LINEAGE POWER

Micro-Outdoor Cabinet Systems (mOCS)

Product Manual
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Notice:
The information, specifications, and procedures in this manual are subject to change without notice. Lineage Power assumes no responsibility for any errors that may appear in this document.

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1 Introduction

Overview

Lineage Power developed the Micro Outdoor Cabinet System (mOCS) as a platform for outdoor environment telecommunications power solutions in worldwide markets

The mOCS 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.

The cabinet also offers specialized interfaces with other OEM cabinets. Contact your sales representative for more information on available built-in interfaces.

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

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

Figures 2-1 and 2-2 show front views of the G18 and G19 micro-OCS cabinets. The G18 features a recessed air-conditioner whereas the G19 has a protruding air-conditioner that frees up internal space for equipment

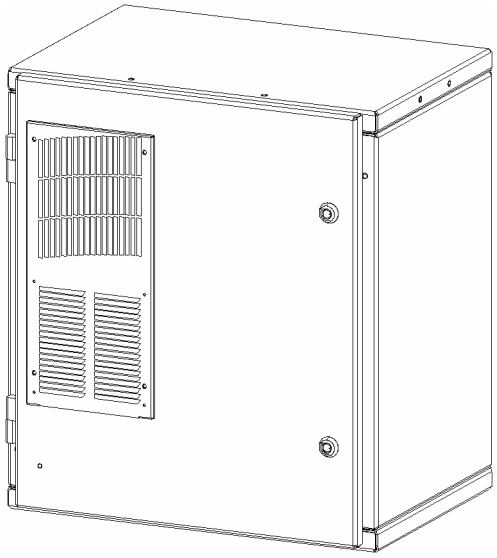


Figure 2-1: G18 with Recessed Air Conditioner – Front View

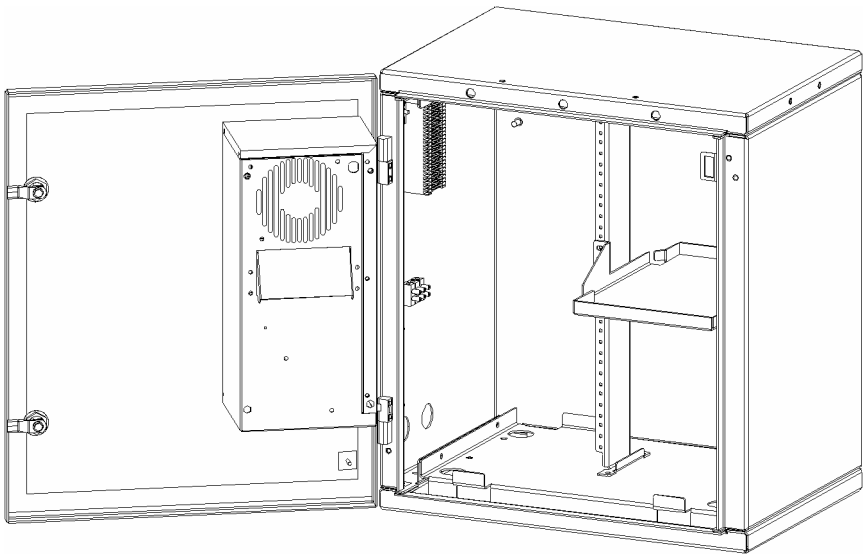


Figure 2-2: G18 with Recessed Air Conditioner – Internal View

Figure 2-3: G19 with protruding Air Conditioner – Front View

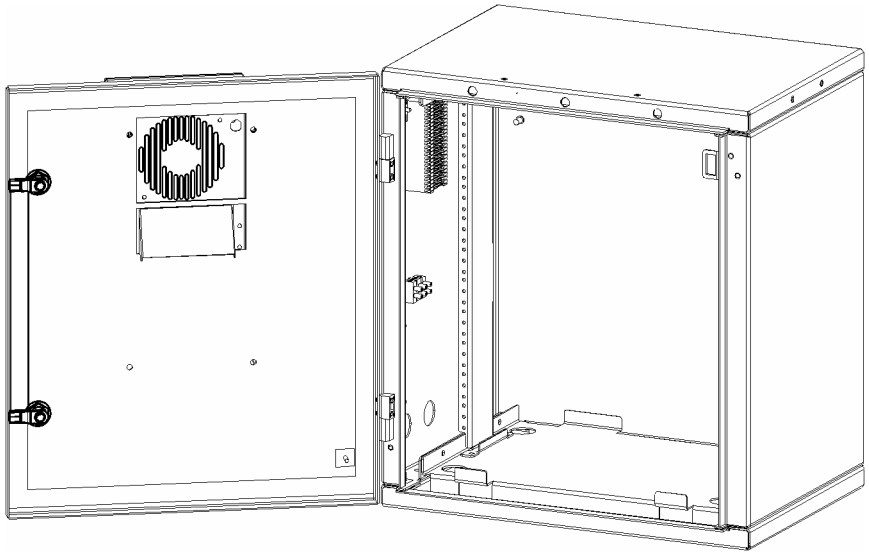


Figure 2-4: G19 with Protruding Air Conditioner – Internal View

System Components

The cabinet has a modular construction consisting of a main compartment with removable door with climate control and optional battery shelves.

Main Compartment
Constructed of 0.090-inch thick aluminum, the main 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 a removable front door, side openings for cable access and removable lifting ears.

Internal Rack
The cabinet may be equipped with 19-inch or half-width rack rails to support embedded equipment or a recessed air-conditioner. Available rack space may vary depending on the presence and number of battery shelves. An empty cabinet offers 10RU.

Battery Shelves
Shelves provided in the cabinet are designed to support customer specific battery strings. Labelling on the shelf identifies the type of battery.

Door
The cabinet is equipped with a front door that houses the climate control system. 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.

Climate Control System
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.

Accessories
The cabinet may be equipped with one or more of the following optional accessories

- Alarm Block
- Smoke Detector with Alarm
- Convenience outlet

Specifications

Table 2-A: G18 and 19 Micro-OCS Cabinet Specifications

Mechanical	
Cabinet	
Nominal Cabinet Dimensions (H x W x D) Recessed A/C Micro Cabinet – G18 19-inch Micro Cabinet – G19	 22”W x 15.6”D x 24.5”H 22”W x 15.6”D x 24.5”H with externally mounted A/C (+6.3”D)
Weight	**48lbs (34 kgs) Weight does not include batteries** **Air-conditioner: 27lbs (12Kgs)**
	Units Per Cabinet
Rectifier Shelves	As equipped
Battery Shelves	As equipped
Controller	As equipped
	Environmental
Air Conditioner	900 BTU with 500W 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, testing pending
	Standards Compliance
Agency Approval	Pending

Ordering Information

All material required for mOCS Outdoor Cabinet Installation is identified in the H569-471 ordering guide for this product. Power Cabinet wiring is documented in T569471

3 Safety

Safety Statements

Please read and follow all safety instructions and warnings before installing, maintaining, or repairing the Micro-OCS cabinet. Reference the individual module product manuals for additional safety statements to installed/furnished equipment

- 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 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 the 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.
- A transient voltage 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, where provided, has been evaluated for connection of minimum 90°C conductors sized according to the US National Electric Code using 75°C ampacity tables

Safety Statements, continued

- 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

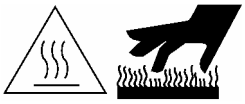
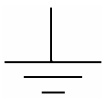
- DC load cables must be sized in accordance with minimum cable lengths shown in the documentation to keep short circuit currents less than the interrupt ratings of dc protectors in each panel

- 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 Stated and Canada, this device shall be Listed/Certified. For installations in Europe and other countries following IEC60364 series installation standards, a device 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 dc 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 the power.
- Hazardous energy and voltages are present in the power cabinet and on the interface cables that can shock or cause serious injury. 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:
- 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.
- The cabinet is 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

Cabinets

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.

The cabinet is shipped from the factory with protective packaging. Handling a cabinet that 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

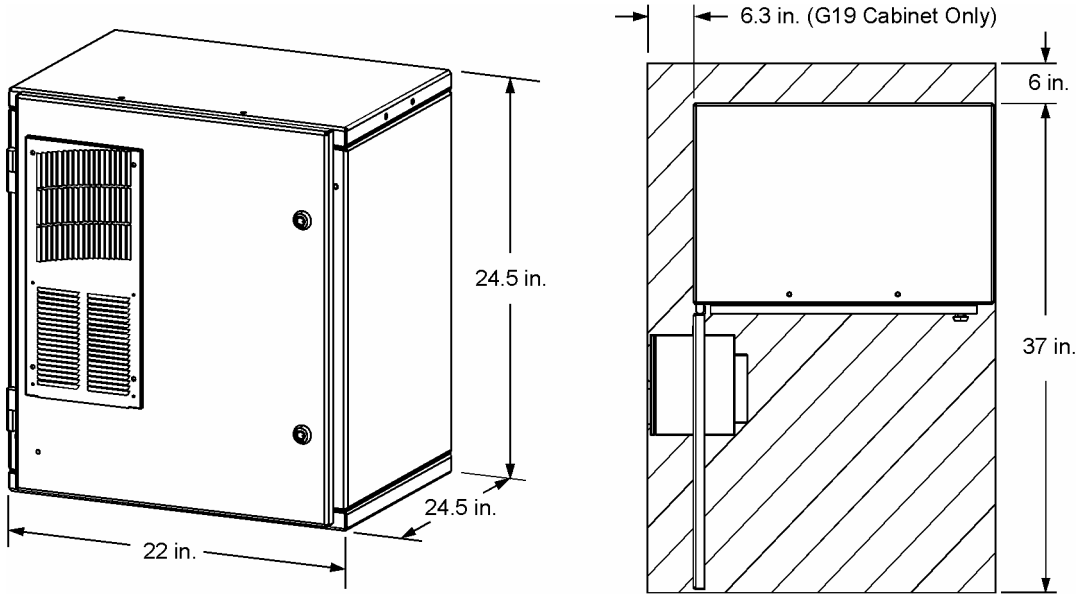


Figure 4-1: G18/G19 Cabinet Dimensions and Clearances

Mounting Footprint

The cabinet may be mounted directly into 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 drawing to meet site requirements. Drawings are provided with the cabinet showing the mounting footprint, overall cabinet dimensions and location of mounting holes.

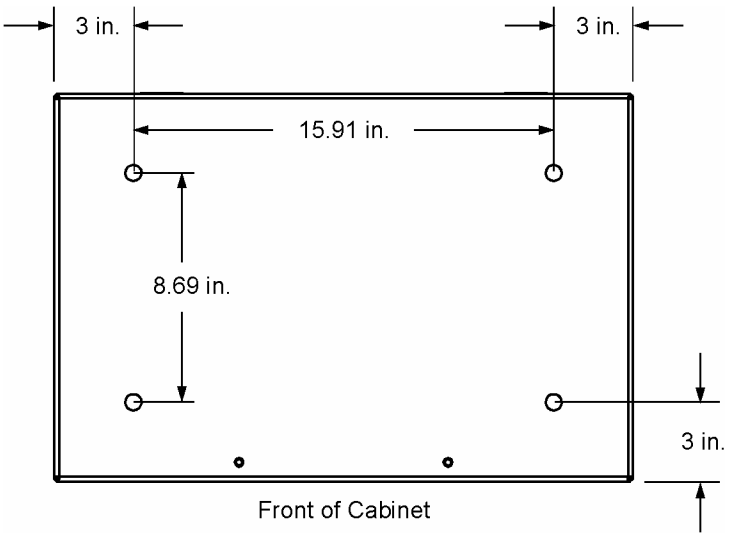


Figure 4-2: G18/G19 Cabinet Mounting Footprint

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 10-15 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

Installation Tools

- Wire cutters and strippers
- Heat shrink gun
- Torque wrench (0-240 in-lb / 28 Nm)
- Digital meter, +/- 0.02%
- Screw Drivers (flat-blade and Phillips)
- ESD wrist strap

Unpacking

Step	Action
1.	Unpacking. Inspect the shipping container for any signs of damage. If damage exists, have the carrier's representative sign a note acknowledging the damage.
2.	Carefully cut the sealing tape and remove the shelf from the carton. Use the parts list to verify all materials are included. Save the shipping package until all parts are operating within specifications.

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. Connection of the cabinet to the ac protective earth (safety earth) and to the ground electrode must be performed during installation

AC Input

G18/G19 Cabinets

Open the appropriate interface on the side of the cabinet. Locate the ac terminal block in the cabinet (Figure 4-3) and connect the ac power wires as shown. Connect the other end to the ac power supply breaker. The 900 Btu air-conditioner requires a 15 A, 2 pole circuit breaker. Its steady state current draw is only 1.5Amps. Verify the ac input circuit breaker for the connection is OFF before terminating the cable/plug.

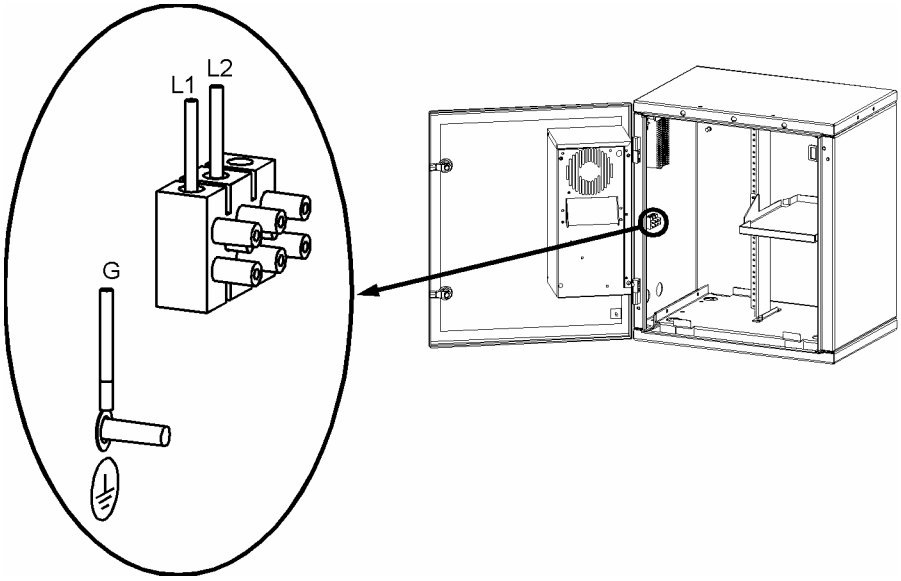


Figure 4-3: Air-conditioner AC Power input

5 Battery Installation

The G18 cabinet with a half-width battery shelf may contain 2 modules of the Unigy I 12GVR-100AH. Other battery module of equivalent or smaller sizes can also be accommodated. Check with your local sales representative for options. The G19 cabinet can have up to 4 modules of the Unigy I 12GVR-100AH or equivalent

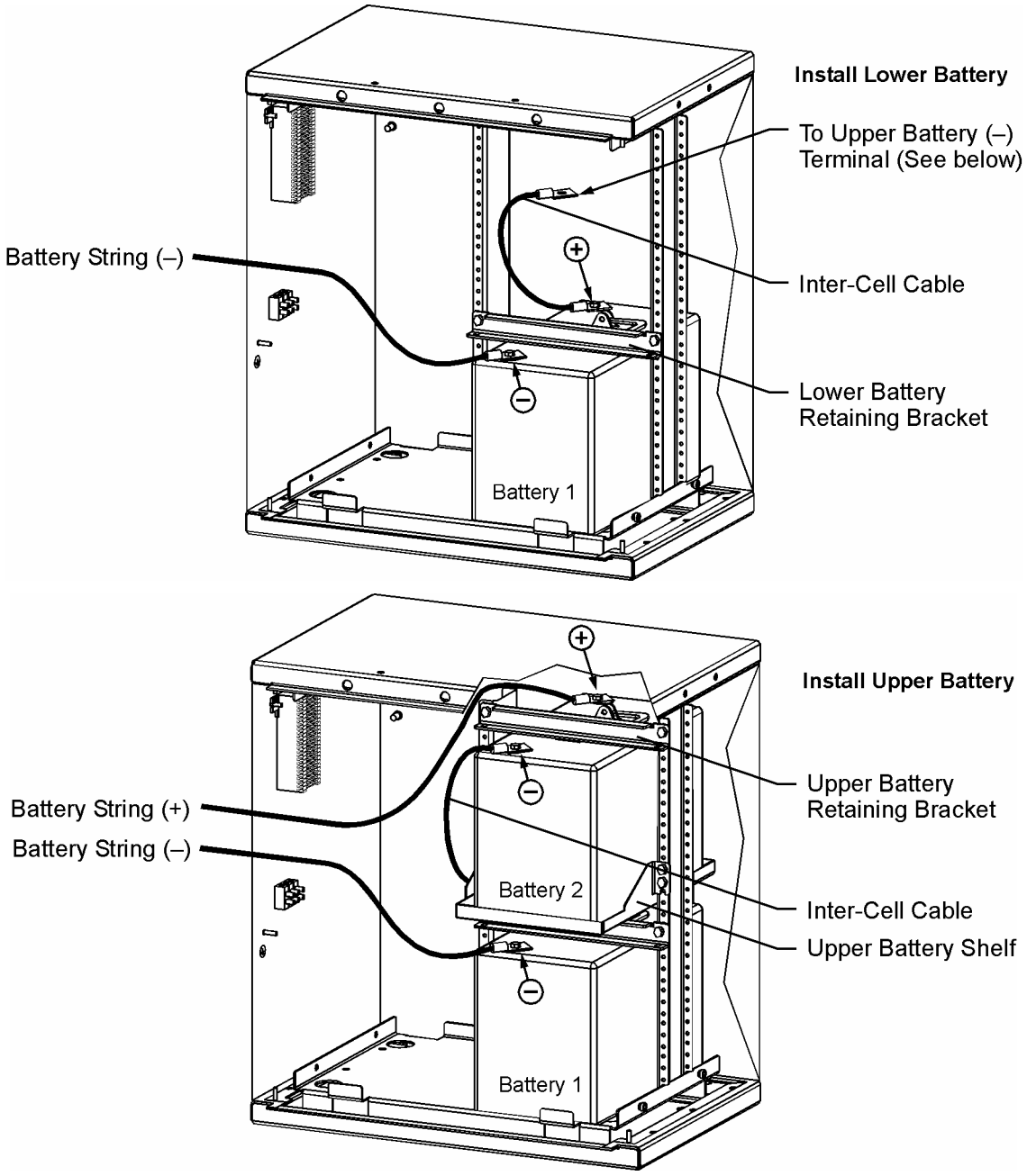


Figure 5-1: Battery Shelf for G18

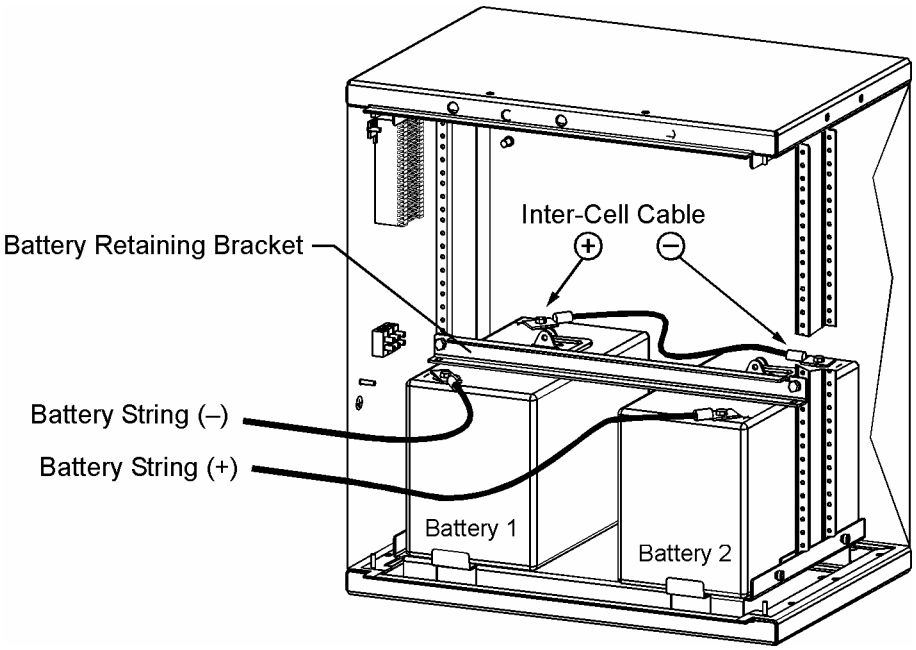


Figure 5-2: Battery Shelf for G19

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 6-3 for lifting precautions.

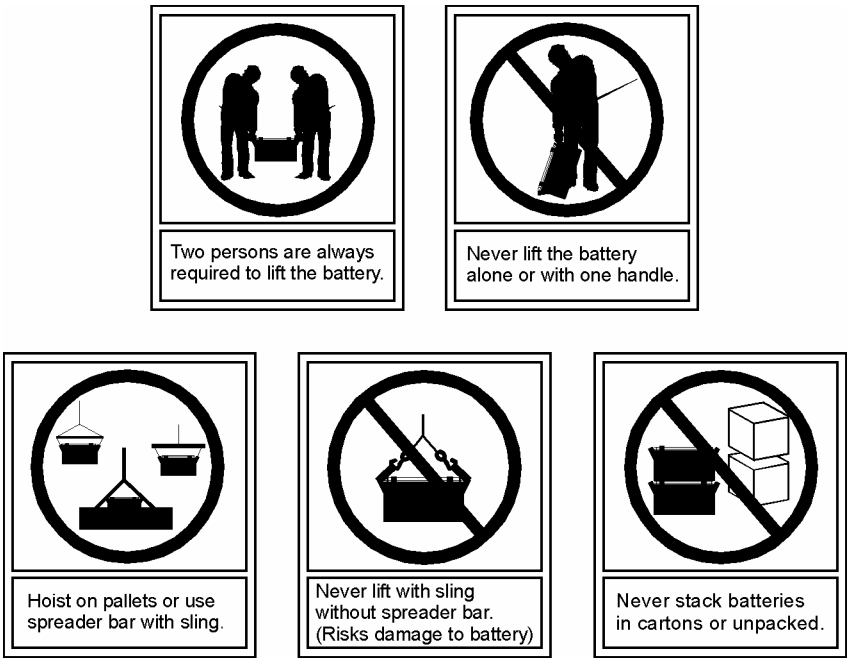


Figure 5-3: Battery Lifting Precautions

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 for G18

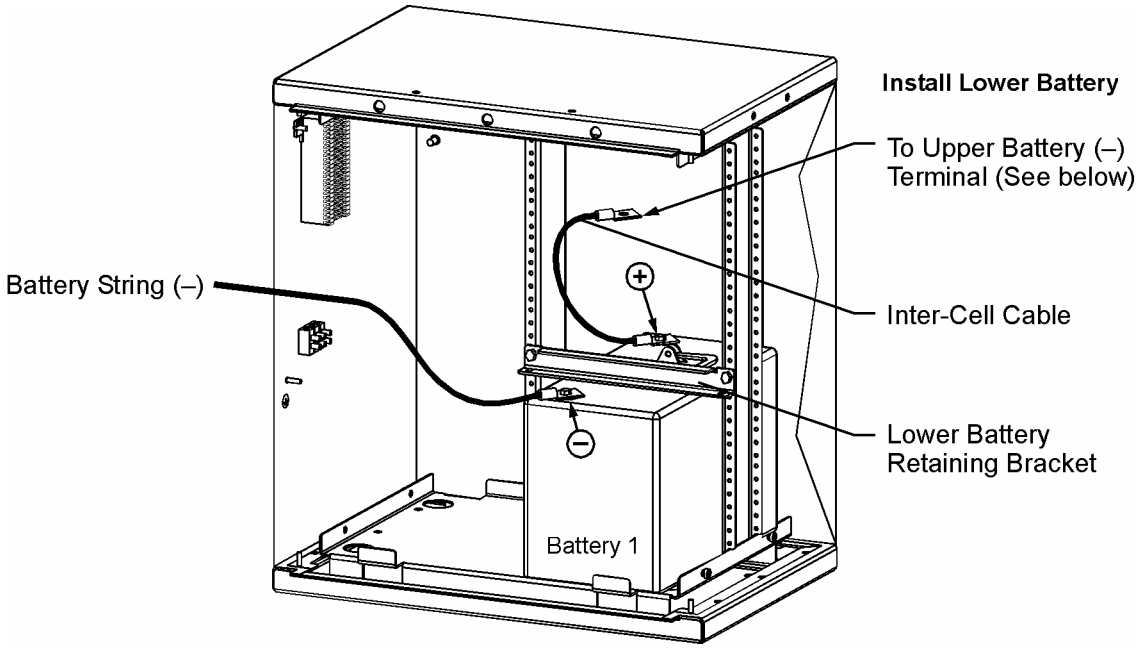
1. Check the charge by date stamped on each battery-shipping container. Check the out-of-box voltage of each battery module. Any module with an open-circuit measurement of less than 12.60V or as otherwise specified by the manufacturer, should not be placed into service.

   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.

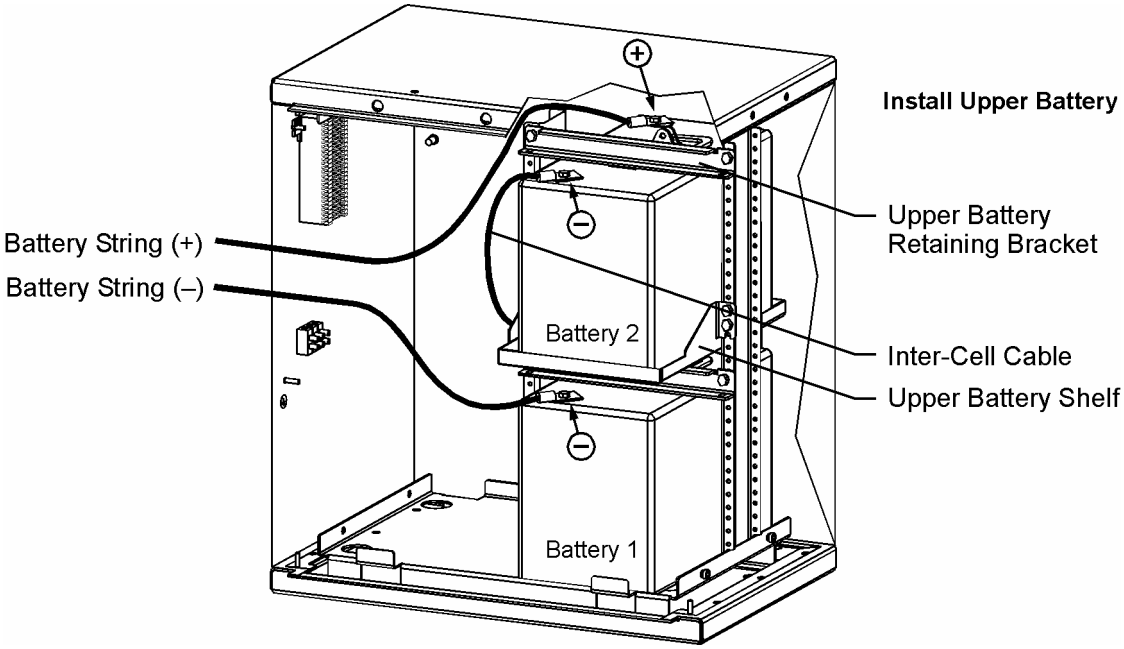
CAUTION

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.

2. With the battery terminals facing the left side of the cabinet, carefully slide Battery 1 onto the bottom battery shelf as shown below



3. Remove any terminal covers from the battery module and spread a thin coat of antioxidant on the battery terminals.
4. Locate Battery 1 negative (-) battery cable (Black). Spread a thin coat of antioxidant on the negative cable connector and place the coated connector onto the negative terminal of the battery module. Using a battery terminal nut and washer, secure the connector(s) to the terminal by hand tightening the nut.
5. Locate the Battery 1 positive (+) battery cable (Black w/Red tape). This is the inter-cell cable that will connect to the negative (-) terminal of the upper battery. Spread a thin coat of antioxidant on the positive cable connector and place the coated connector onto the positive terminal of the lower battery. Using a battery terminal nut and washer, secure the connectors to the terminal by hand tightening the nut.
6. Attach the lower battery retaining bracket
7. Install the upper battery shelf that shipped along with the cabinet. Tighten all screws to ensure it is stable and ready to handle the load of the battery
8. With the battery terminals facing the left side of the cabinet, carefully slide Battery 2 onto the upper battery shelf as shown below



9. Remove any terminal covers from the battery module and spread a thin coat of antioxidant on the battery terminals.
10. Locate the inter-cell cable positive (+) battery cable from Battery 1. Spread a thin coat of antioxidant on the cable connector and place the coated connector onto the negative terminal of Battery 2. Using a battery terminal nut and washer, secure the connector(s) to the terminal by hand tightening the nut.
11. Locate the Battery 2 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 terminal of Battery 2. Using a battery terminal nut and washer, secure the connectors to the terminal by hand tightening the nut.
12. Attach the upper battery retaining bracket.

+24V Battery Installation Procedure for G19

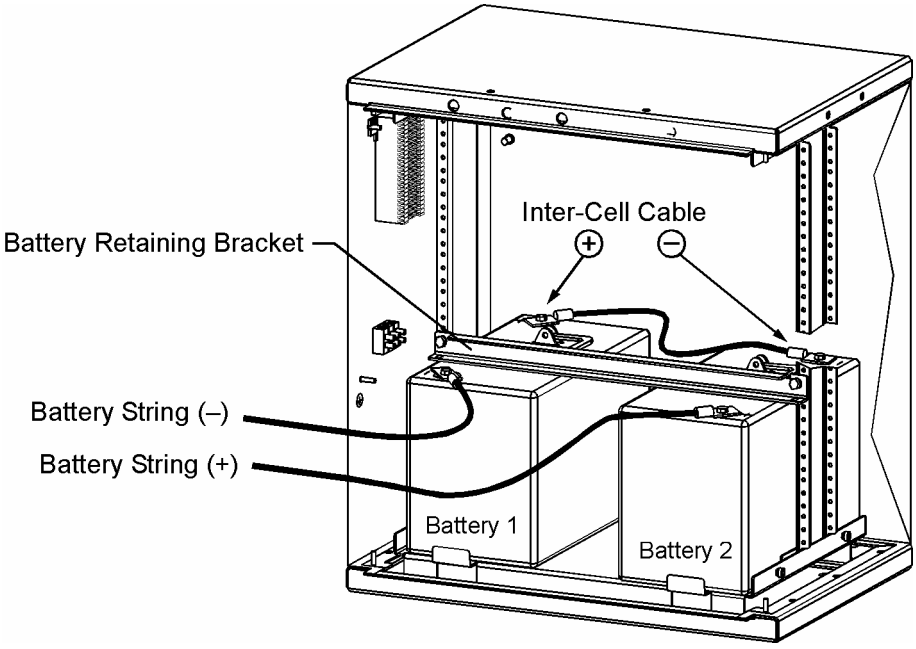
1. Check the charge by date stamped on each battery-shipping container. Check the out-of-box voltage of each battery module. Any module with an open-circuit measurement of less than 12.60V or as otherwise specified by the manufacturer, should not be placed into service.

   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.

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.

2. With the battery terminals facing the left side of the cabinet, carefully slide Battery 1 onto the left side bottom battery shelf as shown below



3. Remove any terminal covers from each of the battery modules and spread a thin coat of antioxidant on all of the battery terminals.
4. For battery 1 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 terminal of the battery module. Using a battery terminal nut and washer, secure the connector(s) to the terminal by hand tightening the nut.
5. For battery 1 locate the positive (+) battery cable (Black w/Red tape). This is the inter-cell cable that will connect to the negative (-) terminal of the second battery. Spread a thin coat of antioxidant on the positive cable connector and place the coated connector onto the positive terminal of Battery 1. Using a battery terminal nut and washer, secure the connectors to the terminal by hand tightening the nut.

6. With the battery terminals facing the right side of the cabinet, carefully slide Battery 2 onto the right side bottom battery shelf as shown in the previous figure.
7. Remove any terminal covers from the battery module and spread a thin coat of antioxidant on the battery terminals.
8. Locate the inter-cell cable positive (+) battery cable from Battery 1. Spread a thin coat of antioxidant on the cable connector and place the coated connector onto the terminal of the battery module. Using a battery terminal nut and washer, secure the connector(s) to the terminal by hand tightening the nut.
9. Locate the Battery 2 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 terminal of the Battery 2. Using a battery terminal nut and washer, secure the connectors to the terminal by hand tightening the nut.
10. Attach the lower battery retaining bracket

-48V or two shelf Battery Installation Procedure for G19

Refer to +24V battery installation procedure for lower battery shelf. Then:

1. Install the upper battery shelf that shipped along with the cabinet. Tighten all screws to ensure it is stable and ready to handle the load of the battery.
2. For a dual 24V string shelf, repeat installation as described for the lower shelf.
3. For a 48V installation, repeat the battery installation as done for the lower shelf with the addition that the positive (+) battery cable from Battery 2 becomes the inter-cell battery cable and connects to the negative(-) terminal of Battery 3.
4. Attach the upper battery retaining bracket.

6 Initial Power-up and Test

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

- Pre-turn-up checks
- Turn-up ac input power

Pre-turn-up checks

- Verify that the external ac utility source circuit breaker is in the OFF position.

DANGER

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

- Verify that the source ac voltage is 208Vac using a multi-meter

Turn-up AC Input Power

- Turn the external ac breaker feeding the mOCS to theON position.
- Using a multimeter, measure the voltage between phases in the ac terminal block. Acceptable voltage ranges are 200-240Vac phase-phase

7 Final Installation

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

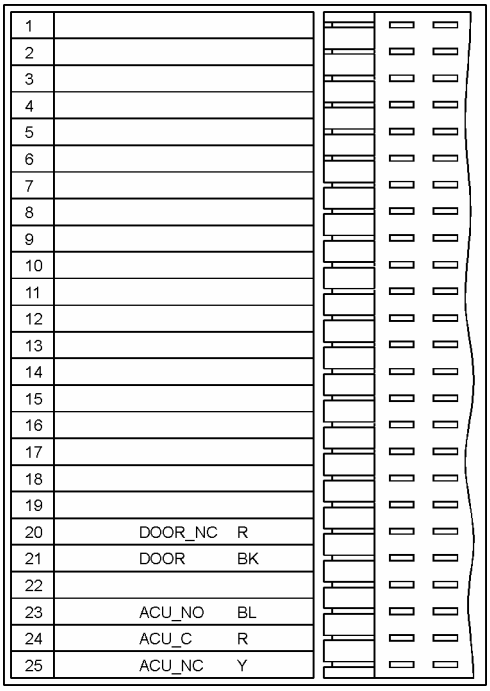


Figure 7-1 Cabinet Alarm connection

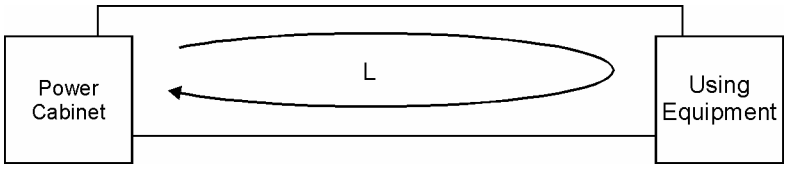
DC Power Connection

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 mm2)	5 feet
8 GA (10 mm2)	8 feet
6 GA (16 mm2)	12 feet
4 GA (25 mm2)	19 feet
2 GA (35 mm2)	30 feet



Cooling System

Energize the air-conditioner. Ensure that the thermostat on the air conditioner is set to 77°F (25°C)

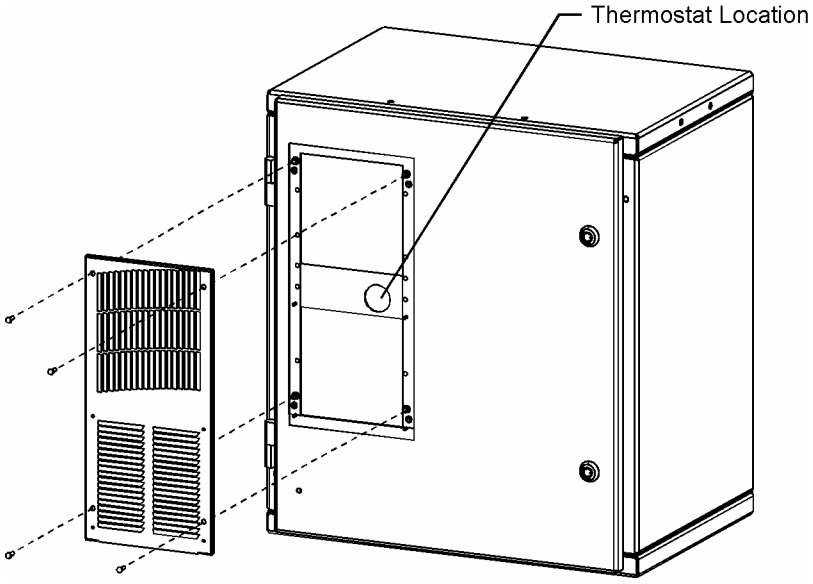


Figure 7-2: Air Conditioner Thermostat Location

8 Troubleshooting and Spare Parts

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

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

Air Conditioning

Refer to the enclosed manufacturers' documentation for troubleshooting the cooling system

AC Supply

Refer to the AC block terminal to check connections

Spare Parts

Table 9A

Comcode	Description	Recommended Quantity
Cooling System		
TBD	T15 Air-conditioner	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.