

# Heritage™

## Calcium Flat Plate



# ES

150-1350 Ah  
0.422-3.020 Kw/Cell

## UPS

## Switchgear

### Specifications

#### PLATE DIMENSIONS:

	Height	Width
Pos:	11.4 in./290mm	9.4 in./239mm
Neg:	11.4 in./290mm	9.4 in./239mm

#### PLATE THICKNESS:

Pos:	0.20 inches (5.1mm)
Neg:	0.14 inches (3.6mm)

#### PLATE SUSPENSION TYPE:

Pos:	Bridge hung
Neg:	Bottom supported

#### CONTAINER:

Styrene acrylonitrile copolymer,  
optional Flame Retardant PVC (LOI 35)

**COVER:** Flame Retardant PVC (LOI 35)

**SEPARATOR:** Microporous plastic

**BOLT CONNECTORS:** Stainless steel,  
standard English measure, hex-head

**INTERUNIT CONNECTORS:**

Lead-plated copper

**ELECTROLYTE OVER PLATES:**

2.1 inches (53.3mm)

**VENT TYPE:**

Flame arrestor, fused alumina

**FLOAT VOLTAGE:**

ACCEPTABLE RANGE: 2.17 - 2.26 VPC

RECOMMENDED: 2.25 VPC

**SEDIMENT SPACE:** 0.75 inches (19.1mm)

**POST TYPE:** Lead-plated copper insert

ES-5 to ES-21 — one positive post  
and one negative post per cell

ES-23 to ES-37 — two positive posts  
and two negative posts per cell

**POST SEAL TYPE:** Slide-Lock™

**SPECIFIC GRAVITY:** 1.215 (1.250  
available upon request)

**WITHDRAWAL TUBE:** One per cell  
(except 37 plate size)

### Description

The Heritage ES is an economical lead-calcium flat plate battery. The ES unit is a medium power battery for high performance and short duration rates. Ideal applications are UPS and switchgear.

### Features

#### Application

- UPS
- Switchgear

#### Economical

- Calcium alloy grids for lowest water loss, resulting in lowest maintenance costs.

#### Performance

- High 1 - minute rates.
- Computerized selection of number of plates and plate thickness with respect to available "free electrolyte" to ensure optimum performance during short-duration discharges without sacrificing component integrity.

#### Durable

- 20 year life expectancy in floating service at 77°F (25°C) ambient temperature.
- Long Life Slide Lock™ post seal design.



# Capacities — Dimensions — Weights

TYPE*	NOM. Ah CAP. <sup>1</sup>	OVERALL DIMENSIONS						WEIGHTS - VOLUMES								OUTLINE DRAWING: SEE CATALOG SECTION
		LENGTH (L)**		WIDTH (W)		HEIGHT (H)		UNPACKED		DOMESTIC PACKED		ELECTROLYTE ONLY 1.215 S.G.				
		in	mm	in	mm	in	mm	lbs	kgs	lbs	kgs	lbs	kgs	gal	ℓ	
ES-5	140	5.10	130	10.8	274	18.7	475	55	24.9	57	25.9	24	10.9	2.4	9.1	
ES-7	200	5.10	130	10.8	274	18.7	475	61	27.7	63	28.6	23	10.5	2.3	8.7	
ES-9	260	5.10	130	10.8	274	18.7	475	68	30.8	70	31.8	22	10.0	2.2	8.3	
ES-11	315	5.10	130	10.8	274	18.7	475	74	33.6	76	34.5	21	9.5	2.1	7.9	
ES-13	375	5.10	130	10.8	274	18.7	475	81	36.7	83	37.6	20	9.1	2.0	7.6	
ES-15	470	6.60	168	10.8	274	18.7	475	98	44.5	101	45.8	30	13.6	3.0	11.4	
ES-17	525	6.60	168	10.8	274	18.7	475	105	47.6	108	49.0	29	13.2	2.9	11.0	
ES-19	585	6.60	168	10.8	274	18.7	475	112	50.8	115	52.2	28	12.7	2.8	10.6	
ES-21	650	6.60	168	10.8	274	18.7	475	119	54.0	123	55.8	27	12.2	2.7	10.2	
ES-23	700	8.10	206	10.8	274	18.7	475	143	64.9	147	66.7	36	16.3	3.6	13.6	
ES-25	740	8.10	206	10.8	274	18.7	475	149	67.6	153	69.5	35	15.9	3.5	13.2	
ES-27	795	8.10	206	10.8	274	18.7	475	155	70.3	160	72.6	34	15.4	3.4	12.9	
ES-29	880	10.10	257	10.8	274	18.7	475	176	79.8	181	82.2	46	20.9	4.5	17.0	
ES-31	915	10.10	257	10.8	274	18.7	475	183	83.0	188	85.4	45	20.4	4.4	16.7	
ES-33	950	10.10	257	10.8	274	18.7	475	190	86.2	196	89.0	44	20.0	4.3	16.3	
ES-35	990	10.10	257	10.8	274	18.7	475	196	88.9	202	91.7	44	20.0	4.3	16.3	
ES-37	1030	10.10	257	10.8	274	18.7	475	203	92.1	209	94.9	43	19.5	4.2	15.9	

57.30

\*Suffix number indicates total plates per cell.

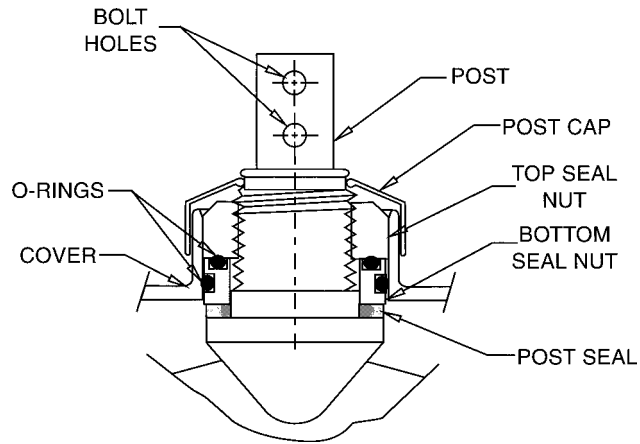
\*\* 0.25 inches must be added between cells for spacing purposes when calculating total battery length.

<sup>1</sup> Nominal Amp hour capacity at the 8 hour rate for 1.215 S.G.

All data subject to change without notice.

## Slide-Lock™ Post Seal

- No thermal stresses are introduced to the post seal, as with conventional burned-on posts.
- Slide-Lock™ design allows movement of post as plates grow during the battery's life without stressing the seal.
- O-Rings maintain seal between post and cover.



# Average Cell Performance Data\*

## Discharge Rates in Amperes \*\*

TYPE	8 HR	7 HR	6 HR	5 HR	4 HR	3 HR	2 HR	90 HR	60 MIN	30 MIN	15 MIN	5 MIN	1 MIN	1 MIN <sup>1</sup> TO 1.50 VPC
<b>TO 1.75 END VOLTS PER CELL</b>								<b>1.215 SPECIFIC GRAVITY</b>						
ES-5	17.7	20	23	26	32	39	53	65	87	144	212	265	324	796
ES-7	25.2	28	32	38	45	56	76	93	124	201	294	388	473	1165
ES-9	32.4	37	42	49	59	73	99	122	162	258	375	504	615	1514
ES-11	39.6	45	51	60	72	90	122	149	198	315	456	613	748	1847
ES-13	46.8	53	60	70	84	105	142	175	233	370	534	716	872	2158
ES-15	58.5	66	76	88	106	134	182	224	295	448	617	811	988	2453
ES-17	65.7	74	85	99	119	149	203	250	330	506	699	899	1096	2727
ES-19	72.9	82	94	109	131	163	222	273	363	562	779	981	1196	2983
ES-21	81.0	91	104	122	146	183	249	306	406	625	858	1056	1287	3219
ES-23	87.3	98	113	131	158	197	268	329	437	688	987	1329	1621	4010
ES-25	92.7	105	120	140	168	211	286	352	467	740	1067	1430	1743	4317
ES-27	99.0	112	127	148	176	220	298	368	491	788	1147	1527	1862	4615
ES-29	109.8	124	142	165	197	247	335	412	548	860	1223	1621	1976	4904
ES-31	114.3	129	147	171	205	257	348	429	572	905	1298	1710	2086	5183
ES-33	118.8	134	153	179	214	268	363	446	594	948	1372	1797	2192	5455
ES-35	123.3	139	159	186	222	278	376	463	618	994	1445	1880	2293	5713
ES-37	128.7	145	166	193	230	288	389	479	641	1037	1514	1960	2391	5964
<b>TO 1.67 END VOLTS PER CELL</b>														
ES-5	17.7	20	23	26	32	39	53	65	90	165	244	365	419	
ES-7	25.2	28	32	38	45	56	76	93	132	228	338	507	613	
ES-9	32.4	37	42	49	59	73	99	122	173	291	432	647	797	
ES-11	39.6	45	51	60	72	90	122	149	212	354	525	789	972	
ES-13	46.8	53	60	70	84	105	142	175	249	414	614	921	1136	
ES-15	58.5	66	76	88	106	134	182	224	313	479	710	1065	1291	
ES-17	65.7	74	85	99	119	149	203	250	352	542	804	1205	1435	
ES-19	72.9	82	94	109	131	163	222	273	389	605	896	1344	1570	
ES-21	81.0	91	104	122	146	183	249	306	423	665	986	1479	1694	
ES-23	87.3	98	113	131	158	197	268	329	456	766	1136	1704	2110	
ES-25	92.7	105	120	140	168	211	286	352	488	829	1228	1841	2272	
ES-27	99.0	112	127	148	176	220	298	368	518	889	1318	1977	2429	
ES-29	109.8	124	142	165	197	247	335	412	581	950	1406	2109	2581	
ES-31	114.3	129	147	171	205	257	348	429	610	1007	1493	2239	2728	
ES-33	118.8	134	153	179	214	268	363	446	638	1065	1577	2366	2870	
ES-35	123.3	139	159	186	222	278	376	463	663	1121	1660	2491	3007	
ES-37	128.7	145	166	193	230	288	389	479	687	1176	1741	2611	3139	
<b>TO 1.75 END VOLTS PER CELL</b>								<b>1.250 SPECIFIC GRAVITY</b>						
ES-5B	19.4	22	25	29	35	43	58	71	96	158	234	291	356	876
ES-7B	27.7	31	36	41	50	62	83	102	137	221	324	427	521	1282
ES-9B	35.6	40	46	54	64	81	109	134	178	284	413	554	676	1665
ES-11B	43.6	49	54	66	79	99	134	164	218	346	502	674	823	2032
ES-13B	51.5	58	66	77	92	115	156	192	256	407	587	787	959	2374
ES-15B	64.4	73	83	97	117	147	200	246	325	493	679	892	1087	2698
ES-17B	72.3	81	93	109	131	164	223	275	363	557	769	989	1206	3000
ES-19B	80.2	90	103	120	144	180	244	301	399	618	857	1079	1316	3281
ES-21B	89.1	100	115	134	160	201	274	337	446	687	943	1161	1416	3541
ES-23B	96.0	108	124	145	173	217	294	362	481	757	1086	1462	1783	4411
ES-25B	102.0	115	132	154	185	232	315	387	514	814	1174	1573	1918	4749
ES-27B	108.9	123	140	163	194	242	328	404	541	867	1261	1680	2048	5077
ES-29B	120.8	136	156	181	217	271	368	454	603	946	1345	1783	2174	5394
ES-31B	125.7	142	162	189	226	282	383	472	629	996	1428	1881	2295	5701
ES-33B	130.7	147	169	197	236	295	399	491	653	1043	1509	1977	2411	6001
ES-35B	135.6	153	175	204	245	306	414	509	680	1094	1589	2068	2523	6284
ES-37B	141.6	159	182	212	253	317	428	527	705	1141	1665	2156	2630	6560
<b>TO 1.67 END VOLTS PER CELL</b>														
ES-5B	19.4	22	25	29	35	43	58	71	99	182	268	402	461	
ES-7B	27.7	31	36	41	50	62	83	102	145	251	372	558	674	
ES-9B	35.6	40	46	54	64	81	109	134	190	320	475	712	877	
ES-11B	43.6	49	54	66	79	99	134	164	233	389	578	868	1069	
ES-13B	51.5	58	66	77	92	115	156	192	274	455	675	1013	1250	
ES-15B	64.4	73	83	97	117	147	200	246	344	527	781	1172	1420	
ES-17B	72.3	81	93	109	131	164	223	275	387	596	884	1326	1579	
ES-19B	80.2	90	103	120	144	180	244	301	428	666	986	1478	1727	
ES-21B	89.1	100	115	134	160	201	274	337	465	732	1085	1627	1863	
ES-23B	96.0	108	124	145	173	217	294	362	502	843	1250	1874	2321	
ES-25B	102.0	115	132	154	185	232	315	387	537	912	1351	2025	2499	
ES-27B	108.9	123	140	163	194	242	328	404	570	978	1450	2175	2672	
ES-29B	120.8	136	156	181	217	271	368	454	639	1045	1547	2320	2839	
ES-31B	125.7	142	162	189	226	282	383	472	671	1108	1642	2463	3001	
ES-33B	130.7	147	169	197	236	295	399	491	702	1172	1735	2603	3157	
ES-35B	135.6	153	175	204	245	306	414	509	729	1233	1826	2740	3308	
ES-37B	141.6	159	182	212	253	317	428	527	756	1294	1915	2872	3453	

\*Ampere values listed represent 100% of the cell's initial capacity.

\*\*At 77°F (25°C) includes intercell connector drop.

<sup>1</sup>One minute rates to 1.50 volts per cell should only be used for short circuit calculations and not as performance data.

All data subject to change without notice.

# Per Cell KW\* Discharge Rates in KW\*\* 1.250 Specific Gravity

TYPE	5 MIN	6 MIN	7 MIN	8 MIN	9 MIN	10 MIN	11 MIN	14 MIN	15 MIN	16 MIN	20 MIN	25 MIN	30 MIN	45 MIN	60 MIN	90 MIN	120 MIN	180 MIN	
<b>TO 1.75 END VOLTS PER CELL</b>																			
ES-5B	0.555	0.536	0.519	0.503	0.488	0.475	0.462	0.430	0.421	0.412	0.381	0.339	0.297	0.212	0.178	0.124	0.103	0.081	
ES-7B	0.767	0.742	0.719	0.698	0.678	0.660	0.642	0.597	0.584	0.572	0.526	0.469	0.411	0.294	0.260	0.184	0.151	0.117	
ES-9B	0.981	0.949	0.919	0.892	0.867	0.843	0.821	0.763	0.746	0.731	0.673	0.600	0.526	0.382	0.331	0.244	0.201	0.152	
ES-11B	1.194	1.158	1.123	1.091	1.059	1.029	1.001	0.927	0.906	0.887	0.819	0.730	0.640	0.470	0.405	0.303	0.248	0.186	
ES-13B	1.398	1.354	1.313	1.274	1.237	1.202	1.169	1.083	1.059	1.037	0.956	0.853	0.746	0.535	0.470	0.359	0.292	0.214	
ES-15B	1.614	1.563	1.516	1.471	1.429	1.389	1.351	1.254	1.226	1.201	1.107	0.987	0.864	0.635	0.595	0.435	0.358	0.278	
ES-17B	1.828	1.770	1.715	1.664	1.616	1.571	1.529	1.420	1.389	1.360	1.255	1.119	0.980	0.721	0.666	0.492	0.404	0.310	
ES-19B	2.037	1.973	1.913	1.857	1.803	1.753	1.705	1.582	1.547	1.515	1.397	1.246	1.092	0.799	0.732	0.551	0.451	0.341	
ES-21B	2.242	2.174	2.109	2.046	1.987	1.931	1.878	1.741	1.702	1.667	1.537	1.371	1.201	0.883	0.818	0.611	0.501	0.382	
ES-23B	2.583	2.502	2.426	2.354	2.287	2.223	2.162	2.005	1.961	1.920	1.772	1.581	1.386	0.999	0.882	0.668	0.546	0.407	
ES-25B	2.794	2.707	2.626	2.549	2.476	2.406	2.340	2.169	2.120	2.076	1.914	1.708	1.497	1.076	0.942	0.718	0.585	0.431	
ES-27B	2.999	2.904	2.815	2.732	2.653	2.579	2.509	2.327	2.277	2.230	2.057	1.834	1.606	1.147	0.990	0.772	0.629	0.456	
ES-29B	3.201	3.099	3.004	2.915	2.831	2.752	2.677	2.483	2.428	2.378	2.193	1.958	1.717	1.244	1.106	0.837	0.683	0.507	
ES-31B	3.397	3.291	3.191	3.097	3.008	2.923	2.843	2.636	2.578	2.524	2.328	2.077	1.821	1.313	1.155	0.891	0.726	0.531	
ES-33B	3.589	3.477	3.372	3.273	3.179	3.089	3.005	2.786	2.724	2.668	2.460	2.195	1.923	1.380	1.201	0.942	0.766	0.553	
ES-35B	3.777	3.659	3.547	3.443	3.344	3.250	3.162	2.933	2.868	2.809	2.591	2.311	2.024	1.447	1.249	0.994	0.807	0.575	
ES-37B	3.961	3.838	3.723	3.613	3.509	3.410	3.316	3.073	3.006	2.944	2.717	2.425	2.124	1.514	1.294	1.045	0.841	0.591	
<b>TO 1.70 END VOLTS PER CELL</b>																			
ES-5B	0.622	0.599	0.577	0.557	0.537	0.519	0.501	0.459	0.447	0.437	0.402	0.357	0.310	0.216	0.179	0.124	0.103	0.081	
ES-7B	0.861	0.828	0.797	0.769	0.742	0.718	0.695	0.637	0.621	0.607	0.556	0.493	0.430	0.303	0.262	0.184	0.151	0.117	
ES-9B	1.102	1.058	1.019	0.982	0.948	0.917	0.888	0.815	0.795	0.777	0.713	0.632	0.550	0.390	0.333	0.244	0.201	0.153	
ES-11B	1.342	1.292	1.245	1.201	1.160	1.120	1.084	0.991	0.966	0.944	0.866	0.768	0.668	0.477	0.409	0.303	0.248	0.186	
ES-13B	1.567	1.509	1.454	1.403	1.354	1.309	1.265	1.157	1.128	1.102	1.012	0.898	0.781	0.552	0.486	0.359	0.292	0.218	
ES-15B	1.811	1.742	1.678	1.619	1.563	1.511	1.462	1.339	1.306	1.277	1.172	1.040	0.904	0.654	0.611	0.435	0.358	0.282	
ES-17B	2.052	1.974	1.901	1.834	1.770	1.711	1.656	1.516	1.479	1.445	1.327	1.178	1.024	0.738	0.686	0.492	0.404	0.315	
ES-19B	2.285	2.199	2.119	2.044	1.973	1.907	1.845	1.690	1.648	1.611	1.479	1.313	1.140	0.820	0.757	0.551	0.451	0.347	
ES-21B	2.517	2.424	2.335	2.252	2.174	2.101	2.032	1.860	1.813	1.772	1.627	1.444	1.255	0.902	0.830	0.611	0.501	0.384	
ES-23B	2.899	2.790	2.688	2.593	2.504	2.420	2.340	2.142	2.088	2.041	1.874	1.664	1.446	1.021	0.897	0.668	0.546	0.410	
ES-25B	3.135	3.016	2.907	2.804	2.707	2.616	2.531	2.316	2.259	2.208	2.027	1.799	1.564	1.102	0.957	0.718	0.585	0.434	
ES-27B	3.366	3.238	3.120	3.009	2.905	2.808	2.716	2.486	2.425	2.370	2.176	1.931	1.677	1.175	1.015	0.772	0.629	0.462	
ES-29B	3.590	3.454	3.328	3.210	3.099	2.995	2.897	2.652	2.587	2.528	2.322	2.062	1.793	1.274	1.136	0.837	0.683	0.514	
ES-31B	3.810	3.667	3.534	3.409	3.291	3.181	3.077	2.816	2.746	2.684	2.465	2.189	1.901	1.347	1.190	0.891	0.726	0.539	
ES-33B	4.027	3.876	3.735	3.603	3.478	3.361	3.251	2.975	2.901	2.835	2.604	2.312	2.009	1.419	1.241	0.942	0.766	0.562	
ES-35B	4.239	4.079	3.930	3.791	3.660	3.537	3.422	3.133	3.055	2.986	2.743	2.434	2.114	1.487	1.292	0.994	0.807	0.585	
ES-37B	4.445	4.278	4.123	3.977	3.839	3.710	3.588	3.284	3.203	3.130	2.876	2.554	2.219	1.556	1.338	1.045	0.841	0.601	
<b>TO 1.67 END VOLTS PER CELL</b>																			
ES-5B	0.663	0.636	0.611	0.587	0.565	0.544	0.524	0.476	0.464	0.453	0.415	0.368	0.319	0.218	0.180	0.124	0.103	0.081	
ES-7B	0.917	0.880	0.846	0.814	0.783	0.754	0.727	0.660	0.643	0.628	0.576	0.510	0.441	0.308	0.264	0.184	0.151	0.117	
ES-9B	1.174	1.126	1.081	1.039	1.000	0.963	0.929	0.844	0.822	0.803	0.736	0.651	0.563	0.392	0.334	0.244	0.201	0.153	
ES-11B	1.428	1.371	1.317	1.266	1.219	1.174	1.133	1.030	1.003	0.979	0.897	0.794	0.686	0.479	0.410	0.303	0.248	0.187	
ES-13B	1.668	1.601	1.538	1.479	1.423	1.371	1.322	1.202	1.170	1.142	1.046	0.926	0.800	0.561	0.493	0.359	0.292	0.219	
ES-15B	1.929	1.850	1.777	1.709	1.645	1.585	1.529	1.390	1.354	1.322	1.211	1.072	0.927	0.664	0.622	0.435	0.358	0.284	
ES-17B	2.185	2.097	2.014	1.936	1.863	1.795	1.731	1.573	1.532	1.495	1.370	1.213	1.049	0.750	0.698	0.492	0.404	0.318	
ES-19B	2.435	2.337	2.244	2.158	2.077	2.000	1.929	1.754	1.708	1.667	1.527	1.353	1.170	0.833	0.771	0.551	0.451	0.350	
ES-21B	2.680	2.573	2.471	2.376	2.287	2.203	2.124	1.931	1.881	1.836	1.682	1.489	1.287	0.914	0.840	0.611	0.501	0.386	
ES-23B	3.087	2.962	2.846	2.737	2.634	2.537	2.446	2.223	2.164	2.113	1.938	1.716	1.482	1.034	0.906	0.668	0.546	0.412	
ES-25B	3.339	3.203	3.077	2.958	2.847	2.743	2.645	2.404	2.341	2.286	2.096	1.855	1.603	1.114	0.969	0.718	0.585	0.436	
ES-27B	3.584	3.439	3.303	3.176	3.057	2.945	2.841	2.582	2.514	2.455	2.249	1.991	1.720	1.191	1.028	0.772	0.629	0.464	
ES-29B	3.824	3.669	3.524	3.389	3.262	3.142	3.030	2.754	2.681	2.618	2.398	2.124	1.837	1.288	1.151	0.837	0.683	0.517	
ES-31B	4.056	3.892	3.739	3.596	3.461	3.335	3.216	2.923	2.846	2.779	2.546	2.255	1.950	1.365	1.211	0.891	0.726	0.543	
ES-33B	4.291	4.116	3.953	3.801	3.658	3.524	3.398	3.089	3.008	2.937	2.692	2.383	2.061	1.439	1.265	0.942	0.766	0.567	
ES-35B	4.516	4.332	4.161	4.000	3.850	3.709	3.577	3.251	3.166	3.092	2.834	2.509	2.169	1.508	1.315	0.994	0.807	0.590	
ES-37B	4.735	4.543	4.363	4.195	4.038	3.890	3.752	3.411	3.322	3.243	2.972	2.631	2.275	1.579	1.365	1.045	0.841	0.607	
<b>TO 1.65 END VOLTS PER CELL</b>																			
ES-5B	0.678	0.651	0.624	0.599	0.575	0.553	0.532	0.480	0.467	0.456	0.418	0.371	0.322	0.220	0.180	0.124	0.103	0.081	
ES-7B	0.940	0.902	0.865	0.831	0.798	0.767	0.738	0.667	0.649	0.633	0.579	0.513	0.444	0.309	0.264	0.184	0.151	0.117	
ES-9B	1.203	1.153	1.105	1.061	1.019	0.980	0.943	0.852	0.829	0.809	0.741	0.656	0.567	0.397	0.335	0.244	0.201	0.153	
ES-11B	1.464	1.403	1.346	1.293	1.242	1.194	1.149	1.039	1.010	0.986	0.902	0.798	0.690	0.484	0.412	0.303	0.248	0.187	
ES-13B	1.710	1.639	1.573	1.510	1.451	1.394	1.341	1.212	1.179	1.150	1.053	0.933	0.807	0.562	0.493	0.359	0.292	0.219	
ES-15B	1.977	1.895	1.817	1.744	1.676	1.611	1.550	1.402	1.364	1.330	1.218	1.080	0.933	0.665	0.622	0.435	0.358	0.284	
ES-17B	2.240	2.147	2.059	1.976	1.898	1.824	1.756	1.587	1.544	1.506	1.380	1.223	1.057	0.752	0.698	0.492	0.404	0.318	
ES-19B	2.494	2.392	2.295	2.203	2.116	2.035	1.958	1.769	1.721	1.679	1.538	1.362	1.178	0.836	0.771	0.551	0.451	0.350	
ES-21B	2.747	2.634	2.527	2.426	2.330	2.240	2.156	1.949	1.896	1.850	1.694	1.500	1.295	0.917	0.840	0.611	0.501	0.386	
ES-23B	3.164	3.033	2.910	2.794	2.684	2.580	2.482	2.243	2.182	2.129	1.951	1.728	1.492	1.038	0.907	0.668	0.546	0.412	
ES-25B	3.422	3.291	3.164	3.040	2.921	2.807</													

# Per Cell KW\* Discharge Rates in KW\*\* 1.215 Specific Gravity

TYPE	5 MIN	6 MIN	7 MIN	8 MIN	9 MIN	10 MIN	11 MIN	14 MIN	15 MIN	16 MIN	20 MIN	25 MIN	30 MIN	45 MIN	60 MIN	90 MIN	120 MIN	180 MIN	
<b>TO 1.75 END VOLTS PER CELL</b>																			
ES-5	0.505	0.487	0.472	0.457	0.444	0.432	0.420	0.391	0.383	0.375	0.346	0.309	0.270	0.193	0.162	0.113	0.094	0.074	
ES-7	0.698	0.675	0.654	0.635	0.616	0.600	0.584	0.542	0.531	0.520	0.478	0.427	0.374	0.268	0.237	0.168	0.138	0.107	
ES-9	0.892	0.862	0.836	0.811	0.788	0.767	0.746	0.694	0.679	0.665	0.612	0.546	0.479	0.348	0.301	0.222	0.183	0.139	
ES-11	1.086	1.053	1.021	0.991	0.963	0.936	0.910	0.842	0.824	0.806	0.744	0.664	0.582	0.428	0.369	0.276	0.226	0.169	
ES-13	1.271	1.231	1.193	1.158	1.124	1.093	1.062	0.984	0.963	0.943	0.869	0.776	0.679	0.487	0.428	0.327	0.266	0.195	
ES-15	1.468	1.421	1.378	1.337	1.299	1.263	1.228	1.140	1.115	1.091	1.006	0.898	0.786	0.578	0.541	0.396	0.326	0.253	
ES-17	1.662	1.609	1.559	1.513	1.469	1.429	1.390	1.291	1.263	1.237	1.141	1.018	0.891	0.656	0.606	0.448	0.368	0.282	
ES-19	1.852	1.794	1.739	1.688	1.639	1.594	1.550	1.438	1.407	1.377	1.270	1.133	0.993	0.727	0.666	0.501	0.410	0.310	
ES-21	2.039	1.976	1.917	1.860	1.807	1.756	1.707	1.583	1.548	1.515	1.397	1.247	1.092	0.803	0.744	0.556	0.456	0.347	
ES-23	2.349	2.274	2.205	2.140	2.079	2.021	1.965	1.823	1.783	1.746	1.611	1.438	1.260	0.909	0.802	0.608	0.497	0.370	
ES-25	2.540	2.461	2.387	2.317	2.251	2.188	2.127	1.971	1.928	1.887	1.740	1.553	1.361	0.979	0.857	0.653	0.532	0.392	
ES-27	2.726	2.640	2.559	2.483	2.412	2.345	2.281	2.116	2.070	2.027	1.870	1.668	1.460	1.043	0.900	0.702	0.572	0.441	
ES-29	2.910	2.817	2.731	2.650	2.574	2.502	2.434	2.257	2.208	2.162	1.994	1.780	1.561	1.131	1.006	0.761	0.621	0.461	
ES-31	3.089	2.992	2.901	2.815	2.734	2.658	2.585	2.396	2.344	2.295	2.116	1.889	1.656	1.194	1.050	0.810	0.660	0.483	
ES-33	3.263	3.161	3.066	2.975	2.890	2.809	2.732	2.532	2.477	2.425	2.237	1.996	1.749	1.255	1.092	0.857	0.697	0.503	
ES-35	3.434	3.326	3.225	3.130	3.040	2.955	2.874	2.666	2.608	2.554	2.355	2.101	1.840	1.316	1.136	0.904	0.734	0.523	
ES-37	3.601	3.489	3.384	3.284	3.190	3.100	3.014	2.794	2.733	2.676	2.470	2.205	1.931	1.377	1.177	0.950	0.765	0.538	
<b>TO 1.70 END VOLTS PER CELL</b>																			
ES-5	0.566	0.545	0.525	0.506	0.488	0.472	0.456	0.417	0.407	0.397	0.366	0.325	0.282	0.197	0.163	0.113	0.094	0.074	
ES-7	0.783	0.752	0.725	0.699	0.675	0.653	0.632	0.579	0.565	0.552	0.505	0.449	0.391	0.276	0.239	0.168	0.138	0.107	
ES-9	1.002	0.962	0.926	0.893	0.862	0.834	0.807	0.741	0.723	0.706	0.648	0.575	0.500	0.355	0.303	0.222	0.183	0.139	
ES-11	1.220	1.174	1.132	1.092	1.054	1.019	0.985	0.901	0.879	0.858	0.788	0.699	0.608	0.434	0.372	0.276	0.226	0.169	
ES-13	1.425	1.372	1.322	1.275	1.231	1.190	1.150	1.052	1.026	1.002	0.920	0.817	0.710	0.502	0.442	0.327	0.266	0.198	
ES-15	1.647	1.584	1.526	1.472	1.421	1.374	1.329	1.218	1.188	1.161	1.065	0.946	0.822	0.595	0.556	0.396	0.326	0.256	
ES-17	1.866	1.795	1.729	1.667	1.609	1.556	1.505	1.379	1.345	1.314	1.206	1.071	0.931	0.671	0.624	0.448	0.368	0.286	
ES-19	2.078	1.999	1.926	1.858	1.794	1.734	1.677	1.536	1.499	1.465	1.345	1.194	1.037	0.746	0.689	0.501	0.410	0.315	
ES-21	2.289	2.203	2.123	2.047	1.976	1.910	1.847	1.690	1.649	1.611	1.479	1.313	1.141	0.820	0.755	0.556	0.456	0.349	
ES-23	2.636	2.536	2.444	2.357	2.276	2.200	2.128	1.947	1.899	1.855	1.704	1.513	1.315	0.929	0.816	0.608	0.497	0.373	
ES-25	2.850	2.742	2.642	2.549	2.461	2.379	2.301	2.106	2.054	2.007	1.842	1.636	1.422	1.002	0.870	0.653	0.532	0.394	
ES-27	3.060	2.944	2.836	2.736	2.641	2.553	2.469	2.260	2.205	2.155	1.978	1.756	1.525	1.069	0.923	0.702	0.572	0.420	
ES-29	3.264	3.140	3.025	2.918	2.817	2.723	2.634	2.411	2.352	2.298	2.111	1.875	1.630	1.159	1.033	0.761	0.621	0.467	
ES-31	3.464	3.334	3.213	3.099	2.992	2.892	2.797	2.560	2.497	2.440	2.241	1.990	1.729	1.225	1.082	0.810	0.660	0.490	
ES-33	3.661	3.523	3.395	3.275	3.162	3.056	2.955	2.705	2.638	2.578	2.367	2.102	1.827	1.290	1.129	0.857	0.697	0.511	
ES-35	3.854	3.708	3.573	3.446	3.327	3.216	3.111	2.848	2.778	2.715	2.493	2.213	1.922	1.352	1.175	0.904	0.734	0.532	
ES-37	4.041	3.889	3.748	3.615	3.490	3.373	3.262	2.985	2.912	2.846	2.614	2.322	2.018	1.415	1.217	0.950	0.765	0.547	
<b>TO 1.67 END VOLTS PER CELL</b>																			
ES-5	0.603	0.578	0.555	0.534	0.514	0.495	0.477	0.433	0.422	0.412	0.377	0.335	0.290	0.199	0.164	0.113	0.094	0.074	
ES-7	0.834	0.800	0.769	0.740	0.712	0.686	0.661	0.600	0.585	0.571	0.524	0.464	0.401	0.280	0.240	0.168	0.138	0.107	
ES-9	1.068	1.023	0.983	0.944	0.909	0.876	0.844	0.768	0.748	0.730	0.669	0.592	0.512	0.357	0.304	0.222	0.183	0.139	
ES-11	1.299	1.246	1.197	1.151	1.108	1.068	1.030	0.936	0.912	0.890	0.816	0.722	0.624	0.436	0.373	0.276	0.226	0.170	
ES-13	1.517	1.455	1.398	1.344	1.294	1.247	1.202	1.092	1.064	1.038	0.951	0.842	0.728	0.510	0.449	0.327	0.266	0.199	
ES-15	1.754	1.682	1.615	1.553	1.495	1.441	1.390	1.264	1.231	1.201	1.101	0.975	0.843	0.604	0.566	0.396	0.326	0.258	
ES-17	1.987	1.906	1.830	1.760	1.694	1.632	1.573	1.430	1.393	1.359	1.245	1.103	0.954	0.682	0.635	0.448	0.368	0.289	
ES-19	2.214	2.124	2.040	1.961	1.888	1.819	1.754	1.594	1.553	1.516	1.389	1.230	1.064	0.758	0.707	0.501	0.410	0.318	
ES-21	2.437	2.339	2.247	2.160	2.079	2.003	1.931	1.755	1.710	1.669	1.529	1.354	1.170	0.831	0.764	0.556	0.456	0.351	
ES-23	2.807	2.693	2.587	2.488	2.395	2.307	2.224	2.020	1.968	1.921	1.761	1.560	1.348	0.940	0.824	0.608	0.497	0.375	
ES-25	3.036	2.912	2.797	2.689	2.588	2.494	2.405	2.186	2.129	2.078	1.905	1.687	1.458	1.013	0.881	0.653	0.532	0.397	
ES-27	3.259	3.126	3.003	2.888	2.779	2.678	2.582	2.347	2.286	2.231	2.045	1.810	1.564	1.083	0.935	0.702	0.572	0.422	
ES-29	3.477	3.336	3.204	3.081	2.965	2.857	2.755	2.503	2.438	2.380	2.180	1.931	1.670	1.171	1.047	0.761	0.621	0.470	
ES-31	3.688	3.539	3.399	3.269	3.147	3.032	2.924	2.657	2.588	2.526	2.315	2.050	1.773	1.241	1.101	0.810	0.660	0.494	
ES-33	3.901	3.742	3.594	3.455	3.325	3.204	3.089	2.808	2.735	2.670	2.447	2.167	1.874	1.309	1.150	0.857	0.697	0.516	
ES-35	4.106	3.938	3.782	3.637	3.500	3.372	3.252	2.956	2.879	2.811	2.576	2.281	1.972	1.371	1.196	0.904	0.734	0.537	
ES-37	4.305	4.130	3.967	3.814	3.671	3.537	3.411	3.101	3.020	2.948	2.701	2.392	2.069	1.436	1.241	0.950	0.765	0.552	
<b>TO 1.65 END VOLTS PER CELL</b>																			
ES-5	0.617	0.591	0.567	0.545	0.523	0.503	0.483	0.436	0.425	0.414	0.380	0.338	0.293	0.200	0.164	0.113	0.094	0.074	
ES-7	0.855	0.820	0.787	0.755	0.726	0.698	0.671	0.606	0.590	0.575	0.527	0.467	0.404	0.281	0.240	0.168	0.138	0.107	
ES-9	1.094	1.048	1.005	0.965	0.926	0.891	0.857	0.775	0.754	0.735	0.674	0.597	0.516	0.361	0.305	0.222	0.183	0.139	
ES-11	1.331	1.275	1.224	1.175	1.129	1.086	1.045	0.944	0.919	0.896	0.820	0.726	0.628	0.440	0.375	0.276	0.226	0.170	
ES-13	1.555	1.490	1.430	1.373	1.319	1.268	1.219	1.102	1.072	1.045	0.958	0.849	0.734	0.511	0.449	0.327	0.266	0.199	
ES-15	1.798	1.722	1.652	1.586	1.523	1.465	1.409	1.274	1.240	1.209	1.108	0.982	0.849	0.605	0.566	0.396	0.326	0.258	
ES-17	2.037	1.952	1.872	1.796	1.725	1.659	1.596	1.443	1.404	1.369	1.255	1.112	0.961	0.684	0.635	0.448	0.368	0.289	
ES-19	2.268	2.175	2.086	2.003	1.924	1.850	1.780	1.608	1.565	1.526	1.398	1.239	1.071	0.760	0.701	0.501	0.410	0.318	
ES-21	2.498	2.395	2.298	2.205	2.119	2.037	1.960	1.772	1.724	1.682	1.540	1.364	1.178	0.834	0.764	0.556	0.456	0.351	
ES-23	2.877	2.758	2.646	2.540	2.440	2.346	2.257	2.039	1.984	1.935	1.773	1.571	1.357	0.944	0.825	0.608	0.497	0.375	
ES-25	3.111	2.992	2.876	2.764	2.656	2.552	2.452	2.208	2.147	2.093	1.917	1.699	1.468	1.016	0.881				

# Accessories

	CATALOG NUMBER
<b>CELL NUMBER SET:</b>	
1-12	802360
1-24	802361
1-60	802362
1-120	802363
1-240	802364
1-300	802365
<b>CELL LIFTING DEVICE:</b>	
ES-5,7,9,11,13	62257
ES-15, 17, 19, 21	80135
ES-23,25,27	80136
ES-29,31,33,35,37	80137
† <b>PORTABLE HYDROMETER</b>	81332
† <b>HYDROMETER — WALL MOUNT</b>	27717
† <b>THERMOMETER</b> (Portable or flame arrestor mounting)	88330
<b>FLAME ARRESTOR</b> (Supplied with each cell)	96300

† included with 12 or more cells

For complete information about these and all other accessories, see catalog **SECTION 80.05**.

**NOTE:** All inter-cell, inter-tier, inter-step, end-to-end inter-rack, back-to-back inter-rack connectors, terminal lugs, and terminal plates are included with every battery. Across-aisle inter-rack connectors are not included.

All data subject to change without notice.

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Rev. Date - 12/98



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