



4400 SERIES UPS Battery Cabinets

INSTALLATION AND OPERATION MANUAL
440B SERIES UPS MATCHING BATTERY CABINETS - 288 VDC



Part # 69445-005
October 2019

Manufactured in the USA

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Product Use and Warranty Restrictions

The Toshiba products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These Toshiba products are neither intended nor warranted for usage in specific applications that are outlined in Section 4.1 (Unintended Usage).

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The instructions contained in this manual are not intended to cover all of the details or variations in equipment, or to provide for every possible contingency concerning installation, operation, or maintenance. Should further information be required or if problems arise which are not covered sufficiently, contact your Toshiba sales office.

The contents of this instruction manual shall not become a part of or modify any prior or existing agreement, commitment, or relationship. The sales contract contains the entire obligation of Toshiba International Corporation UPS Division. The warranty contained in the contract between the parties is the sole warranty of Toshiba International Corporation UPS Division and any statements contained herein DO NOT create new warranties or modify the existing warranty.

Any electrical or mechanical modifications to this equipment without prior written consent of Toshiba International Corporation will void all warranties and may void the UL/CUL listing. Unauthorized modifications can also result in personal injury, loss of life, or destruction of the equipment.

QUALIFIED PERSONNEL ONLY

Only qualified persons are to install, operate, or service this equipment according to all applicable codes and established safety practices. The definition of Qualified Personnel is detailed in Section 2.3



UNINTERRUPTIBLE POWER SYSTEM (UPS)

Please complete the following information and retain for your records.

JOB NUMBER	
MODEL NUMBER	
SERIAL NUMBER	
APPLICATION	
SHIPMENT DATE	
INSTALLATION DATE	
INSPECTED BY	

Purpose

This manual provides information on how to safely install your Toshiba International Corporation power electronics product. This manual includes a section of general safety instructions that describes the warning labels and symbols that are used throughout the manual. Read the manual completely before installing, operating, or performing maintenance on this equipment.

This manual and the accompanying drawings should be considered a permanent part of the equipment and should be readily available for reference and review. Dimensions shown in the manual are in metric and/or the English customary equivalent.

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Toshiba Customer Support Center

Contact the Toshiba Customer Support Center for assistance with application information or for any problems that you may experience with your Uninterruptible Power System (UPS) or ancillary devices.

Toshiba Customer Support Center

8 a.m. to 5 p.m. (CST) - Monday through Friday

USA Toll Free

Pre-Sales Application Support: (855) 803-7087

Tech/Service Support (877) 867-8773

Tel (713) 466-0277

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Web – <https://www.toshiba.com/tic/industrial/uninterruptible-power-systems>

You may also contact Toshiba by writing to:

TOSHIBA INTERNATIONAL CORPORATION SOCIAL INFRASTRUCTURE SYSTEMS GROUP POWER ELECTRONICS DIVISION

13131 West Little York Road

Houston, Texas 77041-9990

Attn: UPS Product Manager

For further information on Toshiba products and services, please visit our website at:
www.toshiba.com/tic/industrial/uninterruptible-power-systems

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1 Introduction

This manual provides information on how to safely install and operate your 4400 Series accessory cabinets. This manual includes a section of general safety instructions that describes the warning labels and symbols that are used throughout the manual. Read the manual completely before installing, operating, or performing maintenance on this equipment.

Qualified personnel should read this manual carefully before transporting, installing, and wiring the UPS Battery Cabinets. In addition they have a thorough understanding of the information provided in the chapters titled:

- General Safety Instructions
- Important Safety Instructions
- Safety Precautions
- Installation Precautions

Please read the 4400 Series Operation Manual for important instructions on operating the UPS Battery Cabinet. This manual and the accompanying drawings should be considered a permanent part of the equipment and should be readily available for reference and review. Dimensions shown in the manual are in metric and/or the English customary equivalent.

Keep the Installation Manual and the Operation Manual near the UPS for necessary reference.

SAVE THESE INSTRUCTIONS

2 General Safety Instructions

DO NOT attempt to transport, install, operate, maintain or dispose of this equipment until you have read and understood all of the product safety information provided in this manual.

2.1 Symbols

The symbols listed below are used throughout this manual. When symbols are used in this manual they will include important safety information that must be carefully followed.



Safety Alert Symbol indicates that a potential personal injury hazard exists.



Prohibited Symbol indicates **DO NOT** take action.



Mandatory Symbol indicates that the following instruction is required.



Ground Symbol indicates the location of the equipment grounding conductor.



Electrical - Voltage & Shock Hazard Symbol indicates parts inside may cause electric shock.



Explosion Hazard Symbol indicates parts may explode.

2.2 Signal Words

The signal words listed below are used throughout this manual. When the words DANGER, WARNING, CAUTION and ATTENTION are used in this manual they will include important safety information that must be carefully followed.



The word **DANGER** in capital letters preceded by the safety alert symbol indicates that an **imminently hazardous** situation exists, and if not avoided **will result in loss of life or serious injury to personnel**.



The word **WARNING** in capital letters preceded by the safety alert symbol indicates that a **potentially hazardous** situation exists, and if not avoided **may result in loss of life or serious injury to personnel**.



The word **CAUTION** in capital letters preceded by the safety alert symbol indicates that a **potentially hazardous** situation exists, and if not avoided **may result in minor or moderate injury**.



The word **NOTICE** in capital letters without the safety alert symbol indicates a **potentially hazardous** situation exists, and if not avoided **may result in equipment and property damage**.

2.3 Qualified Personnel

Installation, operation, and maintenance shall be performed by Qualified Personnel Only. A Qualified Person is one who has the skills and knowledge relating to the construction, installation, operation, and maintenance of the electrical equipment and has received safety training on the hazards involved (Refer to the latest edition of NFPA 70E for additional safety requirements).

Qualified Personnel shall:

- Have read the entire operation manual.
- Be familiar with the construction and function of the UPS, the equipment being driven, and the hazards involved.
- Be trained and authorized to safely energize, de-energize, ground, lockout/tagout circuits and equipment, and clear faults in accordance with established safety practices.
- Be trained in the proper care and use of protective equipment such as safety shoes, rubber gloves, hard hats, safety glasses, face shields, flash clothing, etc., in accordance with established safety practices.
- Be trained in rendering first aid.

For further information on workplace safety visit www.osha.gov.

2.4 Factory Authorized Personnel

Factory authorized personnel have been factory trained and certified to install, service, and repair the UPS. Contact the Toshiba Customer Support Center for assistance in locating the factory authorized personnel nearest you.

3 Important Safety Instructions

3.1 Maximum Operating Temperatures

The following contains important instructions that should be followed during the installation, operation, and maintenance of the 4300 Series UPS Battery cabinets.

 **CAUTION**

Misuse of this equipment could result in personal injury and/or equipment damage. In no event will Toshiba Corporation be responsible or liable for either indirect or consequential damage or injury that may come from the use of this equipment.

The maximum operating ambient temperature for the 4300 Series Battery Cabinets are as follows:

- 440B (Battery Cabinet) – 90 °F (32 °C).

If the 4400 System is exposed to the same ambient temperature as the DC backup supply the maximum operating ambient temperature is:

- DC backup: 90 °F (32 °C). Table 3.2 lists the nominal battery voltage.

TABLE 3.2 UPS NOMINAL BATTERY VOLTAGE

CAPACITY	NOMINAL VOLTAGE	FLOAT VOLTAGE
All	288 Vdc	324 V

3.2 Battery Safety

The following contains important instructions that should be followed during the installation, operation, and maintenance of the 4400 Series UPS Battery Cabinets.



A battery can present a risk of electrical shock and high short circuit current.

To be performed by **Qualified Personnel** only.

1. Verify that the UPS is off and that the power is disconnected from the power source.
2. Remove watches, ring, jewelry, or other metal objects.
3. Use tools with insulated handles to prevent inadvertent shorts.
4. Wear rubber gloves and boots.
5. Do not place tools or any metal parts on top of batteries.
6. Determine if the battery is inadvertently grounded. If inadvertently grounded, remove source of ground. Contact with any part of a grounded battery can result in electrical shock.

The likelihood of shock will be reduced if such grounds are removed prior to installation or maintenance.

INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ

CONSERVER CES INSTRUCTIONS

Cette notice contient des instructions importantes concernant la sécurité



ATTENTION

Un battery puet présenter un risque de choc électrique, de brûlure par transfert d' énergie.



ATTENTION

L'élimination des batteries est règlementée. Consulter les codes locaux à cet effet

4 Safety Precautions

4.1 Unintended Usage



Never use the UPS system in any of the following applications:

- a. Medical Operation Room Equipment
- b. Life Support Equipment
- c. Fire Prevention or Suppression Equipment

Use of the UPS system in any of the above applications will result in serious personal injury or death.



Always read all applicable regulations and standards for the specific application of the UPS system.

Special precautions must be undertaken when the UPS system is used in the following applications:

- a. Nuclear Power Plants
- b. Communications Equipment
- c. Transportation Equipment

Always consult highly trained and qualified technicians in these applications.

Improper use of the UPS system in any of the above applications may result in serious personal injury or death.

4.2 Disclaimer

IN NO EVENT WILL TOSHIBA CORPORATION BE RESPONSIBLE OR LIABLE FOR EITHER INDIRECT OR CONSEQUENTIAL DAMAGE OR INJURY THAT MAY COME FROM THE MISUSE OF THIS EQUIPMENT. ANY MODIFICATIONS WITHOUT AUTHORIZATION BY TOSHIBA COULD RESULT IN PERSONAL INJURIES, DEATH OR DESTRUCTION OF THE UPS.

TOSHIBA RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. TOSHIBA DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR UPS DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

4.3 General Maintenance

 WARNING	
	DO NOT remove the rear/side panels, or any sheet metal not designed to be removed. Removing rear/side panels may result in electric shock, burns, personal injuries or UPS failure.
	Keep the area around the UPS clean. Use a non-metal vacuum cleaner to clean the UPS.
	Only factory authorized personnel should perform internal general maintenance on the UPS and battery cabinets.
	Contact the authorized Toshiba Customer Support Center or an authorized Toshiba representative for information on proper disposal of UPS and battery cabinet components. It is illegal to dispose of certain components without conforming to environmental regulations for industrial/commercial waste.

4.4 Transporting

 WARNING	
	DO NOT tilt the battery cabinet more than 10° from upright position. Tilting the battery cabinet more than 10° may cause crushing, trapping or other personal injuries.
 CAUTION	
	DO NOT transport, move, store, or place the battery cabinet on its sides. Excessive force applied from heavy components inside may damage the battery cabinet.
	Avoid vibration or shock exceeding 0.5 g. Failing to observe this precaution may cause damage to the battery cabinet.
	DO NOT allow the battery cabinet to suffer shock or impact when unpacking. Tools used to remove packaging materials may cause damage to the battery cabinet.
	DO NOT install the battery cabinet where water may fall on it. Water may cause electrical shock, personal injury or battery cabinet failure.
	DO NOT push or pull on the sides of the packaging or the battery cabinet to move it. Always use a crane, forklift, or pallet jack for transporting and positioning the battery cabinet. Pushing/pulling on the sides of the unit to move it may result in damage to the battery cabinet.

The battery cabinet may be packed in a crate for extra protection during transportation. Avoid impact or vibration against the battery cabinet during transportation. DO NOT expose the battery cabinet directly to water.

5 Storage/Operating Environment

5.1 Inspection/Storage

Inspection

Upon receipt of the battery cabinet, an inspection for shipping damage should be performed. Use caution when removing the unit from the pallet. Refer to labels or documentation attached to packing material.

Unpacking

Check the unit for loose, broken, bent or otherwise damaged parts. If damage has occurred during shipping, keep all original crating and packing materials for return to the shipping agent.

NOTE: The factory warranty does not apply to damage incurred during shipping!

Ensure that the rated capacity and the model number specified on the nameplate conform to the order specifications.

Storage

During periods of non-use, the following guidelines are recommended for storage.

Storage Preparation

- 1) The 440B battery cabinet should be charged for 24 hours to fully charge the batteries.
- 2) Stop the battery charger.
- 3) Place both 440B Main Circuit Breaker switches in the "OFF" position.

Storage Conditions

- For best results, store the battery cabinet in the original shipping container and place on a wood or metal pallet
- Storage temperature range: 32 to 104 °F (0 to 40 °C)
- The optimum storage temperature is 70 °F (21 °C). A higher ambient temperature will require recharging batteries more frequently during storage

Avoid the following storage locations:

- Locations that are subject to extreme temperature changes or high humidity
- Locations that are subject to high levels of dust or metal particles
- Locations that are subject to excessive vibration
- Inclined floor surfaces

5.2 Storage Environment

Observe the following when storing the battery cabinets.

- Store battery cabinet indoors.
- Temperature fluctuations should be minimized.
- The optimal storage temperature range is 68 – 77 °F (20 – 25° C).
- A maximum temperature range of 32 – 104 °F (0 – 40 °C) should be observed.
- The optimal relative humidity at the storage location should be between 50 – 60%.
- Humidity must not exceed 90%.
- Avoid locations where battery cabinet may be exposed to corrosive gas.
- Avoid locations with dirt and/or dust.

TABLE 9.1 - UPS STORAGE/OPERATING ENVIRONMENT STANDARDS

Item	Environment standard	
Storage Location	Indoors	
Ambient Temperature	Minimum storage temperature: 32 °F (0 °C)	
	Maximum storage temperature: 104 °F (40 °C)	
Relative Humidity	The relative humidity must be between 30 and 90% and without condensation due to temperature changes.	
Altitude	This equipment is rated for installations up to 3240 ft. (1000 m) above sea level. Consult with the factory to determine the derating factor for installations above 3240 ft. (1000 m).	
Dust	Dust must not exceed normal atmospheric levels and must not include conductive/corrosive particles, silicone or oils.	
Flammable Gas	No flammable and/or explosive gas.	
	Hydrogen sulfide (H ₂ S)	Less than or equal to 0.0001 PPM
	Sulfurous acid gas (SO ₂)	Less than or equal to 0.05 PPM
	Chlorine gas (Cl ₂)	Less than or equal to 0.002 PPM
	Ammonia gas (NH ₃)	Less than or equal to 0.1 PPM
	Nitrous acid gas (NO ₂)	Less than or equal to 0.02 PPM
	Nitrous oxides (NO _x)	Less than or equal to 0.02 PPM
	Ozone (O ₃)	Less than or equal to 0.002 PPM
	Hydrochloric acid mist (HCl)	Less than or equal to 0.1 mg/m ³

5.3 Operating Precautions

Initial startup/commissioning of the battery cabinet should be performed by factory authorized personnel.

- 1) The battery cabinet should not be powered up until the entire operation manual has been read. Follow Lockout/Tag Out procedures.
- 2) The voltage of the input power source must be within the rated input voltage range. The input frequency range must be within the rated input frequency range.
- 3) The battery cabinet should not be used with a load that has a rated input that is greater than the rated output of the UPS.
- 4) If using the battery cabinet to provide power to motors that require high starting current or with motors that require a long starting time, call Toshiba support for guidance in over sizing the UPS for locked-rotor current.
- 5) DO NOT insert metal objects or combustible materials in the ventilation slots of the battery cabinet.
- 6) DO NOT place, hang, or paste any objects on the exterior surfaces of the battery cabinet.
- 7) DO NOT attempt to disassemble, modify, or repair the battery cabinet. Call your Toshiba sales representative for repair information.
- 8) Turn the power on only after installing **ALL** of the covers.
- 9) DO NOT remove any covers of the battery cabinet when power is on.

- 10) If the battery cabinet should emit smoke or an unusual odor or sound, turn the power off immediately.
- 11) Additional warnings and notifications shall be posted at the equipment installation location as deemed required by **Qualified Personnel**.

6 Unpacking

6.1 General Instructions

Unpack the UPS indoors on a paved floor. The UPS should be as close as possible to its final location. Allow enough space for forklift operations to unpack the UPS from the packing crate. Then remove the crate. Properly dispose of the crate.

Points to observe:

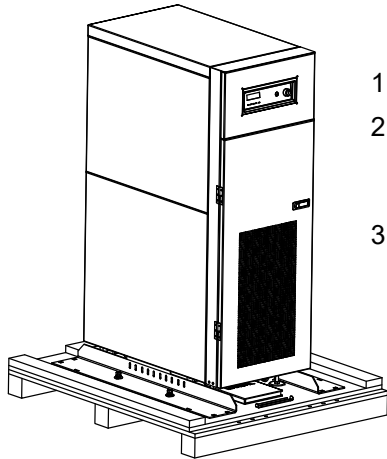
- Retain all small articles during unpacking and installation.
- Make sure that exterior paint is not scratched and that the UPS cabinet is not damaged before uncrating.
- DO NOT damage the UPS when using tools to remove packaging materials.
- If provided, DO NOT remove the protective plastic sheet cover until installation.
- Do not remove the protective fan covers over the fans until UPS start up. The fan covers should be removed by factory authorized personnel. Packing materials should be disposed by the appropriate means.
- Immediately report any abnormalities to Toshiba Customer Support Center or an authorized representative.
- Retain the packing rails for offloading the UPS from the shipping pallet, and for final UPS installation.

6.2 Unpack the 15-30kVA Model UPS (with Casters)

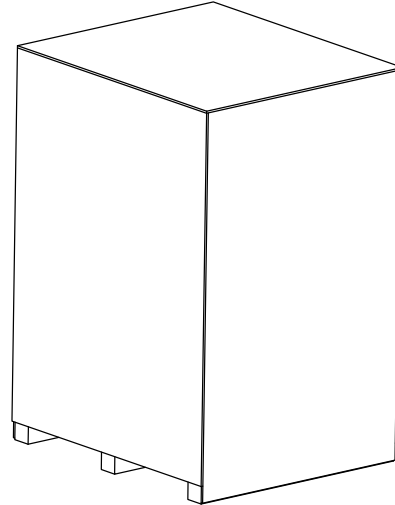
NOTE: The 4400 UPS is equipped with casters and leveling feet. It is attached to the shipping pallet by two unloading rails that double as floor anchors during final placement of the UPS.

 CAUTION	
	TOP HEAVY EQUIPMENT. THIS EQUIPMENT WILL TIP OVER EASILY UNTIL FIXED IN PLACE. Lift and move carefully, and only with adequate equipment and trained personnel. IMPROPER LIFTING CAN RESULT IN INJURY OR DEATH.

Carefully inspect the UPS for shipping damage. Units shipped within North America and NAFTA are shrink wrapped.



1. Remove shrink wrap.
2. Unbolt the rails from both the unit and the shipping pallet.
3. Place the rails on the front of the pallet.



4. Attach the rails as shown to the front of the pallet.
5. Use the four 1/2 x 3" bolts to secure the rails to the shipping pallet.
6. Place the tie brackets in the slots at the upper and lower ends of the ramps.
7. SLOWLY roll the unit down the ramp.

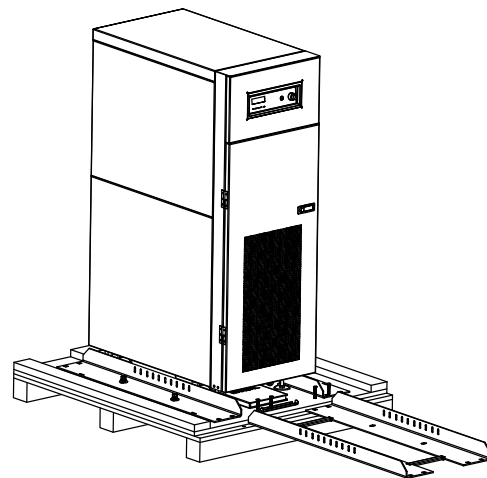


FIGURE 6.1 – UNSHIPPING 15-30KVA BATTERY CABINET

6.3 Unpack the 50-100kVA Model UPS

The 4400 50-100kVA Battery Cabinet has a C-Channel skid base. The skids are bolted to the shipping pallet to secure the UPS during shipping. Follow the directions below to unship the 50-100 kVA Battery Cabinet.

 CAUTION	
	TOP HEAVY EQUIPMENT. THIS EQUIPMENT WILL TIP OVER EASILY UNTIL FIXED IN PLACE. Lift and move carefully, and only with adequate equipment and trained personnel. IMPROPER LIFTING CAN RESULT IN INJURY OR DEATH.

Carefully inspect the UPS for shipping damage. Units shipped within North America and NAFTA are shrink wrapped.

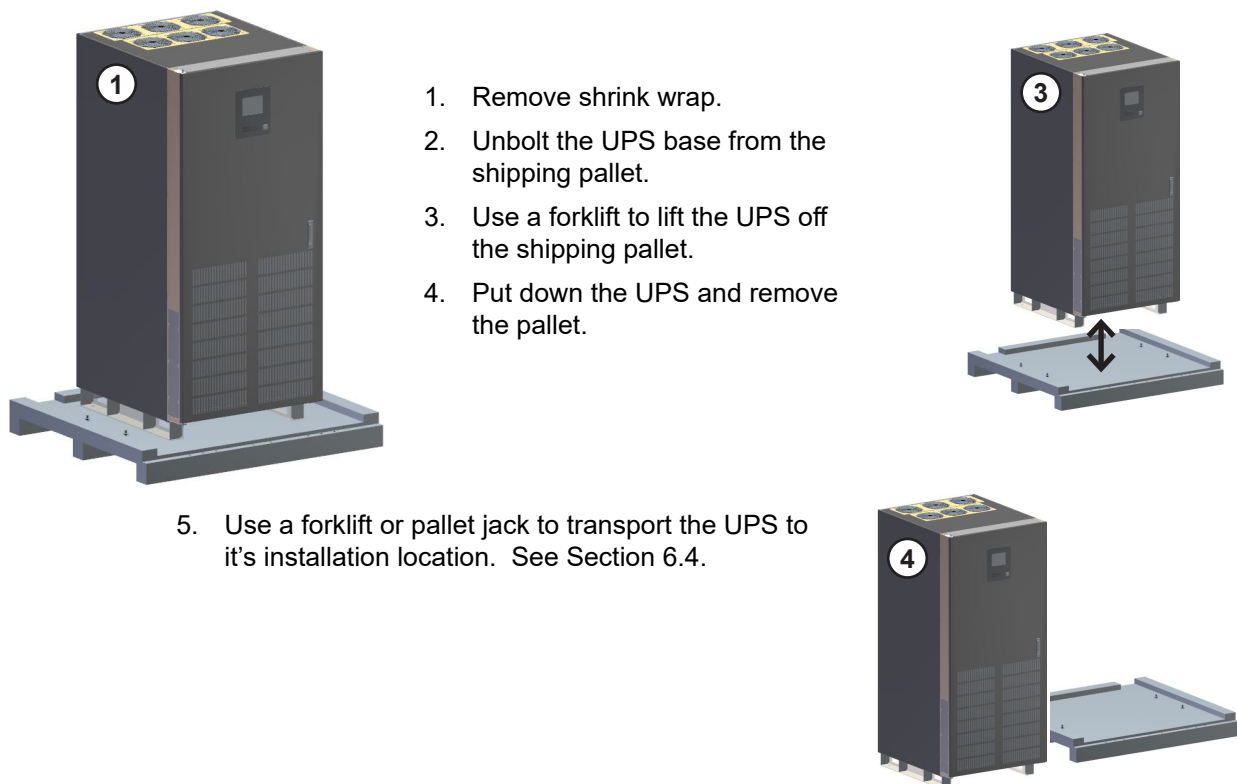


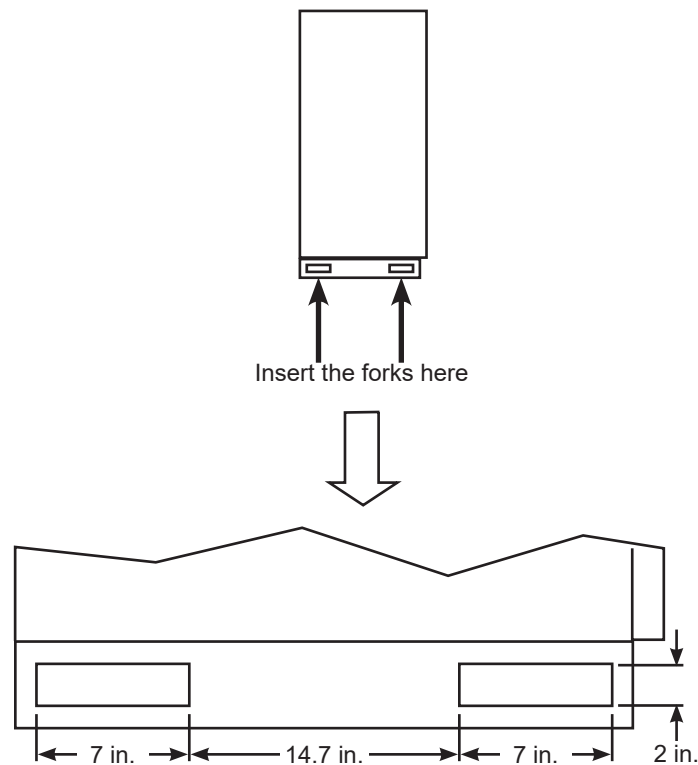
FIGURE 6.2 – UNSHIPPING 50-100KVA BATTERY CABINET

6.4 Transporting By Forklift

Refer to **Appendix A Specifications**.

Verify forklift maximum load capacity and ensure that the forks are long enough to properly support the UPS. Insert the forks into the space shown in Figure 6.3. Spaces for side fork entry are provided in the battery cabinet C-channel base.

DO NOT tilt the battery cabinet when lifting and/or transporting. Minimize the impact when lowering the battery cabinet to the floor.



440B Battery Cabinet: Side View - Fork Access Dimensions in Channel Base

FIGURE 6.3 - TRANSPORTING BY FORKLIFT

7 Installation

7.1 Installation Precautions

 CAUTION	
	Install the battery cabinet in a controlled environment. Improper storage and installation environment may deteriorate insulation, shorten component life and cause malfunctions. <i>See Table 5.1 - UPS Installation Environment Standards</i>
	DO NOT tilt the battery cabinet more than 10° from upright position. Tilting the battery cabinet more than 10° may cause crushing, trapping or other personal injuries and cause physical damage to internal components.
 WARNING	
	Keep the SPECIFIED CLEARANCE around the UPS. Inadequate space around the UPS makes it difficult to perform maintenance/inspections, will lead to insufficient ventilation, and/or cause malfunctions.
	Install anchor bolts to secure the UPS to the installation floor. The UPS may fall during an earthquake if the anchor bolts are not installed and secured.
	Only factory authorized personnel should relocate, modify, or replace parts in the battery cabinet after initial installation. Electrical shock, injury or battery cabinet failure may occur if non-authorized technicians attempt to modify or relocate the UPS. Please contact Toshiba Customer Support Center if you plan to move or make modifications to the UPS

7.2 Battery Cabinet Clearance

Maintain the indicated clearance during installation. See Figure 7.1. Ensure that the front and top air vents are NOT blocked.

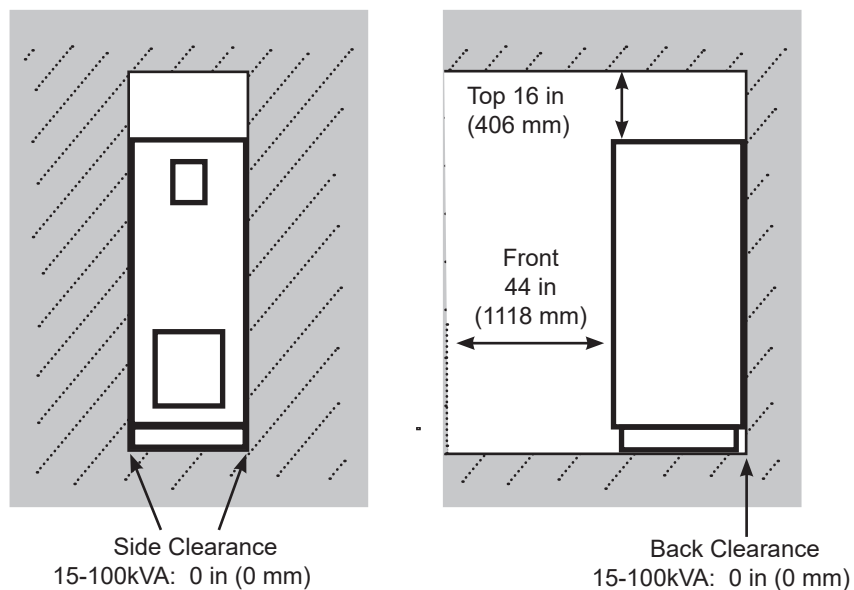


FIGURE 7.1 CLEARANCE FOR BATTERY CABINET USING LEVELING FEET

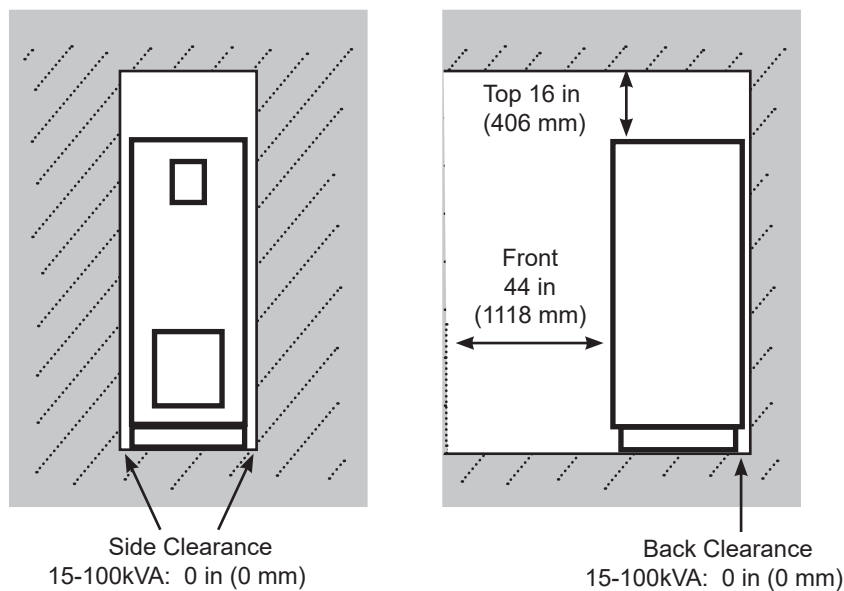


FIGURE 7.2 CLEARANCE FOR SEISMIC INSTALLATIONS

7.3 UPS Anchorage - Standard and Seismic

The 15-30kVA battery cabinet battery cabinet comes with casters and leveling feet. The 50-100kVA battery cabinet comes with Angle Bracket skids.

The leveling feet allow the 15-30kVA battery cabinets to be rolled into place, then the leveling feet extended to remove weight from the casters to ensure the battery cabinet remains stationary.

The 50-100kVA battery cabinets can be bolted directly to the floor via the Angle Bracket skids on the base.

Seismic Installations

For additional stability, an optional Seismic Kit is available for each cabinet model (P/N 440300SEISMICKIT for the 15-30kVA, P/N 440500SEISMICKIT for the 50kVA, P/N 440800SEISMICKIT for the 80/100kVA). This kit enables the UPS system to conform to the OSHPD seismic certification requirements. See the [4400 Seismic Kit Installation Instructions](#), P/N 94016, for details.

Anchorage Bolts

Install the anchor bolts to secure the UPS on the floor. See Figure 7.3 for anchor bolt installation detail.

Use 5/8" (16 mm) diameter anchor bolts. There are 0.7" (17.9 mm) diameter holes provided in the UPS base. See Figure 7.3 and 7.5 for the hole locations and dimensions.

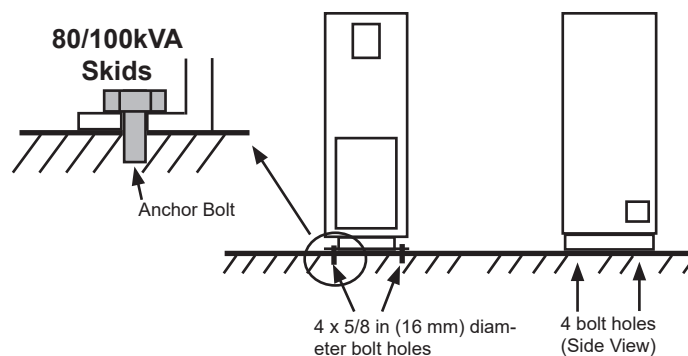


FIGURE 7.3 50-100KVA BC ANCHOR BOLT INSTALLATION DETAIL

7.4 15-30kVA Battery Cabinet Anchorage - Standard

Place the UPS in the final installation location.

Extend the threaded leveling feet until all weight has been removed from the casters and the UPS is level.

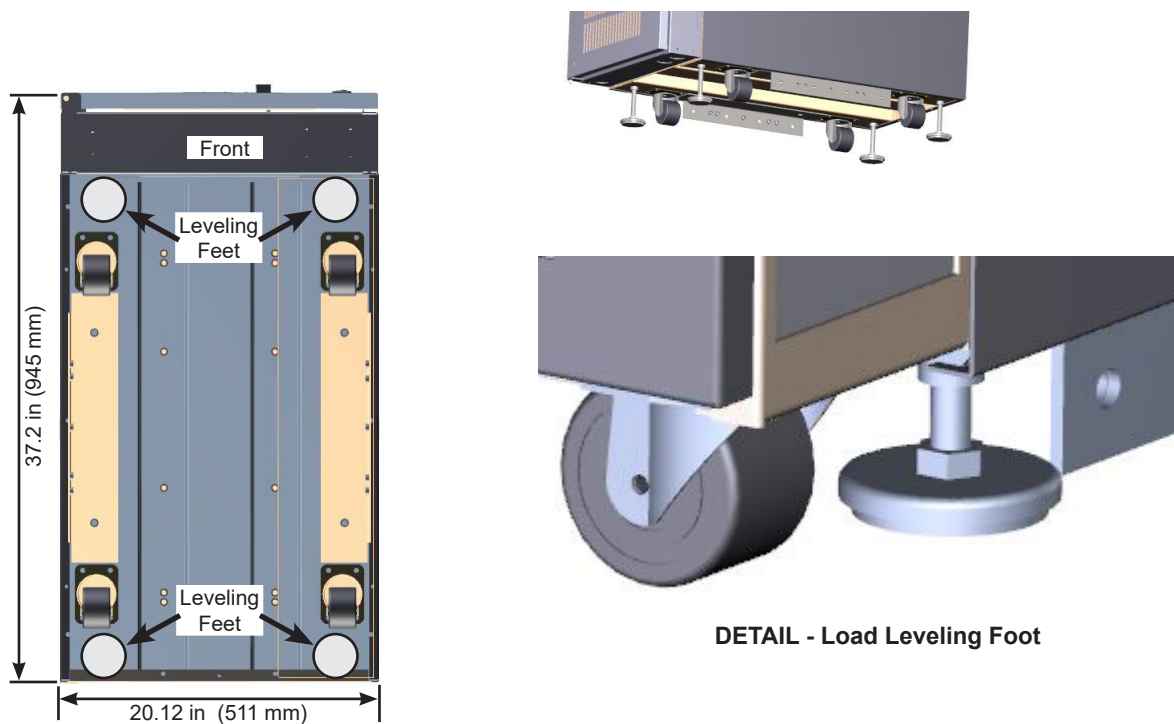


FIGURE 7.4 – FOOTPRINT FOR 15-30 KVA BATTERY CABINET USING LOAD LEVELING FEET

7.5 50-100kVA Battery Cabinet Anchorage - Standard

Install the anchor bolts per Section 7.3 in the pattern shown in Figure 7.5.

Secure the UPS Angle Bracket skids to the floor with the anchor bolts..

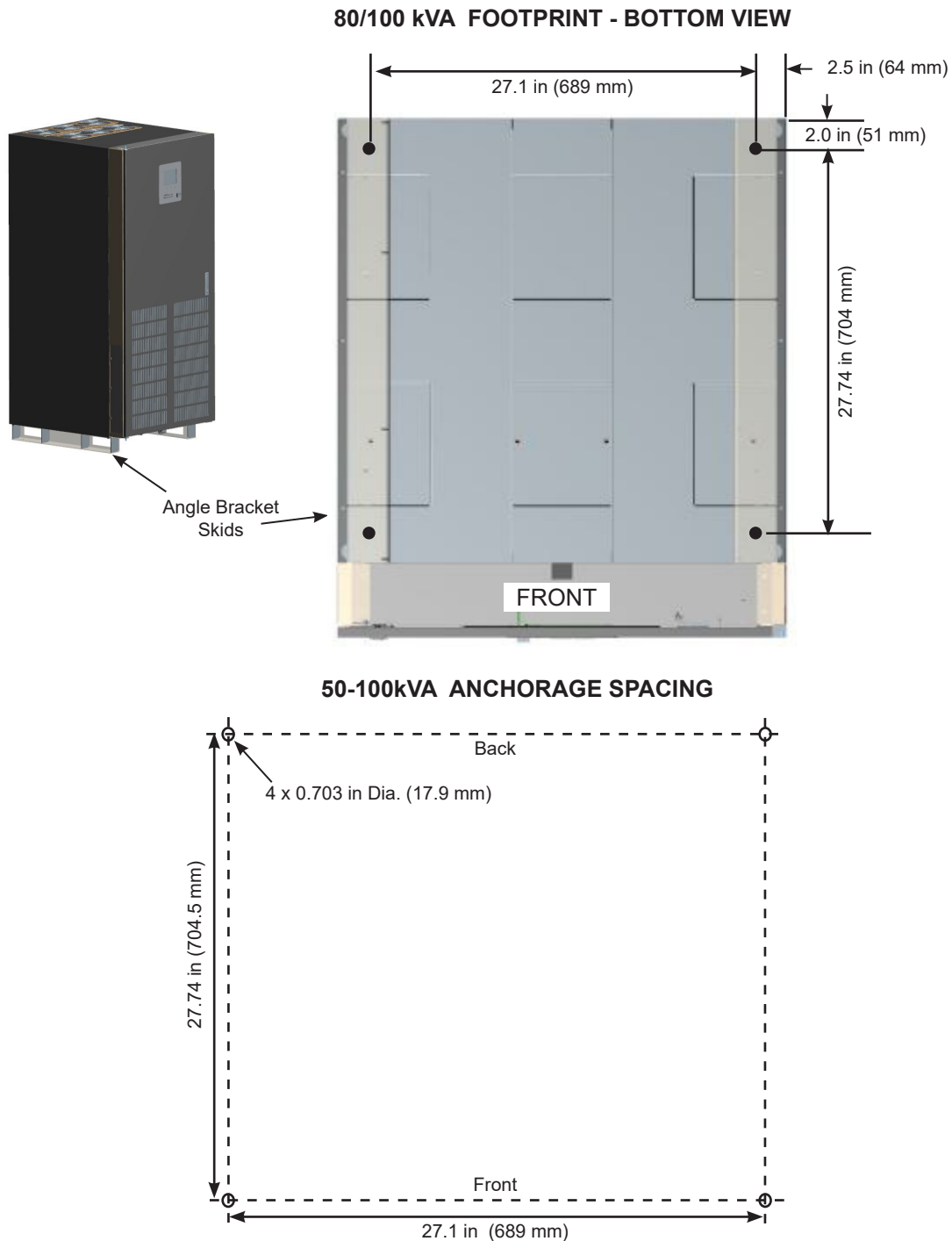


FIGURE 7.5 ANCHORAGE HOLE LOCATIONS – 50-100KVA BATTERY CABINET

8 Battery Cabinet Layout

8.1 Warning Labels

The battery cabinet warning labels are shown below.

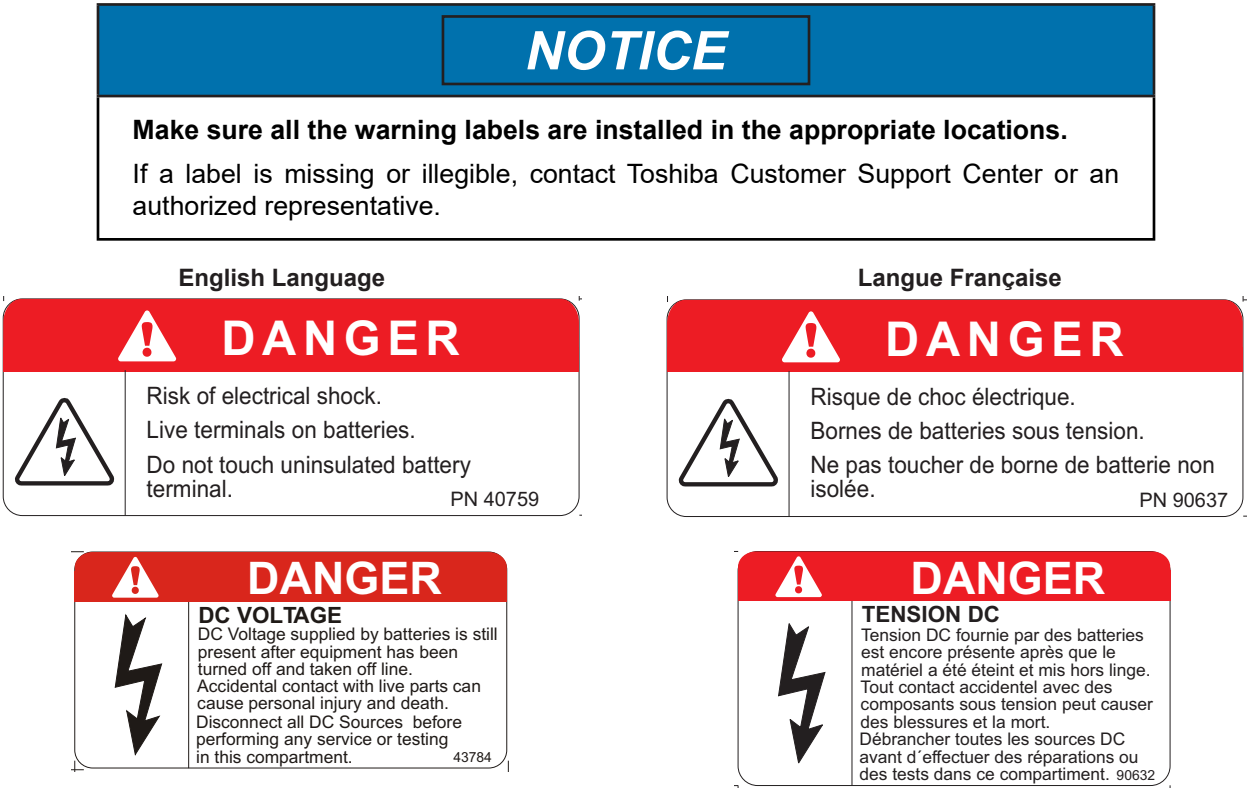


FIGURE 7.1 WARNING LABELS

English Language

DANGER

HAZARDOUS VOLTAGES
Hazardous voltages are used in the operation of this equipment and could cause severe personal injury or loss of life.
The following precautions should be observed to reduce the risk of injury or death.

Only qualified technicians familiar with this equipment and the information supplied with it should be permitted to install and operate this equipment.

Installation of electrical equipment must be done in accordance with National Electrical Code and any other state or local codes. Proper grounding and conductor sizing must be installed for safe operation.

During operation, keep all covers in place and cabinet doors shut.

When performing visual inspections and maintenance, if possible, be sure the UPS is turned off and the incoming AC feed is turned off and locked out.

The UPS and Battery Cabinet will have hazardous voltages present even after the AC feed is turned off.

If it is necessary to make measurements with the power on, do not touch any electrical connection points. Remove all jewelry from wrists and fingers. Make sure test equipment is in good, safe operating condition.

While servicing, stand on some type of insulation, and be sure not to be grounded.

Follow the safety instructions given in the equipment manual carefully and observe all danger, warning and caution notices.

40308

Langue Française

DANGER

TENSIONS DANGEREUSES
Des tensions dangereuses sont utilisées dans l'opération de cet appareil et pourraient causer des blessures graves ou des pertes de vie.
Les mesures de sécurité suivantes doivent être observées pour réduire le risque de blessure ou de mort.

Seulement des techniciens qualifiés et familiarisés avec ce matériel, ainsi que la documentation fournie avec elle, devraient être autorisés à installer et à utiliser cet équipement.

L'installation de l'équipement électrique doit être effectuée selon les normes électriques reconnues par les organismes nationaux ou provinciaux accrédités. Une bonne mise à la terre et un calibre de câble approprié doivent être installés pour un fonctionnement sécuritaire.

Pendant le fonctionnement, maintenir tous les couvercles en place et les portes de l'armoire fermées.

Lors des inspections visuelles et d'entretien, si possible, vérifier que l'UPS soit éteinte et que l'alimentation AC est éteinte et verrouillée.

L'UPS et l'armoire de batterie auront des tensions dangereuses présentes même après avoir coupé l'alimentation AC.

Si des mesures sur l'appareil sous tension doivent être effectuées, ne toucher à aucun point de connexion électrique. Retirer tous les bijoux des poignets et des doigts. S'assurer que l'équipement de test est en bon état de fonctionnement.

Lors des opérations de maintenance, l'opérateur doit se tenir sur une surface isolée non reliée à la mise à la terre.

Suivre attentivement les consignes de sécurité indiquées dans le manuel d'opération et respecter tous les avis de danger, les avertissements et les mises en garde.

90638

WARNING - Risk of electric shock

DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL. HAZARDOUS LIVE PARTS INSIDE THIS UPS ARE ENERGIZED FROM THE BATTERY SUPPLY EVEN WHEN THE INPUT AC POWER IS DISCONNECTED.

CAPACITORS STORE HAZARDOUS ENERGY. DO NOT REMOVE COVER UNTIL 5 MINUTES AFTER DISCONNECTING ALL SOURCES OF SUPPLY.

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, INSTALL IN A TEMPERATURE AND HUMIDITY CONTROLLED INDOOR AREA FREE OF CONDUCTIVE CONTAMINANTS.

AVERTISSEMENT

EN CAS D'UTILISATION EN ATMOSPHERE CONTROLEE. CONSULTER LA NOTICE TECHNIQUE.

BATTERY BACK-UP TIME, WHICH WAS FACTORY-SET AT A PREDETERMINED LEVEL, DECREASES GRADUALLY BETWEEN SERVICE PERIODS. THE BATTERIES SHOULD BE REPLACED EVERY THREE YEARS AFTER THE LAST SERVICING, THE DATE OF WHICH IS WRITTEN ON THE ID PLATE LOCATED ON THE REAR SIDE OF THE UPS UNIT, OR IN THE BOX BELOW.

DATE OF LAST BATTERY CHARGE:

PN 41750

FIGURE 8.1 (CONT.) WARNING LABELS

Label P/N 69883

English	Español	Française
DANGER HIGH VOLTAGE	PELIGRO ALTO VOLTAJE	DANGER HAUTE TENSION
CAUTION RISK OF ELECTRIC SHOCK DO NOT TOUCH UNINSULATED BATTERY TERMINAL	ATENCION RIESGO DE DESCARGA ELÉCTRICA NO TOQUE TERMINAL SIN AISLAMIENTO DE LA BATERIA	CAUTION RISQUE DÉCHARGE ÉLECTRIQUE NE TOUCHEZ PAS LES RACCORDEMENTS DE BATTERIE AVEC AUCUNE ISOLATION
Battery Type Battery Weight Date Battery Terminal Torque Spec FT/LB	USE COPPER 75° C min. CONDUCTORS ONLY! REFER TO INSTRUCTION MANUAL FOR WIRE SIZE AND TIGHTENING TORQUE	
WARNING TURN OFF CABINET MCCB PRIOR TO SERVICING BATTERIES		

Label P/N 49455

WARNING		WARNING
	This unit contains sealed lead acid batteries. Lack of preventative maintenance could result in batteries exploding and emitting gasses and/or flame. Annual preventative maintenance must be performed by an authorized, trained technician.	CRITICAL FUSE SIZING Incorrect fuse replacement size may result in fire or inadequate equipment protection. Replace only with same type and rating of fuse.

FIGURE 8.1 (CONT.) WARNING LABELS

8.2 Battery Cabinet Layout

No.	Part
1	TB2 - Control wiring
2	MCCB - Battery Cabinet Breaker
3	Ground Bus
+	MCCB Positive Lug, Battery Cabinet DC Out
-	MCCB Negative Lug, Battery Cabinet DC Out
4	Anderson Connectors for Battery String Disconnect (1 set per shelf)
5	Battery Retention Strap
6	Batteries
7	Side access panels in expansion band
8	Bottom conduit landing plate in expansion band
9	Top conduit landing plate in expansion band.

(All cabinets are O'Brien Black (Textured))

NOTE: BC shown with dead-front and door removed.

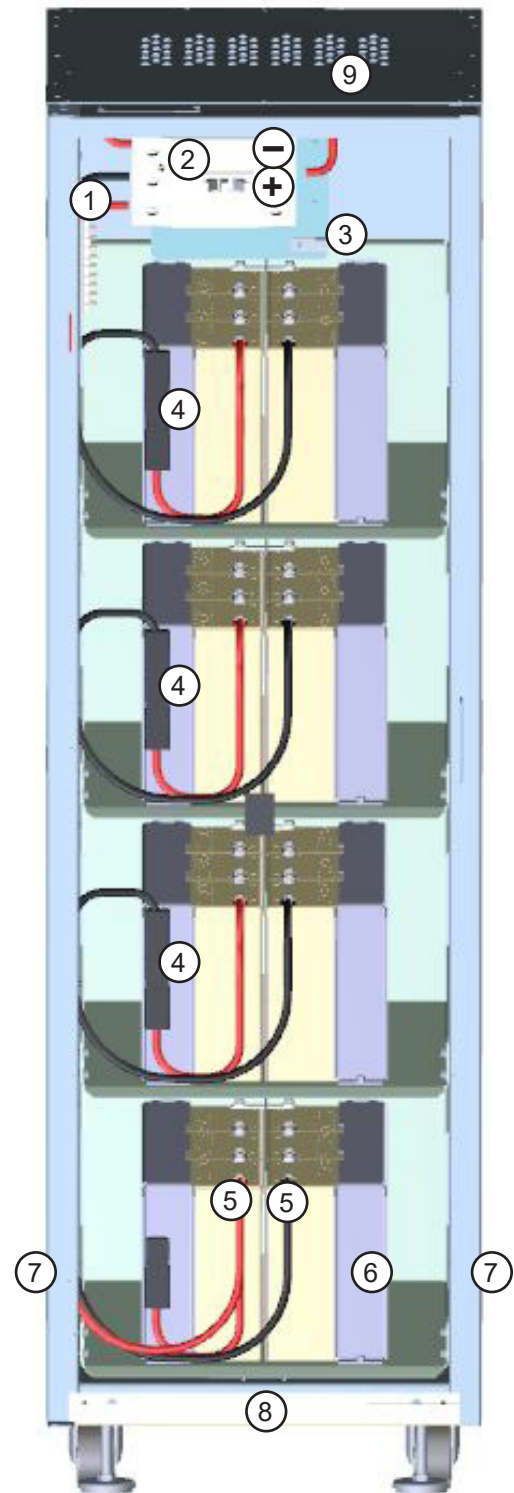


FIGURE 8.2 BATTERY CABINET LAYOUT - 15-30KVA

No.	Part
1	TB2 - Control wiring
2	MCCB - Battery Cabinet Breaker
3	Ground Bus
+	To MCCB Positive Lug Battery Cabinet DC Out
-	To MCCB Negative Lug, Battery Cabinet DC Out
4	Anderson Connectors for Battery String Discon- nect (1 set per shelf)
5	Battery Retention Strap
6	Batteries
7	Side access panels in expansion band
8	Bottom conduit landing plate in expansion band
9	Top conduit landing plate in expansion band.

(All cabinets are O'Brien Black (Textured))

NOTE: BC shown with dead-front and door removed.



FIGURE 8.3 BATTERY CABINET LAYOUT - 50-100KVA

9 Battery Cabinet Wiring

9.1 Battery Cabinet Wiring Locations

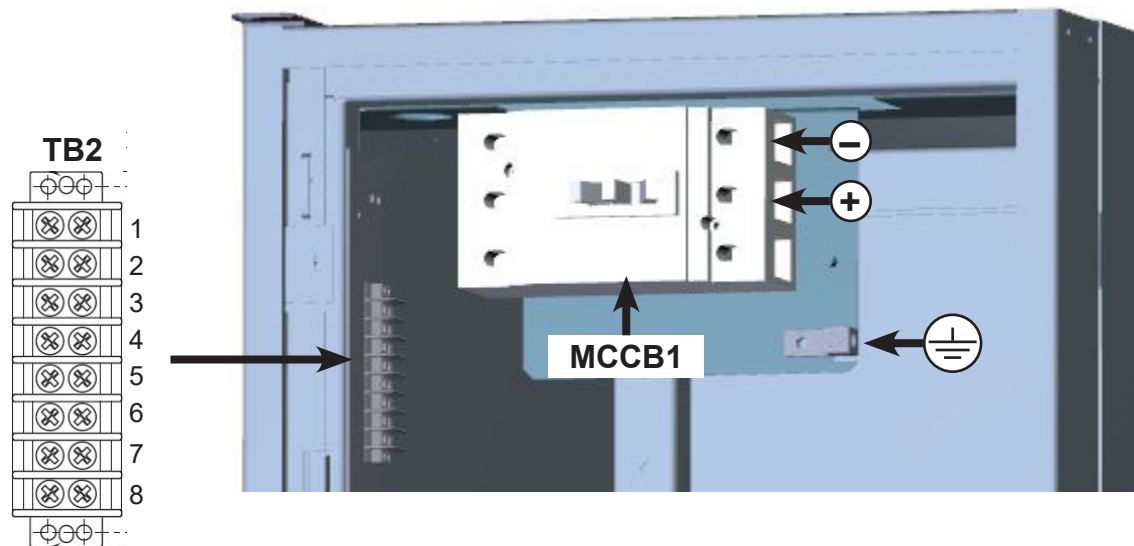


FIGURE 9.1 CABLING CONNECTIONS - 15-30KVA BATTERY CABINET



FIGURE 9.2 CABLING CONNECTIONS - 50-100KVA BATTERY CABINET

9.2 Battery Cabinet to UPS Wiring

Figure 9.3 shows the cabling connections between the 4400 Battery cabinet and the corresponding 4400 Series UPS.

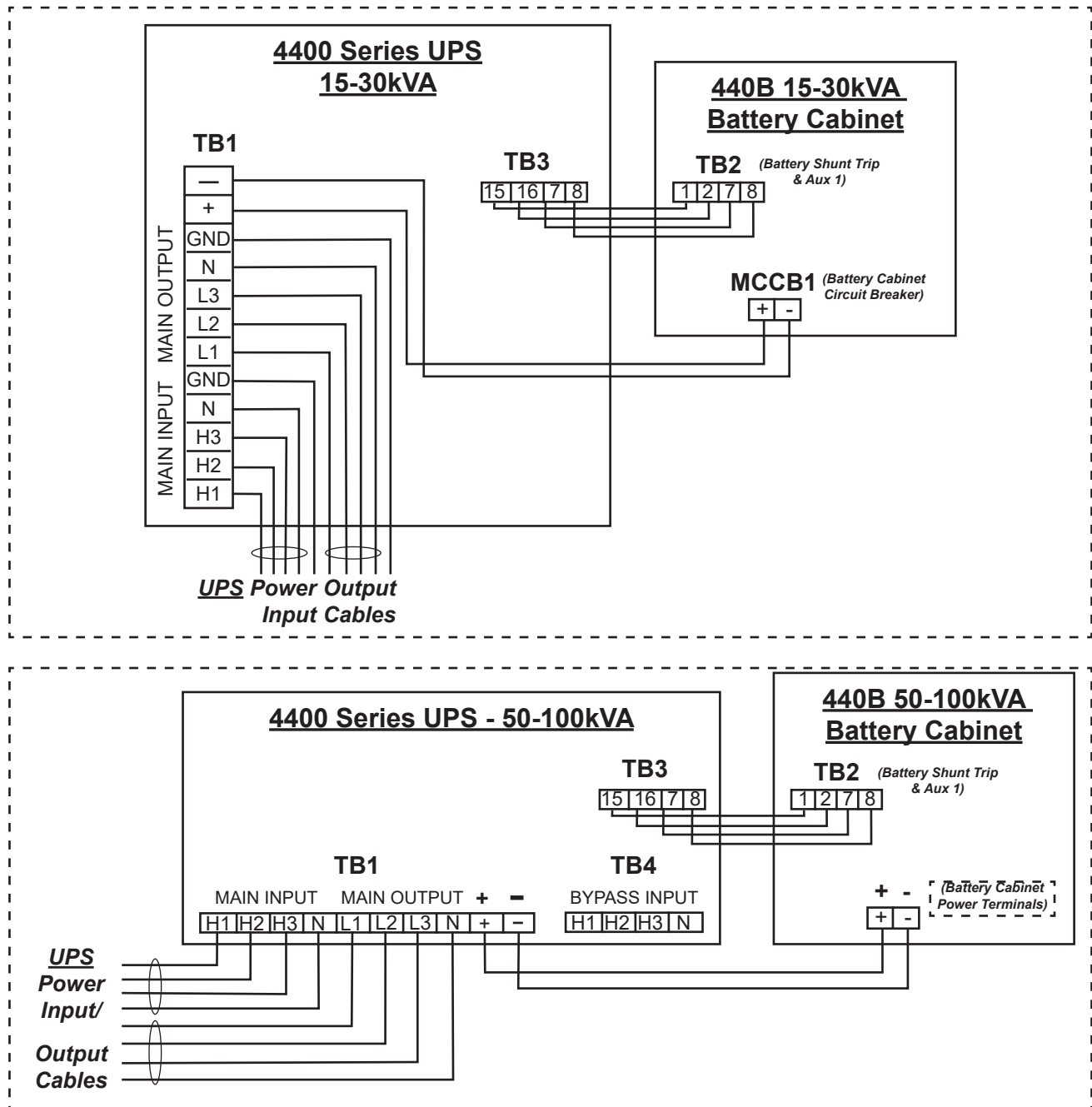


FIGURE 9.3 440B DC AND CONTROL CABLE CONNECTIONS TO 4400 SERIES UPS

9.3 INSTALLATION SAFETY INSTRUCTION

 DANGER 	
	HAZARDOUS VOLTAGES MAY EXIST. • Verify all power is removed from the UPS and power cables prior connecting the power cables to the Battery Cabinet and UPS terminals. • Verify the Battery Cabinet MCCB is OPEN and there is no voltage on the + / – output terminals before connecting the power cables between the UPS and Battery Cabinet.

The Toshiba Battery Cabinet (440B) comes with a single circuit breaker across a single string of twenty-four (24) 12V VRLA Batteries, delivering a nominal 288VDC. The 6 batteries on each shelf are connected in series, and each shelf is connected to the next with Anderson Connectors. The Battery Cabinet ships with these connectors disconnected.

 CAUTION	
	• Connect the power cables between the UPS and the Battery Cabinet MCCB1/ Terminals before connecting the inter-shelf Anderson Connectors. • Verify the correct Proper polarity of Battery Cabinet at the across the input of MCCB1 before energizing the UPS System.

Connect the power cables between the UPS and the Battery Cabinet MCCB before connecting the inter-shelf Anderson Connectors (Figure 9.3).

When connecting more than two Toshiba 440B Battery Cabinets in parallel to the 4400 Series UPS, reference the 4400 Series Battery Cabinet parallel Adapter Kit Installation Guide Doc # 94682.

9.4 CABLE REQUIREMENTS

Select the proper cable size per Table 9.1 and 9.2.

TABLE 9.1 - 440B TO TB1 DC POWER CABLE SIZES

(Cable sizes for 75°C Copper Cable)

Recommended Wire size and Torque Requirement						
UPS Rating	Max. DC Current	Batt Cab MCCB	Lug Capacity	Recommended Cable Size	Cable Strip Back	Tightening Torque
15kVA	64 Adc	150 A	#8 AWG – 3/0	#2 AWG	0.65 in (16 mm)	120 lb-in (14 N•M)
20kVA	85 Adc	150 A	#8 AWG – 3/0	#2 AWG	0.65 in (16 mm)	120 lb-in (14 N•M)
25kVA	107 Adc	150 A	#8 AWG – 3/0	#2 AWG	0.65 in (16 mm)	120 lb-in (14 N•M)
30kVA	128 Adc	150 A	#8 AWG – 3/0	#2 AWG	0.65 in (16 mm)	120 lb-in (14 N•M)
50kVA	215 Adc	250 A	(2x) #2 – 600 kcmil	250 kcmil	1.3 in, (33 mm)	500 lb-in (56 N•M)
80kVA	344 Adc	350 A	(2x) #2 – 600 kcmil	600 kcmil – 2 x 250 kcmil	1.3 in, (33 mm)	500 lb-in (56 N•M)
100kVA	430 Adc	400 A	(2x) #2 – 600 kcmil	2x 350 kcmil	1.3 in, (33 mm)	500 lb-in (56 N•M)

TABLE 9.2 - 440B TB2 CONTROL WIRE SIZE

Battery Cab	Lug Cable Capacity	Screw	Lug Torque
All	22 - 12 AWG	#6	9 lb-in (1.01 N•M)

10 External Layouts/Dimensions

10.1 Dimensional Data

Table 10.1 - External Dimensions

EXTERNAL DIMENSIONS			
Unit	Width	Depth	Height
440B 15-30kVA	20.12 in. (511 mm)	37.4 in. (950 mm)	65.06 in. (1653 mm)
440B 50-100kVA	32.1 in. (816 mm)	37.2 in. (944 mm)	73.6 in. (1868 mm)

10.2 Electrical Conduit Landing Plate Data

Table 10.2 - Conduit Access Ports

CABLE ACCESS OPENING SIZES IN 440B			
	Left/Right Side	Top	Bottom
440B 15-30kVA	2.6 in. x 14.1 in. (67 mm x 359 mm)	L Side - 1" x 3" Conduit landing plate. R Side - 3.5 in.	L Side: 1" Trade-size Knock Out R Side: 2 x 1.25" Knock-outs
440B 50-100kVA	3.85 in. x 21.13 in. (98 mm x 536 mm)	4.4 in. x 27.7 in. (111 mm x 703 mm)	4.4 in. x 27.7 in. (111 mm x 703 mm)

Run the power cabling in a separate conduit from the control wiring.

The 440B 15-30kVA Battery cabinet has pre configured knockouts on the bottom of the expansion band: the smaller single knockout is for the instrumentation cabling conduit, and the two larger knockouts on the right side are for the power cabling conduits.

If running top-entry cabling to the 440B 15-30kVA Battery Cabinet the small conduit landing plate on the left should be used for instrumentation, and drill the power cables conduit holes on the right side of the top expansion band.

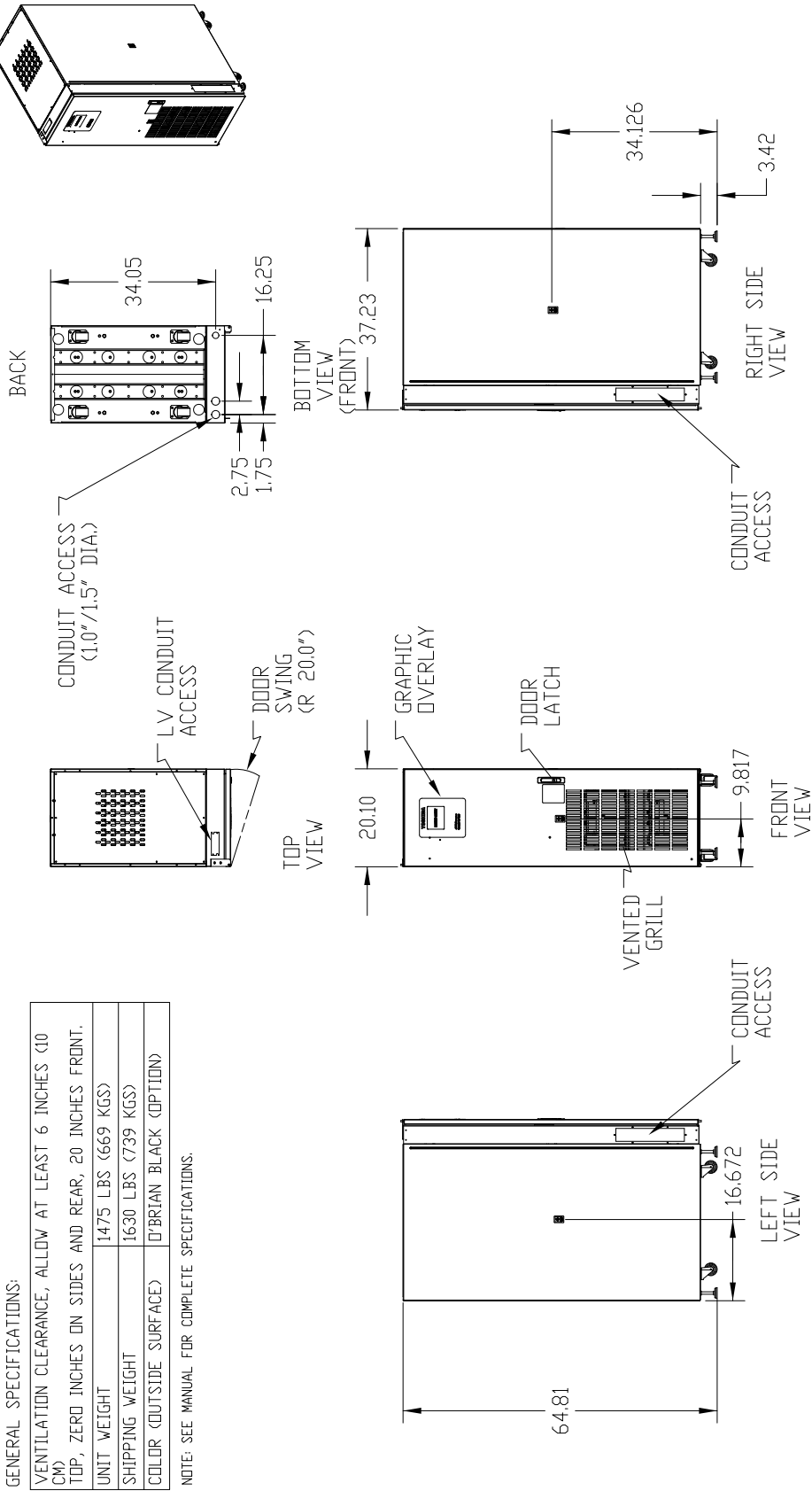
Appendix A Specifications

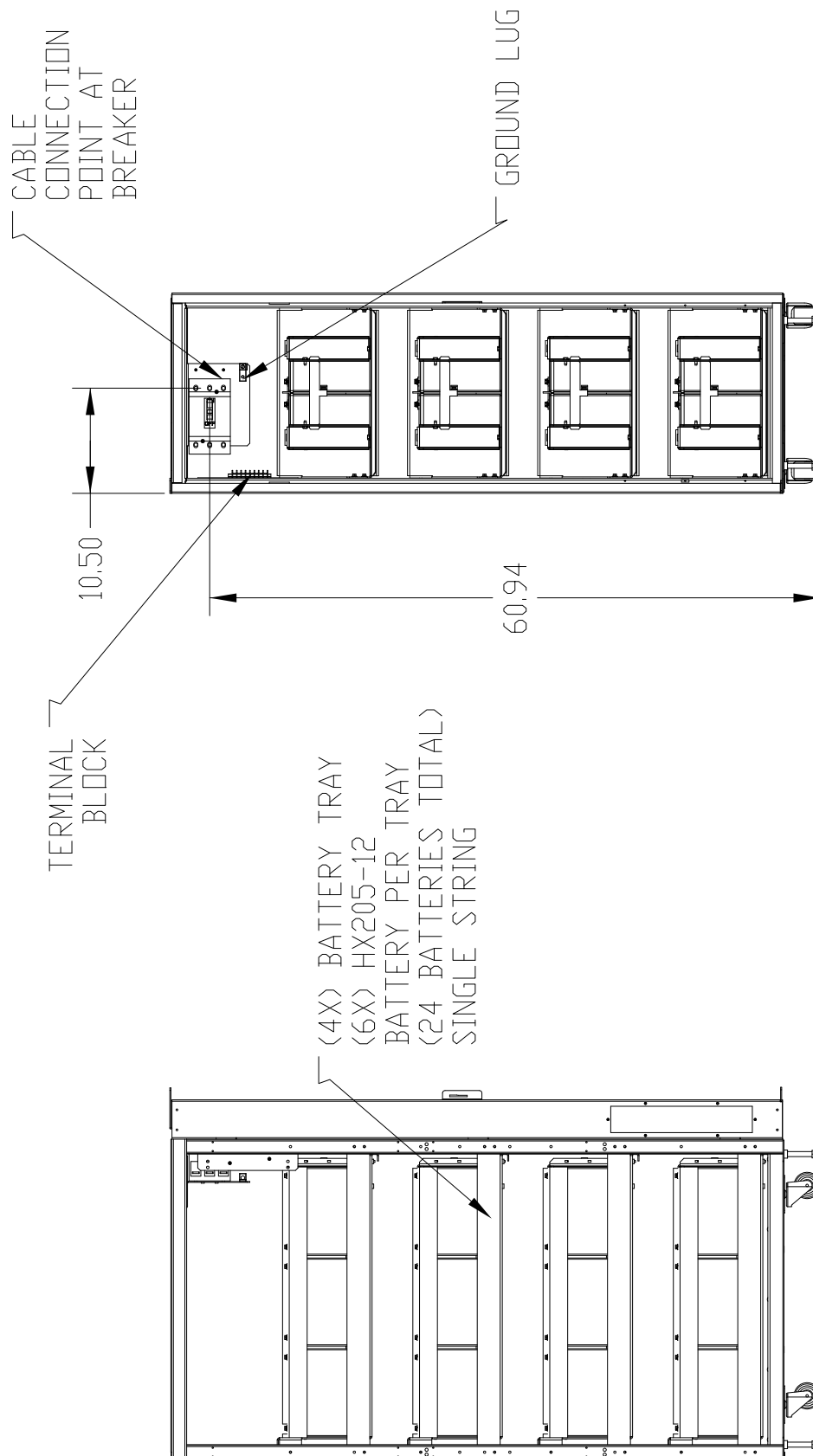
440B SPECIFICATIONS		
	440B 15-30kVA	440B 50-100kVA
ELECTRICAL		
Nominal Voltage/String	288 VDC	
No. of Strings/Cabinet	1 String per Cabinet	
No of Batteries/String	24 Batteries per String	
Battery Type	Energys HX205 12 V, 43 Ah	Energys HX400 12 V, 94 Ah
Circuit Breaker	4400 15kVA: 150 A 4400 20kVA: 150 A 4400 25kVA: 150 A 4400 30kVA: 150 A	4400 50kVA: 250 A 4400 80kVA: 400 A 4400 100kVA: 400 A
MCCB Trip Mode	Shunt Trip	
Aux 1 Switch	Aux 1 (A) wired to TB2 (Aux 1 open when MCCB open)	
MECHANICAL		
Dimensions WxDxH (in./mm)	20.12 in. x 37.4 in. x 65.06 in. (511 mm x 950 mm x 1653 mm)	32.1 in. x 37.2 in. x 73.6 in. (816 mm x 944 mm x 1869 mm)
Weight	15-30kVA: 1475 lbs. (669 kg)*	50kVA: 2440 lbs. (1107 kg) 80kVA: 2470 lbs. (1120 kg) 100kVA: 2470 lbs. (1120 kg)
Shipping Weight	15-30kVA: 1630 lbs. (739 kg)*	50kVA: 2600 lbs. (1179 kg) 80kVA: 2630 lbs. (1193 kg) 100kVA: 2630 lbs. (1193 kg)
Color	Powder Coat, Dupont O'Brien Black	
ENVIRONMENTAL		
Operating Temperature	77 °F – 86 °F (25 °C – 30 °C)	
Storage Temperature	32 °F – 86 °F (0 °C – 30 °C) (Storage at temperatures above recommended values will require more frequent freshening recharges)	

* Estimated weight

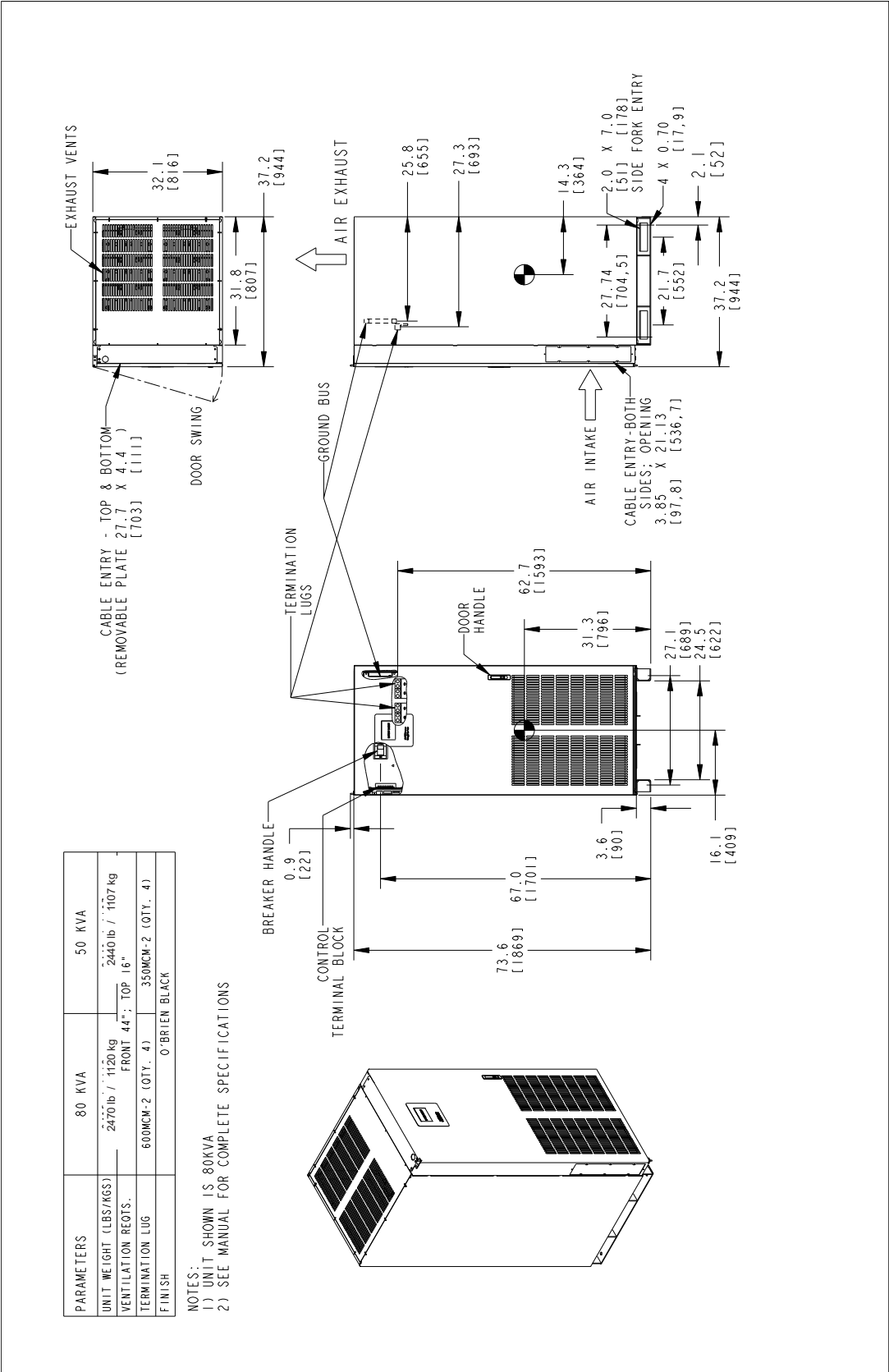
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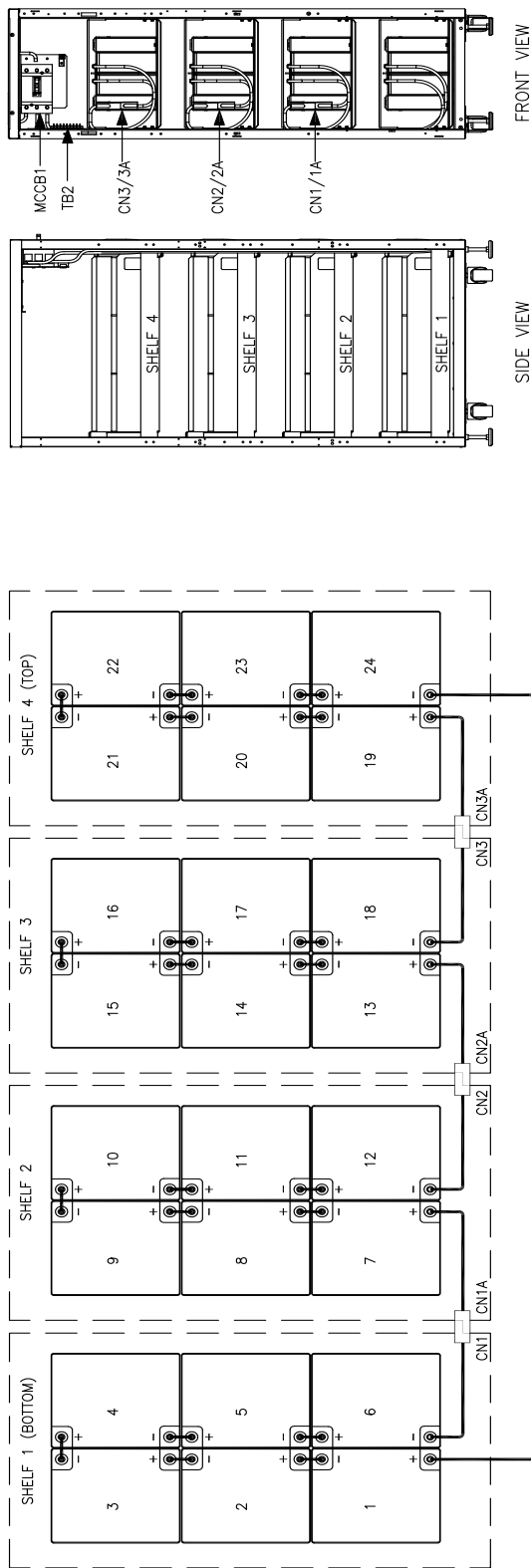
Appendix B Battery Cabinet Drawings





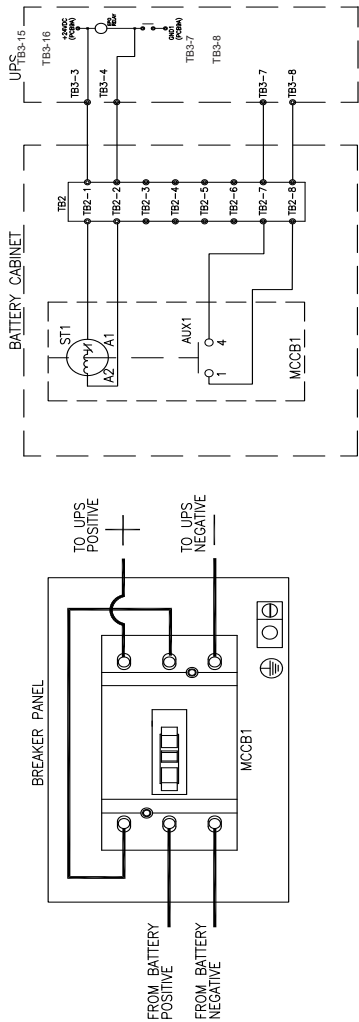
VIEW WITHOUT SKINS



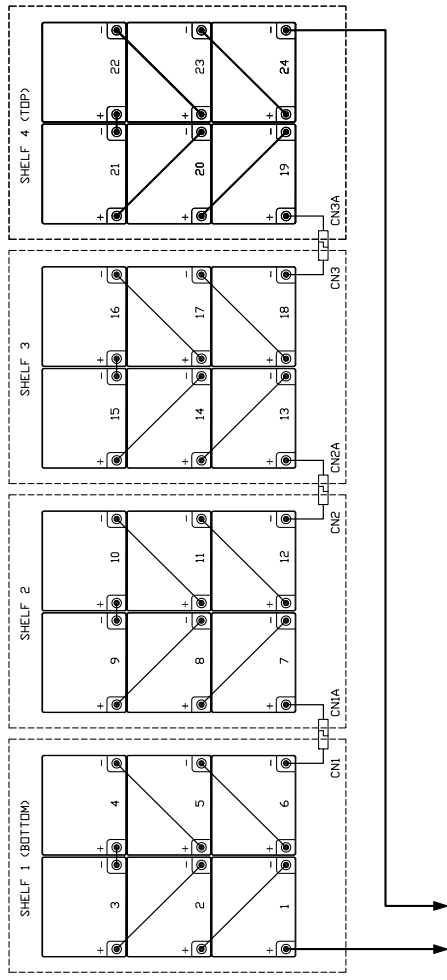
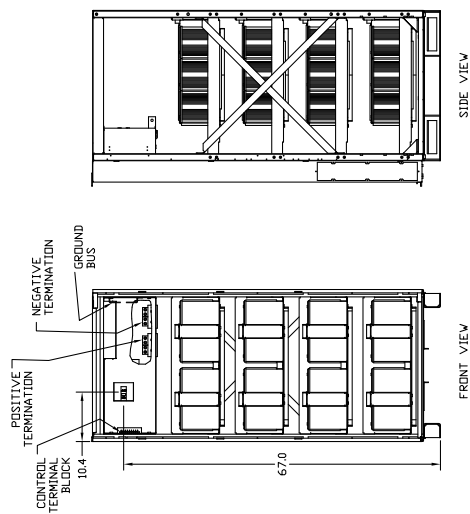


ELECTRICAL NOTES:

- 1) ALL INTERNAL WIRING IS UL LISTED, 105C, MTW STYLE, FLEXIBLE CABLE.
- 2) CABINET IS SHIPPED WITH THE BREAKER IN THE OFF/OPEN POSITION.
- 3) CABINET IS SHIPPED WITH THE STRING CONNECTORS DISCONNECTED TO BREAK STRING VOLTAGE FOR ADDED SAFETY IN SHIPPING.
- 4) ALL POWER FOR CONTROL WIRING IS FROM OUTSIDE SOURCE.
- 5) GROUND LUG CONDUCTOR RANGE IS 1/0 – 14 AWG.
- 6) REFER TO MANUAL OR BATTERY LABEL FOR TORQUE SPECIFICATIONS.
- 7) MAKE SURE MCB1 IS OFF BEFORE SERVICING BATTERIES.



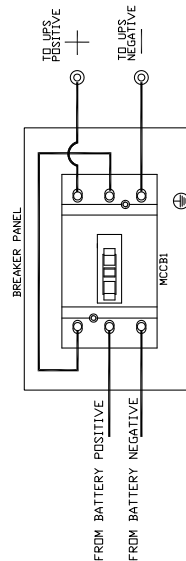
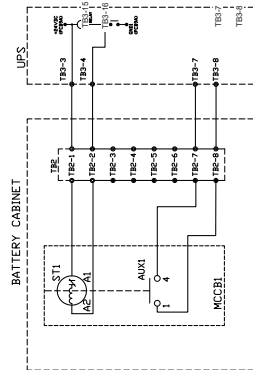
BATTERY CABINET ELECTRICAL PARTS LIST			
COMPONENT	RATING	DESCRIPTION	QUANTITY
BATTI-24	12VDC, 50Ah	BATTERY	24
MCB1	500VDC, 150A	BREAKER	1
ST1	24VDC	SHUNT TRIP (INSIDE BREAKER)	1
AUX1	600VAC, 6A	AUX SWITCH (INSIDE BREAKER)	1

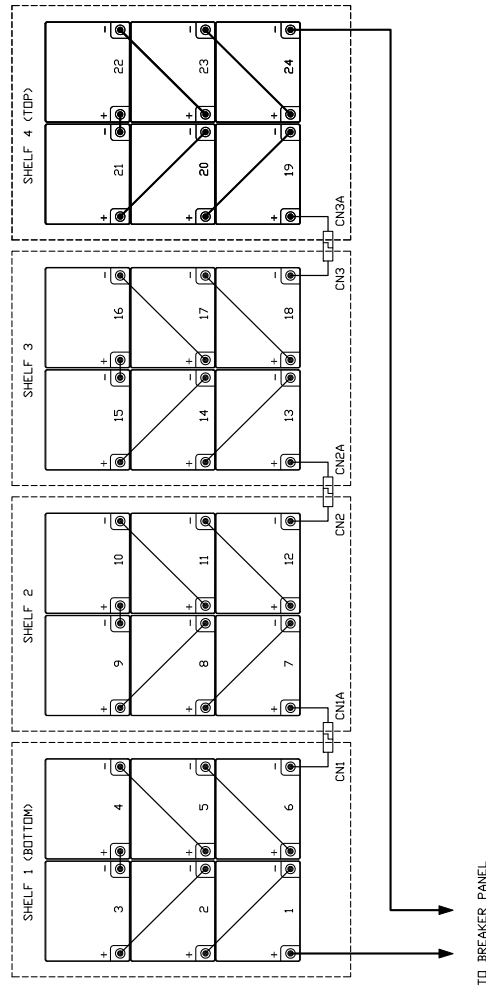
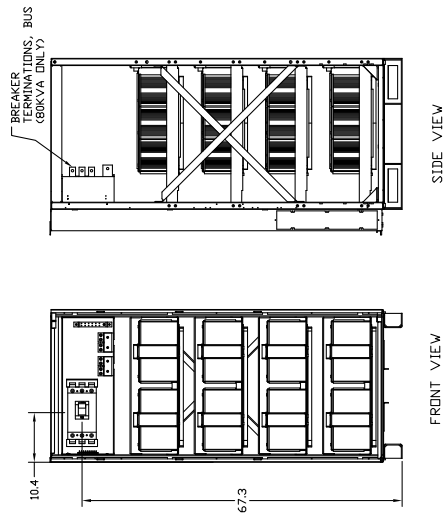


ELECTRICAL NOTES:

- 1) CABINET IS SHIPPED WITH THE BREAKER IN THE OFF/OPEN POSITION.
- 2) CABINET IS SHIPPED WITH THE STRING CONNECTORS DISCONNECTED TO BREAK STRING VOLTAGE FOR ADDED SAFETY IN SHIPPING.
- 3) ALL POWER FOR CONTROL WIRING IS FROM OUTSIDE SOURCE.
- 4) GROUND LUG CONDUCTOR RANGE IS 1/0 - 14 AWG.
- 5) REFER TO MANUAL OR BATTERY LABEL FOR TORQUE SPECIFICATIONS.
- 6) MAKE SURE MCCB1 IS OFF BEFORE SERVICING BATTERIES.

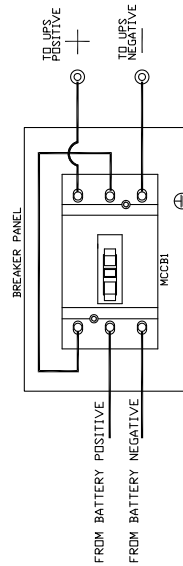
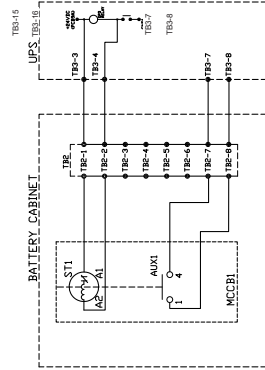
BATTERY CABINET ELECTRICAL PARTS LIST			
COMPONENT	RATING	DESCRIPTION	QUANTITY
BATTI-24	12VDC, 85Ah	BATTERY	24
MCCB1	500VDC 250A	BREAKER	1
ST1	24VDC	SHUNT TRIP (INSIDE BREAKER)	1
AUX1	600VAC, 6A	AUX SWITCH (INSIDE BREAKER)	1





- ELECTRICAL NOTES:**
- 1) CABINET IS SHIPPED WITH THE BREAKER IN THE OFF/OPEN POSITION.
 - 2) CABINET IS SHIPPED WITH THE STRING CONNECTORS DISCONNECTED TO BREAK STRING VOLTAGE FOR ADDED SAFETY IN SHIPPING.
 - 3) ALL POWER FOR CONTROL WIRING IS FROM OUTSIDE SOURCE.
 - 4) GROUND LUG CONDUCTOR RANGE IS 1/0 - 14 AWG.
 - 5) REFER TO MANUAL OR BATTERY LABEL FOR TORQUE SPECIFICATIONS.
 - 6) MAKE SURE MCCBI IS OFF BEFORE SERVICING BATTERIES.

BATTERY CABINET ELECTRICAL PARTS LIST		
COMPONENT	RATING	DESCRIPTION
BATT1-24	12VDC, 85Ah	BATTERY
MCCBI	500VDC 400A	BREAKER
ST1	24VDC	SHUNT TRIP (INSIDE BREAKER)
AUX1	600VAC, 6A	AUX SWITCH (INSIDE BREAKER)



Appendix C Battery Cabinet Runtimes

The following Tables give the typical backup runtimes at various loads for a single cabinet 440Bx000xx-ER111.

Battery runtimes are estimates only, based on new batteries at

Table C.1 - 440B 15-30kVA Typical Runtimes versus Load

UPS	Capacity	PF	Runtime in Minutes at % Full Load									
			100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
4400	15kVA	0.8	40	45	51	60	>60	>60	>60	>60	>60	>60
4400	15kVA	0.9	34	39	45	51	>60	>60	>60	>60	>60	>60
4400	20kVA	0.8	28	31	37	43	51	>60	>60	>60	>60	>60
4400	20kVA	0.9	24	27	31	38	45	55	>60	>60	>60	>60
4400	25kVA	0.8	21	24	28	33	39	49	>60	>60	>60	>60
4400	25kVA	0.9	18	21	24	28	35	42	56	>60	>60	>60
4400	30kVA	0.8	16	19	22	26	32	39	52	>60	>60	>60
4400	30kVA	0.9	14	16.5	19	22	27	34	45	>60	>60	>60

Table C.2 - 440B 50kVA Typical Runtimes versus Load

UPS	Capacity	PF	Runtime in Minutes at % Full Load									
			100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
4400	50kVA	0.8	20	23.5	27	32.5	40	50	>60	>60	>60	>60
4400	50kVA	0.9	15	19.5	23.5	27	34	45	58	>60	>60	>60

Table C.3 - 440B 80-100kVA Typical Runtimes versus Load

UPS	Capacity	PF	Runtime in Minutes at % Full Load									
			100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
4400	80kVA	0.8	10	11.5	14	17.5	21.5	27	36	52	>60	>60
4400	80kVA	0.9	8.5	9.5	11.5	14.5	18	23.5	31	45	>60	>60
4400	100kVA	0.8	7	8	10	12.5	15.5	20.5	27	39.5	>60	>60
4400	100kVA	0.9	5.5	6.5	8	10.5	13	17	23	33.5	56	>60

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