Product Case Study: Battery System for Robotic Focused Opportunity Charging

Overview
A multi-billion dollar corporation is a global leader in providing logistic and material handling solutions. As the number of products produced and shipped around the world increases, this corporation continues to utilize its innovation in helping to provide unique solutions. One area of growth is through robotic or Automated Guided Vehicles (AGVs).

AGVs offer an innovative and flexible solution to today’s companies to help with improving throughput and the overall efficiency of their operations. AGVs can be utilized across a wide selection of operations including manufacturing, warehousing, and even basic transportation. As the control and intelligence of the AGVs continue to increase, so do their flexibility and capabilities. Also, unlike its human operated counterparts, the AGV vehicle can operate 24 hours in adverse conditions as needed.

One of the common uses for the corporation’s AGV systems is to provide automated handling of products in warehouses through an “on-demand” requirement. The AGVs will handle moving products through the warehouse as orders are received. The on-demand operations proceed continuously 24 hours / 7 days a week.

The on-demand operation often only provides short periods of time for opportunity charging. With older Lead Acid batteries such short high power opportunity charging lead to poor performance and reduced battery life. One of the main causes of this effect is inadequate time for battery equalization. In addition, the high current required by opportunity charging drove larger lead acid batteries to try and help compensate the limited charging capabilities. The lead acid batteries were impeding the corporation’s AGV systems from progressing into operations requiring higher efficiencies.

Lithium SafeFlex Solution
Green Cubes Technology (GCT) produces many different power solutions and continually focuses on improving efficiencies. The high efficient nature of lithium battery systems was a great match for the logistics/material-handling corporation’s next generation of AGVs.

GCT provides motive power LithiumSafeFlex battery systems based upon their operating requirements. The GCT engineering team will study the specific use cases and power operating conditions to determine an optimal solution for the end product. The goal and focus is always to help provide a solution to improve overall efficiency but also focus on costs.

The newer AGVs require a battery to be capable of short and frequent charges. In order to work with such conditions, a battery chemistry must be chosen that has a high charge efficiency. GCT engineers selected Lithium Iron Phosphate (LFP) which has a charge efficiency of 98-99%. In addition, the LFP chemistry can accept high power charges so the battery can be effectively charged in a short time period.

In addition to selecting the correct lithium technology, GCT incorporates its in-house designed Battery Management Systems (BMS). The short and frequent charge and discharge periods must be properly balanced and gauged in order to provide the AGV with long cycle life and accurate gas gauging.

GCT provides Lithium SafeFlex battery systems to the logistics/material-handling corporation to help ensure their next generation AGVs are among the world’s most efficient and effective in the market today.

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