Thermal Imaging Batteries

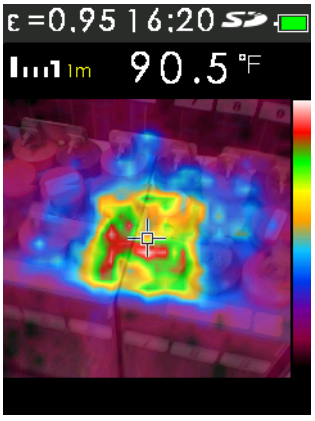
Thermal imaging locates hot spots by examining the IR spectrum.
Heat is the enemy of batteries. A rise of just 10°C will deplete the life of a battery by half. As molecules heat up, they move faster. This increases the rate of chemical reactions. This will increase the rate of oxidation that leads to corrosion. It will also increase the rate of dry out in VRLA batteries. Heating will reduce the life of any battery regardless of the chemistry.

Heating in batteries can be due to many things.
Overcharging can cause heating in batteries as well as excessive discharging and charging.
Bad connections can also cause heating affects.

A connection can be treated as a resistance. As current flows through the resistance there is a voltage drop across it with an associated heating effect. For example; if the connection resistance is 100μΩ and the current passing through it is 20A then the heat generated will be on the order of 0.002j. However if the connection resistance should increase to 10mΩ then the heat generated will be on the order of 0.2j. This is an increase of 100 times.

The elevated voltage drops across poor connections can also lead to low float voltages on some cells. This causes sulfation in those cells and leads to unbalanced strings.

A thermal Imager can locate hot spots.
When a battery measures high impedance, a thermal imager can be used to determine if the battery is running hot. If it is running hot, check that the float voltage is correct and that it is receiving adequate ventilation.
In tight locations where it is not possible to take inter-cell (strap) measurements, a thermal imager can be used to help identify poor connections. Please note that current will need to be flowing through the straps in order to create a significant heat differential. Therefore, this should be done during a discharge test.



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