

Preventing thermal runaway with Powerware® Cellwatch

Thermal runaway is the most dangerous and potentially catastrophic situation involving lead acid batteries. Thermal runaway occurs when the heat generated in a lead acid cell exceeds its ability to dissipate that heat, which can lead to an explosion, especially in sealed cells. Thermal runaway is caused by some internal or external influence that increases cell temperature in a way that causes a further increase in temperature, leading to explosion or fire.

The heat generated in the cell may be caused by overcharging, excessive discharging, internal physical damage, internal short circuit or a hot environment. With so many potential causes, it can be difficult to see the warning signs of thermal runaway and take preventive action. Powerware Cellwatch is a battery monitoring system that is uniquely suited to finding the causes and symptoms of thermal runaway before damage is caused.

Cellwatch monitors every jar or cell in the battery system for signs of failure, excessive heating or other situations that are outside normal operating conditions. By providing critical information about what is happening inside each individual cell, Cellwatch will generate alarms for quick response to a failing situation.

Cellwatch can detect many of the prime causes of failure, internal or external, that would cause thermal runaway. Three alarms generated by Cellwatch are specific to preventing thermal runaway:

Voltage alarms

Cellwatch voltage alarm parameters detect overcharging caused by rectifier problems or adjacent cell failure. They will also detect under voltage that may be indicative of an overheating cell in the early stages of a charger-caused thermal cycle.

Temperature alarms

Mounting Cellwatch temperature probes in the correct locations, at the top of the cabinets and on pilot cells will reduce the probability of thermal runaway by detecting when charger faults occur and overcharge all the cells in a battery.

Ohmic value alarm

Measurement of ohmic value is the best predictor of cell failure, and cell failure is one of a number of causes of thermal runaway. Changes in cell characteristics that cause thermal runaway that are detected by ohmic value alarms would include internal plate shorting and premature aging.

In addition to the alarms, Cellwatch offers graphical reporting that indicates other factors changing in the environment such as a faulty charger that could lead to battery thermal runaway. By providing at-a-glance status of the battery system and environment, Cellwatch provides a key look into the health of the entire system, as well as at an individual cell level.