

The purpose of this instruction set is to assist Veloteq customers who are experiencing problems with battery power storage. It is provided as a public service and does not subject Veloteq to liability of any kind.

How to Restore and Prolong Sealed Lead Acid Batteries

The SLA is designed with a low over-voltage potential to prohibit the battery from reaching its gas-generating potential during charge. Excess charging would cause gassing and water depletion. Consequently, the SLA can never be charged to its full potential.

Finding the ideal charge voltage limit for a sealed lead acid system is critical. Any voltage level is a compromise. A high voltage limit produces good battery performance, but shortens the service life due to grid corrosion on the positive plate. The corrosion is permanent and cannot be reversed. A low voltage preserves the electrolyte and allows charging under a wide temperature range, but is subject to sulfation on the negative plate.

Once the SLA battery has lost capacity due to sulfation regaining its performance is often difficult and time consuming. Reasonably good results in regaining lost capacity are achieved by applying a charge on top of a charge. This is done by fully charging an SLA battery, then removing it for a 24 to 48 hour rest period and applying a charge again. This is repeated several times, and then the capacity of the battery is checked with a full discharge. The SLA is able to accept some overcharge, however, too long an overcharge could harm the battery due to corrosion and loss of electrolyte.

Applying an over-voltage charge of up to 2.50V/cell for one to two hours can reverse the effect of sulfation of the plastic SLA. During that time, the battery must be kept cool and careful observation is necessary. Extreme caution is required not to raise the cell pressure to venting point. Cell venting causes the membrane on some SLA to rupture permanently. Not only do the escaping gases deplete the electrolyte, they are also highly flammable!

Cells can be stored at voltages as low as 1.81V. Reactivation is relatively easily. However, when activating, the cell voltage under charge may initially raise up to 5V while absorbing only a small amount of current. Within about two hours, the small charging current converts the large sulfate crystals back into active material. The internal cell resistance decreases and the charge voltage eventually returns to normal. At a voltage between 2.10V and 2.40V, the cell is able to accept a normal charge.

To prevent damage, current limiting must be applied to protect the battery. Always set the current limit to the lowest practical setting. If current limiting is not available, the battery should be observed at all times. Not all cells allow restoration after prolonged low voltage storage.

Improving the capacity of an older SLA by cycling is mostly unsuccessful. Such a battery may simply be worn out. Cycling would just wear down the battery further. Unlike nickel-based batteries, the lead acid battery is not affected by memory.

SLA batteries are commonly rated at a 20-hour discharge. Even at such a slow rate, a capacity of 100 percent is difficult to obtain. For practical reasons, most battery analyzers use a 5-hour discharge when servicing SLA batteries. This typically produces 80 to 90 percent of the rated capacity. SLA batteries are normally overrated and manufacturers are aware of this.

Important: In case of rupture, leaking electrolyte or any other cause of exposure to the electrolyte, flush with water immediately. If eye exposure occurs, flush with water for 15 minutes and consult a physician immediately.