AC Power
For *Business-Critical Continuity™*

Liebert® SRT™ Battery Cabinet

Installation Manual—250 kW, 30 Seconds, Nominal, 240 VRLA Cells

EMERSON™
Network Power

CONTACTING EMERSON NETWORK POWER® FOR SUPPORT

To contact the Emerson Network Power Liebert® Services for information or repair service in the United States, call 1-800-LIEBERT (1-800-543-2378). Liebert Services offers a complete range of startup services, repair services, preventive maintenance plans and service contracts.

For repair or maintenance service outside the 48 contiguous United States, contact Liebert Services, if available in your area.

For Liebert Services to assist you promptly, have the following information available:

Part Numbers: _____

Serial Numbers: _____

Rating: _____

Date Purchased: _____

Date Installed: _____

Location: _____

Battery Voltage: _____

Battery Reserve Time: _____

Product Warranty Registration

To register for warranty protection, visit the **Service and Support** section of our Web site at:

www.liebert.com

Click on **Product Registration** and fill out the form.

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation of your Liebert SRT (Short Run Time) Battery Cabinet and accessories. Read this manual thoroughly, paying special attention to the sections that apply to your installation, before working with the battery system. Retain this manual for use by installing personnel.

The following warning applies to all battery cabinets supplied with UPS systems.

⚠ WARNING

Risk of improper handling. Can cause equipment damage, injury and death.

Internal battery strapping must be verified before moving a battery cabinet (after initial installation).

- Battery cabinets contain non-spillable batteries.
- Keep units upright.
- Do not stack.
- Do not tilt.

Failure to heed this warning could result in smoke, fire or electric hazard.

Call 1-800-LIEBERT before moving battery cabinets (after initial installation).

⚠ WARNING

Risk of electrical shock. Can cause personal injury and death.

Special safety precautions are required for procedures involving handling, installation and maintenance of the UPS system. Only properly trained and qualified personnel wearing appropriate personal protective equipment should be involved in installing the Liebert SRT battery system or preparing the system for installation.

Special care must be taken when working with the batteries associated with this equipment. When connected together, the battery terminal voltage will exceed 400VDC and is potentially lethal. Be constantly aware that the battery system contains high DC as well as AC voltages. Check for voltage with AC and DC voltmeters before making contact.

Observe all DC safety precautions before working on or near the DC system.

Follow all battery safety precautions when installing, charging or servicing batteries. In addition to the hazard of electric shock, gas produced by batteries can be explosive and sulfuric acid can cause severe burns.

The following precautions must be observed when working on batteries:

- Remove watches, rings and other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- Determine whether the battery is grounded. If it is grounded, remove source of ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if such grounds are removed during installation and maintenance.

If a battery leaks electrolyte, or is otherwise physically damaged, it must be replaced, stored in a container resistant to sulfuric acid and disposed of in accordance with local regulations.

If electrolyte comes into contact with the skin, the affected area should be washed immediately with water.

WARNING

Risk of electric shock, explosive reaction, hazardous chemicals and fire. Can cause equipment damage, personal injury and death.

Lead-acid batteries contain hazardous materials. Batteries must be handled, transported and recycled or discarded in accordance with federal, state and local regulations. Because lead is a toxic substance, lead-acid batteries must be recycled rather than discarded.

Do not dispose of a battery in a fire. The battery may explode.

Do not open or mutilate the battery or batteries. Released electrolyte is harmful to the skin and eyes. It is toxic.

WARNING

Risk of electric shock. Can cause personal injury and death.

In case of fire involving electrical equipment, use only carbon dioxide fire extinguishers or those approved for use in fighting electrical fires.

WARNING

Risk of heavy unit falling over. Can cause equipment damage, injury and death.

Exercise extreme care when handling battery cabinets to avoid equipment damage or injury to personnel. The battery cabinet weighs approximately 2376 lb. (1176kg).

Locate center of gravity symbols and determine unit weight before handling each cabinet. Test lift and balance the cabinets before transporting. Maintain minimum tilt from vertical at all times.

Slots at the base of the cabinets are intended for forklift use. Base slots will support the unit only if the forks are completely beneath the unit.

WARNING

Risk of electric shock. Can cause equipment damage, personal injury and death.

The area around the battery system must be kept free of puddles of water, excess moisture and debris.

Observe all precautions in the UPS user manual before as well as during all installation and maintenance procedures. Observe all battery safety precautions before working on or near the battery.

This equipment contains several circuits that are energized with high voltage. Only test equipment designed for troubleshooting should be used. This is particularly true for oscilloscopes. Always check with an AC and DC voltmeter to ensure safety before making contact or using tools. Even when the power is turned Off, dangerously high potential electric charges may exist at the capacitor banks and at the batteries.

All power and control wiring must be installed by a properly trained and qualified electrician. All power and control wiring must comply with the NEC and applicable local codes.

When performing maintenance with any part of the equipment under power, service personnel and test equipment must be standing on rubber mats. The service personnel must wear insulating shoes for isolation from direct contact with the floor (earth ground).

One person should never work alone, even if all power is disconnected from the equipment. A second person should be standing by to assist and to summon help in case of an accident.

NOTE

Materials sold hereunder cannot be used in the patient vicinity (e.g., use where UL, cUL or IEC 60601-1 is required). Medical applications such as invasive procedures and electrical life support equipment are subject to additional terms and conditions.

NOTICE

This unit complies with the limits for a Class A digital device, pursuant to Part 15 Subpart J of the FCC rules. These limits provide reasonable protection against harmful interference in a commercial environment. This unit generates, uses and radiates radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this unit in a residential area may cause harmful interference that the user must correct at his own expense.

1.0 MECHANICAL INSTALLATION

1.1 Introduction

This following section describes the requirements that must be taken into account when planning the positioning and cabling of the Liebert SRT battery equipment.

This chapter is a guide to general procedures and practices that should be observed by the installing engineer. The particular conditions of each site will determine the applicability of such procedures.

NOTICE

Do not apply electrical power to the UPS equipment before the arrival of the commissioning engineer.

1.2 Preliminary Checks

Before installing the battery equipment, please carry out the following preliminary checks:

- Visually examine the equipment for transit damage, both internally and externally. Report any damage to the shipper immediately.
- Verify that the correct equipment is being installed. The equipment supplied has an identification tag inside the main door.
- Verify that the battery room satisfies the environmental conditions stipulated in the equipment specification, paying particular attention to the ambient temperature and air exchange system.

1.3 Flooring Requirements

1.3.1 Floor Loading

The Liebert SRT should be mounted on a finished surface, such as concrete, block, brick or wood. The floor must be strong enough to support the equipment load and suitable for installation of an anchoring kit with vertical floor loading properly calculated (assume 2,000 PSI or 140 kg/cm^2 contact load at caster wheels; this includes safety factors).

- When installing on a concrete, masonry or stone floor, use the factory-supplied masonry fasteners (anchors). The fastener manufacturer's allowable shear load (parallel to floor) for these fasteners is 2,030 lb. (9 kN) when mounted in normal-weight concrete (2,000 to 3,000 PSI; 140-210 kg/cm^2) of at least 3 in. (7.6cm) thickness.
- If installing on a floor consisting of a material other than normal-weight concrete as described above, the mounting should be capable of sustaining a shear load (parallel to floor) of at least 1,500 lb. (6.7 kN) for each of the four mounting points.
- If installing on a raised floor that is less than 2 in. (5cm) thick or constructed of a material not appropriate for the masonry fasteners provided or lag screw engagement, mount using through bolts with nuts and large diameter washers as shown in **Figure 155**.

Full details for mounting the cabinet are found in **1.8.1 - Cabinet Floor Mounting**.

NOTE

The above loads (both the fastener manufacturer load and the minimum mounting load) include the required safety factors.

1.4 Environmental Considerations

1.4.1 Battery Room

Batteries should be mounted in an environment where the temperature is consistent and even over the whole battery. Temperature is a major factor in determining the battery life and capacity. Typical battery manufacturer performance data are quoted for an operating temperature between 68 and 77°F (20 and 25°C). Operating above this range will reduce the battery life while operation below this range will reduce the battery capacity.

Battery Temperature

In a normal installation, the battery temperature should be kept between 59 and 77°F (15°C and 25°C).

NOTE
Keep batteries away from main heat sources, main air inlets, etc.

1.4.2 Storage

Should the equipment not be installed immediately, it must be stored in a room for protection against excessive humidity and heat sources (see **Table 2**).

NOTICE

Risk of deep discharge. Can cause permanent damage to batteries.

An unused battery must be recharged periodically as recommended by the battery manufacturer.

1.4.3 Clearances

The Liebert SRT has no ventilation grilles at either side or at the rear of the battery system equipment. Clearance around the front of the equipment should be sufficient to enable free passage of personnel with the doors fully opened. It is important to leave a distance of 24" (610mm) between the top of the cabinet and the ceiling of the room in which it is installed to permit adequate circulation of air coming out of the unit and for service access.

1.5 System Composition

A battery system can consist of a number of equipment cabinets, depending on the individual system design requirements, e.g., Battery Cabinet, Junction Cabinet. Refer to **3.0 - Installation Drawings** for the positioning of the cabinets described below.

1.6 Unloading and Unpacking

1.6.1 Inspection Before Removal From the Truck

While the Liebert SRT shipping package is still on the truck:

- Inspect the equipment and shipping container(s) for any signs of damage or mishandling. Check also if the shock and tilt gauges (installed for shipping purposes) indicate excessive shock and/or tilting. If any damage is noted, file a damage claim with the shipping agency within 24 hours and contact your local sales representative or Liebert at 1-800-LIEBERT to notify them of the damage claim and the condition of the equipment.
- Compare the contents of the shipment with the bill of lading. Report any missing items to the carrier, your local Emerson representative and Emerson at 1-800-LIEBERT immediately. Please have the bill of lading available.:

CAUTION

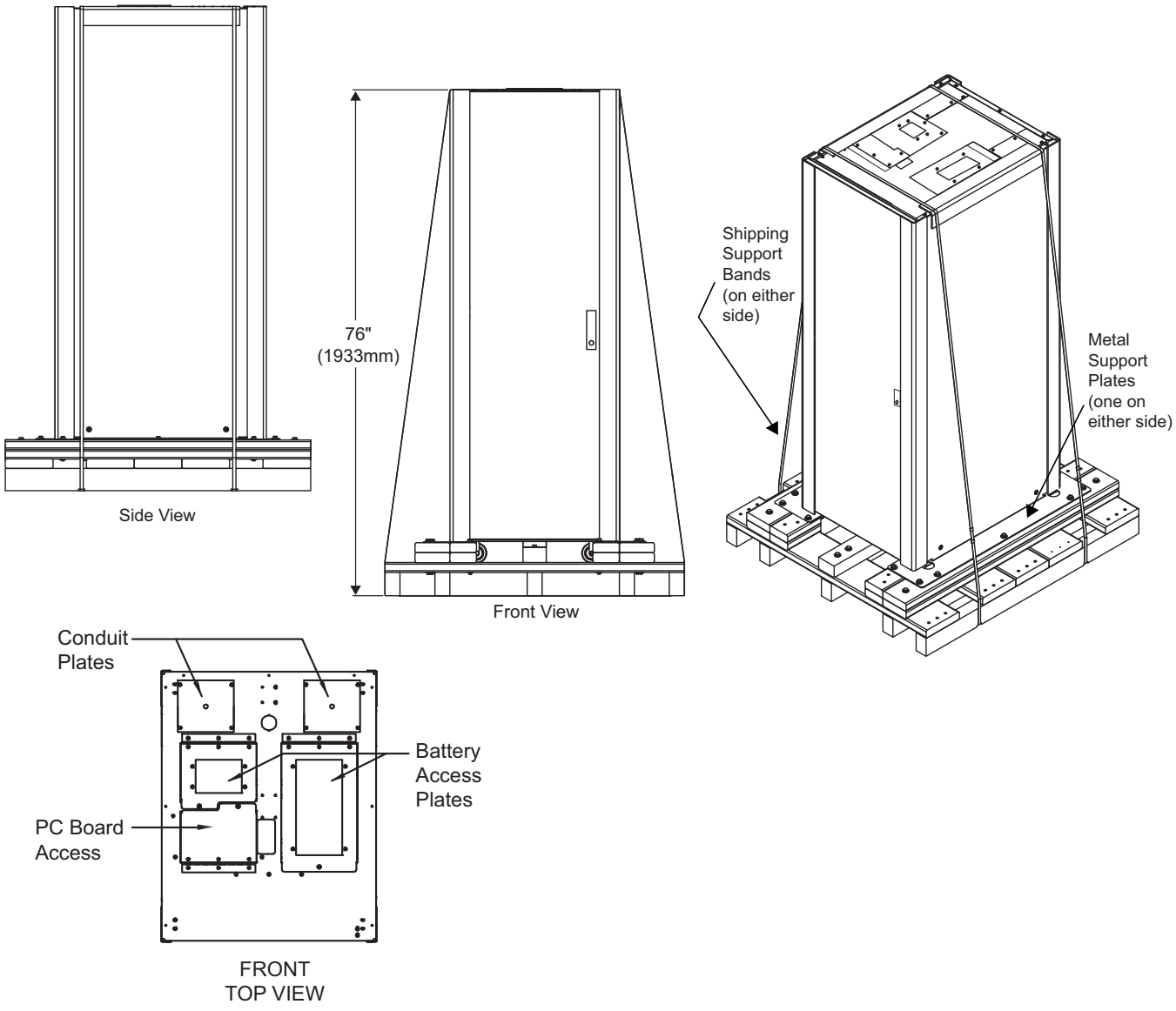
Do not attempt to install the system if damage is apparent.

Table 1 System information

Date Purchased	_____
Date Installed	_____
Location	_____
System Model Number	_____
System Serial Number	_____
Interconnected UPS Manufacturer	_____
Interconnected UPS Model	_____

1.6.2 Unloading

Figure 1 Liebert SRT shipping package



The Liebert SRT as shipped (see **Figure 1**) can weigh up to 2376 lb. (1176kg). It must be handled with care. It must be kept upright—pay special attention to the arrows, which indicate the upright position.

1.6.3 Handling

The Liebert SRT shipping package is designed to be handled using a forklift. Forklift operators must avoid rough handling when picking up, moving and lowering it.

WARNING

Risk of improper transport. Can cause equipment damage, injury and death.

The Liebert SRT is heavy. It weighs 2538 lb. (1256kg) as shipped; 2376 lb. (1176kg) uncrated. Move the unit only with a device that is rated for transporting that weight.

Exhibit care when handling Liebert SRT cabinet to avoid causing the unit to fall. Test lift and balance the cabinet before transporting it. Maintain minimum tilt from vertical at all times. Do not exceed 15 degrees of tilt.

CAUTION

Risk of sharp edges, splinters and exposed fasteners. Can cause injury.

Sheet metal components and framework may have sharp edges. Only properly trained and qualified personnel wearing appropriate safety headgear, gloves, shoes and glasses should attempt to move the unit, lift it, remove packaging from or prepare the unit for installation.

NOTICE

Risk of improper handling. Can cause equipment damage.

The Liebert SRT has sensitive electronics and mechanical components that may be damaged by rough handling.

1.6.4 Unpacking

To reduce the possibility of shipping damage, Liebert SRT cabinets are secured to the pallet by two mounting brackets and two banding straps. These same two mounting brackets are used to mount the cabinet to the floor.

Packing elements should be removed in this order to ease unpacking:

1. Cut and remove the banding straps (see **Figure 1**).

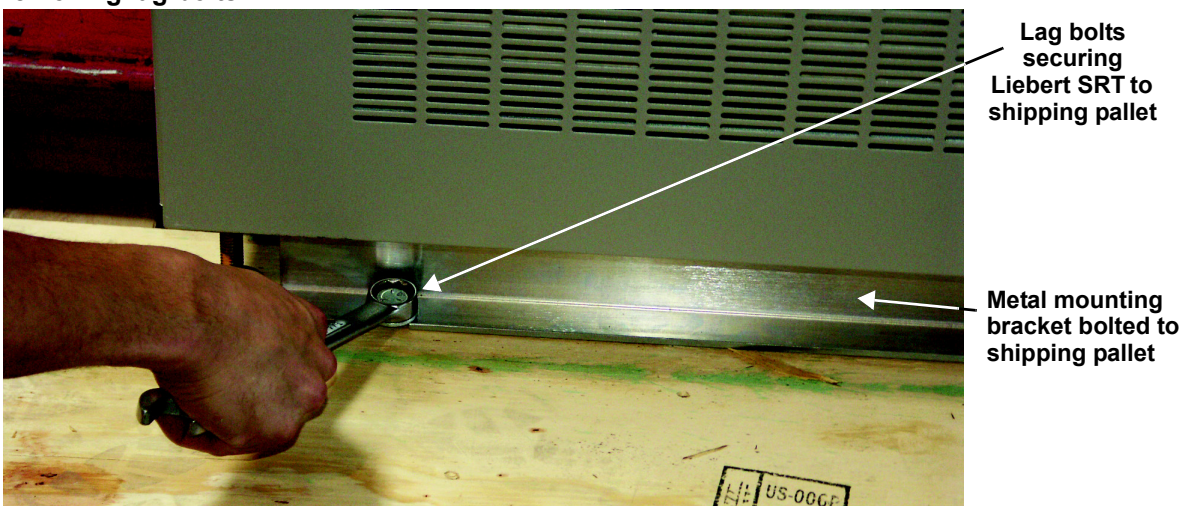
WARNING

Risk of sharp edges under tension. Can cause injury or death.

Use care when removing banding straps and metal mounting brackets. The banding straps are under tension and may snap violently, causing injury or death. Always wear proper eye, hand and foot protection when unpacking or installing the system.

2. Remove hex head bolts holding mounting brackets to pallet as shown in **Figure 2**.
3. Remove lag bolts holding metal mounting brackets to pallet.
4. Remove mounting brackets from Liebert SRT.

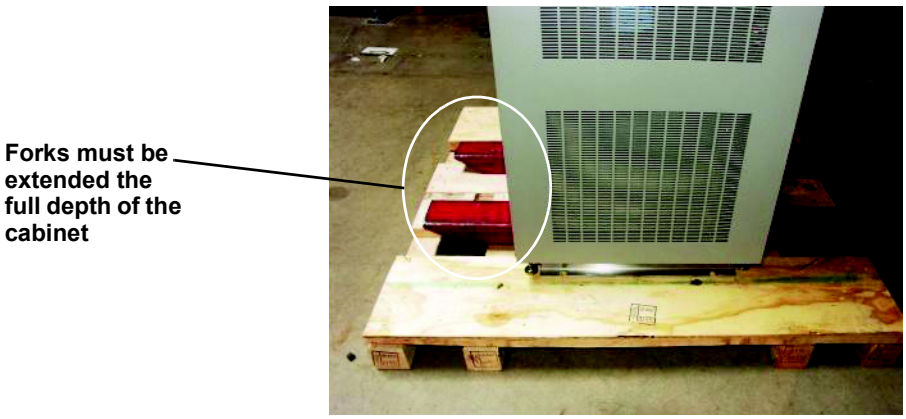
Figure 2 Removing lag bolts



5. Use a forklift to remove the cabinet from the shipping pallet.

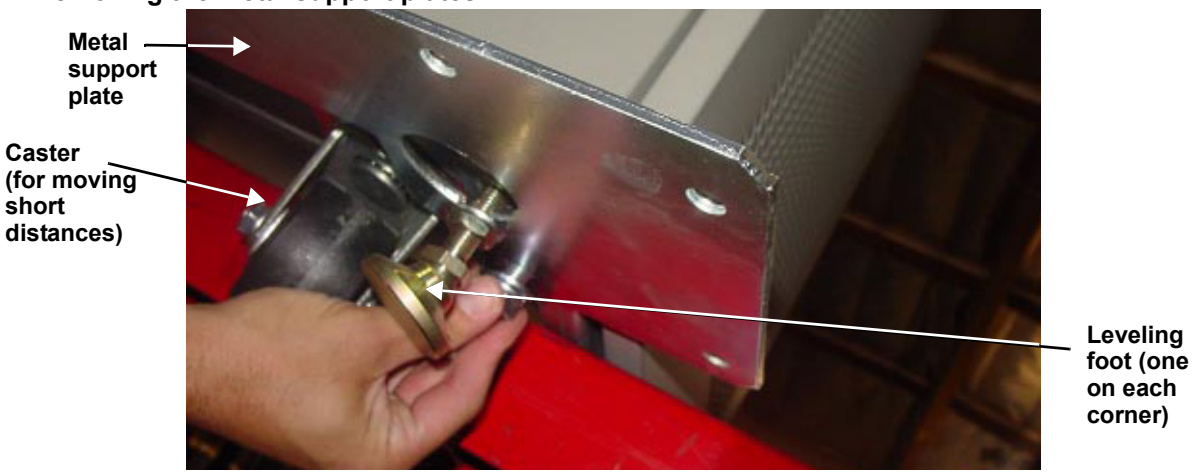
   To lift the Liebert SRT, the forks should be inserted between the caster wheel assemblies (see **Figure 3**). Forks must be extended to the full depth of the cabinet—at least 6 ft. (2m) fork length—to properly support the equipment (see **Figure 3**). This likely requires fork extenders. The Liebert SRT can weigh up to 2376 lb. (1176kg) and must be handled with care.

Figure 3 Lifting the Liebert SRT cabinet



6. Unbolt and remove the two metal support plates (one on either side of the pallet).

Figure 4 Removing the metal support plates



NOTE

Retain the four bolts (1/2" diameter x 1-3/4" long; 12.7mm diameter x 44.5mm long) attaching the metal support plates to the cabinet. These will be used to attach brackets to the cabinet for surface mounting.

7. Examine the Liebert SRT internally and externally for transit damage. Report any damage to the shipper, your local Emerson representative and Emerson immediately.

CAUTION

Do not attempt to install the system if there is any damage.

8. Check visually for loose connections and unsecured components in the cabinet.
9. You will find the installation manual, operation manual and options manual (if any) enclosed in the pocket inside the cabinet door.
10. You will find the serial number and model number plate mounted on the cabinet door pocket or on the upper right corner of the face of the cabinet frame inside the door. Record the model number and serial number in **Table 1 - System information**.

1.7 Positioning the Liebert SRT

1.7.1 Moving the Liebert SRT

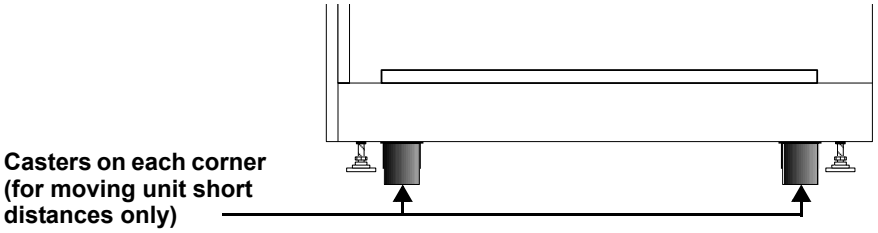
When moving the unit a short distance, the Liebert SRT may be rolled on its built-in casters (see **Figure 5**) to its location.

CAUTION

Risk of improper handling. Can cause equipment and building damage, injury or death.

efore moving the Liebert SRT across a floor, determine whether the surface will support the unit's weight—2538 lb. (1256kg) as shipped; 2376 lb. (1176kg) uncrated.

Figure 5 Liebert SRT cabinet caster location



When moving the unit a longer distance or over rough flooring, move the Liebert SRT with a forklift or similar equipment to facilitate the relocation and to reduce vibration of the unit.

CAUTION

Ensure that the handling equipment is rated for the weight of the Liebert SRT—2538 lb. (1256kg) as shipped; 2376 lb. (1176kg) uncrated.

1.8 Installation

The Liebert SRT system design and safety characteristics allow for a relatively simple and quick installation. The system is designed to be rolled or lifted into place and bolted to the floor using Liebert's mounting kit, included with the system. The mounting kit in most cases does not require any special floor preparations (see **1.6 - Unloading and Unpacking**).

NOTICE

Risk of improper installation. Can cause equipment damage and void warranty.

The Initial System Startup must be performed ONLY under the supervision of an Emerson-certified service technician to ensure proper system operation. Failure to abide by instructions provided herein may void your warranty.

Contact your local Emerson sales representative or Emerson at 1-800-LIEBERT to arrange for system startup.

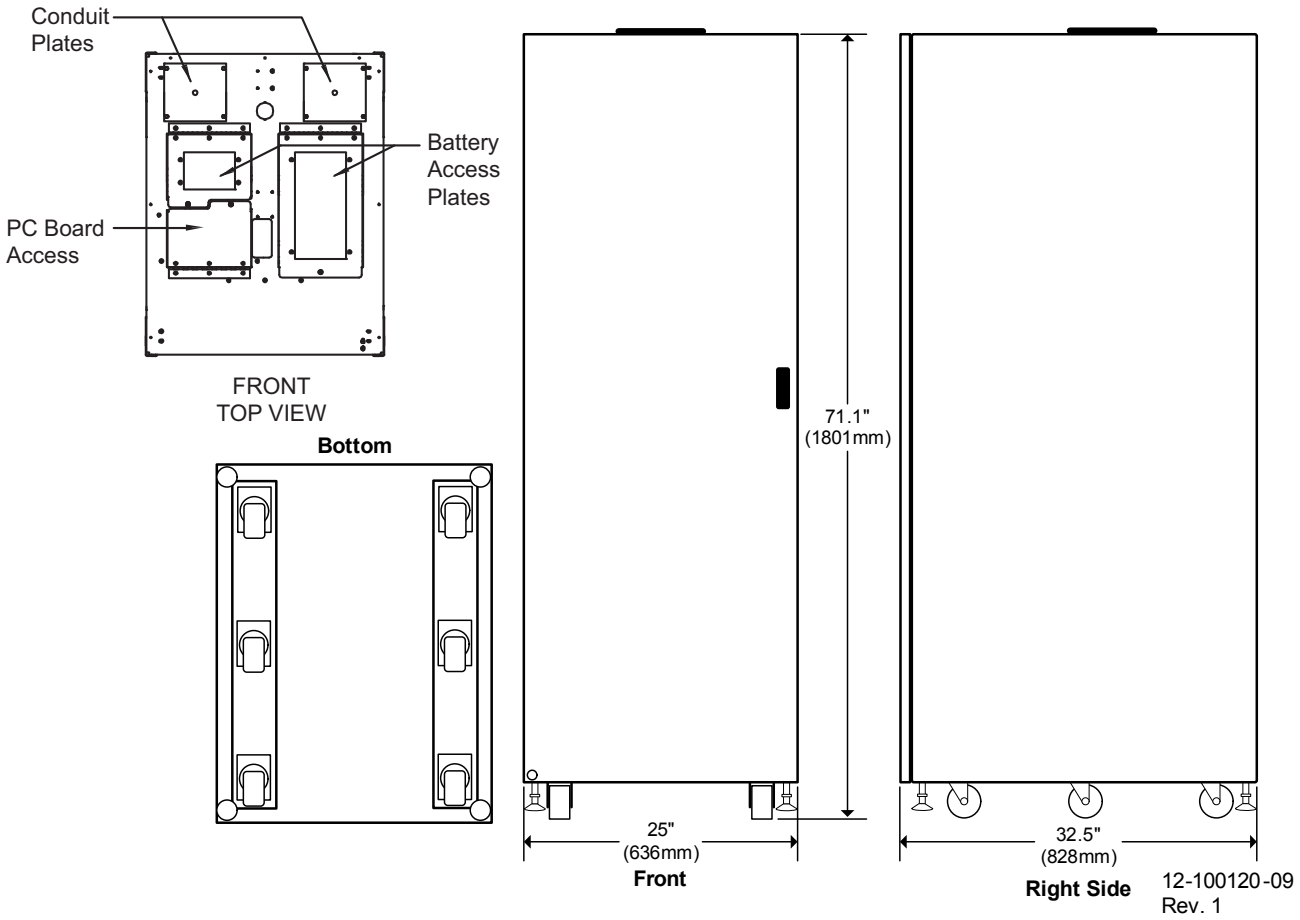
NOTICE

Risk of improper installation. Can cause equipment damage.

The Liebert SRT system must be installed in accordance with the instructions and drawings in this manual.

Never attempt to install or power up any unit suspected of damage during shipment.

Figure 6 Dimensions, general layout

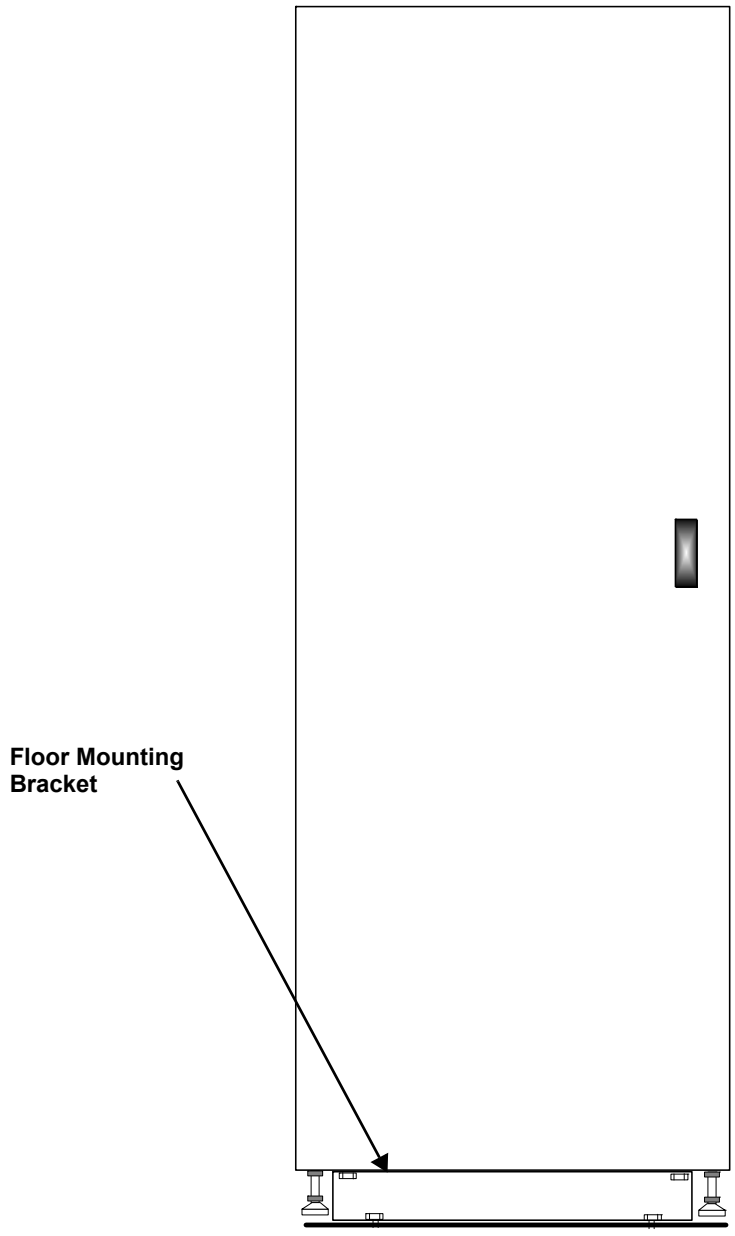


1.8.1 Cabinet Floor Mounting

NOTE
*Before beginning, ensure that the floor where the Liebert SRT will be mounted meets the floor loading specifications in **1.3 - Flooring Requirements**.*

- For placement on concrete, masonry or stone floors, see **Mounting Kit for Concrete, Masonry or Stone Floors on page 13**.
- For placement on wood floors, see **1.8.3 - Wood Floor Mounting**.
- For placement on raised floors, see **1.8.4 - Raised Floor Mounting**.

Figure 7 Floor mounting



1.8.2 Concrete, Masonry or Stone Floor Mounting

Mounting Kit for Concrete, Masonry or Stone Floors

Emerson has included a complete anchoring kit with each Liebert SRT for surface mounting. The kit is intended to securely fasten the Liebert SRT to its intended location for operational safety and seismic requirements.

This kit includes:

- Two (2) cabinet mounting brackets (from shipping pallet)
- Four (4) concrete expansion anchors
- Two (2) drop-in hex head anchor bolts
- Two (2) washers for anchor bolts
- One (1) masonry drill bit
- One (1) floor mounting template (**Figure 21**)
- Two (2) drop-in hex flange anchor bolts
- One (1) setter rod or drive pin (specifically designed for measuring hole depth and for expanding the anchors)
- Four (4) hex bolts from shipping package, each 1/2" diameter and 3/4" long (12.7mm diameter x 20mm long)

Mounting Tools

These tools are needed for the mounting the Liebert SRT on the floor:

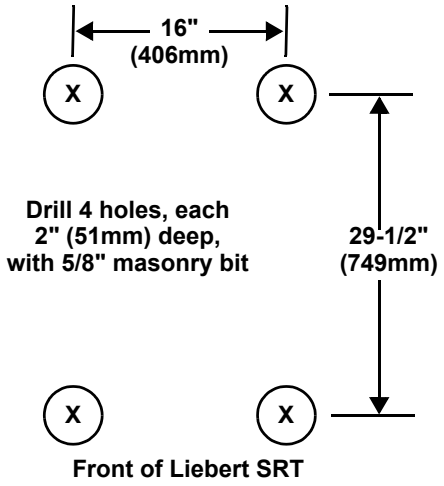
- Concrete drill with 1/2" (12.7mm) minimum chuck size
- Masonry drill bit (included in mounting kit)
- Masonry drill bit—used for pilot hole—for example, 1/8" (3.2mm) diameter
- Setter rod (included in mounting kit)
- Hammer or mallet, 16 oz. (0.5kg) or larger
- Shop vacuum cleaner (to remove dust from hole when drilling)
- 3/4" (19mm) combination wrench
- 18mm combination wrench

Concrete, Masonry or Stone Floor Mounting Instructions

To mount the Liebert SRT cabinet on the floor:

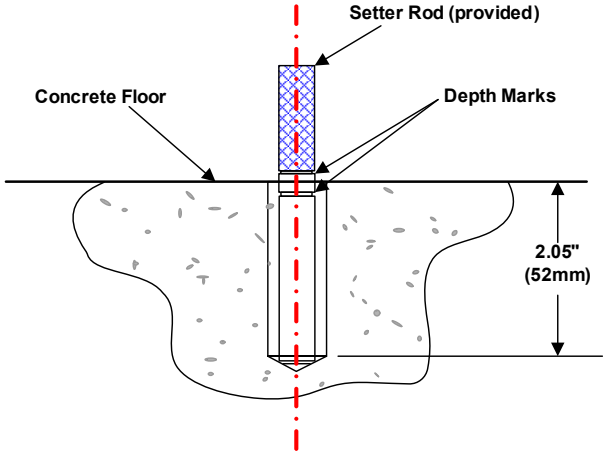
1. Prepare a clean, level, finished surface, free of obstructions, for installation of the mounting kit.
2. Tape the floor mounting template mounting template (**Figure 21**) to the installation location.
3. Using a bit smaller than the one provided in the mounting kit, drill a pilot hole at each of the four places marked with an “X” on the template.
4. Remove template and continue with larger drill bit provided.

Figure 8 Floor mounting template layout



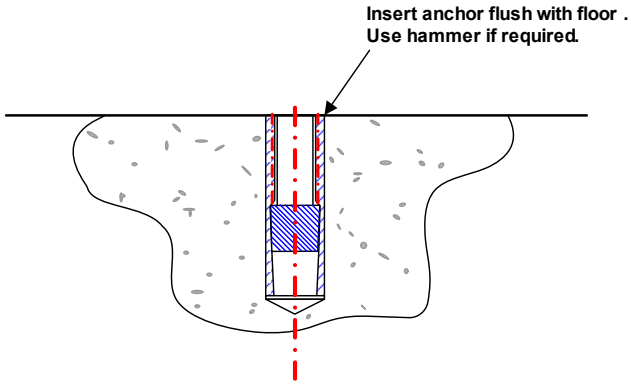
5. Drill 2" (51mm) deep holes in prepared surface using the drill bit included in the kit per bolt pattern described in **Figure 21 - Floor mounting template**. The setter rod should be used as a depth gauge to ensure proper depth. The setter rod is marked with two circles indicating the maximum and minimum hole depth allowed (see **Figure 9**).
   If a hole is drilled too deep, refill the hole with debris to the achieve proper depth.

Figure 9 Checking hole depth



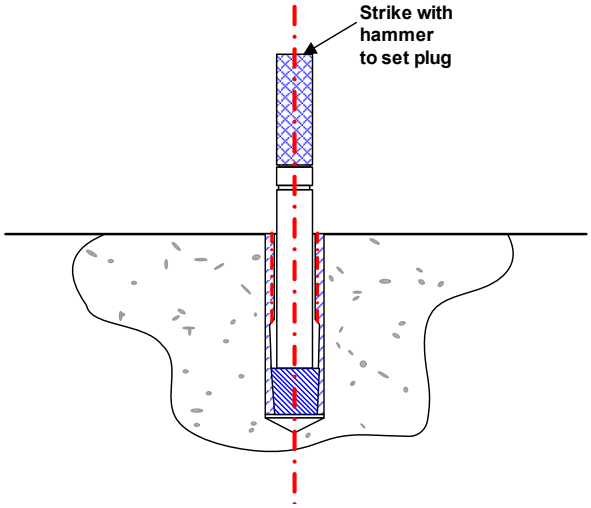
6. Insert four (4) drop-in concrete expansion anchors into drilled holes.

Figure 10 Inserting anchors



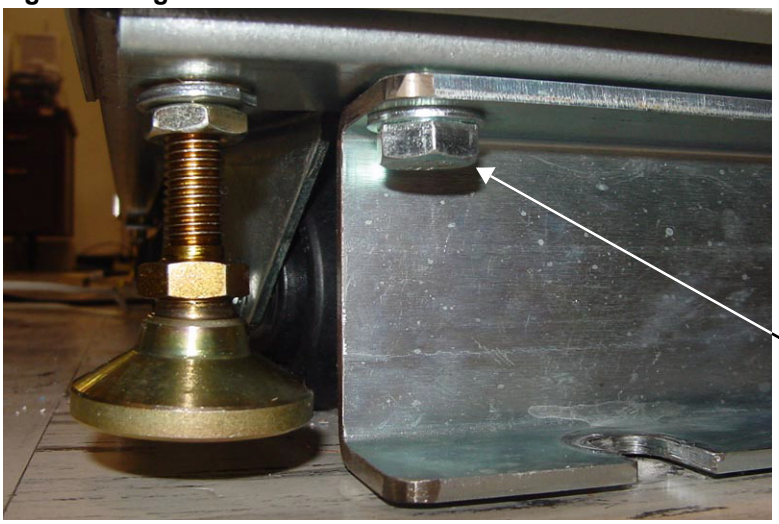
7. Tap anchors into drilled holes using hammer or mallet. When top of anchor is flush with mounting surface, use setter rod to expand and secure.

Figure 11 Expanding anchors



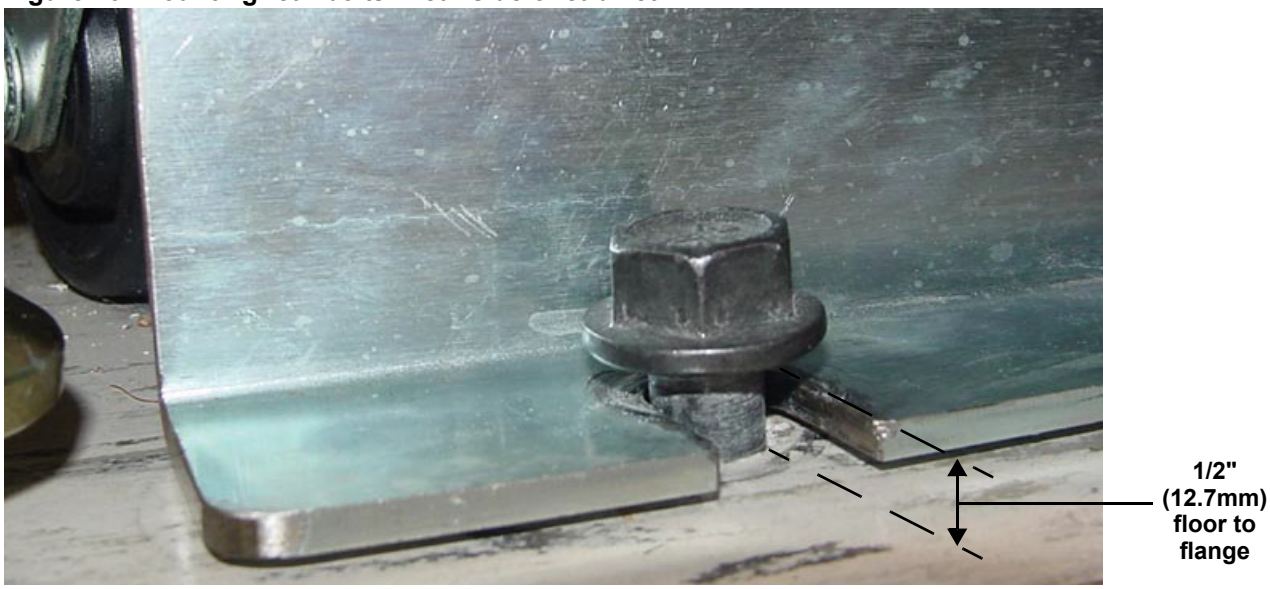
8. Match mounting brackets with the holes on the bottom of the cabinet (see **Figure 12**). Make sure that the bracket holes align with the mounting spots on the underside of the cabinet and secure the brackets with the four 1/2" diameter x 3/4" long (12.7mm diameter x 20mm long) hex bolts retained from the shipping package. Tighten the bolts with a torque of 40 foot-pounds (54 N-m).

Figure 12 Securing mounting brackets to the cabinet



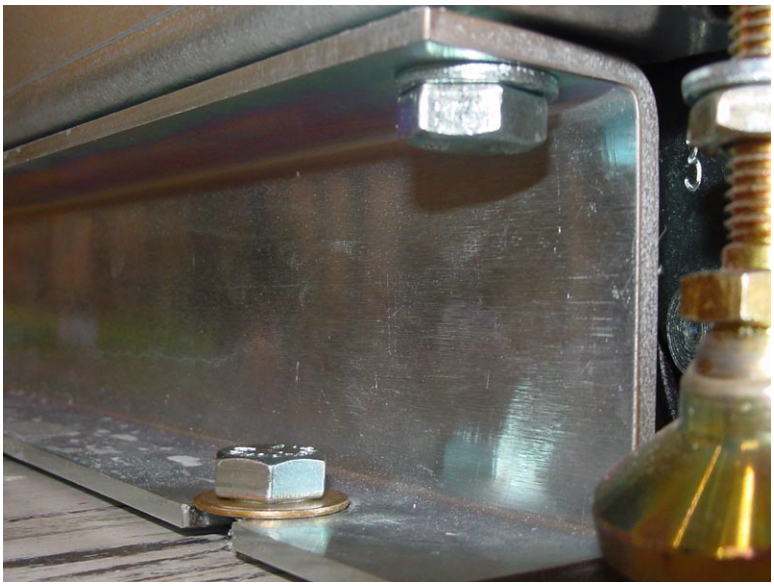
9. Insert the two (2) hex flange bolts in the rear anchors, where the back of the cabinet will be. Complete tightening of the rear bolts should result in 1/2" (12.7mm) gap between bolt flange and floor (see **Figure 13** and **Figure 20**). The rear bolts must be tightened to 20 foot-pounds (27 N-m) of torque. Bolt height or length may need to be adjusted if mounting surface is uneven or if mounting bracket does not slide beneath bolt flange.
10. Position and align cabinet and bracket slots with the newly inserted bolts at rear and position cabinet such that bolts fit in bracket slots (see **Figure 13**).

Figure 13 Mounting rear bolts—rear side of cabinet



11. Insert and begin tightening two (2) hex head bolts with one washer each through bracket mounted at front of cabinet into anchor inserts in mounting surface (see **Figure 14**).

Figure 14 Mounting front bolts—front side of cabinet



12. Firmly tighten the front bolts to drop-in anchors as shown in **Figure 21**. The front bolts must be tightened to 40 foot-pounds (54 N-m) of torque.

1.8.3 Wood Floor Mounting

Determine which of these cases applies to your installation:

- For wood flooring over concrete, follow the instructions in **Mounting Kit for Concrete, Masonry or Stone Floors on page 13**.
- For wood flooring on joists, follow the instructions in this section.

Wood Floor Mounting Parts

- Two (2) cabinet mounting brackets (previously secured Liebert SRT cabinet to shipping pallet)
- Four (4) (1/2" diameter x 2-1/2" long) [or 12.7mm diameter x 63.5mm] lag screws (not included in mounting kit) are recommended
- One floor mounting template, see **Figure 21**
- Four (4) 1/2" diameter x 3/4" long (12.7mm diameter x 20mm long) hex bolts (from shipping package—see **1.6.4 - Unpacking**)

Wood Floor Mounting Tools

The following tools are needed for the cabinet wood floor mounting:

- Electric drill
- 1/4" (7mm) drill bit
- Drill bit—used for pilot hole—for example, 1/8" (3.2mm) diameter
- Shop vacuum cleaner (to remove dust from hole when drilling)
- 3/4" (19mm) combination wrench
- 18mm combination wrench

Wood Floor Mounting Instructions

Installation in wood floor on joists does not require drop-in anchors.

1. Prepare a clean, level surface, free of obstructions, for installation of the mounting kit.
2. Tape the floor mounting template (**Figure 21**) to the installation location.
3. Drill pilot holes, remove the template and use a 1/4" (7mm) drill bit to drill holes 2.5" (64mm) deep.

   NOTICE

   Risk of improper installation. Can cause equipment damage.

   Ensure that holes are centered in the joist. Holes that are not centered may not anchor the unit securely.
4. Match mounting brackets with holes under base of cabinet (see **Figure 12**). Make sure that the bracket holes align with the mounting spots on the underside of the cabinet and secure brackets with the four hex bolts retained from the shipping package. Each bolt is 1/2" diameter x 3/4" long (12.7mm diameter x 20mm long). Tighten the bolts with a torque wrench at 40 foot-pounds (54 N-m).
5. Insert two lag screws through bracket mounted at rear of cabinet leaving head with 1/2" (12.7mm) gap above floor (see **Figure 13**).
6. Position and align cabinet and bracket slots with the newly drilled holes at rear and position cabinet such that bolts fit in bracket slots (see **Figure 13**).
7. Insert two (2) lag screws through bracket mounted at front of cabinet (see **Figure 14**).
8. Firmly tighten the front lag screws to a torque 40 foot-pounds (54 N-m).

1.8.4 Raised Floor Mounting

Raised Floor Mounting Kit

Emerson has included a complete anchoring kit with each Liebert SRT for surface mounting. The kit is intended to securely fasten the Liebert SRT to its location for operational safety and seismic requirements.

The anchoring kit includes:

- One floor mounting template, **Figure 21**
- 2 cabinet mounting brackets
- 4 drop-in hex flange bolts, each 1/2" diameter, 3" long (12.7mm, 76.mm)
- 4 washers (1/2" hole and 2" outer diameter) for hex flange bolts
- 4 lock washers for hex flange bolts
- 4 nuts for hex flange bolts, each 1/2" (12.7mm)
- 4 hex bolts, each 1/2" diameter, 3/4" long (12.7mm diameter, 20mm long) retained from shipping package *(*see **1.6.4 - Unpacking***)*

Raised Floor Mounting Tools

The following tools are needed for the cabinet raised floor mounting:

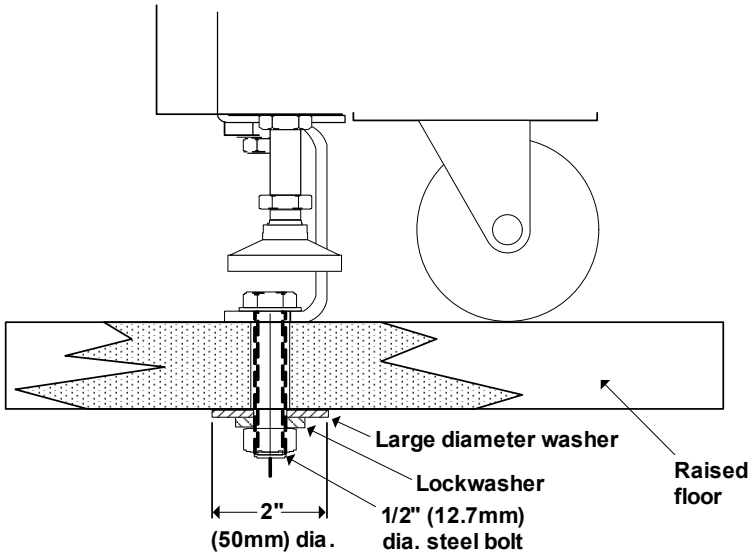
- Electric drill with 1/2" (12.7mm) minimum chuck size
- 5/8" (16mm) drill bit
- Drill bit—used for pilot hole—for example, 1/8" (3.2mm) diameter
- 3/4" (19mm) combination wrench
- 18mm combination wrench

Raised Floor Mounting Instructions

To mount the Liebert SRT cabinet on the floor:

1. Prepare a clean, level finished surface, free of obstructions, for installation of mounting kit.
2. Tape the floor mounting template (see **Figure 21**) to installation location, pre-drill a pilot hole, then remove paper and continue with 5/8" (16mm) drill bit.
3. Match mounting brackets with holes under base of cabinet (see **Figure 12**). Make sure that the bracket holes align with the mounting spots on the underside of the cabinet and secure brackets with the four 1/2" diameter x 3/4" long (12.7mm diameter x 20mm long) hex bolts retained from the shipping package. The bolts must be tightened to 40 foot-pounds (54 N-m) of torque.
4. Position and align cabinet and bracket slots with the newly drilled holes (see **Figure 13**).
5. Insert four drop-in hex flange bolts through bracket mounted at front and rear of cabinet (see **Figure 14**).

Figure 15 Raised floor mounting



6. Attach a large diameter washer, a lock washer and a nut to each hex flange bolts as described in **Figure 15** and **Figure 22**.
7. Firmly tighten down all hex flange bolts with nuts. The bolts must be tightened to 40 foot-pounds (54 N-m) of torque.

2.0 BATTERY INSTALLATION

2.1 Safety

Special care should be taken when working with the batteries associated with the Liebert SRT Battery System equipment. When all the cells are connected together, the battery terminal voltage will exceed 400V and is potentially lethal. A primary safety consideration is to install the battery equipment in an isolated area, accessible only to properly trained and qualified maintenance personnel.

WARNING

Risk of electric shock. Can cause equipment damage, personal injury and death.

Hazardous battery voltage present behind covers. No user-serviceable parts are located behind covers that require a tool for removal. Only properly trained and qualified service personnel are authorized to remove such covers or perform installation or maintenance.

The following general battery safety precautions and warnings must be observed at all times:

- A battery can present risk of electric shock or burn from high short circuit currents.
- When connected in a string, the voltage will exceed 400VDC. This voltage is potentially lethal. Always observe high-voltage precautions.
- Eye protection must be worn to prevent injury from accidental electrical arcs.
- Remove rings, watches, necklaces, bracelets and all other metal objects.
- Use only tools with insulated handles.
- Wear appropriate personal protective equipment when handling batteries.
- If a battery leaks electrolyte or is otherwise physically damaged, it should be placed in a container resistant to wire and disposed of in accordance with local regulations.
- If electrolyte comes into contact with the skin, the affected area should be washed immediately with plenty of clean water.
- Batteries must always be disposed of according to local environmental laws.
- When replacing batteries, use the same number and type that were originally fitted.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- Determine if the battery is grounded. If it is grounded, remove source of ground. Contact with any part of a grounded battery can result in electrical shock.
- Battery support tray must be used whenever a battery tray is being pulled out.

2.2 Layout

The battery cabinets must be installed stand-alone, where the cabinet is not bolted to the UPS. See **Figures 16** and **18** for possible configurations.

Figure 16 Stand-alone battery cabinets, detached from UPS

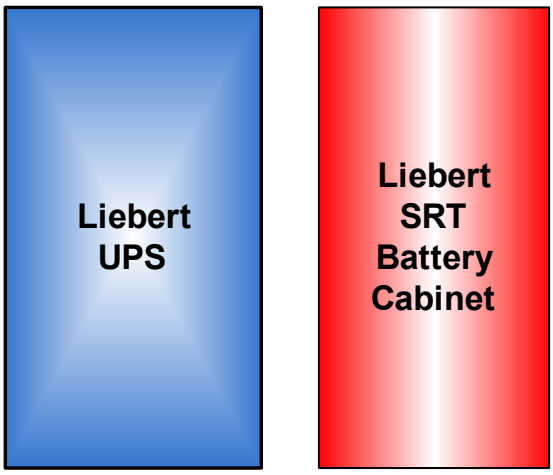
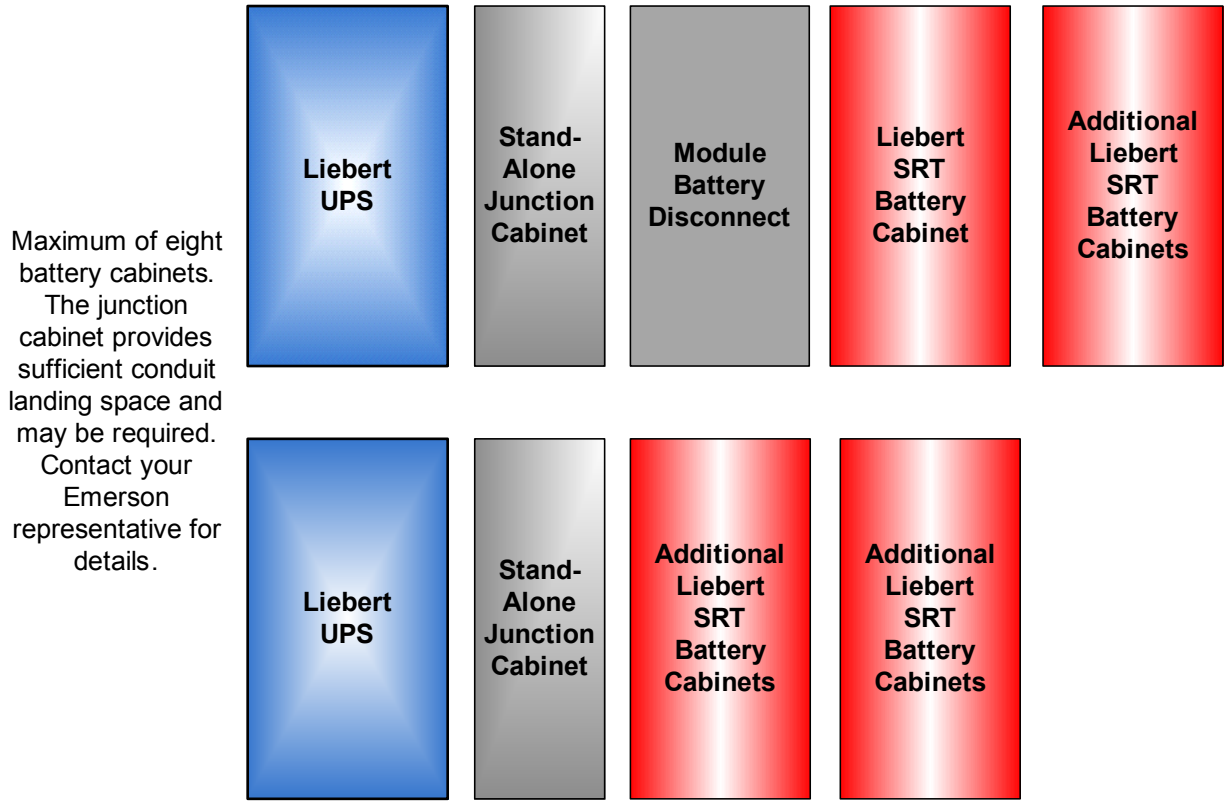


Figure 17 Other possible Liebert SRT configurations



2.3 Cable Entry

Cables may enter the battery cabinet from the top only. Cable entry is made possible by installing conduit to the removable plate fitted at the top of the cabinet. See **3.0 - Installation Drawings**.

2.4 Power Connection

Power connections between the Liebert SRT and the UPS and safety precautions are detailed in the UPS installation or user manuals. See the Liebert documents listed below. Each is available at the Liebert Web site, **www.liebert.com**

- Liebert NXL™—SL-25430
- Liebert Npower™—SL-24532
- Liebert Nx™ 480—SL-25217
- Liebert Nx 225-600 kVA—SL-25356
- Liebert Series 610™:
  - 65-225 kVA—SL-25120 single module; SL-25125 multi-module
  - 300-450 kVA—SL-25130 single module; SL-25135 multi-module
  - 500-750 kVA—SL-25140 single module; SL-25145 multi-module
  - 1000 kVA—SL-251550 single module; SL-25160 multi-module

2.4.1 Stand-Alone System

For cabinets that are ordered as stand-alone, customer must supply all the interconnecting cables and hardware. See **Table 3** for maximum discharge currents and size power cables accordingly.

2.4.2 Grounding

Customer must supply the cables and hardware. See terminal detail drawings for the location of the ground busbar.

2.5 Control Connections

Control connections between the Liebert SRT Battery Cabinet and the UPS are detailed in the UPS installation or user manuals. See the Liebert documents listed below. Each is available at the Liebert Web site, **www.liebert.com**

- Liebert NXL™—SL-25430
- Liebert Npower™—SL-24532
- Liebert Nx™ 480—SL-25217
- Liebert Nx 225-600 kVA—SL-25356
- Liebert Series 610™:
  - 65-225 kVA—SL-25120 single module; SL-25125 multi-module
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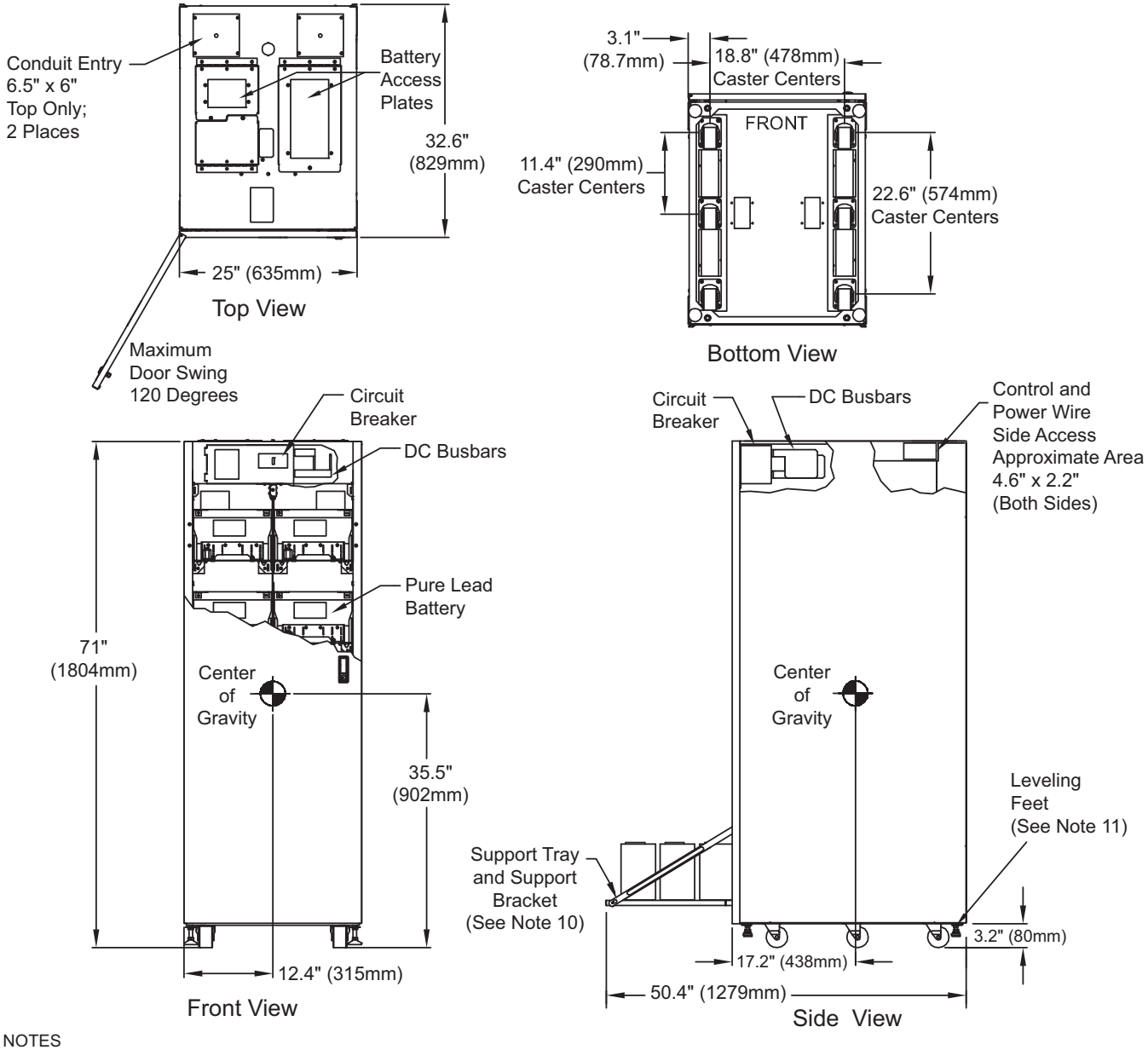
  - 500-750 kVA—SL-25140 single module; SL-25145 multi-module
  - 1000 kVA—SL-251550 single module; SL-25160 multi-module

3.0 INSTALLATION DRAWINGS

Figure 18 Outline drawing Liebert SRT Battery Cabinet



NOTES

1. All dimensions are in Inches (mm).
2. 24" (610mm) minimum clearance above the unit is required for air exhaust and 36" (914mm) front access is required for service.
3. Keep the cabinet within 15 degrees of vertical while handling.
4. Top cable entry is available through access plates.
5. The bottom ofthe unit is structurally adequate for forklift handling.
6. Control wiring and power wiring must be run in separate conduits.
7. Unless otherwise noted, all cables must be suitable for at least 75°C and must be copper conductors only.
8. All wiring must be in accordance ith national and local electrical codes.
9. The shipping weight is 2538 lb. (1256kg); the uncrated weight is 2376lb. (1176kg).
10. Before sliding batteries out on the battery tray, position the support tray and attach it to the cabinet. Then secure two support brackets to the support tray and to the cabinet. Refer to the appropriate user manual for further description and details.
11. The leveling feet are not designed to carry the full weight of the cabinet. Finger-tighten the levelers against the floor, thentighten with a wrench less than two turns for a friction fit against the floor.

Figure 19 Main components Liebert SRT Battery Cabinet

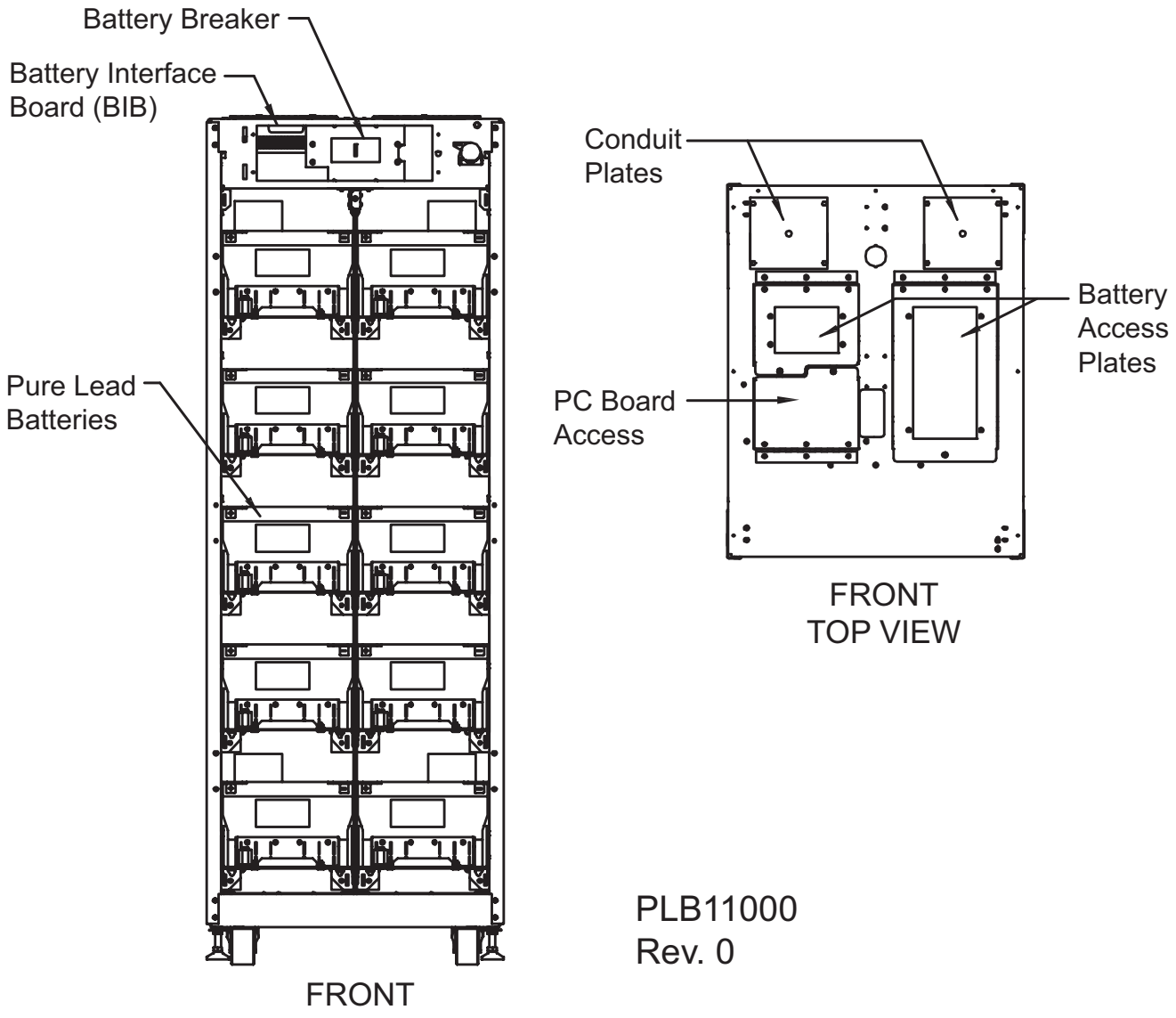


Figure 20 Liebert SRT cabinet mechanical installation

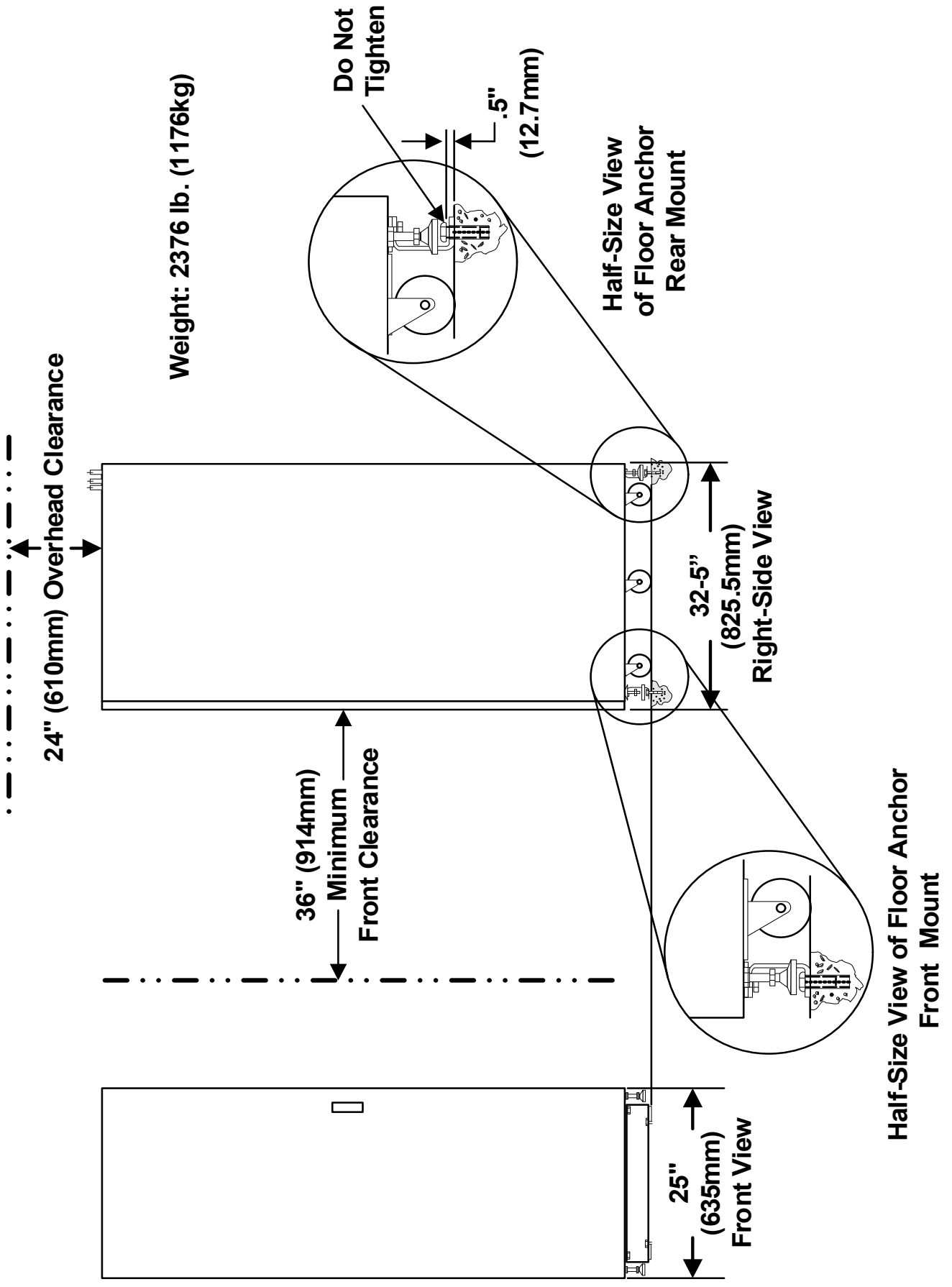


Figure 21 Floor mounting template

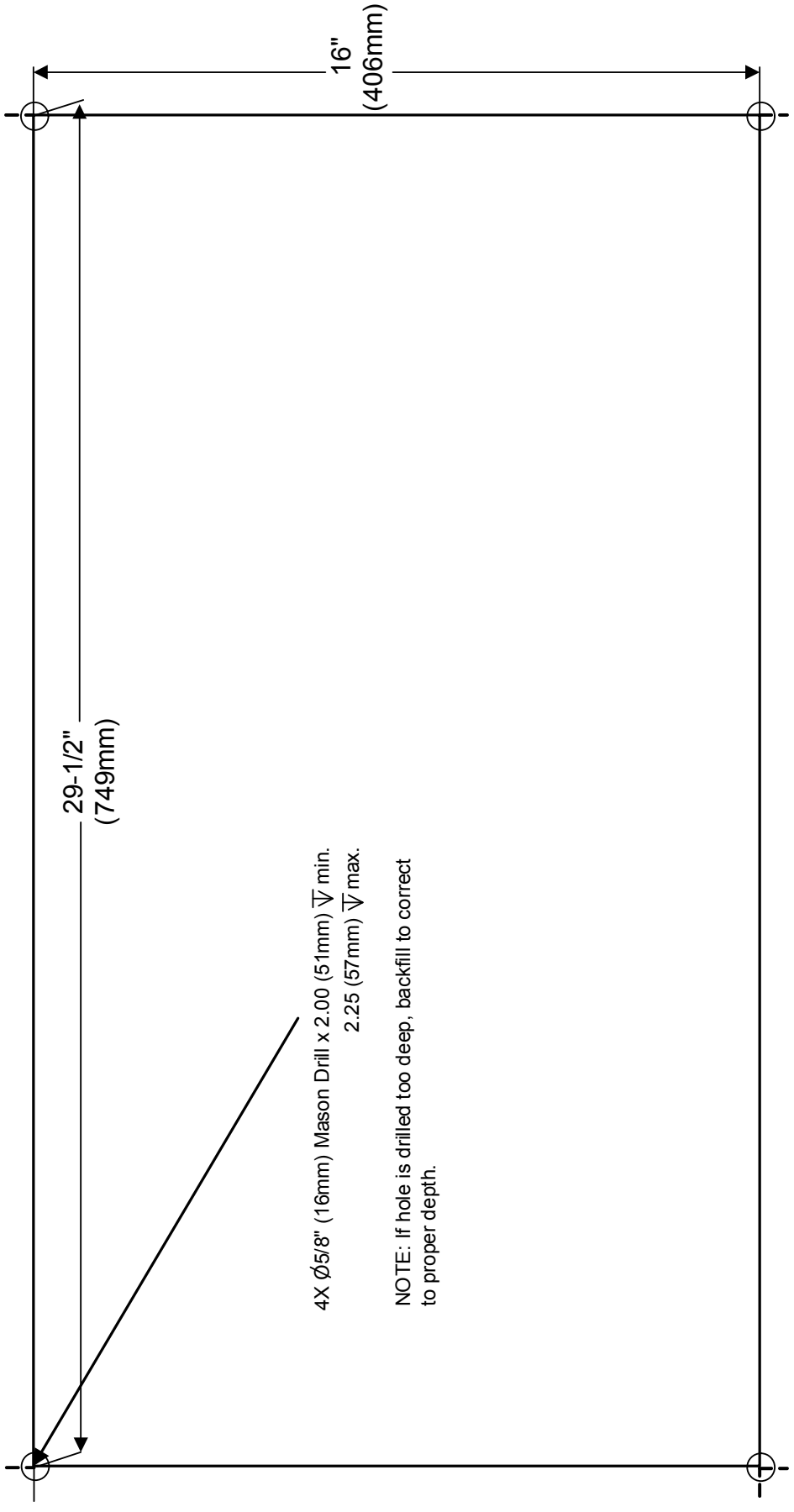
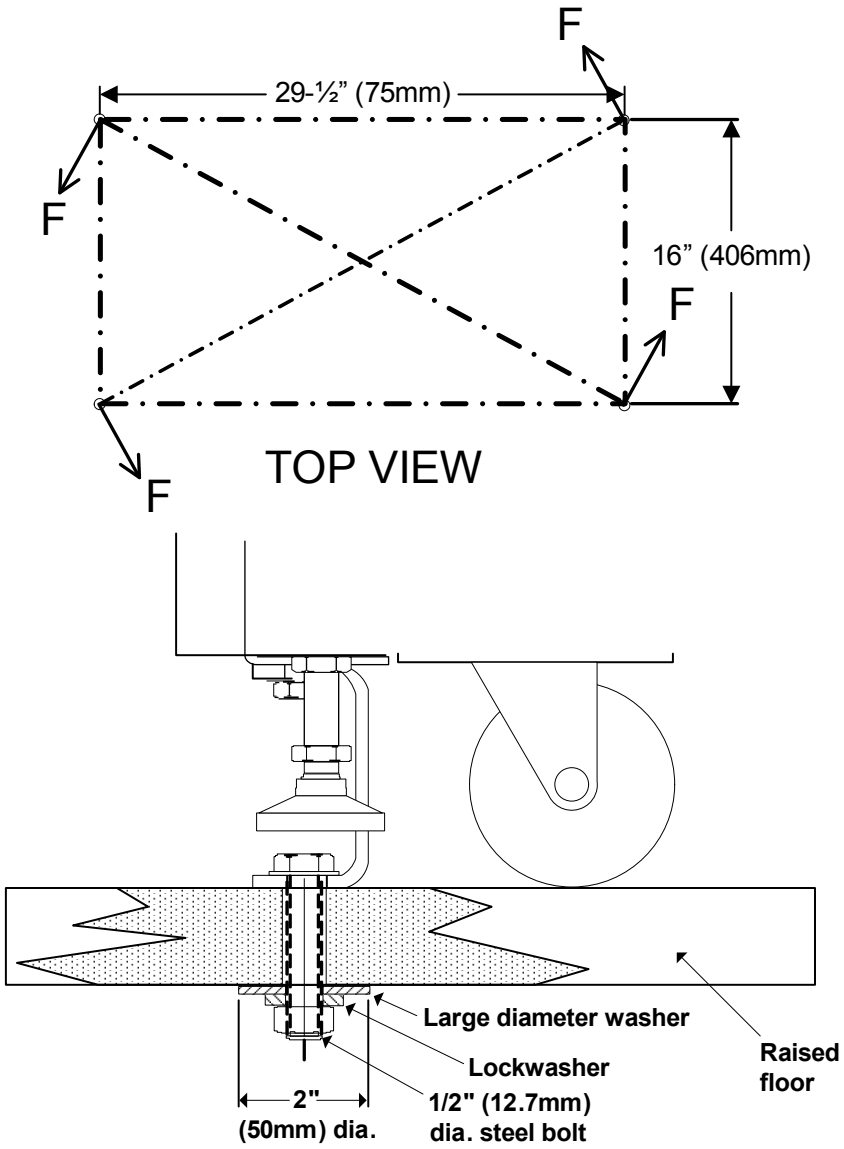
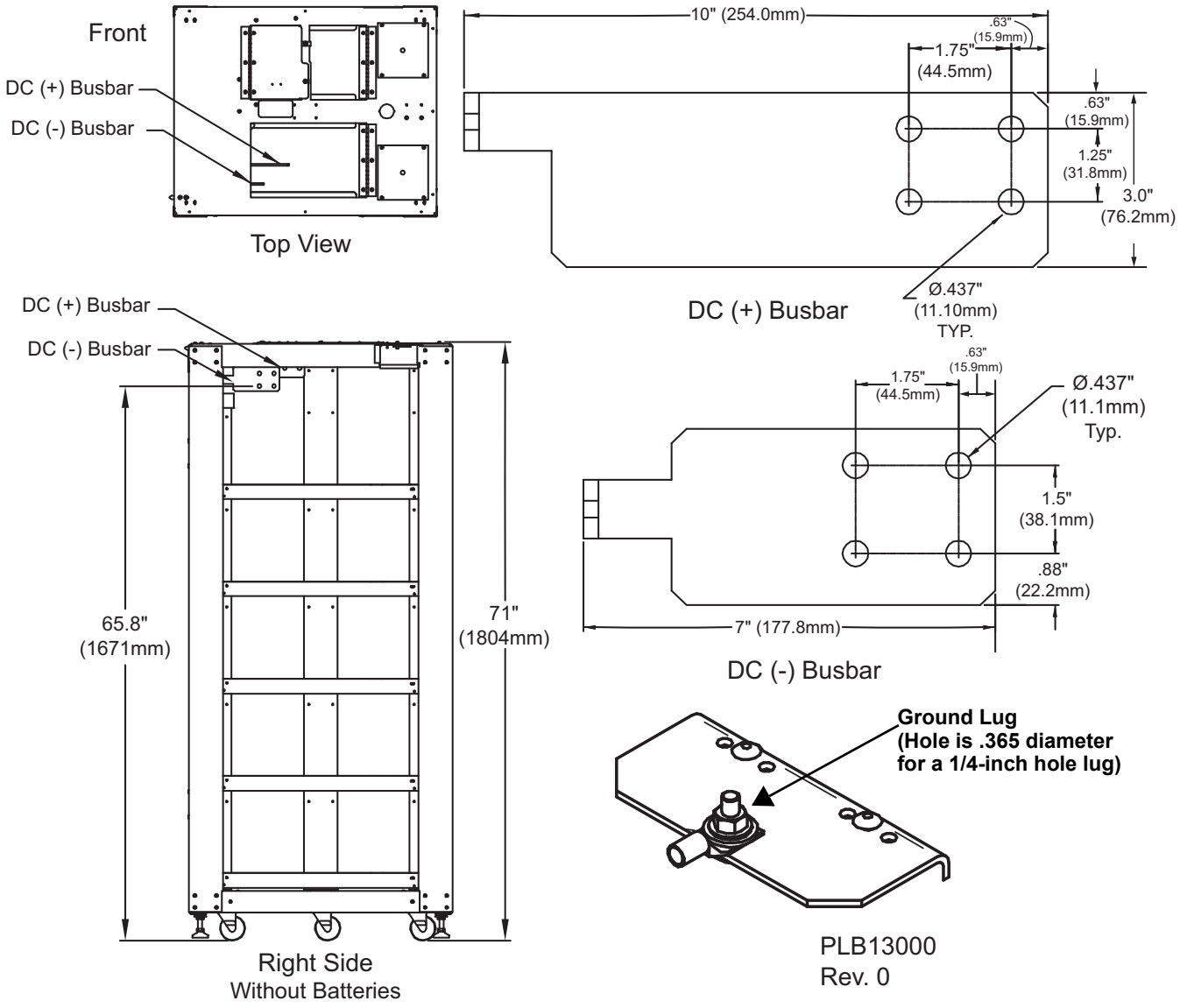


Figure 22 Raised floor mounting



NOTE: Combination of floor material of given thickness, plus properties of large diameter washer and fastener, should result in lateral load capability to withstand shear due to load F=2376 lb (1176kg), parallel to floor.
For thicker floors that might require a bolt length longer than can fit inside mounting channel, insert bolt from below with nut above.

Figure 23 Terminal details Liebert SRT Battery Cabinet



4.0 SPECIFICATIONS

Table 2 Liebert SRT Battery Cabinet specifications

Battery Cabinet Parameters	Values Top-Terminal Cabinet
Battery Type	VRLA (Valve Regulated Lead Acid) Enersys XE60
Battery Breaker	250A (with 6x setting)
Nominal Battery Bus, VDC	480V
Battery Float Voltage, VDC	540V
Minimum EOD Voltage, VDC	400V (for VRLA)
Battery Discharging Maximum Current (EOD), ADC	720A (One Cabinet)
Physical Parameters and Standards	
Width, in. (mm) [1]	25.0 (635)
Depth, in. (mm) [2]	32.6 (829)
Height, in. (mm)	71 (1804)
Weight, lb (kg) approx.	2376 (1176)
Standard Color	Black (ZP-7021)
Front Door Opening (for serviceability)	More than 180°
Degree of Protection for UPS Enclosure	IP 20 (with and without front door open)
Minimum Clearance, Top	24" (610mm)
Minimum Clearance, Back	0"
Minimum Clearance, Sides	0"
Cable Entrance	Top
Standards & Conformities	UL 1778; CSA 22.2 107.3 FCC Part 15, Class A; ISTA Procedure 1H; WEEE; IBC 2012/CBC 2010
Environmental	
Storage Temperature Range, °F (°C)	-13°F to 158°F (-25°C to 70°C) 74°F to 80°F (23-27°C) for optimal battery life
Operating Temperature Range, °F (°C)	32°F to 104°F (0 to 40°C) 74°F to 80°F (23-27°C) for optimal battery life
Relative Humidity	up to 95% Non-Condensing (Operating and Non-Operating)
Maximum Altitude Above MSL, ft (m)	4920 (1500) (as per IEC 62040/3) - 1% Maximum kW derate / 100m rise between 1500-3000m

1. Width dimensions are with side panels attached. Subtract 1.4" (35mm) for dimensions without side panels.
2. Depth dimensions include the front door and rear panel.

Table 3 DC currents for Liebert NXL™ modules, Liebert Npower™, Liebert Nx™ 480, Liebert Nx™ 225-600 and Liebert Series 610™

UPS Rating		Max Battery Discharge Current at EOD (Amps)				
kVA	kW	Liebert NXL	Liebert Nx 480	Liebert Nx 225-600	Liebert Npower	Liebert Series 610
30	24	—	—	—	66	—
40	32	—	—	—	88	—
	36	—	103	—	—	—
50	40	—	—	—	109	—
60	54	—	155	—	—	—
65	52	—	—	—	141	—
80	64	—	—	—	174	—
	72	—	206	—	—	—
100	80	—	—	—	218	218
	90	—	258	—	—	—
120	108	—	309	—	—	—
125	100	—	—	—	—	271
130	104	—	—	—	283	—
150	120	—	—	—	—	326
160	144	—	412	—	—	—
200	180	—	515	—	—	—
225	180	—	—	—	—	488
	225	—	—	586	—	—
250	225	615	—	—	—	—
	250	—	—	653	—	—
300	240	—	—	—	—	651
	270	730	—	—	—	—
	300	—	—	786	—	—
400	320	—	—	—	—	868
	360	980	—	—	—	—
	400	—	—	1048	—	—
500	400	—	—	—	—	1079
	450	—	—	—	—	1214
	500	1241	—	1310	—	—
600	600	—	—	1572	—	—
625	500	—	—	—	—	1349
	625	1648	—	—	—	—
750	600	—	—	—	—	1619
	675	1850	—	—	—	1822
800	800	2061	—	—	—	—
1000	900	—	—	—	—	2440
1100	1100	2860	—	—	—	—

Table 4 Battery torque values

Battery Code	Manufacturer	Battery Model	Torque Value in-lb (Nm)
PG	Enersys	XE60	60 (6.7)

Table 5 Torque specifications, unless otherwise labeled

Bus bar		
Bolt Shaft Size	**Grade 2 Standard lb-in (Nm)**	**Electrical Connections with Belleville Washers lb-in (Nm)**
3/8 (M10)	192 (22)	95 (11)
Circuit Breakers		
Current Rating	**lb-in (Nm)**	**—**
250 Amps	90 (10)	—
Circuit Breakers with Compression Lugs (For Control Wiring)		
AWG Wire Size or Range	**lb-in (Nm)**	**—**
#22 - #14	3.5 to 5.3 (0.4 to 0.6)	—

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