AES
ADVANCED ENERGY STORAGE

C&D TECHNOLOGIES

RENEWABLE ENERGY & PARTIAL STATE OF CHARGE SOLUTIONS

DESIGNED FOR USE IN SOLAR, RENEWABLE, WIND AND HYBRID ENERGY SYSTEMS AND SOLUTIONS

Liberty® AES

C&D TECHNOLOGIES

THE LIBERTY AES 50 SERIES CYCLE BATTERY

FOR RENEWABLE ENERGY STORAGE APPLICATIONS

The Liberty® AES features the proven DCS technology for maximum cycle life in a space efficient, cost effective package. The DCS technology coupled with an advanced C&D Nano-Carbon® enhanced negative electrode provides time proven results and unmatched, industry leading cycle life, even in partial state of charge (PSoC) operation.

Modular systems & single jacketed cells available

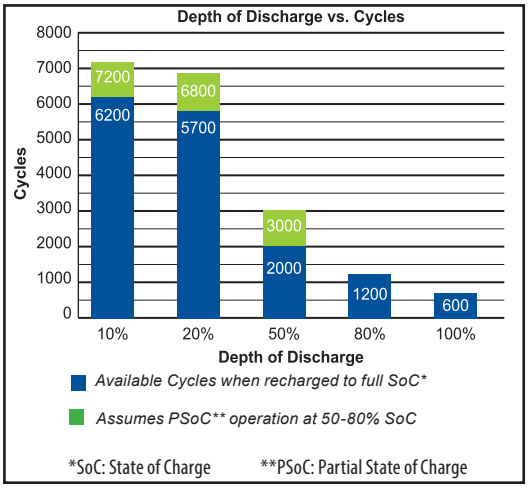
FEATURES & BENEFITS

- 95% round trip efficiency
- 99.9% charge efficiency
- 20 year design life
- High density pasted plates for high cycle life
- Every cell capacity tested to ensure performance
- C&D Nano-Carbon® enhanced active material to maximize cycle performance and PSoC operation
- Low calcium Lead/Tin alloy plates for efficient gas recombination for long life in both cycling and float applications
- Absorbent Glass Mat (AGM) technology for efficient gas recombination of up to 99% and freedom from electrolyte maintenance
- Threaded copper alloy inserts for reduced maintenance and increased safety
- Reduced system hardware for rapid installation
- Flame retardant UL94V0/28% LOI standard
- Terminal versatility - ease of diagnostic readings with C&D Ohmic Ring®
- Meets IBC and UBC seismic requirements
- Non-Spillable design is classified as non-hazardous for any mode of transportation (land, air and water)
- 100% helium leak tested and dielectric tested to ensure seal integrity
- UL-recognized component

APPLICATIONS

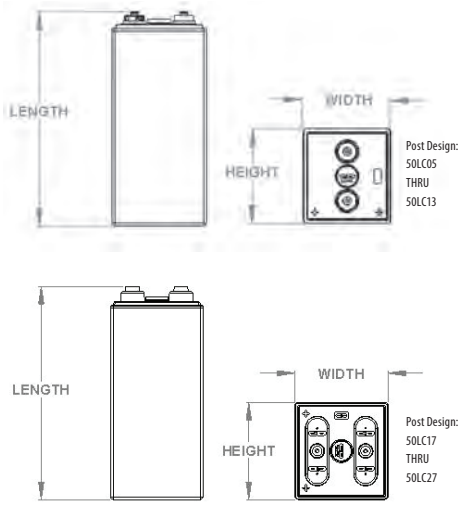
- Telephone Central Offices
- Mobile Telephone Switching Office
- Cable Head End Sites
- Fiber Optic Regenerator Sites
- Microwave Repeater Sites
- Telephone & Internet Network Nodes

INDUSTRY LEADING CYCLE LIFE



DIMENSIONS

Liberty AES Model	Height		Width		Length		Weight	
	inches	mm	inches	mm	inches	mm	lbs	kg
50LC05	6.19	157	2.00	51	13.96	355	19	8.6
50LC09			3.50	89			30	13.6
50LC13			5.00	127			44	20.0
50LC17	6.50	165	6.25	159	14.23	361	58	26.3
50LC19	7.25	184					63	28.6
50LC21	8.00	203					71	32.2
50LC23	8.75	222					77	34.9
50LC25	9.50	241					83	37.6
50LC27	10.25	260					94	42.6
50LC29	11.00	279					100	45.4
50LC31	11.75	299					107	48.5
50LC33	12.50	318					113	51.3



CELL SPECIFICATIONS

Voltage	2 VDC Nominal per cell
Typical Operating Temperature	77°F (25°C)
Connection Torque	110 in-lbs (12.4 N-m)
Recommended float charging voltage	2.25 - 2.27 Volts per cell @ 77°F (25°C)
Recommended cycle service voltage	2.35 - 2.40 Volts per cell @ 77°F (25°C)
Recommended charging current limit	6 x I_{10} w/voltage limit of 2.40 Volts per cell @ 77°F (25°C)
Charger temperature compensation (not recommended for cycle service)	-2mV/cell/°F above 77°F (25°C) +2mV/cell/°F below 77°F (25°C)

PERFORMANCE SPECIFICATIONS

Hours	Amperes* to 1.75 VPC @ 77°F (25°C)									
	1	2	4	5	6	8	10	12	20	24
50LC05	54.1	34.2	20.6	17.5	15.3	12.4	10.6	9.2	6.2	5.3
50LC09	112.9	71.8	42.4	35.8	31.1	24.9	20.9	18.0	11.7	10.0
50LC13	169.3	107.6	63.6	53.7	46.7	37.4	31.3	27.0	17.6	15.0
50LC17	225.7	143.5	84.8	71.6	62.3	49.8	41.8	36.0	23.4	20.0
50LC19	253.9	161.4	95.4	80.6	70.1	56.1	47.0	40.5	26.4	22.5
50LC21	282.1	179.4	106.0	89.5	77.9	62.3	52.2	45.0	29.3	25.0
50LC23	310.3	197.3	116.6	98.5	85.7	68.5	57.4	49.5	32.2	27.5
50LC25	338.6	215.3	127.2	107.4	93.4	74.8	62.6	54.0	35.2	30.0
50LC27	366.8	233.2	137.8	116.4	101.2	81.0	67.8	58.5	38.1	32.5
50LC29	375.2	238.6	141.0	119.0	103.6	82.9	69.4	59.9	39.0	33.3
50LC31	402.0	255.6	151.1	127.5	111.0	88.8	74.4	64.2	41.8	35.6
50LC33	428.8	272.7	161.1	136.0	118.4	94.7	79.3	68.4	44.5	38.0

*All ratings are subject to change by C&D Technologies, Inc.

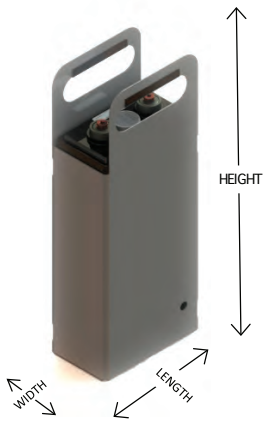
MODULE CONFIGURATIONS

Module Type	Nominal System Voltage	Nominal Ah Capacity (20 hr)	Stacking Dimensions						Unpacked Weight	
			Width		Height*		Depth**			
			in	mm	in	mm	in	mm	lbs	kg
12-50LC05	24	124	16.84	428	13.07	332	13.69	348	269	122
12-50LC09	24	234	25.78	655					422	191
12-50LC13	24	352	34.78	883					610	277
3-50LC17	6	468	21.91	557	6.88	175	16.08	408	218	99
4-50LC17	8		28.25	718					283	128
3-50LC19	6	528	21.91	557	7.63	194			233	106
4-50LC19	8		28.25	718					304	138
3-50LC21	6	586	21.91	557	8.38	213			258	117
4-50LC21	8		28.25	718					337	153
3-50LC23	6	644	21.91	557	9.13	232			276	125
4-50LC23	8		28.25	718					360	163
3-50LC25	6	704	21.91	557	9.88	251			296	134
4-50LC25	8		28.25	718					389	176
3-50LC27	6	762	21.91	557	10.63	270			329	149
4-50LC27	8		28.25	718					431	195
3-50LC29	6	741	21.91	557	11.38	289			348	158
4-50LC29	8		28.25	718					455	206
3-50LC31	6	794	21.91	557	12.13	308			371	168
4-50LC31	8		28.25	718					484	220
3-50LC33	6	846	21.91	557	12.88	327			390	177
4-50LC33	8		28.25	718					511	232

*Height does not include base. Typical base height is 4.00" (102 mm)
** Depth does not include terminal protection. Typical terminal protection adds 0.50" (12.7 mm)

SINGLE CELL TRAY DIMENSIONS

Liberty AES Model	Height		Width		Length		Weight	
	in	mm	in	mm	in	mm	lbs	kg
50LC05	17.12	435	2.20	56	6.37	162	24	11
50LC09			3.69	94			36	16
50LC13			5.19	132			50	23
50LC17	17.13	435	6.78	172	6.58	168	71	32
50LC19			7.53	191			76	35
50LC21			8.28	210			85	39
50LC23			9.03	229			92	42
50LC25			9.78	248			98	45
50LC27			10.53	267			110	50
50LC29			11.34	288	6.64	169	122	55
50LC31			12.09	307			130	59
50LC33			12.84	326			136	62



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