

Polar Power Limited

Polar Power Batteries offers a wide range of batteries for industrial uses



Deep Cycle AGM and Gel Batteries.

Designed using the latest grid plate technology Our deep cycle range of, 6v, 12v, 18v and 36v batteries range from 1.2amp to 250 amp and are capable of 380 cycles to an 80% depth of discharge at an ambient temperature of 20°C / 68°F.

High temperature Deep Cycle series.

For use where deep cycle technology Has to operate in ambient temperatures Of 50°C/122°F to 70°C/158°F. 380 cycles to 80% depth of discharge

Single cell 2V series AGM and Gel.

For High capacity commercial operations where high storage capacity is needed ranging from 100amp/hour to 3000amp/hour

Applications

Standby UPS Systems, Electric Vehicles, Solar and Wind Energy Storage, Telecommunication Systems, Fire Alarm Systems and Security Systems

Polar Power

Units F and G

Treefield Industrial Estate

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Features of Polar Power

AGM VRLA Batteries:

Non Spillable.

Our absorbed electrolyte system ensures all electrolyte is absorbed into the positive plates negative plates and separators, Polar Power VRLA batteries have exceptional leak resistance due to the use of special sealing epoxies and long sealing paths for terminal posts and can be Positioned vertically or horizontally.

Sealed and Maintenance Free.

There is no corrosive gas generation in normal use and no need to add water during service life.

Exceptional deep discharge recovery.

Polar Power batteries have exceptional deep discharge recovery and charge acceptance even after deep or prolonged discharge.

Low Self-Discharge.

Because of the high purity of alloys used in the plate manufacture the rate of self discharge is less than 2% per month at 20°C/68°F

Polar Power Batteries Are
fully CE and UL certified

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1 General Characteristics AGM Batteries

1.1 Discharging

1.1.1 Final Discharge Voltage

The final discharge voltage is the closed circuit voltage per cell which the battery can safely discharge to without shortening battery life. A higher discharge current gives a lower final discharge voltage

Discharging Current	Final Discharging Voltage(VPC)
Up to 0.1CA	1.75
0.11-0.17CA	1.70
0.18-0.25CA	1.67
0.26-1CA	1.60
Above 1.1CA	1.30

1.1.2 Battery discharging characteristics

Figure 2 shows different discharge current corresponding to discharge capacity at 25°C/77°F. It shows a reduced capacity when discharge current exceeds 10-20 hour rate.

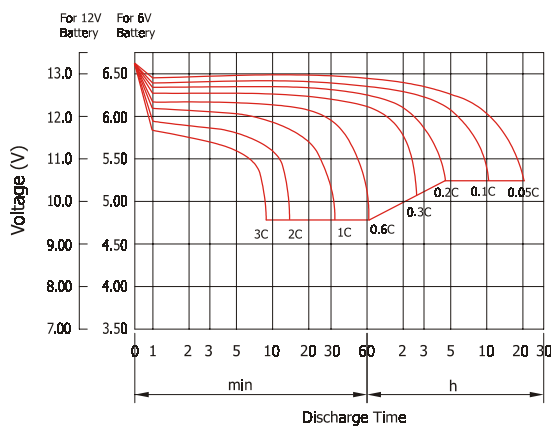
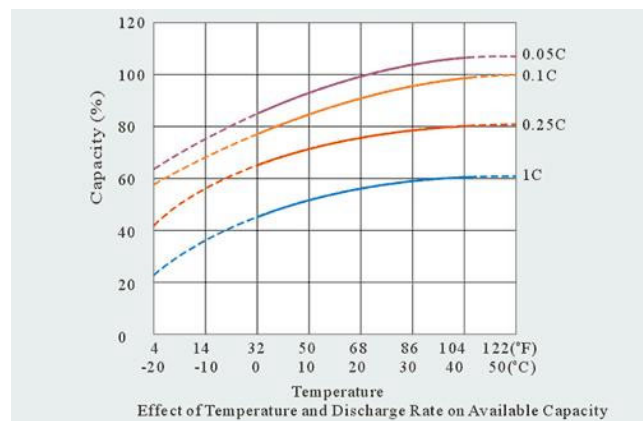


Figure 2: Discharge Characteristics Typically for LFP Type (25°C/77°F)

1.1.3 Temperature effects in relation to battery capacity

At a higher temperature the battery capacity increases and conversely at a lower temperature the battery capacity decreases



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1.2 Charging Methods

1.2.1

Correct charging is one of the most important factors to consider when using valve regulated lead acid batteries. Battery performance and service life will be directly affected by the charging methods.

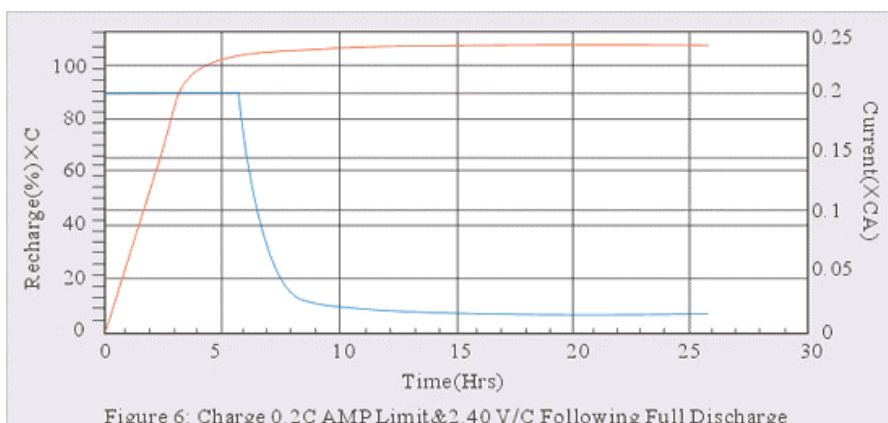
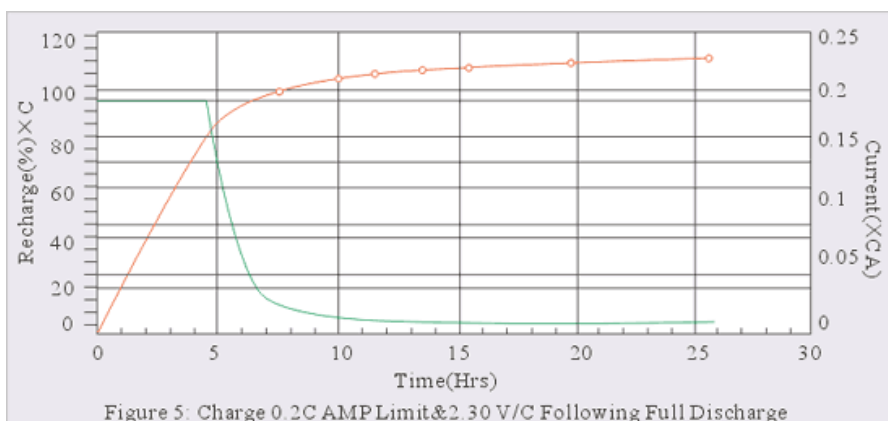
1.2.1 Constant Voltage Charging

This is the recommended method of charging for VRLA batteries. It is necessary to closely control the actual voltage to ensure that it is within the limits advised.

Standby service: 2.23-2.30 Volts Per Cell at 25°C/77°F

Cycle service: 2.40-2.50 Volts Per Cell at 25°C/77°F

It is suggested that the initial current be set within 0.4Camps. Figure 5 and 6 indicate the time taken to fully recharge the battery. It is also seen that the charging current is decreased to approx 0.5-4mA/Ah under charging voltage 2.30 vpc, and 3-10mA/Ah under charging voltage 2.40vpc when the battery is fully charged at 25°C/77°F.



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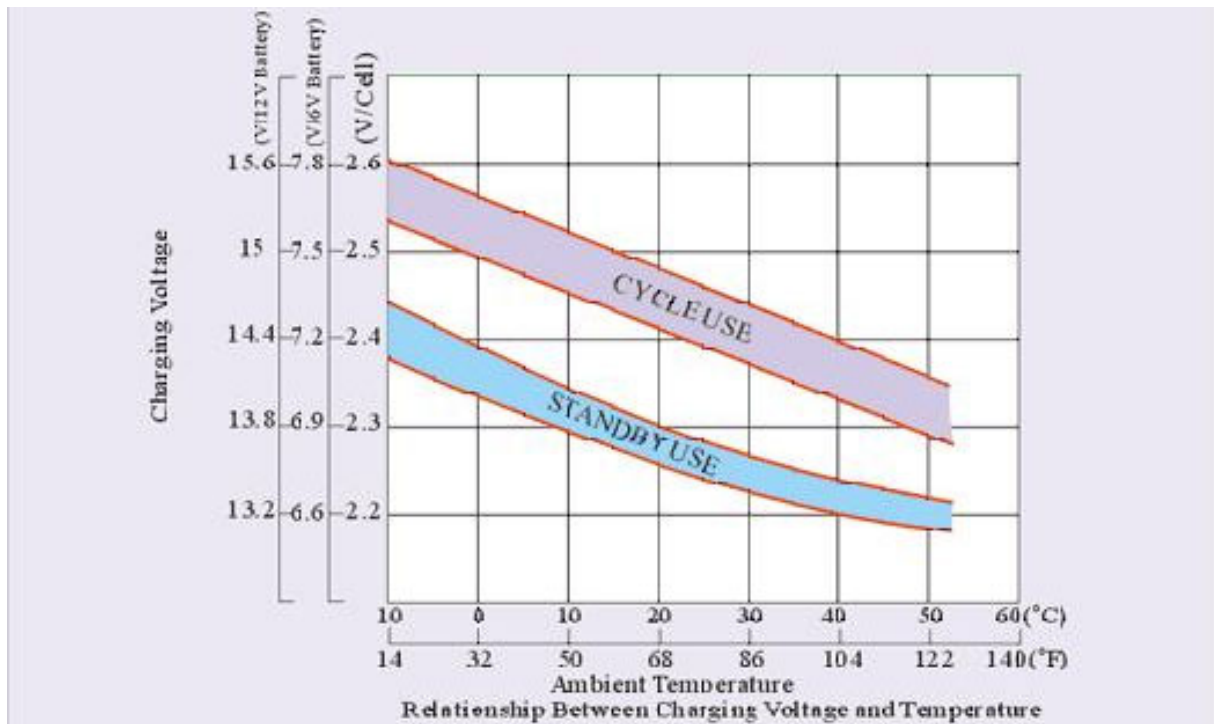
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2.1.1 Effect of temperature on charging voltage

As ambient temperature rises, electrochemical activity in the battery increases. Similarly as ambient temperature decreases electrochemical activity in the battery decreases therefore as temperature increases charge voltage should decrease to prevent overcharging of the battery in general the use of a temperature compensating charger is recommended. The polar power compensation factor is $\pm 3\text{mV}/^\circ\text{C}$ per cell in standby use and $\pm 4\text{mV}/^\circ\text{C}$ per cell in cyclic use.

The table below shows the relationship between temperatures and charging voltages in both cyclic and standby applications



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3.1.1 Battery Life In Cyclic Application

If the battery installation has the optimum ambient temperature then the actual battery in cyclic service will depend on the depth of discharge of each cycle. The figure below shows cyclic life against the depth of discharge.

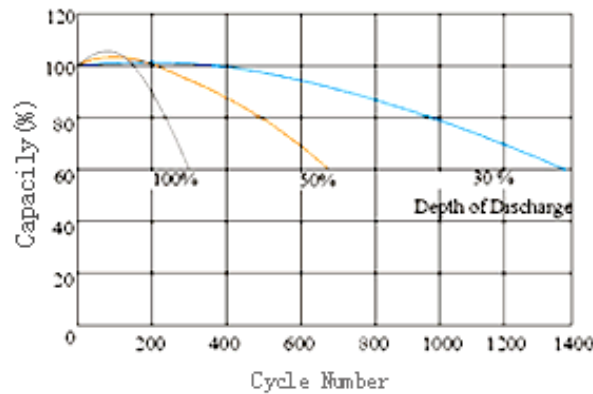
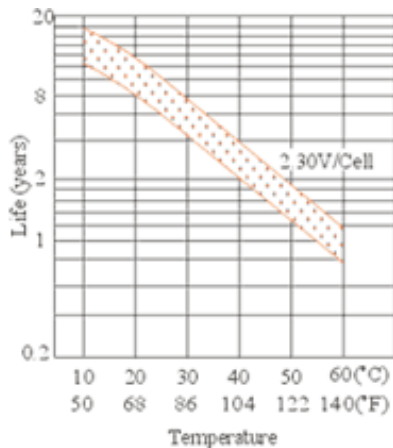


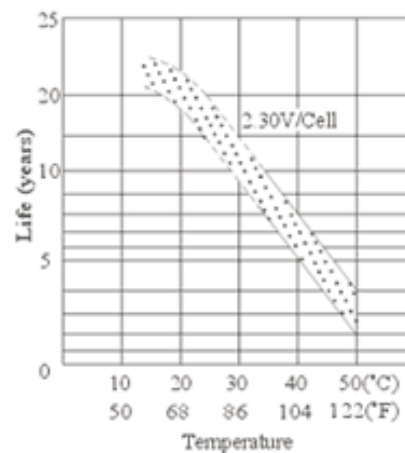
Figure 9: Cycle Life Vs Depth of Discharge For Deep Cycle Services FP, LFP Types

3.2.1 Battery Life In Standby Application

If the battery installation has the optimum ambient temperature of 20°C/68°F the life will be 10 years for the PPC 12v and PPC 6v. The PPC2v will have a float life of more than 18 years at 20°C/68°F. If the temperature is raised above optimum then the battery life will be shortened by 50% for each 8 to 10°C constant above 20°C/68°F



Effect of Temperature on Long Term Float Life



Effect of Temperature on Long Term Float Life **ppc2v**

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Polar Power Gel Series

Introduction:

Our Polar Power Gel Series batteries use sealed gel technology and are designed for the highest reliability and maintenance free power for renewable energy applications.

Features And Benefits

Completely leak proof and can be used either vertically or horizontally

High quality gas control valves to expel gas from over charging to extend battery life.

Heavy duty plates with deep cycle oxide active materials provide quick recharge and superior deep-cycle and float performance in the most demanding applications.

Premium glass mat separators reduce gassing and improve electron flow for optimum performance.

Superior Life.

Water Pumping Wind Energy Cathode Protection
Solar Energy Communications Electric Vehicles
Commercial Deep Cycle Applications

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Charging:

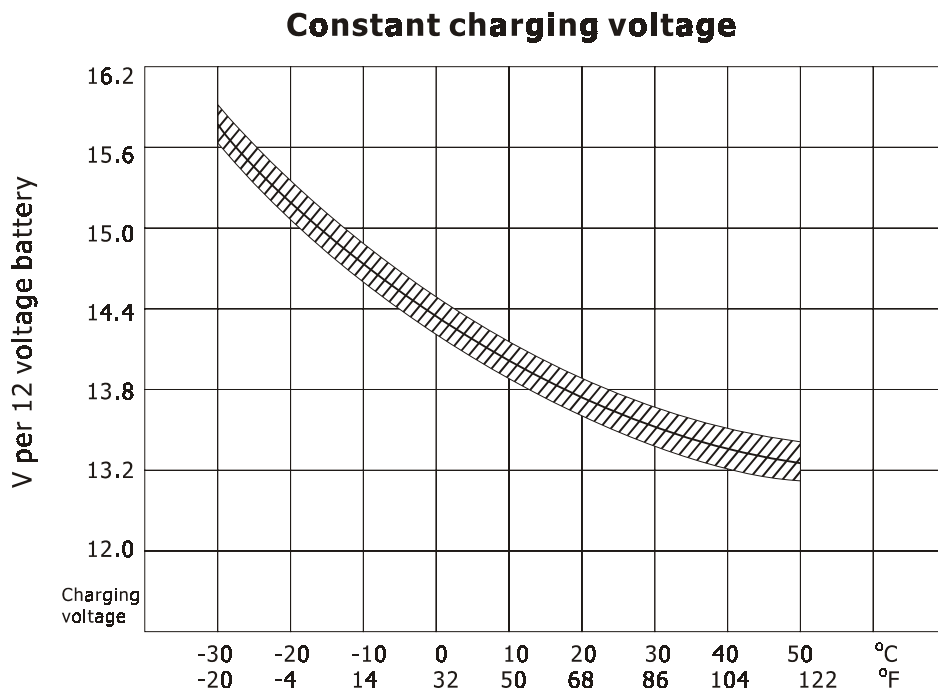
Whilst the gel battery accepts charge very well due to its low internal resistance however due to its sealed valve regulated design, overcharging will drive out the oxygen and hydrogen from the electrolyte reducing capacity and shortening life.

If the battery is undercharged then a power robbing layer of sulphate will form on the plates reducing capacity and shortening its life.

For optimum performance and life Polar Power Gel batteries should be charged to at least 2.30 volts per cell and no more than 2.35 volts per cell at 20°C/68°F.

Constant current chargers must not be used.

The graph below shows the constant charge voltage in relation to ambient temperature.



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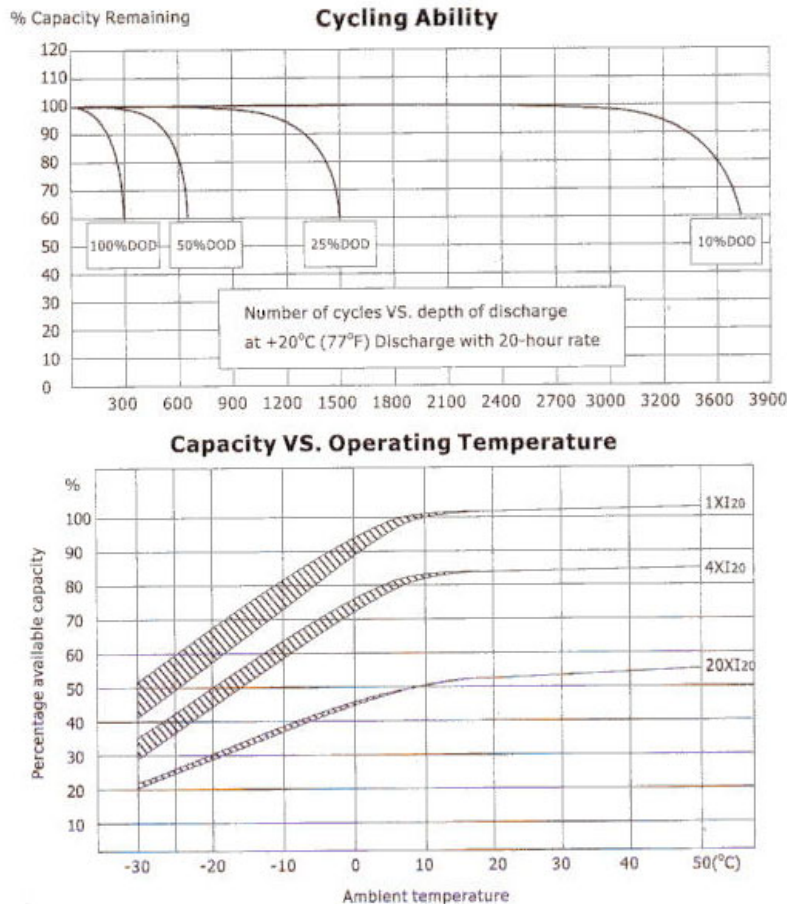
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Discharging and Cycling Ability.

As with our AGM range the battery life depends on the ambient temperature and the depth of discharge.

The Polar Power Gel Battery is an acid limited design which means that the power in the acid is used before the power in the plates preventing the plates from ultra deep discharging which causes them to shed material and reduces positive grid corrosion which destroys a battery.



Capacity VS. Operating temperatures: Shown are the changes resulting from a range of ambient air temperatures giving the available capacity as a percentage of the rated capacity. 3 load examples with uninterrupted discharge are shown to the appropriate discharge cut off point.

The upper edge of the curves were obtained from charging at an ambient temperature of +20°C with a voltage limit of 2.30 volts per cell. For the lower edge, charging was carried out at the specified ambient temperature.

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Deep Cycle Battery Series Available in AGM or Gel

Model	Nominal Voltage (V)	Capacity (AH)	Internal Resistance (mΩ)	Dimensions (mm)				Terminal		Weight (Kg)
				Length	Width	height	Total Height	Type	Position	
PPC12V5	12	5	33	90	70	101	107	T1	C	1.8
PPC12V6	12	6	20	151	65	94	100	T1	F	2.45
PPC12V7	12	7	19							2.6
PPC12V12	12	12	17	151	98	95	101	T2	F	4.1
PPC12V18	12	18	17	181	77	167	167	T3/T8	D	5.5
PPC12V20	12	20	15							5.8
PPC12V24	12	24	12	166	175	125	125	T3/T8	D	8.3
PPC12V30	12	30	10							9.0
PPC18V7	18	7	42	151	102	100	100	plug	P	3.8
PPC18V9	18	9	40							4.0
PPC24V4.5	24	4.5	60	206	77	74	74	plug	P	3.2
PPC24V10	24	10	50	301	65	102	102	plug	P	5.8
PPC24V14	24	14	45	300	98	103	103	plug	P	8.2
PPC36V12	36	12	60	190	150	115	115	plug	P	9.8
PPC6V100	6	100	3.3	194	170	205	210	T9	A	18.0
PPC6V150	6	150	3.2	260	180	245	250	T11	B	24.5
PPC6V200	6	200	3.1	321	176	226	246	T5/T11	A	32.0
PPC12V35	12	35	10	195	130	159	180	T7/T9	C	10.2
PPC12V40	12	40	9.5	197	165	170	170	T4/T9	D	13.5
PPC12V55	12	55	5.8	229	138	208	230	T5/T9	C	19.5
PPC12V60	12	60	5.7	260	168	211	233	T5/T9	C	20.5
PPC12V70	12	70	5.5							24.0
PPC12V80	12	80	5.4							25.5
PPC12V65	12	65	6	350	167	179	186	T5/T9	C	22.0
PPC12V90	12	90	5.5	306	169	211	233	T5/T9	C	28.0
PPC12V100	12	100	4.5	330	171	214	224	T5/T9	C	32.0
PPC12V120	12	120	4	409	176	225	225	T5/T11	C	37.5
PPC12V150	12	150	3.5	485	172	240	240	T5/T11	C	47.0
PPC12V180	12	180	3.5	500	207	211	240	T20/T5	E	58.0
PPC12V200	12	200	3	522	238	218	238	T5/T11	E	65.0
PPC12V250	12	250	2.6	521	269	220	242	T5/T11	E	78.0

Total height is height to the top of the terminals

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Deep Cycle High Temperature Battery Series Available in AGM

Optimal battery performance can be expected at the ambient temperatures at 50°C/122°F to 70°C/158°F

Model	Nominal Voltage (V)	Capacity (AH)	Internal Resistance (mΩ)	Dimensions (mm)				Terminal		Weight (Kg)
				Length	Width	height	Total Height	Type	Position	
PPHT12V7	12	7	25	151	65	94	100	T1	F	2.4
PPHT12V12	12	12	17	151	98	95	101	T2	F	3.8
PPHT12V20	12	20	17	181	77	167	167	T3/T8	D	5.6
PPHT12V24	12	24	12	166	175	125	125	T3/T8	D	8.3
PPHT6V200	6	200	3.1	321	176	226	246	T5/T11	A	32.0
PPHT12V35	12	35	10	195	130	159	180	T7/T9	C	10.2
PPHT12V40	12	40	9.5	197	165	170	170	T4/T9	D	13.8
PPHT12V65	12	65	6	350	167	179	186	T5/T9	C	22.5
PPHT12V60	12	60	5.7	260	168	211	233	T5/T9	C	20.5
PPHT12V70	12	70	5.5							24.0
PPHT12V80	12	80	5.4							25.5
PPHT12V90	12	90	5.2	306	169	211	233	T5/T9	C	29.0
PPHT12V100	12	100	5	330	171	214	224	T5/T9	C	32.0
PPHT12V120	12	120	4.3	409	176	225	225	T5/T11	C	37.5
PPHT12V150	12	150	3.7	485	172	240	240	T5/T11	C	48.0
PPHT12V200	12	200	3.5	522	238	218	238	T5/T11	E	65.0
PPHT12V250	12	250	2.8	521	269	220	242	T5/T11	E	78.0

Total height is height to the top of the terminals

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Deep Cycle 2Volt Cell Battery Series Available in AGM Or Gel

Model	Nominal Voltage (V)	Capacity (AH)	Internal Resistance (mΩ)	Dimensions								Weight		Terminal	
				Length		Width		Height		Total Height		Kg	lb	Type	Position
				mm	in	mm	in	mm	in	mm	in				
PPC2V100	2	100	0.9	171	6.73	72	2.83	206	8.11	209	8.23	7.2	15.9	T10	A
PPC2V150	2	150	0.83	171	6.73	102	4.02	206	8.11	221	8.70	8.5	18.7	T10	A
PPC2V200	2	200	0.7	173	6.81	109	4.29	330	13.0	364	14.3	14.5	32.0	T10	G
PPC2V250	2	250	0.67									15.5	34.2		
PPC2V300	2	300	0.65	171	6.73	151	5.94	330	13.0	364	14.3	20	44.1	T10	G
PPC2V350	2	350	0.6									21	46.3		
PPC2V400	2	400	0.5	210	8.27	171	6.73	330	13.0	367	14.4	27	59.5	T10	H
PPC2V450	2	450	0.45									28	61.7		
PPC2V500	2	500	0.4	241	9.49	171	6.73	330	13.0	365	14.4	32	70.6	T10	H
PPC2V550	2	550	0.35									34	75.0		
PPC2V600	2	600	0.32	302	11.9	175	6.89	330	13.0	367	14.4	40	88.2	T10	H
PPC2V800	2	800	0.24	410	16.1	175	6.89	330	13.0	367	14.4	55	121	T10	I
PPC2V1000	2	1000	0.2	475	18.7	175	6.89	330	13.0	367	14.4	65	143	T10	I
PPC2V1200	2	1200	0.18									71	157		
PPC2V1400	2	1400	0.18	400	15.7	350	13.8	345	13.6	382	15.0	98	216	T10	J
PPC2V1500	2	1500	0.16									102	225		
PPC2V1600	2	1600	0.15									104	229		
PPC2V1800	2	1800	0.13									112	247		
PPC2V2000	2	2000	0.12	490	19.29	350	13.78	345	13.58	382	15.04	130	287	T10	K
PPC2V2400	2	2400	0.11									140	309		
PPC2V2500	2	2500	0.11									143	315		
PPC2V3000	2	3000	0.11	710	28.0	350	13.8	345	13.6	382	15.0	200	441	T10	K
PPC2V3500	2	3500	0.1									212	467		

Total height is height to the top of the terminals/battery cover

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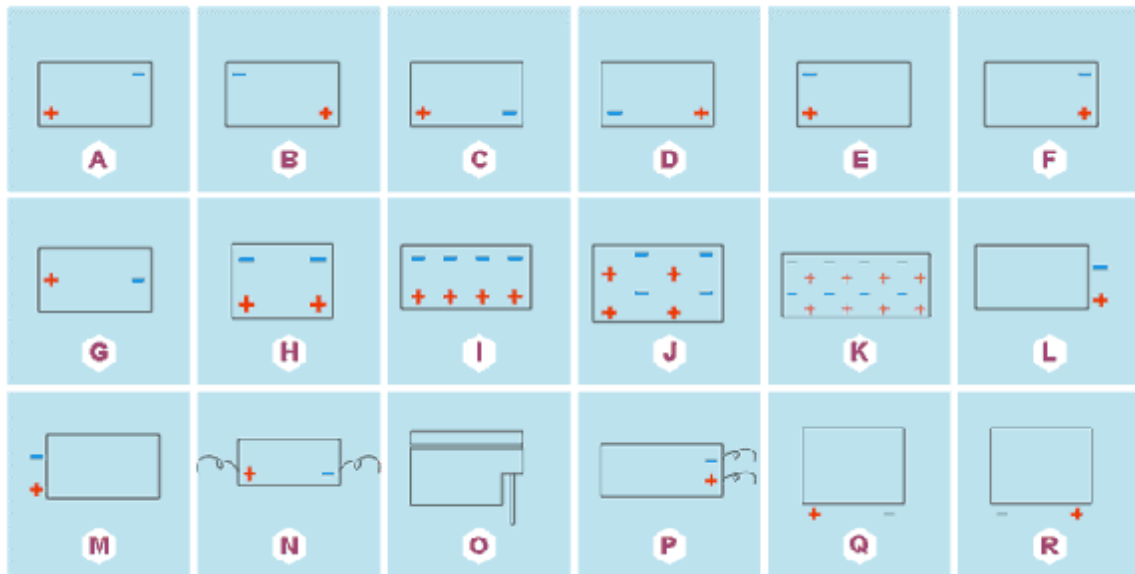
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Terminal Layouts

Type	A	B	C	D	E	Material
T3	12	2.0	14	5.0	ø5.5	Cu
T4	20	3.0	16	7.0	ø6.0	Cu
T5	22	3.5	22	8.5	ø8.0	Cu
T6	17	9.0	18	8.0	ø6.0	Pb
T7	17	6.0	16	7.0	ø8.0	Pb
T16	20	3.0	18	7.5	ø8.0	Cu
T17	18	7.0	20	7.5	ø7.0	Pb
T18	23	7.0	19	8.5	ø7.0	Pb
T19	25	7.0	24	10.5	ø9.0	Pb
T20	27	8.0	29	12.0	ø9.0	Pb

Type	14	ø	Material
T8	5	12	Cu
T9	6	14	Cu
T10	8	20	Cu
T11	8	16	Cu
T12	8	14	Cu



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