

SOLAR OPzS

Deep Cycle OPzS Series



GENERAL INFORMATION



UNIBAT Solar OPzS are vented - low maintenance 2V cells, designed to meet the needs of the most demanding customers in Renewable Energy systems. It is optimized for repeated deep cycling, maximum cycle life (up to 3350 cycles @ 50% D.O.D) with reduced or no maintenance and highest reliability.

They comply to DIN 60736, IEC 61427 and IEC 60896-11, DIN 40740, DIN 43530, safety & low ventilation requirements according to EN 50272-2 and DIN 62485-2 standards. Solar OPzS offers stronger constant power discharge capability with better charge reception.

Tubular positive plates are widely used for particularly demanding and heavy duty cycling applications. This rugged construction has been incorporated within manufacturing process, to compliment extended cycle life and elevated capacity. Top-quality DIN manufacturing pure raw materials, offer superior results and reliability thanks to their robust construction based on tubular 100 bar pressure technology.

Positive plates: The positive electrode is tubular type plate. Optimum low antimony alloy grids are die-casted and inserted into special gauntlet tubes made of polyester fibers. The corrosion resistance is excellent and the service life is extended.

Negative plates: The negative electrode is a pasted lead grid plate. The lead oxide, serves both as a carrier of the active material and as an electrical conductor. The formation process converts the paste into pure lead.

Electrolyte: High purity diluted sulfuric acid s.g 1.240 at 25 °C at fully charged condition.

Battery casing: High impact resistant SAN transparent case, prevents also the internal

structure from corrosion, has high strength and visible electrolyte contact, which allows the state of battery to be directly observed.

Separator: The combined separator from multi-hole corrugated plastic plate and microporous silica, provides bigger electrolyte storage space, enhances dispersion speed of electrolyte, while it greatly reduces internal resistance of battery and prevents dendrite short circuit after deep discharge.

Terminals: The built-in copper-core lead-based terminal post has strong current carrying capacity and corrosion resistance. The unique terminal post sealing structure can effectively eliminate the stress which is generated due to plate extension, leakage is avoided, sealing reliability of terminal post is ensured and service life of battery is greatly increased. Brass inserts with M10 stainless steel bolts are combined with colored washers for easy polarity recognition.

Vent plugs: Anti-explosion porous ceramic plugs that filter out any drops of electrolyte from the escaping gases are optionally supplied.

Connectors: Fully insulated flexible cable connectors bolt on to the terminal with easy access for electrical measurement of the cell. In addition they are easily connected to build 6, 12, 24 or 48V battery banks.

UNIBAT Solar OPzS includes a full range of deep cycling, low maintenance batteries, designed for long life installations with high reliability that require daily cycling 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.

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

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APPLICATIONS

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

DESIGN FEATURES & BENEFITS

- DIN Tubular positive plates made from High pressure die-cast spines encased in select resilient multitube gauntlet for high cycle applications.
- Innovative bottom bar with space that allows some downward growth of the spines.
- Negative plates flat pasted grids.
- Cell container - Transparent SAN for easy inspection / Cell lid - Opaque SAN.
- Microporous silica separators.
- Poles of unique design that effectively prevents acid leakage and pillar corrosion over the cell's lifetime. Female brass insert pole for bolt-on connection. Plastic encapsulation over lead post.
- Vent plug selection of Normal / Ceramic / Catalyst
- Electrolyte full charge specific gravity 1.240 +/-0.010 at 20°C
- Inter-cell Connectors option of insulated solid copper or copper cable.
- Designed service life of 20 years @ 25°C
- Better safety performance and reliability
- Low Maintenance and Extended Watering Intervals
- High cycle service life (3350+ cycles @ 50% D.O.D)
- Wide operation temperature range
- Excellent deep discharge recovery
- Advanced low current discharge performance
- Modular assembly & installation design
- Partial State of Charge operation stability
- Capacities from 295 to 4650 AH
- Superior value/price ratio

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RANGE SUMMARY

UNIBAT SOLAR OPzS SPECIFICATION TABLE											
TYPES	ELECTRICAL DATA - CAPACITIES (AH@25 °C)						PHYSICAL DATA				
	C10	C20	C48	C100	C120	C240	DIMENSIONS (mm)			WEIGHT	Number of poles
	F.V=1,80V	F.V=1,80V	F.V=1,85V	F.V=1,85V	F.V=1,85V	F.V=1,85V	L	W	H	(kg)	
SOLAR OPzS 295	216	259	279	293	296	308	103	206	430	19,10	2
SOLAR OPzS 380	262	314	340	377	381	396	124	206	430	22,20	2
SOLAR OPzS 460	315	378	408	457	461	480	145	206	430	26,40	2
SOLAR OPzS 540	378	454	490	537	542	564	124	206	546	30,20	2
SOLAR OPzS 650	462	554	584	647	653	679	145	206	546	36,00	2
SOLAR OPzS 750	531	637	674	743	751	781	166	206	546	41,00	2
SOLAR OPzS 800	558	670	708	792	800	832	145	206	721	45,90	2
SOLAR OPzS 930	660	792	838	924	933	970	145	206	721	49,20	2
SOLAR OPzS 1100	780	936	989	1092	1103	1147	210	191	721	61,40	4
SOLAR OPzS 1265	877	1052	1112	1254	1267	1317	210	191	721	65,50	4
SOLAR OPzS 1400	990	1188	1256	1386	1400	1455	210	233	721	77,00	4
SOLAR OPzS 1550	1098	1318	1393	1537	1553	1614	210	233	721	80,00	4
SOLAR OPzS 1860	1315	1578	1645	1841	1859	1933	210	275	721	93,30	4
SOLAR OPzS 2250	1620	1944	2032	2229	2251	2341	210	275	871	118,00	4
SOLAR OPzS 3000	2171	2605	2717	2974	3004	3123	214	399	847	160,40	6
SOLAR OPzS 4000	2830	3396	3547	3962	4002	4160	212	487	847	205,00	8
SOLAR OPzS 4650	3290	3948	4117	4606	4652	4836	212	576	847	241,80	8

CHARGING INSTRUCTIONS

Charging procedure shall be compliant to IU or IUla characteristic.

Standard charge procedures:

IU - characteristic:

Used for regular recharge after every battery discharge. The charging procedure shall comply to IU-characteristic with 2.4 V/cell.

Note: Up to 2.4 V/Cell the charging current is theoretically not limited. However the recommended charging current is 5A to 20A/100 Ah nominal battery capacity (C10).

IUla – characteristic:

Charge with IU-characteristic as described above. Keep the charging current at 5A/100Ah nominal battery capacity (C10) as soon as the current has dropped to this value during constant U-phase. During Ia phase the charging voltage ranges between 2.6 to 2.75 V/Cell. Ia phase should last either 2 or 4 hours.

If the battery is fully charged the charging voltage needs to be adjusted to normal float charge voltage for standby batteries (2.23V/cell at temperature between 10°C and 30°C).

Equalizing Charge:

Equalizing charges are required after (deep) discharges with depth of discharge (DoD) of $\geq 80\%$ and/or inadequate charges. They have to be executed as follows:

- Max. 2.4 V/Cell up to 72 hours. Note: Up to 2.4 V/C the charging current is theoretically not limited. However a restriction of max. charging current to 20A/100 Ah nominal battery capacity (C10) is reasonable. In case of charging

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voltages above 2.4V/C the charging current needs to be restricted to 5A/100 Ah battery capacity (C_{10}). Resulting voltage range is 2.6 to 2.75 V/C.

- The cell/bloc temperature must never exceed 55° C. If it does, stop charging or revert to float charge in order to allow temperature to fall. Avoid operating temperatures in excess of 45°C for long periods of time.
- The end of equalization charge is reached when the cell voltages and electrolyte densities do not increase during a period of 2 hours.

Temperature dependent voltage adjustment as shown in table below:

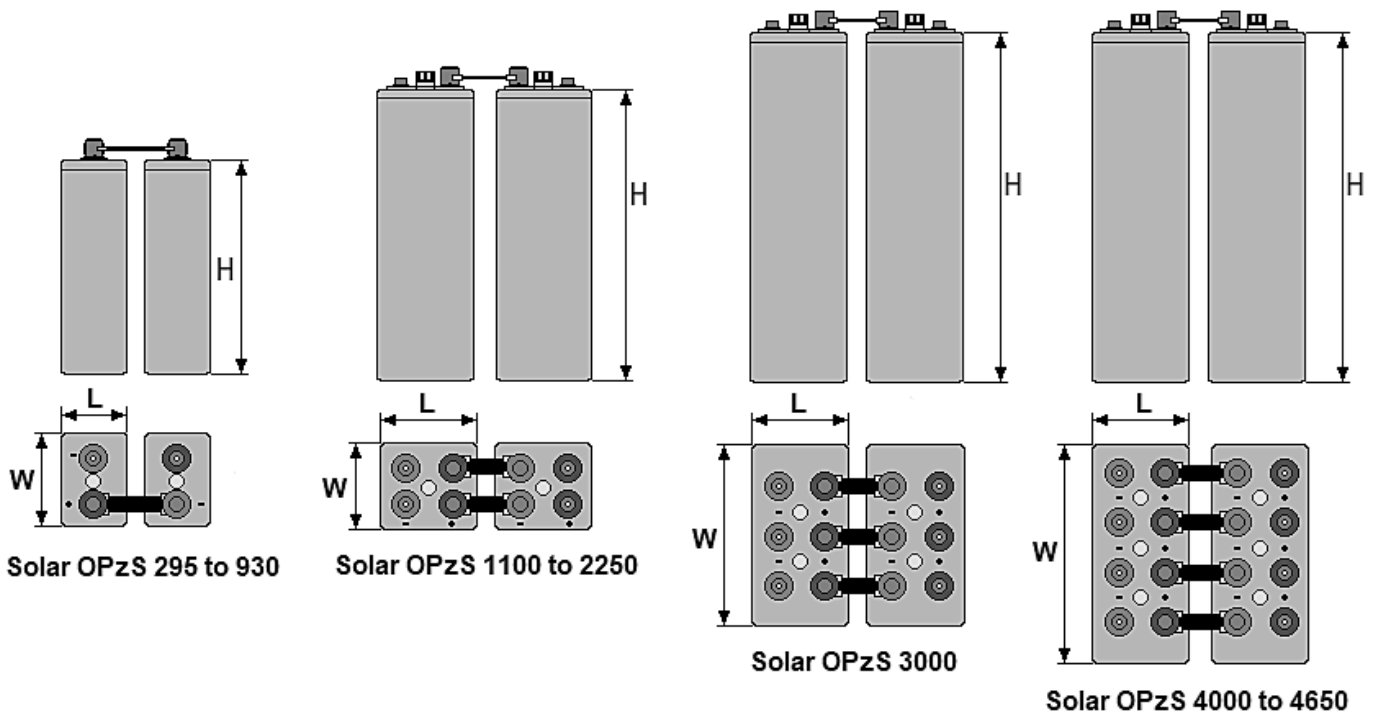
Operating temperature	Voltage adjustment per cell
< 10°C	+0.004 V/K (Voltage needs to be increased)
Between 10°C to 30°C	No Adjustment
Between 30°C to 40°C	-0.004 V/K (Voltage needs to be decreased)
> 40°C	-0.003 V/K (Voltage needs to be decreased)

UNIBAT recommends for cyclic applications, battery recharging according to the following guideline:

After every 10 cycles or 10 days (whatever occurs first), recharge battery with IU1a characteristic. Ia phase with $I = 5A/100Ah$ nominal battery capacity (C_{10}) for two hours.

After every 20 cycles or 20 days (whatever occurs first), recharge battery with IU1a characteristic. Ia phase with $I = 5A/100Ah$ nominal battery capacity (C_{10}) for four hours.

DIMENSIONS – LAYOUTS

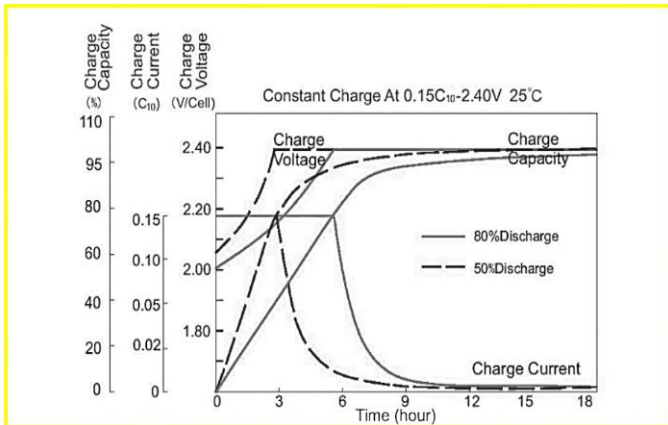


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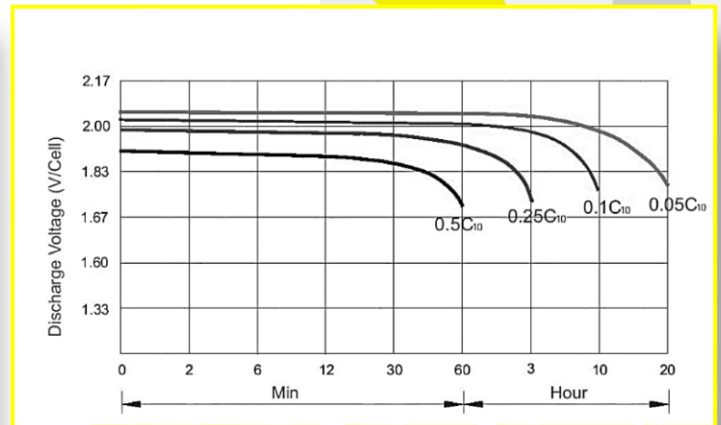
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PERFORMANCE CURVES

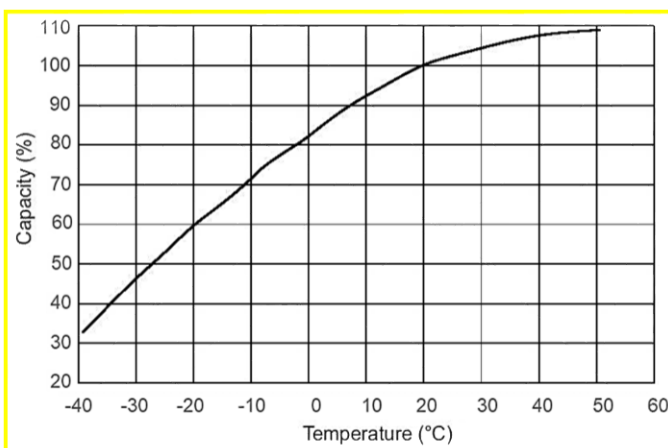
CHARGE CHARACTERISTIC - FLOAT



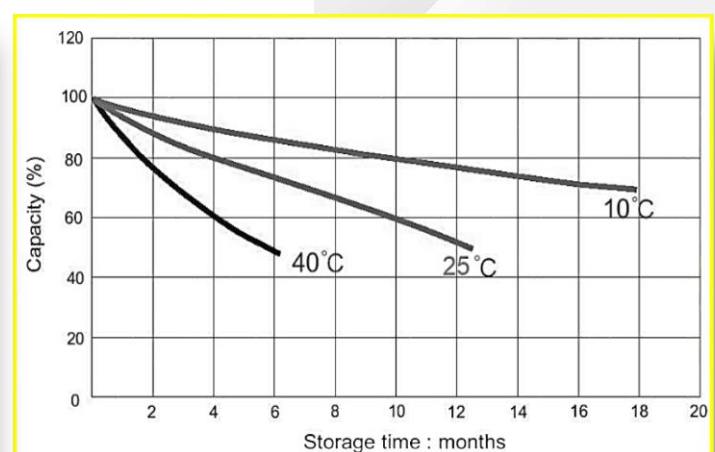
DISCHARGE CHARACTERISTIC



CAPACITY vs TEMPERATURE



SELF DISCHARGE CHARACTERISTICS



CYCLE LIFE vs DEPTH OF DISCHARGE

