

## 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

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

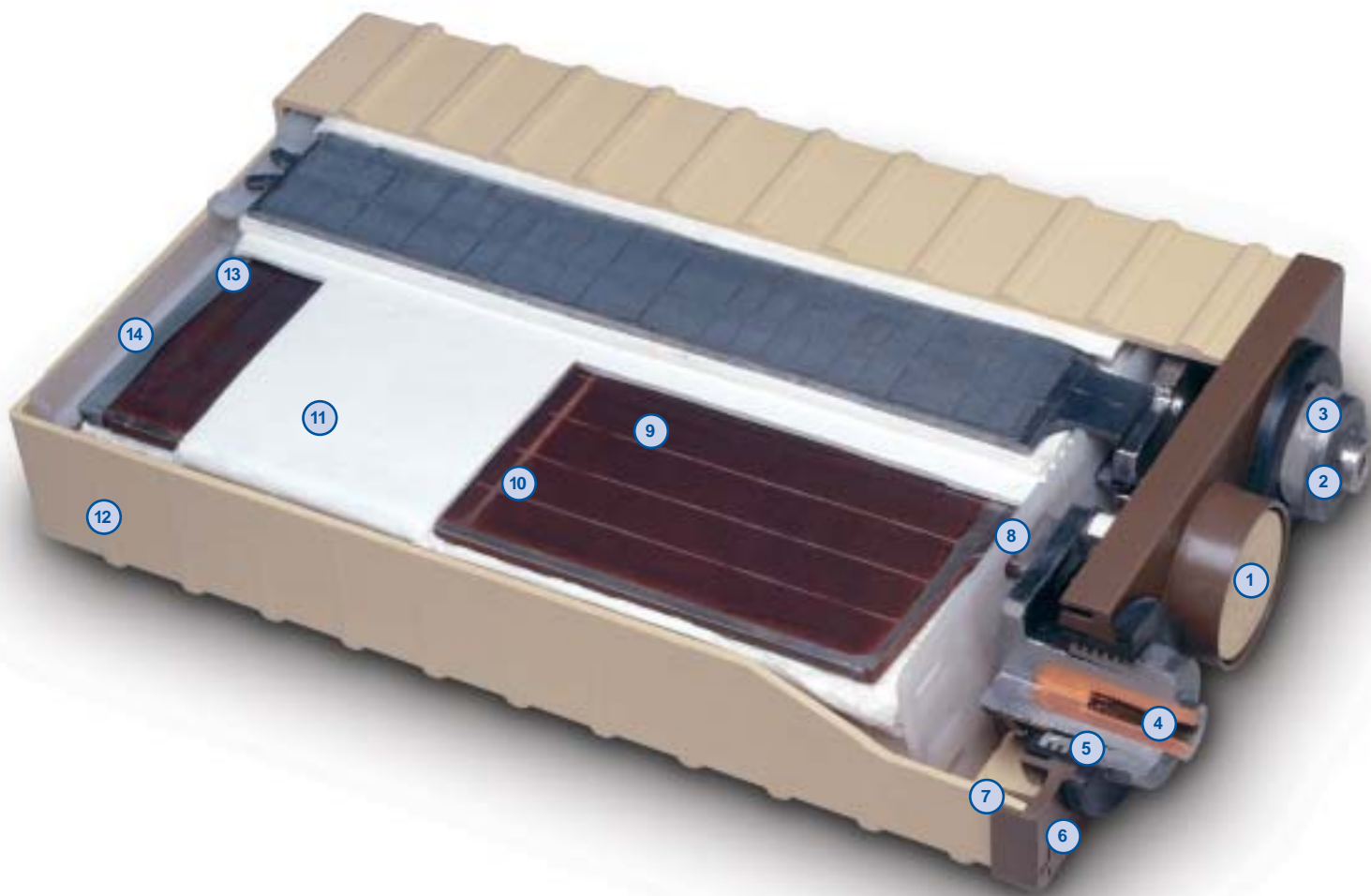
## FEATURES AND BENEFITS

- **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)

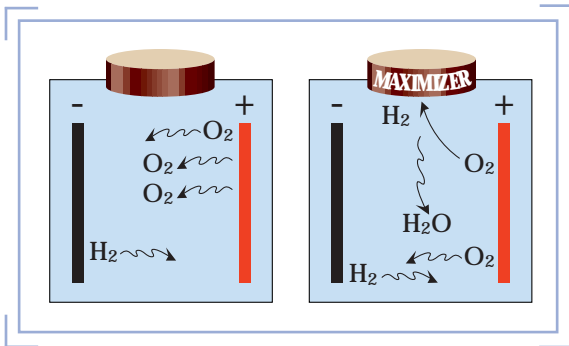
## SPECIFICATIONS

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	

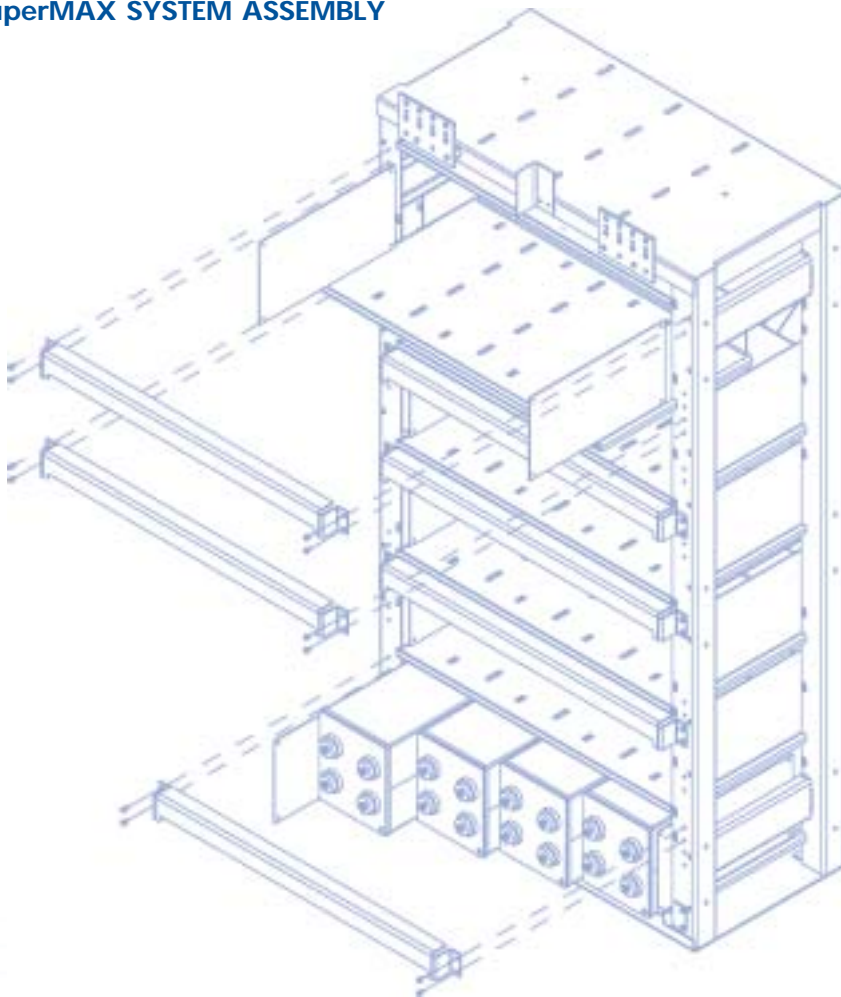
Note: All ratings conform to IEEE-485. Additional ratings available on the C&D Technologies Powercom Battery Selection Application Program at [www.cdpower.com.net](http://www.cdpower.com.net).

## 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](http://www.cdpowercom.net)

## TYPICAL SuperMAX SYSTEM ASSEMBLY



Visit the C&D Technologies' Powercom web site at [www.cdtechno.com](http://www.cdtechno.com) for Liberty 2000 SuperMAX system assembly drawings.

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