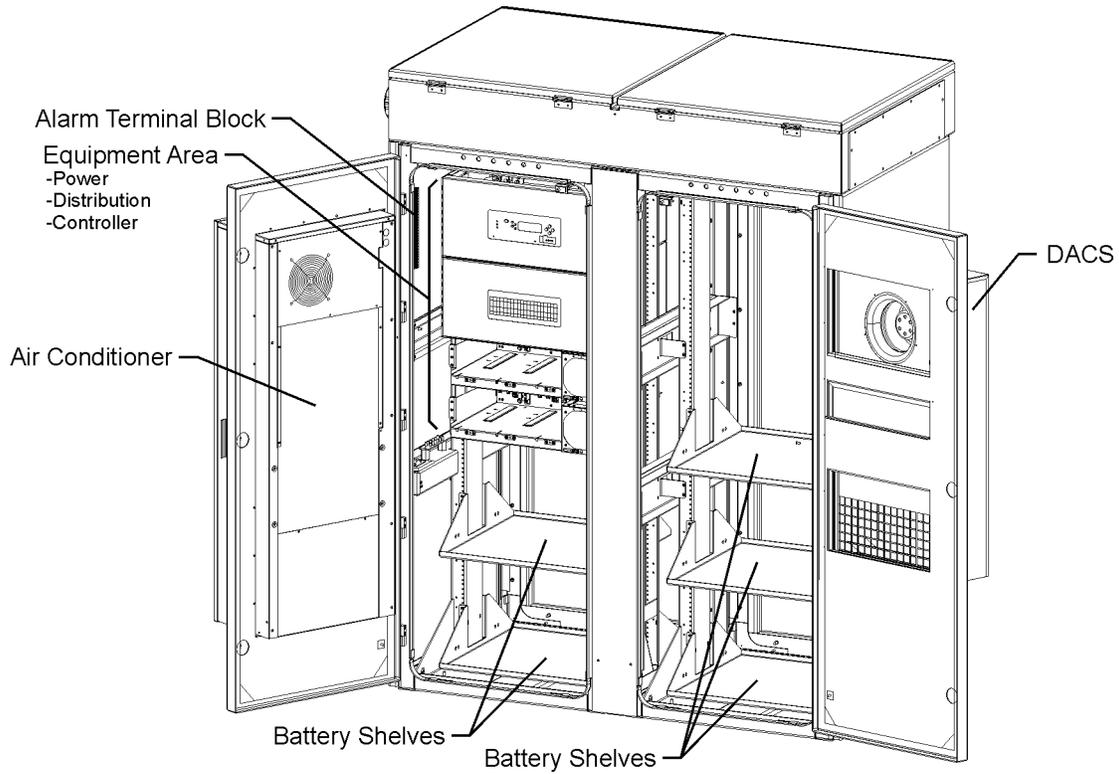


Figure 2-1: G2 Integrated Cabinet (Electronics and Battery Reserve)

System Components

The cabinet has a modular construction consisting of two equipment compartments, doors, cooling systems and power entrance.

Cabinet Shell

Constructed of heavy duty 0.125 inch thick aluminum, the outer compartment is completely weatherproof and designed to meet Telcordia Zone 4 earthquake requirements with the enclosed equipment. The cabinets have a modular construction allowing for two front doors, support for overhanging equipment (ac distribution panel, Telco box, etc.), metallic plinth support (optional) and an overhead cable box with rear and side openings.

Internal Rack

The cabinet is equipped with 23-inch rack rails to support embedded equipment.

Power System

The cabinet can be equipped with a 24V or 48V power system rated up to 24kW.

Battery Shelves

Shelves provided in the cabinet are designed to support customer specific battery strings. Labelling on the shelf identifies the type of batteries supported. Battery shelves are provided with Anderson disconnect switches for convenience, and built-in spill containment.

Doors

The cabinet is equipped with two front doors. Doors are designed with removable hinges to enable a door swap in the field. They are equipped with handles with padlocking feature for secure access.

Rear panels

The cabinet is equipped with two rear panels. Panels can be removed independently of each other.

Power Entrance

The cabinet offers a variety of service entrance and ac distribution panels. Refer to the enclosed literature for information on the system provided with the cabinet. The default configuration is 200A, 30 position panel with a manual transfer switch, surge protection and generator plug.

Climate Control Systems

The cabinet offers a range of climate control systems encompassing air conditioning and direct air cooling in capacities engineered for the enclosed equipment. Refer to the literature included with the cabinet for information on the installed system. The cabinet can accommodate primary and secondary cooling systems.

Roof Cabling Compartment

A roof cabling compartment offers convenient and quick access for external cabling. The cable compartment is designed to match adjacent Infinity cabinets or a preferred OEM cabinet on the sides or through the rear of the OCS-DC cabinet. A bridge kit is available as mentioned in the Appendix of this manual. It can also be used as an ac power junction box to external ac power from the service entrance to adjacent cabinets.

Accessories

The Infinity OCS-DC cabinet may be equipped with one or more of the following accessories:

- Alarm block
- Smoke detector with alarm
- Internal light
- Telco box
- Internal ground bar
- Laptop tray
- Convenience outlet
- Document holder

Specifications

Table 2-A: G2 Infinity OCS-DC Cabinet Specifications

Mechanical	
Cabinet	
Nominal Cabinet Dimensions (H x W x D)	77.4 in. x 60 in. x 31 in.
Weight	1200 lb (545 kg) Weight does not include batteries.
Units per Cabinet	
Rectifier Shelves	As equipped
Battery Shelves	As equipped
Controller	As equipped
Environmental	
Air Conditioner	12,000 BTU with 1500W heater
Operating Temperature	-40°C to +52°C
Altitude	-50 to 4000 meters
Humidity	5% to 100% Outdoor, outside the cabinet
Earthquake Rating	Zone 4, upper floors (pending)
Standards Compliance	
Agency Approvals	<p>cULus Listed (pending): UL60950/C22.2 No. 60950-00 Third Edition + UL Application Guideline: Certification of Information Technology Equipment Installed Outdoors;</p> <p>TUV-GS Licensed (pending): EN60950 Third Edition + IEC60529: 1989+A1: 1999 (IP44 Classification);</p> <p>CE Marking (pending): Council Directives 73/23/EEC and 89/336/EEC as amended by Directive 93/68/EEC</p>

Ordering Information

All material required for and Infinity OCS-DC installation is identified in the H569-471/472 Ordering Guide for this product. Power Cabinet wiring is documented on T85584-30.

3 Safety

Safety Statements

Please read and follow all safety instructions and warnings before installing, maintaining, or repairing the Infinity Outdoor Cabinet System-DC. Reference the individual module product manuals for additional safety statements specific to the modules.

- The cabinet must be installed, serviced, and operated only by 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 power cabinet has been evaluated for use in a continuous outdoor ambient temperature not to exceed 46°C.
- Fuses/circuit breakers may not be provided with the equipment. Refer to the documentation for the proper hardware. **Use only the parts specified in the documentation.** Installing fuses or circuit breakers not specified for use in this equipment may result in injury to service personnel or equipment damage.
- For installations in the U. S. or Canada, use Listed/Certified compression connectors to terminate Listed/Certified field-installed conductors where required. If the proper connector for the country of installation is not provided, obtain appropriate connectors and follow manufacturer's and all local requirements for proper connections.
- Torque electrical connections to the values specified on labels or in the product documentation.
- Battery cables must be dressed 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.
- An external service disconnect suitable for outdoor use must be provided with either fuses or circuit breakers that protect/open all non-grounded poles, and must be sized as required by the National Electric Code (NEC) and/or local codes. Refer to the equipment ratings to assure rating of equipment will not exceed 80% of the value of the protector chosen. Refer to the system T-drawing (wiring diagram) for recommended circuit protection for the different options.
- The supply neutral conductor must be grounded at the external service supply disconnect panel.
- The subject Outdoor Cabinet will be tested to ANSI/IEEE C62.41 Category B and EN61000-4-5 (Lighting Surge, level 4). A transient voltage surge protector*, at the service entrance panel, is recommended for installations where surges are common or the ac line is exposed after the point of protection.

- The ac input distribution has been evaluated for connection of minimum 90°C conductors sized according to the US National Electrical Code using the 75°C ampacity tables.
- The dc distribution is considered a Safety Extra Low Voltage (SELV) with the return side connected to the chassis (earth ground) inside the cabinet.

CAUTION

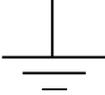
The dc distribution contains hazardous energy levels.

- DC load cables must be sized in accordance with minimum cable lengths shown in the documentation to keep short circuit currents less than the interrupt ratings of dc protectors in each panel.
- Maximum ratings for alarm connections are 60Vdc and 0.5 amperes. Exceeding these maximum ratings could result in fire or damage to the unit.

*Note: For installations in the United States and Canada, this device shall be Listed/Certified. For installations in Europe and other countries following IEC60364 series installation standards, a devices compliant with IEC61643 should be used if required by local authorities having jurisdiction.

Warning Statements 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

When working on or using this type of equipment, the following precautions should be noted:

- The internal equipment may be powered by multiple ac circuits. Make sure that the appropriate circuit protection device for each ac input being serviced is disconnected before servicing the equipment.
- Batteries are connected to the power system. Disconnecting the ac alone will not necessarily remove power to the equipment. Make sure the equipment is not also powered by the batteries.
- High leakage currents may be possible on this type of equipment. Make sure the equipment is properly safety earth grounded before connecting power.
- Hazardous energy and voltages are present in the power cabinet and on the interface cables that can shock or cause serious injury or death. Exercise care and follow all safety warnings and practices when servicing this equipment.
- 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 the batteries, that are typically used in telecommunications utility rooms or equipment cabinets can operate at high current levels. Personnel with electronic medical devices need to be aware of their restrictions when working around electricity.

In addition to proper job training and safety procedures, the following are some basic precautions that should always be used:

- 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.
- Use only properly insulated tools.
- Remove all metallic objects (key chains, glasses, rings, watches, or any other jewelry).
- Wear safety glasses.
- Test circuits before touching.
- Lock out and tag any 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 any wiring).
- Use care when removing or replacing any covers; avoid contacting any circuits.
- The power cabinet is extremely heavy and must be loaded, unloaded, and moved into place using suitable equipment, and by personnel properly trained in this activity and the use of the moving equipment. This manual does not provide instructions for performing these functions beyond identifying cabinet lifting points. Follow all safety and job precautions.

4 Initial Cabinet Installation

DANGER

The cabinet contains electrical hazards that can cause serious injury or death.

The cabinet is extremely heavy and can cause severe injury or death if not handled properly.

Please review all safety warnings in Section 3 before beginning the installation process. Observe all warnings and labels on the equipment.

Cabinet

Cabinets are usually shipped to a staging area (for example, a garage or warehouse). Proper equipment should be available to unload and transport the cabinet to the job site. A forklift truck may be used to lift the packed cabinet as long as the forks are at least 4 feet long and the cabinet can be safely lifted. If a dolly is used, a side of the cabinet without a removable panel should face the dolly and the cabinet should not be tilted more than 30 degrees from vertical. The cabinet is equipped with hoisting eye bolts in the Roof cable compartment that may be used for handling where the use of a forklift is not available or practical.

The cabinet is shipped from the factory with protective packaging. This packaging includes a bottom pallet and protective cardboard sides and/or “bubble wrap.” Handling a cabinet that is not properly secured to the bottom pallet or has its protective packaging removed may result in damage. It is recommended that none of the protective packaging be removed until the cabinet has been placed at the job site.

Dimensions and Required Clearance

The weatherproof enclosure dimensions for the cabinet are provided with an enclosed drawing. Refer to the drawing for the minimum front, rear and side access clearances required for installation and maintenance. Refer to Appendix A for interface details

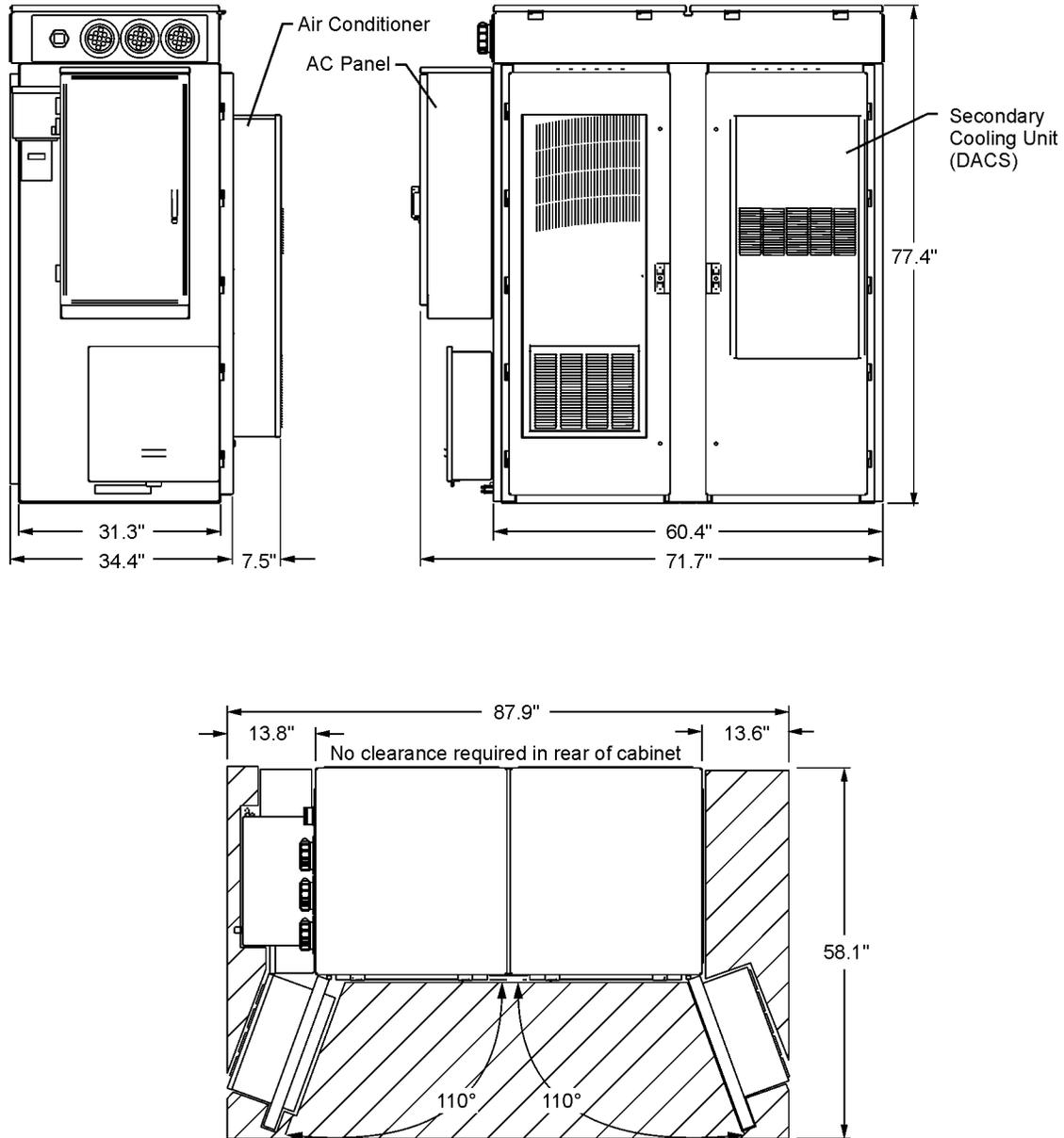


Figure 4-1: G2 Cabinet Dimensions and Required Clearances

Mounting Footprint

The cabinet may be mounted directly onto a concrete pad that has been equipped with anchor holes or it may be mounted onto a steel-mounting bracket or I-beam system. The anchoring hardware is not provided as part of the cabinet and may be selected from choices provided in the H569-471/472 drawing to meet site requirements. Drawings are provided with the cabinet showing the mounting footprint, overall cabinet dimensions and location of mounting holes.

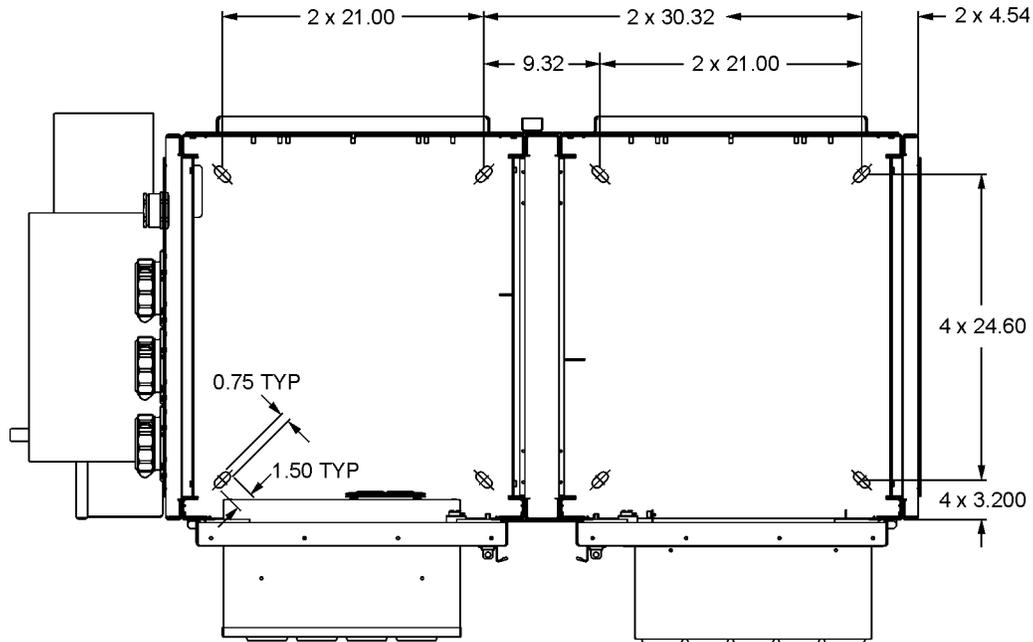


Figure 4-2: Cabinet Mounting Footprint (G2)

Note: If installation of the cabinet is not going to continue on the same day as cabinet placement outdoors, or it cannot be powered up for any reason, a 60-watt heat source must be activated inside the cabinet to prevent water condensation. An incandescent light bulb or other low power heat source may be used for this purpose.

Grounding

Cabinet grounding consists of grounding the cabinet frame to the grounding electrode, ring ground, halo ground, or central office ground as required by the using system grounding requirements. Both the ac system ground and dc distribution return are bonded to the cabinet framework as part of the power cabinet circuitry. Connection of the cabinet to the ac protective earth (safety earth) and to the ground electrode must be performed during installation.

An external ground bus bar is provided on one side of the cabinet next to the ac box (see Figure 4-1). Up to 2 AWG cable can be terminated on the bus bar. As per user system grounding requirements, oxid-inhibiting joint compound (No Ox) must be applied and used at these ground connections.

Access

The OCS-DC cabinet provides access through various removable panels. The figure below shows panels that can be removed to enhance access during installation and maintenance of the cabinet.

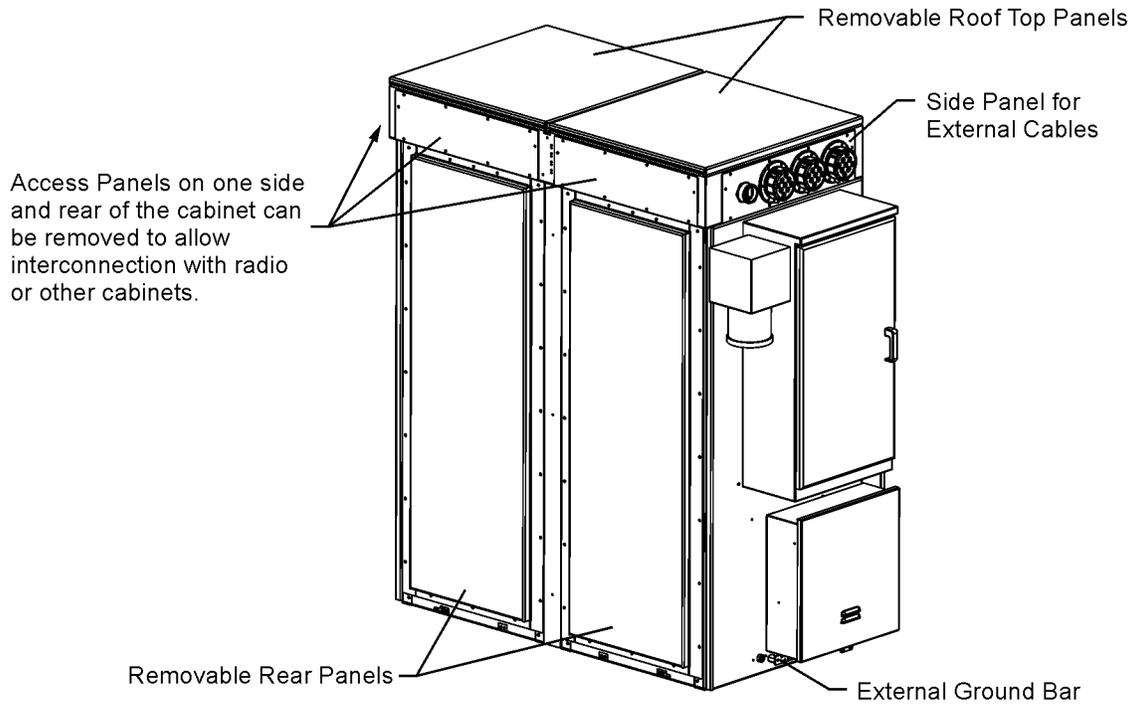


Figure 4-3: Access Panels

AC Input

G2 Cabinets

Fittings for 2-inch Liquid Tight Flexible Metal (LFML) conduit have been provided for convenience on the H569-471/472 Ordering Guide. The use of this conduit type is not mandatory, but the mechanical protection provided for these conductors must meet the weatherproof specifications of LFML conduit.

Open the AC Panel door and remove the thumb screws to open the inside cover. Figure 4-4 shows the ac power connections.

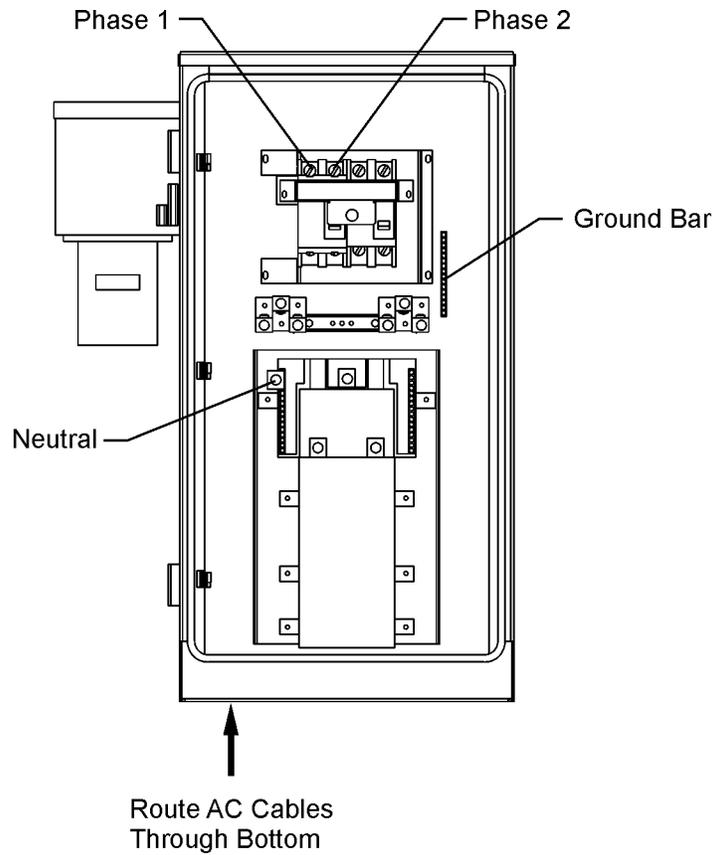


Figure 4-4: AC Connection Points

TELCO Box

Remove the retaining screw from the bottom of the TELCO Box to remove the cover. Figure 4-5 shows the internal view of the TELCO Box.

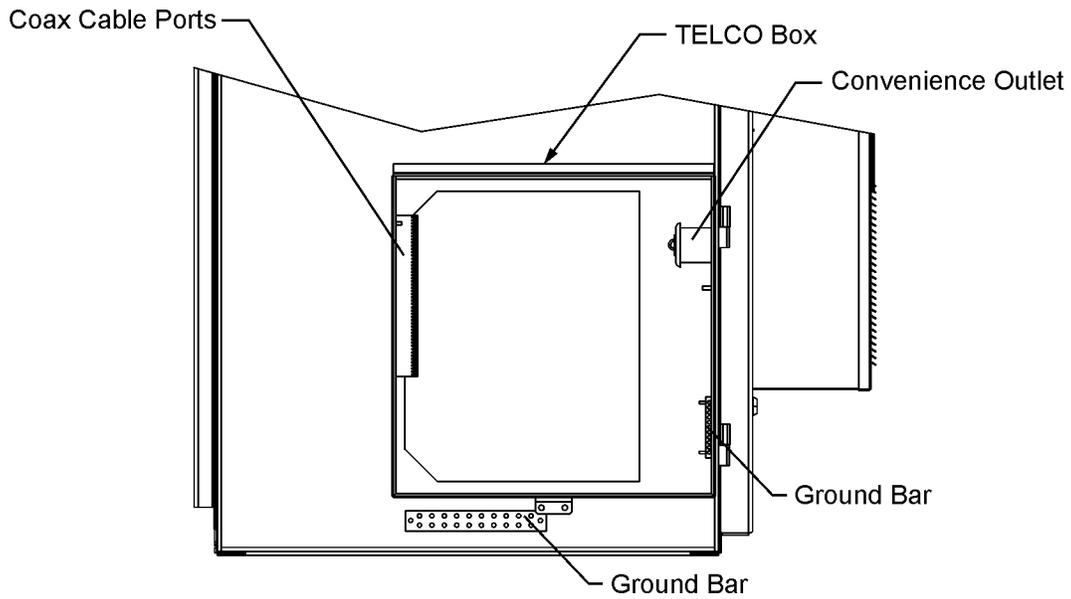


Figure 4-5: TELCO Box Internal View

5 Battery Installation

The OCS-DC cabinet may contain up to 20 battery modules (5 shelves) used in a series/parallel configuration to provide +24 volt backup reserve.

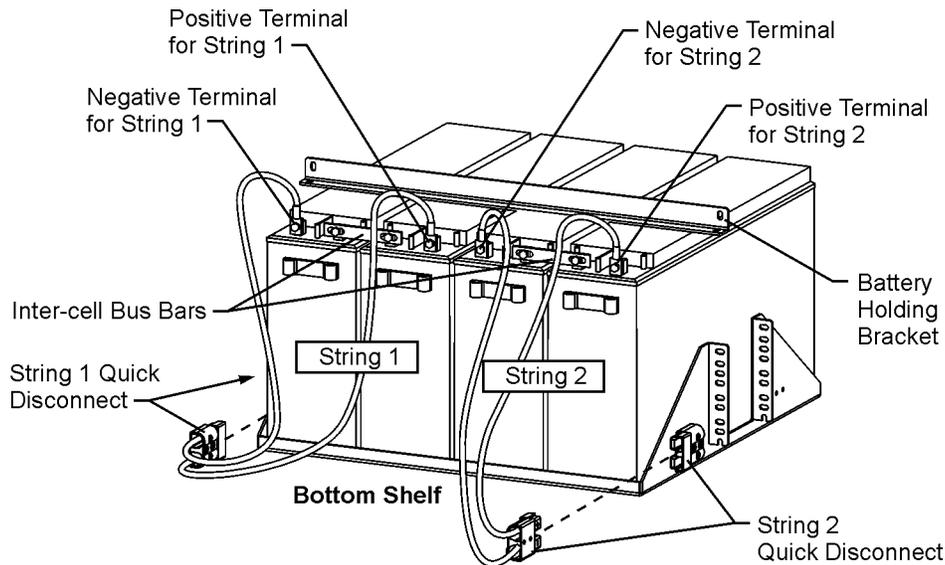


Figure 5-1: Battery Shelves

Battery Handling Precautions

CAUTION

Read the following safety precautions carefully before attempting to unpack and install any battery. Storage type batteries differ from other sources of power in that they are delivered to the points of installation as live units. Fully brief anyone who is permitted access to battery areas on the hazards of handling lead-acid batteries. Make it clear to anyone handling, unpacking, or installing lead-acid batteries that they contain electrolyte (sulfuric acid and water). Everyone must wear protective equipment such as rubber gloves, rubber aprons, full-facemask, and splash-proof goggles when performing any activity involving handling of batteries or cells containing electrolyte.

- In case of electrolyte contact with the skin, remove the electrolyte immediately by flushing the affected area with large amounts of plain tap water. In case of electrolyte in the eye, pour water into the inner corner of the eye and allow at least one quart of water to run over the eye and under the eyelid. A physician should treat eye injuries immediately.
- A storage battery gives no indication by its appearance of the potential energy stored in it. All lead acid storage cells/batteries have enormous short circuit capability, which can result in serious burns. Use extreme care to avoid shorting out cell and/or

battery terminals. Shorting a cell or battery with a non-insulated tool can vaporize or throw the tool.

- The use of insulated tools is mandatory. Never place metal objects on top of a battery module. Remove all metal jewelry such as rings and watches when working on or near batteries.
- All lead-acid batteries generate hydrogen gas, even under open circuit conditions. If not permitted to escape, this gas can build up to explosive concentrations. NEVER tamper with or block the vent caps of the battery modules. A damaged gas vent cap could become clogged, resulting in an explosion due to internal pressure. Such an explosion could short circuit other battery modules and result in a fire. ALWAYS place batteries in a well-ventilated area. NEVER place battery modules in a sealed environment.
- Avoid creating sparks, including those from static electricity, or the use of an open flame near batteries since the gas generated by batteries is highly explosive. Before performing each work operation, firmly touch a ground to discharge the static electricity from your body.
- Battery gases are flammable. NO sparks or open flame is allowed near battery modules. To direct attention to the possible source of danger from battery gases, post one or more warning signs, lettered in large characters, in a conspicuous location near the battery.

Battery Lifting Precautions

Most of the 12V battery modules weigh 125 lbs or more. Refer to Figure 5-2 for lifting precautions.

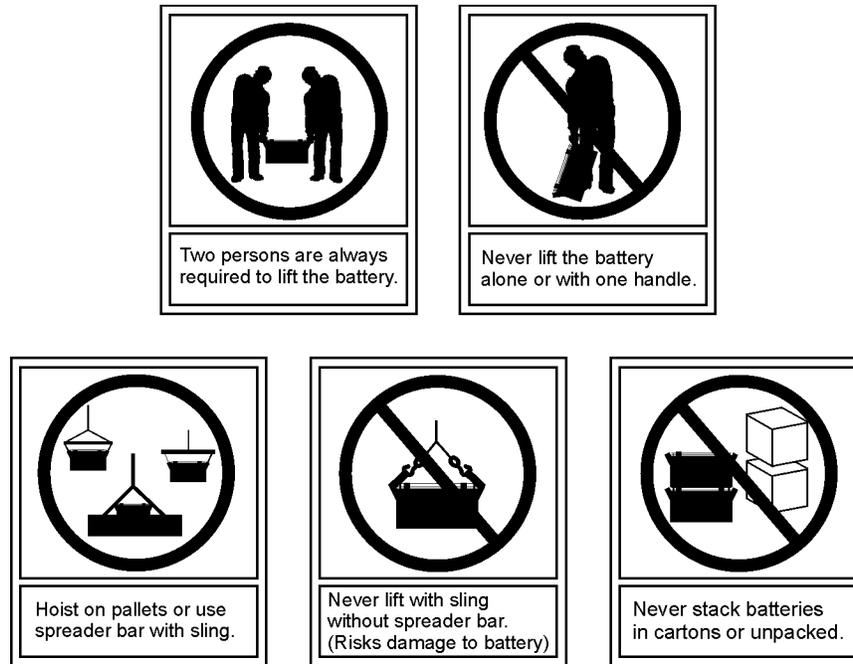


Figure 5-2: Battery Lifting Precautions

Battery Storage and Charging

12V battery modules are shipped fully charged. The maximum time that a charged module may stay on open circuit is typically six months at 77°F. If the storage temperature exceeds 90°F (32°C), the time the battery stays on open circuit should NOT exceed four months.

The charge by date stamped on the shipping container is the date at which the battery will have been on open circuit for six months. If the batteries cannot be put into service by the date stamped on the shipping container, follow one of the maintenance procedures below and record the actions taken until the normal installation can be initiated. Check the above based on the battery manufacturer's data and instructions.

DANGER

Provide adequate ventilation while charging.

For maximum safety, batteries should NOT be handled during charging and for 24 hours thereafter.

Procedure 1

Maintain the battery on continuous float charge operation as per the battery manufacturer's recommendation until the normal installation can be done. A typical float charge voltage is 13.62 ± 0.06 volts per battery module.

Procedure 2

Charge battery modules 8 hours a day, 5 days a week until the normal installation can be done.

+24V Battery Installation Procedure

1. Check the charge by date stamped on each battery-shipping container. Check the out-of-box voltage of each battery module. Any module with an open-circuit measurement of less than 12.60V or as otherwise specified by the manufacturer, should not be placed into service.

NOTE:

If the charge by date has been exceeded, the batteries must have been charged using one of the procedures listed above, or they cannot be put into service.

2. Locate the battery cable connectors for the battery strings. Disconnect all battery cable connectors.

CAUTION

Do not reconnect any of these connectors until ready to put the batteries into service during the final installation procedures (Section 7).

3. Pull all of the insulated battery cable sets and optional thermistor wire sets clear of the area where the battery modules will be located. Refer to Figure 6-1 for string locations. Strings are numbered left to right, and from the bottom battery shelf to the top shelf.

CAUTION

Check battery weight. Due to the high weight of each battery module (>125 lbs), two people are required to lift each module onto the cabinet shelf.

4. With the battery terminals facing the front of the cabinet, carefully slide a battery module onto the left side of the bottom battery shelf. Place another battery module onto the shelf and slide it to the immediate right of the first module.
5. Repeat for the 2nd battery string (2 battery modules) on the right side of the bottom shelf (if equipped). Repeat for remaining strings on upper shelves (if equipped).
6. Remove any terminal covers from each of the battery modules and spread a thin coat of antioxidant on all of the battery terminals.

NOTE:

In the following steps, be certain to check that the polarity marking on each cable matches that of the battery terminal. Positive polarity cables are Black w/Red tape, negative polarity cables are Black only. The lengths of the cables sets on each shelf determine the string for which they are intended. Refer to Figure 6-1.

7. For battery string 1, (left half of the bottom shelf) locate the negative (-) battery cable (Black). Spread a thin coat of antioxidant on the negative cable connector and place the coated connector onto the negative (left) terminal of the left-most battery module. If equipped with a thermal probe, spread a thin coat of antioxidant on its ring terminal and place it onto the negative (left) terminal of the battery module along with the negative (-) battery cable. Using a battery terminal nut and washer, secure the connector(s) to the terminal by hand tightening the nut.
8. For battery string 1, (left half of the bottom shelf) locate the positive (+) battery cable (Black w/Red tape). Spread a thin coat of antioxidant on the positive cable connector and place the coated connector onto the positive (right) terminal of the 2nd battery module of string 1. Locate the thermal probe cable for this shelf if provided. Spread a thin coat of antioxidant on its ring terminal and place it onto the positive (right) terminal of the 2nd battery module of string 1 along with the positive (+) battery cable. Using a battery terminal nut and washer, secure the connectors to the terminal by hand tightening the nut. Neatly secure any slack in the thermistor cable with a wire tie.
9. Repeat these steps for battery string 2, made up of the 2 battery modules on the right half of the bottom shelf.
10. Repeat for other strings on upper shelves (if equipped). Place the thermal probe for the upper shelf onto the positive (+) battery post of the upper shelf string in the same manner as completed for string 1 on the bottom shelf.

6 Initial Power-up and Test

This section provides the basic turn up procedures for the Infinity OCS-DC cabinet. The following procedures are provided:

- Pre-turn-up Checks
- Turn-up ac Input Power
- Test Alarms

Pre-turn-up Checks

- Verify that the ac utility source circuit breaker is in the OFF position.
- Verify that all ac circuit breakers in the ac distribution panel are in the OFF position.
- Verify that all dc circuit breakers in the dc distribution bus are in the OFF position.
- Turn-up AC Input Power
- Verify that all circuit breakers in the ac distribution panel are in the OFF position.
- Place the breaker for the cabinet in the pedestal or power panel to the ON position.

DANGER

AC voltage present on the distribution panel terminals will cause death or severe personal injury. Exercise extreme care when making the measurements in the following step.

- Using a multimeter, measure the voltage between phases and from each phase to neutral in the ac distribution panel. Acceptable voltage ranges are 176 to 256 Vac phase-phase and 90 to 130 Vac phase-neutral.

Note: If the above voltage requirement is not met, correct the problem and repeat this measurement. Do not proceed with cabinet power-up until the ac source is within this voltage range.

- Replace the ac distribution panel cover.

7 Final Installation

Note that ac and dc distribution conductors may not be routed together within the same conduits when exiting the power cabinet. Alarm cabling may be run with dc distribution cabling, subject to the 40% maximum fill requirement of that conduit. Tables have been provided on the H569-471/472 Ordering Guide to assist with the engineering of conduits and cables exiting the power cabinet.

Alarms

Factory wired OCS alarm connections are made at the M66-50 alarm terminal block. Alarm designations are shown in Figure 7-1. Maximum ratings for alarm relay connections are 60Vdc and 0.5A. The alarm condition is a closure from C to NC, and an open from C to NO.

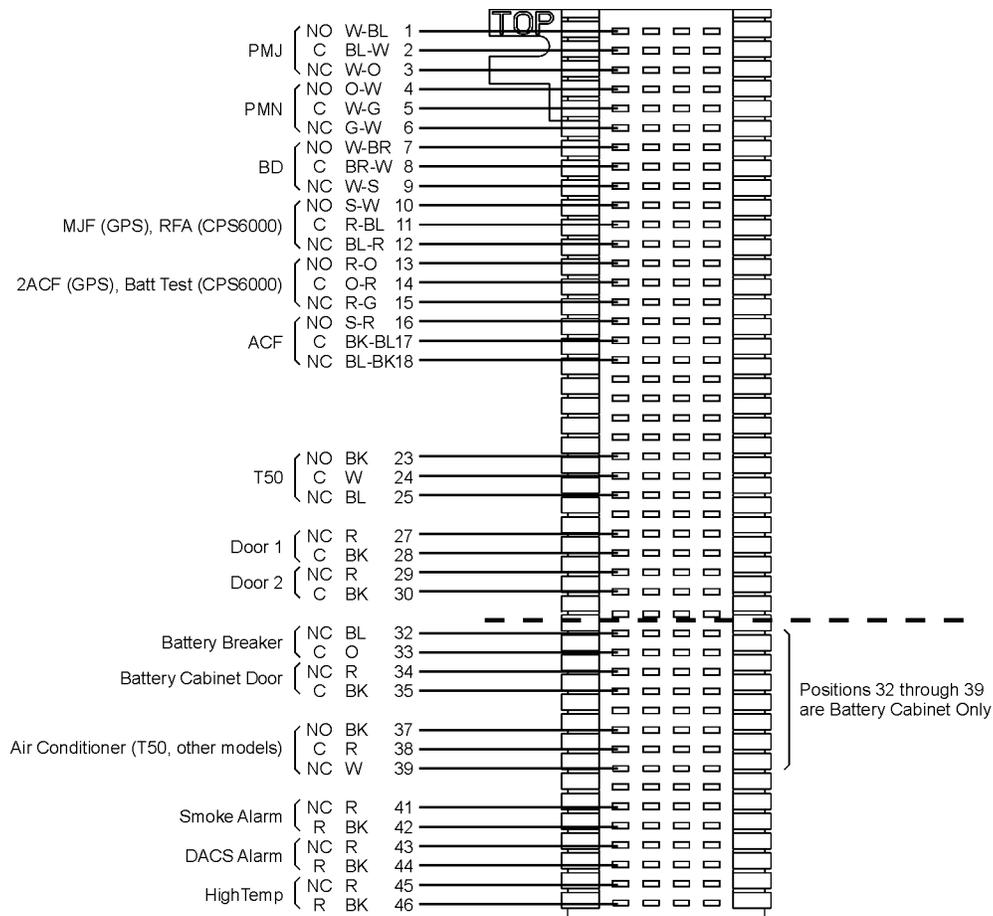


Figure 7-1: Cabinet Alarm Connections

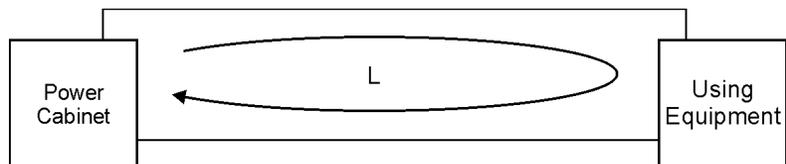
DC Distribution

Minimum DC Cable Length

A minimum cable length for a given cable size and protector type must be used to ensure proper short circuit protection in the case of a bolted fault.

Provide cable run lengths as least as long as the minimum length indicated here to assure that the short circuit currents are less than the interrupt current rating of 10,000A.

Cable Size	Minimum Cable Length "L"
10 GA (6 mm ²)	5 feet
8 GA (10 mm ²)	8 feet
6 GA (16 mm ²)	12 feet
4 GA (25 mm ²)	19 feet
2 GA (35 mm ²)	30 feet



Load Connections

DC distribution loads may be assigned to circuit breakers on a panel located in the top portion of the electronics compartment. Breakers of the appropriate style must be installed into desired positions on the dc distribution panel(s). When installing the circuit breakers, first insure that the breaker is in the OFF position and that the LINE and LOAD terminals of the breaker properly align with the associated positions on the panel. As the breaker is installed, make sure the center contact (alarm contact) engages into the alarm position for that position on the distribution panel so that the alarm for a tripped breaker is properly reported.

Load assignments made to distribution breakers should be recorded on the breaker ID label for that panel, located on the side of the OCS power cabinet.

DC load conductors shall be terminated onto their assigned breakers and onto the common load return bus on the power cabinet, and routed out one of the four, 2-inch conduit openings on either side of the power cabinet to the load equipment cabinet(s). Make breaker assignments and route these conductors in a manner to avoid blocking access for future load assignments in the power cabinet.

DC conductor sizing to meet voltage drop requirements should be based on a minimum battery voltage of 1.77 volts per cell or 21.25V at the power cabinet. DC conductor and circuit breaker sizing may also be influenced by conductor ampacity de-rating caused by more than 3 conductors in a conduit and/or outdoor ambient temperatures of up to 45°C for the conduit(s). Reference Chapter 3 of the NEC or other local codes as necessary when selecting conductor and breaker sizes. The H569-471/472 Ordering Guide includes tables to assist in meeting the 40% conduit fill requirement.

AC Distribution

Spare positions are available on the ac input panel of the power cabinet as shown on the appropriate wiring diagram for service to the cooling/heating system and ac convenience outlets of supplemental cabinets and/or ac loads in customer equipment cabinets as necessary. Do not mix ac and dc load conductors in the same conduit when exiting the power cabinet.

Rectifiers, GPS

1. Locate and turn off the ac service feeding the rectifiers. Note: Do not turn off ac service to the entire system, only to the rectifiers being installed/serviced

Installing a 596B6 Rectifier

1. Use the rotary switches on the back of the unit to set the rectifier ID. Each id should be unique so that the controller can identify the rectifier
2. Slowly slide new rectifier onto the shelf until it contacts the rear connector.
3. Using the Allen wrench, turn the Allen-head bolt clockwise to pull the rectifier into the shelf.
4. Turn the ac service back on.

Rectifier Fan Assembly

The expected life of the rectifier fans at 25°C (77°F) is approximately eight years. The fans in the rectifiers may be replaced in the field.

Two approaches can be taken to fan maintenance:

- The first approach is to replace the fan on a routine basis every seven to eight years; this ensures that the fan does not fail in the field under normal operating conditions. This approach is appropriate when there are no remote alarm facilities at the site.
- The second approach, assuming one has remote alarm capability, is to wait until the fan fails. The rectifier will safely shut down and issue both a fail alarm and a thermal alarm. The fan can then be replaced. Since it is likely that all the rectifiers in that installation are of roughly the same age, all rectifier fans at that site should be replaced at that time.

The approach used depends on the location and manning of the site as well as the monitoring of alarms used at the site. Refer to “Replacing a Rectifier Fan Assembly” in this section.

Replacing a Rectifier Fan Assembly

1. Remove the rectifier from the system. See the “Installing or Replacing a Rectifier” procedure in this section for the procedure.
2. WAIT five minutes for capacitors to discharge.
3. Loosen the white front cover by removing 14 screws (5 top, 5 bottom, 2 on each side). Before fully removing the cover, disconnect the ribbon cable from the display circuit pack.
4. Remove the screws attaching the old fan to the chassis and carefully unplug the fan connector. The fan connector is keyed and can be loosened by inserting a screwdriver into the slotted side of the connector and gently prying the fan-side connector loose.
5. Replace the old fan with a new fan.
6. Reconnect the ribbon cable removed in Step 3.
7. Attach the front cover.
8. Install the rectifier, following instructions in the “Installing or Replacing a Rectifier” procedure in this section.

Controller

For GPS Systems, refer to the enclosed Vector Controller Manual for information on default settings and procedures to change settings.

Cooling System

Energize the air conditioner. Ensure that the thermostat on the air conditioner is set to 77°F (25°C). This is the factory default setting.

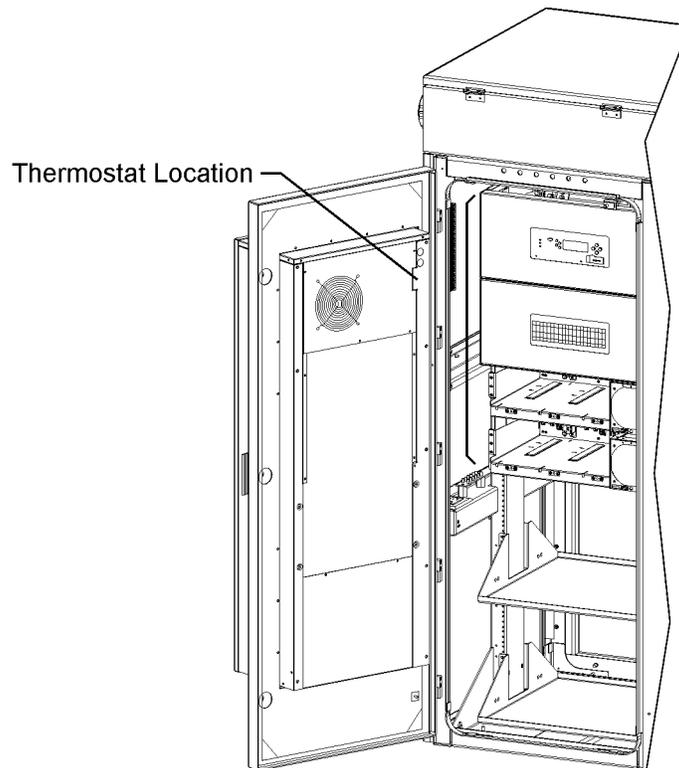


Figure 7-2: Air Conditioner Thermostat Location

Direct Air Cooling System (DACS)

The DACS is energized from the DC bus. The default temperature setting is 130F(55C) and is internally set. It can be tested by turning off the air-conditioner from the AC panel, powering up the rectifiers with a small load to allow the internal temperature to build up to 55C. Remember to turn the Air-conditioner ON after the DACS testing is done

Connecting Batteries

With the air conditioner activated and the power system stabilized, it is safe to connect the batteries into the power system. First, the polarity and wiring of the battery disconnect cables that was completed in Section 4 must be verified:

1. Locate the battery cable quick-disconnect connectors for the available battery strings. All should still be disconnected from their mating connectors for the plant at this point.
2. Using a multimeter on the appropriate DC voltage scale, carefully measure the open circuit voltage across each equipped battery string in turn at the connector body for the battery side of each cable set. Make sure that battery voltage is within manufacturer recommended limits.
3. Observe the polarity of each reading and the meter probe orientation into the connector end. Determine the plant side connector direction required to mate to each battery side connector cable set. Make this measurement into the plant side connector and verify that the polarity matches that seen on the mating battery side connector.
4. If using the Lineage Power Vector Controller, locate the J23 cable set plugged into the top left portion of the Vector controller BTJ2/3 Termination board and disconnect it. Listen to hear the opening of the LVBD contactor as this cable set is disconnected.

If using a third party power system, disengage the battery contactor connected to the new install. Ensure battery/engine power is available to provide power to already energized systems so that an ac failure during installation will not bring down the system.

CAUTION

Do not connect or disconnect battery connectors while batteries are charging or discharging. This will create arcing that could damage the connectors or result in injury.

5. Plug in each of the battery cable quick-disconnect connectors for the battery strings that are equipped. **Do not plug in cables for strings that are not equipped.**

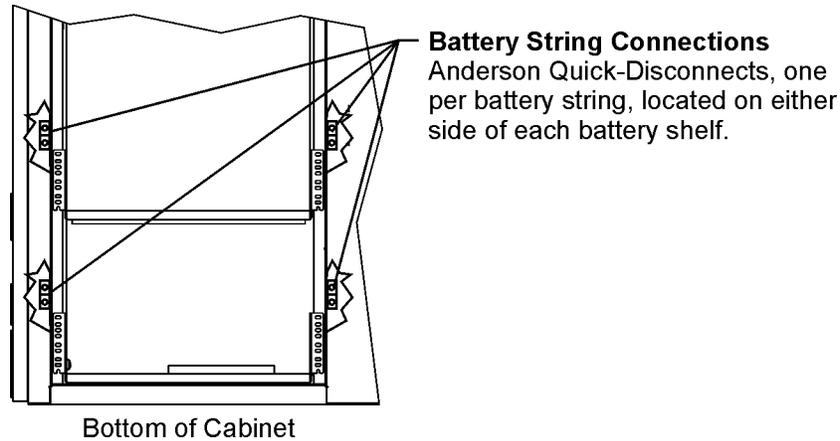


Figure 7-3: Battery Connector Locations

6. If using the Lineage Power Vector Controller, reconnect the J23 cable set into the Vector BTJ2 Termination board. Listen to hear the closing of the LVBD contactor as this cable set is connected. The rectifier output currents observed on their displays may increase for a period as battery charging begins.

If using a third party power system, engage the contactor to connect the batteries to the system.

7. Measure the voltage across each installed battery string at the battery terminals with a multimeter on the appropriate DC voltage scale, again observing polarity. Verify that each measurement agrees with the reading at the Plant Voltage jacks of the Vector display.

8 Troubleshooting and Spare Parts

Preliminary

This section provides information needed in preparation for locating and interpreting visual indicators to help identify problems. When replacing a part does not correct the problem or visual indicators do not identify a defective part, notify Lineage Power Technical Support.

Safety

Review all safety instructions and warnings in Section 3 of the manual before troubleshooting.

Tools

The following tools are necessary in order to troubleshoot the

- Infinity OCS-DC:
- 3/16-inch (5 mm) Allen-head wrench
- Insulated hand tools
- Calibrated digital voltmeter (DVM) (0.05% accuracy on dc scale)
- ESD wrist strap

Warnings

- Hazardous ac and dc voltages and/or energy are present. Caution should be exercised. Tools must be insulated to help prevent accidental contact with live surfaces.
- Coordinate all troubleshooting activities with other personnel that may be working on the system.

The troubleshooting procedures that follow are used when a trouble condition has been identified and a technician has been dispatched to the system location as a first and fundamental step in diagnosing and correcting the problem.

Troubleshooting - GPS Systems

Organization

This section is based on Galaxy Controller and rectifier installations. Refer to enclosed documentation for other systems and more detailed information.

The tables in this section are organized alphabetically by alarm type, then grouped according to the status of the alarm, Major or Minor.

Table Reference

Use the reference below to locate the table corresponding to the message displayed after pressing ““ View Alarms.”

Display Message	Table
AC failure	9-A, AC Alarms
MULTIPLE AC FAIL	
phase failure	
VERY LOW VOLTAGE	9-B, Battery Alarms
CONTACTOR1 OPEN	
CONTACTOR1 FAIL	
HIGH BATT TEMP	
(no message)	9-C, Controller Alarms
CONTACTOR2 OPEN	9-D, Distribution Alarms
CONTACTOR2 FAIL	
DISTRIBUTION FUSE	
RECT ID CONFLICT	9-E, Rectifier and Converter Related Alarms
rectifier fail	
MULTI RECT FAIL	
VERY HIGH VOLTGE	
rect manual off	
high float volt	
CONV FAN FAILURE	
CONV DISTRBUTION	
conv id conflict	
converter fail	
MULTI CONV FAIL	
conv fan fail	9-F, Miscellaneous Alarms
temp probe fail	
BATT ON DISCHARGE	
AUXILIARY INPUT	
MAINTENANCE OPEN	
SENSE VOLT FAIL	
load imbalance	

Note: If an alarm condition exists, but no alarm LED is lit, refer to Table 9-F. Display messages in lower case are minor alarms. Display messages in upper case are major alarms.

AC Alarms

Table 8-A: AC Alarms

Controller Alarm Status	Vector Controller Display	Other Indication(s)	Possible Problem(s)	Possible Solution(s)
Major	MULTIPLE AC FAIL	ACF on rectifier display	Rectifier(s) not receiving ac power: <ul style="list-style-type: none"> • AC input circuit breaker has operated. • AC input voltage is out of range. • Internal rectifier failure 	<ol style="list-style-type: none"> 1. Verify that ac circuit breaker is closed; close circuit breaker if operated. 2. If the problem is not corrected, replace the rectifier(s).
Minor	ac failure	ACF on rectifier display	Rectifier not receiving ac power: <ul style="list-style-type: none"> • AC input circuit breaker has operated. • AC input voltage is out of range. • Internal rectifier failure 	<ol style="list-style-type: none"> 1. Verify that ac circuit breaker is closed; close circuit breaker if operated. 2. If the problem is not corrected, replace the rectifier.
Minor	phase failure	PF on rectifier display	Phase failure: <ul style="list-style-type: none"> • Rectifier high voltage shutdown • External phase imbalance or failure • Internal rectifier failure 	<ol style="list-style-type: none"> 1. 596B4/B5: Toggle the ON/STBY switch into the STBY position and then back into the ON position. 596B6: Remove the rectifier from the shelf, wait 30 seconds and re-install. 2. If the problem is not corrected, replace the rectifier.

Battery Alarms

Table 8-B: Battery Alarms

Controller Alarm Status	Vector Controller Display	Other Indication(s)	Possible Problem(s)	Possible Solution(s)
Major	VERY LOW VOLTAGE	--	Occurs in an operating system following an extended commercial ac power outage, during which the batteries are providing power for the system and the system voltage is approaching the user-defined low limit.	<ol style="list-style-type: none"> 1. If commercial ac power is present but the system voltage remains low, call technical support. 2. Investigate other alarms that may be present (rectifier-related alarms and the AC Fail alarm may also occur during the fault condition).
Major	CONTACTOR1 OPEN	Red LED on contactor drive board is lit.	Contactor is open: <ul style="list-style-type: none"> • Open has been initiated by controller. • Open has been initiated manually. 	<ol style="list-style-type: none"> 1. Follow instructions on the label adjacent to the contactor drive board. 2. If the problem is not corrected, call technical support.
Major	CONTACTOR1 FAIL	--	Contactor or drive board has failed.	Call technical support.
Major	HIGH BATT TEMP	Alarm on 210E unit, if equipped	Batteries have exceeded temperature threshold.	Call technical support.

Controller Alarms

Table 8-C: Controller Alarms

Controller Alarm Status	Vector Controller Display	Other Indication(s)	Possible Problem(s)	Possible Solution(s)
Major	None	--	<ul style="list-style-type: none"> • Controller failure 	<p>Check controller to see if the green LED is extinguished and the red LED is lit. If so, perform the following steps:</p> <ol style="list-style-type: none"> 1. Remove and reset the controller circuit board. If all diagnostics pass, it is possible that some type of “one time” abnormality occurred to cause the failure. 2. If the diagnostics did not pass, replace the controller circuit board and verify the failure is resolved. 3. If the problem is not corrected, call technical support.
Major	None	--	<ul style="list-style-type: none"> • Controller failure • Display failure 	<p>If the front panel LED module, LEDs, or switches fail, perform the following steps:</p> <ol style="list-style-type: none"> 1. Verify that the ribbon cable from the controller board to the BMW display is not cut, abraded, or otherwise mangled. Replace the cable if damaged. 2. Reset the controller board. 3. If the display is still not operating, replace the display module.
Minor	TEMP PROBE FAIL	--	Battery thermal probe has failed.	Call technical support.

Distribution Alarms

Table 8-D: Distribution Alarms

Controller Alarm Status	Vector Controller Display	Other Indication(s)	Possible Problem(s)	Possible Solution(s)
Major	CONV DISTRBUTION	FA LED on converter is lit.	A fuse or circuit breaker in the converter distribution has operated.	Replace fuse or reset circuit breaker.
Major	CONTACTOR2 OPEN	Red LED on contactor drive board is lit.	Contactors are open: <ul style="list-style-type: none"> • Open has been initiated by controller. • Open has been initiated manually. 	<ol style="list-style-type: none"> 1. Follow instructions on the label adjacent to the contactor drive board. 2. If the problem is not corrected, call technical support.
Major	CONTACTOR2 FAIL	--	Contactors or drive board has failed.	Call technical support.
Major	DISTRBUTION FUSE	Alarm LED on dc distribution panel is lit.	DC load fuse or circuit breaker has operated.	Replace fuse or reset circuit breaker.
Major	DISTRBUTION FUSE	--	Fuse has operated.	Replace fuse F1 (alarm battery supply) on the BLJ3 terminal board.

Rectifier Related Alarms

Table 8-E: Rectifier Related Alarms

Rectifier Related Alarms					
Controller Alarm Status	Vector Controller Display	Rectifier LED	Rectifier Display	Possible Problem(s)	Possible Solution(s)
Major	RECT ID CONFLICT	None	None	Rectifier ID number has not been set.	Set the rectifier ID using the procedure in Section 12, “Installing or Replacing a Rectifier”.
Major	RECT ID CONFLICT	None	None	Two or more rectifiers have the same ID number.	See above.
Major	MULTI RECT FAIL	ALM	None	More than one rectifier has an ALM LED lit.	See rectifier alarms listed below.
Major	MULTI RECT FAIL	--	--	Loss of communication with controller: <ul style="list-style-type: none"> Defective interface from multiple rectifiers to controller Internal failure of controller or multiple rectifiers 	<ol style="list-style-type: none"> Verify that the controller is powered and operating correctly. If there are no controller alarms, replace rectifiers that have lost communication. If the problem is not solved, call technical support.
Major	VERY HIGH VOLTGE	ALM	HO	<ul style="list-style-type: none"> Lightning has struck system. Internal rectifier failure 	<ol style="list-style-type: none"> 596B4/B5: Toggle the ON/STBY switch into the STBY position and then back into the ON position. 596B6: Remove the rectifier from the shelf, wait 30 seconds and re-install. If the problem is not corrected, replace the rectifier.
Minor	RECTIFIER FAIL	Blinking ALM LED on rectifier	--	Loss of communication with controller: <ul style="list-style-type: none"> Defective interface from rectifier to controller Internal controller or rectifier failure 	<ol style="list-style-type: none"> Verify that the controller is powered and operating correctly. If there are no controller alarms, replace the rectifier. If the problem is not corrected, call technical support.

Rectifier Related Alarms					
Controller Alarm Status	Vector Controller Display	Rectifier LED	Rectifier Display	Possible Problem(s)	Possible Solution(s)
Minor	RECTIFIER FAIL	ALM	HO	High output voltage: <ul style="list-style-type: none"> Rectifier high voltage shutdown Internal rectifier failure 	<ol style="list-style-type: none"> Verify the configurable HV thresholds in the controller. 596B4/B5: Toggle the ON/STBY switch into the STBY position and then back into the ON position. 596B6: Remove the rectifier from the shelf, wait 30 seconds and re-install. If the problem is not corrected, replace the rectifier.
Minor	RECTIFIER FAIL	ALM	TA	Thermal alarm: <ul style="list-style-type: none"> Excessive ambient temperature Internal rectifier failure 	<ol style="list-style-type: none"> Verify that there is no obstruction of the fan inlet. 596B4/B5: Toggle the ON/STBY switch into the STBY position and then back into the ON position. 596B6: Remove the rectifier from the shelf, wait 30 seconds and re-install. If the problem is not corrected, replace the rectifier.
Minor	RECTIFIER FAIL	ALM	FSE	Fuse alarm: <ul style="list-style-type: none"> DC fuse open Internal rectifier failure 	<ol style="list-style-type: none"> 596B4/B5: Toggle the ON/STBY switch into the STBY position and then back into the ON position. 596B6: Remove the rectifier from the shelf, wait 30 seconds and re-install. If the problem is not corrected, replace the rectifier.

Rectifier Related Alarms					
Controller Alarm Status	Vector Controller Display	Rectifier LED	Rectifier Display	Possible Problem(s)	Possible Solution(s)
Minor	RECTIFIER FAIL	ALM	LO	Low output voltage: <ul style="list-style-type: none"> Excessive output current Internal rectifier failure 	<ol style="list-style-type: none"> 596B4/B5: Toggle the ON/STBY switch into the STBY position and then back into the ON position. 596B6: Remove the rectifier from the shelf, wait 30 seconds and re-install. If the problem is not corrected, replace the rectifier.
Minor	RECTIFIER FAIL	ALM	ICS IP5 IP6 IP7	Internal rectifier failure	<ol style="list-style-type: none"> Place the ac circuit breaker for the rectifier in the OFF position. Remove the rectifier from the shelf. Wait for 30 seconds or until all front panel display LEDs have extinguished. Replace the rectifier. Return the ac breaker to the ON position. 596B4/B5: Place the rectifier ON/STBY switch into the ON position. If the problem is not corrected, replace the rectifier.
Minor	RECTIFIER FAIL	ALM	SEN	Thermal sensor failure: <ul style="list-style-type: none"> Internal rectifier failure 	<ol style="list-style-type: none"> Place the ac circuit breaker for the rectifier in the OFF position. Remove the rectifier from the shelf. Wait for 30 seconds or until all front panel display LEDs have extinguished. Replace the rectifier. Return the ac breaker to the ON position. 596B4/B5: Place the rectifier ON/STBY switch into the ON position. If the problem is not

Rectifier Related Alarms					
Controller Alarm Status	Vector Controller Display	Rectifier LED	Rectifier Display	Possible Problem(s)	Possible Solution(s)
					corrected, replace the rectifier with a new one.
Minor	RECTIFIER FAIL	FAN ALM	None	Fan failure	Replace the fan in the rectifier.
Minor	rect manual off	STBY	Blank	Rectifier has been manually turned off.	Turn rectifier on.
Minor	high float volt	None	None	Configuration problem	Call technical support.

Miscellaneous Alarms

Table 8-F: Miscellaneous Alarms

Controller Alarm Status	Vector Controller Display	Other Indication(s)	Possible Problem(s)	Possible Solution(s)
Major	BATT ON DISCHARGE	Rectifiers may say ACF.	Temporary condition that may be associated with other alarms	Call technical support.
Major	AUXILIARY INPUT	Auxiliary equipment may have alarm.	Problem with operation of auxiliary equipment	Call technical support.
Major	MAINTENANCE OPEN	Red LED is lit on control panel.	Input Number 4 (MAINT) of the BLJ3 terminal connection board is interrupted.	Re-establish connection.
Major	SENSE VOLT FAIL	Red LED is lit on control panel.	Broken connection or blown fuse.	Re-establish connection or replace blown fuse.
Minor	load imbalance	Yellow LED is lit on control panel.	A rectifier is unable to load share properly.	Identify rectifier that is not functioning properly; reseat and retest. If rectifier still does not load share, replace rectifier.
None	None	Red LED is lit on some battery contactor drive boards, while green LED is lit on others.	If a green LED is lit despite a contactor open command issued by the controller, the drive card or the contactor has failed.	Call technical support.
None	None	--	Fuse has operated.	Replace fuse F2 (power) on the BLJ terminal board.

Air Conditioning / Direct Air Cooling System (DACS)

Refer to the enclosed manufacturer's documentation for troubleshooting the cooling system.

AC Panel

The OCS-DC can be equipped with various optional AC Panels

Refer to Figure 8-1 for ac panel wiring schemes

Spare Parts

Table 8-H: Spare Parts

Comcode	Description	Recommended Quantity
Cooling System		
TBD	T50 Air Conditioner	1 per Area
TBD	24V DACS	1 per Area
AC Distribution Spares		
TBD	QO115 1-pole, 15 Amp Circuit Breaker	As needed
TBD	QO220 2-pole, 20 Amp Circuit Breaker	As needed
TBD	QO230 2-pole, 30 Amp Circuit Breaker	As needed
TBD	Surge Arrestor Kit	1 per Area

9 Product Warranty

A. Seller warrants to Customer only, that:

1. As of the date title to Products passes, Seller will have the right to sell, transfer, and assign such Products and the title conveyed by Seller shall be good;
2. During the warranty period stated in Sub-Article B below, Seller's Manufactured Products (products manufactured by Seller), which have been paid for by Customer, will conform to industry standards and Seller's specifications and shall be free from material defects;
3. With respect to Vendor items (items not manufactured by Seller), Seller warrants that such Vendor items, which have been paid for by Customer, will be free from material defects for a period of sixty (60) days commencing from the date of shipment from Seller's facility.

B. The Warranty Period listed below is applicable to Seller's Manufactured Products furnished pursuant to this Agreement, commencing from date of shipment from Seller's facility, unless otherwise agreed to in writing:

Warranty Period

Product Type	New Product	Repaired Product*
Central Office Power Equipment**	24 Months	6 Months

* *The Warranty Period for a repaired Product or part thereof is six (6) months or, the remainder of the unexpired term of the new Product Warranty Period, whichever is longer.*

C. If, under normal and proper use during the applicable Warranty Period, a defect or nonconformity is identified in a Product and Customer notifies Seller in writing of such defect or nonconformity promptly after Customer discovers such defect or nonconformity, and follows Seller's instructions regarding return of defective or nonconforming Products, Seller shall, at its option attempt first to repair or replace such Product without charge at its facility or, if not feasible, provide a refund or credit based on the original purchase price and installation charges if installed by Seller. Where Seller has elected to repair a Seller's Manufactured Product (other than Cable and Wire Products) which has been installed by Seller and Seller ascertains that the Product is not readily returnable for repair, Seller will repair the Product at Customer's site.

With respect to Cable and Wire Products manufactured by Seller which Seller elects to repair but which are not readily returnable for repair, whether or not installed by Seller, Seller at its option, may repair the cable and Wire Products at Customer's site.

- D. If Seller has elected to repair or replace a defective Product, Customer shall have the option of removing and reinstalling or having Seller remove and reinstall the defective or nonconforming Product. The cost of the removal and the reinstallation shall be borne by Customer. With respect to Cable and Wire Products, Customer has the further responsibility, at its expense, to make the Cable and Wire Products accessible for repair or replacement and to restore the site. Products returned for repair or replacement will be accepted by Seller only in accordance with its instructions and procedures for such returns. The transportation expense associated with returning such Product to Seller shall be borne by Customer. Seller shall pay the cost of transportation of the repaired or replacing Product to the destination designated by Customer.
- E. Except for batteries, the defective or nonconforming Products or parts which are replaced shall become Seller's property. Customer shall be solely responsible for the disposition of any batteries.
- F. If Seller determines that a Product for which warranty service is claimed is not defective or nonconforming, Customer shall pay Seller all costs of handling, inspecting, testing, and transportation and, if applicable, traveling and related expenses.
- G. Seller makes no warranty with respect to defective conditions or nonconformities resulting from actions of anyone other than Seller or its subcontractors, caused by any of the following: modifications, misuse, neglect, accident, or abuse; improper wiring, repairing, splicing, alteration, installation, storage, or maintenance; use in a manner not in accordance with Seller's or Vendor's specifications or operating instructions, or failure of Customer to apply previously applicable Seller modifications and corrections. In addition, Seller makes no warranty with respect to Products which have had their serial numbers or month and year of manufacture removed, altered, or experimental products or prototypes or with respect to expendable items, including, without limitation, fuses, light bulbs, motor brushes, and the like. Seller's warranty does not extend to any system into which the Product is incorporated. This warranty applies to Customer only and may not be assigned or extended by Customer to any of its customers or other users of the Product.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. CUSTOMER'S SOLE AND EXCLUSIVE REMEDY SHALL BE SELLER'S OBLIGATION TO REPAIR, REPLACE, CREDIT, OR REFUND AS SET FORTH ABOVE IN THIS WARRANTY.

Appendix A: Cabinet Interconnection

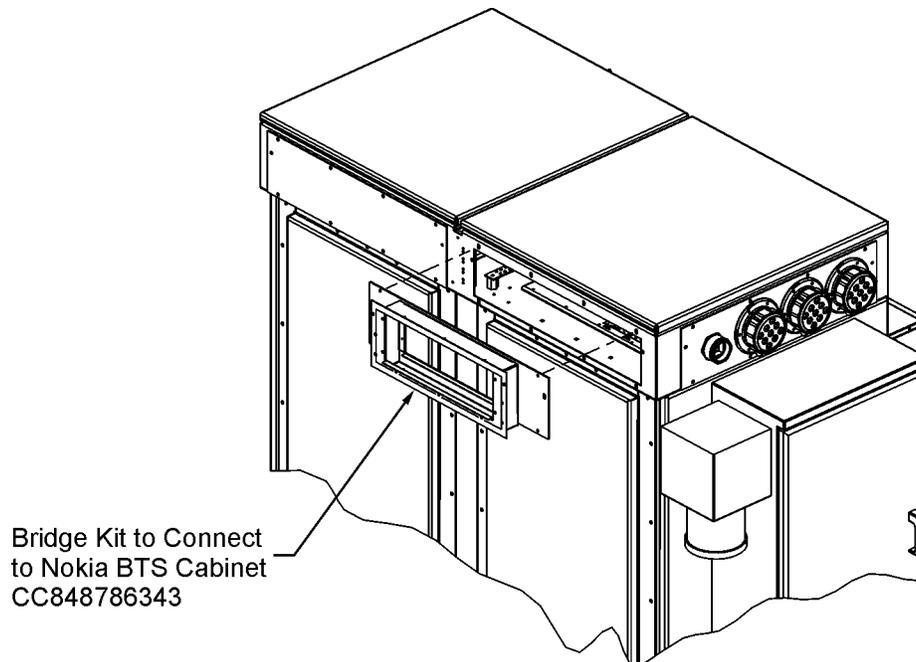
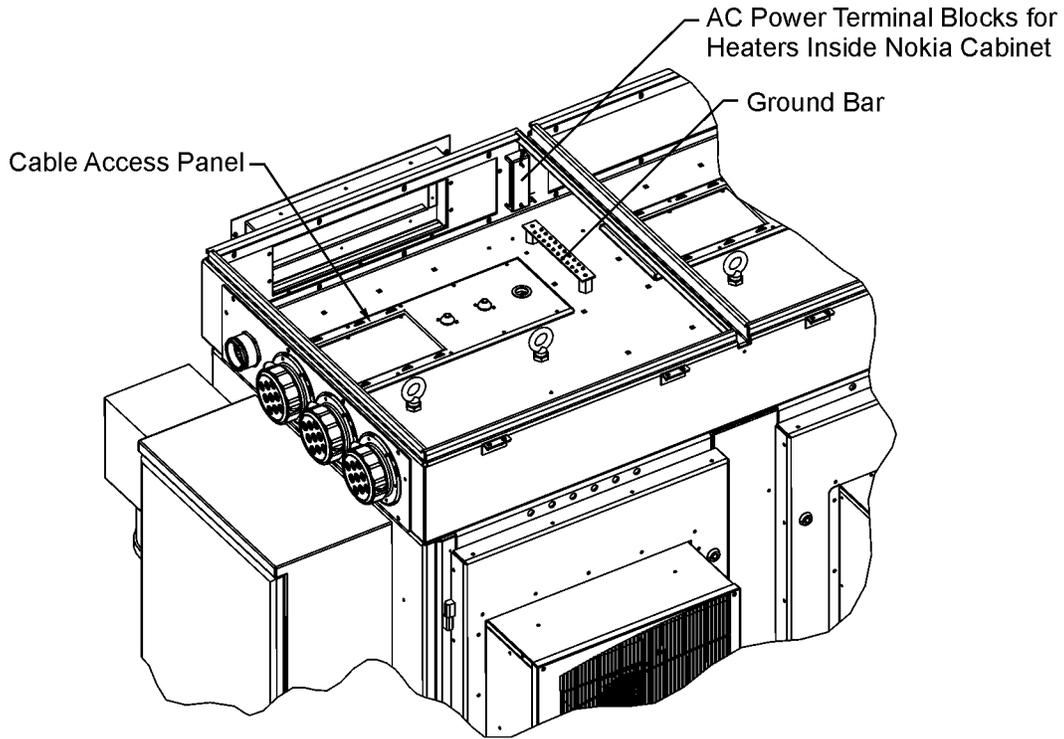


Figure A-1: Cabinet Interconnection

The cabinet can be lined up and connected with other cabinets through the removable upper panels. The rear pane is for ease of access and not for routing cables.

Appendix B: Roof Cabling Compartment



Top covers removed to show inside details

Figure B-1: Roof Cabling compartment

The Roof cabling compartment is used to route cabling from the OCS-DC cabinet to the adjacent OEM cabinet

Revision History

Issue 5

Rebranding

Issue 4

Formatting issues

Issue 3

Nokia cabinet interface. Drawings updated

Issue 2

Removed rollout tarp. Updated cable boot labeling. Listed approvals as pending

