

POWER FOR TOMORROW TODAY

The Eternity Technologies range is built using only the highest quality and most efficient production processes at our state-of-the-art manufacturing centre in the UAE.

It is this innovation, modern design criteria and industry-leading machinery that allows Eternity Technologies to not only meet the needs of the global industrial market with increased reliability but define it for the future.



Service



Accessories



Bloc Batteries



Chargers



Network Power



Motive Power



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Installation, Operation and Maintenance

OPzS Standby & Solar Batteries

Eternity Technologies OPzS Standby & Solar Batteries are designed to be used as back-up power to support users that need reliable service continuity in case of power blackouts and outages of the electricity distribution network. They can also be used in off grid and hybrid installations. Lead-acid Standby & Solar Batteries are components of a system and although they are low maintenance, they require suitable precautions and behavioural norms to guarantee safe working conditions and to ensure maximum performance of the battery during its entire life. The scope of this document is to supply the necessary instructions for the correct care, handling, installation, use and maintenance of Eternity Technologies OPzS Standby & Solar Batteries.



Safety Instructions

Carefully read this manual in all its parts upon receipt of Eternity Technologies OPzS Standby & Solar Batteries.

The non compliance with the instructions given herein may cause injury to personnel and damage to equipment as well as bad operation and performance of the battery

Store this manual in close proximity to the batteries at all times and ensure it is accessible to the relevant personnel.



No naked flames



Corrosive



Wear safety goggles



Read instructions



**First aid /
medical assistance**



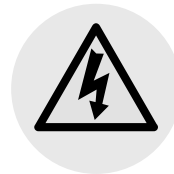
Keep away from children



Explosive



Caution



Electric shock risk

Observe the following precautions at all times

Observe the operating instructions - work on the battery should be carried out by qualified personnel only.

Exposed metal parts of the battery always carry a voltage and are electrically live with the risk of short circuits.

Avoid any electrostatic charge; before starting work on the battery, first discharge any possible electricity from yourself by touching an earth-connected part; repeat this action occasionally until the work is complete.

Use protective equipment, such as protective clothing, rubber gloves and goggles.

Use insulated tools.

DO NOT place or drop metal objects on top of the battery.

DO NOT wear rings or bracelets. Remove any articles of clothing with metal parts that might come into contact with the battery terminals.

DO NOT smoke and DO NOT use open flames or create electric sparks.

Take all precaution when using the main supply.

Make sure that the first aid kits and fire extinguishers are easily accessible.

Used batteries contain recyclable materials. They must not be disposed with household waste but as a special waste. Methods of return and recycling must conform to the regulations in operation at the site where battery is located. If in doubt please contact Eternity Technologies



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1. Delivery, Unpacking and Storage

Unpack the batteries as soon as they are delivered.
Verify that the equipment has been delivered in good condition.
Any damage must be reported immediately to the carrier and the damaged items retained for inspection by the carrier's representative.

The details on the label should be read carefully and the following points to be observed:

Cell Type
Cell Voltage
Capacity
Float charge voltage
Operating Temperature

If the battery cannot be immediately installed, store it in a dry, cool and clean place.

Do not expose the battery to direct sunlight, to avoid any damage to containers and lids.

IMPORTANT NOTE Storage time for charged cells is limited.

Eternity Technologies recommends the following storage times:

3 months @ 20°C
2 months @ 30°C
1 month @ 40°C

A refreshing charge should take place after the relevant period of time above (see section 3. Commissioning).

Failure to observe the above conditions may result in a greatly reduced capacity and service life or in permanent damage to the cells.

2. Installation

Please refer to the latest edition of the battery room standards, effective at the moment of the installation of the battery.
NORM REF: EN 50272-2 & IEC 62485-2

Check that local regulations are also being complied with.

WARNING

The cells are already charged when delivered and should be unpacked with care. Avoid short circuiting terminals of opposite polarity.

Before installing the cells, clean all parts. Remove the short circuit ABS protectors from the terminal posts and clean them with a soft clean cloth.

Before replacing old batteries ensure all electrical loads are switched off.

Battery Room - Points to Consider

Ensure the floor is structurally capable of carrying the battery load.
The floor should be resistant to Electrolyte (diluted sulphuric acid).
There should be no ignitable sources near to the cells.

Ensure there are no unauthorised access points to the battery room.
All rooms should have the correct fire fighting equipment fitted in case of emergency.

Place the cells on the rack (or cabinet) and make sure that the spacing allows the accommodation of the inter-cell connectors (around 10mm). Most batteries have cells connected in a simple series arrangement, so the cells should be arranged to preserve the sequence: positive (+), negative (-), positive (+), negative (-) throughout the whole battery.

WARNING

Never lift cells by the terminal posts. Always use appropriated devices (such as lifting straps and suitable mechanical lifting devices) to prevent injury to personal or damage to the cells.

For batteries to be installed on multiple tiers, start by placing the cells on the lower tier on either side of the frame where the stand sections meet. Any unused stand spaces should be on the upper tier.

For batteries on stepped racks, leave any unused space on the back (top) step.

Where multiple racks are arranged end-to-end, adjust the position of the adjacent end cells to accommodate the flexible inter-rack connectors.

Take particular care to preserve the positive to negative sequence when using flexible inter-tier, inter-step or inter-rack connectors between rows of cells. Leave the main positive and negative terminals of the battery free for connection to the charging source.

Check cell alignment.

Prepare the inter-cell connectors by cleaning the contact surfaces with a soft clean cloth.

Fit the inter-cell and inter-tier connectors using approved, insulated bolts and nuts. Ensure all bolts, connectors and cell terminals are free from dust or debris before connecting.

Use insulated wrenches to tighten the parts firmly together, with torque setting of 23 Nm (203 in lbs).
Pay special attention to avoid short-circuiting the cells with any of the battery hardware.

Check tightness and cleanliness.

When all cells have been connected up check the terminal voltage, this should equal to the sum of all the individual cell voltages. If the total voltage is different to the calculated figure, some cells may have been installed correctly.

Connect the positive terminal of the battery to the positive terminal of the charger and the battery negative to the charger negative.

Number the cells by using a set of numbering stickers. It is common practice to number the cells beginning with #1 at the positive end of the battery and following the sequence of electrical connection of the cells, through to the negative end of the battery.

3. Commissioning

Batteries lose charge while in transit or during storage. For this reason, a refresh charge should be given before putting the battery into service.

Recommended charge settings – at the ambient temperature range of 20°C to 25°C – are as follows:

IU Boost Charge

Charging time with voltage limits of 2.33 – 2.40V/cell should be between 12 – 36 hrs. Max current 4xI10. Charging should be paused if the temperature exceeds 55°C.

I Boost Charge

Constant current charging must have a limit of 5A/100Ah with a final charging voltage of 2.50 – 2.75V/Cell.

The charging time should be between 6 to 24hrs and should not exceed 55°C. Charging should be paused if this temperature is reached.

Float Charge

See section 4.1 for float charge details. The cell is fully charged when the voltages and specific gravity do not increase, and the charging current does not decrease further for a period of 2 hrs.

4. Charging in Service

Once commissioned, Eternity OPzS Standby & Solar Batteries should be charged as follows:

4.1 Float Charge

To maintain the battery in fully charged condition during normal battery operation or, after a discharge, to recover 90% of nominal capacity within 20 hours, a recommended float charge has to be applied.

Recommended float voltage settings are as follows:

Constant voltage 2.23 V/cell at 20°C (68°F) ±1%

The voltage must be adjusted if the temperature range is outside 10-30°C. If the temperature is greater than 30°C then the float charge voltage should be reduced by 0.003V/cell per K. If the temperature is less than 10°C the charging voltage should be increased by 0.003V/cell per K.

With the method described above, the effecting charging current is limited to very low values; such current increases as a function of temperature and age of the battery.

4.2 Equalizing / Boost Charge 2.33 – 2.4V

The equalizing charge is generally required:

When the total voltage spread between the cells is greater than 0.04V under float charging conditions;

After exhaustive discharges;

For fast recharging after a discharge;

When charging cells in standby applications with frequent power outages;

For float charge using voltages below 2.23 Vpc

Boost charge at a constant voltage between 2.33 – 2.4V per cell is permitted for a maximum duration of 72 hours. The equalisation charge finishes when the cell voltages remain constant for a period of at least 2 hrs

If the temperature reaches 55°C during the equalisation/boost charge cycle the charging process must be interrupted, or a temporary switch made back to float charging, to allow the temperature to drop.

4.3 Limits of charging current

Charging Process	Recommended charge current per 100 Ah	Cell Voltage	Temperature Limits
IU-Method	5A to 40A	2.33V/c to 2.40V/c	+55°C to -20°C
I-Method Above 2.40V/c	2.5A to 5A	2.50V/c to 2.75V/c	+55°C to -20°C

4.4 AC Ripple Current

The AC ripple current must not exceed 5A per 100 Ah C10. If this figure is exceeded the life of the cell will be greatly reduced.

5. Discharge Low Voltage Disconnect

Discharging too much capacity from the battery will lead to early failure so the user must ensure that measures are in place to prevent this. The recommended low voltage disconnect settings are mentioned below:

Back up time (h)	U(V) per cell
3 min – 59 min	1,60
1 hr – 5 hr	1,70
5 hr - 8 hr	1,75
8 hr – 24 hr	1,80

6. Operating Temperature

The battery is designed to perform optimally at temperatures between 15-30°C. At lower temperatures the battery capacity is lower and at elevated temperatures the life is reduced. Short periods outside of these temperatures will not have a detrimental effect on the battery.

7. Electrolyte

Eternity Technologies OPzS cells have a diluted sulphuric acid electrolyte solution. The nominal specific gravity of these cells is 1.240 Kg/l at 20°C. The electrolyte levels must be within the limits shown on the side of the container. If the levels are low they must be topped up with demineralised water. The SG readings of the

electrolyte will vary depending on the temperature. The SG correction factor is -0.0007 per °C.

For example - an SG reading of 1.230kg/l at +35°C corresponds to an SG of 1.240kg/l at 20°C.

An equalisation charge can be performed after topping up to assist with the homogenisation of the electrolyte.

8. Battery Maintenance

Eternity Technologies OPzS are flooded cells that require periodic maintenance.

The containers and lids must be kept dry and free from dust.

Cleaning must be done only with a damp cotton cloth.

Avoid static discharges generated during cleaning.

Electrolyte levels must be kept between the MIN and MAX levels at all times.

Every 6 months

Check for evidence of damage on the battery and equipment.
Check and record the total battery float voltage, the voltage on pilot cells* the SG and temperature.

Once a year

Check and record individual SG's and cell voltages.
Perform a discharge test according to IEC 60896-11 standard until the battery shows signs of degradation and then every six months thereafter.

Keep a log book to record all maintenance and inspection operations, which will be helpful to monitor long-term changes of the battery condition.

*Pilot Cell

For regular monitoring of the battery condition, select one cell near the middle of the battery string as a "pilot" cell (for battery consisting of more than 60 cells, it is advisable to select one pilot cell out of 60).

Additional Information

For any further information on Eternity Technologies OPzV VRLA Standby & Solar Batteries, please contact:

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