MAINTENANCE

The maintenance of a battery is reduced to these simple operations:

Top up the elements with distilled water, when the electrolyte is no longer visible from the lid. The frequency of toppings depends on many causes: the amount of work and charge to which is subject, the temperature, the state of the opening caps, etc.
Refilling shall be stopped when the liquid reaches a level approximately 40mm for elements type PzS and 25 mm for elements type PzB, from the upper deck of the cover nozzle.
At the end of the topping up operation all the elements should have the electrolyte at the same level.
Measure occasionally the electrolyte density, and possibly the tension of each element. Also check the charger, so that the regularity of the charge is assured.

- Do not neglect cleaning to prevent leakage, corrosion, etc.: the lids, the connections, the edges of the receptacles and of the box must be kept clean and dry, using a brush wet in distilled water and rags.

- Do not grease the connections, but only the ends with pure vaseline or neutral fats. In case of formation of oxide on the sockets or on the edges of the cases, this must be dissolved or eliminated with distilled water.

GENERAL DESCRIPTON

The battery is a set of single elements, which thanks to the different behaviour in a suitable environment create a flow of electrons and multiplication of this phenomenon allows you to reach voltage levels between input and output (poles) such as to allow sufficient current to pass through various uses.
The batteries are of various types depending on the elements that make up the batteries and the environment in which they are immersed.
There are open batteries and sealed batteries, the first one normally contain a liquid that constitutes the environment that favours the flow of electrons, such liquid is subject to consumption and therefore requires a periodic refill, while the latter normally have a solid environment and do not require any maintenance other than charging and cleaning that later will be described.
The main and interesting features of a battery are the difference in potential normally called voltage and the intensity of current flow commonly called amperage.
By inter acting an electrical user of various types between the two poles of the battery, the flow of energy that normally cannot flow between the two poles is exploited and it is possible to operate the connected equipment (electric motor, lamp, etc.).
The outer casing which contains both the batteries and the material which allows the exchange of electrons is of material plastic not attachable by the content elements that usually have or develop a certain level of chemical aggression (acidity).

TECHNICAL CHARACTERISTICS

NOMINAL CAPACITY:	**AH (C5) N**
OMINAL VOLTAGE:	**V**
ACID SOLUTION CONTENT:	**Lt.**

BATTERY USAGE

PRELIMINARY TECHNICAL NOTES

Lead-acid accumulators shall have a sufficient capacity to cover up, for about 8 hours, all service needs of the forklift or other electric vehicle.
To achieve a good life and maximum performance of a battery it is essential to follow the following tips.

REMEMBER THAT:

• When the battery is completely discharged, the electrodes suffer a general damage and it may happen that the voltage of some element drops below 1.70 olt with inevitable deterioration of the element itself.
• Batteries should discharge about 90% of their capacity in 5 hours, and the discharge limit can be established by controlling the electrolyte density and voltage, when the battery gives signs of reduced efficiency.
• Prolonged charging beyond what is necessary or carried out with an amperage greater than that required by the battery causes:
• Overheating of elements above 50°C, resulting in alteration of the internal insulation of the elements;
• Escape of active matter from the multitubular sheaths of positive plates and crumbling of the sheaths themselves.
• Insufficient charge produces:
- sulphation of electrodes (negative in particular);
- loss of capacity and consequent reduction of autonomy of the vehicle.
• It is essential that the charge is carried out by an automatic charger, suitable to provide a correct charge to avoid insufficient or excessive charges, which would cause the premature deterioration of the battery.
Before the use of the battery, brush the poles, put up and tighten the terminals respecting polarity, apply a thin layer of grease in order to protect the poles and connectors from a possible phenomenon of oxidation.

Check cleaning of the storage cell housing.
Gently place the battery in the accommodation fix and arrange the same in the manner provided by the manufacturer of the vehicle.

WARNINGS

Users are invited to comply with the safety standards represented on the accumulator:

- Do not smoke, keep away from open flames, keep away from sparks
- Use eye protection
- Keep away from children
- Warning: Presence of acid, possibility of corrosion
- Follow the operating instructions
- Attention: Explosive gas
- Use the following PPE


Glasses


Gloves


Shoes

PALLETIZING AND HANDLING

The batteries shall not be overturned and shall always be lifted by two persons, unless the weight exceeds 50 kg, through the appropriate handles.

WAREHOUSING

Charged batteries tend to lose part of their charge over time due to the phenomenon of self-discharge.
To limit this phenomenon it is advisable to store the batteries in dry environments, at temperature
between 15 and 30 degrees, it is also desirable to use racking or wooden platforms (it is good always keep the batteries raised from the ground).
After this period it is recommended to make a “refreshment recharge”.
If you need to keep charged batteries you must take some precautions such as :

- The periodic rotation of the warehouse;

- Monthly monitoring of battery density and charging of those with density below 1.240 Kg/l.

CHARGE: The charge shall be carried out with direct current only. Connect the battery to its properly chosen charger avoiding overload of contacts and connecting cables, improper gasification and leakage of the electrolyte from the elements. If the charger was purchased separately from the battery have it checked by the Service Department of the battery manufacturer to check its suitability. During the charge, the environment must be properly ventilated so that the gases produced are eliminated. The cover of the battery compartment or the body must remain open. The caps of the elements must remain closed. Connect the battery to the charger respecting polarities and turn on the battery charger. During the charge the electrolyte's temperature increases by about 10°C, you can start to charge the accumulator only if the temperature does not exceed 45ºC (in the same way the charge must start with temperatures above 10º C, the result due to lower temperatures create insufficient charges).

EQUALIZATION CHARGE: The equalization charges are carried out to maintain over time the capacity of the battery. Discharges and recharge incompletely and repeat the process. During the equalization charge control the temperature.

DISCHARGE: To ensure a good battery life it is necessary that the battery itself is not discharged below 80% of the nominal capacity. Empty batteries (including partially discharged batteries) must be charged immediately.

TEMPERATURE: The electrolyte reference temperature is 30º C, if the temperature is higher, it will reduce the life of the accumulator contrary if it is lower it will reduce the capacity available. The maximum acceptable temperature is 55º C, not tolerable as operating temperatures.

ELECTROLYTE: The specific gravity and the level of the electrolyte are referred to the temperature of 30º C and fully charged battery. Higher temperatures reduce the specific weight, lower temperatures increase it.

CHARGE: In order to verify the state of charge of an accumulator it is necessary to carry out some controls:

- Verify the battery voltage;
- Check the battery density

A charged battery verifies the following specifications:

- Voltage between xx V and yy V
- Electrolyte density of all individual elements at least 1.280 Kg/l at a temperature between 20°C and 25°C.

The density of the electrolyte is the best indicator of the state of charge of the battery.
For example:
-If all elements have density lower than 1.210 Kg/l the battery is totally discharged and has need a recharge of at least of 24h;
-If all elements have a density greater than 1.210 Kg/l the battery is slightly low, it is however, charge it for 24h but with a lower charging current.

MAINTENANCE AND CLEANING

Daily Maintenance: Recharge the battery after every discharge. At the end of the charge check the level of the electrolyte and if it is necessary restore it with distilled or demineralized water.

Weekly Maintenance: Provide a visual inspection of the battery after the charge, removing any accumulated dirt. Check all battery components with special attention to cables and plugs.

Monthly Maintenance: when the battery is charge and disconnected from the charger, detect battery voltages and individual elements; also detect the density and temperature of the individual elements. In case there are significant variations compared to the last registration, ask for assistance.

SIMPLE OPERATIONS TO MANTEIN THE BATTERY:

Top up the elements with distilled water, when the electrolyte is no longer visible from the lid. The frequency of refills depends on many causes: the amount of work and charge to which the battery is subject, temperature, state of the breather caps, etc.
Refilling shall be stopped when the liquid reaches a level approximately 40 mm from the upper deck of the cover nozzle. At the end of the topping operation all elements should have the electrolyte at the same level. Measure occasionally the electrolyte density, and possibly the tension of each element. Also check the charger, so that the regularity of the charge is assured.
-Do not neglect cleaning to avoid dispersion, corrosion, etc.: Lids, connections, container and box edges should be kept clean and dry, using wet brushes in distilled water and rags

- Do not grease the connections, but only the ends with pure vaseline or neutral fats. In case of formation of oxide on the sockets or on the edges of the cases, this must be dissolved or eliminated with distilled water..

BFS AUTOMATIC TOPPING UP SYSTEM

The automatic refill system bfs allows to maintain the level of the electrolyte. The float, connected to a valve, controls the flow of water during refilling. When the water reaches the right level, the float (rising) will allow the valve to close. Topping up takes place when the tank is connected with the battery. The time of filling depends on the battery usage and on the corresponding temperature. The required pressure (from 0,2 to 0,6 bar) is obtained by placing the tank at a difference in height of 2 meters above the surface of the battery. Different pressure will result in incorrect refilling. The water used must be demineralized suitable for batteries. During the topping up, the flow of water into the battery must be controlled through a flow meter inserted into the barrel that starts from the tank. During the filling the flow meter turns indicating the good operation. When the flow meter stops the filling, operation is terminated.

POSSIBLE PROBLEMS AND THEIR SOLUTIONS

Below you can find some issues that you might encounter using the Battery.
Some cases need simple resolution while others require the intervention of a technician or of the manufacturer.
Do not hesitate to contact us for any doubts. We are available to solve any problem.

IMPORTANT ENVIRONMENTAL SAFETY WARNINGS

The environmental policy of Futura Batterie limits the use of polluting material to the minimum (lead, solvents, etc.). According to current Community legislation, it is necessary to dispose of the battery in accordance with local regulations on the disposal of electrical and electronic waste.
There is no reason to abandon the product in the environment: action criminally punishable, as well as source of long-term pollution.
In the house of further doubts about the disposal, contact Futura Batterie srl.