

BATTERY  
**CSB**



**HRL** series  
High Rate  
Long Life

**PRODUCT APPLICATION ▼**

Confidence & Creativity  
Service & Sincerity  
Belief & Bravery

# HRL



# HRL series

HRL-series batteries are specially designed for high rate discharge applications. With VRLA technology, they are small, lightweight and offer more than 260 cycles at 100% discharge.

Because of its innovative design, HRL-series output energy is 20% higher than comparable products with longer design life.

As with all CSB batteries, they are rechargeable, highly efficient, maintenance free, leakproof, viable in any orientation and ISO/UL certified.



## Performance

- Innovative plate structure greatly increases energy/density ratios.
- Increased current delivery for high-rate discharge.
- Up to 50% greater resistance to grid growth under optimal temperature.
- Reduced internal resistance for superior performance.
- Uniform plate formation for consistent capacity.
- No-spill design.
- Viable in any orientation.
- Maintenance free.

## Long service life

- Up to 10 years expected life under normal float charge conditions at 25°C (77°F).
- Extended shelf life (up to 14 months at 20°C).

## Reliability

- CSB manufactured batteries are 100% 2-cycle tested by CCDS.
- CSB-manufactured batteries are UL-recognized components under UL 924 and UL 1989. CSB file number MH 14533.
- ISO 9001/14001 certified.

## Applications

### Standby use

- UPS power supply.
- Workstation UPS.
- Emergency lighting equipment.
- Precision instrument backup power.
- Fire alarm and security systems.
- Communications and electrical equipment.
- Office computers, microcomputers and OA equipment.
- Robots, control equipment and other FA equipment.
- Emergency power supply in power plants and substations.

### Cycle use

- Portable measuring equipment.
- Cameras and photographic equipment.
- Various toys and hobby equipment.

### Solar Cell Power Generation

- Street lighting.
- Portable power supply.
- Water pumping.
- Rural power systems.

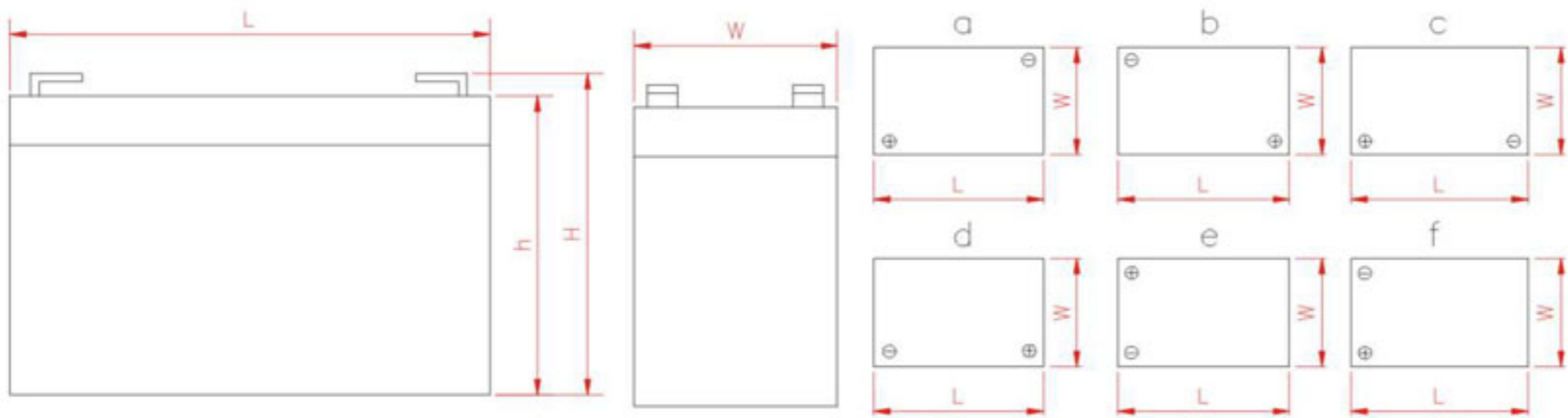


## Specifications

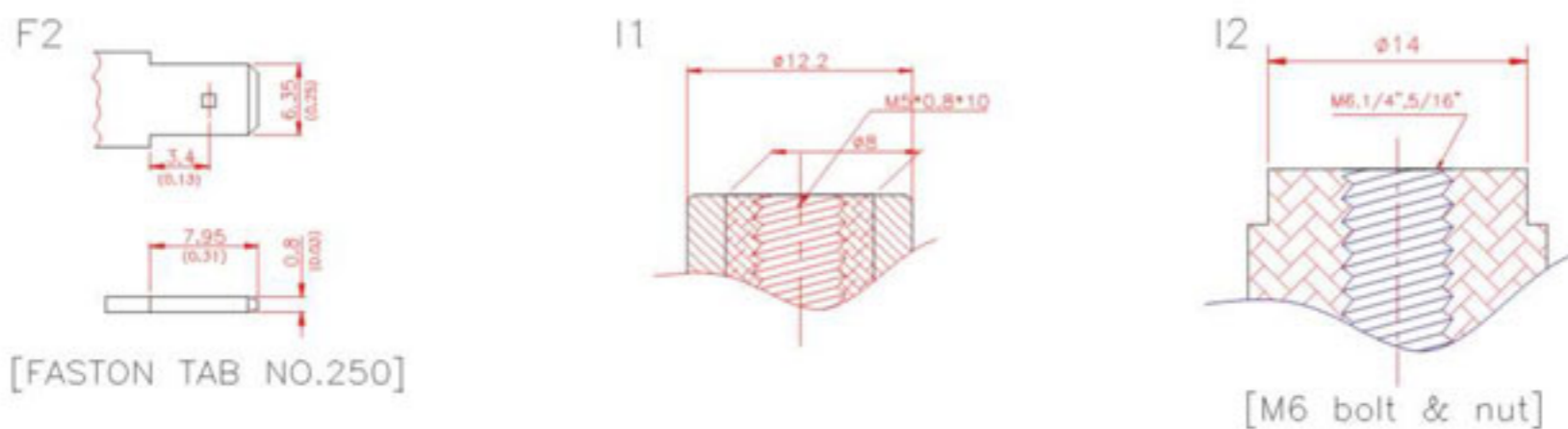
Battery Type	Nominal Voltage(V)	Nominal Capacity (15min) (Wh/cell)	Weight (Approx. kg)	Energy Density (Wh/kg)	Specific Energy (Wh/kg)	Internal Resistance Approx. (mΩ)	Max. Discharge Current 5 sec (A)	Dimensions (mm)				Terminal Position	Terminal Type	Max. Charging Current (A)	Max. Screw Torque value	
								Overall Height (H)	Container Height (h)	Length (L)	Width (W)				kgf-cm/lbf-in	N-m
HRL634	6	34	1.32	52.8	19.32	10.00	130	98.3±1.0	94±1.0	151±2.0	34±1.0	c	F2	3.40	---	---
HRL1210	12	10	1.10	38.7	13.64	35.00	40	70±1.0	64±1.0	178±2.0	34±1.0	c	F2	1.00	---	---
HRL1223	12	23	2.10	53.8	16.43	19.00	130	106±1.5	101.8±1.5	90±1.0	70±1.0	c	F2	2.30	---	---
HRL1234	12	34	2.70	55.3	18.89	17.00	130	98.3±1.0	94±1.0	151±2.0	65±1.0	e	F2	3.40	---	---
HRL1280	12	80	6.50	54.4	18.46	9.00	300	167±2.0	160±2.0	181±2.0	76.2±1.0	d	I1	8.00	65/56	6.37
HRL12110	12	110	9.90	48.0	16.67	9.00	400	175±2.0	165.5	166±2.0	125±1.5	c	I1	11.00	65/56	6.37
HRL12150	12	150	11.75	59.6	19.15	7.00	225	172±2.0	148.5±2.0	195.6±2.0	130±1.5	c	I2	15.00	127/110	12.45
HRL12200	12	200	17.60	47.0	17.05	5.90	300	207.3±2.5	202.3±2.5	228±2.5	138.4±1.5	c	I2	20.00	127/110	12.45
HRL12280	12	280	25.80	45.2	16.28	4.00	800	214.2±2.5	211.2±2.5	261±2.5	168.5±2.0	c	I2	28.00	127/110	12.45
HRL12330	12	330	29.60	44.9	16.72	4.00	800	214.3±2.5	211.3±2.5	308.7±2.5	169±2.0	c	I2	33.00	127/110	12.45
HRL12390	12	390	33.00	46.9	17.73	4.00	800	217.6±2.5	214.6±2.5	342±2.5	170±2.0	c	I2	39.00	127/110	12.45
HRL12500	12	500	45.70	46.8	16.41	3.70	800	277.7±2.5	274.7±2.5	343±2.5	170±2.0	c	I2	50.00	127/110	12.45

**Charging(V) :** • Standby Use : 2.275V±0.025V/CELL AT 25°C (77°F) Temp Coefficient -3.3mV/CELL°C  
 • Cycle Use : 2.45V±0.05V/CELL AT 25°C (77°F) Temp Coefficient -5mV/CELL°C

## Terminal Position



## Terminal Type



## HRL634W

Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)

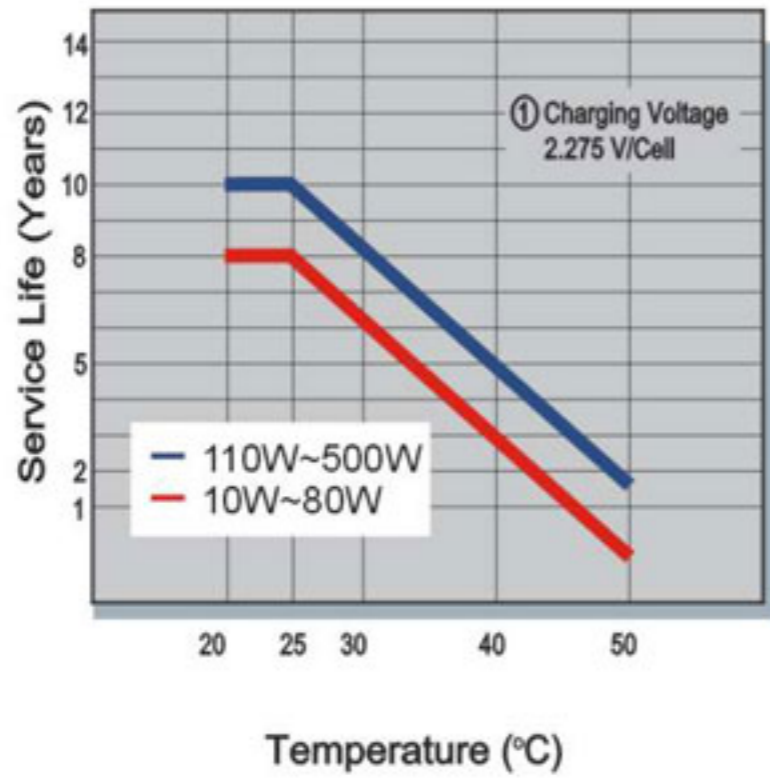
F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	60.4	47.4	37.6	30.9	26.6	18.7	14.4	10.3	5.84	4.66
1.67V	56.5	44.4	35.4	29.3	25.2	18.6	14.3	10.2	5.80	4.63
1.70V	54.9	43.1	34.2	28.6	24.6	18.5	14.2	10.1	5.78	4.62
1.75V	51.9	40.7	32.3	27.0	23.8	18.3	14.1	10.0	5.74	4.57
1.80V	48.9	37.9	30.6	25.8	23.0	18.1	13.9	9.94	5.69	4.52
1.85V	45.4	35.1	28.6	24.6	22.0	17.9	13.8	9.84	5.65	4.47

Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)

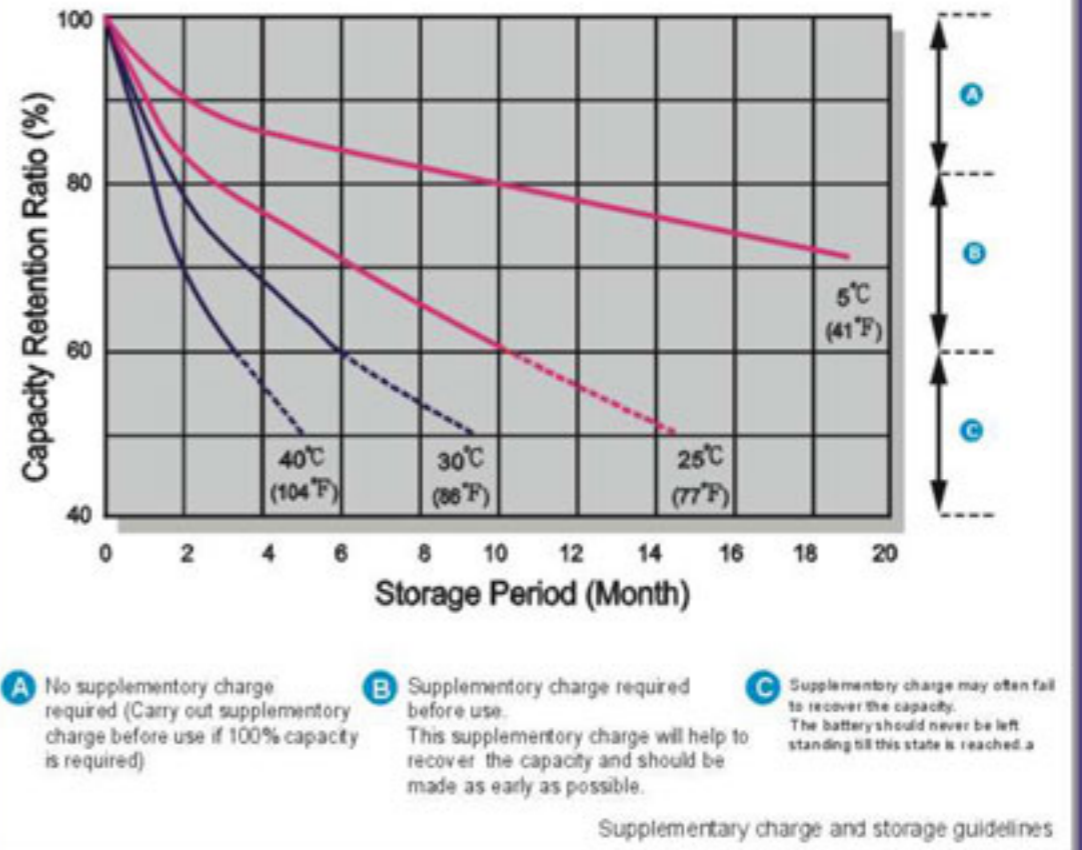
F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	327	260	209	175	150	110	84.0	60.7	34.6	27.7
1.67V	312	246	197	167	143	109	82.6	60.3	34.5	27.6
1.70V	305	240	192	163	140	108	82.0	59.7	34.4	27.5
1.75V	292	228	183	155	135	104	81.0	59.3	34.2	27.3
1.80V	278	215	173	147	129	100	80.0	58.9	33.9	27.1
1.85V	265	203	164	139	123	96.0	79.0	58.1	33.7	26.9



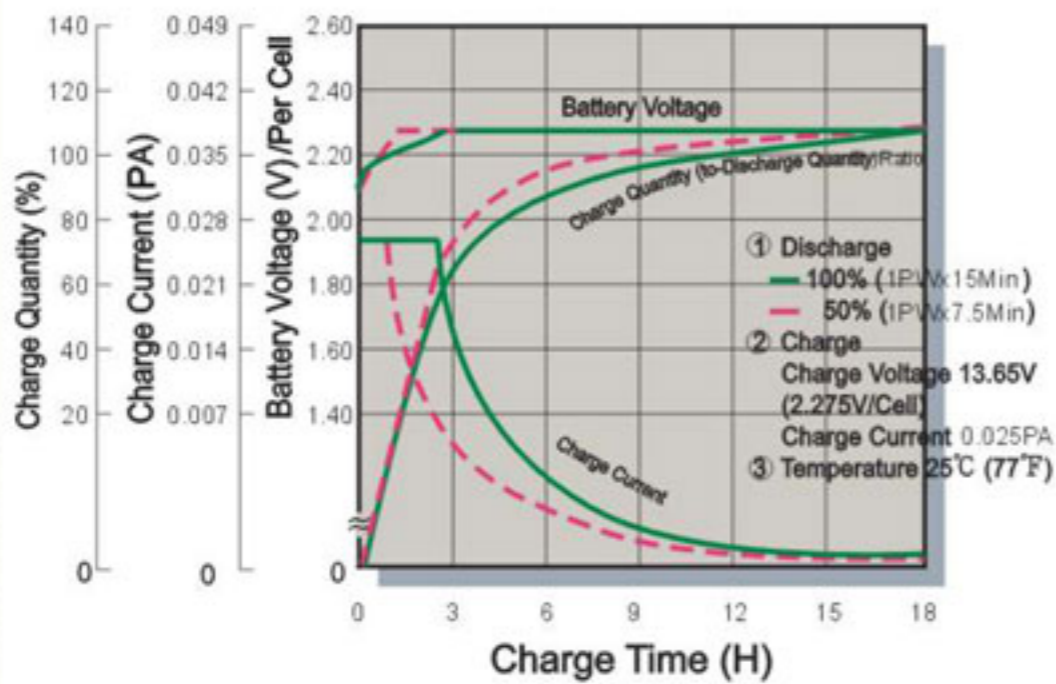
### Trickle (or Float) Service Life



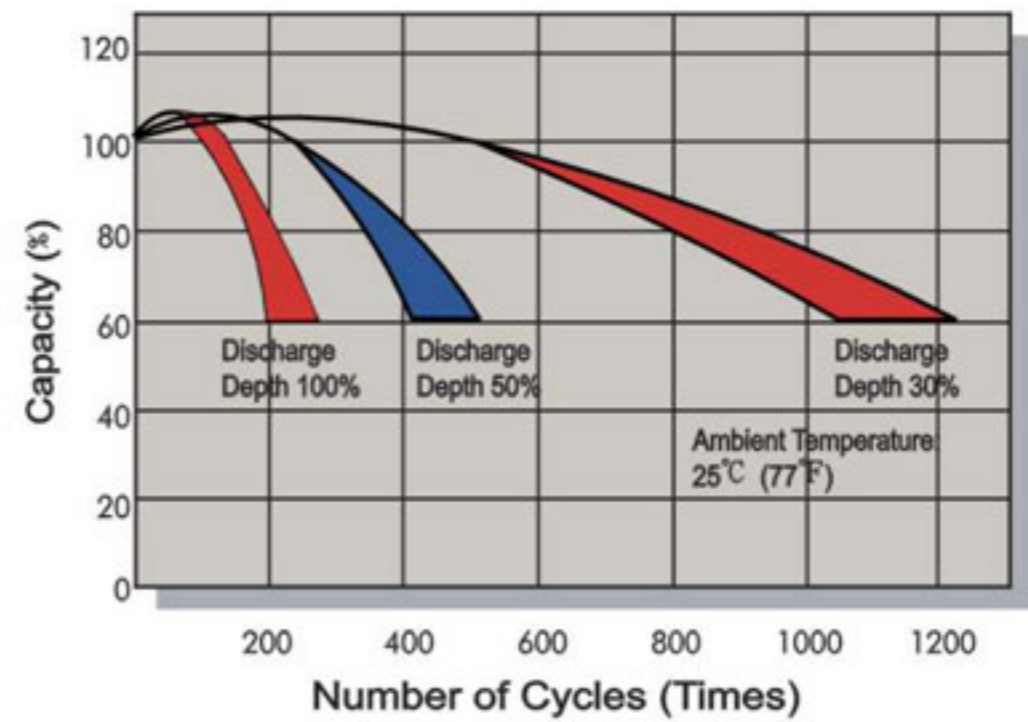
### Capacity Retention Characteristic



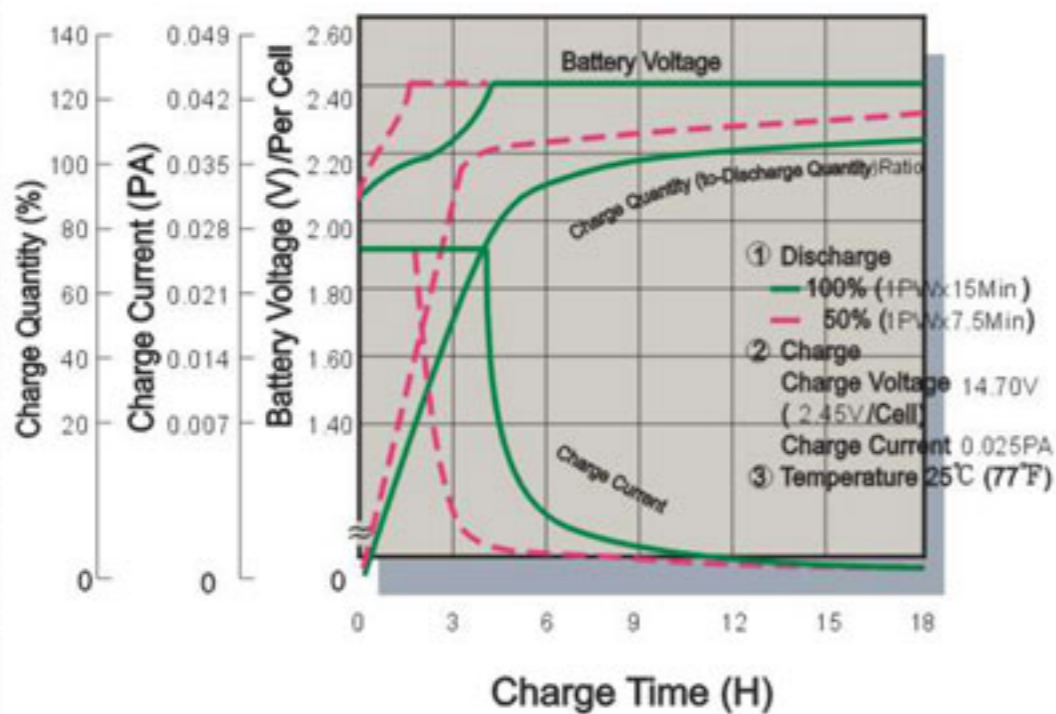
### Battery Voltage and Charge Time for Standby Use



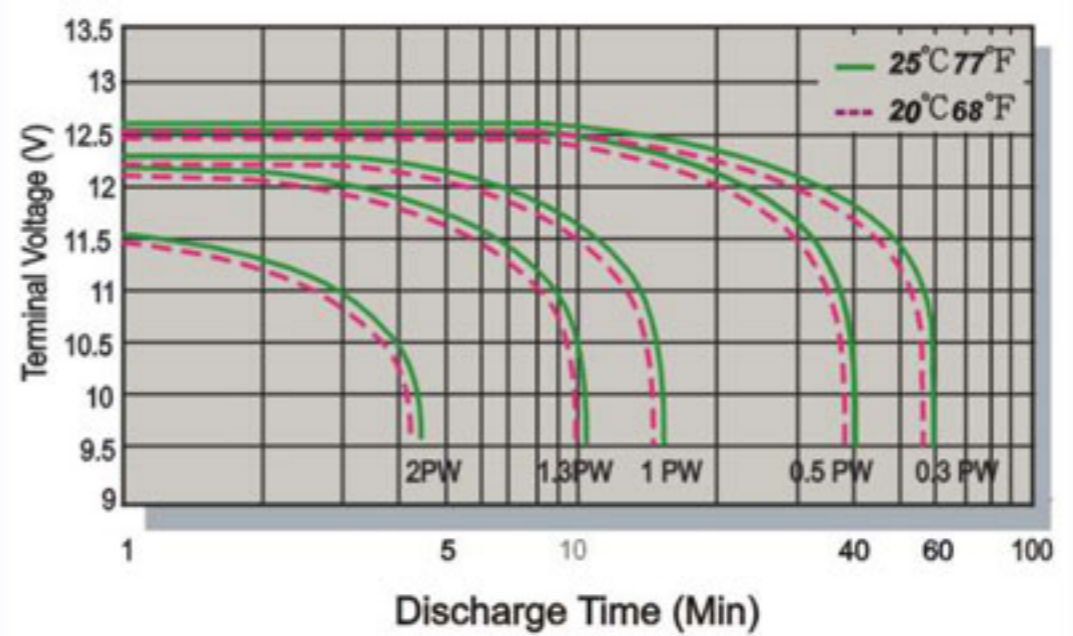
### Cycle Service Life



### Battery Voltage and Charge Time for Cycle Use



### Terminal Voltage (V) and Discharge Time





**HRL1210W****Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)**

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	19.2	13.7	10.5	8.84	7.47	5.51	4.24	3.06	1.66	1.29
1.67V	18.3	13.3	10.2	8.70	7.37	5.43	4.20	3.03	1.64	1.28
1.70V	17.9	13.0	10.1	8.64	7.32	5.39	4.18	3.02	1.63	1.27
1.75V	17.1	12.5	9.85	8.37	7.15	5.27	4.10	2.98	1.62	1.26
1.80V	16.3	11.8	9.50	8.10	6.98	5.14	4.02	2.93	1.60	1.25
1.85V	15.6	11.1	9.15	7.83	6.81	5.02	3.94	2.89	1.59	1.24

**Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)**

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	200	147	113	95.6	81.5	60.9	47.0	34.1	18.7	14.7
1.67V	193	143	110	94.0	80.5	60.0	46.5	34.0	18.6	14.6
1.70V	189	140	108	92.9	79.8	59.3	46.3	33.9	18.5	14.5
1.75V	182	134	106	91.0	78.9	58.5	46.0	33.5	18.4	14.4
1.80V	175	128	103	89.1	77.3	57.2	45.2	33.0	18.2	14.3
1.85V	169	121	100	86.6	75.8	55.8	44.5	32.6	18.1	14.2

**HRL1223W****Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)**

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	50.7	32.9	25.0	20.3	17.5	12.9	10.3	7.42	4.22	3.01
1.67V	46.7	31.4	24.2	20.0	17.3	12.8	10.2	7.35	4.18	2.99
1.70V	43.8	30.6	23.8	19.7	17.0	12.6	10.1	7.29	4.17	2.98
1.75V	39.7	28.4	22.6	19.1	16.5	12.3	10.0	7.22	4.14	2.94
1.80V	35.2	26.0	21.2	17.9	15.7	11.8	9.61	7.04	4.05	2.92
1.85V	30.6	22.8	19.1	16.2	14.3	11.0	8.99	6.58	3.85	2.78

**Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)**

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	497	337	264	221	192	141	114	84.4	49.8	36.5
1.67V	464	326	259	219	190	140	113	84.0	49.5	36.2
1.70V	445	317	258	217	188	139	112	83.6	49.2	36.0
1.75V	410	301	247	209	182	137	111	82.8	49.0	35.9
1.80V	373	278	233	199	175	133	109	80.8	48.1	35.3
1.85V	323	252	212	183	162	124	102	76.6	46.4	34.3

**HRL1234W****Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)**

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	66.0	45.0	34.5	28.0	24.0	17.6	14.0	10.1	5.69	4.00
1.67V	58.0	41.0	32.3	27.1	23.5	17.4	13.8	9.90	5.61	3.96
1.70V	54.4	39.1	31.3	26.4	23.1	17.2	13.7	9.83	5.57	3.93
1.75V	48.5	35.9	29.4	25.0	22.1	16.8	13.4	9.68	5.50	3.87
1.80V	42.5	32.8	27.0	23.2	20.6	15.8	12.8	9.33	5.36	3.80
1.85V	36.6	29.6	24.6	21.1	18.8	14.4	11.7	8.71	5.06	3.62

**Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)**

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	643	465	375	306	265	205	159	115	65.9	46.7
1.67V	581	435	354	299	262	204	158	114	65.4	46.6
1.70V	550	419	342	293	259	202	155	111	64.6	46.4
1.75V	503	393	324	280	251	198	152	109	63.9	46.0
1.80V	456	367	307	266	238	189	147	108	62.9	45.1
1.85V	409	341	284	246	217	174	137	102	60.2	43.4

**HRL1280W****Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)**

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	165	113	87.9	72.3	62.4	44.4	35.0	24.9	14.6	10.6
1.67V	142	103	81.7	69.5	58.7	43.5	34.0	24.6	14.4	10.4
1.70V	133	98.6	80.7	67.8	58.1	42.4	33.7	24.3	14.2	10.2
1.75V	119	92.3	75.5	64.3	54.3	41.6	32.9	23.7	14.0	10.1
1.80V	105	83.2	70.0	60.8	51.8	39.8	32.1	23.0	13.6	10.0
1.85V	92.3	76.6	65.2	56.8	49.2	37.6	30.1	22.1	13.5	9.84

**Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)**

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	1,584	1,171	955	790	691	496	391	282	169	122
1.67V	1,431	1,073	895	761	661	485	382	280	167	121
1.70V	1,369	1,045	884	743	660	475	381	275	165	118
1.75V	1,270	983	832	708	626	468	370	270	161	117
1.80V	1,173	909	781	679	593	453	364	266	159	116
1.85V	1,091	855	734	641	561	426	346	257	156	115



**HRL12110W****Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)**

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	170	145	118	97.5	81.6	61.4	48.0	33.6	21.3	14.9
1.67V	151	129	108	91.1	77.5	59.6	47.0	33.2	20.8	14.7
1.70V	141	121	103	88.3	75.7	58.6	46.3	32.7	20.4	14.5
1.75V	125	108	93.2	82.7	72.2	56.1	44.7	32.3	20.0	14.4
1.80V	109	94.0	83.7	76.4	68.7	53.7	42.5	31.9	19.6	14.2
1.85V	89.3	78.7	73.6	69.2	64.4	51.0	40.8	29.7	18.3	14.0

**Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)**

F.V/Time	2MIN	4MIN	6MIN	8MIN	10MIN	15MIN	20MIN	30MIN	60MIN	90MIN
1.60V	1,806	1,541	1,270	1,053	888	682	554	385	247	174
1.67V	1,624	1,386	1,171	988	852	665	535	377	243	173
1.70V	1,530	1,316	1,107	956	827	655	526	372	239	171
1.75V	1,358	1,190	1,020	900	796	636	510	361	234	170
1.80V	1,177	1,054	941	851	764	610	495	352	229	168
1.85V	995	918	854	793	733	589	478	337	217	167

**HRL12150W****Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)**

F.V/Time	5MIN	7.5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	50MIN	60MIN	90MIN
1.60V	169	138	116	86.7	69.6	50.4	40.0	33.5	28.9	20.8
1.67V	152	127	107	82.2	66.3	48.4	38.7	32.5	28.6	20.5
1.70V	144	122	103	80.0	64.7	47.5	38.0	32.1	28.4	20.4
1.75V	132	112	96.8	76.0	62.0	45.7	36.8	30.9	27.8	20.0
1.80V	119	104	90.0	71.1	58.4	43.8	35.1	29.8	26.8	19.5
1.85V	107	94.1	82.8	67.0	55.1	41.7	33.6	28.6	25.0	18.6

**Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)**

F.V/Time	5MIN	7.5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	50MIN	60MIN	90MIN
1.60V	1,794	1,479	1,263	968	788	577	463	387	335	244
1.67V	1,624	1,370	1,182	935	753	559	451	386	334	239
1.70V	1,549	1,322	1,143	916	737	548	442	382	332	236
1.75V	1,422	1,234	1,075	877	704	530	428	374	325	231
1.80V	1,302	1,143	1,006	825	675	507	410	361	314	226
1.85V	1,188	1,057	943	773	639	486	396	337	296	222

**HRL12200W****Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)**

F.V/Time	5MIN	7.5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	50MIN	60MIN	90MIN
1.60V	225	184	155	116	92.7	67.2	53.4	44.6	38.5	27.7
1.67V	205	169	144	110	89.4	64.7	52.0	44.3	38.1	27.4
1.70V	195	163	138	108	87.6	63.6	51.1	43.9	37.8	27.3
1.75V	177	150	128	103	83.6	61.2	49.5	42.8	37.0	26.7
1.80V	159	138	119	95.7	79.0	58.7	47.4	41.0	35.7	26.0
1.85V	142	125	110	89.3	73.4	55.6	44.8	38.1	33.3	24.8

**Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)**

F.V/Time	5MIN	7.5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	50MIN	60MIN	90MIN
1.60V	2,392	1,972	1,684	1,290	1,050	770	618	516	447	325
1.67V	2,176	1,842	1,589	1,235	1,010	748	612	514	445	323
1.70V	2,081	1,774	1,540	1,208	988	737	607	510	443	322
1.75V	1,914	1,648	1,449	1,160	945	710	594	499	434	315
1.80V	1,747	1,526	1,359	1,093	900	683	568	481	419	308
1.85V	1,584	1,410	1,258	1,031	852	649	528	450	395	295

**HRL12280W****Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)**

F.V/Time	5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	45MIN	50MIN	60MIN	90MIN
1.60V	318	216	167	137	103	82.6	76.0	70.1	59.9	44.6
1.67V	283	200	155	128	98.3	79.9	72.9	67.1	57.7	42.1
1.70V	266	192	149	124	96.3	78.1	71.2	65.4	55.6	40.6
1.75V	236	175	141	117	91.3	75.9	68.5	63.5	53.8	38.5
1.80V	207	161	131	111	85.4	70.5	63.7	58.8	50.1	36.3
1.85V	178	145	122	105	81.3	65.8	59.7	55.1	47.3	34.7

**Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)**

F.V/Time	5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	45MIN	50MIN	60MIN	90MIN
1.60V	3,354	2,304	1,788	1,476	1,110	888	822	762	648	485
1.67V	3,036	2,166	1,700	1,417	1,079	876	804	738	636	466
1.70V	2,880	2,100	1,643	1,384	1,060	864	792	726	618	454
1.75V	2,615	1,955	1,575	1,326	1,023	834	780	703	600	436
1.80V	2,329	1,800	1,493	1,274	980	802	738	678	581	422
1.85V	2,016	1,656	1,408	1,212	938	760	694	636	550	404



### HRL12330W

#### Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)

F.V/Time	5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	45MIN	50MIN	60MIN	90MIN
1.60V	383	260	201	165	123	98.4	89.9	82.0	70.2	52.1
1.67V	339	239	188	157	117	94.2	85.3	78.1	67.1	49.4
1.70V	318	229	181	152	113	91.1	83.4	76.4	64.9	47.3
1.75V	284	210	168	144	106	85.6	78.9	72.5	61.2	44.4
1.80V	253	193	158	135	98.4	79.6	72.5	66.4	56.6	41.6
1.85V	219	177	147	125	92.5	74.9	68.5	62.5	53.5	39.5

#### Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)

F.V/Time	5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	45MIN	50MIN	60MIN	90MIN
1.60V	4,044	2,772	2,148	1,770	1,320	1,062	972	888	762	566
1.67V	3,621	2,608	2,040	1,712	1,290	1,032	936	864	744	547
1.70V	3,438	2,520	1,979	1,679	1,266	1,008	924	852	726	529
1.75V	3,115	2,354	1,891	1,605	1,210	963	894	816	696	503
1.80V	2,791	2,180	1,795	1,528	1,145	918	833	762	650	484
1.85V	2,478	2,016	1,690	1,428	1,070	864	786	720	613	460

### HRL12390W

#### Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)

F.V/Time	5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	45MIN	50MIN	60MIN	90MIN
1.60V	443	308	236	191	142	112	102	93.5	78.8	58.0
1.67V	398	285	223	182	134	108	97.1	88.8	75.1	54.1
1.70V	376	274	215	177	130	105	94.6	86.4	72.2	51.4
1.75V	336	254	203	167	122	99.3	90.8	82.2	69.2	49.1
1.80V	295	232	187	154	114	92.2	83.8	76.4	64.7	45.6
1.85V	254	210	171	141	105	85.8	78.2	71.6	60.7	43.4

#### Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)

F.V/Time	5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	45MIN	50MIN	60MIN	90MIN
1.60V	4,674	3,276	2,526	2,052	1,524	1,206	1,098	1,014	858	630
1.67V	4,226	3,051	2,388	1,956	1,471	1,182	1,068	978	820	600
1.70V	4,000	2,945	2,330	1,910	1,440	1,164	1,050	960	804	574
1.75V	3,615	2,770	2,217	1,809	1,380	1,117	1,013	936	776	556
1.80V	3,226	2,600	2,090	1,708	1,296	1,062	964	882	746	530
1.85V	2,868	2,404	1,957	1,614	1,213	990	902	828	708	505

### HRL12500W

#### Constant Current Discharge Characteristics Unit:Amperes(25°C, 77°F)

F.V/Time	5MIN	7.5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	50MIN	60MIN	90MIN
1.60V	491	444	388	294	235	172	136	112	95.7	67.2
1.67V	449	405	356	278	223	164	134	110	94.3	66.1
1.70V	425	386	340	270	217	161	133	109	93.5	65.4
1.75V	388	348	310	253	206	155	130	107	91.1	64.5
1.80V	348	309	278	233	194	147	123	102	87.3	62.0
1.85V	304	270	247	211	179	140	115	95.3	81.1	57.3

#### Constant Power Discharge Characteristics Unit:Watts(25°C, 77°F)

F.V/Time	5MIN	7.5MIN	10MIN	15MIN	20MIN	30MIN	40MIN	50MIN	60MIN	90MIN
1.60V	5,275	4,691	4,167	3,181	2,594	1,951	1,558	1,292	1,112	783
1.67V	4,880	4,300	3,790	3,018	2,490	1,871	1,520	1,276	1,091	769
1.70V	4,640	4,110	3,610	2,932	2,422	1,829	1,507	1,258	1,083	763
1.75V	4,250	3,750	3,290	2,748	2,309	1,740	1,466	1,237	1,066	754
1.80V	3,830	3,340	2,950	2,497	2,138	1,657	1,390	1,186	1,025	731
1.85V	3,366	2,882	2,600	2,203	1,964	1,564	1,321	1,130	977	695

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