VRLA Battery Usage Guidelines

Valve Regulated Lead Acid Batteries, commonly known as VRLA. In order to ensure the safe operation of our VRLA batteries, correct and accurate procedures must be employed. All individuals who work with VRLA must be made aware of the Dangers, Warnings, Attentions and Suggestions, for proper use of our batteries in order to avoid accidents and injuries. Please read this document thoroughly and retain it for reference in case it is needed in an emergency situation. Our VRLA batteries contain high density energy. Incorrect operation can cause explosion, leaking acid, as well as extreme heat. Those situations can cause harm to an individual who has not read and understood this document.

VRLA BATTERY DANGERS:
Means extreme danger, will cause a serious injury, even death under improper usage.

(1) Do not seal the battery inside of any machinery. Please make sure that the battery is well ventilated. Placing the battery in an hermetically sealed space can cause the battery to explode causing damage to the machinery or extreme personal injury.

(2) Do not place the battery in a hermetically sealed space that is closed or close to any source of heat or flame. This could cause the battery to ignite or even explode.

(3) All connection cables should be well insulated and not able to short electrically. If the cables do cause an electrical short, that may cause smoke or the battery to cause a large destructive fire.

(4) Do not use any metal such as steel wire brush to connect or clean the terminals. Be careful not to drop any personal jewelry, hair pins or any other metallic objects when servicing the batteries. Metal objects can cause an electrical short which can be a source of leaking, heat or a destructive fire.

VRLA BATTERY WARNINGS:
Means urgent danger, causing the possibility of death or serious injury is less likely; can possibly cause light injury or facility damage under faulty operation.

(1) Always use the proper charger and the charging regulations set by CSB Battery. Not following our guidelines and procedures, or using non-approved charging procedures, can cause the battery to leak acid, heat up, or cause a destructive fire.

(2) When our batteries are used for medical applications, please be aware of the possibility that the battery could fail. Back-up units should be in place to prevent injuries.

(3) The container cannot come in contact with metal products. Please use insulated material that has acid and heat resisting characteristics to be the battery container. Not using insulated materials may cause fire or an explosion by leaking.

(4) Do not install batteries close to any location where a spark may occur such as a switch or a fuse. Sparks may cause fire or an explosion.
Always wear insulated gloves during any battery servicing activities, otherwise you could get an electrical shock.

Do not install a battery in a high traffic area without adequately protecting the battery. Not doing so could cause an electrical shock or fire in case the battery is disturbed or dislodged.

Do not burn the battery or throw it into a fire. Doing so may cause the battery to explode and toxic gas to be released.

Do not disassemble, reassemble or destroy the battery. Doing so could cause the acid inside the battery to leak and cause severe burns or other accidents.

Do not use any dry fabric or other materials to clean the battery that could cause static electricity. Always use a damp cloth that has had the moisture wrung out of it.

The battery should be replaced before the expiration date. Upon installation a log of expiration dates should be kept in a handbook or on front of the machinery.

- When the battery’s performance has only 50% left at 25°C, the battery should be replaced. The battery's life will curtail one half with a raise of each 10°C in temperature. If the discharging current is higher than 0.25CA, the battery's life will be shortened.
- When the battery approaches the end of its life, its performance will decrease very fast. The internal exhausted electrolyte and the corrosion of the positive plate may cause a failure. If the battery continues in operation under these conditions, there could be extreme heat, leaking of even explosion.

There is sulfuric acid inside of the battery. Please use water if skin or clothes become contaminated by the acid. If acid gets into your eyes, use ample clean fresh water to flush your eyes and seek immediate medical attention.

ATTENTION:
Means ordinary danger, the chance for serious injury is less. However, light injury or facility damage could be possible with faulty operation.

- The standard operating temperature for our batteries is 5-35°C (41-95°F). Usage outside this range will cause damage to the battery.
- Our batteries cannot be used beside any heat source such as a transformer.
- Do not let water or sea water wet or soak our batteries.
- Do not leave one of our batteries inside an automobile or any other place with strong sunlight.
- Do not place our batteries in areas where there is a lot of powder residue. The powder could cause a short in the battery.
- When using our batteries in a series, connections should be made between the batteries before charging or placing the series under a load. Remember, the positive terminal of the battery must connect to the positive side of the charger or the load. The negative terminal of the battery must connect to the negative side of the charge or load. Otherwise an explosion may occur causing personnel or equipment damage.
- Be careful when handling batteries or taking them out of their racks or storage units. Please wear protective footwear when handling our batteries.
(8) When unpacking our batteries from their shipping container, be careful when removing them so as not to drop them. If dropped, their container could crack and cause sulfuric acid to leak out.

(9) Placing our batteries upside down could cause sulfuric acid to leak out.

(10) Do not grab the battery terminal or cable to shift its position. Doing so could cause damage to the battery or electrical shock.

(11) Be careful not to let a battery fall. A dropped battery could cause a crack in its container and sulfuric acid could leak out.

(12) Some of the models of our batteries are very heavy, please carry or transport them correctly to prevent an occupational injury.

(13) Please do not use any type of organic solvent to clean our batteries, and never use chemicals on the battery, for any other purpose. Otherwise the container or cover may develop cracks. If you need to use any chemical on the battery, please contact us for more information.

(14) Always release any static electricity buildup on your body before touching or servicing our batteries to prevent sparks.

(15) Do not use plastic sheets to cover our batteries. Removing a plastic sheet could cause a static electricity build up and sparks could occur.

(16) Please use the connection screws that we provide to avoid possible sparks.

(17) Please use insulated materials to cover the terminal and connector in order to avoid possible sparks and shorts.

(18) For electric mobility, bikes or lawn mowers where the equipment might have vibrations during usage, please be sure that our batteries are firmly anchored to avoid damage or shorting of the terminals.

(19) Please terminate all switches between the battery, load or charger before making any connections.

(20) Do not use the battery out of its application usage range. Doing so may cause leaking, heat or fire.

(21) If there is an observed unusual situation of charging voltage or discharge characteristics, please replace the battery.

(22) Please follow the list below to ensure proper battery safety. A failure to do so could cause a battery to leak, radiate heat or cause an explosion.

  ✓ Ensure that there is a correct connection between the battery and the charger; do not reverse the terminal connection.
  ✓ Do not weld directly on the terminal.
  ✓ Do not mix different brands, models, or date codes of batteries.
  ✓ Do not dismantle any part of the battery assembly.
  ✓ Do not throw the battery or hit it with any type of instrument.

(23) Do not charge the battery over the recommended charging time, otherwise the battery could leak, radiate heat, or even explode.

(24) Our batteries should be placed in a safe place out of reach from children. If our batteries are the power source for a toy that a child uses, they should be supervised and instructed in the proper operation, charging and usage of the battery.

(25) Our batteries are constructed with a negative plate absorption system. This means the oxygen from the positive plate will be absorbed by the negative plate. In the first 12 months of usage, the float charge voltage may be out of the
standard value. This is normal for this type of battery.

(26) If there is an unexpected electrolyte (sulfuric acid) spill or leakage, immediately neutralize the spill with sodium carbonate then wipe it up. If the spill is not neutralized, there could be corrosion on the floor or equipment.

(27) If a battery catches on fire, please use a proper powder charged fire extinguisher. Do not ever use a water based fire extinguisher.

(28) After an earthquake, please check the tightness or each connection to avoid spark.

(29) After an earthquake, please inspect each battery container to make sure that there are no cracks or leaks. If you notice an unusual situation, immediately terminate the operation of the equipment to ensure the safety of all personnel and equipment.

VRLA BATTERY SUGGESTIONS:
Means unsuitable usage will affect the quality and performance of the battery.

(1) Please make sure that the battery is properly stabilized. A strong impact can affect the battery's performance.

(2) Battery life should be verified by actual loading conditions as well as by different charging/discharging conditions.

(3) Battery installation should only be done by trained and qualified personnel.

(4) For the initial use or if a battery has been stored for a long period of time, please recharge the battery fully before putting it into service. A battery's performance will reduce automatically by self discharge.

(5) If a battery is stored for more than 3 months, we suggest a recharge before the battery is put into service. When storing a VRLA battery, a recharge should be repeated every 3 months.

(6) Do not let a VRLA battery discharge to a voltage lower than its suggested final voltage. Doing so will affect the battery's performance.

(7) Do not over-discharge a VRLA battery. After discharge immediately recharge a battery.

(8) Use the right charging/discharging settings to ensure the battery's quality and performance.

(9) Shut down the main switch of any equipment that the VRLA battery is connected to after usage otherwise an over discharge state may occur.

(10) If the equipment will not be in use for a long period, please remove the battery from the equipment and store in a dry area.

(11) If the environmental temperature increases by 10°C, the recharging time must be decreased by one half. If a battery is stored under 35°C, it should be recharged every 11/2 months instead of every 3 months.

(12) If a battery is stored for more than a year without any recharging activity, the battery's life will be worth less than the original specifications.

(13) VRLA battery inventories should be rotated to ensure that batteries pulled out of storage are fresh and ready to use. After a long period of storage, without a regular recharging program, a battery's performance may not come back to specified capacity.