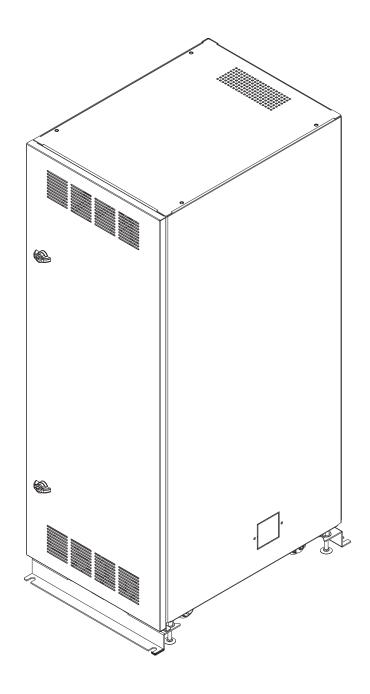


Mitsubishi Electric Power Products, Inc. BC16 Battery Cabinet

Installation, Operation, & Maintenance Manual





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1. IMPORTANT INFORMATION ABOUT THIS MANUAL

SAVE THESE INSTRUCTIONS! This manual contains important information that is needed during the installation and maintenance of the system.

1.1 MANUAL SYMBOLS



Warning:

Indicates information provided to protect the user against personal injury and/or safety hazards.



Caution:

Indicates information provided to protect the user against safety hazards and/or possible equipment damage.



Important:

Indicates information provided as an installation or operating instruction or tip as well as general important installation and system information.

2. Introduction:

The C&C Power family would like to thank you for choosing a C&C Power Inc. product for your equipment needs. We know there are a lot of choices in the industry and we appreciate the opportunity to supply each of our customers with the highest quality power products manufactured in the United States today. All of C&C Power's solutions are factory tested to some of the highest standards is the industry. Every battery cabinet system is Hi Pot tested to UL standards at our facility prior to shipment.

Sales support for future equipment needs or upgrades is provided by our regional sales staff and qualified representatives. All technical questions and service issues should be directed to our main office by dialing the number listed below. This is a 24-hour, 7-day service number. After normal working hours, please leave a detailed message with your phone number on the voice mail system and a qualified service representative will contact you as quickly as possible.

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3. SAFETY PRECAUTIONS



Before installing or maintaining this system, it is extremely important to read this manual and be sure that all system drawings and schematics are reviewed and clearly understood. If there are any questions concerning this manual or any of the installation or maintenance procedures and/or requirements please contact a C&C Power representative before proceeding.



When installing this power system, follow all applicable federal, state and local regulations as well as industry guidelines to insure proper system installation.



Only qualified electricians or DC power technicians should attempt to install or service this equipment.



System installation and maintenance should always be performed with heavily insulated tools. It is also recommended to wear rubber gloves, boots, and use insulating mats to stand on when working on this equipment.



Always wear eye protection when installing or maintaining batteries and/or power equipment.



Battery cabinet systems are extremely heavy. Use a minimum of two people when unloading and setting equipment in place.



Do not smoke or present open flames near any battery system.



For the safety of others, never leave an open cabinet or panel unattended.



To reduce the risk of fire, replace fuses with the same type and rating of fuses supplied with the system.



DC Power and Batteries can be very dangerous and have extremely high short circuit current. Electrical shock, severe burns, fire or death can result from a system short.



To avoid personal injury including electrical shock, severe burns and possible death, all jewelry including bracelets, rings and watches must be removed prior to installing or servicing this system.



Do not open or mutilate batteries. Opened or severely damaged batteries can release toxic electrolyte which is harmful to the skin and eyes.



Never lay loose cables, metal parts or tools on top of batteries.



Under certain conditions, batteries can vent potentially explosive gas (hydrogen). Never enclose batteries or battery cabinets in a sealed room.

4. Inspection Upon Receipt of Goods

4.1 GENERAL

Special precautions and care have been taken to ensure the system arrives safe and undamaged. However, upon receipt, you should inspect the entire shipment, including the crate and any boxes for evidence of damage that may have occurred during transit.

4.2 VISIBLE DAMAGE

It is the responsibility of the person receiving the shipment to inventory and fully inspect all materials against the bill of lading or weigh bill IMMEDIATELY while the carrier representative is still present. Insure that all items are accounted for, including number of skids and quantity of boxes. Also note any visible external damage that may have occurred during transit. Make all applicable notations on the delivery receipt before signing and file a damage report with the carrier.

4.3 CONCEALED DAMAGE

Within 3 to 30 days of receipt (depending on courier), unpack the system and check for any concealed damage. Check the materials received against the detailed packing list to verify the quantity and the condition as complete and satisfactory.

Note any damage to the internal packaging, then request an inspection by the carrier and file a concealed damage claim. If there is a material shortage, contact a C&C Power representative at the main office to file a claim.

Please contact your shipping company for all shipping damage. C&C Power is not responsible for any shipping damage.

4.4 RETURN OF DAMAGED GOODS

Should equipment be damaged and require return to C&C Power for repair, a representative will provide instructions along with an RMA number to expedite the return.

A RMA number must be obtained before returning equipment to C&C Power, Inc.

5. System Overview

During normal operating conditions the UPS supplies power to the load as well as the necessary power required to keep the batteries at the proper float voltage. When AC power fails, the batteries will discharge in order to provide the necessary backup power to the load. It is the responsibility of the customer to make sure the batteries are not discharged below manufactures recommendations. After any battery discharge has occurred, the batteries should be recharged as soon as possible. Batteries will be damaged if not properly recharged right away. See the UPS manual for more information on charging the batteries.

6. System Specifications

6.1 BATTERIES

Please refer to system drawings for model specific information. **Type:** Valve Regulated Lead Acid (VRLA), sealed, non-spillable

Voltage: 12 VDC Nominal

Battery Strings: The cabinet can accommodate two (2) 288 VDC battery strings. Each string is composed of four (4) trays of five (5) 12 VDC batteries each and a single tray of four (4) 12VDC batteries for a resulting 288VDC battery string.



Only cabinets with Flame Retardant Batteries are suitable for computer room

use.

6.2 SYSTEM GROUNDING



All system ground wires should be derived from the main building ground source.

Cabinet Safety Ground: Each cabinet is supplied with a #14-1/0 mechanical ground lug, located on the lower right corner of the breaker pan, which accepts bare wire from #6 AWG to 300 MCM cable.

Torque: 325 lb-in

Wire Size and Type: Ground wire should be sized per NEC and/or all applicable national and local codes.

Battery Cabinet Breaker or Fuse Size	Minimum Copper Ground Wire Size
Up to 200 amps	6 AWG
201-300 amps	4 AWG
301-400 amps	3 AWG
401-500 amps	2 AWG
501-600 amps	1 AWG

6.3 DC OUTPUT

Please refer to system drawings for model specific information.

Voltage: 288 VDC Nominal

Circuit Breaker: UL Listed 600 VDC rated. See system drawings for details.

Battery Tray Fuse Type: Ferraz (Gould) A50QS, A50P or equivalent

Wire Size and Type: Per NEC and/or all applicable national and local codes.



Wire should be sized for a maximum voltage drop of 0.5 volt.

6.4 GENERAL SPECIFICATIONS

Cabinet Size: 19.70"W x 26.75"D x 55.12"H

Empty Cabinet Weight: 375 lbs (approximately)

Operating Temperature: 20°C to 25°F (68°F to 77°F) recommended for optimum battery

performance.

Ventilation: Through ventilation slots in front, rear and top panels. A minimum of four inches is required in front and behind the cabinet. This refers to obstruction of ventilation only. Clearance around the equipment should be as suggested by NEC and/or all applicable national and local codes.



Under certain conditions, batteries can vent potentially explosive gas (hydrogen). Never enclose batteries or battery cabinets in a sealed room.



Batteries should be stored no longer than three months at 25°C (77°F) or lower before recharging. Exceeding the recommended ambient storage temperature may cause damage to the batteries.

7. Installation

7.1 PREPARATION

7.1.1 EQUIPMENT INSPECTION

Remove the equipment from the packaging material and inspect for any shipping damage that may have been overlooked upon receipt of goods. Verify that the system includes all necessary hardware for installation.

7.1.2 NECESSARY EQUIPMENT AND TOOLS

- Heavily insulated assortment of hand tools
- Digital voltmeter

7.1.3 Installation Safety Precautions



Before proceeding with system installation, be sure to review and understand all of the SAFETY PRECAUTIONS in this manual!

DC VOLTAGE WARNING!



Hazardous DC voltages are present in the system. This hazard will always be present in a battery system including when it is offline. Accidental short circuit of the positive and negative terminal will cause tremendous currents to flow resulting in electrical shock, severe burns, fire and possible death! Use extreme caution when installing and maintaining the system!

7.2 Installation Steps



Before installing or maintaining this system, it is extremely important to read this manual and be sure that all system drawings and schematics are reviewed and clearly understood. If there are any questions concerning this manual or any of the installation or maintenance procedures and/or requirements please contact a C&C Power representative before proceeding.

7.2.1 EQUIPMENT LOCATION

Prior to installation, verify floor loading requirements and all applicable codes pertaining to the related equipment. Environmental conditions should also be reviewed. Battery systems require an area with proper ventilation and cooling. An ambient temperature between 20°C to 25°C (68°F to 77°F) is recommended for optimum battery life and performance. The cabinet has vent holes located at the front and rear of the system. Never install the cabinet into a sealed enclosure. Clearance around the equipment should be as suggested by NEC and/or all applicable national and local codes.



Under certain conditions, batteries can vent potentially explosive gas (hydrogen). Never enclose batteries or battery cabinets in a sealed room.

7.2.2 EQUIPMENT MOUNTING



Battery cabinet systems are extremely heavy. Use a minimum of two people when unloading and setting equipment in place.

- 1. The BC16 battery cabinet is equipped with four casters, two swivel types in front and two rigid types in the back. Move the cabinet into the desired location and lock the front casters.
- 2. Lower the four leveling feet located at each corner to stabilize the cabinet and prevent it from moving.

7.2.3 EQUIPMENT GROUNDING



All system ground wires should be derived from the main building ground source.



For multi cabinet systems, each cabinet needs to have a designated cabinet ground wire derived from the main building ground source.

Terminate a cabinet ground wire from the main building ground source to the supplied #14-1/0 mechanical lug located on the breaker pan. See section 6.2 for sizing recommendations. Wire should be sized per NEC and/or all applicable national and local codes.

7.2.4 DC CONNECTIONS



Review the attached system drawings and schematics for model specific information on DC output connections.



Wire should be sized for a maximum voltage drop of 0.5 volt.



Battery cabinets that are not supplied with an incorporated DC output disconnect device must have an appropriate disconnect device provided external to the cabinet.



Verify that the output breaker is in the off/open position before making any DC connections to additional cabinets or to the UPS. Also verify that the UPS charger is not running.

- 1. Open the front door on the cabinet and check for any noticeable problems or damage that may have occurred during shipment.
- 2. Review the attached installation drawing and schematic.
- 3. Check and re-torque internal battery connections, as shipping may have caused these connections to come loose. Proper torque values are noted on the drawing and also on the battery case.
- 4. Connect main cables from the UPS or charger source to the battery cabinet output. The main output connection point is directly to the circuit breaker. Review the supplied cabinet drawing for information on the battery cabinet output. All cables should be sized per NEC and any other local codes pertaining to this equipment. Refer to the UPS or charger manual for wiring external batteries. Note! Make sure any charging source is disconnected before making these connections.

b

7.2.5 SYSTEM OPERATION

Please refer to the UPS system manual for system start up and operation information.

8. System Maintenance



Before proceeding with system maintenance, be sure to review and understand all of the SAFETY PRECAUTIONS in this manual!



Verify that the output breaker is in the off/open position before servicing the system.

8.1 BATTERY REPLACEMENT



Only qualified electricians or DC power technicians should attempt to diagnose a battery malfunction, remove a malfunctioning battery and replace a battery.



When batteries are replaced they must be properly installed paying special attention to terminal polarity orientation! If wired incorrectly it will cause a short in the system and can result in electrical shock, severe burns, fire and possible death! Be sure to review the system schematics before terminating any battery cables.



Do not dispose of batteries in a fire. The batteries may explode. Contact your local hazardous waste or recycling center for battery disposal requirements.

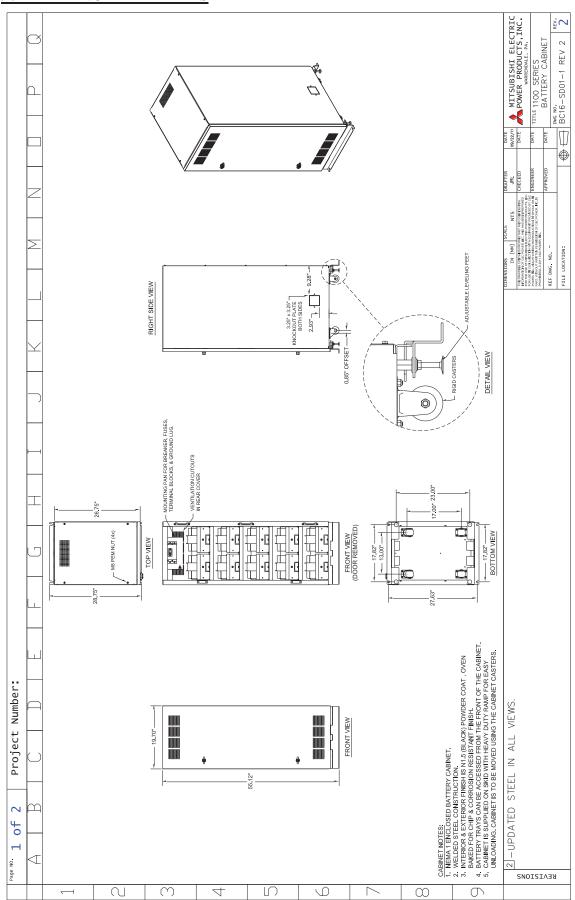


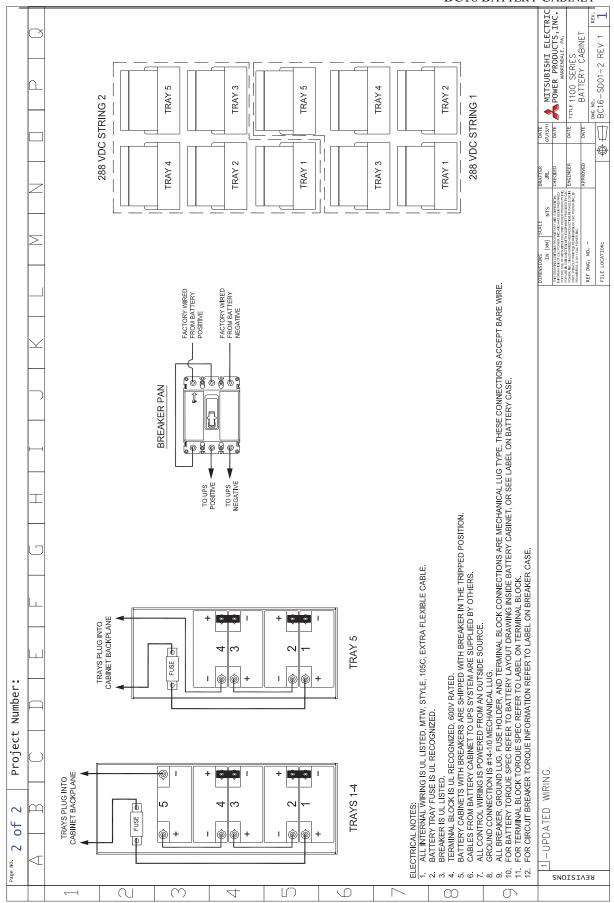
Do not discard batteries in the trash. This product contains sealed lead acid batteries. Contact your local hazardous waste or recycling center for battery disposal requirements.

- 1. Locate the shelf with a suspected malfunctioning battery.
- 2. Disconnect the UPS from the battery string by opening the circuit breaker in the battery cabinet.
- 3. Remove the shelf from the cabinet.
- 4. Test the individual batteries residing in the shelf to isolate the malfunctioning battery.
- 5. Remove the retaining bar that holds down the batteries in the shelf.
- 6. Disconnect the malfunctioning battery from the string.
- 7. Prepare the new battery for installation. Verify that the battery is the same type and amphour rating as the batteries that are in the system.
- 8. Using a digital voltmeter, measure the battery voltage to verify that it is 12.4 VDC or above.
- 9. Use a brass wire brush or abrasive pad to polish the battery terminals.
- 10. Apply no-ox type terminal grease to the battery terminals to avoid corrosion.
- 11. Remove the bad battery.

- 12. Put the new battery into place. Make sure new battery is installed properly regarding polarity orientation. Use the supplied wiring drawing found inside the battery cabinet door to verify the cabinet wiring.
- 13. Reconnect the cable and connecting bar to the installed battery and make sure the connections are properly torqued.
- 14. Check the battery string voltage of the shelf; 60VDC for shelves 1 through 4 and 48VDC for shelf 5.
- 15. Re-install the retaining bar that holds down the batteries in the shelf.
- 16. Re-install the shelf in the cabinet making sure it is fitted properly into the cabinet backplane.
- 17. Check the battery string voltage at the input side of the circuit breaker.
- 18. Reconnect the UPS to the battery string by closing the circuit breaker in the battery cabinet.

9. REFERENCE MATERIALS





I	_ 	()			L				 <u></u>		\sum					C
		CUTLER H	CUTLER HAMMER SERIES C BREAKER	RIES C BF		SIZING			S	SIEMENS SERIES G BREAKER SIZING	ERIES G	BREAKE	SIZING			
	BREAKER SIZE AMPS	*35A.			-	*50A.	50A.	BREAKER SIZE AMPS	\vdash	_	_	_	60A.	70A.	100A.	
	A.I.C. RATING, 250DC	10,000 A.I.C.		10,000 A.I.C.	_	10,000 A.I.C.	42,000 A.I.C.	A.I.C. RATING, 500DC	0DC 18,000 A.I.C.		18,000 A.I.C. 18,0	18,000 A.I.C. 18	18,000 A.I.C.	18,000 A.I.C.	18,000 A.I.C.	
	A.I.C. RATING, 600DC		35,000 A.I.C.		35,000 A.I.C.		35,000 A.I.C.	OUTPUT LUG SIZE	ZE (1) #8-1/0		(1) #8-1/0 (1)	(1) #8-1/0	(1) #8-1/0	(1) #8-1/0	(1) #8-1/0	
	OUTPUT LUG SIZE	(1) #14-1/0	(1) #14-1/0	(1) #14-1/0	(1) #14-1/0	(1) #14-1/0	(1) #14-1/0		1							
								BREAKER SIZE AMPS						250A.	300A.	
	BREAKER SIZE AMPS	*60A.	60A.	*70A.	70A.	*100A.	100A.	A.I.C. RATING, 500DC	0DC 18,000 A.I.C.	-	18,000 A.I.C. 18,0			25,000 A.I.C.	25,000 A.I.C.	
	A.I.C. RATING, 250DC	10,000 A.I.C.	42,000 A.I.C.	10,000 A.I.C.	42,000 A.I.C.	10,000 A.I.C.	42,000 A.I.C.	OUTPUT LUG SIZE	IZE (1) #8-1/0		(1) #8-1/0 (1)	(1) #4-350 ((1) #4-350	(1) #4-350	(2) 3/0-250	
	A.I.C. RATING, 600DC		35,000 A.I.C.		35,000 A.I.C.		35,000 A.I.C.									
	OUTPUT LUG SIZE	(1) #14-1/0	(1) #14-1/0	(1) #14-1/0	(1) #14-1/0	(1) #14-1/0	(1) #14-1/0	BREAKER SIZE AMPS	-				\rightarrow	600A.		
								A.I.C. RATING, 500DC	``	- 1		_		25,000 A.I.C.		
	BREAKER SIZE AMPS	*125A.	\rightarrow	*150A.	\rightarrow	*200A.	200A.	OUTPUT LUG SIZE	IZE (2) 3/0-250	1-250 (2) 3,	(2) 3/0-250 (2)	(2) 4/0-500 ((2) #2-600	(2) #2-600		
	A.I.C. RATING, 250DC	10,000 A.I.C.	-	10,000 A.I.C.	-	10,000 A.I.C.	42,000 A.I.C.		SIEMENS	SIEMENS BREAKER ACCESSORY CONTACT RATING	R ACCES:	SORY CC	NTACT R	ATING		
	A.I.C. KATING, 600DC		35,000 A.I.C.		35,000 A.I.C.		35,000 A.I.C.	VOLTAGE	24 VDC		125 VDC 25	250 VDC	230 VAC	400 VAC	600 VAC	
	OUTPUT LUG SIZE	(1) #4-4/0	(1) #4-4/0	(1) #4-4/0	(1) #4-4/0	(1) #4-350	(1) #4-350	AUXILIARY SWITCH	_		+	25 AMPS*	6 AMPS	3 AMPS	.25 AMPS	
	PDEAKED SIZE AMDS	225A	2504	3000	3504	4004	4504	BELL ALARM				.25 AMPS*	6 AMPS	3 AMPS	.25 AMPS	
	_	42 000 A I C	45	45	12	7	7			*	* NON-INDUCTIVE LOAD	IVE LOAD.				
	_	42,000 A.I.C.			+	_	_									
	_	(1) #4-350		_	_	_										
									SOIL	SOLIARE-D POWERPACT BREAKER SIZING	WFRPAC	T BREAK	CER SIZIN	C		
		500A.	\rightarrow					SPEAKED SIZE AMPS	L		400	200	600	200	1000	
		42,000 A.I.C.						A I C BATING 500DC	20.0		C	c		20 000 A I C	20 000 4 1	
		35,000 A.I.C.						A.I.C. RAIING, 300	+		_		-	(1) #14 2/0	ZU,000 A.I.C.	
	OUTPUT LUG SIZE	(2) 3/0-350	(2) 400-500					OUTPUT LUG SIZE	ZE (1)#14-3/0	-	(1) #14-3/0	-	1)#14-2/0	0/9-+1+(1)	(1) #14-5/0	
	* 2 POLE BREAKERS THAT ARE USED FOR BUS VOLTAGES EQUAL	ERS THAT AI	RE USED FOR L	BUS VOLTAGE		TO 216 VDC AND BELOW	ELOW	BREAKER SIZE AMPS	MPS 1254	-	1504	2002	2254	2504	3004	
	CUTLER HAMMER SERIES C BREAKER ACCESSORY CONTACT RATING	MER SER	IES C BREA	WER ACC	ESSORY C	ONTACT R	ATING	A I C RATING 500DC	20.		C	c	0	20 000 A I C	20 000 A I C	
	VOI TAGE	125 VDC	250 VDC	230 VAC	AND VAC	600 VAC		OUTPIT HE SIZE	_		_		_	(1) 3/0-350	(1) #1-600	
	ALIVII ADV CIVITOLI	E AMBC*	SE AMBE*	S AMBC	O VINDS	OK AMBC			+	+	+	+		200 200 (2)		
	RELIALARM	S AMPS	25 AMPS*	6 AMPS	3 AMPS	25 AMPS		BREAKER SIZE AMPS	MPS 350A.		400A.	450A.	500A.	600A.		
			* NON-INC	* NON-INDUCTIVE LOAD				A.I.C. RATING, 500DC	0DC 20,000 A.I.C.		20,000 A.I.C. 20,0	20,000 A.I.C. 20	20,000 A.I.C.	20,000 A.I.C.		
								OUTPUT LUG SIZE	-		-	_	+-	(3) 3/0-200		
								SQUAR	E-D POWE	ERPACT B	REAKER	ACCESS	ORY CON	SQUARE-D POWERPACT BREAKER ACCESSORY CONTACT RATING	ING	
								VOLTAGE	24/48 VDC	VDC 240	240 VDC 38	380 VDC 2	240/380 VAC	480 VAC	600/690 VAC	
								AUXILIARY SWITCH	+	+		T	6 AMPS	6 AMPS	6 AMPS	
								BELL ALARM	╁	╀	+	.3 AMPS*	6 AMPS	6 AMPS	6 AMPS	
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10. WARRANTY

LIMITED WARRANTY AND EXCLUSIONS

C&C Power, Inc. strives to produce quality products at reasonable prices. If you are not satisfied with our product because of a defect, we will repair or replace the defective part or parts free of charge for a period of one year from the date of purchase. In the event you claim that the product contains a defect, simply notify C&C Power, Inc. of the defect, and we will arrange for repair or replacement. The sole and exclusive remedy against C&C Power, Inc. relating in any way to a product defect shall be the repair or replacement of defective parts as provided for under this LIMITED WARRANTY. No other remedy, including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss, is available. This LIMITED WARRANTY shall not be deemed to have failed of its essential purpose so long as C&C Power, Inc. is willing and able to repair or replace defective parts in the manner prescribed in this LIMITED WARRANTY.

Certain integrated products, which are not manufactured by C&C Power; will be warranted by the applicable manufacturer. These warranties shall be between the manufacturer and the user. Terms and conditions may vary. These integrated products include, but may not be limited to, the following products: Batteries, Inverters and UPS Systems.

Any action for breach relating to the sale of a C&C Power, Inc. product must be commenced within one year after the cause of action has accrued.

THIS LIMITED WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL SUCH WARRANTIES ARE EXCLUDED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.