

LIBERTY® 2000 SuperMAX

For standby applications
Capacities from 295 to 2000 Ampere-hours



C&D Technologies' Powercom Division valve regulated lead-acid (VRLA) batteries are engineered to provide greater performance reliability and consistency over the life of the product. Designed using C&D's patented processes, these products offer long battery life with minimal maintenance. The versatile Liberty® 2000 SuperMAX fits virtually anywhere, and provides superior performance in the most demanding applications.

SPECIFICATIONS

Recommended Float Voltage @ 77F (25C)	2.26 +/-0.01VPC @ 1.300 Specific Gravity (HD) 2.20 +/-0.01VPC @ 1.250 Specific Gravity (HDL)
Intercell Connectors	Tin-plated copper (Stainless steel hardware)
Warranty	Twenty-year limited warranty (3 Full + 17 pro rata)
Jar & Cover Material PVC	Meets ASTM D-635, UL-94-VO, >32% LOI Standard

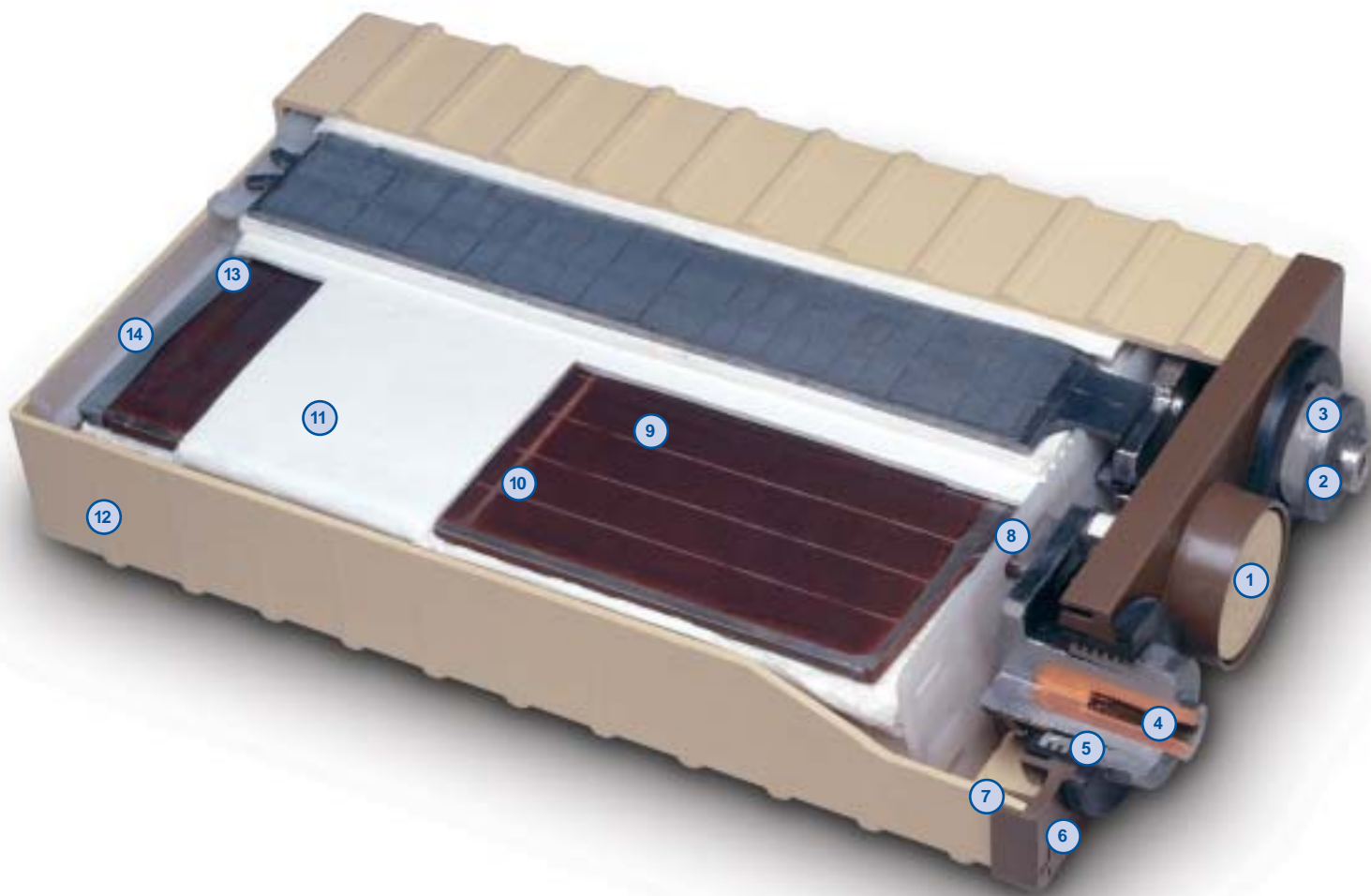
FEATURES AND BENEFITS

- **Internal Catalyst** – The Maximizer® is the patented vent assembly system that reduces float current, maintains cell capacity, and extends battery life (dual catalysts are used in the HD-2000 and HDL-1700)
- **'Frame and Shelf' Racking Methodology** - Cells are installed in a patented seismic zone 4 qualified frame with removable shelves - resulting in 40% less hardware and a minimum savings of 20% installation time over standard modular rack assemblies
- **Improved Performance** – Redesigned positive grids have improved plate performance by an average of 4.6% at the eight-hour rate
- **Horizontal Plate Orientation** – Plates are oriented in a 'pancake' fashion so that the weight of the element maintains compression without the need for mechanical devices
- **Battery Frame Base** – The base is a solid steel plate, maximizing weight distribution and dramatically reducing contact-point floor loading
- **Protective Covers** – Clear protective covers allow for easy visual inspection and are simple to secure and remove from the front of the battery rack system for routine maintenance inspections
- **Tin Plated Intercell Connectors** – More resistant to corrosion, less required maintenance
- **Redesigned Cover** - The covers have been reinforced at the positive posts, to help maintain cover integrity. Additional 'stand-offs' incorporated in the groove of the cover seal to allow more epoxy to bond
- **Moveable Post Seal** - Patent-pending flexible post seal allows for movement, greatly reducing stress on the cover and insuring the longest service life*

* (HD-2000 and HDL-1700 cells only)

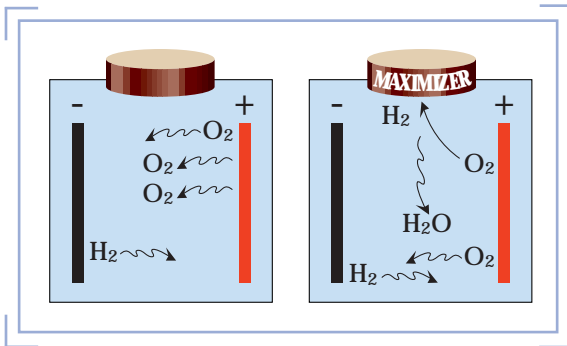
SPECIFICATIONS

Model Number	Positive Plates	Height in (mm)	Depth in (mm)	Width in (mm)	Weight lbs (kgs)	Electrolyte Specific Gravity	Float Voltage
HD-350 HDL-295	3	3.0 (76.2)	23.1 (587.5)	8.9 (226.1)	63 (28)	1.300 HD 1.250 HDL	2.25-2.27 Vpc @77F (25C) HD 2.19-2.21 Vpc@77F (25C) HDL
HD-460 HDL-390	4	3.8 (96.5)			80 (36)		
HD-580 HDL-490	5	4.5 (114.3)			98 (45)		
HD-810 HDL-685	7	5.9 (149.9)			132 (60)		
HD-1040 HDL-880	9	7.4 (188.0)			167 (75)		
HD-1260 HDL-1075	11	8.9 (226.0)			204 (91)		
HD-1500 HDL-1270	13	10.3 (261.6)			237 (108)		
HD-2000 HDL-1700	17	13.4 (339.0)			317 (143)		



1 THE MAXIMIZER® PATENTED CAP SYSTEM

- Reduces corrosion of the positive grids
- Maintains a properly charged negative plate
- Virtually eliminates dry-out



2 LARGEST POST DESIGN

- Lower post resistance
- Larger area for easy access by test equipment

3 COMPUTER-CONTROLLED HELIARC WELD

- High quality consistent weld
- 100% tested for maximum reliability
- Provides leak-free operation

4 THREADED COPPER INSERTED POST

- Reduces resistance
- Improves high rate performance
- High torque limit 160 in-lbs
- Minimal maintenance required

5 REDUNDANT POST SEAL DESIGN

- Patented bonding process adheres lead to rubber bushing and rubber to PVC cover
- Provides leak-free operation
- Patent-pending flexible post seal on HD-2000 and HDL-1700 cells

6 PVC JAR AND COVER

- Prevents premature dry-out
- Lowest combination of oxygen and water transmission rate
- Meets ASTM D-635, UL-94-VO, 32% LOI standard

7 PROVEN JAR-TO-COVER SEAL

- Six times more reliable than most seal designs
- Tested to be leak free for over 20 years
- All cells 100% factory tested
- Ensures maximum product reliability

8 MOSS SHIELD

- Prevents premature shorting, extending usable battery life

9 TETRABASIC LEAD SULFATE

- Patented C&D paste formula provides large interlocking crystals for longer life

PATENTED POSITIVE GRID DESIGN

- 10 • Proprietary grid design reduces plate growth
- Excellent cycling capability of 1200 cycles at 80% DOD to 1.75 Vpc at 77F (25C)
- Thick lead-calcium-tin positive plate — 0.275 inches (7 mm) for 20-year design life

C-WRAP AGM

- 11 • Prevents plates from shorting on the side and edges
- Extra thick and absorbent mats for long life

PATENTED RIBBED JAR DESIGN

- 12 • Provides extra strength
- Provides space-efficient airflow gap for uniform cell temperatures
- Better heat dissipation optimizes cell life
- Five times more tolerant against thermal runaway effects than non-ribbed design

INSULATED PLATE BOOT

- 13 • Prevents shorting at bottom of plate
- Boot and c-wrap fully insulate plate

DEEP WELL SUPPORT BRIDGE

- 14 • Allows plate growth without affecting performance
- Increases the life of battery
- Reduces stress on Jar-to-Cover and Post seals
- Supports the element in horizontal position

RATINGS IN AMPERES AT 77F (25C) (PER CELL)

	FV/Cell	Model	8 hr	7 hr	6 hr	5 hr	4 hr	3 hr	2 hr	1 hr
HD	1.75	HD-350	43.1	48.1	54.6	63.1	74.9	92.5	122.2	186.3
		HD-460	57.4	64.2	72.7	84.1	99.8	123.3	163.0	248.3
		HD-580	71.8	80.2	90.9	105.1	124.8	154.1	203.7	310.4
		HD-810	100.5	112.3	127.3	147.1	174.7	215.8	285.2	434.6
		HD-1040	129.2	144.4	163.7	189.2	224.6	277.4	366.7	558.8
		HD-1260	157.9	176.5	200.1	231.2	274.5	339.1	448.2	682.9
		HD-1500	186.7	208.5	236.4	273.2	324.4	400.7	529.7	807.1
		HD-2000	248.3	276.8	312.9	360.3	425.9	523.4	687.5	1044.1
	1.84	HD-350	39.9	44.4	50.1	57.7	68.1	83.4	108.6	159.1
		HD-460	53.2	59.2	66.9	76.9	90.7	111.2	144.9	212.2
		HD-580	66.4	74.0	83.6	96.1	113.4	139.0	181.1	265.2
		HD-810	93.0	103.6	117.0	134.6	158.8	194.5	253.5	371.3
		HD-1040	119.6	133.2	150.4	173.1	204.2	250.1	325.9	477.4
		HD-1260	146.2	162.8	183.9	211.5	249.6	305.7	398.4	583.5
		HD-1500	172.8	192.4	217.3	250.0	294.9	361.3	470.8	689.6
		HD-2000	229.5	255.0	287.2	329.3	387.0	471.9	612.1	896.5
	1.88	HD-350	37.1	41.3	46.6	53.5	62.9	76.7	99.0	140.6
		HD-460	49.5	55.0	62.1	71.3	83.9	102.3	131.9	187.5
		HD-580	61.8	68.8	77.6	89.1	104.9	127.8	164.9	234.4
		HD-810	86.5	96.3	108.6	124.8	146.8	179.0	230.9	328.2
HD-1040		111.3	123.8	139.7	160.4	188.7	230.1	296.9	421.9	
HD-1260		136.0	151.3	170.7	196.0	230.7	281.3	362.8	515.7	
HD-1500		160.7	178.9	201.8	231.7	272.6	332.4	428.8	609.5	
HD-2000		213.8	237.3	267.0	305.6	358.2	434.8	558.5	793.6	
1.90	HD-350	35.6	39.5	44.6	51.1	60.0	72.9	93.5	130.6	
	HD-460	47.4	52.7	59.4	68.1	80.0	97.3	124.7	174.2	
	HD-580	59.3	65.9	74.3	85.2	100.0	121.6	155.8	217.7	
	HD-810	83.0	92.2	104.0	119.2	140.0	170.2	218.2	304.8	
	HD-1040	106.7	118.6	133.7	153.3	180.0	218.8	280.5	391.9	
	HD-1260	130.4	145.0	163.4	187.3	220.0	267.4	342.9	479.0	
	HD-1500	154.1	171.3	193.1	221.4	260.0	316.1	405.2	566.1	
	HD-2000	204.9	227.3	255.4	292.0	341.6	413.5	528.0	737.5	
HDL	1.75	HDL- 295	36.6	40.9	46.4	53.6	63.5	78.4	103.5	157.5
		HDL- 390	48.9	54.6	61.8	71.4	84.7	104.5	138.0	210.0
		HDL- 490	61.1	68.2	77.3	89.3	105.9	130.7	172.5	262.5
		HDL- 685	85.5	95.5	108.2	125.0	148.2	182.9	241.5	367.5
		HDL- 880	109.9	122.8	139.1	160.7	190.6	235.2	310.5	472.5
		HDL-1075	134.3	150.0	170.0	196.4	232.9	287.5	379.5	577.5
		HDL-1270	158.8	177.3	200.9	232.1	275.3	339.7	448.5	682.5
		HDL-1700	207.6	231.9	262.8	303.5	360.0	444.3	586.5	892.5
	1.84	HDL- 295	33.3	37.0	41.8	48.1	56.7	69.5	90.7	133.7
		HDL- 390	44.3	49.4	55.8	64.1	75.6	92.7	120.9	178.2
		HDL- 490	65.4	71.7	79.7	90.2	104.6	125.9	161.2	222.8
		HDL- 685	77.6	86.4	97.6	112.2	132.4	162.2	211.6	311.9
		HDL- 880	99.8	111.1	125.4	144.3	170.2	208.5	272.1	401.0
		HDL-1075	121.9	135.8	153.3	176.3	208.0	254.9	332.6	490.1
		HDL-1270	144.1	160.5	181.2	208.4	245.9	301.2	393.0	579.2
		HDL-1700	188.4	209.8	237.0	272.5	321.5	393.9	514.0	757.4
	1.88	HDL- 295	31.3	34.8	39.3	45.1	53.0	64.4	82.7	116.4
		HDL- 390	41.7	46.4	52.3	60.1	70.6	85.9	110.3	155.2
		HDL- 490	52.1	58.0	65.4	75.1	88.3	107.4	137.9	193.9
		HDL- 685	73.0	81.2	91.6	105.1	123.6	150.4	193.0	271.5
HDL- 880		93.9	104.4	117.8	135.2	158.9	193.3	248.2	349.1	
HDL-1075		114.7	127.6	144.0	165.2	194.2	236.3	303.4	426.7	
HDL-1270		135.6	150.9	170.1	195.3	229.5	279.3	358.5	504.3	
HDL-1700		177.3	197.3	222.5	255.4	300.2	365.2	468.8	659.4	
1.90	HDL- 295	30.3	33.7	38.0	43.5	51.0	61.7	78.3	106.7	
	HDL- 390	40.4	44.9	50.6	58.0	68.0	82.3	104.4	142.3	
	HDL- 490	50.5	56.1	63.3	72.5	85.0	102.9	130.4	177.8	
	HDL- 685	70.7	78.6	88.6	101.5	119.0	144.0	182.6	249.0	
	HDL- 880	90.8	101.1	113.9	130.5	153.0	185.2	234.8	320.1	
	HDL-1075	111.0	123.5	139.2	159.6	187.1	226.3	287.0	391.2	
	HDL-1270	131.2	146.0	164.5	188.6	221.1	267.5	339.2	462.3	
	HDL-1700	171.6	190.9	215.1	246.6	289.1	349.8	443.5	604.6	

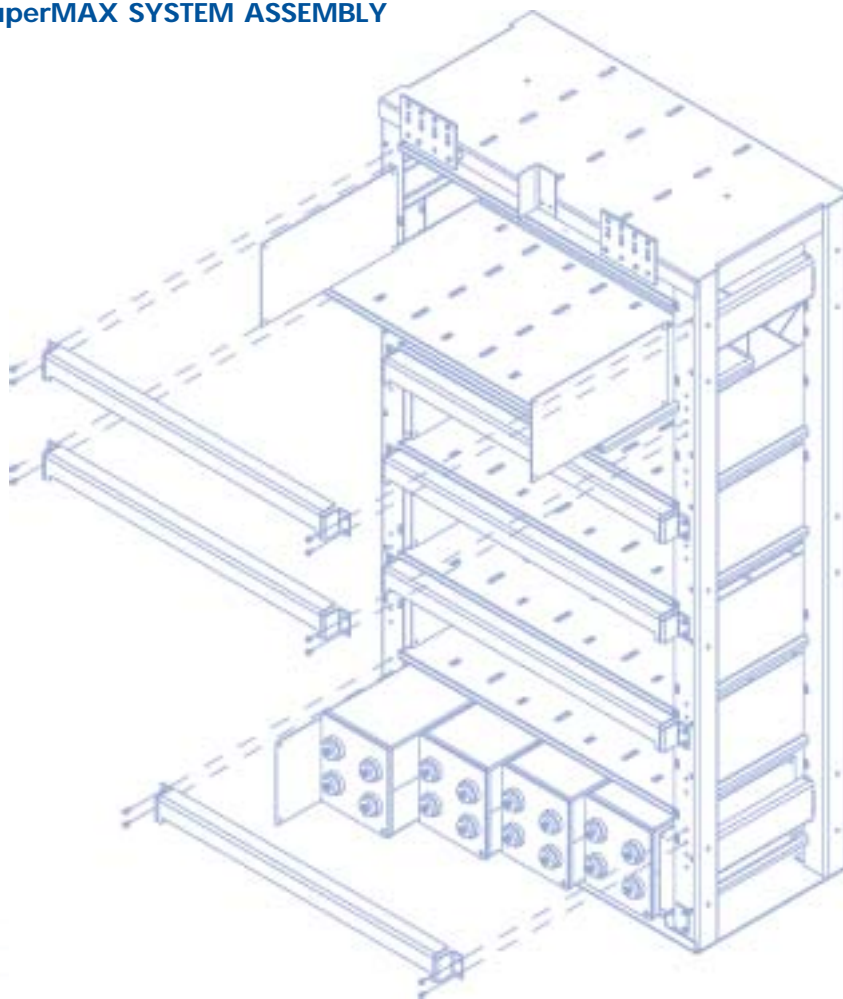
Note: All ratings conform to IEEE-485. Additional ratings available on the C&D Technologies Powercom Battery Selection Application Program at www.cdpower.com.net.

RATINGS IN KILOWATTS AT 77F (25C) (PER CELL)

FV/Cell	Model	1 hr	30 min	15 min	1 min
1.67	HD-350	0.357	0.498	0.641	0.802
	HD-460	0.476	0.664	0.854	1.070
	HD-580	0.596	0.830	1.068	1.337
	HD-810	0.834	1.162	1.495	1.872
	HD-1040	1.072	1.494	1.922	2.407
	HD-1500	1.548	2.158	2.776	3.476

Note: All rates conform to IEEE-485. Additional ratings available on the C&D Technologies Powercom Battery Selection Application Program at www.cdpowercom.net

TYPICAL SuperMAX SYSTEM ASSEMBLY



Visit the C&D Technologies' Powercom web site at www.cdtechno.com for Liberty 2000 SuperMAX system assembly drawings.

C&D TECHNOLOGIES, INC.

POWERCOM DIVISION

1400 Union Meeting Road
P.O. Box 3053 • Blue Bell, PA 19422-0858
(215) 619-2700 • Fax (215) 619-7899 • (800) 543-8630
powercom@cdtechno.com
www.cdtechno.com

Any data, descriptions or specifications presented herein are subject to revision by C&D Technologies, Inc. without notice. While such information is believed to be accurate as indicated herein, C&D Technologies, Inc. makes no warranty and hereby disclaims all warranties, express or implied, with regard to the accuracy or completeness of such information. Further, because the product(s) featured herein may be used under conditions beyond its control, C&D Technologies, Inc. hereby disclaims all warranties, either express or implied, concerning the fitness or suitability of such product(s) for any particular use or in any specific application or arising from any course of dealing or usage of trade. The user is solely responsible for determining the suitability of the product(s) featured herein for user's intended purpose and in user's specific application.