

*EverExceed*<sup>®</sup>  
*power your applications*

# Nickel Cadmium Industrial BATTERY SOLUTIONS



*Reliable capacities  
for increased security*

**NICKEL CADMIUM BATTERIES**  
**SINTERED / POCKET PLATES**  
 5AH to 1000AH / 20+ years long life

*EverExceed Nickel Cadmium industrial cells using advanced sintered plate / pocket plate technology have been used successfully in industrial battery applications for long years. With a design life of more than 20 years, they have proved to be a very reliable DC power source in float service or cyclic applications in harsh conditions with temperatures up to 60°C.*



**XHP Series (Ultra High Discharge Rate Cells)**

XHP Series Ultra High Discharge Rate nickel cadmium battery is made of sintered plate, characterized by compact construction, low internal resistance, high reliability, high capacity, long service life and excellent low temperature performance. The battery is suitable for ultra high rate discharging such as AGV, engine starting, switch tripping and closing and any special purpose.

**EBH Series (High Discharge Rate Cells)**

EBH Series High Discharge Rate nickel cadmium battery is made of pocket plate with the characteristics of thin plate, high porosity and low internal resistance. The battery is particularly suitable for short discharge periods such as switch-gear tripping and closing, UPS, etc.

**EBM Series (Medium Discharge Rate Cells)**

EBM Series Medium Discharge Rate nickel cadmium battery is made of pocket plate. The battery is suitable for medium discharge periods between 30 minutes and 5 hours such as standby for UPS, gas turbine control, etc.

**EBL Series (Low Discharge Rate Cells)**

EBL Series Low Discharge Rate nickel cadmium battery is made of pocket plate. The battery is designed for general purpose and standby applications such as lighting on train and operation of circuit breaker, etc.

Battery Model	Discharge Performance	Plate Type	Applications
<b>XHP Series</b>	Ultra High Discharge Rate	Sintered Plate	AGV, gas turbine generation, engine starting, operating / control of computer systems, transportation networks, airport, etc.
<b>EBH Series</b>	High Discharge Rate	Pocket Plate	Engine starting, UPS (up to 30 minutes), operation and control of DC motor, water treatment plants, etc.
<b>EBM Series</b>	Medium Discharge Rate	Pocket Plate	UPS (over 30 minutes), railway DC power sources, auxiliary power sources for power stations, chemical plants, oil refineries, iron works, etc.
<b>EBL Series</b>	Low Discharge Rate	Pocket Plate	Emergency lighting, telecommunications, operation of communication equipment on a ship lighting, air conditioner control on a train, etc.



**Container:** Translucent Plastic or Steel  
**Terminal Seal:** Compressed O-Ring  
**Plates:** Sintered / Pocket Plates  
**Electrolyte:** Potassium Hydroxide 1.19~1.20kg/l

**Float Voltage**

**Boost / Equalize Charge**

XHP Type: 1.38~1.40 VPC  
 EBH/EBM Type: 1.42~1.45 VPC  
 EBL Type: 1.48~1.50 VPC

XHP Type: 1.46~1.48 VPC  
 EBH/EBM/EBL Type: 1.55~1.60 VPC

**Temperature Range:**  
 -20°C to +60°C



**Connector covers**

Material: plastic.

**Flame arresting vents**

Material: polypropylene.

**Cell container**

Material: translucent polypropylene.

**Plate tab**

Spot-welded both to the plate side frames and to the upper edge of the pocket plate.

**Plate group bus**

Connects the plate tabs with the terminal post. Plate tabs and terminal post are projection welded to the plate group bus.

**Separating grids**

Separate the plates and insulate the plate frames from each other. The grids allow free circulation of electrolyte between the plates.

**Plate frame**

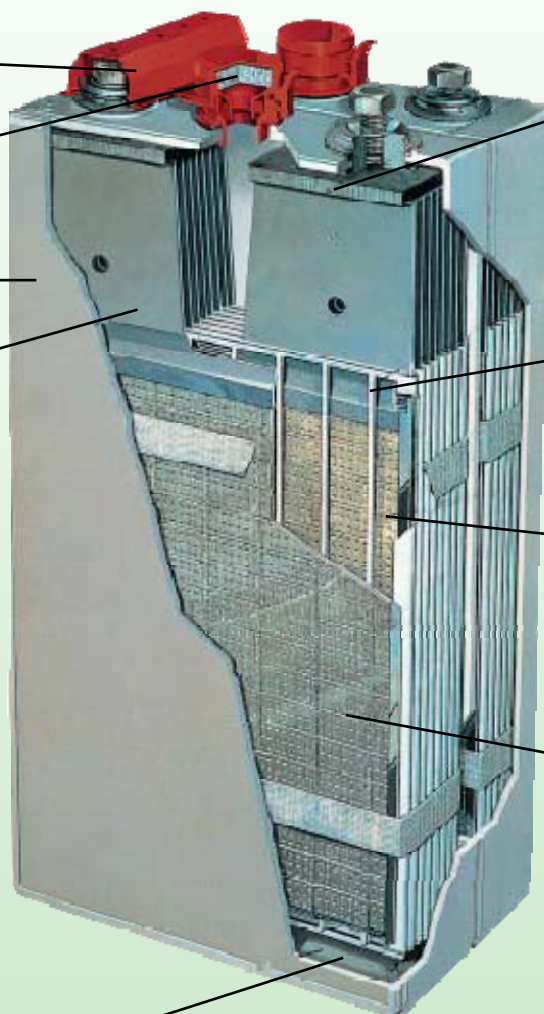
Seals the plate pockets and serves as a current collector.

**Plate**

Horizontal pockets of double-perforated steel strips.

**Electrolyte**

An alkaline solution of potassium hydroxide (KOH) which does not corrode steel.



## Battery Charging

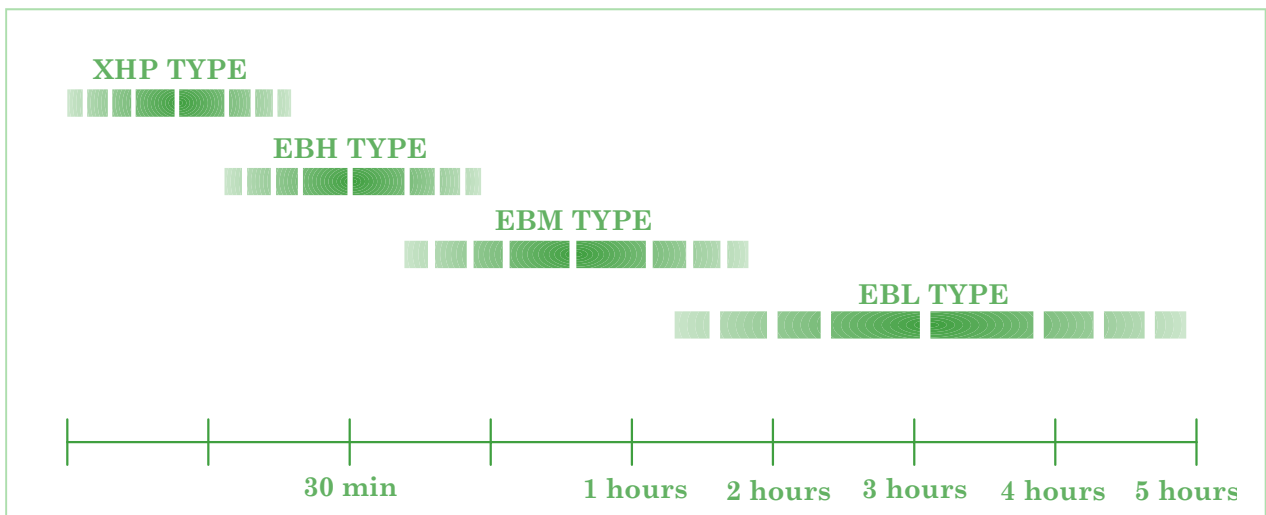
It is recommended to use Constant Voltage method of charging for Nickel Cadmium Batteries, usually with current limitation to  $C/5$  or  $C/10$ . Charging voltages must be regularly checked. To optimize the battery performance, it is necessary to ensure that the voltage is kept within the following limits:

### Recommended Charging Voltage Per Cell

Cell Type	IEC Type	Floating Charge	Equalizing Charge
XHP	KXP	1.38~1.40	1.46~1.49
EBH	KHP	1.42~1.45	1.55~1.60
EBM	KMP	1.42~1.45	1.55~1.60
EBL	KLP	1.48~1.50	1.55~1.60

## Recommended Type Selection

According to backup time required by application:



## Initial Charging

The whole charge should preferably be carried out at constant current. The charging time is inversely proportional to the current which is set by the current limit of the charging equipment.

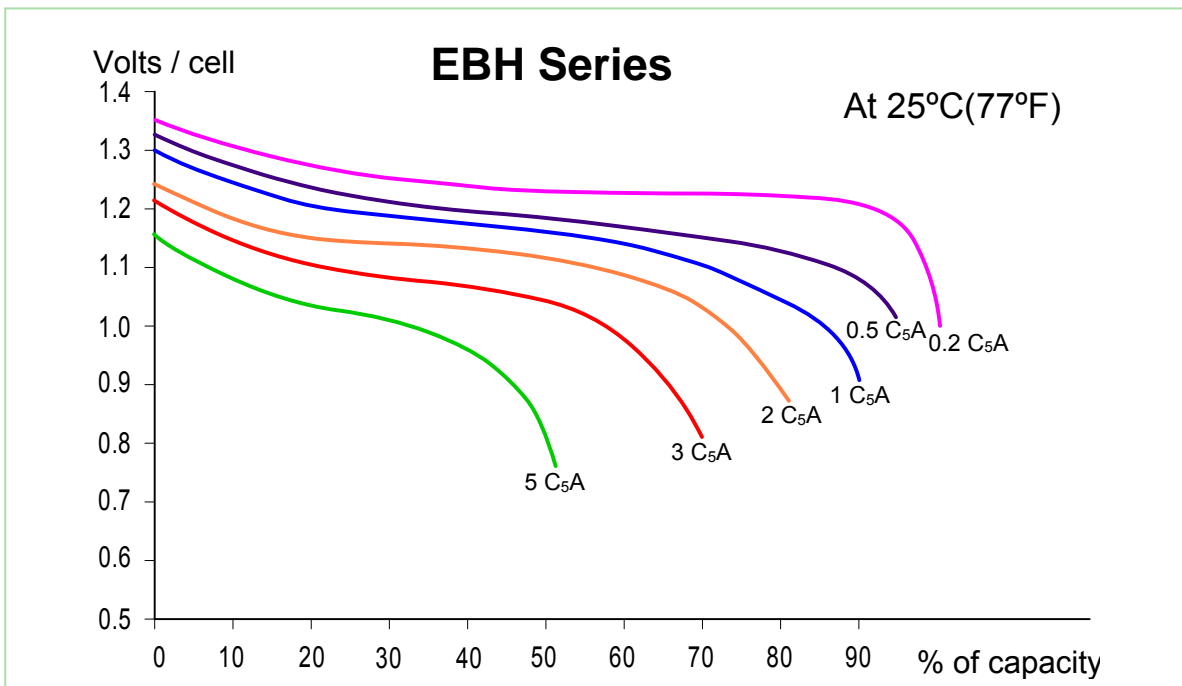
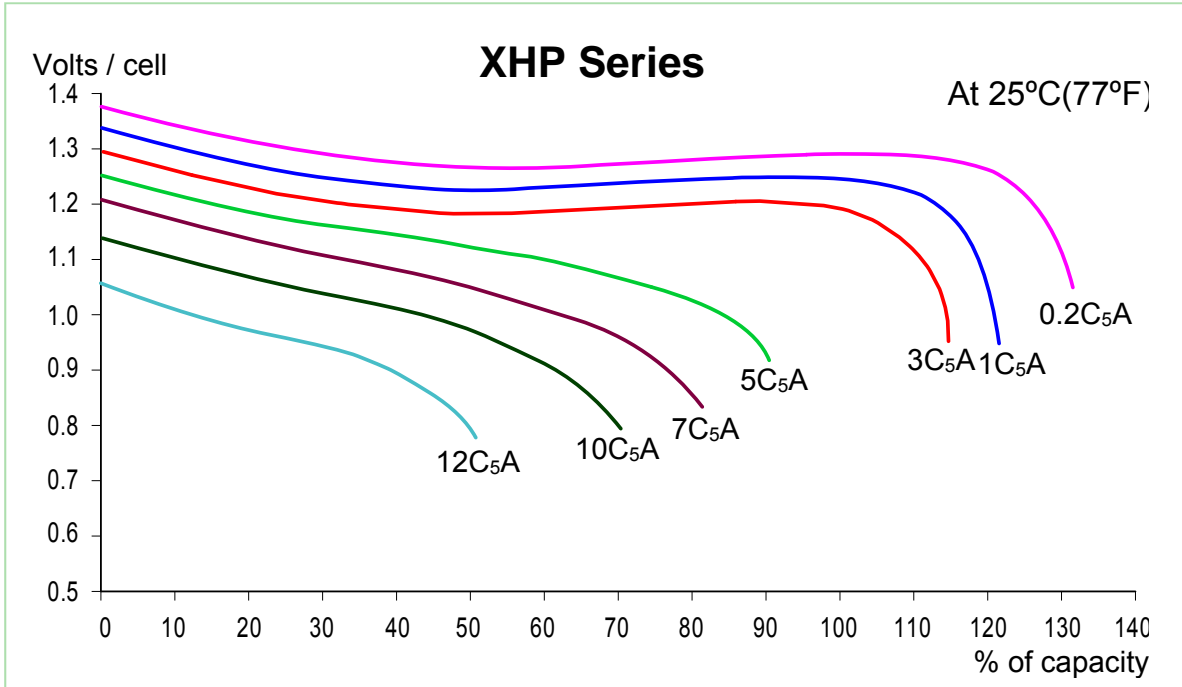
Recommended rates for the first charging:

0.2  $C_5A$  for 10 hours

0.1  $C_5A$  for 20 hours

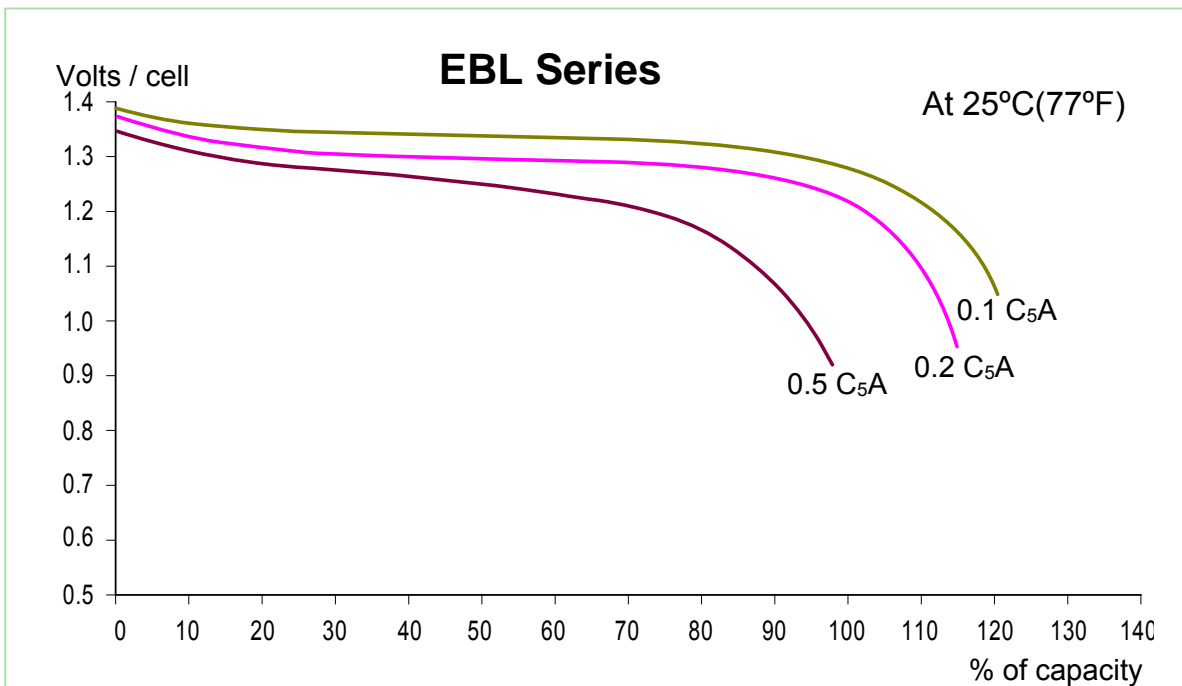
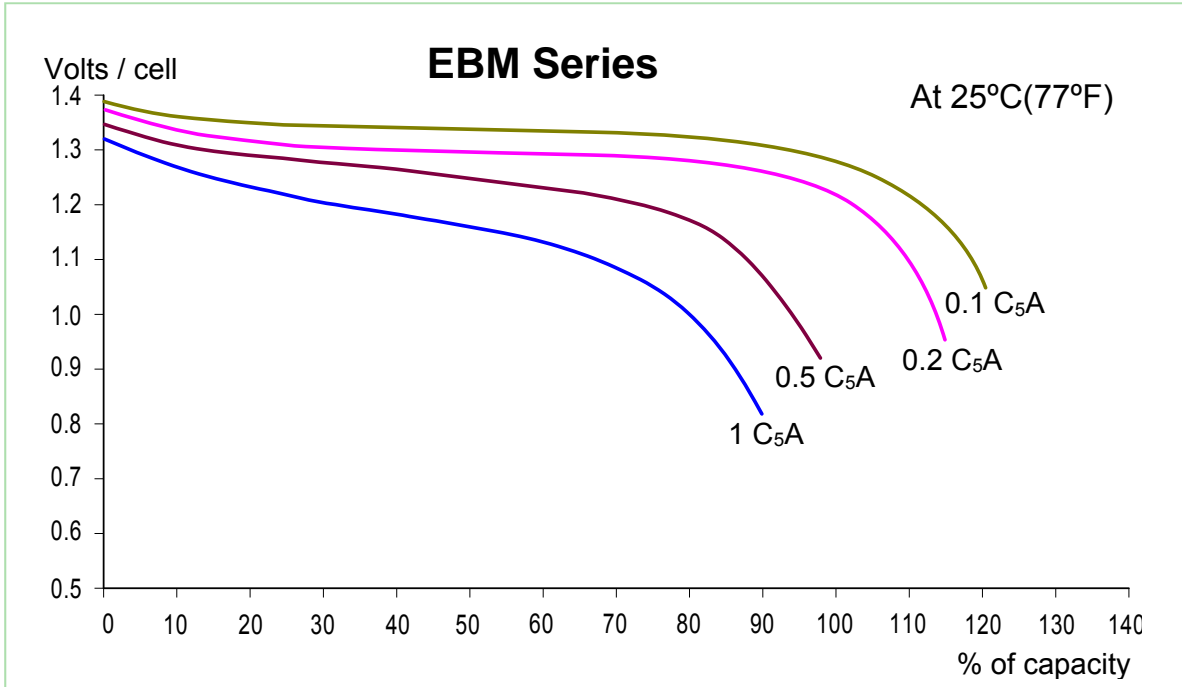
## Discharging Curves

Nominal voltage: 1.2V/Cell



## Discharging Curves

Nominal voltage: 1.2V/Cell



## EverExceed XHP Series – Ultra High Discharge Rate Type

Cell Type	Nominal Capacity (Ah) @5hr Rate	Cell Dimensions (mm)			Cell Weight (Filled) kg	Volume of Electrolyte (L)
		Length	Width	Height		
XHP5	5	26	81	163	0.51	0.031
XHP10	10	26	81	163	0.62	0.060
XHP20	20	33	81	245	1.22	0.120
XHP30	30	43	81	266	1.80	0.250
XHP40	40	43	81	266	1.88	0.220
XHP50	50	43	81	266	1.98	0.200
XHP60	60	61	138	266	3.90	0.550
XHP70	70	61	138	266	4.00	0.500
XHP80	80	61	138	266	4.20	0.400
XHP90	90	61	138	266	4.31	0.310
XHP100	100	61	138	266	4.40	0.305
XHP110	110	61	138	266	4.50	0.250
XHP120	120	61	138	266	4.80	0.305
XHP140	140	79	138	362	9.20	1.800
XHP140	140	105	165	350	9.20	1.900
XHP150	150	88	165	350	10.1	1.750
XHP150	150	105	138	362	10.1	1.850
XHP170	170	105	165	350	10.0	1.750
XHP190	190	105	165	350	10.4	1.650
XHP210	210	105	165	350	11.2	1.500
XHP250	250	105	165	350	11.8	1.450
XHP300	300	105	165	350	12.5	1.400
XHP320	320	105	165	350	12.8	1.380

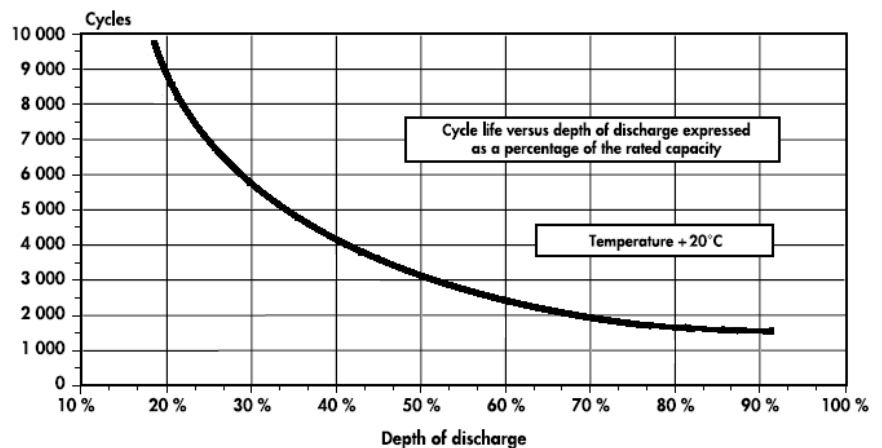
## EverExceed EBH Series – High Discharge Rate Type

Cell Type	Nominal Capacity (Ah) @5hr Rate	Cell Dimensions (mm)			Cell Weight (Filled) kg	Volume of Electrolyte (L)
		Length	Width	Height		
EBH30	30	67	142	227	3.50	0.90
EBH40	40	79	139	291	4.50	1.30
EBH50	50	79	139	291	6.00	1.60
EBH60	60	79	139	362	6.50	1.70
EBH70	70	79	139	362	9.00	1.80
EBH80	80	104	164	345	9.50	2.00
EBH100	100	104	164	345	13.00	3.00
EBH120	120	162	167	343	13.50	3.50
EBH150	150	174	286	348	23.00	5.00
EBH200	200	174	286	348	24.50	5.00
EBH250	250	172	232	410	27.00	5.50
EBH300	300	174	291	505	33.00	6.50
EBH350	350	174	291	505	34.50	7.00
EBH400	400	174	291	505	36.00	7.50
EBH500	500	184	398	562	53.00	15.00

## EverExceed EBM Series – Medium Discharge Rate Type

Cell Type	Nominal Capacity (Ah) @5hr Rate	Cell Dimensions (mm)			Cell Weight (Filled) kg	Volume of Electrolyte (L)
		Length	Width	Height		
EBM30	30	67	142	227	3.50	0.83
EBM40	40	79	139	291	4.50	1.00
EBM50	50	79	139	291	5.00	1.30
EBM60	60	79	139	362	6.00	1.40
EBM75	75	79	139	362	6.50	1.67
EBM85	85	104	164	345	9.00	1.60
EBM90	90	104	164	345	9.15	1.68
EBM100	100	104	164	345	9.30	1.75
EBM120	120	162	167	343	12.5	2.92
EBM150	150	162	167	343	13.5	3.08
EBM200	200	174	286	348	24.5	5.83
EBM250	250	174	286	348	26.0	5.83
EBM300	300	161	176	557	23.0	4.17
EBM350	350	174	291	505	36.0	7.00
EBM400	400	174	291	505	37.0	7.20
EBM500	500	174	291	505	39.0	7.50
EBM600	600	176	390	557	59.0	13.00
EBM700	700	176	390	557	62.0	14.00
EBM800	800	176	390	557	65.0	15.00

### Cycling Curve



Typical cycle life versus depth of discharge

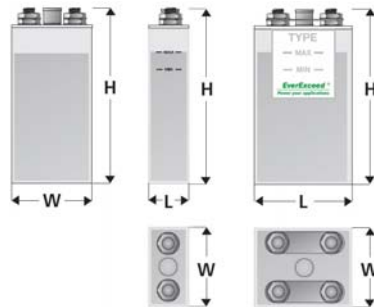




## EverExceed EBL Series – Low Discharge Rate Type

Cell Type	Nominal Capacity (Ah) @5hr Rate	Cell Dimensions (mm)			Cell Weight (Filled) kg	Volume of Electrolyte (L)
		Length	Width	Height		
EBL10	10	39	85	126	0.66	0.12
EBL22	22	54	145	248	2.30	0.45
EBL30	30	54	145	248	2.50	0.55
EBL40	40	54	145	248	2.70	0.60
EBL45	45	54	145	248	3.00	0.60
EBL50	50	52	135	273	3.20	0.70
EBL60	60	52	135	273	4.10	1.00
EBL70	70	79	139	362	6.00	1.30
EBL80	80	79	139	362	6.00	1.50
EBL90	90	79	139	362	6.25	1.60
EBL100	100	79	139	362	6.50	1.70
EBL125	125	89	139	362	8.50	2.50
EBL150	150	162	167	343	13.0	3.30
EBL200	200	162	167	343	14.0	3.30
EBL250	250	161	176	557	20.0	4.50
EBL300	300	161	176	557	21.5	5.50
EBL350	350	161	176	557	23.0	4.00
EBL400	400	161	176	557	24.5	5.00
EBL500	500	172	290	505	39.0	7.50
EBL600	600	172	290	505	50.0	9.00
EBL700	700	184	398	572	60.0	17.00
EBL800	800	184	398	572	63.0	17.50
EBL900	900	184	398	572	70.0	18.30
EBL1000	1000	184	398	572	73.0	18.30

### NiCd Cell Dimension



Other cell types of special requirements also available (Custom design, not included in the above list), please contact EverExceed Nickel Cadmium Division for more details.



Please visit [www.everexceed.com](http://www.everexceed.com) for more product information.

## Final Discharge Voltage 1.14 Volts Per Cell

Cell Type	C5 Ah	Discharge Time in Hours							Discharge Time in Minutes							Time in Seconds		
		10	8	5	3	2	1.5	1	45	30	20	15	10	5	1	30	5	1
<b>XHP5</b>	5			1.0			3.3	4.6		7.58	10.8	12.0	13.4	18.1	23.8	26.4	33.8	35.6
<b>XHP10</b>	10			2.0			6.5	9.3		15.8	22.5	25.0	28.0	37.5	49.5	55.3	70.5	74.3
<b>XHP20</b>	20			4.0			13.0	18.5		30.5	43.2	48.0	53.7	72.0	95.0	106	135	142
<b>XHP30</b>	30			6.0			19.5	27.7		47.2	67.5	75.0	84.0	112	148	165	211	222
<b>XHP40</b>	40			8.0			26.0	37.0		60.9	86.4	96.0	107	144	190	212	270	285
<b>XHP50</b>	50			10.0			32.5	46.2		78.7	112	125	140	187	247	276	352	371
<b>XHP60</b>	60			12.0			39.0	55.5		94.5	135	150	168	225	297	331	423	445
<b>XHP70</b>	70			14.0			45.5	64.7		110	157	175	196	262	346	386	493	519
<b>XHP80</b>	80			16.0			52.0	74.0		126	180	200	224	300	396	442	564	594
<b>XHP90</b>	90			18.0			58.5	83.2		141	202	225	252	337	445	497	634	668
<b>XHP100</b>	100			20.0			65.0	93.0		157	225	250	280	375	495	552	705	742
<b>XHP120</b>	120			24.0			78.0	111		189	270	300	336	450	594	663	846	891
<b>XHP140</b>	140			28.0			91.0	130		220	315	350	392	525	693	773	987	1039
<b>XHP150</b>	150			30.0			97.5	139		236	338	375	420	563	743	828	1058	1113
<b>XHP170</b>	170			34.0			111	157		267	382	425	476	637	841	939	1198	1262
<b>XHP190</b>	190			38.0			123	175		299	427	475	532	712	940	1049	1339	1410
<b>XHP210</b>	210			42.0			137	194		330	472	525	588	780	984	1100	1480	1550
<b>XHP250</b>	250			50.0			163	231		393	562	625	700	929	1171	1310	1762	1845
<b>XHP300</b>	300			60.0			196	277		471	674	750	840	1114	1406	1571	2114	2214
<b>XHP320</b>	320			64.0			209	296		503	719	800	896	1189	1499	1676	2255	2362
<b>EBH30</b>	30	2.99	3.73	5.97	9.38	13.0	15.4	22.4	27.3	32.2	37.9	43.3	58.3	68.0	103	115	147	154
<b>EBH40</b>	40	3.98	4.98	7.96	12.5	17.4	20.6	29.9	36.4	43.0	50.5	57.7	77.8	90.4	138	153	197	206
<b>EBH50</b>	50	4.98	6.23	9.95	15.6	21.7	25.7	37.4	45.5	53.8	63.1	72.1	97.3	113	172	191	246	257
<b>EBH60</b>	60	5.98	7.48	11.9	18.7	26.0	30.8	44.9	54.6	64.6	75.7	86.5	117	136	206	229	295	308
<b>EBH70</b>	70	6.97	8.72	13.9	21.8	30.4	36.0	52.4	63.7	75.3	88.4	101	136	158	241	268	345	360
<b>EBH80</b>	80	7.98	9.92	15.9	25.0	34.8	41.1	59.8	72.8	85.6	101	115	155	181	276	306	394	411
<b>EBH100</b>	100	9.97	12.4	19.9	31.2	43.5	51.4	74.8	91.0	107	126	144	194	226	345	383	493	514
<b>EBH120</b>	120	11.9	14.9	23.8	37.5	52.2	61.7	89.8	109	129	151	173	233	272	414	460	591	617
<b>EBH150</b>	150	14.9	18.6	29.8	46.9	65.3	77.2	112	136	161	189	216	291	340	518	575	739	772
<b>EBH200</b>	200	19.9	24.9	39.8	62.5	87.1	102	149	182	215	252	288	388	453	691	766	986	1029
<b>EBH250</b>	250	24.9	31.1	49.8	78.1	109	128	186	228	269	315	360	485	566	864	958	1233	1286
<b>EBH300</b>	300	29.9	37.3	59.7	93.8	130	154	224	273	322	379	433	583	680	1033	1150	1479	1544
<b>EBH350</b>	350	34.8	43.6	69.6	109	152	180	262	318	376	442	505	680	793	1209	1341	1726	1801
<b>EBH400</b>	400	39.8	49.8	79.6	125	174	205	299	364	430	505	577	777	907	1382	1533	1972	2059
<b>EBH500</b>	500	49.8	62.3	99.5	156	217	257	374	455	538	631	721	972	1134	1728	1917	2466	2574
<b>EBM30</b>	30	3.02	3.78	6.06	9.56	12.5	14.8	17.1	18.0	20.5	23.8	26.3	28.9	33.8	47.9	53.8	62.6	69.9
<b>EBM40</b>	40	4.03	5.04	8.08	12.7	16.6	19.7	22.8	24.0	26.9	31.7	34.9	38.6	45.1	63.7	71.5	83.4	93.2
<b>EBM50</b>	50	5.04	6.30	10.1	15.9	20.8	24.7	28.5	30.0	33.5	39.5	43.7	48.3	56.4	79.7	89.5	105	117
<b>EBM60</b>	60	6.04	7.56	12.1	19.1	24.9	29.6	34.2	36.0	40.2	47.5	52.3	57.9	67.6	95.4	109	127	143

<b>EBM75</b>	75	7.56	9.45	15.2	23.9	31.2	37.1	42.8	45.0	48.8	58.9	64.1	72.4	84.6	117	133	155	169
<b>EBM85</b>	85	8.56	10.7	17.1	27.0	35.3	42.0	48.4	51.0	55.3	66.8	72.6	82.1	95.8	134	151	177	190
<b>EBM90</b>	90	9.06	11.3	18.1	28.6	37.4	44.5	51.2	54.0	58.6	70.7	76.9	86.9	101	142	160	187	201
<b>EBM100</b>	100	10.1	12.6	20.2	31.8	41.6	49.4	57.0	60.0	66.9	78.9	87.2	96.6	112	160	181	210	235
<b>EBM120</b>	120	12.1	15.1	24.3	38.3	49.9	59.3	68.4	72.0	80.2	94.6	105	115	135	192	215	251	279
<b>EBM150</b>	150	15.1	18.9	30.3	47.8	62.5	74.2	85.5	90.0	101	119	132	144	169	240	269	315	352
<b>EBM200</b>	200	20.2	25.2	40.4	63.7	83.3	98.9	114	120	135	160	175	193	225	319	358	419	467
<b>EBM250</b>	250	25.3	31.5	50.5	79.5	104	124	143	150	167	197	218	242	280	400	453	525	588
<b>EBM300</b>	300	30.2	37.8	60.6	95.6	125	148	171	180	201	235	264	289	338	476	540	627	699
<b>EBM350</b>	350	35.2	44.1	70.7	111	145	173	199	210	235	279	305	338	394	558	630	731	815
<b>EBM400</b>	400	40.3	50.4	80.8	127	166	197	228	240	269	318	349	386	451	637	724	839	932
<b>EBM500</b>	500	50.4	63.0	101	159	208	247	285	300	336	397	436	483	564	796	894	1041	1161
<b>EBM600</b>	600	60.4	75.6	121	191	249	296	342	360	402	473	524	579	676	955	1072	1252	1402
<b>EBM700</b>	700	70.5	88.2	141	223	291	346	399	420	469	552	611	676	789	1111	1253	1461	1631
<b>EBM800</b>	800	80.6	100	161	254	333	395	456	480	535	631	697	772	902	1273	1433	1672	1862
<b>EBL10</b>	10	1.00	1.31	1.99	2.76	3.29	3.83	4.58	4.95	5.71	6.21	6.39	6.79	7.70	9.09	10.5	10.9	11.2
<b>EBL22</b>	22	2.00	2.87	4.37	6.08	7.20	8.43	10.1	10.9	12.5	13.6	14.1	14.9	16.9	19.8	21.7	24.1	24.6
<b>EBL30</b>	30	3.13	3.91	5.95	8.30	9.87	11.5	13.7	14.8	17.1	18.6	19.1	20.3	23.0	27.5	31.5	32.7	33.6
<b>EBL40</b>	40	4.00	5.22	7.94	11.2	13.2	15.3	18.3	19.8	22.8	24.8	25.6	27.1	30.7	36.5	41.9	43.6	44.8
<b>EBL45</b>	45	5.00	5.87	8.93	12.4	14.8	17.3	20.6	22.3	25.7	27.9	28.7	30.5	34.6	40.6	44.3	49.1	50.4
<b>EBL50</b>	50	5.00	6.50	9.93	13.8	16.5	19.2	22.9	24.8	28.5	31.0	31.9	33.9	38.4	45.7	52.5	54.5	56.1
<b>EBL60</b>	60	6.00	7.83	11.9	16.7	19.7	23.0	27.5	29.7	34.2	37.2	38.3	40.7	46.1	54.7	62.9	64.4	67.2
<b>EBL70</b>	70	7.31	9.10	13.8	19.3	23.0	26.8	32.0	34.7	40.0	43.4	44.7	47.5	53.8	63.8	73.0	76.4	78.4
<b>EBL80</b>	80	8.35	10.4	15.8	22.1	26.3	30.6	36.6	39.6	45.7	49.6	51.1	54.3	61.5	72.9	83.4	87.3	89.6
<b>EBL90</b>	90	9.18	11.8	17.8	24.9	29.6	34.5	40.7	44.6	51.4	55.9	57.5	61.1	67.7	82.0	94.2	98.2	100
<b>EBL100</b>	100	10.0	13.1	19.8	27.6	32.9	38.3	45.8	49.5	57.1	62.1	63.9	67.9	73.9	91.0	105	109	112
<b>EBL125</b>	125	13.0	16.3	24.8	34.5	41.2	47.9	57.3	61.9	71.4	77.6	79.8	84.9	96.2	112	123	136	140
<b>EBL150</b>	150	16.0	19.6	29.8	41.4	49.4	57.5	68.7	74.3	85.7	93.1	95.8	101	115	138	158	163	168
<b>EBL200</b>	200	21.0	26.1	39.7	55.3	65.8	76.7	91.6	99.1	114	124	127	135	153	183	211	218	224
<b>EBL250</b>	250	26.1	32.7	49.6	69.1	82.3	95.8	114	123	142	155	159	169	192	229	263	272	280
<b>EBL300</b>	300	31.3	39.2	59.5	82.9	98.7	115	137	148	171	186	191	203	230	276	316	327	336
<b>EBL350</b>	350	36.5	45.7	69.5	96.7	115	134	160	173	200	217	223	237	269	321	368	381	392
<b>EBL400</b>	400	41.8	52.2	79.4	110	131	153	183	198	228	248	255	271	307	366	419	436	448
<b>EBL500</b>	500	52.2	65.3	99.2	138	164	192	229	247	285	310	319	339	384	457	522	545	560
<b>EBL600</b>	600	62.6	78.3	119	165	197	230	275	297	342	372	383	407	461	549	627	654	672
<b>EBL700</b>	700	73.0	91.3	138	193	230	268	320	346	400	434	447	475	538	637	731	763	784
<b>EBL800</b>	800	83.5	104	159	221	263	307	366	396	457	496	511	543	615	729	845	873	896
<b>EBL900</b>	900	93.9	117	178	248	296	345	412	445	514	558	575	611	692	820	940	982	1008
<b>EBL1000</b>	1000	104	130	198	276	329	383	458	495	571	621	639	679	769	911	1043	1091	1120

## Final Discharge Voltage 1.10 Volts Per Cell

Cell Type	C5 Ah	Discharge Time in Hours							Discharge Time in Minutes							Time in Seconds			
		10	8	5	3	2	1.5	1	45	30	20	15	10	5	1	30	5	1	
XHP5	5			1.1			3.3	4.8			8.2	11.4	13.2	18.7	21.2	29.1	33.8	35.1	43.9
XHP10	10			2.1			6.6	9.5			17.3	23.7	27.5	39.0	44.3	61.3	70.5	73.3	91.7
XHP20	20			4.1			13.3	19.0			33.1	45.6	52.8	74.8	84.9	117	135	140	176
XHP30	30			6.2			19.8	28.5			51.7	71.2	82.5	117	132	183	211	219	275
XHP40	40			8.3			26.5	38.0			66.2	91.2	105	149	169	235	270	281	352
XHP50	50			10.3			33.1	47.5			86.2	118	137	195	221	306	352	366	458
XHP60	60			12.4			39.8	57.0			104	142	165	234	265	367	423	439	550
XHP70	70			14.4			46.3	66.5			120	166	192	273	309	428	493	518	642
XHP80	80			16.5			53.0	76.0			138	190	220	312	354	490	564	586	734
XHP90	90			18.6			59.5	85.5			155	213	247	351	398	551	634	669	825
XHP100	100			21.0			66.0	95.0			173	237	275	390	442	612	705	732	917
XHP120	120			24.8			80.0	114			207	285	330	468	531	735	846	879	1101
XHP140	140			28.9			93.0	133			242	332	385	546	619	857	987	1025	1284
XHP150	150			31.0			99.6	143			259	356	413	585	663	918	1058	1098	1376
XHP170	170			35.1			113	162			293	403	467	663	752	1041	1198	1245	1559
XHP190	190			39.9			125	180			327	451	522	741	840	1163	1339	1406	1743
XHP210	210			43.3			139	200			362	498	577	819	929	1250	1406	1538	1831
XHP250	250			51.5			165	238			431	593	687	975	1106	1488	1674	1831	2180
XHP300	300			61.9			199	286			517	711	824	1170	1327	1786	2009	2197	2616
XHP320	320			66.0			212	305			552	759	879	1248	1416	1905	2142	2344	2790
EBH30	30	3.03	3.79	6.06	9.57	13.7	17.4	24.3	29.3	35.3	44.3	51.8	69.1	85.3	115	140	168	185	
EBH40	40	4.05	5.06	8.08	12.7	18.2	23.3	32.4	39.1	47.2	59.0	69.1	92.0	114	154	187	224	247	
EBH50	50	5.06	6.32	10.1	15.9	22.8	29.1	40.5	48.9	59.0	73.7	86.4	115	142	192	234	280	309	
EBH60	60	6.07	7.58	12.1	19.1	27.4	34.9	48.6	58.7	70.8	88.4	104	138	170	230	281	336	371	
EBH70	70	7.08	8.84	14.1	22.3	32.0	40.8	56.7	68.5	82.1	101	120	161	199	269	327	393	433	
EBH80	80	8.08	10.1	16.2	25.5	36.6	46.6	64.8	78.3	95.2	119	138	184	227	308	374	449	495	
EBH100	100	10.1	12.6	20.2	31.9	45.7	58.3	81.0	97.9	119	149	172	230	284	385	468	561	619	
EBH120	120	12.1	15.1	24.2	38.3	54.8	69.9	97.0	117	142	178	207	276	341	462	561	673	743	
EBH150	150	15.2	19.9	30.3	47.8	68.5	87.4	121	146	177	223	259	345	426	577	702	842	928	
EBH200	200	20.2	25.2	40.4	63.8	91.4	116	162	195	236	296	345	460	568	771	936	1123	1238	
EBH250	250	25.3	31.5	50.5	79.8	114	145	203	244	295	370	431	575	710	964	1170	1404	1548	
EBH300	300	30.3	37.9	60.6	95.7	137	174	243	293	355	443	518	691	853	1155	1404	1684	1857	
EBH350	350	35.4	44.2	70.8	111	160	204	283	342	413	517	604	806	995	1348	1638	1965	2167	
EBH400	400	40.4	50.5	80.9	127	182	233	324	391	473	590	691	921	1137	1540	1872	2246	2476	
EBH500	500	50.6	63.2	101	159	228	291	405	489	589	737	864	1152	1422	1926	2340	2808	3096	
EBM30	30	3.10	3.83	6.13	9.84	13.5	16.5	20.3	22.3	25.5	30.7	32.4	36.4	41.2	54.0	57.1	71.8	84.3	
EBM40	40	4.10	5.11	8.18	13.1	18.0	22.1	27.1	29.7	33.9	41.0	43.2	48.9	54.9	72.0	76.2	95.7	115	
EBM50	50	5.10	6.39	10.2	16.4	22.6	27.6	33.9	37.2	42.6	51.3	54.0	60.7	68.7	90.0	95.2	119	140	
EBM60	60	6.15	7.66	12.2	19.6	27.1	33.1	40.7	44.6	60.0	61.5	64.8	72.9	82.4	108	114	143	171	



<b>EBM75</b>	75	7.69	9.58	15.3	24.6	33.9	41.4	50.9	55.8	65.8	76.9	81.0	91.1	103	135	142	179	207
<b>EBM85</b>	85	8.72	10.8	17.3	27.8	38.4	46.9	57.7	63.5	74.3	87.2	91.8	103	116	153	161	203	235
<b>EBM90</b>	90	9.23	11.4	18.3	29.4	40.7	49.7	61.1	67.2	78.7	92.3	97.2	109	123	162	170	215	249
<b>EBM100</b>	100	10.2	12.7	20.4	32.8	45.2	55.2	67.9	74.4	84.9	102	108	121	137	180	190	239	282
<b>EBM120</b>	120	12.3	15.3	24.5	39.3	54.2	66.3	81.5	89.2	103	123	129	145	164	216	228	287	335
<b>EBM150</b>	150	15.3	19.2	30.6	49.2	67.8	82.8	101	111	128	153	162	182	206	270	285	359	421
<b>EBM200</b>	200	20.5	25.5	40.9	65.6	90.4	110	135	148	170	205	216	243	274	360	381	478	559
<b>EBM250</b>	250	25.5	31.8	51.0	82.0	113	138	169	186	212	255	270	303	343	450	475	598	705
<b>EBM300</b>	300	30.7	38.3	61.3	98.4	135	165	203	223	253	307	324	364	412	540	571	718	839
<b>EBM350</b>	350	35.9	44.7	71.6	114	158	193	237	260	299	359	378	425	380	630	666	837	978
<b>EBM400</b>	400	41.0	51.1	81.8	131	180	221	271	297	343	410	432	486	549	720	762	957	1115
<b>EBM500</b>	500	51.3	63.9	102	164	226	276	339	372	430	513	540	607	687	900	952	1197	1385
<b>EBM600</b>	600	61.5	76.6	122	196	271	331	407	446	511	615	648	729	824	1080	1143	1436	1669
<b>EBM700</b>	700	71.8	89.4	143	229	316	386	475	520	597	718	756	850	961	1260	1333	1675	1942
<b>EBM800</b>	800	82.1	102	163	262	361	442	543	595	679	820	864	972	1099	1440	1524	1915	2225
<b>EBL10</b>	10	1.05	1.31	2.03	2.98	3.73	4.67	5.53	6.00	6.84	7.56	8.10	8.46	9.31	10.8	11.5	13.7	14.3
<b>EBL22</b>	22	2.31	2.89	4.47	6.57	8.21	10.2	12.1	13.3	15.0	16.6	17.8	18.6	20.4	23.9	25.3	30.1	31.5
<b>EBL30</b>	30	3.15	3.94	6.10	8.96	11.2	14.0	16.6	18.0	20.5	22.6	24.3	25.3	27.9	32.6	35.9	41.1	43.0
<b>EBL40</b>	40	4.21	5.25	8.13	11.9	14.9	18.6	22.1	24.0	27.3	30.2	32.4	33.8	37.2	43.5	47.5	54.9	57.4
<b>EBL45</b>	45	4.74	5.93	9.15	13.4	16.8	21.0	24.9	27.0	30.7	34.0	36.4	38.0	41.9	49.0	51.8	61.7	64.5
<b>EBL50</b>	50	5.26	6.57	10.1	14.9	18.6	23.3	27.6	30.0	34.2	37.8	40.5	42.3	46.5	54.4	59.0	68.6	71.7
<b>EBL60</b>	60	6.32	7.88	12.2	17.9	22.4	28.0	33.2	36.0	41.0	45.3	48.6	50.7	55.8	65.3	71.5	82.3	86.1
<b>EBL70</b>	70	7.37	9.19	14.2	20.9	26.1	32.6	38.7	42.0	47.9	52.9	56.7	59.2	65.2	76.2	83.4	95.4	99.8
<b>EBL80</b>	80	8.42	10.5	16.2	23.9	29.8	37.3	44.2	48.0	54.7	60.4	64.8	67.6	74.5	87.1	95.3	109	114
<b>EBL90</b>	90	9.46	11.8	18.3	26.9	33.6	42.0	49.8	54.0	61.6	68.0	72.9	76.1	83.8	97.6	108	123	129
<b>EBL100</b>	100	10.5	13.1	20.3	29.8	37.3	46.6	55.3	60.0	68.4	75.6	81.0	84.6	93.1	108	120	137	143
<b>EBL125</b>	125	13.1	16.4	25.5	37.3	46.6	58.3	69.1	75.0	85.5	94.5	101	105	116	136	144	171	179
<b>EBL150</b>	150	15.8	19.7	30.5	44.8	56.0	70.0	83.0	90.0	102	113	121	126	139	163	179	205	215
<b>EBL200</b>	200	21.1	26.2	40.6	59.7	74.7	93.3	110	120	136	151	162	169	186	217	238	274	287
<b>EBL250</b>	250	26.3	32.8	50.8	74.7	93.3	116	138	150	171	189	202	211	232	272	288	343	358
<b>EBL300</b>	300	31.5	39.4	61.0	89.6	112	140	166	180	205	226	243	253	279	326	345	411	430
<b>EBL350</b>	350	36.8	45.9	71.1	104	130	163	193	210	239	264	283	296	326	381	403	480	502
<b>EBL400</b>	400	42.1	52.5	81.3	119	149	186	221	240	273	302	324	338	372	435	460	549	574
<b>EBL500</b>	500	52.6	65.7	101	149	186	233	276	300	342	378	405	423	465	544	576	686	717
<b>EBL600</b>	600	63.1	78.8	122	179	224	280	332	360	410	453	486	507	558	653	691	823	861
<b>EBL700</b>	700	73.5	91.7	142	208	261	326	387	420	479	529	567	592	652	756	805	959	1000
<b>EBL800</b>	800	84.2	105	162	239	298	373	442	480	547	604	648	676	745	872	921	1098	1148
<b>EBL900</b>	900	94.7	118	183	268	336	420	498	540	615	680	729	761	838	980	1036	1235	1291
<b>EBL1000</b>	1000	105	131	203	298	373	466	553	600	684	756	810	846	931	1089	1152	1372	1435

## Final Discharge Voltage 1.05 Volts Per Cell

Cell Type	C5 Ah	Discharge Time in Hours							Discharge Time in Minutes							Time in Seconds		
		10	8	5	3	2	1.5	1	45	30	20	15	10	5	1	30	5	1
XHP5	5			1.10			3.40	4.90		8.54	12.8	14.7	21.5	25.9	33.9	38.1	40.7	52.2
XHP10	10			2.10			6.80	9.80		17.8	26.7	30.8	44.8	54.0	70.7	79.5	84.7	108
XHP20	20			4.30			13.5	19.5		35.3	51.3	59.0	85.9	103	135	152	162	208
XHP30	30			6.51			20.2	29.2		53.2	80.2	92.2	134	162	212	238	254	326
XHP40	40			8.70			27.0	39.0		70.8	102	118	171	207	271	305	325	417
XHP50	50			10.8			33.7	48.7		88.7	133	150	223	270	353	397	423	543
XHP60	60			13.0			40.5	58.5		106	160	179	268	324	424	477	508	652
XHP70	70			15.1			47.2	68.2		124	187	215	313	378	495	556	593	761
XHP80	80			17.3			54.0	78.0		142	214	235	358	432	566	636	678	870
XHP90	90			19.5			60.7	87.7		159	240	276	402	486	636	715	762	978
XHP100	100			22.0			68.0	98.0		177	267	296	447	540	707	795	847	1087
XHP120	120			26.0			81.0	117		213	321	357	537	648	849	954	1017	1305
XHP140	140			30.3			95.0	137		248	374	430	626	756	990	1113	1186	1522
XHP150	150			32.5			102	147		266	401	461	671	810	1061	1193	1271	1631
XHP170	170			36.5			115	166		301	454	522	760	918	1202	1351	1440	1848
XHP190	190			41.2			128	185		337	508	584	850	1026	1344	1510	1610	2066
XHP210	210			45.0			142	205		372	561	645	939	1134	1410	1586	1695	2169
XHP250	250			53.6			169	244		443	668	768	1118	1350	1679	1888	2018	2582
XHP300	300			64.3			203	293		531	801	921	1341	1620	2014	2266	2421	3099
XHP320	320			68.6			216	312		567	855	983	1431	1728	2149	2417	2583	3305
EBH30	30	3.04	3.81	6.10	10.7	13.9	17.9	24.9	30.6	38.4	50.5	58.1	75.6	110	144	155	209	228
EBH40	40	4.06	5.08	8.08	14.3	18.6	23.8	33.2	40.9	51.2	67.4	77.4	101	146	193	207	279	305
EBH50	50	5.07	6.35	10.1	17.9	23.2	29.8	41.5	51.1	64.0	84.2	96.8	126	183	241	259	349	381
EBH60	60	6.08	7.62	12.1	21.5	27.8	35.8	49.8	61.3	76.8	101	116	151	220	289	311	419	457
EBH70	70	7.10	8.89	14.2	25.1	32.5	41.8	58.2	71.5	89.7	117	135	176	257	337	362	488	534
EBH80	80	8.08	10.2	16.2	28.7	37.1	47.8	66.5	81.6	102	134	154	202	294	386	414	558	610
EBH100	100	10.1	12.7	20.3	35.9	46.4	59.7	83.1	102	128	168	193	252	367	482	518	698	763
EBH120	120	12.1	15.2	24.4	43.1	55.7	71.7	99.7	122	153	202	232	302	440	578	622	838	915
EBH150	150	15.2	19.0	30.5	53.8	69.6	89.6	124	153	192	252	290	378	550	723	777	1047	1144
EBH200	200	20.3	25.4	40.6	71.8	92.8	119	166	204	256	336	387	504	734	964	1036	1396	1526
EBH250	250	25.4	31.8	50.8	89.8	116	149	208	255	320	420	484	630	918	1205	1295	1745	1908
EBH300	300	30.4	38.1	61.0	107	139	179	249	306	384	505	581	756	1101	1447	1555	2095	2289
EBH350	350	35.5	44.4	71.1	125	162	207	291	357	448	589	677	882	1285	1688	1814	2444	2671
EBH400	400	40.6	50.8	81.3	143	185	239	332	408	512	673	774	1008	1468	1929	2073	2793	3052
EBH500	500	50.7	63.5	101	179	232	293	415	511	640	842	968	1260	1836	2412	2592	3492	3816
EBM30	30	3.11	3.89	6.21	10.0	14.1	17.2	22.6	27.0	33.0	37.2	39.9	43.0	50.1	65.5	72.3	87.3	94.2
EBM40	40	4.15	5.18	8.28	13.3	18.8	22.9	30.2	36.0	44.0	49.6	53.2	57.5	66.8	87.3	96.4	116	126
EBM50	50	5.19	6.48	10.3	16.7	23.5	28.6	37.8	45.1	55.0	62.1	66.6	71.1	83.5	109	120	145	158
EBM60	60	6.22	7.77	12.3	20.0	28.2	34.4	45.3	54.1	66.0	74.5	79.9	85.9	100	131	144	174	192



<b>EBM75</b>	75	7.78	9.72	15.5	25.1	35.3	43.0	56.7	67.6	82.6	93.1	99.9	107	125	163	180	218	235
<b>EBM85</b>	85	8.82	11.0	17.5	28.4	40.0	48.7	64.2	76.7	93.6	105	113	122	142	185	205	247	265
<b>EBM90</b>	90	9.34	11.6	18.5	30.1	42.4	51.6	68.0	81.2	99.1	111	120	129	150	196	217	262	281
<b>EBM100</b>	100	10.3	12.9	20.7	33.4	47.1	57.3	75.6	90.2	110	124	133	147	167	218	241	291	315
<b>EBM120</b>	120	12.4	15.5	24.8	40.1	56.5	68.8	90.7	108	132	149	159	176	200	262	289	349	381
<b>EBM150</b>	150	15.5	19.4	31.0	50.2	70.6	86.0	113	135	165	186	199	217	250	327	361	436	475
<b>EBM200</b>	200	20.7	25.9	41.4	66.9	94.2	114	151	180	220	248	266	292	334	436	482	528	626
<b>EBM250</b>	250	25.8	32.3	51.8	83.5	118	143	189	226	275	310	333	368	418	545	603	728	788
<b>EBM300</b>	300	31.1	38.9	62.1	100	141	172	226	270	330	372	399	431	501	655	723	873	939
<b>EBM350</b>	350	36.3	45.3	72.4	117	164	200	264	315	385	434	466	505	584	764	844	1018	1093
<b>EBM400</b>	400	41.5	51.8	82.8	133	188	229	302	360	440	496	532	572	668	873	964	1164	1255
<b>EBM500</b>	500	51.9	64.8	103	167	235	286	378	451	550	621	666	716	835	1092	1206	1455	1566
<b>EBM600</b>	600	62.2	77.7	124	200	282	344	453	541	660	745	799	859	1002	1310	1447	1746	1871
<b>EBM700</b>	700	72.6	90.7	144	234	329	401	529	631	771	869	932	1002	1169	1528	1688	2037	2183
<b>EBM800</b>	800	83.0	103	165	267	376	458	604	721	881	993	1065	1145	1336	1747	1929	2328	2510
<b>EBL10</b>	10	1.06	1.32	2.05	3.08	4.24	6.19	6.67	7.32	7.38	8.64	9.36	10.2	11.3	13.1	14.2	16.0	16.8
<b>EBL22</b>	22	2.32	2.90	4.51	6.77	9.33	11.4	14.6	16.1	16.2	19.2	20.5	22.4	25.0	28.9	31.3	35.2	37.1
<b>EBL30</b>	30	3.17	3.95	6.14	9.23	12.7	15.5	20.0	21.9	22.2	25.9	28.0	30.6	34.1	39.4	42.7	48.0	50.6
<b>EBL40</b>	40	4.23	5.27	8.19	12.3	16.9	20.7	26.6	29.2	29.5	34.5	37.4	40.8	45.5	52.5	57.0	64.0	67.5
<b>EBL45</b>	45	4.76	5.93	9.22	13.8	19.0	23.3	30.0	32.9	33.2	38.8	42.1	45.9	51.2	59.1	64.1	72.0	75.9
<b>EBL50</b>	50	5.29	6.59	10.2	15.3	21.2	25.9	33.3	36.6	36.9	43.2	46.8	51.0	56.5	65.7	71.3	80.1	84.3
<b>EBL60</b>	60	6.34	7.91	12.2	18.4	25.4	31.1	40.0	43.9	44.2	51.8	56.1	61.2	68.2	78.8	85.5	96.0	101
<b>EBL70</b>	70	7.40	9.19	14.3	21.5	29.7	36.3	46.6	51.2	51.6	60.5	65.5	71.7	79.6	91.9	99.8	112	118
<b>EBL80</b>	80	8.46	10.5	16.3	24.6	33.9	41.5	53.3	58.5	59.0	69.1	74.8	81.9	91.0	105	114	128	135
<b>EBL90</b>	90	9.48	11.8	18.4	27.7	38.2	46.7	60.0	65.9	66.4	77.8	84.2	92.0	102	118	128	144	152
<b>EBL100</b>	100	10.5	13.1	20.4	30.7	42.4	51.8	66.6	73.2	73.8	86.4	93.6	102	113	131	142	160	168
<b>EBL125</b>	125	13.2	16.4	25.6	38.4	53.0	64.8	83.3	91.5	92.2	108	117	127	142	164	178	200	210
<b>EBL150</b>	150	15.8	19.7	30.7	46.1	63.6	77.8	100	109	110	129	140	153	170	197	213	240	253
<b>EBL200</b>	200	21.1	26.3	40.9	61.5	84.8	103	133	146	147	172	187	204	227	262	285	320	337
<b>EBL250</b>	250	26.4	32.9	51.2	76.9	106	129	166	183	184	216	234	255	284	328	356	400	421
<b>EBL300</b>	300	31.7	39.5	61.4	92.3	127	155	200	219	221	259	280	306	341	394	427	480	506
<b>EBL350</b>	350	37.0	46.1	71.6	107	148	181	233	256	258	302	327	357	398	459	499	560	590
<b>EBL400</b>	400	42.3	52.7	81.9	123	169	207	266	292	295	345	374	408	455	525	570	640	675
<b>EBL500</b>	500	52.9	65.9	102	153	212	259	333	366	369	432	468	510	569	657	713	801	843
<b>EBL600</b>	600	63.4	79.1	122	184	254	311	400	439	443	518	561	612	682	788	855	941	1012
<b>EBL700</b>	700	74.0	92.3	143	215	297	363	466	512	516	604	655	715	796	919	998	1121	1181
<b>EBL800</b>	800	84.6	105	163	246	339	415	533	585	590	691	748	817	910	1051	1141	1281	1350
<b>EBL900</b>	900	95.2	118	184	277	381	467	600	658	664	777	842	919	1024	1182	1283	1441	1518
<b>EBL1000</b>	1000	105	131	204	307	424	518	666	732	738	864	936	1021	1138	1314	1426	1602	1687

## Final Discharge Voltage 1.00 Volts Per Cell

Cell Type	C5 Ah	Discharge Time in Hours							Discharge Time in Minutes							Time in Seconds		
		10	8	5	3	2	1.5	1	45	30	20	15	10	5	1	30	5	1
XHP5	5			1.20			3.40	5.10		9.08	14.4	16.8	24.0	32.6	43.8	48.2	51.2	59.6
XHP10	10			2.20			6.90	10.3		19.0	30.0	34.0	50.0	68.0	91.2	100	106	124
XHP20	20			4.40			13.8	20.5		37.8	57.6	67.3	96.0	130	175	192	204	238
XHP30	30			6.60			20.6	30.7		56.8	90.0	106	150	204	273	301	320	372
XHP40	40			8.80			27.5	41.0		75.6	115	134	192	261	350	385	409	477
XHP50	50			11.0			34.3	51.2		94.8	150	174	250	340	456	502	533	621
XHP60	60			13.2			41.3	61.5		113	180	202	300	408	547	603	640	745
XHP70	70			15.4			48.0	71.7		127	210	229	350	476	638	703	747	869
XHP80	80			17.6			55.0	82.0		152	240	269	400	544	730	804	854	994
XHP90	90			19.8			61.8	92.2		170	270	300	450	612	821	904	960	1118
XHP100	100			22.1			69.0	103		189	300	335	500	680	912	1005	1067	1242
XHP120	120			26.2			82.0	123		228	360	402	600	816	1095	1206	1281	1491
XHP140	140			30.5			96.0	144		265	420	457	700	952	1277	1407	1494	1739
XHP150	150			32.7			103	154		284	450	490	750	1020	1368	1508	1601	1863
XHP170	170			36.7			116	174		322	510	552	850	1156	1551	1708	1814	2112
XHP190	190			41.8			130	194		360	570	617	950	1292	1733	1909	2028	2360
XHP210	210			45.2			144	215		398	630	682	1050	1356	1877	2110	2196	2557
XHP250	250			53.8			171	256		474	750	812	1250	1614	2235	2512	2614	3044
XHP300	300			64.6			206	307		569	900	974	1500	1937	2681	3014	3137	3653
XHP320	320			68.9			219	328		606	960	1039	1600	2066	2860	3215	3346	3896
EBH30	30	3.06	3.84	6.14	10.9	14.1	18.9	27.0	34.2	48.5	64.0	75.2	88.5	118	152	184	232	264
EBH40	40	4.09	5.13	8.16	14.6	18.8	25.6	35.9	45.6	64.7	86.4	99.2	118	158	202	246	310	353
EBH50	50	5.11	6.41	10.2	18.2	23.5	32.0	44.9	57.0	80.9	108	124	147	198	253	307	387	441
EBH60	60	6.13	7.69	12.2	21.8	28.2	38.4	53.9	68.4	97.1	130	149	176	238	304	368	464	529
EBH70	70	7.15	8.97	14.3	25.5	33.0	43.1	60.0	79.8	98.7	123	147	206	277	355	430	542	617
EBH80	80	8.16	10.2	16.3	29.1	39.4	50.0	72.9	91.2	130	172	197	236	317	406	492	619	706
EBH100	100	10.2	12.8	20.4	36.4	49.2	62.5	91.1	114	163	215	246	295	396	507	615	774	882
EBH120	120	12.2	15.3	24.5	43.7	57.1	76.2	109	136	196	257	295	354	475	609	738	929	1007
EBH150	150	15.3	19.2	30.7	54.7	70.9	94.1	136	171	245	321	368	442	594	761	923	1161	1323
EBH200	200	20.4	25.6	40.9	72.9	94.3	125	181	228	325	427	490	590	792	1015	1231	1548	1764
EBH250	250	25.5	32.0	51.1	91.1	118	156	226	285	406	534	613	738	990	1269	1539	1935	2205
EBH300	300	30.6	38.4	61.4	109	143	187	270	342	487	639	734	885	1188	1522	1846	2323	2646
EBH350	350	35.7	44.8	71.6	127	165	218	315	399	569	746	856	1033	1386	1776	2154	2710	3087
EBH400	400	40.8	51.2	81.9	145	190	249	359	456	648	855	978	1180	1584	2030	2462	3097	3528
EBH500	500	51.1	64.1	102	182	237	311	448	570	808	1066	1213	1479	1980	2538	3078	3871	4410
EBM30	30	3.13	3.92	6.28	10.1	14.8	18.7	24.8	31.2	40.5	46.1	50.7	52.2	58.1	72.0	82.8	94.8	111
EBM40	40	4.17	5.23	8.37	13.5	19.6	24.9	33.1	41.6	54.0	61.5	67.6	69.9	77.5	96.0	110	126	148
EBM50	50	5.22	6.54	10.4	16.9	24.5	31.0	41.4	52.0	67.5	76.9	84.6	87.0	96.9	120	138	158	185
EBM60	60	6.26	7.84	12.5	20.3	30.2	37.2	49.6	62.4	81.0	92.3	101	104	116	144	165	189	222





<b>EBM75</b>	75	7.83	9.81	15.7	25.4	36.2	45.2	62.1	78.0	101	115	126	130	145	180	207	237	255
<b>EBM85</b>	85	8.87	11.1	17.7	28.8	41.0	51.2	70.3	88.4	114	130	143	147	164	204	234	268	289
<b>EBM90</b>	90	9.39	11.8	18.7	30.5	43.4	54.2	74.4	93.6	120	138	151	156	174	216	248	284	306
<b>EBM100</b>	100	10.4	13.0	20.9	33.9	48.7	61.9	82.8	104	135	153	169	174	193	240	276	318	370
<b>EBM120</b>	120	12.5	15.6	25.1	40.6	58.4	74.3	99.3	124	162	184	203	208	232	288	331	379	444
<b>EBM150</b>	150	15.6	19.6	31.5	50.8	72.9	92.7	124	156	202	230	253	261	290	360	414	474	556
<b>EBM200</b>	200	20.8	26.1	41.8	67.8	97.1	124	165	208	270	307	338	348	387	480	552	632	741
<b>EBM250</b>	250	26.0	32.5	52.3	84.8	122	155	207	260	338	383	423	435	483	600	690	790	925
<b>EBM300</b>	300	31.3	39.2	62.8	101	147	187	248	312	405	461	507	522	581	720	828	948	1110
<b>EBM350</b>	350	36.5	45.7	73.2	118	172	218	289	364	472	538	592	609	678	840	966	1106	1290
<b>EBM400</b>	400	41.7	52.3	83.7	135	199	249	331	416	540	615	676	696	775	980	1104	1264	1480
<b>EBM500</b>	500	52.5	65.0	104	169	248	313	414	520	675	769	846	870	969	1200	1380	1581	1850
<b>EBM600</b>	600	62.6	78.4	125	203	292	373	496	624	810	923	1015	1044	1162	1440	1656	1897	2220
<b>EBM700</b>	700	73.0	91.5	146	237	343	435	579	728	945	1077	1184	1218	1356	1680	1932	2213	2590
<b>EBM800</b>	800	83.5	104	167	271	389	499	662	832	1080	1231	1353	1392	1550	1920	2208	2529	2960
<b>EBL10</b>	10	1.06	1.32	2.06	3.12	4.42	5.68	7.69	8.58	9.76	10.5	10.8	11.8	12.6	15.0	15.6	19.1	19.5
<b>EBL22</b>	22	2.34	2.91	4.51	6.86	9.72	12.5	16.9	18.8	21.4	23.1	23.7	25.9	27.8	33.0	35.3	42.0	43.0
<b>EBL30</b>	30	3.18	3.96	6.15	9.40	13.2	17.0	23.0	25.7	29.2	31.5	32.4	35.4	37.9	48.9	52.7	57.3	58.7
<b>EBL40</b>	40	4.25	5.29	8.21	12.8	17.6	22.7	30.7	34.3	39.0	42.1	43.2	47.2	50.5	64.7	70.5	76.4	78.3
<b>EBL45</b>	45	4.78	5.95	9.23	14.0	19.8	25.5	34.5	38.6	43.9	47.3	48.6	53.1	56.9	67.6	73.2	85.9	88.1
<b>EBL50</b>	50	5.31	6.62	10.2	15.9	22.0	28.4	38.4	42.9	48.8	52.6	54.0	59.0	63.2	81.4	88.2	95.5	97.9
<b>EBL60</b>	60	6.37	7.94	12.3	19.1	26.5	34.1	46.1	51.4	58.5	63.1	64.8	70.8	75.8	97.2	107	114	117
<b>EBL70</b>	70	7.43	9.19	14.4	22.4	30.9	39.8	53.8	60.0	68.3	73.7	75.6	82.7	88.4	114	125	133	137
<b>EBL80</b>	80	8.49	10.5	16.4	25.6	35.3	45.5	61.5	68.6	78.0	84.2	86.4	94.5	101	130	143	152	156
<b>EBL90</b>	90	9.55	11.9	18.5	28.5	39.7	51.2	69.2	77.2	87.8	94.6	97.2	106	114	147	160	172	176
<b>EBL100</b>	100	10.6	13.2	20.5	31.4	44.1	56.8	76.9	85.8	97.6	105	108	118	126	164	177	191	195
<b>EBL125</b>	125	13.2	16.5	25.6	38.9	55.2	71.1	96.1	107	121	131	135	147	158	187	195	238	244
<b>EBL150</b>	150	15.9	19.8	30.7	47.4	66.1	85.3	115	128	146	157	162	177	189	245	265	286	293
<b>EBL200</b>	200	21.2	26.4	41.0	63.2	88.3	113	153	171	195	210	216	236	252	325	353	382	391
<b>EBL250</b>	250	26.5	33.0	51.3	79.3	110	142	192	214	243	263	270	295	316	375	390	477	489
<b>EBL300</b>	300	31.8	39.6	61.5	94.2	132	170	230	257	292	315	324	354	379	450	468	573	587
<b>EBL350</b>	350	37.1	46.3	71.8	112	154	199	269	300	341	368	378	413	442	526	546	668	685
<b>EBL400</b>	400	42.4	52.9	82.0	129	176	227	307	343	390	421	432	472	505	601	624	764	783
<b>EBL500</b>	500	53.1	66.1	102	158	220	284	384	429	487	526	540	590	632	751	780	955	979
<b>EBL600</b>	600	63.7	79.3	123	189	265	341	461	514	585	631	648	708	758	901	936	1146	1174
<b>EBL700</b>	700	74.3	92.6	143	224	309	398	538	600	682	737	756	826	885	1062	1093	1337	1370
<b>EBL800</b>	800	84.9	105	164	253	353	455	615	686	780	842	864	945	1011	1202	1249	1528	1566
<b>EBL900</b>	900	95.5	119	184	286	397	511	691	772	878	947	972	1063	1138	1351	1405	1719	1762
<b>EBL1000</b>	1000	106	132	205	317	441	568	768	858	975	1035	1080	1181	1264	1503	1561	1910	1958

### Final Discharge Voltage 0.85 Volts Per Cell

Cell Type	C5 Ah	Discharge Time in Minutes			Discharge Time in Seconds			
		10	5	1	30	10	5	1
XHP5	5	24.4	35.1	58.3	61.0	66.3	72.8	81.8
XHP10	10	51.0	73.2	120	123	138	151	170
XHP20	20	97.9	140	244	249	265	297	327
XHP30	30	153	219	365	410	414	455	511
XHP40	40	195	281	486	508	530	592	654
XHP50	50	255	366	607	620	691	758	852
XHP60	60	306	439	728	760	829	910	1023
XHP70	70	357	512	849	860	967	1062	1193
XHP80	80	408	585	970	990	1105	1214	1364
XHP90	90	459	658	1092	1100	1243	1365	1534
XHP100	100	510	732	1215	1230	1382	1517	1705
XHP120	120	612	878	1455	1480	1658	1821	2046
XHP140	140	714	1024	1700	1720	1934	2124	2387
XHP150	150	765	1097	1821	1850	2072	2276	2558
XHP170	170	867	1244	2064	2100	2349	2579	2898
XHP190	190	920	1293	2146	2160	2442	2681	3012
XHP210	210	963	1383	2295	2310	2611	2868	3222
XHP250	250	1146	1646	2732	2800	3108	3414	3836
XHP300	300	1376	1976	3279	3300	3730	4097	4603
XHP320	320	1467	2107	3497	3515	3979	4370	4910

### Final Discharge Voltage 0.65 Volts Per Cell

Cell Type	C5 Ah	Discharge Time in Minutes			Discharge Time in Seconds			
		10	5	1	30	10	5	1
XHP5	5	26.0	42.3	85.2	88	96.7	103	115
XHP10	10	54.7	88.2	176	182	201	215	241
XHP20	20	105	169	373	380	405	428	463
XHP30	30	164	264	559	568	606	645	690
XHP40	40	210	338	744	760	810	859	927
XHP50	50	273	441	929	950	1010	1077	1150
XHP60	60	328	529	1113	1128	1215	1292	1380
XHP70	70	383	617	1243	1260	1411	1507	1610
XHP80	80	438	706	1486	1520	1625	1723	1840
XHP90	90	492	794	1598	1630	1814	1938	2070
XHP100	100	547	882	1858	1890	2018	2154	2300
XHP120	120	657	1059	2228	2250	2421	2585	2760
XHP140	140	766	1235	2486	2510	2823	3016	3413
XHP150	150	821	1323	2664	2720	3025	3231	3657
XHP170	170	930	1500	3019	3100	3427	3662	4145
XHP190	190	988	1592	3205	3310	3638	3889	4400
XHP210	210	1034	1667	3356	3432	3810	4071	4607
XHP250	250	1231	1985	3995	4160	4536	4846	5485
XHP300	300	1477	2381	4794	4895	5443	5816	6581
XHP320	320	1576	2540	5114	5325	5806	6203	7020

## Calculation Methods

### Information required for battery capacity calculation

The following information needed for a precise battery capacity calculation:

-Nominal voltage of the system	-Load current required	-Backup time required
-Maximum voltage (for charging)	-Minimum voltage	-Temperature range
-Battery layout and available space	-Physical condition	

## Float Voltage Operation

In these conditions the float voltage, being the voltage at which the general load circuit will operate, then a decision will have to be reached on the cell float voltage needed to maintain the battery in the required condition.

$$\text{Number of cells required} = \frac{\text{Circuit voltage}}{\text{Cell Float voltage}}$$

$$\text{Minimum cell voltage} = \frac{\text{Minimum D.C. voltage}}{\text{Number of cells}}$$

The most commonly used float voltages are 1.40-1.48 voltage per cell, but the exact figure has to be related carefully to circumstances.

## For Example

An EverExceed Nickel Cadmium battery is required to maintain an inverter load of 50KVA at 0.8 power factor for a backup time of 30 minutes, at 20~25°C temperature. The DC voltage to the inverter operates within the limit of 265 volts with the battery on float charge to a minimum of 202 volts at end of back up time. The inverter has an 85% efficiency rate.

- Number of Cells (at recommended float of 1.44VPC) =  $265/1.44 \approx 184$  cells
- Minimum Cell Voltage =  $202/184 \approx 1.10$  volts per cell
- Maximum Battery Current

$$= \frac{\text{Inverter load in KVA} \times \text{Power factor}}{\text{Min. cell voltage} \times \text{Number of cells} \times \text{Inverter efficiency}}$$

$$= \frac{50\text{KVA} \times 0.80}{1.10 \times 184 \times 0.85} = 232.5 \text{ Amps}$$

We shall choose the battery with capacity equal or just above 232.5Amps.

To meet the 30 minutes backup time requirement, we determine to choose the battery size from EBM Range.

From our catalogue data, the cell type is EBM300.

Battery shall comprise 184 cells of EverExceed Nickel Cadmium type EBM300.

System Voltage	Number of Cells	Spread Range Number of Cells
24	20	18~21
36	30	27~31
48	40	36~41
110	92	88~93
220	184	180~186

The number of cells in a battery may be determined by simply dividing the nominal voltage of the system by the nominal voltage of a cell (1.2 Volts).



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