

**Modular Gel Range Valve Regulated Lead Acid (V.R.L.A.)
2 Volt Flat Pasted Plate Battery Range
Gelled Electrolyte Technology
Capacities: 50AH to 4000AH**

PowerPlus Modular Gel Range sealed, maintenance free Valve Regulated Lead Acid (V.R.L.A.) batteries are designed for float service or deep cycle (1000+ x 80%) applications. PowerPlus advanced gelled electrolyte technology ensures reliable performance, safety, outstanding battery life and value. Battery has a design life of 15 years and complies with BS 6290 Part 4, JIS, EUROBAT (IEC896-2) standards and is a recognized component of UL1989 under the Standby Battery Category.

Features

- Valve regulated Lead Acid (V.R.L.A.) design
- Gelled thixotropic electrolyte
- Non-gassing
- Never needs addition of water
- Spill-proof and leak-proof
- Operates at a low internal pressure
- For use in vertical or horizontal position
- Each cell has a low pressure safety release venting system
- Flame Retardant material V-0 optional

Specifications

- Positive Plate: Calcium Flat Plate Grid
- Negative Plate: Flat Pasted Grid
- Electrolyte: Sulfuric acid thixotropic gel
- Container & Cover: Grade 6 ABS
- Separators: Micro-porous Duroplastic Separator
- Float Voltage: 2.25 VPC +/- 1% at 20° C /25° C
- Cycle service: 2.35 VPC +/- 1% at 20° C /25° C
- Max. Charge Voltage: 2.40 VPC at 20/25° C
- Safety One-Way Valve: 1-3PSI self-resealing
- Terminals: Integral Copper Insert

Applications

- Cycling / Float service Photovoltaic / Solar / Wind Energy
- Telecommunications
- Cathodic Protection
- Emergency Lighting
- UPS system
- Switchgear
- Cellular Radio
- Control Systems
- Engine Starting
- Boats / Marine / Navigation Aids

**Operating temperature range**

Discharge: -40° F (-40° C) to 140° F (60° C)

Charge: -4° F (-20° C) to +122° F (50° C)

Ideal operating temperature range

+68° F (20° C) to +77° F (25° C)

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Introduction

PowerPlus Modular Gel Range VRLA batteries are suitable for renewable energy deep cycle applications.

The positive and negative grids are cast from a calcium / tin lead alloy to reduce grid growth and corrosion. The active material is manufactured from a high purity lead (99.9999%) to minimize the negative effects of impurities.

Separator is manufactured utilizing the latest German technology. The base material is a microporous duroplastic exhibiting excellent high temperature stability and mechanical strength, resulting in very good resistance to vibration and mechanical shock. The integrity of the battery will be maintained under extreme conditions. The purpose of the separator is to maintain a constant distance between the positive and negative plates, totally eliminating the possibility of short circuits whilst allowing the active materials to fully react with the gelled electrolyte. The separator also has an open construction, which allows little resistance to the flow of the electrolyte during filling. A thin layer (typically 0.4mm) of non-woven glass mat is an integral part of the separator and is placed against the positive for improved surface contact. A compression platform at the bottom of the cell allows expansion and contraction of the plates.

General Features

Valve Regulated (Sealed) Construction

Modular Gel Range valve regulated rechargeable lead acid batteries are for safe, maintenance free operation in Vertical or Horizontal position. The acid is immobilized in a specially formulated thixotropic gel electrolyte and it provides a safe non-spillable battery.

Gas Recombination System

The gasses generated in the normal charge / discharge use of the battery are recombined during normal operation. In normal operation, more than 99% of the gases generated are efficiently recombined.

Maintenance Free

The Battery has been designed and built such that no addition of electrolyte is needed for the life of the battery. There is no need to add water or take specific gravity readings.

Battery Life – Float Service

PowerPlus Modular Gel Range is designed for float (Standby) service with design life of 15 years at 20° C (68° F).

Battery Life – Cycle Service

PowerPlus Modular Gel Range is designed for more than 4000 charge / discharge cycles, actual quantity will depend on the frequency, depth of discharge (D.O.D.) and ambient temperature.

Safety Valve

If excess pressure builds up within the battery, the safety valve automatically opens and re-closes, releasing the gas at 1-3 PSI. The valve does not allow the ingress of oxygen which is harmful and reduces the life expectation of the battery.

Temperature Range for Normal Operation

PowerPlus Modular Gel Range has a wide operating temperature range. However for maximum life and safety, continuous operation over 45° C is not recommended.

Grid Design and Paste Formation

PowerPlus has optimized the grid design and paste formation to maximize the operating and storage life of the Gel battery. This optimized design provides the following advantages:

- Excellent recovery from deep discharge or over discharge;
- Low self-discharge to ensure maximum storage time when not in use;
- Good safety margins in tough operating conditions;
- Excellent cycling capability.

Modular Gel Range Cell Discharge Watts Data @ 20° C (68° F)

Cell Type	End VPC	Discharge Watts Per Cell @ 20° C						End VPC	Discharge Watts Per Cell @ 20° C									
		Discharge Time In Minutes							Discharge Time In Hours									
		5	10	15	30	45	60		1.5	2	3	4	5	6	8	10	12	24
2-50	1.80	212	161	135	89.5	68.9	56.6	1.85	38.6	31.3	23.8	18.7	15.6	13.8	11.3	9.37	7.99	4.38
	1.75	218	165	138	92.8	70.0	58.8	1.80	40.7	33.1	25.2	19.7	16.5	14.6	12.0	9.92	10.2	4.65
	1.67	226	171	143	94.5	71.8	59.4	1.75	41.0	33.4	25.4	20.0	16.6	14.7	12.1	10.1	10.3	4.70
2-100	1.80	425	322	271	179	138	113	1.85	77.2	62.7	47.6	37.3	31.1	27.6	22.6	18.7	16.0	8.76
	1.75	444	337	282	189	143	120	1.80	81.5	66.2	50.4	39.5	32.9	29.2	24.0	19.8	16.9	9.28
	1.67	465	358	307	193	146	121	1.75	83.6	68.1	51.9	40.7	33.9	30.1	24.7	20.5	17.4	9.59
2-120	1.80	510	386	325	215	166	136	1.85	92.6	75.2	57.1	44.8	37.3	33.1	27.1	22.4	19.2	10.5
	1.75	533	404	338	227	172	144	1.80	97.8	79.4	60.5	47.4	39.5	35.0	28.8	23.8	20.3	11.1
	1.67	558	430	368	232	175	145	1.75	100	81.7	62.3	48.8	40.7	36.1	29.6	24.6	20.9	11.5
2-150	1.80	523	436	392	259	200	164	1.85	116	94.0	71.5	56.0	46.7	41.3	34.0	28.1	24.0	13.1
	1.75	548	456	409	275	207	174	1.80	122	99.0	75.5	59.2	49.4	43.7	36.0	29.8	25.4	13.9
	1.67	554	459	427	280	212	176	1.75	125	102	77.8	61.0	50.9	45.1	37.1	30.7	26.2	14.4
2-200	1.80	575	498	439	325	262	219	1.85	155	126	95.8	75.1	62.6	55.4	45.5	37.7	32.1	17.7
	1.75	669	545	470	345	273	233	1.80	163	132	101	79.0	65.8	58.3	47.9	39.7	33.8	18.6
	1.67	721	615	516	354	280	236	1.75	168	137	104	81.8	68.2	60.4	49.7	41.3	35.2	19.3
2-250	1.80	725	622	523	406	328	274	1.85	194	157	120	93.8	78.1	69.2	56.9	47.1	40.1	22.0
	1.75	835	681	586	431	341	291	1.80	204	166	126	99.0	82.3	72.9	59.9	49.6	42.3	23.2
	1.67	901	768	645	442	349	294	1.75	210	171	130	102	85.2	75.5	62.0	51.4	43.8	24.1
2-300	1.80	862	747	628	487	393	328	1.85	232	189	143	112	93.7	83.0	68.2	56.4	48.1	26.4
	1.75	1002	817	703	517	409	349	1.80	244	199	151	118	99.0	87.5	71.9	59.5	50.7	28.0
	1.67	1080	921	774	531	419	353	1.75	252	205	156	122	102	90.5	74.4	61.6	52.5	28.9
2-400	1.80	1149	996	837	650	524	438	1.85	309	251	191	150	125	111	90.8	75.2	64.1	35.1
	1.75	1335	1088	937	689	544	464	1.80	326	265	201	158	132	117	95.9	79.4	67.6	37.1
	1.67	1439	1227	1031	707	558	470	1.75	335	273	208	163	136	121	99.1	82.1	69.9	38.4
2-500	1.80	1436	1245	1046	812	655	547	1.85	387	315	239	188	156	138	114	94.1	80.2	44.0
	1.75	1671	1362	1173	863	681	581	1.80	407	331	252	197	165	146	120	99.2	84.5	46.4
	1.67	1801	1536	1290	885	699	588	1.75	420	342	260	204	170	151	124	103	87.5	48.1
2-600	1.80	1724	1494	1255	974	786	657	1.85	465	377	287	225	187	166	136	113	96.2	52.7
	1.75	2003	1634	1406	1034	817	697	1.80	489	397	302	237	197	175	144	119	101	55.7
	1.67	2160	1842	1547	1061	838	705	1.75	503	410	312	245	204	181	149	123	105	57.7
2-700	1.80	2011	1743	1464	1137	917	766	1.85	541	440	334	262	218	193	149	124	105	58.2
	1.75	2336	1905	1640	1206	953	813	1.80	570	464	353	276	231	204	154	131	112	60.0
	1.67	2518	2148	1804	1238	977	822	1.75	587	478	364	286	238	211	163	136	116	60.6
2-800	1.80	2298	1992	1674	1299	1048	876	1.85	620	503	383	300	250	221	182	151	128	70.3
	1.75	2672	2179	1876	1380	1090	930	1.80	652	530	403	316	263	233	192	159	135	74.3
	1.67	2881	2457	2064	1415	1118	941	1.75	672	547	416	327	272	241	198	165	140	77.0
2-1000	1.80	2873	2490	2092	1624	1310	1094	1.85	774	629	478	375	312	277	227	186	160	87.8
	1.75	3338	2722	2343	1723	1361	1161	1.80	815	662	504	395	329	292	240	198	169	92.8
	1.67	3599	3069	2578	1768	1396	1175	1.75	839	683	520	408	340	302	248	205	175	96.1

2-1200	1.80	3447	2988	2510	1949	1572	1313	1.85	929	755	573	449	374	332	272	226	192	105
	1.75	4006	3267	2813	2069	1634	1394	1.80	977	795	605	474	395	350	288	238	203	111
	1.67	4319	3684	3094	2122	1676	1410	1.75	1007	820	624	490	408	362	298	246	210	115
2-1400	1.80	4022	3486	2929	2274	1835	1533	1.85	1085	881	669	525	437	387	318	263	224	123
	1.75	4666	3805	3275	2409	1903	1623	1.80	1141	928	705	553	461	408	336	278	237	130
	1.67	5030	4290	3603	2471	1952	1643	1.75	1172	955	727	570	476	422	346	287	245	134
2-1500	1.80	4309	3735	3138	2436	1966	1642	1.85	1162	944	717	562	468	415	341	282	240	132
	1.75	4999	4077	3509	2581	2039	1739	1.80	1222	994	755	592	494	437	360	298	254	139
	1.67	5389	4596	3860	2648	2091	1760	1.75	1256	1023	779	611	510	452	371	307	262	144
2-1600	1.80	4596	3984	3347	2598	2097	1751	1.85	1239	1007	765	599	499	443	364	301	256	141
	1.75	5332	4349	3743	2753	2175	1855	1.80	1303	1060	805	631	527	466	384	318	271	148
	1.67	5748	4902	4117	2825	2230	1877	1.75	1340	1091	831	652	544	482	396	327	279	154
2-1800	1.80	5171	4482	3766	2923	2359	1970	1.85	1394	1132	860	675	563	498	410	338	289	158
	1.75	6011	4902	4220	3104	2452	2092	1.80	1466	1193	906	711	592	525	431	357	304	167
	1.67	6481	5527	4642	3184	2515	2117	1.75	1511	1230	937	734	613	543	446	370	315	173
2-2000	1.80	5746	4980	4184	3248	2621	2189	1.85	1549	1258	956	750	625	553	455	376	321	176
	1.75	6679	5447	4689	3449	2724	2324	1.80	1629	1325	1007	790	658	583	479	397	338	186
	1.67	7201	6141	5158	3538	2794	2352	1.75	1679	1367	1041	816	681	603	496	411	350	192
2-2500	1.80	7182	6224	5230	4060	3276	2736	1.85	1936	1573	1195	937	780	691	568	470	401	220
	1.75	8347	6807	5859	4310	3404	2904	1.80	2036	1656	1259	987	823	729	599	496	423	232
	1.67	8998	7674	6445	4421	3492	2939	1.75	2098	1708	1310	1020	851	754	620	513	437	240
2-3000	1.80	8618	7469	6276	4872	3931	3283	1.85	2323	1887	1434	1124	937	830	682	564	481	265
	1.75	10017	8169	7032	5172	4086	3486	1.80	2444	1987	1511	1185	987	875	719	595	507	279
	1.67	10800	7210	7735	5306	4191	3527	1.75	2517	2050	1561	1225	1021	905	744	616	525	289
2-4000	1.80	11491	9959	8368	6496	5242	4377	1.85	3098	2516	1912	1499	1249	1106	909	752	641	351
	1.75	13357	10892	9376	6897	5448	4647	1.80	3258	2649	2015	1579	1316	1167	959	794	676	371
	1.67	14400	12282	10314	7074	5588	4703	1.75	3357	2732	2081	1633	1362	1206	992	822	700	384

Actual battery performance data may be $\pm 5\%$ of figures shown above

Modular Gel Range Cell Discharge Amperes Data @ 20° C (68° F)

Cell Type	End VPC	Discharge Amps Per Cell @ 20° C							End VPC	Discharge Amps Per Cell @ 20° C										
		Discharge Time In Minutes						Discharge Time In Hours												
		5	10	15	30	45	60	1.5		2	3	4	5	6	8	10	12	24	48	100
2-50	1.80	118	88.5	73.8	48.4	36.3	29.5	1.85	20.1	16.2	12.2	9.52	7.90	6.97	5.70	4.70	4.00	2.18	1.13	0.58
	1.75	122	91.8	76.5	50.2	37.6	30.6	1.80	21.3	17.3	13.0	10.1	8.40	7.42	6.06	5.00	5.10	2.32	1.20	0.62
	1.67	128	96.0	84.0	51.6	38.6	31.1	1.75	21.8	17.6	13.3	10.3	8.57	7.57	6.18	5.10	5.20	2.37	1.22	0.63
2-100	1.80	236	177	148	97.0	72.6	59.0	1.85	40.1	32.4	24.4	19.0	15.8	13.9	11.4	9.40	7.99	4.36	2.25	1.16
	1.75	250	187	156	102	76.8	62.4	1.80	42.7	34.5	26.0	20.3	16.8	14.8	12.1	10.0	8.50	4.64	2.40	1.23
	1.67	269	199	171	105	78.7	63.4	1.75	44.4	35.9	27.0	21.1	17.5	15.4	12.6	10.4	8.84	4.83	2.49	1.28
2-120	1.80	283	212	178	116	87.1	70.8	1.85	48.1	38.9	29.3	22.8	19.0	16.7	13.7	11.3	9.59	5.23	2.70	1.39
	1.75	300	224	187	122	92.2	74.9	1.80	51.2	41.4	31.2	24.4	20.2	17.8	14.5	12.0	10.2	5.57	2.88	1.48
	1.67	323	239	205	126	94.4	76.1	1.75	53.3	43.1	32.4	25.3	21.0	18.5	15.1	12.5	10.6	5.80	2.99	1.54
2-150	1.80	291	239	214	140	105	85.5	1.85	60.2	48.6	36.7	28.6	23.7	20.9	17.1	14.1	12.0	6.54	3.38	1.73
	1.75	308	253	226	148	111	90.5	1.80	64.0	51.8	39.0	30.4	25.2	22.3	18.2	15.0	12.8	6.96	3.59	1.85
	1.67	322	262	249	153	114	92.0	1.75	66.6	53.8	40.6	31.6	26.2	23.1	18.9	15.6	13.3	7.24	3.74	1.92
2-200	1.80	319	274	228	176	138	114	1.85	80.6	65.2	49.1	38.3	31.8	28.0	22.9	18.9	16.2	8.77	4.53	2.32
	1.75	376	303	259	187	147	121	1.80	85.3	69.0	52.0	40.5	33.6	29.7	24.3	20.0	17.0	9.28	4.79	2.46

	1.67	419	351	289	194	150	123	1.75	89.2	72.1	54.3	42.3	35.1	31.0	25.3	21.0	17.8	9.70	5.01	2.57
2-250	1.80	399	342	285	219	172	143	1.85	101	81.4	61.4	47.8	39.6	35.0	28.6	23.6	20.1	11.0	5.65	2.90
	1.75	469	378	324	233	183	151	1.80	107	86.3	65.0	50.6	42.0	37.1	30.3	25.0	21.3	11.6	5.99	3.08
	1.67	524	439	360	242	188	154	1.75	110	90.0	67.9	52.9	43.8	38.7	31.6	26.1	22.2	12.1	6.25	3.21
2-300	1.80	479	410	342	263	207	171	1.85	121	98.0	73.6	57.3	47.5	42.0	34.3	28.3	24.1	13.1	6.78	3.48
	1.75	563	454	388	280	220	182	1.80	128	104	78.0	60.8	50.4	44.5	36.4	30.0	25.5	14.0	7.19	3.69
	1.67	628	526	432	290	225	185	1.75	134	108	81.4	63.4	52.6	46.4	38.0	31.3	26.6	14.5	7.50	3.85
2-400	1.80	638	547	456	351	276	228	1.85	161	130	98.0	76.3	63.3	55.9	45.7	37.7	32.0	17.5	9.03	4.64
	1.75	750	605	518	372	293	242	1.80	171	138	104	81.0	67.2	59.3	48.5	40.0	34.0	18.6	9.58	5.00
	1.67	837	701	576	386	300	246	1.75	178	144	108	84.4	70.1	61.9	50.6	42.0	35.4	19.4	9.99	5.13
2-500	1.80	798	684	570	439	345	285	1.85	201	163	123	95.6	79.3	70.0	57.2	47.2	40.1	22.0	11.3	5.81
	1.75	939	757	648	466	366	303	1.80	213	173	130	101	84.0	74.2	60.6	50.0	42.5	23.3	12.0	6.15
	1.67	1047	878	721	484	376	308	1.75	223	180	136	106	87.7	77.4	63.3	52.2	44.4	24.2	12.5	6.42
2-600	1.80	958	821	684	527	414	342	1.85	241	195	147	115	95.1	84.0	68.6	56.6	48.1	26.3	13.6	6.96
	1.75	1126	908	777	559	439	363	1.80	256	207	156	122	101	89.0	72.8	60.0	51.0	28.0	14.4	7.38
	1.67	1256	1053	864	580	451	369	1.75	267	216	163	127	105	92.9	75.9	62.6	53.2	29.1	15.0	7.70
2-700	1.80	1118	958	798	615	483	399	1.85	281	228	172	134	111	98.0	75.0	62.0	52.7	29.0	15.9	8.12
	1.75	1314	1059	907	652	512	424	1.80	299	242	182	142	118	104	78.0	66.0	56.1	30.0	16.8	8.61
	1.67	1465	1229	1008	677	526	431	1.75	312	252	190	148	123	108	83.0	69.0	58.7	30.5	17.5	8.98
2-800	1.80	1277	1094	912	702	552	456	1.85	322	260	196	153	127	112	91.5	75.5	64.2	35.0	18.1	9.29
	1.75	1501	1211	1036	746	586	484	1.80	341	276	208	162	134	119	97.0	80.0	68.0	37.1	19.2	9.84
	1.67	1675	1404	1153	773	601	493	1.75	356	288	217	169	140	124	101	83.5	71.0	38.8	20.0	10.3
2-1000	1.80	1596	1368	1140	878	690	570	1.85	402	325	245	191	158	140	114	94.3	80.2	43.8	22.6	11.6
	1.75	1875	1512	1295	932	732	605	1.80	427	345	260	203	168	148	121	100	85.0	46.4	24.0	12.3
	1.67	2092	1754	1440	966	751	615	1.75	445	360	271	211	175	155	126	104	88.7	48.5	25.0	12.8
2-1200	1.80	1915	1642	1368	1054	828	684	1.85	482	390	294	229	190	168	137	113	96.2	52.6	27.1	13.9
	1.75	2250	1814	1554	1118	878	726	1.80	512	414	312	244	202	178	145	120	102	55.7	28.8	14.8
	1.67	2510	2105	1728	1159	901	738	1.75	534	432	325	253	210	186	151	125	106	58.2	30.0	15.4
2-1400	1.80	2234	1915	1596	1229	966	798	1.85	564	455	343	268	222	196	161	133	113	61.3	31.6	16.2
	1.75	2621	2114	1810	1302	1023	846	1.80	597	483	364	284	235	208	170	140	119	65.0	33.5	17.3
	1.67	2924	2452	2012	1351	1049	861	1.75	622	503	379	295	245	217	176	146	124	67.7	34.9	17.9
2-1500	1.80	2394	2052	1710	1317	1035	855	1.85	604	488	368	287	238	210	172	142	121	65.7	33.9	17.4
	1.75	2808	2265	1939	1395	1096	906	1.80	640	518	390	304	252	223	182	150	128	69.6	35.9	18.5
	1.67	3133	2627	2156	1447	1124	922	1.75	666	539	406	316	262	232	189	156	133	72.5	37.4	19.2
2-1600	1.80	2554	2189	1824	1405	1104	912	1.85	644	521	393	306	254	224	183	151	129	70.1	36.2	18.6
	1.75	2995	2416	2068	1488	1169	966	1.80	683	553	416	324	269	238	194	160	137	74.2	38.3	19.7
	1.67	3342	2802	2300	1543	1199	983	1.75	710	575	433	337	279	247	202	166	142	77.3	39.9	20.5
2-1800	1.80	2873	2462	2052	1580	1241	1026	1.85	725	586	442	344	285	252	206	170	145	79.2	41.3	21.2
	1.75	3377	2723	2331	1678	1319	1089	1.80	768	621	468	365	302	267	219	180	153	83.5	43.1	22.2
	1.67	3768	3158	2593	1740	1352	1108	1.75	801	648	489	381	316	279	228	188	159	87.2	45.6	23.4
2-2000	1.80	3192	2736	2280	1756	1379	1140	1.85	805	651	491	382	317	280	229	189	161	88.0	45.2	23.2
	1.75	3752	3026	2590	1864	1465	1210	1.80	853	690	520	405	336	297	243	200	170	92.8	47.9	24.6
	1.67	4187	3509	2881	1933	1502	1231	1.75	890	720	543	423	351	310	253	209	177	96.9	50.0	25.7

2-2500	1.80	3990	3420	2850	2195	1724	1425	1.85	1006	814	613	477	396	350	286	236	200	109	56.5	29.0
	1.75	4689	3782	3237	2329	1830	1513	1.80	1067	863	650	506	420	371	303	250	213	116	59.9	30.8
	1.67	5232	4385	3601	2416	1877	1539	1.75	1113	900	678	528	438	387	316	261	222	121	62.5	32.1
2-3000	1.80	4788	4104	3420	2633	2069	1710	1.85	1207	976	736	573	475	420	343	283	241	132	67.8	34.8
	1.75	5628	4539	3885	2796	2197	1815	1.80	1280	1035	780	608	504	445	364	300	255	139	71.9	36.9
	1.67	6279	5263	4321	2899	2253	1847	1.75	1335	1080	814	634	526	464	380	313	266	145	75.0	38.5
2-4000	1.80	6384	5472	4560	3512	2758	2281	1.85	1610	1302	981	764	634	560	457	377	321	176	90.4	46.4
	1.75	7504	6052	5180	3728	2929	2421	1.80	1707	1380	1040	810	672	593	485	400	340	186	95.8	49.2
	1.67	8372	7018	5762	3866	3004	2462	1.75	1781	1440	1085	845	701	619	506	418	354	193	99.9	51.3

Actual battery performance data may be $\pm 5\%$ of figures shown above

Modular Range Cell Discharge Ampere Hours Data @ 20° C (68° F)

Cell Type	End VPC	Discharge Amps Per Cell @ 20° C							End VPC	Discharge Data Ampere Hours Per Cell @ 20° C										
		Discharge Time In Minutes						Discharge Time In Hours												
		5	10	15	30	45	60	1.5		2	3	4	5	6	8	10	12	24	48	100
2-50	1.80	118	88.5	73.8	48.4	36.3	29.5	1.85	30.2	32.4	36.6	38.1	39.5	41.8	45.6	47.0	48.0	52.3	54.2	58.0
	1.75	122	91.8	76.5	50.2	37.6	30.6	1.80	32.0	34.6	39.0	40.4	42.0	44.5	48.5	50.0	61.2	55.7	57.6	62.0
	1.67	128	96.0	84.0	51.6	38.6	31.1	1.75	32.7	35.2	39.9	41.2	42.9	45.4	49.4	51.0	62.4	56.9	58.6	63.0
2-100	1.80	236	177	148	97.0	72.6	59.0	1.85	60.2	64.8	73.2	76.0	79.0	83.4	91.2	94.0	95.9	105	108	116
	1.75	250	187	156	102	76.8	62.4	1.80	64.1	69.0	78.0	81.2	84.0	88.8	96.8	100	102	111	115	123
	1.67	269	199	171	105	78.7	63.4	1.75	66.6	71.8	81.0	84.4	87.5	92.4	101	104	106	116	120	128
2-120	1.80	283	212	178	116	87.1	70.8	1.85	72.2	77.8	87.9	91.2	95.0	100	110	113	115	126	130	139
	1.75	300	224	187	122	92.2	74.9	1.80	76.8	82.8	93.6	97.6	101	107	116	120	122	134	138	148
	1.67	323	239	205	126	94.4	76.1	1.75	80.0	86.2	97.2	101	105	111	121	125	127	139	144	154
2-150	1.80	291	239	214	140	105	85.5	1.85	90.3	97.2	110	114	119	125	137	141	144	157	162	173
	1.75	308	253	226	148	111	90.5	1.80	96.0	104	117	122	126	134	146	150	154	167	172	185
	1.67	322	262	249	153	114	92.0	1.75	99.9	108	122	126	131	139	151	156	160	174	180	192
2-200	1.80	319	274	228	176	138	114	1.85	121	130	147	153	159	168	183	189	194	210	217	232
	1.75	376	303	259	187	147	121	1.80	128	138	156	162	168	178	194	200	204	223	230	246
	1.67	419	351	289	194	150	123	1.75	134	144	163	169	176	186	202	210	214	233	240	257
2-250	1.80	399	342	285	219	172	143	1.85	152	163	184	191	198	210	229	236	241	264	271	290
	1.75	469	378	324	233	183	151	1.80	161	173	195	202	210	223	242	250	256	278	288	308
	1.67	524	439	360	242	188	154	1.75	165	180	204	212	219	232	253	261	266	290	300	321
2-300	1.80	479	410	342	263	207	171	1.85	182	196	221	229	238	252	274	283	289	314	325	348
	1.75	563	454	388	280	220	182	1.80	192	208	234	243	252	267	291	300	306	336	345	369
	1.67	628	526	432	290	225	185	1.75	201	216	244	254	263	278	304	313	319	348	360	385
2-400	1.80	638	547	456	351	276	228	1.85	242	260	294	305	317	335	366	377	384	420	433	464
	1.75	750	605	518	372	293	242	1.80	257	276	312	324	336	356	388	400	408	446	460	500
	1.67	837	701	576	386	300	246	1.75	267	288	324	338	351	371	405	420	425	466	480	513
2-500	1.80	798	684	570	439	345	285	1.85	302	326	369	382	397	420	458	472	481	528	542	581
	1.75	939	757	648	466	366	303	1.80	320	346	390	404	420	445	485	500	510	559	576	615
	1.67	1047	878	721	484	376	308	1.75	335	360	408	424	439	464	506	522	533	581	600	642
2-600	1.80	958	821	684	527	414	342	1.85	362	390	441	460	476	504	549	566	577	631	653	696
	1.75	1126	908	777	559	439	363	1.80	384	414	468	488	505	534	582	600	612	672	691	738
	1.67	1256	1053	864	580	451	369	1.75	401	432	489	508	525	557	607	626	638	698	720	770

2-700	1.80	1118	958	798	615	483	399	1.85	422	456	516	536	555	588	600	620	632	696	763	812
	1.75	1314	1059	907	652	512	424	1.80	449	484	546	568	590	624	624	660	673	720	806	861
	1.67	1465	1229	1008	677	526	431	1.75	468	504	570	592	615	648	664	690	704	732	840	898
2-800	1.80	1277	1094	912	702	552	456	1.85	483	520	588	612	635	672	732	755	770	840	869	929
	1.75	1501	1211	1036	746	586	484	1.80	512	552	624	648	670	714	776	800	816	890	922	984
	1.67	1675	1404	1153	773	601	493	1.75	534	576	651	676	700	744	808	835	852	931	960	1030
2-1000	1.80	1596	1368	1140	878	690	570	1.85	603	650	735	764	790	840	912	943	962	1051	1085	1160
	1.75	1875	1512	1295	932	732	605	1.80	641	690	780	812	840	888	968	1000	1020	1114	1152	1230
	1.67	2092	1754	1440	966	751	615	1.75	668	720	813	844	875	930	1008	1040	1064	1164	1200	1280
2-1200	1.80	1915	1642	1368	1054	828	684	1.85	723	780	882	916	950	1008	1096	1130	1154	1262	1301	1390
	1.75	2250	1814	1554	1118	878	726	1.80	768	828	936	976	1010	1068	1160	1200	1224	1337	1382	1480
	1.67	2510	2105	1728	1159	901	738	1.75	801	864	975	1012	1050	1116	1208	1250	1272	1397	1440	1540
2-1400	1.80	2234	1915	1596	1229	966	798	1.85	846	910	1029	1072	1110	1176	1288	1330	1356	1471	1517	1620
	1.75	2621	2114	1810	1302	1023	846	1.80	883	966	1092	1136	1175	1248	1360	1400	1428	1560	1608	1730
	1.67	2924	2452	2012	1351	1049	861	1.75	925	1006	1137	1180	1225	1302	1408	1460	1488	1625	1675	1790
2-1500	1.80	2394	2052	1710	1317	1035	855	1.85	975	976	1104	1148	1190	1260	1376	1420	1452	1577	1627	1740
	1.75	2808	2265	1939	1395	1096	906	1.80	960	1036	1170	1216	1260	1338	1456	1500	1536	1670	1723	1850
	1.67	3133	2627	2156	1447	1124	922	1.75	999	1078	1218	1264	1310	1392	1512	1560	1596	1740	1795	1920
2-1600	1.80	2554	2189	1824	1405	1104	912	1.85	966	1042	1179	1224	1270	1344	1464	1510	1548	1682	1738	1860
	1.75	2995	2416	2068	1488	1169	966	1.80	781	1106	1248	1296	1345	1428	1552	1600	1644	1781	1838	1970
	1.67	3342	2802	2300	1543	1199	983	1.75	829	1150	1299	1348	1395	1482	1616	1660	1704	1855	1915	2050
2-1800	1.80	2873	2462	2052	1580	1241	1026	1.85	862	1172	1326	1376	1425	1512	1648	1700	1740	1901	1982	2120
	1.75	3377	2723	2331	1678	1319	1089	1.80	879	1242	1404	1460	1510	1602	1752	1800	1836	2004	2069	2220
	1.67	3768	3158	2593	1740	1352	1108	1.75	932	1296	1467	1524	1580	1674	1824	1880	1908	2093	2189	2340
2-2000	1.80	3192	2736	2280	1756	1379	1140	1.85	972	1302	1473	1528	1585	1680	1832	1890	1932	2112	2170	2320
	1.75	3752	3026	2590	1864	1465	1210	1.80	1280	1380	1560	1620	1680	1782	1944	2000	2040	2227	2299	2460
	1.67	4187	3509	2881	1933	1502	1231	1.75	1335	1440	1629	1692	1755	1860	2024	2090	2124	2326	2400	2570
2-2500	1.80	3990	3420	2850	2195	1724	1425	1.85	1509	1628	1839	1908	1980	2100	2288	2360	2400	2616	2712	2900
	1.75	4689	3782	3237	2329	1830	1513	1.80	1601	1726	1950	2024	2100	2226	2424	2500	2556	2784	2875	3080
	1.67	5232	4385	3601	2416	1877	1539	1.75	1670	1800	2034	2112	2190	2322	2528	2610	2664	2904	3000	3210
2-3000	1.80	4788	4104	3420	2633	2069	1710	1.85	1811	1952	2208	2292	2375	2520	2744	2830	2892	3168	3254	3480
	1.75	5628	4539	3885	2796	2197	1815	1.80	1920	2070	2340	2432	2520	2670	2912	3000	3060	3336	3451	3690
	1.67	6279	5263	4321	2899	2253	1847	1.75	2003	2160	2442	2536	2630	2784	3040	3130	3192	3480	3600	3850
2-4000	1.80	6384	5472	4560	3512	2758	2281	1.85	2415	2604	2943	3056	3170	3360	3656	3770	3852	4224	4339	4640
	1.75	7504	6052	5180	3728	2929	2421	1.80	2561	2760	3120	3240	3360	3558	3880	4000	4080	4464	4598	4920
	1.67	8372	7018	5762	3866	3004	2462	1.75	2672	2880	3255	3380	3505	3714	4048	4180	4248	4632	4795	5130

Actual battery performance data may be $\pm 5\%$ of figures shown above

Modular Range Cell Specifications

Model No.	Nominal Voltage (V)	Nominal AH Cap. @10hr to 1.80VPC	Outline Dimensions (mm/inch)				Weight (kg/lb)	Terminal Type	No. of Term.	Internal Resist. mOhms	Max. Charge Current	Short Circuit Current
			Length	Width	Height	Total Height						
2-50	2	50	161/6.34	50/1.97	166/6.54	172/6.78	4.5/9.9	ST1	2	2.10	10	420
2-100	2	100	171/6.74	72/2.83	205/8.07	211/8.31	8/17.6	ST1	2	2.00	20	890
2-120	2	120	171/6.74	72/2.83	205/8.07	211/8.31	9/19.8	ST1	2	1.80	24	1050
2-150	2	150	171/6.74	102/4.02	205/8.07	211/8.31	11/24.3	ST1	2	1.50	30	1280

2-200	2	200	171/6.74	106/4.18	330/13.0	336/13.2	15/33.1	ST2	2	0.50	40	1320
2-250	2	250	171/6.74	106/4.18	330/13.0	336/13.2	18/39.7	ST2	2	0.45	50	1660
2-300	2	300	171/6.74	151/5.95	330/13.0	336/13.2	21/46.2	ST2	2	0.40	60	1990
2-400	2	400	210/8.27	173/6.82	330/13.0	336/13.2	28/61.7	ST2	4	0.36	80	2660
2-500	2	500	241/9.50	171/6.74	330/13.0	336/13.2	33/72.8	ST2	4	0.30	100	3320
2-600	2	600	302/11.9	175/6.90	330/13.0	336/13.2	42/92.6	ST2	4	0.28	120	3980
2-700	2	700	302/11.9	175/6.90	330/13.0	336/13.2	50/110	ST2	4	0.22	140	4850
2-800	2	800	410/16.2	175/6.90	330/13.0	336/13.2	57/126	ST2	8	0.20	160	5300
2-1000	2	1000	482/19.0	175/6.90	330/13.0	336/13.2	66/146	ST2	8	0.16	200	6550
2-1200	2	1200	482/19.0	175/6.90	330/13.0	336/13.2	70/154	ST2	8	0.13	240	8200
2-1400	2	1400	400/15.8	350/13.8	345/13.6	351/13.8	95/210	ST2	8	0.12	280	9450
2-1500	2	1500	400/15.8	350/13.8	345/13.6	351/13.8	100/220	ST2	8	0.11	300	9920
2-1600	2	1600	400/15.8	350/13.8	345/13.6	351/13.8	106/234	ST2	8	0.11	320	11000
2-1800	2	1800	490/19.3	350/13.8	345/13.6	351/13.8	120/365	ST2	8	0.10	360	12300
2-2000	2	2000	490/19.3	350/13.8	345/13.6	351/13.8	132/291	ST2	8	0.09	400	13400
2-2500	2	2500	490/19.3	350/13.8	345/13.6	351/13.8	175/386	ST2	8	0.08	500	16540
2-3000	2	3000	710/27.9	350/13.8	345/13.6	351/13.8	210/463	ST2	8	0.08	600	19980
2-4000	2	4000	710/27.9	350/13.8	345/13.6	351/13.8	261/576	ST2	8	0.06	800	27500

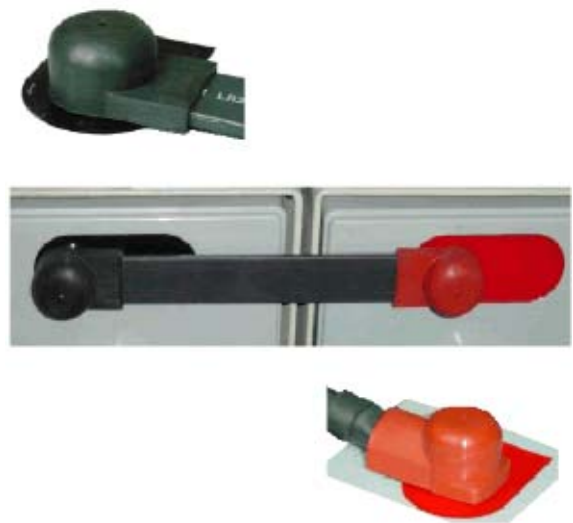
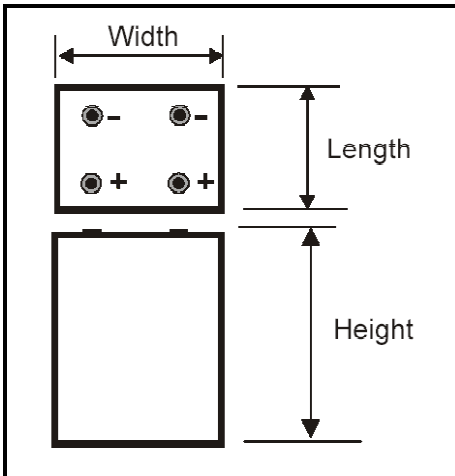
Terminal Type



ST1: Copper Insert type terminal with 16 mm Diameter insert. Standing 5mm above the top of the battery case with M8 thread M8 bolt. Flat and Spring washer supplied.

ST2: Copper Insert type terminal with 18 mm Diameter insert. Standing 5mm above the top of the battery case with M8 thread M8 bolt. Flat and Spring washer supplied.

Cell Dimensions for Rack Layout



Charging Characteristics

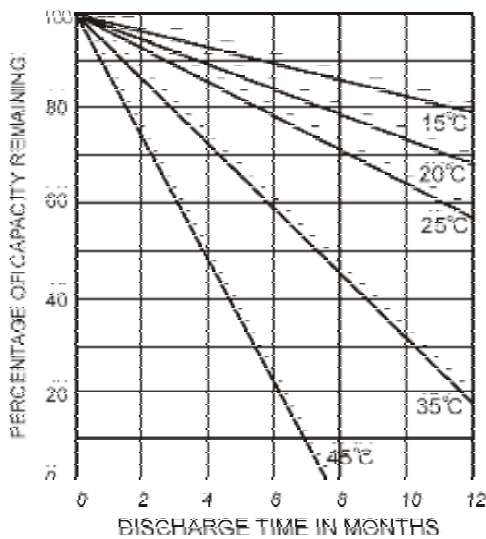
Floating – The optimum float voltage for a battery is temperature dependant, at 15~24° C the recommended value is 2.27~2.30 Volts. Float voltage should be set to compensate for temperature variations. For higher or lower temperatures outside the table range use temperature correction factor of 0.003 ± 0.001 per volt per cell per °C.

Battery Float Voltage	
Ambient Temperature	Recommended Applied Float Voltage VPC
0~9° C	2.33-2.35
10~14° C	2.30-2.33
15~19° C	2.27-2.30
20~24° C	2.27-2.30
25~29° C	2.25-2.27
30~34° C	2.23-2.25
35~40° C	2.21-2.23

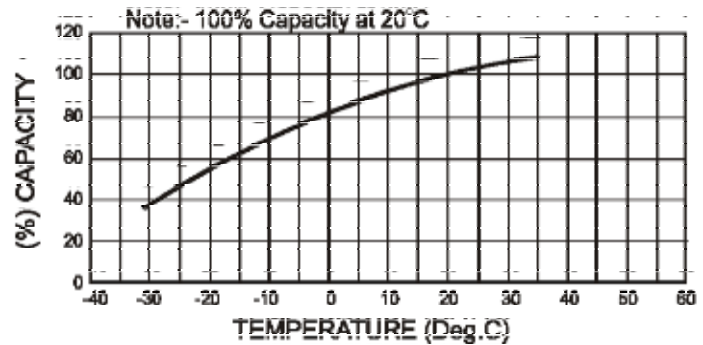
The most suitable charging method for battery life and performance is the constant voltage charging with a limited initial current, usually limited to a maximum of $C_{10}/4$.

MODULAR GEL RANGE PERFORMANCE CURVES

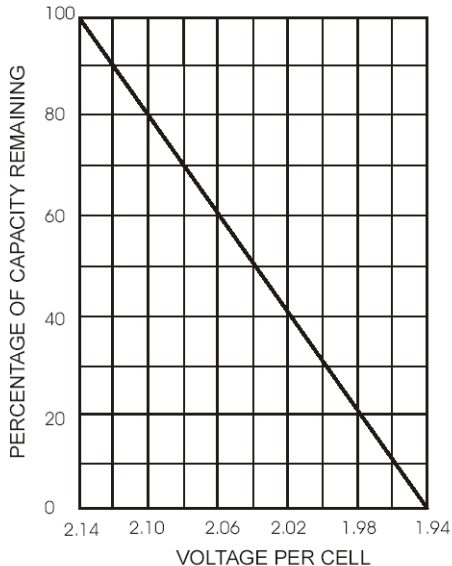
SELF DISCHARGE CHARACTERISTIC



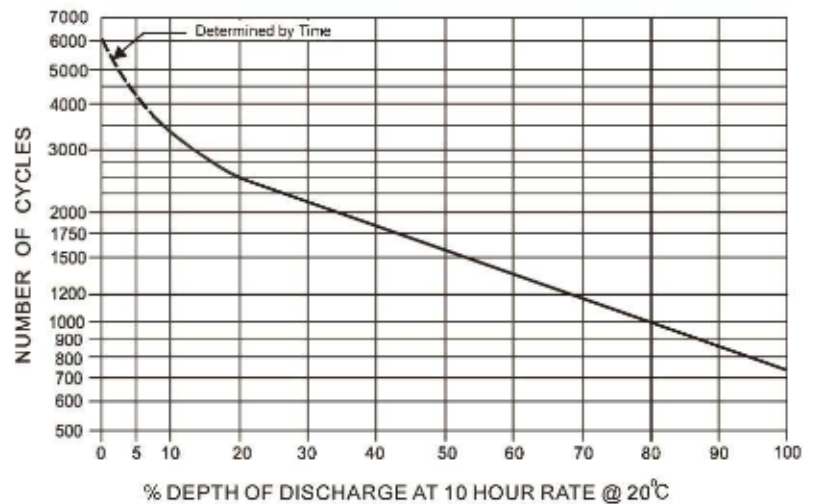
CAPACITY vs TEMPERATURE



OPEN CIRCUIT VOLTAGE vs CAPACITY

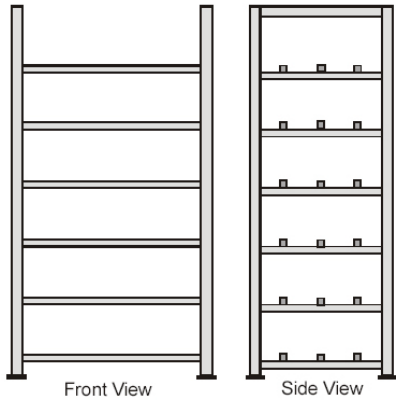


FLOAT SERVICE / CYCLE LIFE

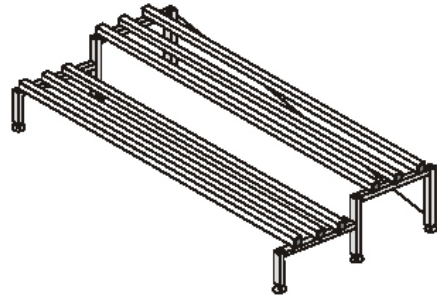


MODULAR GEL RANGE – HORIZONTAL & VERTICAL RACKING SYSTEMS

Modular Gel Range batteries can be mounted on / in vertical or horizontal racking system. It is not recommended to mount batteries larger than 1200AH in horizontal position.



Typical rack for horizontal configuration of Modular Gel Range batteries



Typical rack for vertical configuration of Modular Gel Range batteries

