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WHITE PAPER

Energy Management for Material Handling Equipment

The cost for operating equipment in manufacturing facilities and distribution centers is an ongoing cost that requires a substantial commitment in electrical power. In the general scheme of things, if energy can be saved, it reduces cost due to reduced power requirements and ultimately fewer natural resources will generate the power. Whether it is a new or existing facility, power consumption can be considerable. To this end, companies can reduce electrical demand by upgrading to energy-efficient equipment and incorporating best management practices.

Challenge

Many manufacturing and distribution facilities are extremely large and house material handling systems that handle varying sizes and weights of containers or products. An individual conveyor belt can be as long as 300 feet, and the total length of a single facility's conveyor system could measure five to six miles. Managing and maintaining this equipment can be a challenge.

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Facility engineering teams are always looking for new ways to improve their performance in order to keep equipment running smoothly and efficiently. For example, depending on the complexity of the facilities conveyor system, it could account for as much as 50% of a facility's electrical load. Because of these systems' huge use of electricity, it is a natural target for improving efficiency and saving energy.

Solutions

To reduce power consumption while maintaining performance, you can use some of the following solutions:

- 1. PLC system control utilizing existing photo-eyes.**
An internal timer can be set that says if a product or carton is not seen in a 10 minute window of time the conveyor will shut off until activity on the conveyor resumes.
- 2. Retrofit existing conveyor motors with highly efficient, variable-speed motors that complement the PLC system by the variable-speed motors.** This includes a "soft-start" feature that reduces the mechanical shock to the conveyor belts when restarting, significantly cutting maintenance costs. In addition, the "soft start" alleviates the motors' high draw of electrical current during a restart.
- 3. Induction loads, in particular where motors and transformers are found, along with other devices such as a variable frequency drive, can use supplied power inefficiently.** By correcting the power factor with capacitors, a utility company will not have the opportunity to impose power factor penalties.



Solutions (cont.)

Additionally, some secondary gains can be seen from energy management practices. They are as follows:

- A reduction in noise levels.
- Reduced wear and tear on the system equipment.
- Maintenance is minimized due to a reduction in run-time hours.

What Can be Gained?

One example would be the replacement of conveyor motors along with the implementation of a sensor-based automated energy management system. A company could anticipate a project of this magnitude to reduce energy consumption by as much as 80%. Of course, this may vary depending on the complexity of the system. In the end however, substantial dollars in annual energy costs can be realized.

Another potential opportunity is working with your local utility company on a potential rebate for a reduced peak-load demand. Some utility companies offer these incentives because it minimizes the load on power supplied by the local power plant. Utility companies policies on these types of programs may vary from state to state so be sure to inquire about any potential programs that may exist.

Conclusion

Both manufacturing and distribution industries have many energy-saving opportunities. Intelligent motor control solutions, including high-efficiency variable-frequency drives (VFD) are an important part of an energy efficiency program to optimize equipment and processes and reduce electric energy bills.

Careful evaluation of your facility, your application(s) and the different products available to you are the keys to investing well. Look for drives that use intelligent motor control through advanced technological features, including regeneration, synchronous bypass, and transformer less options, software and communications to optimize energy consumption. Making the right decisions can result in significant returns.

The right energy management solutions — like those described above — are investment strategies for long-term reduced operating costs that have typically provided users payback within one to three years.

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