

Deep Cycle GEL

Tubular D.C GEL Series



GENERAL INFORMATION

UNIBAT Deep Cycle GEL Tubular Positive plates series, are well established for partial state of charge operation and designed for repeated Deep Cycle use, even in heavy power cut areas or entirely off-grid systems.

GEL electrolyte makes it compact and maintenance free with no topping up for life. It is made with updated GEL VRLA technology from pure materials with excellent know how to meet all needs, providing excellent cyclic and recovery performance after over-discharging. Series consist of 12V monoblocks 26 to 200 AH and 2V cells 200 to 1000 AH housed in stackable MS modules (4V, 8V or 16V).

UNIBAT Deep Cycle GEL differs from conventional VRLA batteries, as it contains more lead, tubular plates and other special materials that enable to deliver more power and capacity over many charging cycles.

Positive plate: Robust Tubular spines with ultra low maintenance Pb-Ca-Sn alloy.

Negative plate: Pb-Ca alloy grid providing low corrosion and maintenance free characteristics.

Separator: Micro-porous and resin based separators with high porosity and low electrical resistance.

Electrolyte: Sulphuric acid in immobilized gelled form, specially made

by mixing thixotropic inert additives.

Terminal structure: Bolt - on terminal with brass insert, specially designed for sustained high current discharges.

Valve: Flame arresting vent plug housing, long life rubber, explosion proof, self resealing and pressure regulating type.

Casing: The unique construction and sealing techniques of UNIBAT Deep Cycle GEL series guarantee leak proof operation in any position with no adverse effect to capacity or service life. The battery case is made of high grade pure polypropylene co-polymer material.

UNIBAT Deep Cycle GEL batteries are designed for a long service life in cyclic applications, up to 2200 cycles (12V monoblocks) or 3250 cycles (2V cells) for 50% Depth Of Discharge.

All models comply to IEC 60896-21/22, IEC 61427, BS 6290 part IV standards, also classified according to Eurobat Guide 2015 "Very Long Life".

APPLICATIONS

- Off-Grid solar systems.
- Power Plants.
- Railway Signaling.
- Telecom / Data Centers.
- Power substations / Oil & Gas Pipelines.
- Marine signaling / service applications.
- Road lights.
- RV service applications.

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DESIGN FEATURES & BENEFITS

- Sealed construction / Maintenance Free / No acid stratification.
- Free from Orientation Constraints : The sealed construction allows battery to be installed in any position, horizontal, vertical, sideways - without any effect on its performance.
- Can safely be used in high ambient temperature zone.
- Eco Friendly : The unique gas recombination technology effectively nullifies generation of gas during normal use.
- Very low foot-print - Easy Handling - Easy Installation.
- Ready To Use : Available in fully (factory) charged condition.
- Excellent Service Life: More than 10 years lifetime, 2200 - 3250 charge/discharge cycles for cyclic use at 25°C.
- Low Self Discharge : Can be stored for more than 6 months.
- High Reliability : Tough construction and heavy duty tubular design with superior corrosion resistant lead calcium tin alloy.
- Specially designed to sustain high current discharge and mechanical ruggedness.

RANGE SUMMARY

UNIBAT D.C GEL SPECIFICATION TABLE											
BATTERY TYPE	V	CAPACITY @ 25°C (AH)		DIMENSIONS (mm)			WEIGHT (kg)	CONTAINER MATERIAL	TERMINAL	Ri (mΩ)	MAX DISCHARGE CURRENT (A)
		C20 @ 1,80 Vpc	C120 @ 1,85 Vpc	L	W	H					
12V monoblocks											
26 - 12	12	26	34	197	165	170	13	PP	M5	13,0	156
40 - 12	12	40	52	354	169	230	22	PP	M5	10,0	240
65 - 12	12	65	85	354	169	230	26	PP	M6	8,2	390
75 - 12	12	75	98	531	170	258	38	PP	M6	7,0	450
100 - 12	12	100	130	531	170	258	42	PP	M8	6,0	600
120 - 12	12	120	156	531	170	258	48	PP	M8	5,4	720
150 - 12	12	150	195	533	250	240	61	PP	M8	5,0	900
200 - 12	12	200	260	428	287	400	80	PP	M8	4,0	1200
BATTERY TYPE	V	CAPACITY @ 25°C (AH)		MODULE DIMENSIONS (mm)			MODULE WEIGHT (kg)	CONTAINER MATERIAL	MODULE VOLTAGE (V)	Cells per module	TERMINAL
		C10 @ 1,80 Vpc	C120 @ 1,85 Vpc	L	W	H					
2V cells											
200 - 2	2	200	260	709	268	343	101	PP	16	8	M10
300 - 2	2	300	390	717	214	510	121	PP	8	4	M10
400 - 2	2	400	520	717	214	510	133	PP	8	4	M10
500 - 2	2	500	650	717	214	510	157	PP	8	4	M10
600 - 2	2	600	780	717	262	502	181	PP	8	4	M10
800 - 2	2	800	1040	386	262	677	200	PP	4	2	M10
1000 - 2	2	1000	1300	386	278	677	235	PP	4	2	M10

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CHARGING INSTRUCTIONS

Batteries always to be recharged in CC-CV mode only.

A. Commissioning Charge

Before commissioning a new battery, IU charging method (bulk charge) is recommended :

At a raised voltage of 2.40 volts per cell. The charging time will be 12 to 24 hours depending on the initial charge condition. The current is required to be limited to 20% of the battery Ah capacity (0.2 C₂₀).

Bulk charging must be switched off or switched over to float charging as soon as the fully charged state is reached.

B. Normal Recharge

Recommended Parameters for ambient temperature 25° - 30°C are shown below :

Tubular GEL VRLA Series	
RECHARGING CHARACTERISTICS DURING OPERATIONS	
Charging Current	Maximum : 20% of the battery Ah capacity Minimum : 10% of the battery AH capacity
Bulk Voltage	2.40 +/- 0.02v x no. of cells
Float Voltage	2.28 +/- 0.02V x no. of cells
Load Reconnect Voltage	2.20 +/- 0.02V x no. of cells
Low Voltage Disconnect	1.90 +/- 0.02V x no. of cells
Recharge Factor	106% of discharge Ah
Temperature Correction Factor (reference 25°C)	Cyclic : -5mV/ °C/cell Float: -3mV/ °C/cell

BATTERY BANKS

In order to increase Battery Storage capacity, paralleling of Battery Strings is permitted under following conditions :

- Paralleling of a maximum of three strings is allowed provided they are all of the same brand, same age and Ah capacity.
- Adequate care shall be taken in ensuring that all inter-unit connecting cables have equal length and cross-section. All system cables from each of the strings, shall also be of same length and cross-section.
- Total charging current in the case of parallel strings, to be taken care of so that each of the strings get the recommended level of Amperes - minimum 10% and maximum 30% of the rated C₂₀ capacity of each of the 2V cells / 12V blocks.

For inter-block connection flexible copper cable with suitable lugs are recommended. Cable cross section may be estimated at 2.8 Amps/mm² at the maximum anticipated discharge load.

Even though **UNIBAT Deep Cycle GEL** batteries are designed to perform anywhere between -20 to +50°C, for optimum battery life avoid prolonged operation in ambient in excess of 35°C.

Above 25°C, for every 10°C rise of weighted average operating temperature, battery life is reduced by 50%.

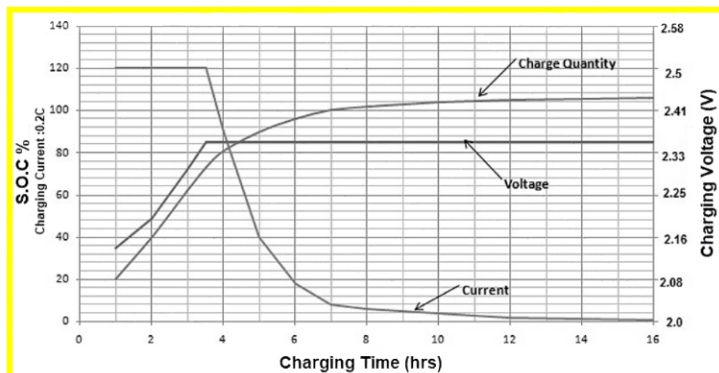
Ensure that batteries are put to recharge immediately after any discharge, under no circumstance the gap between the end of discharge and initiation of recharge should be more than 24 hours.

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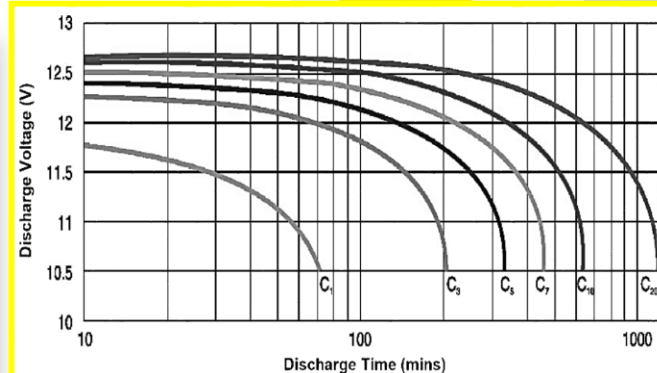
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PERFORMANCE CURVES

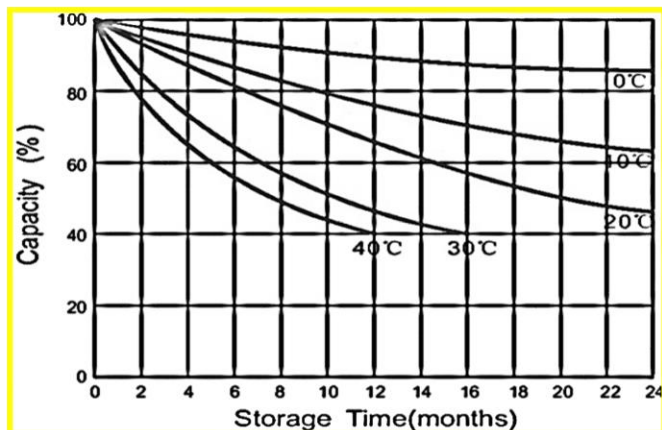
CHARGING CURVES



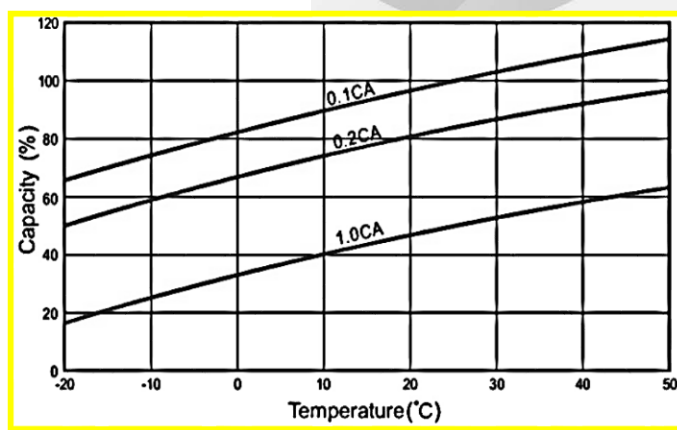
DISCHARGING CURVES



CAPACITY RETENTION – SELF DISCHARGE



TEMPERATURE vs CAPACITY



CYCLE LIFE vs DEPTH OF DISCHARGE

