BCI Standard Batteries

Installation, Operation and Maintenance

Safety Instructions

Carefully read this manual in all its parts upon receipt of Eternity Technologies BCI Standard Batteries.

Lead-acid BCI Standard Batteries are components of a system and 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 Installation, Operation and Maintenance instruction manual supplies the necessary instructions for the correct care, handling, installation, use and maintenance of Eternity Technologies BCI Standard Batteries.

The non compliance with the instructions given herein may cause injury to personnel and damage to equipment as well as poor operation and performance of the battery. Any repairs made without authorisation may render the warranty void.

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

Wear protective clothing

Wear protective gloves

Battery charging

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 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 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.

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.

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.

During the storage time, the open circuit voltage (OCV) must periodically be checked.

Cells must be refreshed at least every 3 months or when the OCV drops below 2.09V. See the table below for a guide of how long the refresh charge will take based on the OCV reading.

OCV, Volts	Min Time in hrs (@ 6% of C5 current)
2.09	4.7
2.08	6.0
2.07	7.3
2.06	8.7
2.05	10.0
2.04	11.3
2.03	12.7
2.02	14.0
2.01	15.3
2.00	16.7

2. Installation & Handling

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 protectors from the terminal posts and discard.

When lifting the cells off the pallet ensure that the cells are adequately secured on all four side to prevent cells from falling over.

Motive power batteries are heavy, so adequate mechanical handling systems should be used. Cells that are lifted using mechanical equipment should be lifted with both terminals. Ensure that the lifting equipment does not short out the battery terminals.

After putting the cells into the tray check that the electrolyte levels are consistent and are covering the separator. If the level is low, top the cells up using distilled or deionized water only.

Anti corrosive terminal grease is applied to the terminals to prevent corrosion of the brass insert in the terminal. It is recommended to apply more anti corrosive grease to the terminals if required before fitting the connectors and bolts. Ensure that the cell polarities are lined up correctly before connecting the cells. Connecting the same polarity terminals will cause a short.

Bolts must be tightened to a torque of 23Nm +/- 2Nm. The connectors should be well anchored and sufficiently long to prevent pulling on the battery terminals. The cells must be accessible to facilitate testing and topping up.

Before fitting the battery to the vehicle make sure the top of the battery is clean and dry.

Batteries must be kept upright when lifting. Provided in the battery tray (container) are holes into which lifting hooks should be located. Ensure that the battery is located in its correct position on the vehicle and secure any restraining devices.

3. Charging

Recharge the batteries daily, except where only lightly discharged – specific gravity above 1.220 and OCV above 2.06V. Never leave the battery in a discharged state. Regularly check the condition of the charging plug and socket and keep contact surfaces clean.

Methods of charging:

Taper charging or constant current followed by taper charger: it is important that the output of the charger is matched to the capacity of the battery. See charger manufacturers recommendations.

Equalising Charges:

An equalizing charge consists of a regular charge extended until the voltage and specific gravities of all the cells have remained constant over three successive hourly readings.

Supplementary / Opportunity Charging:

When the battery has been performing an unusually heavy duty and some supplementary charging is required in the middle of the day, this can be given by connecting the battery to the normal charging source for the time available.

This supplementary charging, also referred to as 'Opportunity Charging' is most beneficial when used in conjunction with a modern self compensating charger. The ampere-hours put back into the battery during such a charge are determined by the relative state of discharge of the battery. There is little benefit in trying to charge the battery when it is 75% charged or above, whereas a battery that is 50% charged will have in the region of 13% of ampere-hour capacity restored in an hour of charge using an 8 hour charger. A 12 hour charger will in the same circumstances restore 9%. Too many opportunity charges may cause unnecessarily high temperatures and cause premature failure of the battery.

4. Operation

a) General

It is recommended that the battery is not discharged beyong 80% of nominal capacity. Deeper discharging nullifies the warranty. When the battery has been discharged it should be recharged as soon as possible on the appropriate charger. Open the battery compartment to get additional ventilation during the charge. Leave the vent plugs firmly in position. The maximum recommended temperature is 43°C (110°F)

b) Fully charged specific gravity

Eternity Technologies fully charged cell gravity should be 1.295@ 30°C *

c) How to ascertain the state of discharged cells:

The change of the specific gravity of the acid is directly proportional to the ampere hours taken out of the cell on discharge. Where extreme accuracy is required, readings should be taken after a stabilization period of several hours with the battery on open circuit. A discharged battery operated in accordance with our recommendations will have a specific gravity of 1.130* minimum**.

d) Using a hydrometer

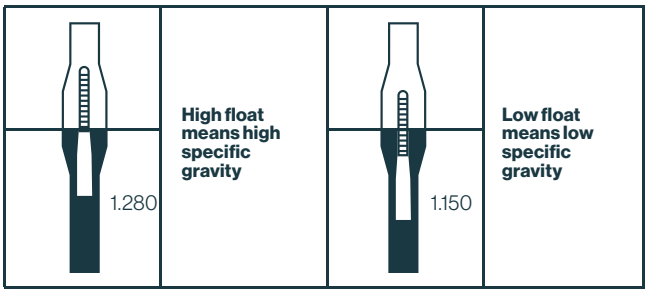
A quantity of acid is drawn out from the cell into the barrel until the hydrometer float moves freely. The specific gravity is then read at the point where the scale emerges from the acid.

Acid density or specific gravity varies with temperature, being lower at high temperature and higher at low temperature; thus the hydrometer readings must be temperature compensated. For every 1°C of the cell acid temperature above 30°C add 0.0007 to the hydrometer reading. For every 1°C below 30°C subtract 0.0007 from the hydrometer reading.

Example: Temperature 40°C, hydrometer reading 1.240, the true corrected specific gravity is 1.240 + 0.007 = 1.247.

*All specifc gravities mentioned relate to a temperature of 30°C

**is a stabilized specific gravity. Actual observed gravities at the end of discharge will read 0.015 – 0.020 higher.



5. Maintenance

Battery in Service

Add nothing to the cells but distilled, deionized or approved water and do this often enough to keep the visible components covered (electrolyte visible) If using an automatic filling system ensure the correct float is installed as the wrong size float can lead to improper filling.

Never add acid except to compensate for spilling.

To prevent electrical leakage between the cells keep the top of the battery trays and containers dry and clean. Should there be any corrosion of the metal work remove the corroded parts and neutralize any remaining acid with a solution of water and sodium bicarbonate or with dilute ammonia. Cover with acid proof paint or petroleum jelly to protect from further corrosion.

Lifting facilities on battery trays should be examined periodically for corrosion or other deterioration. Do not lift damaged trays as there is a danger of collapse. If the battery is in two units, these should be kept together when charging.

If excessive corrosion or other deterioration becomes evident in any part of the battery it should be reported to Eternity Technologies.

Check bolted connections on the battery for tightness and ensure that they are clean.

Inspect battery cable insulation and battery charging connectors for wear and damage to insulation and burning of contacts. Refurbish or replace as necessary.

Keep all terminal connections smeared with an approved anti-corrosive grease.

Keep vent plugs closed and connections tight. Remove or open vent plugs only when topping up and taking specific gravity readings.

Battery out of Service

If a battery is to be taken out of service for a time, or if a new charged battery cannot be put into service immediately, it should be given a charge and stored in a cool dry place.

Disconnect detachable connectors.

Every month, check the acid levels and give the battery a charge.

If a vehicle is used at irregular intervals the battery should be given a charge every month and the battery disconnected from the vehicle during it's idle periods. Before putting back into service, charge the battery and check the levels.

6. Disposal of old batteries

Careless disposal of a battery can harm the environment and can be dangerous to the public. Always dispose of spent batteries to an authorised, licensed dealer. Do not attempt to open or dismantle a battery or cell.

Additional information

For any further information on Eternity BS & DIN Standard batteries, please contact:

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