TOSHIBA

BATTERY CABINET SYSTEM
FOR 4200*FA* SERIES 15 & 25kVA UPS

4200FA SERIES

MANUFACTURED IN THE U.S.A.

OPERATION MANUAL

March, 2004
Part # 56795-000

4200*FA* SERIES

THREE PHASE- 15 & 25kVA

BATTERY SYSTEM

OPERATION MANUAL
FOR MODELS

T42-BC-FA

TOSHIBA INTERNATIONAL CORPORATION

INDUSTRIAL DIVISION

13131 West Little York Rd., Houston Texas, U.S.A. 77041

IMPORTANT NOTICE

These Instructions are not intended to cover all of the details or variations in equipment, or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. This manual may change without notice. Contact your local Toshiba sales office to verify that this is the latest revision. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the local Toshiba sales office.

The contents of this instruction manual shall not become a part of or modify any prior or existing equipment, commitment, or relationship. The sales contract contains the entire obligation of Toshiba International Corporation's UPS Division. The warranty contained in the contract between the parties is the sole warranty of Toshiba International Corporation's 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 UL/CUL listing. Unauthorized modifications also can result in personal injury, death, or destruction of the equipment.

UNINTERUPTIBLE POWER SUPPLY

If additional information or technical assistance is required call Toshiba's marketing department toll free at 1-800-231-1412 or write to: Toshiba International Corporation, 13131 W. Little York Rd., Houston, TX 77041-9990.

Please complete the following information for your records and to remain within this equipment manual:

Model Number: _____

Serial Number: _____

Date of Installation: _____

Inspected By: _____

GENERAL SAFETY INSTRUCTIONS

Warnings in this manual appear in the following three ways:

1) *Danger warnings* - The danger symbol is an exclamation mark enclosed in a triangle, which precedes the 3/16' high letters spelling the word "DANGER". The danger symbol is used to indicate situations, locations, and conditions that exist and WILL serious injury or death.

DANGER

2) *Caution warnings* - The caution warning symbol is an exclamation mark in a triangle, which precedes the 3/16" high letters spelling the word "CAUTION". The warning symbol is used to indicate situations and conditions that can cause operator injury and/or equipment damage.

CAUTION

3) *Attention warning* - The attention warning symbol is an exclamation mark enclosed in a triangle which precedes the 3/16" high letters spelling the word "ATTENTION". The Attention warning symbol is used to indicate situations and conditions that can cause operator injury and/or equipment damage.

ATTENTION

Other warning symbols may appear along with the *Danger* and *Caution* symbol and are used to specify special hazards. These warnings describe particular areas where special care and/or procedures are required in order to prevent serious injury and possible death:

1) *Electrical warnings* - The electrical warning symbol is a lighting bolt mark enclosed in a triangle. The Electrical warning symbol is used to indicate high voltage locations and conditions that may cause serious injury or death if the proper precautions are not observed:

2) *Explosion warnings* - The explosion warning symbol is an explosion mark enclosed in a triangle. The Explosion warning symbol is used to indicate locations and conditions where molten, exploding parts may cause serious injury or death if the proper precautions are not observed:

CONTENTS

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important that should be followed during the installation and maintenance of the Battery System. Turn off, lockout and tagout all power sources before proceeding to connect the power wiring to the equipment or when performing maintenance.

The maximum ambient temperature that the Battery Systems should be operated in is **40°C (104°F).**

The nominal battery voltages for these models are as follows:

15kVA:	288VDC
25kVA:	288VDC

Servicing of the batteries should only be performed by a qualified Toshiba Representative who is knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries. To arrange for battery replacement, contact your nearest Toshiba authorized service center.

Qualified Personnel ONLY

A Qualified Person is one that has the skills and knowledge relating 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:

1) Have carefully read the entire operation manual.
2) Be trained and authorized to safely energize, de-energize, ground, lockout and tag circuits and equipment, and clear faults in accordance with established safety practices.
3) 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.
4) Be trained in rendering first aid.
5) Be knowledgeable of batteries and required precautions.

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

When replacing batteries, use the same number and type-form of the following sealed, lead-acid battery:

Model Number	Manufacturer	Type	Quantity
T42-BC-FA	Enersys	NPX-150R	24

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

CAUTION

Do not dispose of the batteries in a fire. The batteries may explode.

CAUTION Do not open or mutilate the batteries. Released electrolyte is harmful to the eyes and skin and could also be toxic.

IMPORTANT SAFETY INSTRUCTIONS

CAUTION This unit contains sealed lead acid batteries. Lack of preventative maintenance could result in batteries exploding and emitting gasses and/or flame. An authorized, trained technician must perform annual preventative maintenance.

CAUTION Failure to replace a battery before it becomes exhausted may cause the case to crack, possibly releasing electrolytes from inside the resulting in secondary faults such as odor, smoke, and fire.

CAUTION Installation and servicing of batteries should be performed by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from the batteries.

CAUTION Proper maintenance to the battery system of this unit must be done by a qualified service technician, this is essential to the safety and your UPS system. Refer to service manual.

DANGER ***A battery can present a risk of electrical shock and high circuit current.*** Observe the following when working with Batteries.

QUALIFIED PERSONNEL ONLY!

1) Verify that the UPS is off and that the power cord is disconnected from the power source.
2) Remove watches, rings or other metal objects.
3) Use tools with insulated handles to prevent inadvertent shorts.
4) Wear rubber gloves and boots.
5) Do not lay tools or 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 such shock will be reduced if such grounds are removed during installation and maintenance.
7) Verify circuit polarities prior to making connections.
8) Disconnect charging source and load prior to connecting or disconnecting terminals.
9) VRLA batteries contain an explosive mixture of hydrogen gas. Do not smoke, cause a flame or spark in the immediate area of the batteries. This includes static electricity from the body.
10) Do not attempt to open the batteries in order to add water or sample the specific gravity of the electrolyte. The batteries are valve regulated lead acid type and such servicing is not possible without damaging the battery.
11) Use proper lifting means when moving batteries and wear all appropriate safety clothing and equipment.
12) Do not dispose of lead acid batteries except through channels in accordance with local, state and federal regulations.

INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ

CONSERVER CES INSTRUCTIONS

Cette notice contient des instructions importantes concernant la sécurté

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

ATTENTION Por le replacement, utiliser le même nombre de batteries du modéle suivant.

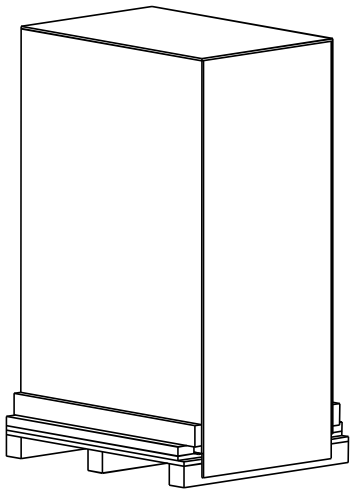
Model Number	Manufacturer	Type	Quantity
T42-BC-FA	Enersys	NPX-150R	24

ATTENTION L'élimination des batteries est règlementèe. Consultar les codes locaux à cet effet.

2.0 Uncrating/Inspection/Storage/Disposal

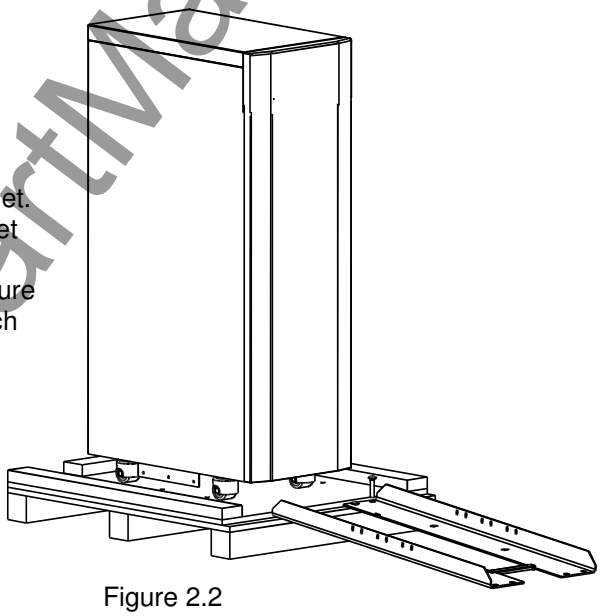
2.1 Uncrating the Battery System

Upon receipt of the Battery System, a careful inspection for shipping damage should be made.



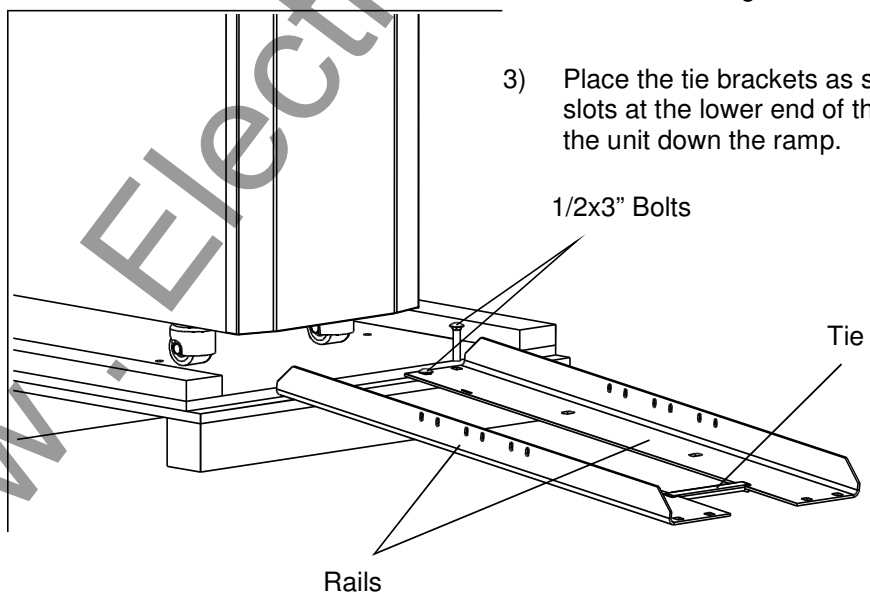
1) On International models only, remove the screws that attach the shipping crate to the pallet. Remove the crate and packing material.

Figure 2.1.1



2) Unbolt the rails from the shipping pallet. Place the rails on the front of the pallet as shown in figure 2.2 and figure 2.3. Use the four 1/2x3" bolts used to secure the rails to the shipping pallet to attach the rails as shown to the front of the pallet.

Figure 2.2



3) Place the tie brackets as shown in figure 2.3 in the slots at the lower end of the ramps. SLOWLY roll the unit down the ramp.

Figure 2.1.3

2.0 Uncrating/Inspection/Storage/Disposal (cont.)

2.2 Inspection of the new Battery System

Upon receipt of the Battery System, a careful inspection for shipping damage should be made. Use caution when removing the unit from pallet. Refer to labels or documentation attached to packing material.

After Uncrating:

1) Check the unit for loose, broken, bent, or otherwise damaged parts. If damage has occurred during shipment, keep all original crating and packing materials for return to the shipping agent. Warranty will not apply to units that are damaged during shipment.
2) Check to see that the rated capacity and the model number specified on the nameplate conform to the order specifications.

2.3 Storage of the Battery System

If the battery system is to be subjected to long or short term storage, the following guidelines should be used.

Avoid:

1) Storage in sites subject to extreme changes in temperature or high humidity.
2) Storage in sites subject to exposures of high levels of dust or metal particles.
3) Storage on inclined floor surfaces or in sites subject to excessive vibrations.

Before Storing:

1) Charge the systems batteries. **(See connection diagram on page 5-1)**
2) Place the Battery Systems input switch (MCCB-B) in the OFF position.

Storing:

1) Store within a temperature range of –20° to 40° C (-4° to 107°F)
2) For best results store the Battery System in the original shipping container and place on a wood pallet.
3) The optimum storage temperature is 21°C (70°F). Higher ambient temperatures cause the batteries to need recharging more frequently.

After Storing:

Batteries need to be recharged to maintain life during storage. Please follow the recommended recharges for your condition. **(FAILURE TO MAINTAIN BATTERY CONDITION WILL VOID BATTERY WARRANTY)**

1) If stored in an ambient temperature under 20°C (68°F), recharge the batteries every 9 months.
2) If stored in an ambient temperature of 20° to 30°C (68° to 86°F), recharge the batteries every 6 months.
3) If stored in an ambient temperature of 30° to 40°C (86° to 104°F), Please consult the factory **(adjustment to the system charger will be needed or over charge could occur)**.

2.4 Disposal

Please contact your state environmental agency for details on disposal of electrical components and packaging in your particular area.

It is illegal to dump lead-acid batteries in landfills or dispose of improperly. Please help our Earth by contacting the environmental protection agencies in your area, the battery manufacture, or call Toshiba toll free at 1-800-231-1412 for more information about recycling.

3.0 Installation

3.1 Installation Precautions

CAUTION

1) Install the system in a well-ventilated location; allow at least 10cm (4 inches) on all sides for air ventilation and maintenance.
2) Install the unit in a stable, level, and upright position that is free of vibration.
3) Install the unit where the ambient temperature is within the correct operating range (see Specifications in Section 6.0).
4) Do not install the Battery System in areas that are subject to high humidity.
5) Do not allow direct sunlight to shine on the system.
6) Do not install the Battery System in areas that are subject to contamination such as high levels of airborne dust, metal particles, or flammable gasses.
7) Avoid installation near sources of electrical noise and always make sure that the unit ground is intact to prevent electrical shock and to help reduce electrical noise.
8) Do not install where water, any foreign object, or substances may get inside the Battery System.
9) **Note: Contact the factory when paralleling Battery Systems, to ensure compatibility of mating different batteries.**

3.2 Conductor Routing and Grounding

1) Use separate metal conduits for routing the power and control circuits.
2) A separate ground cable should be run inside the conduit with the power and control circuits.
3) Always ground the unit to prevent electrical shock and to help reduce electrical noise.
4) Follow wire size and tightening torque in manual.

CAUTION **THE METAL GROUND OF CONDUIT IS NOT AN ACCEPTABLE GROUND.**

4.0 Precautions

4.1 Prestart Precautions

CAUTION

1) Before connecting the Battery System to the UPS, verify that both DC links are of the same polarity and voltage.
2) Before connecting the Battery System to the UPS, move the MCCB-B switch (ON/OFF) on the front panel (See Section 5.2) to the OFF position.

UPS MODEL NUMBER	DC VOLTS	BATTERY CABINET MODEL	DC VOLTS
T42#3#150#####	288	T42-BC-FA	288
T42#3#250#####	288	T42-BC-FA	288

3) The Battery System should not be used with an UPS other than those listed above. DO NOT attempt to connect if the Model numbers do not match the above chart. This will result in damage to the UPS, the Battery System, or both. Call your Toshiba representative if you should have any questions.

4) When installing a Battery System, do not connect different size (AMP/HR) battery systems to the UPS. If necessary, contact Toshiba so an authorized service technician can be scheduled to disconnect the smaller batteries to ensure proper operation.

4.2 Operating Precautions

1) The Battery System should not be energized until the entire operation manual has been reviewed.
2) Do not insert metal objects or combustible materials in the unit's ventilation slots.
3) Do not place, hang, or paste any objects on the top or on the exterior surfaces of the Battery System.
4) Do not attempt to disassemble, modify or repair the Battery System. Call your Toshiba sales representative for repair information.
5) Move the MCCB-B switch to the ON position only after attaching ALL the covers. Do not remove any covers when the MCCB-B is in the ON position.
6) If the Battery System should emit smoke or an unusual odor or sound, turn the power off immediately.
7) Additional warnings and notifications shall be posted at the equipment installation location as deemed required by **Qualified Personnel**.

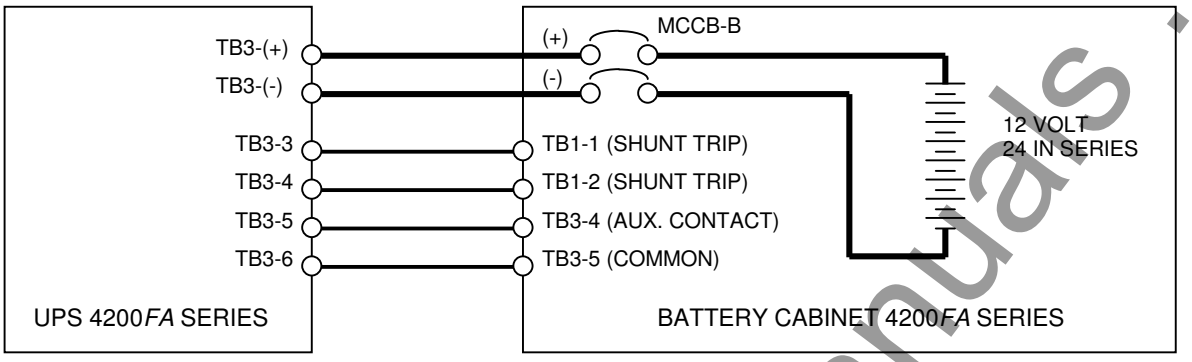
CAUTION

When the UPS is in inverter mode, turning the breaker to the "OFF" position will cause the unit to go into the battery backup mode. The UPS will continue to provide power to the load. The unit must be in bypass mode and then the breaker turned to the "OFF" position for the UPS to shutdown power to the load.

5.0 Battery System Connections

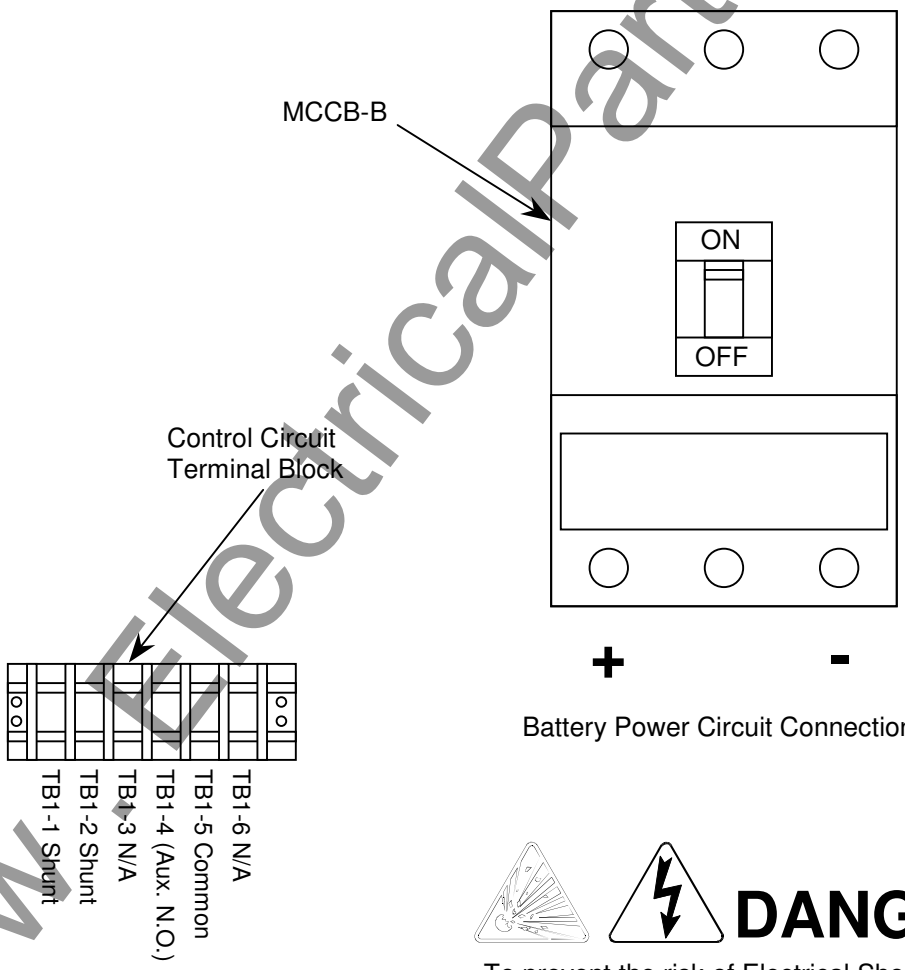
5.1 Power Connections

The following shows the wiring connections from the UPS System to the terminals of the Battery System models T42-BC-FA.



5.2 Terminal Block Details

The following illustration is a detail view of the terminal block and wiring connections necessary for proper operation. (See section 8.0 for terminal block locations)



Battery Power Circuit Connections

Battery Control Circuit Connections

DANGER

To prevent the risk of Electrical Shock, Fire, and or Explosion: **Observe Proper Polarity**

5.0 Battery System Connections

5.3 Wire Size and tightening torque

Wire Size and Tightening Torque for Battery System Terminals (15 & 25kVA)		
Terminal (Terminal Number)	15 & 25kVA	
	Wire Size	Tightening Torque
Battery Control Circuit (1-6)	14-16	16 in-lbs.
Battery (+ -)	3 AWG min. 350MCM max.	150 in-lbs.
Ground (GND)	8 AWG min.	75 in-lbs.

6.0 Specifications

Power Circuit	Battery Voltage	288Vdc nominal
	Discharge Cut-off Voltage	216Vdc min. (1.50Vdc/cell)
	Discharge Current	100Adc max.
	Nominal Run Time	15minutes min., 25kVA UPS at 100% load 30minutes min., 15kVA UPS at 100% load
	Charging Voltage	328Vdc max.
	Charging Current	5.5Adc max.
Control Circuit	Shunt Trip Coil Voltage	24Vdc nominal, 18Vdc min., 26.4Vdc max.
	Shunt Trip Coil Current	1.5A nominal
	Auxiliary Contact Ratings	5Adc max. at 30Vdc 10Aac max. at 120Vac to 250Vac
Environmental	Operating Temperature	0 ℃ to 40 ℃; optimal temperature is 25 ℃
	Operating Humidity	Less than 90% RH (non-condensing)
	Altitude	Less than 1000 meters
Mechanical	Dimensions	23.5 inch W, 33.7 inch D, 59.2 inch H

7.0 Preventive Maintenance and Scheduled Maintenance/Parts Replacement

7.1 Preventive Maintenance

Toshiba's 4200*FA* Series UPS battery cabinets have been design to provide years of trouble free operation requiring a minimum of preventive maintenance.

The best preventive measure that the UPS Battery System user can take is to keep the area around the unit, particularly the air inlet vents, clean and free of moisture and dust accumulations. If the atmosphere of the installation site is very dusty, use a vacuum cleaner to periodically remove the dust accumulations from the system. Schedule authorized service centers to perform internal parts inspections annually.

CAUTION

Before performing any maintenance the technician should be familiar with and follow the Important Safety Instructions on Pages 3 and 4.

CAUTION

Proper maintenance of the Battery System by a qualified service technician is essential to the safety and reliability of your UPS System. Refer to the Service Manual.

The following list shows intervals for periodic maintenance and replacement of certain battery cabinet parts:

1) Batteries: SVRLA batteries are maintenance free with respect to electrolyte only. The charging voltage, temperature, performance, and connection resistance must be monitored periodically. Necessary corrective actions must be made in order to assure safe reliable power is supplied by the UPS System. The aforementioned items affect the life of the batteries, so replacement should be once every 5 years as a minimum. All of the batteries must be replaced at the same time.

Quarterly Maintenance

a) Visual Checks
   1) Leakage
   2) Corrosion on Positive terminal
b) Check the battery temperature at the negative terminal.
c) Measure and record the system float charging voltage.
d) Measure and record the individual unit's float charging voltage.

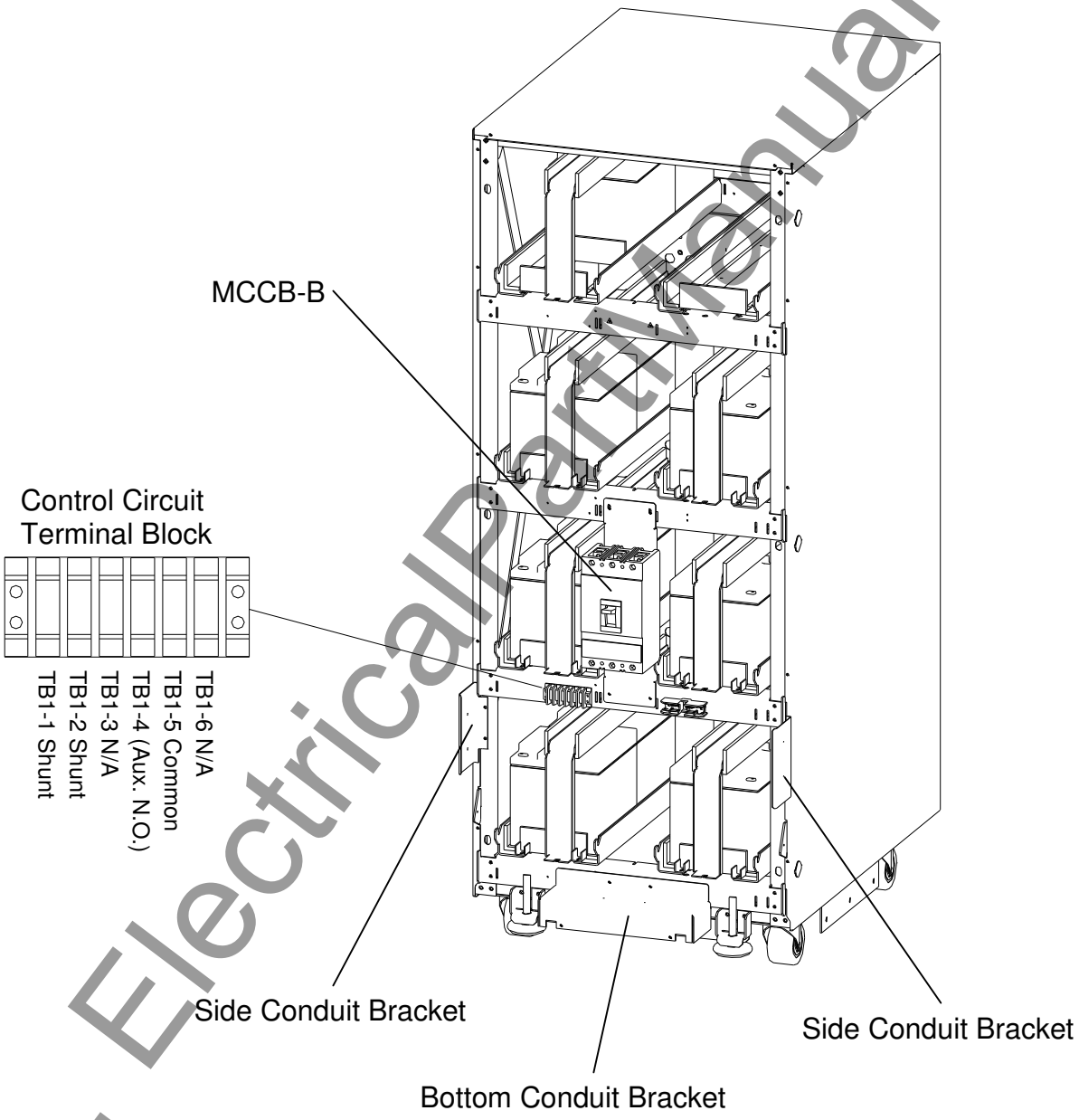
Semi-Annual Maintenance

a) Repeat the quarterly checks.
b) Perform a 10-second high rate (e.g. 100 amp) load test on the individual batteries.
c) Optionally test for the purpose of trending the battery over time.
d) Re-torque all inter-battery connector hardware.
e) Perform inter-battery connector resistance checks.

8.0 External Layouts/Dimensions/Weights

8.1 External Layouts: T42-BC-FA

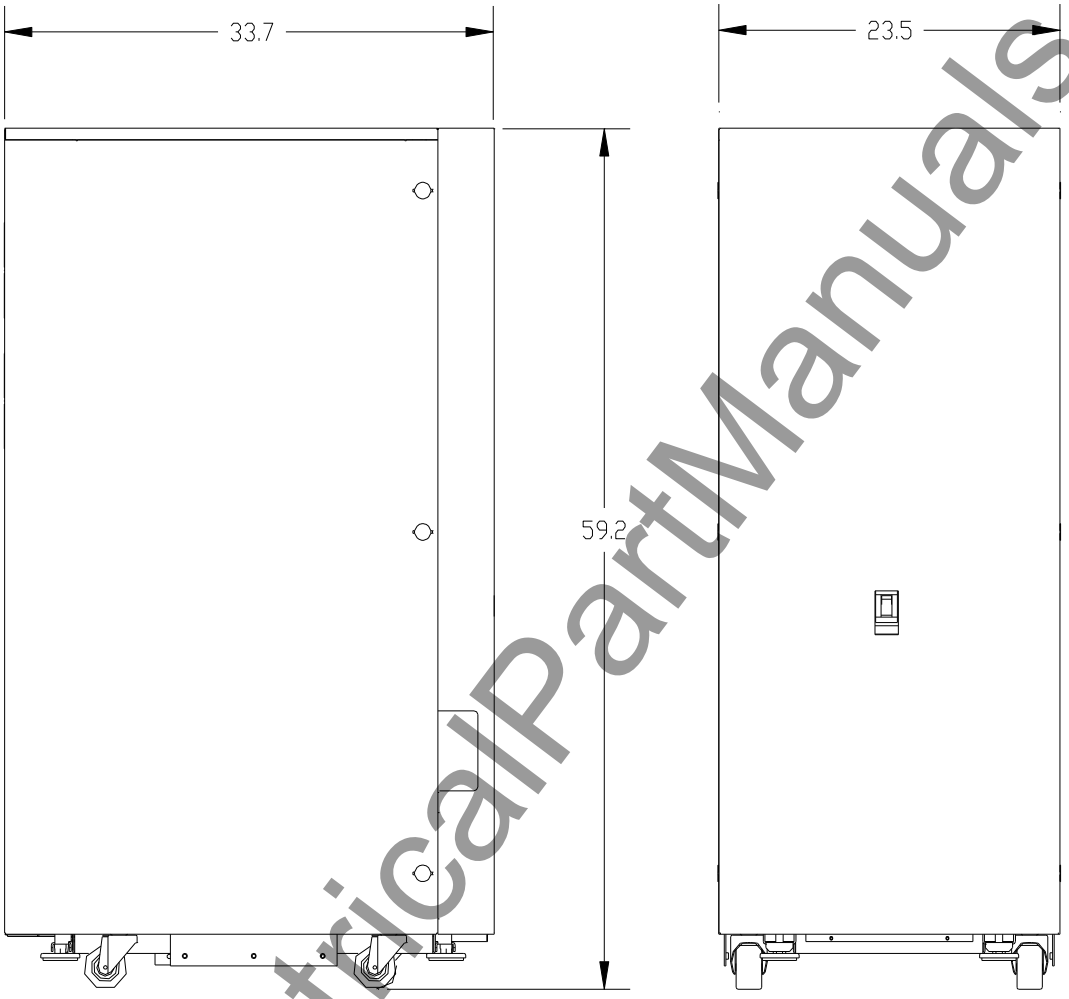
The following shows the location of the Battery Systems Control Terminal Block, DC Disconnect (MCCB-B) and the Conduit Brackets. The Conduit Brackets may be removed in order to drill the holes necessary to accommodate the conduit fittings used in the installation.



8.0 External Layouts/Dimensions/Weights

8.2 External Dimensions

The following shows the external dimensions of the T42-BC-FA



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