



UL Recognized Component



LIBERTY® SERIES 1000

VALVE REGULATED LEAD-CALCIUM BATTERY FOR STANDBY APPLICATIONS

Capacities from 55 to 600 Ampere-hours (8 hours to 1.75 VPC)
172 to 2060 Watts per cell (15 mins to 1.67 VPC)

C&D Technologies' valve regulated lead-acid (VRLA) batteries are engineered to provide 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® Series 1000 10-year VRLA product fits virtually anywhere and provides superior performance in the most demanding applications.

APPLICATIONS

Telecom

- Customer Premise
- Broadband
- Wireless
- PBX
- Repeaters
- Fixed Wireline
- Outside Plants
- Underground Battery Vaults

Switchgear Utility

- Electric Utility
- Railway Signals
- Emergency Systems
- Manufacturing Facilities
 - Assembly Lines
 - Process Controls
- Petrochemical processing plants
- Pipelines

UPS

- Data Centers
- Network Operations Centers
- Industrial Process Control Facilities
- Semiconductor Manufacturing
- Banks & Financial Markets
- Power Generation Plants
- Hospital & Testing Laboratories
- Emergency 911 response centers

SPECIFICATIONS

Electrolyte at 77°F (25°C)	1.300 specific gravity nominal sulfuric acid
System float voltages	2.25–2.27 volts per cell
Life expectancy	10 years, full float service at 77°F (25°C)
Container and cover	High-impact, flame-retardant PVC Flammability ratings: UL 94-V0; ASTM D-635, self-extinguishing Oxygen index > 32
Safety vent system	Low-pressure release valve with flash arrester

Note: AC ripple current from the charger shall not exceed 5 percent of the 8 hour (ampere-hour) rating of the battery.

FEATURES & BENEFITS

- Advanced, computer-controlled thermal cover-to-jar weld for greater reliability and consistency
- Automated, state-of-the-art, cast-on strap process ensures consistent, high-quality, low electrical-resistance welds
- Through-the-partition intercell connection shortens current paths and increases performance
- Copper-to-copper connections minimize resistance, especially at high rates, and shorten maintenance time by reducing the need for retorquing connections
- Patented and time-tested C&D post seal design with secondary epoxy seal to increase integrity
 - Leak-free operation
 - Superior reliability
- Two-fold vent system, comprised of a low-pressure safety valve with flash arrester, minimizes bulging and prevents flashback explosion from external ignition source
- Thick radial grid design for both positive and negative plates improves current carrying capacity and performance resulting in long float life
- Fully automated vacuum and filling operation results in uniform acid volume distribution and consistent float voltage
- Immobilized electrolyte technology using an absorbent glass mat design (AGM) offers safe handling and storage
- Non-spillable designation on most models for lower shipping cost
- High-impact resistant PVC container and cover provide excellent water vapor retention, preventing dry out and oxygen infiltration

MEASURABLE QUALITY AND OUTSTANDING PERFORMANCE

- 100 percent of cells tested for conductance, voltage and capacity
- Tested in accordance with Bellcore TR-NWT-000766 specifications
- 100 percent of cells tested to 95 percent capacity at the 8 hour rate to 1.75 VPC

SPECIFICATION

	LS 12-55	LS 12-80	LS 12-100	LS 6-200	LS 4-300	LS 2-600*
Nominal voltage	12 volts	12 volts	12 volts	6 volts	4 volts	2 volts
Number of cells	6 / unit	6 / unit	6 / unit	3 / unit	2 / unit	1 / unit
Rated 8-hr to capacity (ampere-hours to 1.75 VPC)	52 Ah to 10.5 volts	80 Ah to 10.5 volts	100 Ah to 10.5 volts	200 Ah to 5.25 volts	300 Ah to 3.5 volts	600 Ah to 1.75 volts
Rated 15-min capacity (watts per cell to 1.67 VPC)	172	286	344	688	1032	2063
Internal resistance per cell	0.001570 Ohms	0.000940 Ohms	0.000786 Ohms	0.000393 Ohms	0.000262 Ohms	0.000131 Ohms
Short circuit current	1274 A	2128 A	2545 A	5089 A	7634 A	15267 A
Unit height	8.95 in (227 mm)	8.95 in (227 mm)	8.95 in (227 mm)	8.95 in (227 mm)	8.95 in (227 mm)	8.95 in (227 mm)
Unit length (includes handles)	10.14 in (257 mm)	13.94 in (354 mm)	16.58 in (421 mm)	16.58 in (421 mm)	16.58 in (421 mm)	16.58 in (421 mm)
Unit width	6.80 in (173 mm)	6.84 in (174 mm)	6.84 in (174 mm)	6.84 in (174 mm)	6.84 in (174 mm)	6.84 in (174 mm)
Weight	56 lbs (25 kg)	79 lbs (36 kg)	95 lbs (43 kg)	95 lbs (43 kg)	95 lbs (43 kg)	95 lbs (43 kg)
Plate thickness positive	0.140 in (3.56 mm)					
negative						
Terminal characteristics	0.55 in diameter, threaded-brass insert, 0.50 in deep Fasten with 10-32 stainless steel hex bolt /washer.		0.625 in diameter, threaded copper insert, 0.75 in deep. Fasten with 1/4-20 stainless steel hex bolt /washer.			

* 2 cells connected in parallel for 2-volt units

RATINGS IN AMPERES AT 77°F (25°C)

Final volts per cell	Reserve Time														
	Models	1 min	5 min	10 min	15 min	30 min	1 hr	2 hr	3 hr	4 hr	5 hr	6 hr	8 hr	10 hr	20 hr
1.95	LS12-55	61.6	57.6	52.4	47.3	35.0	22.8	14.1	10.3	8.2	6.8	5.8	4.5	3.8	2.1
	LS12-80	98.6	92.1	83.8	75.7	56.0	36.6	22.5	16.5	13.1	10.8	9.2	7.2	6.0	3.3
	LS12-100	123.2	115.1	104.8	94.6	70.0	45.7	28.1	20.7	16.3	13.5	11.6	9.1	7.5	4.1
	LS6-200	246.5	230.2	209.5	189.3	140.1	91.4	56.3	41.3	32.7	27.0	23.1	18.1	15.0	8.3
	LS4-300	372.6	348.5	317.8	287.6	213.4	139.1	85.5	62.0	49.0	40.5	34.7	27.2	22.5	12.4
	LS2-600	739.4	690.6	628.6	567.8	420.2	274.2	168.8	124.0	98.0	81.0	69.3	54.3	45.0	24.8
1.90	LS12-55	93.7	84.7	73.5	63.4	43.7	27.7	16.7	12.1	9.5	7.9	6.7	5.2	4.3	2.3
	LS12-80	150.0	135.5	117.6	101.5	69.9	44.4	26.7	19.3	15.2	12.6	10.8	8.4	6.9	3.7
	LS12-100	187.5	169.4	147.0	126.8	87.4	55.5	33.4	24.2	19.0	15.8	13.5	10.5	8.6	4.7
	LS6-200	374.9	338.8	293.9	253.6	174.9	110.9	66.7	47.2	38.1	31.6	27.0	21.0	17.2	9.3
	LS4-300	562.4	508.2	440.9	380.4	262.3	166.4	100.1	72.6	57.1	47.4	40.5	31.5	25.9	14.0
	LS2-600	1124.7	1016.4	881.8	760.9	524.6	332.7	200.2	145.1	114.3	94.8	81.0	62.9	51.7	27.9
1.88	LS12-55	108.0	95.5	80.7	68.5	46.5	29.0	17.3	12.6	9.9	8.2	7.1	5.5	4.5	2.4
	LS12-80	172.6	153.2	129.5	109.5	74.0	46.7	27.9	20.2	16.0	13.2	11.2	8.7	7.2	3.8
	LS12-100	216.1	191.0	161.5	137.0	93.0	58.1	34.8	25.2	19.9	16.5	14.2	11.0	9.1	4.8
	LS6-200	431.9	382.3	323.2	273.9	185.7	113.5	69.7	50.4	39.8	33.0	28.3	22.1	18.1	9.7
	LS4-300	616.2	548.5	467.9	399.6	273.0	171.3	102.5	74.3	58.9	49.0	42.1	32.9	27.1	14.4
	LS2-600	1295.2	1148.3	970.7	820.2	562.0	350.9	208.0	151.1	119.5	99.1	84.7	65.8	53.9	28.3
1.85	LS12-55	129.3	112.1	91.7	76.0	50.7	31.2	18.6	13.4	10.6	8.8	7.5	5.8	4.7	2.5
	LS12-80	206.9	179.4	146.8	121.5	81.2	49.9	29.7	21.5	17.0	14.0	12.0	9.3	7.6	4.0
	LS12-100	258.6	224.2	183.5	151.9	101.5	62.4	37.1	26.9	21.2	17.5	15.0	11.6	9.5	5.0
	LS6-200	517.1	448.4	367.0	303.8	203.0	124.8	74.2	53.8	42.4	35.1	30.0	23.2	19.0	9.9
	LS4-300	775.7	672.6	550.5	455.8	304.5	187.3	111.3	80.7	63.6	52.6	44.9	34.8	28.4	14.9
	LS2-600	1551.4	1345.3	1100.9	911.5	609.0	374.5	222.6	161.4	127.2	105.3	89.9	69.6	56.9	29.7
1.84	LS12-55	136.4	117.0	94.7	77.9	51.6	31.6	18.8	13.6	10.7	8.9	7.6	5.9	4.8	2.5
	LS12-80	218.2	187.1	151.4	124.7	82.6	50.6	30.1	21.8	17.2	14.2	12.1	9.4	7.7	4.0
	LS12-100	272.7	233.9	189.3	155.8	103.2	63.3	37.6	27.3	21.6	17.9	15.3	11.9	9.7	5.1
	LS6-200	545.4	467.9	378.6	311.7	206.5	126.6	75.1	54.6	43.2	35.8	30.6	23.8	19.5	10.2
	LS4-300	818.2	701.8	567.9	467.5	309.7	189.8	112.9	81.8	64.4	53.3	45.5	35.2	28.7	15.0
	LS2-600	1636.4	1403.6	1135.8	935.0	619.4	379.6	225.8	163.6	128.9	106.6	90.9	70.4	57.4	30.0
1.80	LS12-55	164.7	136.2	106.5	85.9	55.0	33.5	19.9	14.3	11.3	9.3	7.9	6.1	5.0	2.6
	LS12-80	263.5	218.0	170.4	137.4	88.0	53.6	31.8	22.9	18.0	14.9	12.7	9.8	8.0	4.2
	LS12-100	329.4	272.4	213.0	171.7	110.1	67.0	39.7	28.7	22.5	18.6	15.8	12.2	10.0	5.2
	LS6-200	658.8	544.9	426.0	343.5	220.1	134.1	79.4	57.4	45.1	37.2	31.7	24.5	20.0	10.4
	LS4-300	988.2	817.3	639.0	515.2	330.2	201.1	119.2	86.0	67.6	55.8	47.5	36.7	29.9	15.6
	LS2-600	1976.5	1634.7	1278.0	1030.4	660.3	402.2	238.3	172.1	135.3	111.6	95.1	73.5	59.9	31.2
1.78	LS12-55	179.1	142.3	108.8	87.5	56.1	34.0	20.2	14.6	11.5	9.5	8.1	6.3	5.1	2.7
	LS12-80	286.7	227.3	174.5	140.2	89.6	54.4	32.2	23.2	18.3	15.1	12.8	9.9	8.1	4.2
	LS12-100	358.4	284.2	218.2	175.3	112.0	68.0	40.2	29.1	22.8	18.8	16.1	12.4	10.1	5.3
	LS6-200	716.5	569.3	435.1	350.1	224.5	135.5	80.5	58.2	45.7	37.7	32.1	24.8	20.2	10.5
	LS4-300	1075.1	852.5	654.5	525.9	336.1	204.0	120.7	87.2	68.5	56.5	48.2	37.2	30.3	15.8
	LS2-600	2149.6	1708.0	1305.3	1050.4	673.4	406.6	241.6	174.6	137.2	113.2	96.4	74.4	60.6	31.5
1.75	LS12-55	200.9	151.1	112.7	90.2	57.5	34.7	20.5	14.9	11.8	9.8	8.4	6.5	5.3	2.8
	LS12-80	321.4	241.7	180.3	144.3	92.1	55.5	32.8	23.7	18.6	15.4	13.1	10.0	8.2	4.3
	LS12-100	401.7	302.2	225.4	180.3	115.1	69.4	41.0	29.6	23.3	19.2	16.4	12.6	10.3	5.4
	LS6-200	803.5	604.4	450.7	360.6	230.1	138.8	82.1	59.3	46.6	38.4	32.7	25.0	20.6	10.7
	LS4-300	1205.2	906.5	676.1	540.9	345.2	208.2	123.1	88.9	69.9	57.7	49.1	37.5	30.9	16.1
	LS2-600	2410.4	1813.1	1352.2	1081.9	690.4	416.4	246.3	177.8	139.7	115.3	98.2	75.0	61.9	32.2

Note: Liberty Series 1000 batteries are tested to 95 percent of published rates at time of shipment at 8 hour rate to 1.75 VPC. Additional ratings and application information is available in the Battery Selection Program at www.cdstandbypower.net

RATINGS IN KW PER CELL AT 77°F (25°C)

Final volts per cell	Reserve Time										
	Models	1 min	5 min	10 min	15 min	20 min	30 min	1 hr	3 hr	5 hr	8 hr
1.95	LS12-55	0.120	0.113	0.103	0.094	0.085	0.070	0.045	0.021	0.014	0.009
	LS12-80	0.200	0.188	0.172	0.156	0.141	0.116	0.076	0.034	0.023	0.015
	LS12-100	0.240	0.225	0.207	0.188	0.170	0.139	0.091	0.041	0.028	0.018
	LS6-200	0.480	0.451	0.413	0.375	0.339	0.279	0.181	0.083	0.055	0.037
	LS4-300	0.720	0.676	0.620	0.563	0.509	0.418	0.272	0.124	0.083	0.055
	LS2-600	1.440	1.353	1.239	1.126	1.017	0.836	0.544	0.248	0.165	0.111
1.90	LS12-55	0.178	0.162	0.142	0.123	0.108	0.086	0.055	0.024	0.016	0.010
	LS12-80	0.297	0.270	0.236	0.206	0.180	0.143	0.091	0.040	0.026	0.017
	LS12-100	0.357	0.324	0.284	0.247	0.216	0.172	0.109	0.048	0.032	0.021
	LS6-200	0.713	0.649	0.568	0.493	0.431	0.343	0.219	0.096	0.063	0.042
	LS4-300	1.070	0.973	0.851	0.740	0.647	0.515	0.328	0.144	0.095	0.063
	LS2-600	2.139	1.946	1.703	1.480	1.294	1.030	0.657	0.289	0.189	0.126
1.85	LS12-55	0.296	0.251	0.200	0.162	0.137	0.105	0.065	0.028	0.018	0.012
	LS12-80	0.399	0.351	0.291	0.242	0.207	0.163	0.101	0.044	0.029	0.019
	LS12-100	0.479	0.421	0.349	0.291	0.249	0.196	0.122	0.053	0.035	0.023
	LS6-200	0.958	0.842	0.698	0.581	0.497	0.392	0.243	0.106	0.070	0.046
	LS4-300	1.436	1.263	1.047	0.872	0.746	0.588	0.365	0.159	0.105	0.070
	LS2-600	2.873	2.525	2.094	1.744	1.492	1.175	0.729	0.319	0.209	0.139
1.80	LS12-55	0.296	0.251	0.200	0.162	0.137	0.105	0.065	0.028	0.018	0.012
	LS12-80	0.494	0.419	0.333	0.270	0.228	0.176	0.108	0.047	0.030	0.020
	LS12-100	0.593	0.502	0.399	0.324	0.274	0.211	0.130	0.056	0.037	0.024
	LS6-200	1.186	1.005	0.799	0.649	0.548	0.422	0.260	0.113	0.073	0.048
	LS4-300	1.779	1.507	1.198	0.973	0.822	0.633	0.391	0.169	0.110	0.072
	LS2-600	3.558	3.015	2.396	1.946	1.643	1.265	0.781	0.338	0.219	0.145
1.75	LS12-55	0.352	0.274	0.208	0.168	0.142	0.110	0.067	0.029	0.019	0.013
	LS12-80	0.586	0.456	0.347	0.281	0.237	0.183	0.112	0.048	0.031	0.021
	LS12-100	0.703	0.547	0.416	0.337	0.284	0.219	0.134	0.058	0.038	0.025
	LS6-200	1.406	1.094	0.832	0.673	0.568	0.438	0.268	0.116	0.075	0.050
	LS4-300	2.109	1.642	1.249	1.010	0.853	0.657	0.402	0.174	0.113	0.074
	LS2-600	4.218	3.283	2.497	2.020	1.705	1.314	0.804	0.348	0.226	0.149
1.70	LS12-55	0.400	0.287	0.213	0.172	0.145	0.111	0.067	Not recommended to discharge longer than 1 hour below 1.75 VPC.		
	LS12-80	0.667	0.479	0.355	0.286	0.241	0.185	0.112			
	LS12-100	0.801	0.575	0.426	0.343	0.289	0.222	0.134			
	LS6-200	1.602	1.149	0.853	0.687	0.579	0.445	0.268			
	LS4-300	2.403	1.724	1.279	1.030	0.868	0.667	0.402			
	LS2-600	4.805	3.448	2.558	2.060	1.737	1.335	0.803			
1.67	LS12-55	0.429	0.296	0.218	0.172	Not recommended to discharge longer than 15 min. below 1.70 VPC.					
	LS12-80	0.714	0.494	0.363	0.286						
	LS12-100	0.857	0.592	0.436	0.343						
	LS6-200	1.715	1.186	0.872	0.687						
	LS4-300	2.571	1.777	1.309	1.030						
	LS2-600	5.143	3.554	2.618	2.060						
1.65	LS12-55	0.447	0.302	0.219	0.172	Not recommended to discharge longer than 15 min. below 1.70 VPC.					
	LS12-80	0.738	0.501	0.364	0.287						
	LS12-100	0.893	0.603	0.436	0.344						
	LS6-200	1.787	1.205	0.873	0.689						
	LS4-300	2.680	1.808	1.309	1.033						
	LS2-600	5.360	3.615	2.618	2.067						
1.63	LS12-55	0.465	0.306	0.219	0.173	Not recommended to discharge longer than 15 min. below 1.70 VPC.					
	LS12-80	0.774	0.509	0.364	0.288						
	LS12-100	0.929	0.612	0.437	0.345						
	LS6-200	1.859	1.223	0.874	0.691						
	LS4-300	2.788	1.836	1.310	1.036						
	LS2-600	5.576	3.671	2.620	2.072						

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OPTIONAL ACCESSORIES

Steel Jackets

For demanding applications, C&D provides optional components to enhance battery life. An optional steel jacket is available to preserve jar shape and maintain element compression in high-temperature operations.



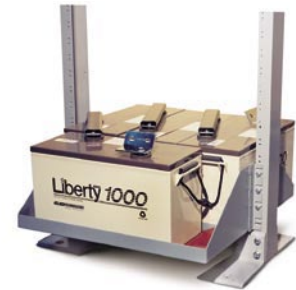
Wiring Harnesses

Special wiring harnesses are available which speed battery installation.



Relay Rack Battery Trays

C&D manufactures a wide range of battery trays to mount in 19 inch (48.3 cm) and 23 inch (58.4 cm) relay racks.



RACKS

C&D is a major supplier of high-quality VRLA battery racks to Telecommunications, Switchgear & Control, and UPS markets. Both standard and modular racks are designed and manufactured to suit all cell configurations, including multi-row and multi-tier layouts. C&D racks meet seismic loading requirements. Contact C&D Technologies for additional information.

C&D's modular racks provide a flexible, efficient method for racking Liberty Series 1000 batteries. These attractive, durable racks provide accessibility to the batteries and are easy to install. Racks are available in 29 inch (73.7 cm) and 43 inch (109.2 cm) lengths and are stackable. Optional panels are available to completely enclose racks, providing a cabinet-like appearance. Please see 12-380 for more information. Complete standby power systems from C&D include batteries, racks, and electronics.



Modular Rack with Panels



Modular Rack

NTEGRITY BATTERY CABINET SYSTEMS

Complete, pre-packaged battery cabinet systems are available from C&D Technologies. Systems include battery breaker or fuse, battery cabling and batteries – all installed and ready to connect to UPS upon installation. Options for battery monitoring will also be available.

Powder-coated steel cabinets are UL1778 listed with seismic zone 4 capability available as an option. Fast acting fuses or circuit breakers are provided for system protection. Batteries are tested to assure system integrity.

Mechanical robustness, approved electrical disconnects and high quality C&D batteries all combine to provide an easily installed complete battery system with the finished appearance of a UPS cabinet.



LCT II 1700



Liberty 1000



SAGE



DYNASTY

MCT II

A CENTURY OF EXPERIENCE YOU CAN TRUST

From our inception 100 years ago, C&D Technologies has been a pioneer in the development of energy storage and conversion systems that enable telecommunications, data transmission, computer system infrastructure and utilities to maintain critical operations during power outages. C&D supplies products to leading telecommunication companies, from the smallest outside plant and wireless site to the largest major central office switch facilities preventing loss of traffic and associated revenue. Our products are used in electrical power generation plants and substations for major electric utility companies, preventing damage to expensive infrastructure equipment. To this day, C&D continues to be the industry leader providing the highest quality of products and service along with reliable long lasting batteries for all applications. Our web site www.cdtechno.com can provide access to a nearby representative located in over 40 countries. Our century long success is due to many factors including; our products and service, our employees and sales partners, but mostly C&D's success is due to the loyalty of our customers.

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