

# SOLAR ExC-T

## Extreme Cycling Tubular Series

### GENERAL INFORMATION

UNIBAT Solar ExC-T series are flooded - low maintenance 2V cells, especially built to last, meeting and exceeding stringent customer requirements in the Solar & Power Sector. It is optimized for daily deep cycling, extreme cycle life (up to 3000 cycles @ 50% D.O.D) with minimum maintenance and highest performance reliability.

It complies to IEC 61427 and IEC 60896-11, as well as safety requirements according to IEC 62485-2 standards.

Constructed with 100 bar pressure technology Tubular positive plates, Solar ExC-T series eliminate shedding, operate even at low/available charge current, under Partial State of Charge & ensures good capacity and long cycle life.

UNIBAT Solar ExC-T series includes a full range of deep cycling, low maintenance 2V cells, designed for long life – deep discharge applications with regular charging, and medium to long duration discharges. They perform excellent for a wide range of temperatures from -20°C up to +55°C.

Cells up to 1200 are fitted in (8/6/4V) modules so that can be installed straightway on arrival at site.

It's high performance make series ideal for a wide range of renewable applications, such as Remote, Residential and Commercial RES systems, smart or mini-grids, Telecom hybrid systems, Signaling and Lighting.



### CONSTRUCTION FEATURES

- Positive plates are spine grids produced on High Pressure Die Casting (PDC) Machines give defect-free grid with fine gain structure with excellent corrosion resistance and long life. High tensile acid resistant polyester gauntlets contain active material. Low antimony selenium alloy enhances the life of battery, minimizes water loss and reduces the topping up frequencies.
- Negative lead – calcium plates are pasted, made from Automatic Grid Casting Machine.
- Optimum porosity envelope separators with low electrical resistance.
- Robust and aesthetically superior PPCP (Polypropylene Co polymer) container & lid.
- Heavy duty bold terminals.
  - High purity diluted H<sub>2</sub>SO<sub>4</sub> s.g 1.24 at 25°C at fully charged condition.
  - Special electrolyte level indicator.

### APPLICATIONS

- Solar and Wind power On/Off Grid systems
- Renewable Energy / Grid Support Storage
- Electric / Nuclear Power Stations and sub-stations
- Railway / Marine / Airport signaling
- Telecommunication / UPS / Remote Power Networks
- Emergency lighting / Automation

### DESIGN ADVANTAGES

- Excellent Cycle Life (3.000 cycles @ 50% D.O.D, 5.500 cycles @ 30% D.O.D).
- Ideally suited for operation in PSOC conditions.
- Special alloy in grids and pastes results very low water loss i.e. ultra low topping up frequency.
- Special non woven gauntlet for positive plates imports extra life of battery.

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- Wrap around separators – Provide additional protection against internal battery short circuits.
- Large 'top-of-plate' electrolyte reservoir.
- Better safety performance and reliability.
- Wide operation temperature range.
- Excellent deep discharge recovery.
- Advanced low current discharge performance.
- Cells up to 800AH are housed in Steel Powder Coated racks (8/6/4V) so that compact modules can be installed directly (stands not required).
- Easy to Handle & Transport - Modular assembly & installation design.
- Inter-cell Connectors option of insulated solid copper or copper cable.
- Capacities from 450 to 1500 AH.
- Higher ampere-hour and watt-hour efficiencies.
- Batteries are supplied in factory charged condition and thus ready to be Installed and used.
- 100% recyclable.
- Superior value/price ratio.

### RANGE SUMMARY

UNIBAT SOLAR ExC-T 2V CELLS SPECIFICATION TABLE											
TYPES	ELECTRICAL DATA - CAPACITIES (AH@25 °C)						PHYSICAL DATA				
	C10	C20	C48	C72	C100	C120	DIMENSIONS (mm)			WEIGHT	Number of poles
	F.V=1,80V		F.V=1,85V				L	W	H	(kg)	
<b>SOLAR ExC-T 450</b>	322	378	398	391	440	451	125	158	543	21,00	2
<b>SOLAR ExC-T 600</b>	429	504	531	522	587	603	125	158	699	29,00	2
<b>SOLAR ExC-T 750</b>	536	630	664	652	733	751	173	158	699	38,00	2
<b>SOLAR ExC-T 900</b>	643	756	797	783	880	904	173	158	699	41,00	2
<b>SOLAR ExC-T 1050</b>	750	882	930	913	1027	1051	205	158	753	51,00	4
<b>SOLAR ExC-T 1200</b>	858	1008	1062	1043	1173	1202	205	158	753	53,00	4
<b>SOLAR ExC-T 1350</b>	965	1134	1195	1174	1320	1353	416	171	535	67,00	4
<b>SOLAR ExC-T 1500</b>	1072	1260	1328	1304	1467	1501	416	171	535	72,00	4

UNIBAT SOLAR ExC-T MODULES SPECIFICATION TABLE									
TYPES	ELECTRICAL DATA @25 °C			PHYSICAL DATA					
	NOMINAL VOLTAGE	C10	C120	DIMENSIONS (mm)			WEIGHT	CELLS per MODULE	
		F.V=1,80V	F.V=1,85V	L	W	H	(kg)		
<b>SOLAR ExC-T 450 - 8V</b>	8 V	322 AH	451 AH	700	157	554	95,00	4	
<b>SOLAR ExC-T 600 - 6V</b>	6 V	429 AH	603 AH	552	157	705	106,00	3	
<b>SOLAR ExC-T 750 - 6V</b>	6 V	536 AH	751 AH	552	205	705	125,00	3	
<b>SOLAR ExC-T 900 - 6V</b>	6 V	643 AH	904 AH	552	205	705	134,00	3	
<b>SOLAR ExC-T 1050 - 4V</b>	4 V	750 AH	1051 AH	387	237	755	121,00	2	
<b>SOLAR ExC-T 1200 - 4V</b>	4 V	858 AH	1202 AH	387	237	755	125,00	2	

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### CHARGING INSTRUCTIONS

#### • COMMISSIONING CHARGE

Before commissioning a new battery, please apply following IU charge procedure :

Bulk charging is performed at a raised voltage of 2.40 to 2.45 Volts per cell. The charging time will be 12 to 24 hours depending on the state of charge condition during installation. The current is required to be limited to 20% of the battery Ah capacity (0.2 C10). The s.g of each cells rise to the maximum level (1.240 to 1.245) and remains constant till four consecutive hourly readings. Bulk charging must be switched off or switched over to float charging as soon as the fully charged state is reached.

#### • RECHARGE DURING OPERATION

PARAMETERS	Recommended Parameters for ambient temperature of 25-30 °C
Charging Current	Minimum : 10% - Maximum : 20% of the battery Ah capacity
Bulk Voltage	2.60 ± 0.02 V/cell
Float Voltage	2.30 ± 0.02 V/cell
Equalizing Voltage	2.45 ± 0.02 V/cell
Load Reconnect Voltage	2.16 ± 0.02 V/cell
Low Voltage disconnect	1.90 ± 0.02 V/cell
Recharge factor	110% of discharged Ah
Temperature Correction Factor (ref. 25°C)	<b>Float</b> : - 3mV/°C/2V unit, <b>Cyclic</b> : - 5mV/°C/2V unit

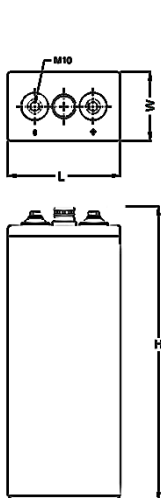
#### • REVIVAL CHARGE

Sometimes, due to variable solar irradiation or various operational electrical loses low specific gravity is observed in battery banks. It is very important to maintain a good state of charge condition of battery bank to prevent premature failure. The s.g of the fully charged cell is at a range of 1.240 to 1.245, but due to insufficient recharging the s.g reduces progressively and if any point of time it is found at 1.180 or even lower, the battery bank must be recharged immediately either through solar panel or by a dedicated Diesel Generator or Mains. The following setting in the charger is recommended to perform during revival of the battery bank:

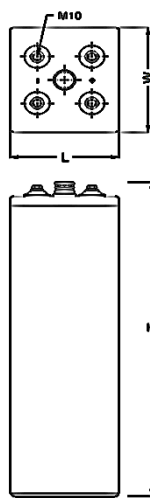
<b>Bulk Voltage</b>	2.70 ± 0.02 V/cell
<b>Charging Duration</b>	10 to 12 hours or till specific gravity of 1.240 to 1.245 are achieved & remains constant for all cells for four hours. The charging duration will solely depend on the battery bank S.O.C condition.

The specific gravity requires to be checked once in a month and the above recommended revival charge procedure must be planned according to the state of health of the battery bank.

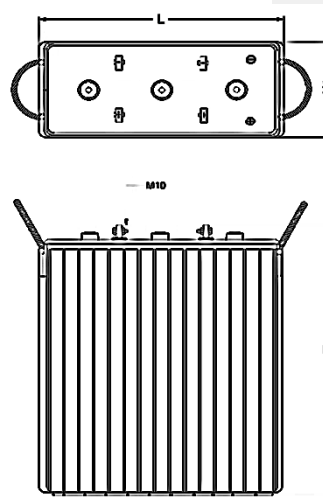
### DIMENSIONS – LAYOUTS



ExC-T 450 to 900



ExC-T 1050 & 1200

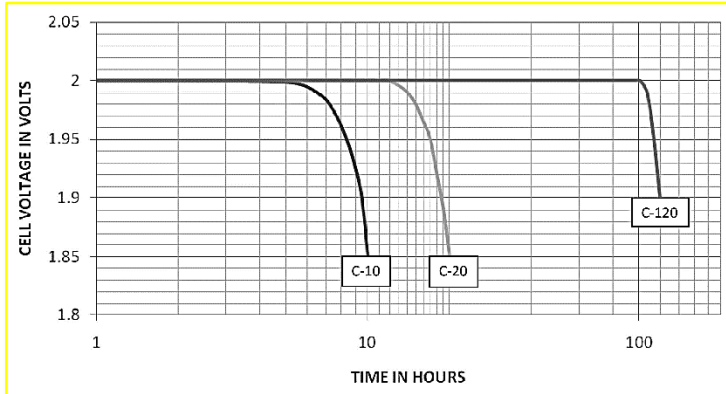


ExC-T 1350 & 1500

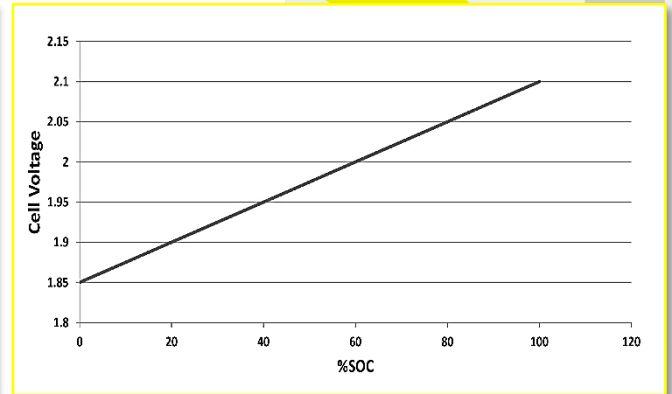
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### PERFORMANCE CURVES

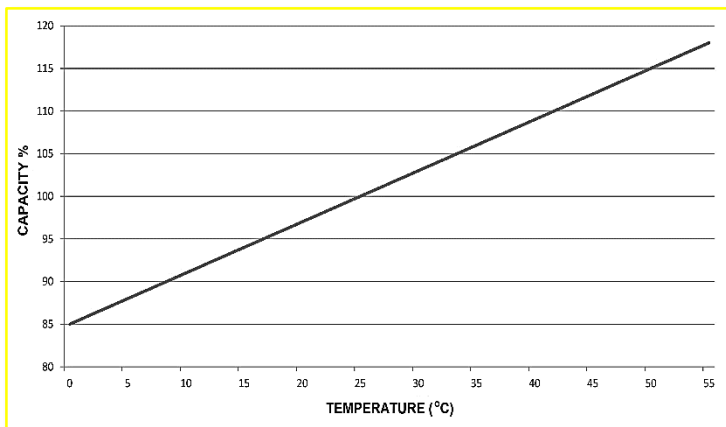
**DISCHARGE CHARACTERISTIC**



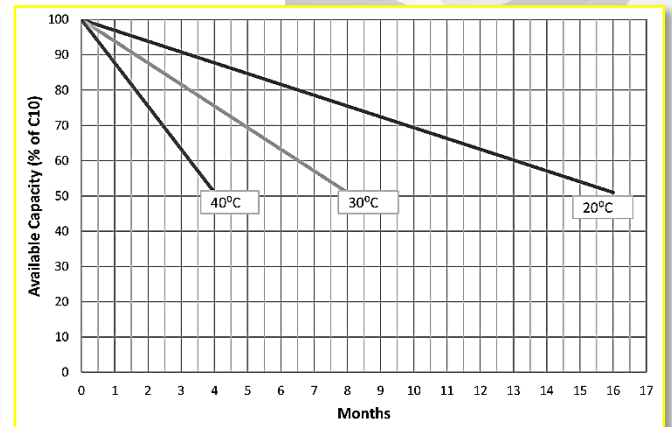
**OPEN CIRCUIT VOLTAGE vs % S.O.C**



**CAPACITY vs TEMPERATURE**



**SELF DISCHARGE CHARACTERISTICS**



**CYCLE LIFE vs DEPTH OF DISCHARGE**

